Site Permit Application
For A Large Wind Energy Conversion System

enXco Wind Power Plant

Prepared for

enXco, inc.

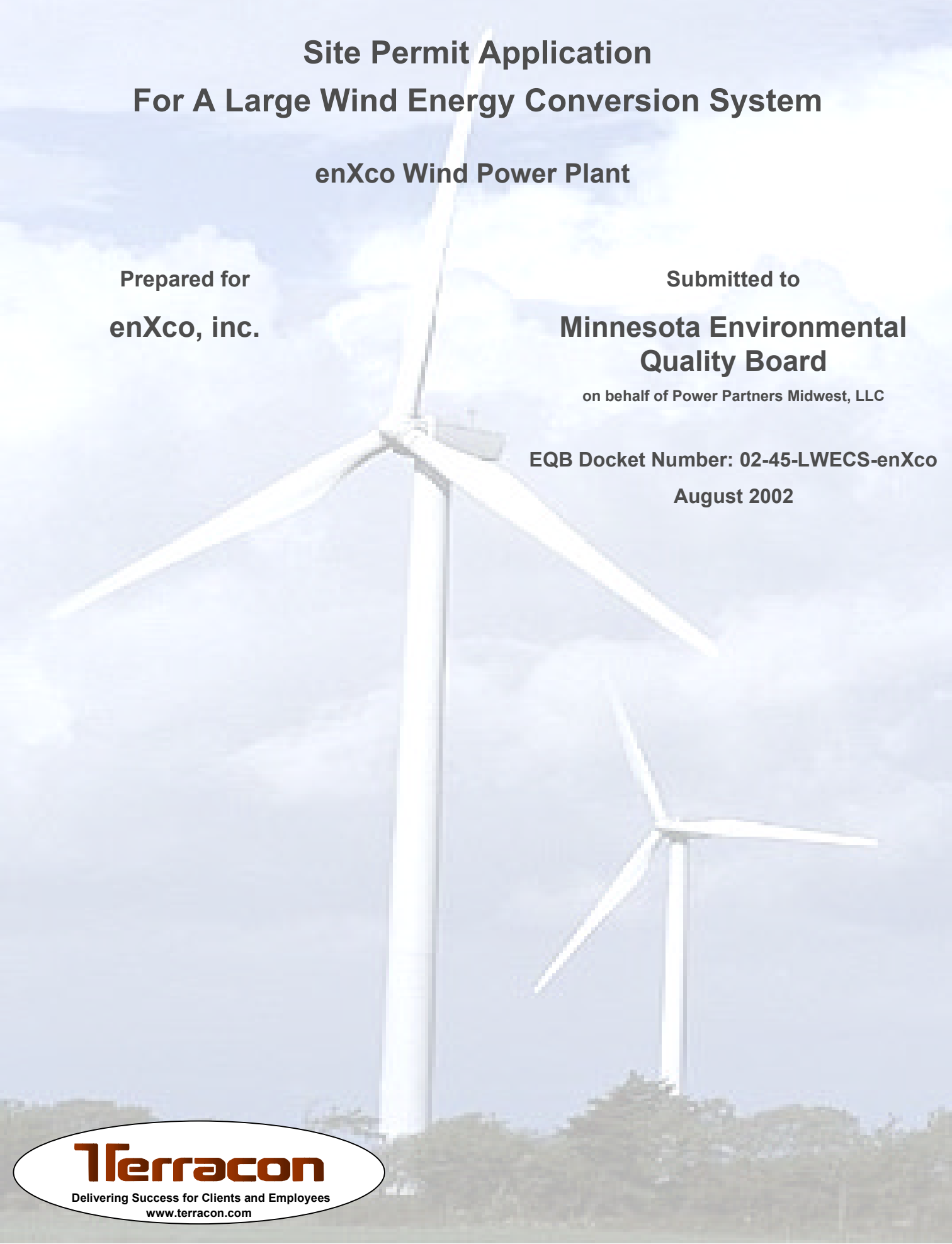
Submitted to

Minnesota Environmental Quality Board

on behalf of Power Partners Midwest, LLC

EQB Docket Number: 02-45-LWECS-enXco

August 2002



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A. INTRODUCTION

1. Overview

enXco, inc. (enXco), sole member and manager of Power Partners Midwest, LLC (PPM, LLC) is submitting this application to the Minnesota Environmental Quality Board (MEQB) for a Site Permit to construct up to 87 megawatts (MW) of nameplate wind power generating capacity (the "Development"). PPM, LLC was formed in July 2001 as a holding company to consolidate development assets. The total Development will consist of several wind Projects. Each Project will sell wind-generated electricity to a purchasing utility under a long-term purchase agreement. At least two separate utilities will purchase power from Projects within the Development. The projects to be built include a 24 MW project for Great River Energy and a 54 MW project for Xcel Energy. Three under 5 MW projects, anticipated for Xcel Energy, are also planned in the Development site. It is anticipated that the projects will employ a GE Wind Energy 1.5 MW turbine (or a turbine similar in specifications) and associated power collection systems, including power collection lines, and pad-mounted step-up transformers.

Available wind monitoring data indicates that the best wind resource in Minnesota occurs on Buffalo Ridge in southwestern Minnesota (Figure 1). The Development site identified in this application is located in Pipestone and Murray Counties (Figure 2).

2. Development Summary

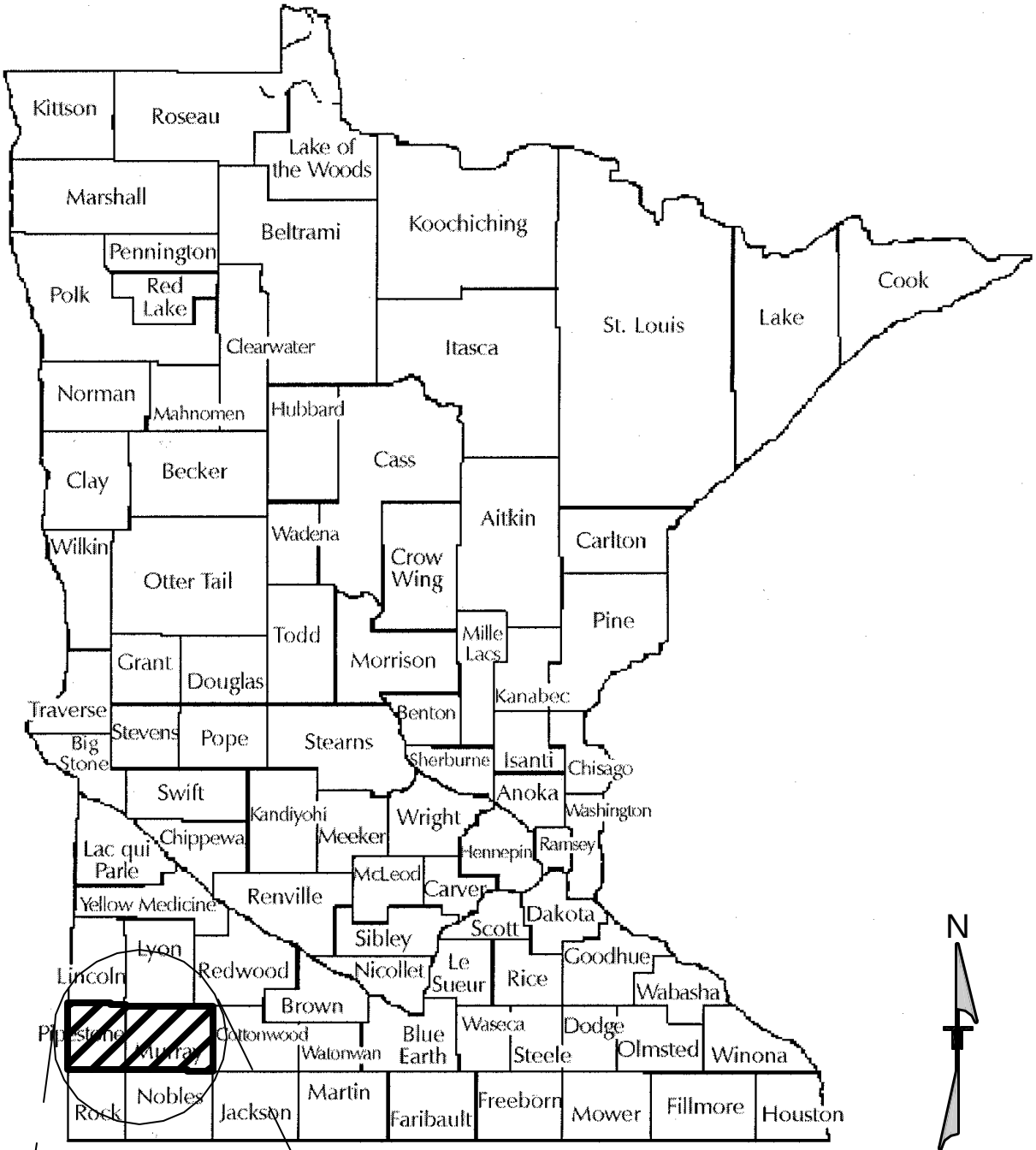
Development Description

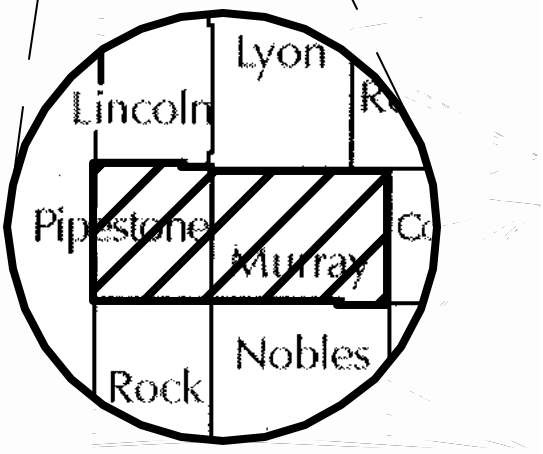
enXco proposes to own, finance, construct, operate, maintain, and manage the Development near the towns of Woodstock and Lake Wilson, Minnesota. The Development is anticipated to utilize GE 1.5 MW wind turbines (or a turbine similar in specifications). Based on the recent acquisition of Enron Wind Corporation by GE Power Systems to form the new GE Wind Energy, the specifications for the GE 1.5 MW wind turbines were not available at the time of drafting this application. The turbine documentation information is from Enron Wind.

The Development will be nominally rated at up to a maximum 87 MW and will consist of up to 58 units of 1.5 MW wind turbines and associated power collection systems, including power collection lines, and pad-mounted step-up transformers. The 1.5 MW wind turbines will be mounted atop free-standing tubular towers. The towers will be 65 to 80 meters (213 to 262 feet) in height. The blades on the wind turbine are 35 meters (115 feet) long, resulting in a maximum overall height of the wind turbines of 100 to 115 meters (328 to 377 feet) when one blade is in the vertical position. The rotor diameter will be 70.5 meters (231 feet).

Certificate of Need

All power sales agreements for the Development will result from either Xcel Energy's Wind Mandate or All Source Solicitation, or are less than 50 MW in total nameplate capacity. Therefore, pursuant to Minnesota Statute 216B, a Certificate of Need will not be required prior to receiving a site permit from the MEQB.





LEGEND:

PROJECT COUNTY

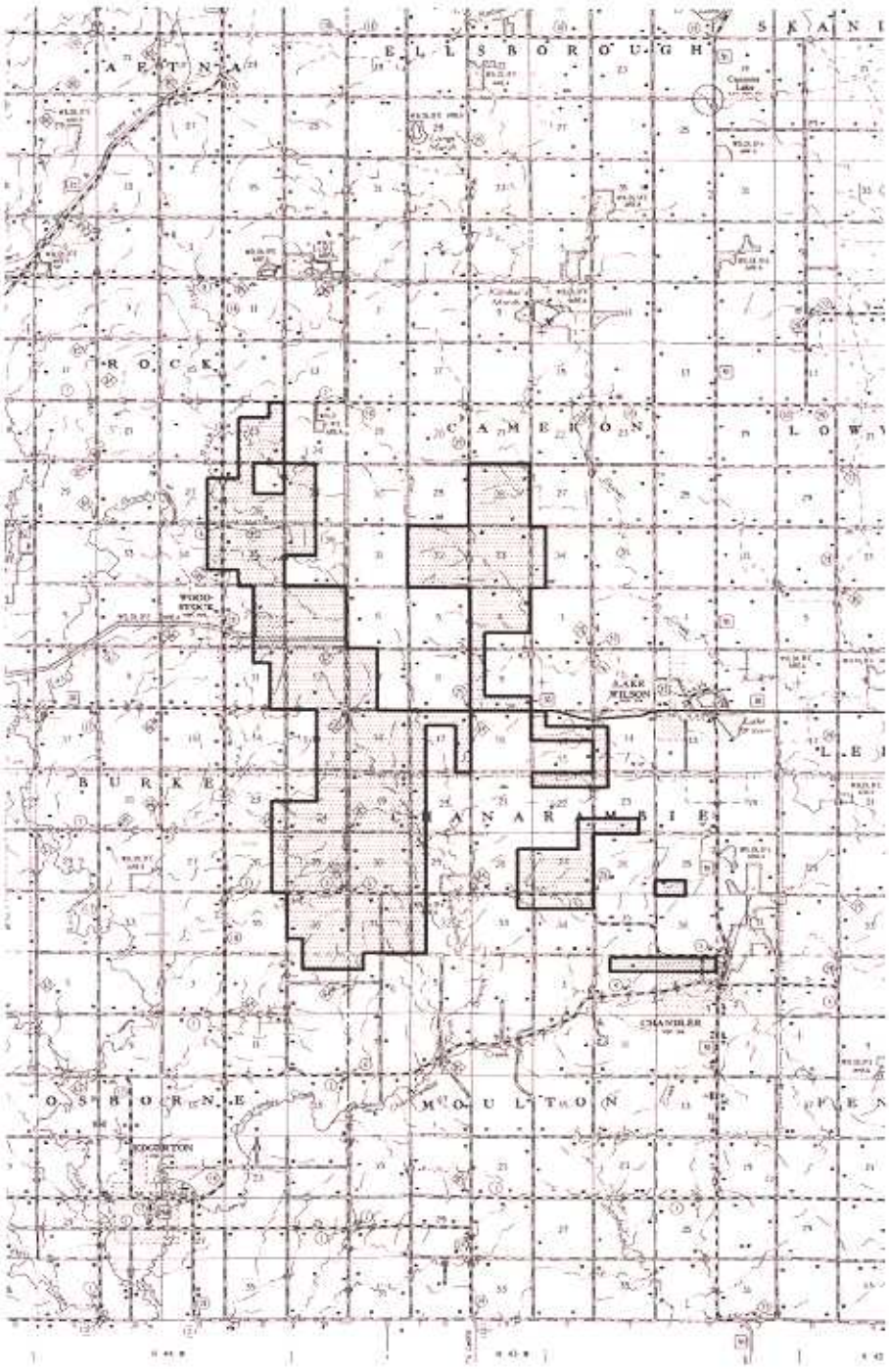
GENERAL VICINITY MAP

enXco WIND POWER PLANT

PIPESTONE / MURRAY COUNTIES, MN

Project Mngr:	MMF	Terracon	Project No. 41017725
Designed By:	JLM		Scale: NO SCALE
Checked By:	MMF	9535 Hoffman Road East White Bear Lake, MN 55110	Date: JULY 2002
Approved By:	JLM		Drawn By: BMS (41)
File Name:	41017725-gv.dwg	Layout1	Figure No. 1

DIAGRAM IS FOR GENERAL LOCATION ONLY,
AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES



N

PROJECT VICINITY MAP

enXco WIND POWER PLANT

PIPESTONE / MURRAY COUNTIES, MN

Project Mngr:	MMF	Terracon	Project No. 41017725
Designed By:	JLM		Scale: AS SHOWN
Checked By:	JLM	3535 Hoffman Road East White Bear Lake, MN 55110	Date: JULY 2000
Approved By:	MMF		Drawn By: BMS (41)
File Name:	41017725.dwg	Layout1	Figure No. 2

GRAPHICS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Proposed Site

The proposed Development site is located in Pipestone and Murray Counties, Minnesota, near the towns of Woodstock and Lake Wilson. The Development site is within six townships, Rock (T107N, R44W); Burke (T106N, R44W); Cameron (T107N, R43W); Chanarambie (T106N, R43W); Osborne (T105, R44W); and Moulton (T105, R43W) where enXco has obtained lease options or rights to easement options. All turbines will be sited within the Development site boundary. The total Development site area including the wind plants and land easements is approximately 18,990 acres. The total Development consists of approximately 24.83 acres. Additional land has been included in the site permit application to account for uncertainties resulting from possible unavailability of land rights controlled by GE Wind Energy.

The proposed Development site runs roughly north to south along the outside of NSP's Phase IV wind power plant project in Murray County. The Development site is designed to make use of remaining wind resource in the vicinity of Chanarambie substation but to allow design engineers flexibility to design the Development in the most efficient manner, thus to ensure orderly development of wind resources in this region of Minnesota.

The Development site exhibits high relative elevation to the surrounding land areas and excellent wind exposure for optimum energy capture. An extensive wind resource assessment has been performed by enXco in the proposed Development site area as well as surrounding areas and monitoring continues to increase knowledge of the local wind resource both at a regional level and a micro level.

Figure 3 is a detailed map showing the Development site area including the topography of the Buffalo Ridge area, bodies of water, section numbers, county boundaries, existing roads, railroads, other infrastructure, residences (with 500 to 1,000 foot setbacks noted), wooded areas, Development site boundaries, and layout of the proposed Development with approximate locations of the 1.5 MW wind turbines. Turbines and access road locations are subject to change or relocation.

Projected Output

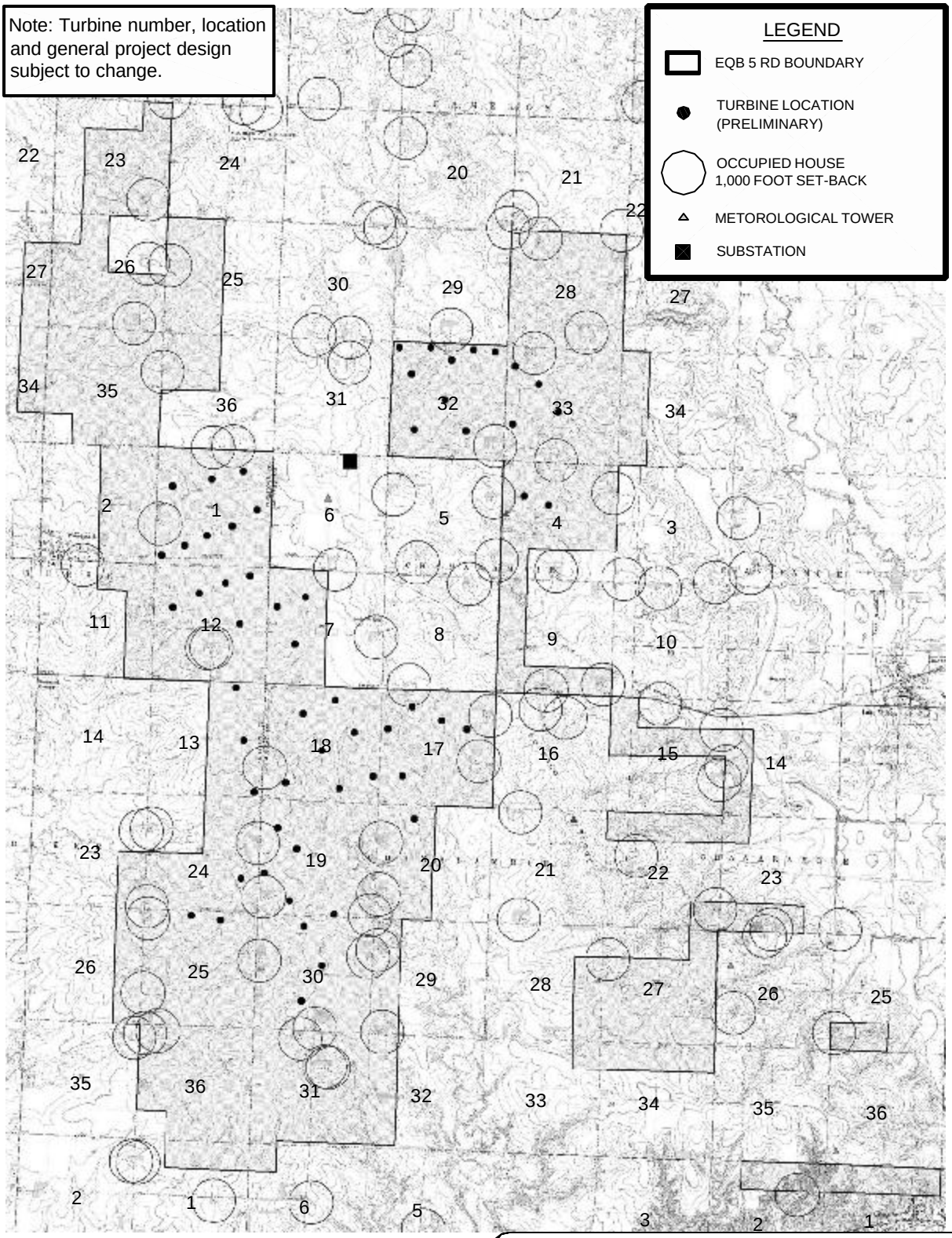
Under estimated average wind conditions in the Development site, the up to 87 MW of generating capacity will deliver approximately 270,000 MWh per year.

Siting Plan

The Development site is located in southwestern Minnesota along the higher land areas of the Buffalo Ridge near the towns of Woodstock and Lake Wilson. enXco has explored and monitored multiple prospective wind sites in the regions of southwestern Minnesota and eastern South Dakota and have run rigorous comparisons to select the site which offers the optimum advantages in terms of the available wind resource and ability to deliver power directly to the Chanarambie substation.

The wind turbine siting plan is designed to meet the substantive criteria set

Note: Turbine number, location and general project design subject to change.



N

PROJECT SITE MAP

enXco WIND POWER PLANT

PIPESTONE / MURRAY COUNTIES, MN
enXco

Project Mngr:	JLM	Project No.	41017725
Designed By:	JLM	Scale:	NO SCALE
Checked By:	MMF	Date:	05/14/02
Approved By:	JLM	Drawn By:	BMS (41)
File Name:	41017725sm.dwg Layout1	Figure No.	3

Terracon
3535 Hoffman Road East
White Bear Lake, MN 55110

DRAWINGS PROVIDED BY enXco
DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

forth in Minn. Statute 116C.57, subd. 4. Spacing between the wind turbines is approximately 4 to 5 rotor diameters (RD). Spacing between wind turbine strings is approximately 7 to 8 RD. Extra land is available in the Development site to provide flexibility in final turbine placement.

The turbines will be placed using a 500 to 1,000 foot minimum setback from occupied residences as is shown in the turbine layout in this application. The turbine setbacks from public roads will be 250 feet. Turbines will not be located in wildlife management areas (WMAs), scientific and natural areas (SNAs), or Class 3, 4, or 5 wetlands.

It is a wind industry standard to setback wind turbines from occupied homes a minimum of 1,000 feet. enXco engineers will attempt to maintain a minimum 1,000 foot setback, which is greater than the minimum of 500 feet that is required by the MEQB Site Permit.

Establishing the 500 to 1,000 foot setback from homes allows for greater public acceptance within the Development site. enXco strives to create positive working relationships with homeowners within the Development site and feels the increased setback contributes to this.

Commercial Operation Date

The Development is anticipated to be fully commercially operational by November 2003.

Operations and Maintenance

enXco or an affiliated company, will be responsible for the operation and maintenance of the Development for the life of the project(s), which is anticipated to be a minimum of 20 to 30 years.

Site Control

As of the date of this application, enXco has obtained lease and easement agreements and/or rights to such agreements with landowners for all land within the Development site that is required for the up to 87 MW Development.

Permits and Licenses

enXco will undertake all required environmental review and obtain all permits and licenses that are necessary but not covered by a Site Permit issued by the Minnesota Environmental Quality Board.

Development and Construction

enXco and/or its construction affiliate will perform or manage all development and construction activities. Specifically, enXco, and/or its construction affiliate will:

- Acquire land easements (completed)
- Install wind sensors (completed)
- Measure and analyze the wind resource and site wind turbines (partially completed)
- Undertake environmental review and obtain specific permits and licenses for the Development (partially completed)
- Perform civil engineering for construction of the Development, construct foundations, towers, install pad-mounted transformers, the power collection system and substation, assemble and install wind turbines
- Install the communication system, including supervisory control and data acquisition software and hardware
- Arrange project financing (completed)

3. Project Ownership

enXco proposes to own, finance, construct, operate, maintain, and manage the combined plants, totaling up to 87 MW of generation capacity. The Development will be designed, constructed, operated and managed by enXco with enXco's in house capability with staffing in North Palm Springs, California; Clear Lake, Iowa; and Minneapolis, Minnesota.

enXco will maintain ownership of the Development, but reserves the right to assign ownership to one or more investors or project entities. enXco also intends to maintain ownership of the NSP-4 Chanarambie Project and will merge the proposed Site Permit with the Chanarambie Site Permit to achieve a well-coordinated wind energy development area.

a. enXco

Since 1984, enXco has been one of the fastest growing companies in the wind energy industry. With more than 3,400 wind turbines in operation for various projects, enXco is one of the largest wind project service companies in the world. enXco has emerged an industry leader as a developer, manager, and/or owner of turbines with a worldwide energy capacity of over 750 MW.

enXco's team of professionals have completed extensive re-engineering and retrofitting programs on more than 700 technically troubled turbines. enXco has designed and retrofitted turbines for other wind turbine operators in California and has been awarded numerous operations and maintenance contracts from other developers. Having accumulated extensive technical expertise with various types of wind turbine technology, enXco prides itself as knowing what types of technology will and will not survive the test of time and climate conditions for a given application.

B. DEVELOPMENT DESCRIPTION

enXco is applying for a Site Permit pursuant to the EQB procedures as set forth in Minnesota Power Plant Siting Act, Minnesota Statue Section 116C.691-697, and Minnesota Rules Chapter 4401, for development of a wind power plant(s). The siting is to be made in a manner compatible with environmental preservation, sustainable development, and the efficient use of resources.

In submittal of this application, enXco has complied with the Statue and Rules.

1. Description of the 1.5 Windpower Technology

The 1.5 MW wind turbine is a three bladed, upwind, active yaw, and active aerodynamic control regulated wind turbine 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.

Each wind turbine is equipped with a wind direction sensor. The wind direction sensor communicates with the computer system, which evaluates the measured wind parameters, and within a specified time interval activates the yaw drives to align the nacelle to the wind direction.

Each 1.5 MW wind turbine generates output at 575 volts (V). The electricity then goes to a pad-mounted step-up transformer that raises the voltage from 575 V to 34.5 kilovolts (kV). The 34.5kV feeder lines from the Project collection system feed to one independent breaker position at the substation. The substation steps up the voltage from the collection system from 34.5kV to the transmission system level of 115kV. Revenue metering will occur at the point of delivery which will be at the 34.5kV side of this substation. Collection and feeder lines for the Development will be underground were reasonably possible; however, aboveground cable will be used in some areas of the Development where it is not feasible to use underground cable.

2. General Location

As described in more detail in Section C below, the Pipestone and Murray Counties Development site was selected based on topographic and wind resource considerations, combined with environmental factors reviewed in Section F. The overall location for the proposed wind plant(s) was selected based on several years of wind monitoring data and related research in Minnesota, specifically in the Buffalo Ridge area. The Development site is in close proximity to existing wind power plants and transmission lines northwest of Pipestone County on Buffalo Ridge.

The specific site boundaries (shown in Figure 2) were delineated to provide flexibility in the siting of the 1.5 MW wind turbine strings and to allow for an adequate buffer distance from residences, roads, and sensitive areas and to take into account wake from adjacent wind turbines.

3. Physical Description

The proposed 87 MW Development will consist of up to 58 wind turbines mounted atop free standing tubular towers. Figure 4 is a photograph of the 1.5 MW wind turbine that is anticipated to be used.

The Development has an associated power collection system, including power collection lines and pad-mounted step-up transformers. It will also include an automated supervisory control and data acquisition system (SCADA), including up to four permanent meteorological towers. Figure 5 is the Infrastructure and SCADA System Scheme.

The 1.5 MW utilizes a 3 bladed rotor with a blade length of 35 meters (115 feet) and a diameter of 70.5 meters (231 feet). The 1.5 MW has a full span variable pitch rotor system and a variable speed synchronous generator that combine to maximize power output and minimize mechanical strain and undesirable power fluctuations on the grid.

The 1.5 MW turbines will be mounted atop free standing tubular towers. The towers will be 65 to 80 meters (213 to 262 feet) in height, resulting in a maximum overall height of the wind turbines of 100 to 115 meters (328 to 377 feet) when one a blade is in the vertical position. The rotor diameter is 231 feet.

Each tower will be secured by a concrete foundation that will vary in size depending upon the soil conditions. At the base of the tower is a lockable steel door that provides access to the wind turbine control system.

Additionally, a pad-mounted transformer will be designated for each wind turbine to collect power from the turbines and transfer it to the electrical collection system via underground cables. Both power and communication cables are buried in trenches next to the project access roads on private property. Each wind turbine is accessible via all-weather gravel roads that follow the turbine strings to the nearest public road. The communication and power collection system continues underground to the substation.

4. Development Layout

Wind turbines are sited in clusters or strings along hilltops and ridgelines within the Development site boundaries. Individual, isolated turbine sites are avoided to minimize interconnect and access costs. The wind turbines are sited so as to have good exposure to winds from all directions, with emphasis on exposure to the prevailing southerly wind direction. Prevailing winds over the site terrain cause higher wind speeds on the downslopes of the ridgelines. Sufficient spacing between the turbines is utilized to minimize wake losses when the winds are blowing parallel to the turbine rows.

Almost all of the turbine sites are above 1,800 feet in elevation and are considered prime wind locations by enXco's consulting meteorologists. The turbine strings are typically oriented west-northwest to east-southeast, which is roughly perpendicular to the prevailing south winds. The turbine strings are typically spaced about 7 to 8 rotor diameters apart. Greater or lesser spacing between the turbine strings was used in areas where terrain dictated the spacing. The turbines have been spaced approximately 4 to 5 rotor diameters apart within the rows. Setbacks from

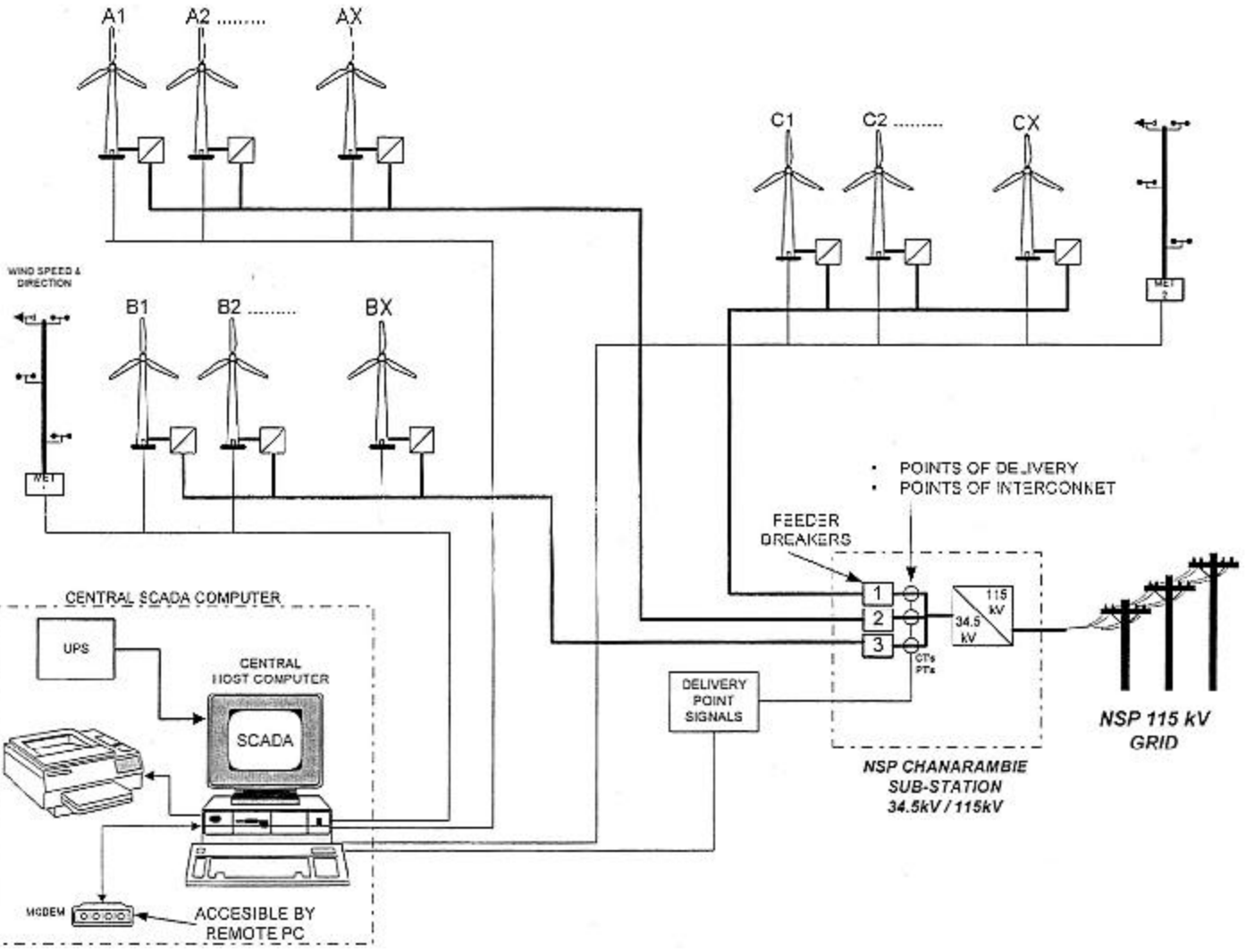
EW 1.5 MW WIND TURBINE NACELLE AND ROTOR

ARRAY OF EW 1.5 MW WIND TURBINES
(LAYOUT AND TERRAIN SIMILAR TO CHANARAMBIE WIND POWER PLANT)

PICTURE OF 1.5 MW WIND TURBINE
enXco WIND POWER PLANT

PIPESTONE / MURRAY COUNTIES, MN

Project Mngr: MMF	Terracon		Project No. 41017725
Designed By: JLM			Scale: NO SCALE
Checked By: JLM	3535 Hoffman Road East White Bear Lake, Minnesota		Date: JULY 2002
Approved By: MMF			Drawn By: BMS
File Name: 41017725wt.dwg			Figure No. 4



INFRASTRUCTURE AND SCADA SYSTEM SCHEME

enXco WIND POWER PLANT
PIPESTONE / MURRAY COUNTIES, MN

Project Mngr: MMF	Terracon		Project No. 41017725
Designed By: JLM			Scale: NO SCALE
Checked By: JLM	3535 Hoffman Road East White Bear Lake, Minnesota		Date: JULY 2002
Approved By: MMF			Drawn By: BMS
File Name: 41017725gel.dwg			Figure No. 5

DRAWINGS PROVIDED BY enXco

occupied residences of a proposed 500 to 1,000 feet has been established. In addition, setbacks of 250 feet from public roads has been established.

5. Associated Facilities

In addition to the 1.5 MW wind turbines and step-up pad-mounted transformers, the Development also includes a system of gravel access roads that allow for easy accessibility to the wind turbines year round. These roads will be approximately 16 feet wide and low profile to allow cross-travel by farm equipment. enXco will work closely with the landowners to locate access roads in order to minimize land-use disruptions, enXco will install gates when necessary between access roads and public roads. The Development will also have several permanent reference meteorological towers (met towers). The guyed towers will be 50 meters in height with at least one tower at 65 meters. They will be equipped with six anemometers and wind direction sensors at several levels. The total number of met towers required is expected to be six, with the final number being determined during the final turbine siting process. As with access roads, enXco will locate the met towers to have the least possible impact to farming operations.

The operations and maintenance (O & M) facility that will serve the Development is proposed to be the Chanarambie Wind Power Plant O & M facility.

6. Land Rights and Easement Agreements

As of the date of this application, enXco has obtained lease and easement option agreements and/or rights to such agreements with landowners for all land within the Development site boundary necessary for installation of the plant(s). Such land is useful to optimize energy production for the Development.

Table 1

List of Landowners Included in the Development site

Rock Township, Pipestone County		**T107N-R44W**		
Last	*First*	*Sec*	*Portion*	*Acreage*
Erickson	Dale	27	N 1/2	320
Erickson	Ronald	26	S 1/2	320
Fennicle	Merle	35	S 1/2 NW 1/4	80
Fikse	Darrell	26	NW 1/4	160
		23	N 1/2 SW 1/4	80
Ford	Dennis	35	NE 1/4	160
Fritz	Otto	34	NE 1/4	160
Fritz	Anna Mae	23	N 1/2	320
Kruisselbrink	Howard	35	SW 1/4	159
Kruisselbrink	James	36	NW 1/4	160
Kruisselbrink	Eleanor	35	SE 1/4	161
Nienkerk	Donald	27	E 1/2 SE 1/4	80
		35	N 1/2 NW 1/4	80

Rock Township, Pipestone County		**T107N-R44W**		
Strom	John	23	SE 1/4	160
Tiedeman	Judith	34	SE 1/4	152
VanMeveren	Vernon	23	S 1/2 SW 1/4	80
Burke Township, Pipestone County		**T106N-R44W**		
Last	*First*	*Sec*	*Portion*	*Acreage*
Blackwood	Donna Mae	1	N 1/2 NE 1/4	81
City of Woodstock		2	SE 1/4	160
DeGroot	Albertus	13	SE 1/4	160
		26	SE 1/4	
DeGroot	Jay	25	S 1/2 NE 1/4	80
Dekok	Dan	12	NE 1/4	160
Erdman Family Farm	J.	1	SW 1/4	194
Erpelding	Genevieve	12	N 1/2 NW 1/4	80
Fikse	Andrew	1	SE 1/4	154
Holzmer	Robert	1	S 1/2 NE 1/4	80
		1	NW 1/4	121
Jasper	Dale	36	N 1/2	308
Payne	Harold	25	S 1/2	320
Pierson	Edith	12	S 1/2	315
Pierson	Mavis	13	NE 1/4	159
Pierson	Raymond	12	S 1/2 NW 1/4	80
Powers	Helen	25	NW 1/4	149
Schuld	Earl	24	S 1/2 NE 1/4	80
		24	SE 1/4	160
Schuld	Fred	24	N 1/2 NE 1/4	80
Sluis	Arnold	36	SE 1/4	160
Sluis	Lester	26	NE 1/4	160
Spronk	Arwin	36	SW 1/4	144
Vandervoot	Gilbert	11	E 1/2	306
Vanruler	Eldon	23	SE 1/4	160
Vanruler	Gregory	24	SW 1/4	160
Veldhuizen	Elmer	2	NE 1/4	151
Watry	Thomas	25	N 1/2 NE 1/4	80
Osborne Township, Pipestone County		**T105N-R44W**		
Last	*First*	*Sec*	*Portion*	*Acreage*
Bylsma	John	1	NE 1/4	160
Lovrien	Fred	1	NW 1/4	160

Cameron Township, Murray County		**T107N-R43W**		
Last	*First*	*Sec*	*Portion*	*Acreage*
Bentson	Arlyn	8	NW 1/4	160
Berreau	Frederic	28	NW 1/4	160
Edmundson	Herman	28	NE 1/4	160
Gass	A.	8	SW 1/4	148
Gilbertson	Arvin	34	SW 1/4	150
Gilbertson	Brian	33	SE 1/4	160
Gleis	Steve	33	SW 1/4	151
Jurrens	Harold	32	E 1/2	320
		8	SE 1/4	160
Kruger	Daniel	28	SW 1/4	160
		33	NW 1/4	160
Ludens	Helen	28	SE 1/4	160
Miersma	Curtis	32	W 1/2	320
Struiksma	Kathryne	33	NE 1/4	160
Young	Roger	34	NW 1/4	160
Chanarambie Township, Murray County		**T106N-R43W**		
Last	*First*	*Sec*	*Portion*	*Acreage*
Anderon	Kevin	9	SE 1/4	157
Andrews	Judy	17	S 1/2 SW 1/4	80
Beek	Alvina	14	N 1/2	270
		23	NW 1/4	160
Beers	Marlin	27	N 1/2 NE 1/4	80
Biegler	Ronnie	4	SE 1/4	152
		15	NW 1/4	155
Bloemendaal	Phyllis	17	NW 1/4; W 1/2 NE 1/4	237
Bose	Norman	31	NW 1/4	162
Dekam	Harold	30	NW 1/4	136
Dekam	Loren	29	NW 1/4	160
DeKruif	Alan	34	N 1/2 NE 1/4	80
Gleis	Vera	4	NE 1/4	162
Gnadt	Arthur	15	NE 1/4	142
Grogan	Woodrow	33	E 1/2	308
Heard	Edward	19	NW 1/4	162
Heard	Marvin	18	SW 1/4	138
Heard	Merle	17	SE 1/4; N 1/2 SW 1/4	240
Karssen	Alden	22	SE 1/4	160
Kooiman Trust	John	30	NE 1/4	160
Langford	James	31	SW 1/4	165
Lovrien	Fred	18	NE 1/4	157

Chanarambie Township, Murray County		**T106N-R43W**		
Manderscheid	Rosella	17	E 1/2 NE 1/4	79
McBeth	Connie	4	NW 1/4	154
McDaniel	Joseph	4	E 1/2 SW 1/4	88
Nelson	Dorothy	4	W 1/2 SW 1/4	80
Nienkerk	Donald	19	N 1/2 NE 1/4	75
Ossefoot	Robert	20	SW 1/4	160
Pierson	Ray	18	NW 1/4	158
Sankey Bros. Inc.		34	NW 1/4	160
Schmidt	Duane	31	S 1/2 NE 1/4; N 1/2 SE 1/4	155
Schmidt	Henry	31	S 1/2 SE 1/4	80
Schuld	Dale	18	SE 1/4	160
Schuld	Earl	19	SW 1/4	160
		30	S 1/2 SW 1/4	80
Schuld	Virgil	30	N 1/2 SW 1/4	80
Schut	Harold	7	NW 1/4	160
State Bank		19	SE 1/4	150
Stoel	Gene	23	S 1/2	320
Stout	Joan	7	SW 1/4	160
Swine Trust	Matty	19	S 1/2 NE 1/4	84
		20	W 1/2 NW 1/4	80
Talsma	Glen	25	SW 1/4	160
Tuin	JoAnn	27	S 1/2	320
VanDam	Gary	27	NW 1/4	160
Vanderlugt	Peter	22	N 1/2 NE 1/4; NE 1/4 NW 1/4	120
VanDyk	Walter	22	NW 1/4 NW 1/4	40
Vanheuvelen	Eugene	29	SW 1/4	160
		32	NW 1/4	160
Vaniperen	Donald	9	W 1/2 NW 1/4; SW 1/4	221
Van Ruler	Mary	28	SE 1/4	160
Vlieger	MaryAnn	28	E 1/2 NE 1/4	80
Vogel	Donald	14	SW 1/4	160
Vogel	Kenneth	27	S 1/2 NE 1/4	80
Warren	Winthrop	30	SE 1/4	160
		31	N 1/2 NE 1/4	80
		32	SW 1/4	160

Moulton Township, Murray County		**T105N-R43W**		
Last	*First*	*Sec*	*Portion*	*Acreage*
City of Chandler		1	NE 1/4; NW 1/4	320
Lost Timber Bible Camp		2	NE 1/4	160
Masselink	Robert	6	W 1/2 NW 1/4	80
Post	James	2	E 1/2 NW 1/4	80

The secured site lease and easement option agreements ensure enXco access to the Development site for construction and operation of the proposed Project(s), and prohibits landowners from any activities that might interfere with the execution of the proposed Project(s). Fully executed lease and easement options are in enXco's possession, and memoranda of lease and easement options have been recorded with the county recorder. Terms of the lease and easement options are typical of industry standards.

C. PROPOSED SITE

1. Site Boundaries

The proposed Development site is located in Pipestone and Murray Counties, Minnesota, near the towns of Woodstock and Lake Wilson. The Development site is within six townships, Rock (T107N, R44W); Cameron (T107N, R43W); Burke (T106N, R44W); Chanarambie (T106N, R43W); Osborne (T105, R44W); and Moulton (T105, R43W) where enXco has obtained lease options or rights to easement options. All turbines will be sited within the Development site boundary.

The Development site boundaries with proposed turbine locations are illustrated on Figure 3, which was generated from U.S. 7.5 Minute Topographical Map Quadrangles: Balaton SW, Chandler, Edgerton NE, and Woodstock.

2. Wind Resource Considerations

Wind power plant production is determined by the wind resource at the Development site. enXco engineering staff in conjunction with several independent meteorological firms have analyzed extensive meteorological databases to develop energy production estimates for the Development site. These projections include the project's annual, seasonal and monthly deliveries based on several years of wind data at or near the Development site. By correlating site-specific characteristics with long-term data from a location in the same wind regime, an estimate of the inter-annual variation of energy output has also been made.

As a major part of the Development site selection process, enXco thoroughly investigated available meteorological data and installed meteorological towers at over ten locations inside or near the Development site. All research and data indicates that the Development site on Buffalo Ridge is an excellent wind area in the state of Minnesota.

3. Wind Characteristics of Buffalo Ridge

Buffalo Ridge rises about 200 feet above the surrounding terrain with a general orientation northwest to southeast. Winds perpendicular to the ridge are topographically accelerated as they flow over the ridge. Land use in the Buffalo Ridge area is agricultural with intensive farming and grazing activities and, as a result, there are fewer trees or structures in the proposed Development site to diminish the wind as it passes over the ridge.

The wind resource in the Buffalo Ridge area is well documented. The National Weather Service (NWS) maintains a site in Sioux Falls, South Dakota about 60 miles southwest of the Development site. This NWS location provides good climatic references for the region, and enXco has acquired long-term hourly data as a base reference.

The Minnesota Department of Commerce has collected data for sites in the vicinity of Buffalo Ridge that provide a broader range of elevations and thus a broader spectrum analysis of the wind resource in southwestern Minnesota. One of the meteorological sites is very near to the Development site and provides an excellent reference point for correlation.

All enXco wind data has been subjected to standard quality assurance procedures.

a. Interannual Variation

The wind resource varies from year to year. The inter-annual variation of the long-term site at Holland is presented in Figure 6. The data suggests that the maximum variation in energy has been within +/- 13 percent. Based on these data, one would expect the annual variation in energy at the Development site to be within or above a 10 percent of the mean during most years.

b. Seasonal Variation

On a seasonal basis, the wind speeds measured on the Development site are weakest in July and August and increase steadily during the fall. The strongest winds occur between November and May. Table 2 shows the estimated monthly percent of annual energy budget.

Table 2.

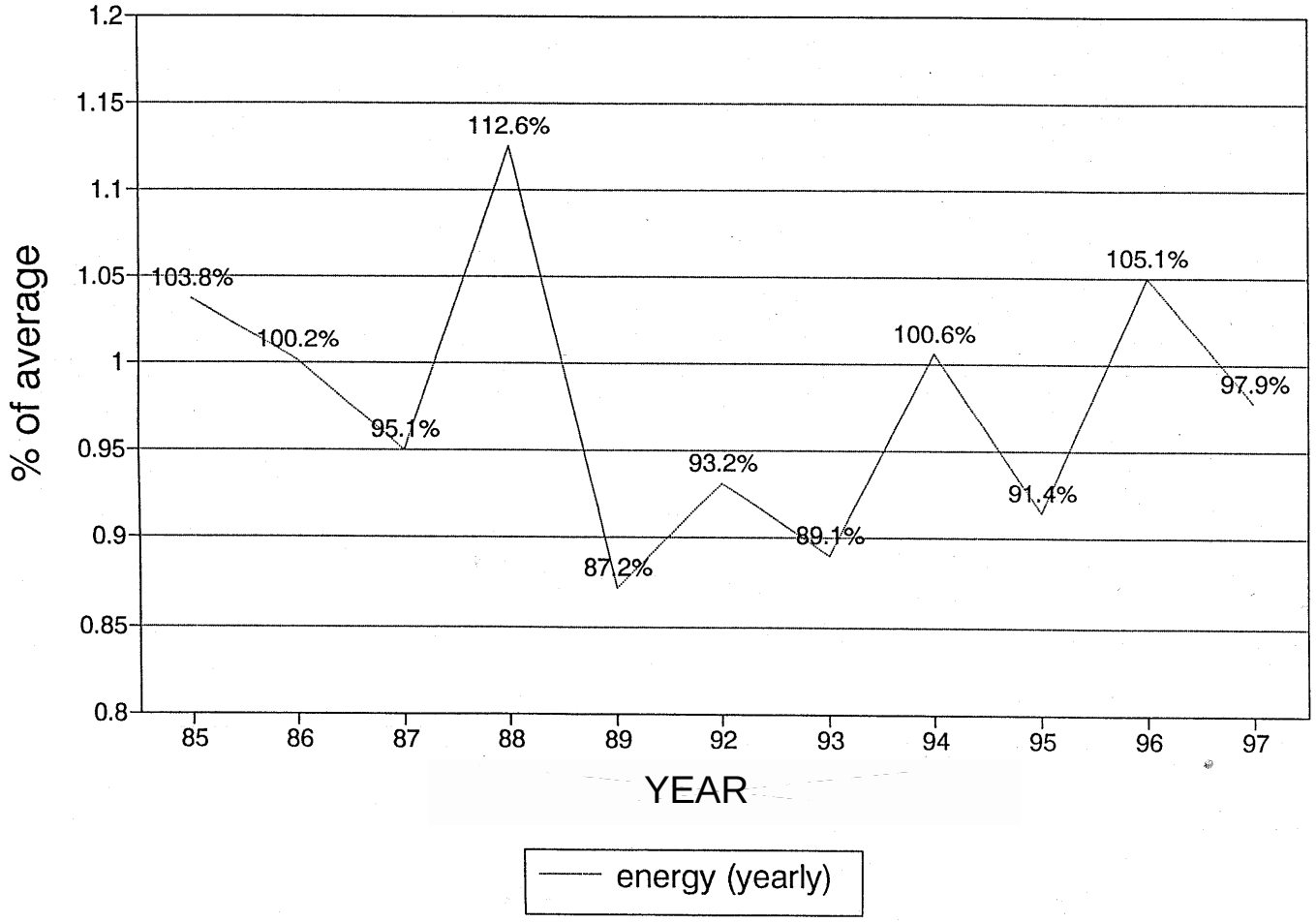
Monthly Percent of Annual Energy Budget

January	10.7%
February	9.1%
March	9.7%
April	9.1%
May	9.1%
June	7.1%
July	5.9%
August	5.9%
September	7.5%
October	8.5%
November	8.8%
December	8.6%

c. Diurnal Wind Speed Variation

Figure 7 is a plot that shows the diurnal mean wind speeds at 10, 20, 50, and 70 meter levels at Chandler. The graph shows a number of interesting things, including the vertical wind shear, or change of wind speed with height. The separation of the lines is indicative of this shear, which ranges from roughly 1 mph at noon to 2 to 3 mph at night. The graph shows that the 10 meter level has a significant diurnal peak in the afternoon hours, with lowest winds just before dawn and around sunset. At the 70 meter level there is less of a diurnal variation and peak winds occur at night, just the opposite of the 10 meter level. The afternoon peak at the lower levels is because of the mixing of the atmosphere by the sun. When the air is well mixed, momentum from aloft is brought down to near surface levels. However, at night when the atmosphere is more stable, the stronger winds remain aloft. The vertical shear exponent between the 30, 50, 60, and 70 meter levels at the Chandler 70 meter tower is 0.22. This shear exponent has been used at the other met towers to extrapolate above their top sensor levels.

Inter-annual variation at SW Minn.
Buffalo ridge theoretical energy

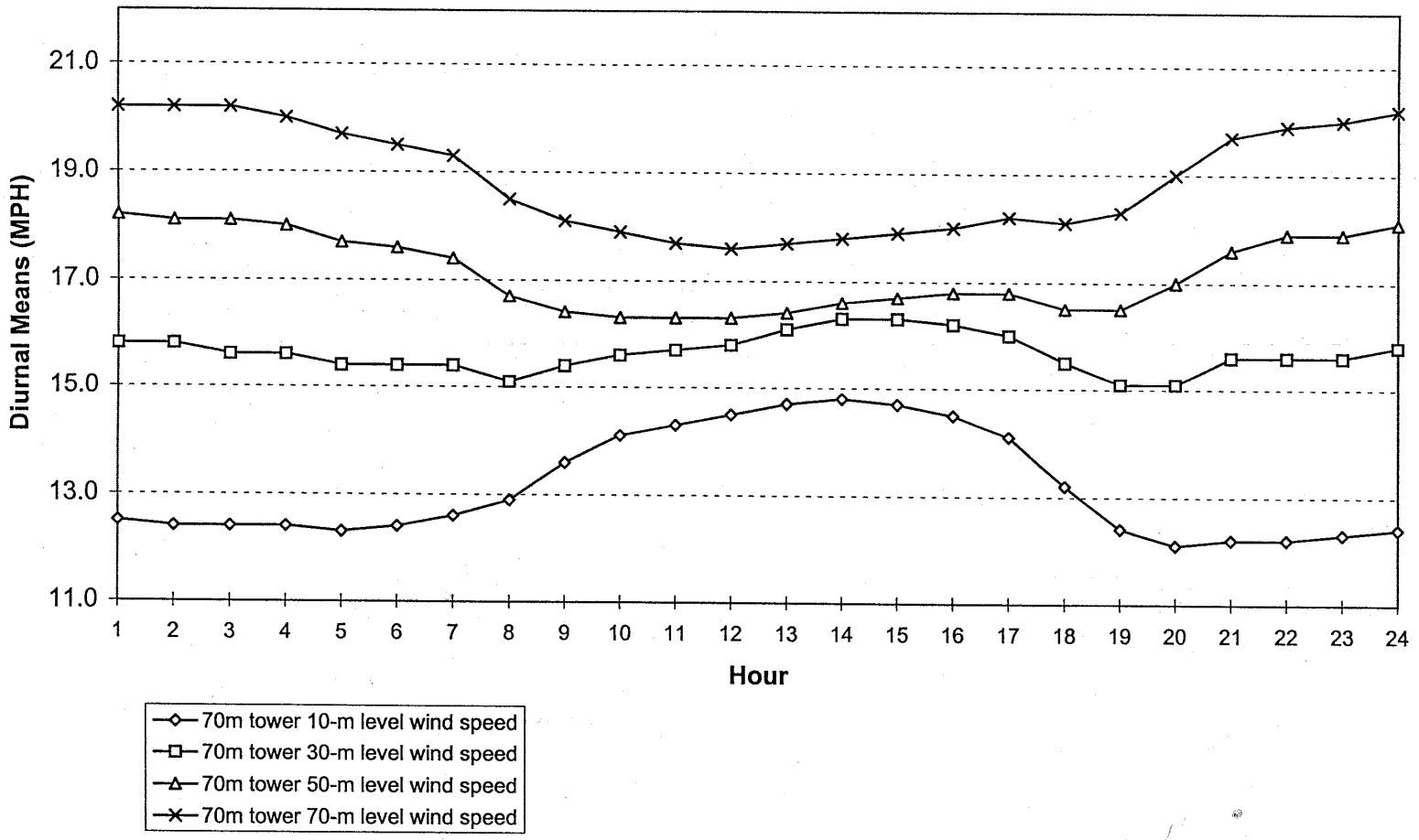


*NOTE: NO DATA IN 1990-91

INTER-ANNUAL VARIATION AT SW MINNESOTA BUFFALO RIDGE THEORETICAL ENERGY enXco WIND POWER PLANT PIPESTONE / MURRAY COUNTIES, MN			
Project Mngr: MMF	Terracon		Project No. 41017725
Designed By: JLM			Scale: NO SCALE
Checked By: JLM	3535 Hoffman Road East White Bear Lake, Minnesota		Date: JULY 2002
Approved By: MMF			Drawn By: BMS
File Name: 41017725iv.dwg			Figure No. 6

DRAWINGS PROVIDED BY enXco

Diurnal Summary By Parameter
DPS Site 135, Chandler, MN
Dec 12, 1996 - Mar 7, 1999



DRAWINGS PROVIDED BY enXco

DIURNAL SUMMARY BY PARAMETER
enXco WIND POWER PLANT

PIPESTONE / MURRAY COUNTIES, MN

Project Mngr: MMF	Terracon	Project No.	41017725
Designed By: JLM		Scale:	NO SCALE
Checked By: JLM	3535 Hoffman Road East	Date:	JULY 2002
Approved By: MMF	White Bear Lake, Minnesota	Drawn By:	BMS
File Name: 41017725ds.dwg		Figure No.	7

d. Atmospheric Stability

The current reports do not include information on atmospheric stability. This information will be provided upon request.

e. Hub Height Turbulence

Turbulence information for four wind speed classes has been calculated. The 1.5 MW wind turbine power curve is corrected for turbulence effects at hub height. The turbulence intensity in all classes between 10 and 60 mph was 0.10. This turbulence level is quite low, as would be expected on the relatively smooth terrain on Buffalo Ridge.

f. Extreme Winds

Extremely high wind speeds are uncommon in southwestern Minnesota. The highest gust recorded at the nearest NWS Sioux Falls' site is 71 mph. On Buffalo Ridge, extreme wind speeds may occur with winds from any of the prevailing directions and may happen during any season. Numerous violent tornadoes have occurred in the general region of the site over a 30-year period. Wind speeds in the 200+ mph range can occur in a tornado. Wind turbines are not designed to survive tornado-force winds.

g. Wind Speed Frequency Distribution

Table 3 is the frequency distribution and has been integrated with the density corrected 1.5 MW power curve. As manufacturers change their power curves regularly, the developers should determine if the curve listed in column three of the table is still current. The 36,915 total hours of data shown at the bottom of the table is used to achieve a long term average and is scaled down to 8,760 hours to represent the wind speed distribution for one year. The theoretical energy is normalized to 8,760 hours (one full year) and the annual gross energy yield is 6,400 MWh per year. This is the estimated gross energy output for a typical turbine location in the area of the Development site. Table 3 shows the annual wind speed frequency distribution at the turbine hub height.

Table 3

Linear Adjusted Wind Speed Distribution

Speed (mps)	Hours	Power kW	Energy kWh
0	92	0	0
1	389	0	0
2	956	0	0
3	1,599	8	12,536
4	2,114	35	74,582
5	2,760	102	281,299
6	3,209	201	644,688
7	3,616	337	1,219,026
8	3,679	517	1,903,662
9	3,527	759	2,675,300
10	3,452	1,057	3,650,214
11	2,988	1,315	3,929,698
12	2,592	1,431	3,708,634
13	1,908	1,479	2,822,047
14	1,444	1,500	2,166,000
15	937	1,500	1,405,500
16	640	1,500	960,000
17	434	1,500	651,000
18	228	1,500	342,000
19	165	1,500	247,500
20	93	1,500	139,500
21	36	1,500	54,000
22	23	1,500	34,500
23	18	1,500	27,000
24	13	1,500	19,500
25	1	1,500	1,500
26	2	0	0
27+	0	0	0
Totals:	36,915		26,969,680

*Multiple frequency distributions were used to develop energy production estimates that reflect the diversity of the Project site area (multiple meteorological stations were used). The 36,915 total hours of data is used to achieve a long term average and is scaled down to 8,760 hours to represent the wind speed distribution for one year as represented above. The 36,915 hours of data represents a long term data set of 4 years.

h. Wind Variation with Height

Wind shear has been measured at over ten monitoring sites in the Development area. Shear values are computed using the power law. The definition of the power law is, wind speed, and hence power, varies relative to height above the ground. Friction from the earth surface generally causes wind speeds to be lower as distance from the surface decreases. This change in wind speed with change in height is called “wind shear”. The general formula for wind

shear is: $S/S_o = (H/H_o)^{\alpha}$ where S_o and H_o are speed and height associated with the lower level, respectively, and α is the power law coefficient, typically in the range of 0.14 to 0.3. Analysis of the shear data has shown significant variation depending on season, direction and time of day. The average power law exponent for the Development site is 0.19. Local roughness and terrain appear to have a significant impact on variations in alpha from site to site. The largest shear value has coincided with the maturation of the surrounding corn crop. Shear values are lower at locations with soybean and crop rotation plan ground cover.

i. Spatial Wind Variations

Analysis of meteorological sites within the Development site area indicates that energy production is expected to vary within the site by a maximum of approximately 15 percent.

j. Wind Direction

Regionally, the prevailing wind directions are southeast through south and northwest. However, along Buffalo Ridge, the prevailing winds appear to be oriented south-southwest and northwest through northeast. The Holland windrose shows that the winds blow from all directions, with a prevalence of southerly winds. Of the annual energy budget, 21 percent comes from southerly winds, which are most frequent in the summer. The energy band for each compass point from west through north each contains about 8 percent of the energy budget. The northwest winds typically occur in winter. Figure 8 is a wind direction frequency rose for the Buffalo Ridge area and contains a wind energy rose for the Buffalo Ridge area.

4. Other Meteorological Conditions

a. Temperature

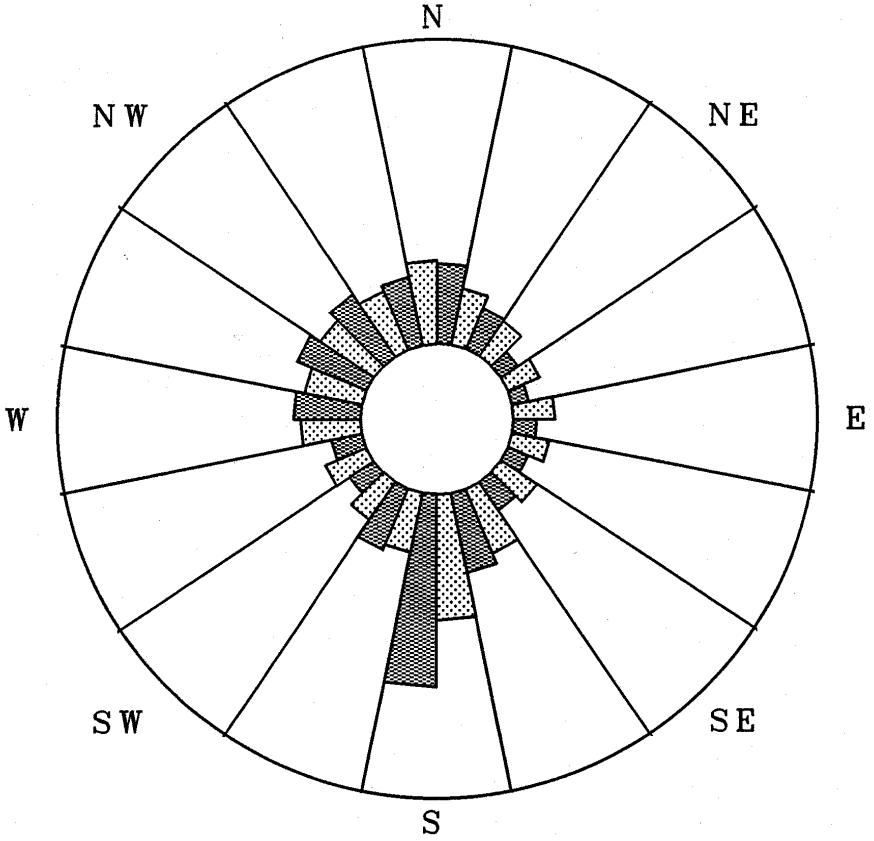
Monthly average temperatures range from a low of 13°F in January to a high of 70°F in July. Extreme temperature conditions recorded at the nearest official weather bureau site are -36°F and 110°F.

b. Extreme Weather

Thunderstorms occur on about 44 days each year. Tornadoes and sever thunderstorms strike occasionally. These storms are local in extent and of short duration. They result in sparse damage in small areas. Hail occasionally falls in scattered small areas during the warmer periods. Neither hail nor lightning from severe storms presents a problem for operation of the proposed Development. Wind turbines; however, are not designed to survive tornado-force winds of 200+ mph. In the winter, icing events are variable in frequency. It is expected that the average annual energy loss will be 2 percent due to icing.

WIND ENERGY ROSE

NSP: Lake Benton, Buffalo Ridge, Minnesota
Holland-7 30-m level wind speed
01-01-1992 to 06-30-1998



= % Turbine Energy = % Time Inner Circle = 0 % Outer Circle = 30 %

Compass Direction		% Time	% Turbine Energy	Mean Speed (MPH)
N	349 - 11	8.9	8.5	15.4
NNE	11 - 34	6.1	4.7	13.9
NE	34 - 56	4.4	2.2	11.8
ENE	56 - 79	3.7	1.8	11.9
E	79 - 101	4.4	2.5	12.8
ESE	101 - 124	4.1	2.4	13.2
SE	124 - 146	4.7	3.7	14.4
SSE	146 - 169	7.4	8.7	16.8
S	169 - 191	13.5	20.8	19.0
SSW	191 - 214	6.5	7.1	16.2
SW	214 - 236	5.0	3.1	13.3
WSW	236 - 259	4.8	3.4	14.0
W	259 - 281	6.5	7.3	16.5
WNW	281 - 304	6.4	8.2	17.6
NW	304 - 326	7.0	8.1	16.8
NNW	326 - 349	6.8	7.4	16.4

41720 HOURS OF VALID DATA 73% DATA RECOVERY 11-02-2000

WIND ENERGY ROSE
enXco WIND POWER PLANT

PIPESTONE / MURRAY COUNTIES, MN

Project Mngr: MMF	Terracon		Project No. 41017725
Designed By: JLM			Scale: NO SCALE
Checked By: JLM	3535 Hoffman Road East White Bear Lake, Minnesota		Date: JULY 2002
Approved By: MMF			Drawn By: JLK
File Name: 41017725wer.dwg			Figure No. 8

DRAWINGS PROVIDED BY enXco

5. Energy Projections

a. Proposed Array Spacing for Wind Turbines

Wind turbines are sited in clusters or strings along hilltops and ridgelines within the site boundaries. The wind turbines are sited so as to have good exposure to winds from all directions, with emphasis on exposure to the prevailing southerly wind direction. Sufficient spacing between the turbines is utilized to minimize array wake losses.

Almost all of the turbine sites are above 1,800 feet in elevation and are considered prime wind locations by several met firms under contract with enXco. Turbine placement has been designed to provide 4 to 5 rotor diameter spacing in the east-west direction and 7 to 8 rotor diameter spacing in the north-south direction, with respect to the predominant energy production directions. Given the prevalence for southerly winds, the spacing is greatest in this direction. A wake investigation shows that the estimated array losses will be 4 percent.

b. Base Energy Calculation

A representative wind speed frequency distribution adjusted for inter-annual wind variation and adjusted using the shear coefficient listed in subsection h above (wind variation with height) to the hub height has been used to predict average annual output for 1.5 MW turbines at the Development site. This frequency distribution described above sets forth the percentage of time the winds will occur in each one-mile per hour wind speed bin on an annual basis. This frequency distribution is matched to the 1.5 MW power curve to estimate the gross energy production. Net output for each turbine, or the actual energy delivered to the substation, is calculated by applying various loss factors.

Table 4 presents the estimated gross annual output per turbine. The net annual energy output is estimated to be 5,171 megawatthour (MWh) per turbine in the Project site.

Table 4.

Energy Estimates On A Per Turbine Basis

Gross Annual Energy Output* (MWh)	Efficiency	Per Turbine Net Annual Energy Output (MWh)
5,937	87.1%	5,171

c. Output Variability

The base energy calculation presented above assumes a normal or average wind year. In order to show the magnitude of year-to-year variability in the proposed Development site output, a simulation of the annual average output was developed using a long-term reference site.

The maximum variation in energy has been within +/- 13 percent. Based on these data, one would expect the annual variation in energy at the Development site to be within 10 percent of the mean during most years.

6. Efficiency of Proposed Development Layout

Analysis of enXco wind direction data suggests that the optimal turbine string alignments are approximately from west-northwest to east-southeast. Individual, isolated turbine sites are avoided to minimize interconnect and access costs. The wind turbines are sited so as to have good exposure to winds from all directions, with emphasis on exposure to the prevailing southerly wind direction. Sufficient spacing between the turbines is utilized to minimize wake losses when the winds are blowing parallel to the turbine rows.

Greater or lesser spacing between the turbine strings was used in areas where terrain dictated the spacing. Setbacks from occupied residences of a proposed 500 to 1,000 feet has been established. In addition, setbacks of 250 feet from public roads has been used.

7. Existing Wind Turbines within the Buffalo Ridge Area

A 103.5 MW wind power plant consisting of 138 units of the Zond 750kW wind turbine is located west-northwest of the Development site in Pipestone County (NSP Phase III). Another wind power plant, Woodstock Wind Farm consisting of 17 wind turbines (10.2 MW) is located adjacent west of the Development site. Chandler Wind Power Plant 1, 2 and 3, consisting of a total of 9 turbines, is located on the south side of the town of Chandler, which is south of the Development site. The Chanarambie 80 MW (NSP Phase IV) Project will be located between the Pipestone County and Murray County portions of the Development site. The Development will be located around the 80 MW Project. At a distance, the wind turbines can be distinguished from vertical forms in the landscape, such as overhead transmission lines or trees. Figure 9 depicts an existing wind power plant in the area.

8. Sensitive Features

The sensitive features, human and natural, that may be impacted by the proposed wind power Development are further discussed in Section F of this Site Permit Application.

TURBINES AT THE CHANDLER WIND POWER PLANT

VIEW OF CHANDLER WIND PLANT
enXco WIND POWER PLANT

PIPESTONE / MURRAY COUNTIES, MN

Project Mngr: MMF	Terracon	Project No.	41017725
Designed By: JLM		Scale:	NO SCALE
Checked By: JLM	3535 Hoffman Road East White Bear Lake, Minnesota	Date:	JULY 2002
Approved By: MMF		Drawn By:	BMS
File Name: 41017725vw.dwg		Figure No.	9

D. COST ANALYSIS

This section describes the cost-related implications of the Development as a means of assessing the suitability for development. The site-specific wind resource, construction costs and operating costs have been considered.

1. Energy Output

The sole fuel for the proposed Development is wind, a clean and reliable energy source. Integrated into a utility fuel mix, wind is an excellent hedge against other fuel price risks, has no fuel transportation cost or environmental hazard and emits no pollutants (greenhouse gases) that would alter the climate.

The single most important factor affecting the price of wind generated electricity is the capital cost required to build the Development. With zero "fuel" costs and essentially linear costs for ongoing operations and maintenance, the number of kilowatt-hours produced has a dramatic effect on the cost of wind generated electricity. Because the Development's capital costs are fixed, the greater the number of kilowatt-hours produced the lower the cost per kilowatt-hour. For this reason, an accurate understanding of the wind resource is critical to the success of the Development.

enXco engineers and meteorologists have used an extensive meteorological database to develop accurate energy projections for the Development site wind resource and have produced reliable estimates of the proposed Development's annual, seasonal and monthly deliveries based on several years of wind data collected at Buffalo Ridge.

Net output for each turbine, or the actual energy delivered to the substation, is calculated by applying various loss factors. The net annual energy output is estimated to be 5,171 MWh per turbine in the Project site.

2. Capital and Operational Costs

The total installed capital costs for enXco's Development are estimated to be approximately $90 million, including 1.5 MW wind turbines, associated electrical and communication systems, roads. Ongoing operations and maintenance costs and administrative costs are estimated to be approximately $2,850,000 per year, including royalties to landowners for wind easement rights and property taxes. The $2,850,000 per year is anticipated to be roughly split between the operations and maintenance costs, royalties to landowners for wind easement rights, and property taxes.

3. Site and Design Dependent Costs

The overall cost of developing the Development will depend primarily on site selection and construction timing. Site-dependent costs will include: the relative ease of access to the individual wind turbine locations; site-specific subsurface conditions which determine foundation design; site access road design and layout, ease of underground trenching; and the layout of the turbine arrays which governs underground cable placement. Table 5 sets forth the estimated

acreage and costs for the Development site, as provided by enXco. Underground and aboveground cable will be employed in all areas of the Development to connect the individual wind turbine generators to transformers, communication enclosures, and feeder lines. The underground placement of the cables along the wind turbine strings is preferable for land use and aesthetic purposes on all land. Aboveground cable will be minimized or eliminated where possible.

Table 5.

Facility Acreage Estimates at the Project Site

Project Related Facility		Unit Costs
Access Roads (approximately 16 feet wide)		
Miles of Access Road	10.1	$13.00 per foot
Acres of Access Road	19.6	
Turbine Foundations		
Square Feet per Turbine	>1,600	$60,000 per foundation
Acres of Turbine	2.13	
Underground Cable (approximately one-foot wide trench)		
Miles of cable	10.6	$15.00 per foot
Acres of Cable	1.3	
Overhead Collection Line		
Miles of Collection Line	15.1	$10.00 per foot
Acres of Collection Line	1.8	
Total Development Land Area (acres)	24.83	
Temporary Disturbance of Land for Work Spaces/Staging Areas		
Acres per Turbine	3	
Total Acres	174	
Total Acres of Temporary Disturbance for Development Site	149.17	

These temporary work spaces/staging areas disturbed by construction will be restored after construction is complete.

E. ENGINEERING AND OPERATIONAL DESIGN AND ANALYSIS

Section E provides a summary description of the Development's energy system, an overview of the current configuration of the 1.5 MW wind turbine and the balance of plant items that make up the key components of the Development.

The proposed Development will consist of up to 58 units of 1.5 MW wind turbines interconnected by communication and electrical power collection facilities including pad-mounted transformers and feeder lines.

Each wind turbine generator output is at 575 V, which feeds down drop cables that extend from the turbine nacelle to a base ground panel inside the tower. Each turbine has a 575/34,500V pad-mounted step-up transformer installed immediately outside the base of each tower. Each pad-mounted transformer is loop-fed to the neighboring turbine as each turbine is interconnected through an underground electrical collection system at 34.5kV. For safety and control, all pad-mounted transformers are configured with a loop-feed dead front arrangement, oil level and pressure gauges, a lockable front door as well as a switch to allow individual turbines to be isolated to allow for any special electrical repair or maintenance to the turbine.

The collection system makes up the backbone of the electrical collection/distribution system establishing a connection between the individual strings of wind turbines in the field and the substation. The 34.5kV feeder lines from the Project collection system feed to one independent breaker position at the substation. The interconnection substation steps up the voltage from the collection system at 34.5kV to the transmission system level at 115kV.

Land will be graded for each turbine pad and access roads will be installed. The operations and maintenance facility that will accommodate the Development is the Chanarambie Wind Power Plant O & M facility.

A communication system will be located either at the substation or the Project(s) operations and maintenance facility. The Supervisory Control and Data Acquisition (SCADA) system will be able to give status indications of the individual wind turbines and the substation and allow for remote control of the wind turbines.

1. Plant and Associated Facilities Description

The Development will consist of up to 58 units of 1.5 MW turbines, a pad-mounted transformer located next to each turbine, a power collection system connecting the turbines to the substation, meteorological towers, turbine access roads, and a shared operations and maintenance facility.

2. Turbine Assemblies and Components

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 and 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 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 ensures 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 64.7, 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 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 causes 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.

3. Manufacturing Quality

The selection of the 1.5 MW wind turbine is based on proven design and availability. The 1.5 MW wind turbine is a three bladed, upwind, active yaw, and active aerodynamic control regulated wind turbine with power/torque control capabilities. The rotor uses full-span blade pitch regulation and a variable speed operation to provide maximum power output at varying wind speeds.

enXco has performed a critical and thorough review of the 1.5 MW turbine equipment and design. The 1.5 MW turbine is one of the best proven turbines in its class with more than 174 units in operation since the introduction of the unit in Germany under the Tacke name in 1997. The overall availability of these fleet of turbines averages 98% over the past 18 months of operation. enXco will be working closely with the turbine manufacturer through the procurement and construction process as well as into operations of the turbines through the years to come.

There are three main types of utility grade wind turbines available on the market today: (i) variable speed with variable pitch; (ii) constant speed with variable pitch; and (iii) constant speed with stall regulation. All of these technologies have advantages and disadvantages, as with any equipment used in industry. By evaluating each technology, enXco is able to select the most appropriate equipment for the application providing the best quality product at the most competitive energy rates to the customer.

In addition to matching the best equipment for a particular project, enXco also carefully scrutinizes the wind turbine manufacturer. enXco has visited the manufacturing facilities of every major wind turbine system supplier over the past several years and most recently in the past 6 months, and is constantly evaluating new designs and improvements in technology with various leading vendors.

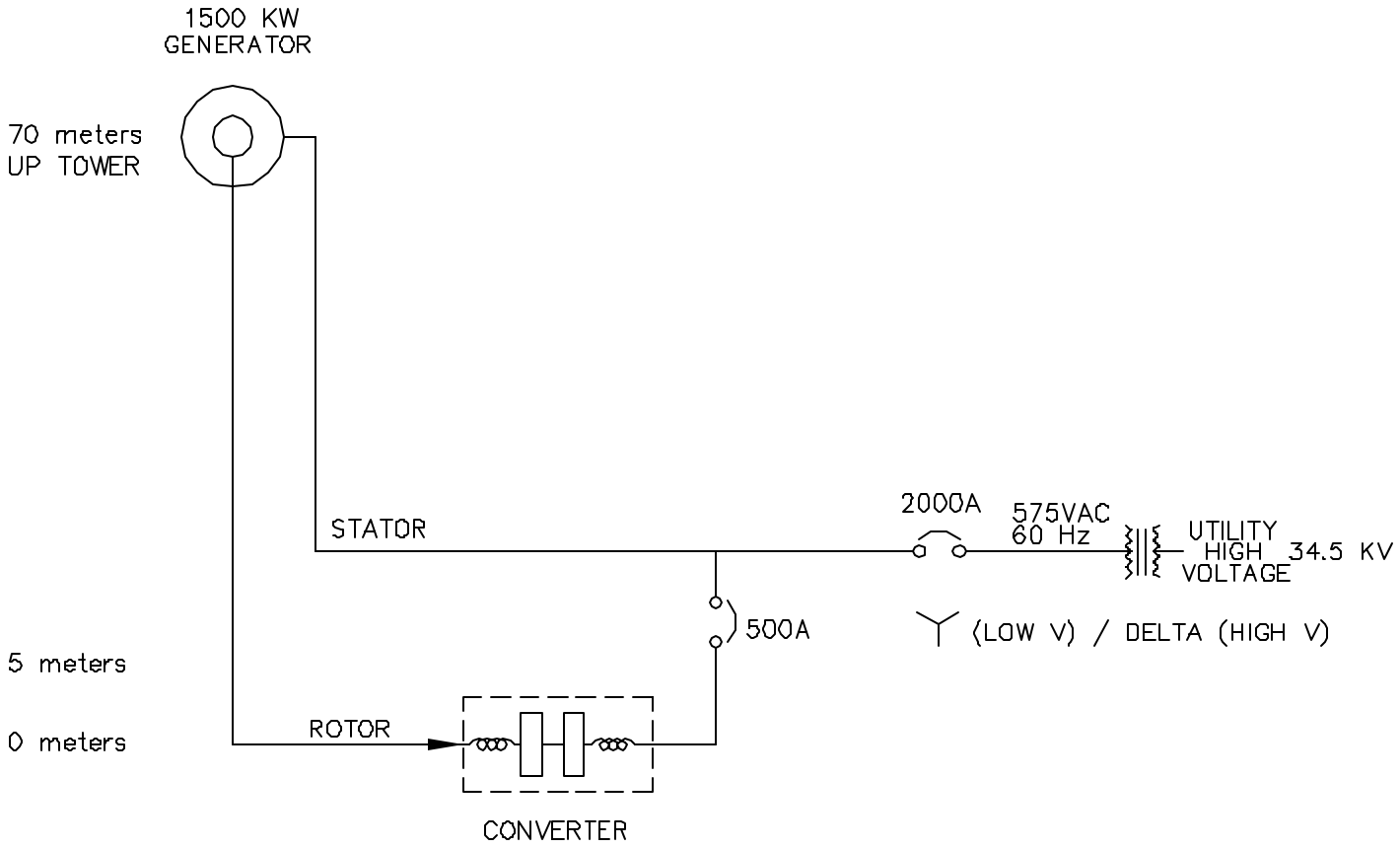
4. Hazardous Materials

The wind turbines will use synthetic oil as a lubricant in the gearboxes and hydraulic fluid for the blade pitch actuators. Each wind turbine contains approximately 104 gallons of oil. Every six (6) months the oil will be monitored through test samples and replaced every five (5) years. Waste oil generated will be collected at each turbine location during maintenance procedures and taken to the O & M facility where it will be poured into a 50-gallon oil sump. Waste oil will then be filtered through a low flow oil separator with a heavy duty soil and grating separating out the sludge. The waste oil will then be discharged to a 550-gallon concrete holding tank. The oil which is removed from the turbines will be disposed of through an approved waste disposal carrier. Any hazardous materials generated by the Project will be stored and disposed of in accordance with Minnesota Rules Chapter 7045. Wastes generated at the Project site will be hauled off-site and disposed of under a U.S. EPA Small Quantity Hazardous Waste License.

5. Electrical System

a. Low Voltage System and Pad-Mounted Transformers

Each wind turbine generator output is at 575 V, which feeds down drop cables that extend from the turbine nacelle to a base ground panel inside the tower. Figure 10 illustrates the



ONE-LINE DIAGRAM OF 1.5 MW WIND TURBINE
(doubly fed, wound rotor asynchronous generator)
enXco WIND POWER PLANT
PIPESTONE / MURRAY COUNTIES, MN

Project Mngr: MMF	Terracon		Project No. 41017725
Designed By: JLM			Scale: NO SCALE
Checked By: JLM	3535 Hoffman Road East White Bear Lake, Minnesota		Date: JULY 2002
Approved By: MMF			Drawn By: JLK
File Name: 41017725ol.dwg			Figure No. 10

DRAWINGS PROVIDED BY enXco

specifications for the WTG electrical design. Each turbine has a 575/34,500V step-up transformer installed immediately outside the base of each tower. Each pad-mounted transformer is loop-fed to the neighboring turbine as each turbine is interconnected through an underground electrical collection system at 34.5kV. For safety and control, all pad-mounted transformers are configured with a loop-feed dead front arrangement, oil level and pressure gauges, a lockable front door as well as a Load Break Oil Rotary (LBOR) switch, which is the main on-off switch, to allow individual turbines to be isolated to allow for any special electrical repair or maintenance to the turbine.

b. Medium Voltage System

Each turbine has a 575V/34,500V step-up transformer installed immediately outside the base of each tower. Each pad-mounted transformer is loop-fed to the neighboring turbine as each turbine is interconnected through an underground electrical collection system at 34.5kV. For safety and control, all pad-mounted transformers are configured with a loop-feed dead front arrangement, oil level and pressure gauges, a lockable front door as well as a LBOR switch to allow individual turbines to be isolated to allow for any special electrical repair or maintenance to the turbine.

The general configuration of the turbine, foundation, pad transformer, and the collection system are shown in Figure 11. This collection system makes up the backbone of the electrical collection/distribution system establishing a connection between the individual strings of wind turbines in the field and the substation.

c. Transformer to Substation Wiring, Design & Routing

The 34.5kV feeder lines from the Project collection system feed to one independent breaker position at the designated substation. The interconnection substation steps up the voltage from the collection system at 34.5kV to the transmission system level at 115kV. Revenue metering will occur at the 34.5kV side of the substation. The feeder lines will be aboveground where they meet the designated substation.

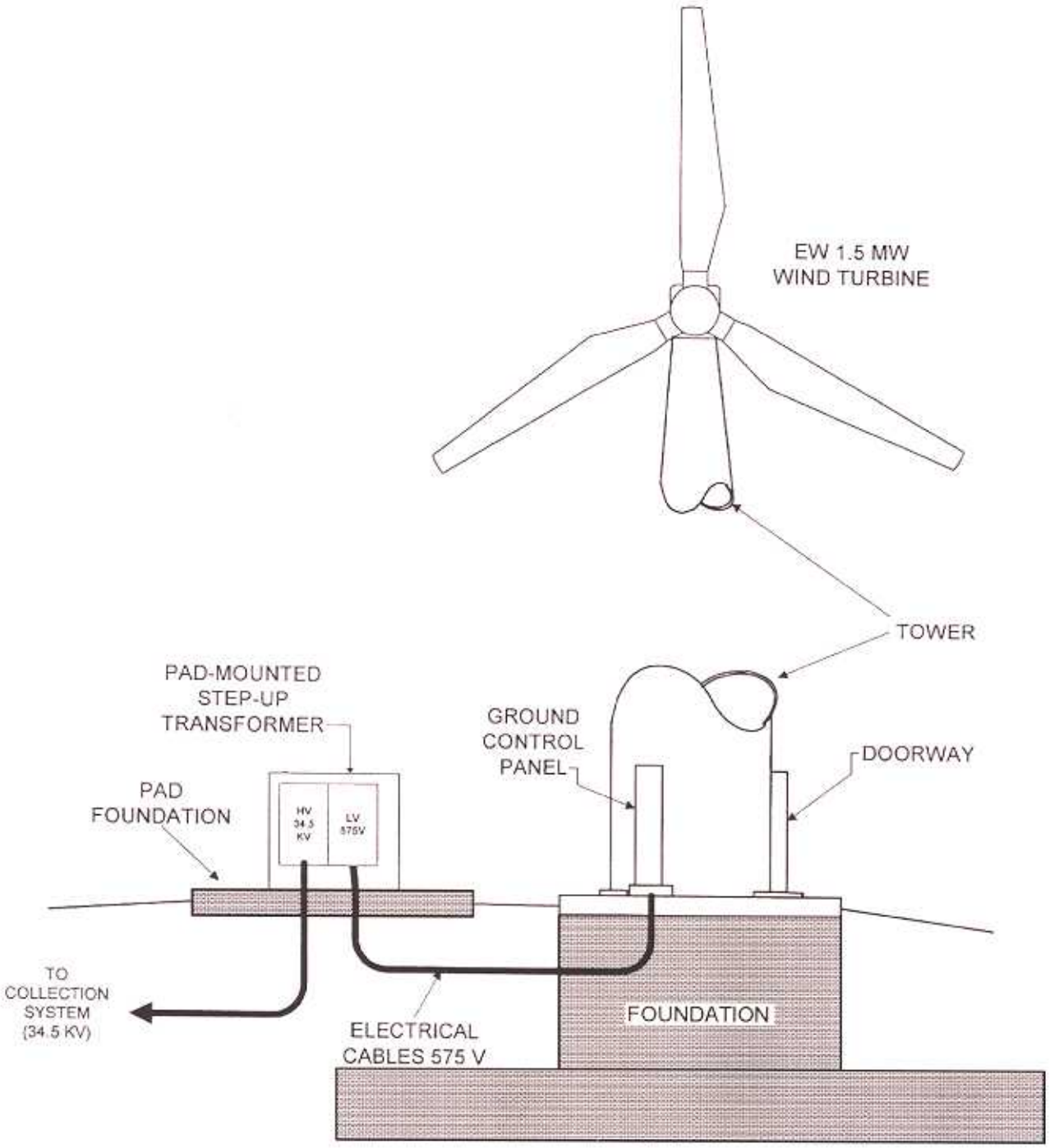
6. Transmission Line and Interconnection

a. Description

The feeder lines associated with the Development are currently planned to be underground and aboveground. Aboveground cable will be minimized or eliminated where possible. Any aboveground feeder lines, if used, would be wood-pole, 34.5kV typical of wind project feeder lines, such as that currently connecting NSP Phase III project with the Chanarambie substation. Interconnection is proposed to be to the Chanarambie Substation. Refer to Figure 5 for interconnection points.

b. Design Standards

enXco will 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



GENERAL CONFIGURATION OF WIND TURBINE, PAD-MOUNTED TRANSFORMER AND COLLECTION SYSTEM

enXco WIND POWER PLANT

PIPESTONE / MURRAY COUNTIES

Project Mngr: JLM	Terracon	Project No.	41017725
Designed By: JLM		Scale:	NO SCALE
Checked By: MMF	3535 Hoffman Road East White Bear Lake, Minnesota	Date:	JULY 2002
Approved By: JLM		Drawn By:	BMS
File Name: 41017725gc.dwg		Figure No.	11

DRAWINGS PROVIDED BY enXco

load flow analysis for the Project(s) 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 both the Project's electrical system as well as the purchasing utilities system.

enXco will work closely with the purchasing utilities transmission and protection group in establishing the relay settings and specifications for the Project(s) site, especially for the 34.5kV feeder breakers. Typically, enXco will specify SEL or similar relays to interface with the feeder breakers. These relays are typically installed at the substation control house and coordinated with the rest of the protective devices on both the Project(s) side and the utility side of the breaker.

Typically, the coordination study involves modeling the stressing of the Project(s) electrical distribution system and sacrificing selectivity in any cases where both goals (protection and selectivity) cannot be realistically achieved. Protective device settings and ratings recommended by the coordination study are based on providing adequate overload protection for the transformers, cables, generators and switchgear. Selectivity is achieved in all possible instances by establishing suitable time margins between device operating points. Time margins are set to be consistent with the recommendations of the device manufacturers.

c. Locations of the Proposed Electrical Facilities

Figure 12 depict the locations of the proposed electrical facilities and collection system throughout the Development site.

7. Substation

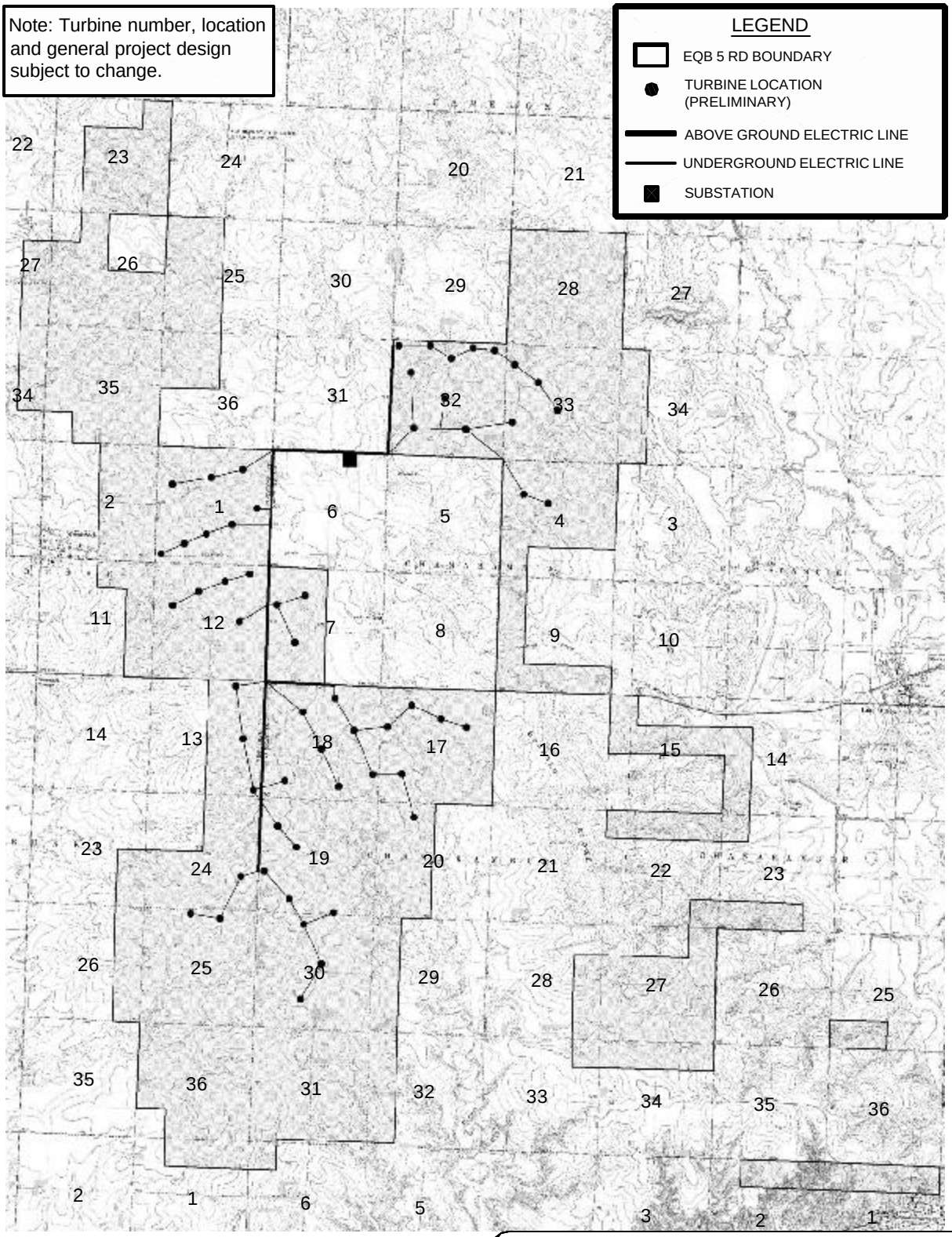
The Chanarambie Substation is anticipated to serve as the interconnection location for delivery of electricity to the grid for the Development. The substation is located at 58 111th Street in Woodstock in the northeast ¼ of Section 6 in Chanarambie Township.

The Chanarambie Substation is designed with 34.5kV feeder bays for the interconnection of wind plant feeder lines. Collection lines will connect to a secondary bus via feeder breakers with over-current protection. A single 34.5/115kV 120MVA transformer will step-up the voltage to transmission voltage. Design schematics for the Chanarambie substation are included in Figure 13.

The substation will be monitored by a site control and data acquisition (SCADA) system capable of monitoring and controlling most aspects of the substation facility. As with the individual wind turbines, the substation will be monitored from enXco's control facility in North Palm Springs, California.

The Chanarambie Substation will have a small building provided within the fenced substation to house the control and relaying equipment, station batteries, and SCADA system. The entire substation is enclosed by a looped chain link fence.

Note: Turbine number, location and general project design subject to change.



N

ELECTRICAL SYSTEMS

enXco WIND POWER PLANT

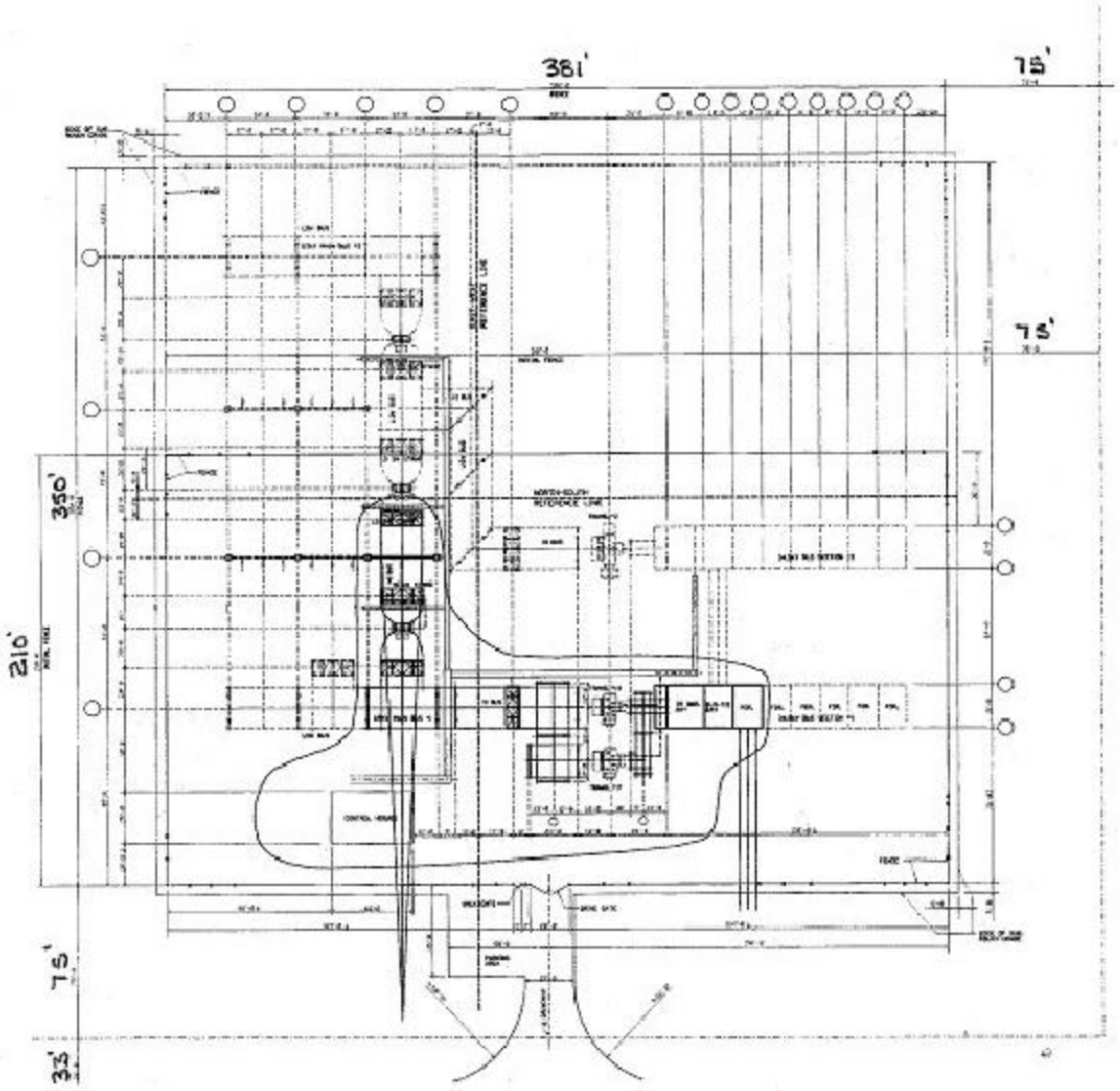
PIPESTONE / MURRAY COUNTIES, MN
enXco

Project Mngr:	JLM	Project No.	41017725
Designed By:	JLM	Scale:	NO SCALE
Checked By:	MMF	Date:	05/14/02
Approved By:	JLM	Drawn By:	BMS (41)
File Name:	41017725es.dwg Layout1	Figure No.	12

Terracon
3535 Hoffman Road East
White Bear Lake, MN 55110

DRAWINGS PROVIDED BY enXco

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES



DESIGN SCHEMATICS FOR THE SUBSTATION
enXco WIND POWER PLANT

PIPESTONE / MURRAY COUNTIES, MN

Project Mngr: MMF	Terracon	Project No.	41017725
Designed By: JLM		Scale:	AS SHOWN
Checked By: JLM	3535 Hoffman Road East White Bear Lake, Minnesota	Date:	JULY 2002
Approved By: MMF		Drawn By:	BMS
File Name:	41017725sub.dwg	Figure No.	13

DRAWINGS PROVIDED BY enXco

a. Grounding System

All equipment, cables, wind turbines and structures will be connected together by a robust metallic, project-wide ground network. This system will serve to manage ground fault currents, step and touch potentials, ground potential rise and lightning surges.

b. Communications System

All turbines and a meteorological tower system will be interconnected with fiber optic communication cable that will be installed underground together with the 34.5kV cable. The communication cables will run back to a central host computer which will be located either at the substation or the Project Operations and Maintenance Facility where a Supervisory Control and Data Acquisition (SCADA) system will located. Signals from the current and potential transformers at each of the delivery points will also be fed to the central SCADA host computer. The SCADA system will be able to give status indications of the individual wind turbines and the substation and allow for remote control of the wind turbines locally or from a remote computer at one of enXco's operations centers. A two-way communication link between the wind project/substation and the purchasing utilities control center will be made by normal microwave system communication. Figure 5 illustrates the general scheme for the electrical collection system and central computer control system (SCADA).

c. kW Rating

The Chanarambie substation will include 34.5/115kV transformer(s) capable of serving the 87,000kW of wind power generation included in the DEVELOPMENT.

8. Operations

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 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.

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.

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 Development is warranted.

9. Turbine Operation

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.

The 1.5 Series turbine is designed in accordance with the International Electrotechnical Committee 1400-1 Standard and Germanischer Lloyd's Rules and Regulations for Wind Turbine Design. All components of the machine (rotor, drivetrain, and tower) are designed using calculated input loads and finite element modeling and analysis techniques. This ensures an efficient structure to carry the design extreme and fatigue loads.

The 1.5 Series turbine features bedplate drivetrain design where all nacelle components are attached to the bedplate. The entire assembly is easily mounted on top of the yaw system without the need for component alignment. Turbine assembly is completed with the attachment of the nacelle housing and mounting of the rotor. The hub centerline is 65 to 80 meters above ground level.

The 1.5 Series turbine was developed on the basis of Tacke Wind Energie's TW-1.5 wind turbine design combined with experience with the installation, operation and maintenance of more than 4,000 wind turbines ranging from 65 kW to 1,500 kW. The design principle of the rotor, bedplate, yaw system, control and monitoring system, and the towers for the 1.5 Series turbine is to provide high efficiency, cost effective and reliable operation, as well as ease of assembly and maintenance.

Conventional wind turbines utilized squirrel cage induction wind turbine generators that operated passively with respect to voltage, volt amps reactive (VAR), torque, and speed. Passive controls were used because wind turbine generators (WTG) were small and they did not adversely effect the local utility grid.

Today, WTGs are constructed to provide more power, which is evident in the present size of WTGs, commonly 750 to 1500 kW and greater. This ever-increasing size has presented the challenge of stabilizing the local electrical network. Wind variations, coupled with larger wind turbines result in voltage instability. These voltage fluctuations are so great that the voltage goes out of the WTGs operating range, resulting in down time and loss of production. There are two ways of handling this problem. One is to upgrade the existing electrical infrastructure. The second is to build WTGs that can provide voltage and VAR support to the grid. This problem has been recognized and the variable speed 1.5 MW turbine has been developed.

10. Construction

a. 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.

Generally, enXco, by itself or in coordination with local 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 also serves as the key contact and interface for subcontractor coordination. enXco oversees the installation of communication and power collection lines as well as the substation. enXco also oversees the installation of access roads, concrete foundations, towers, machines and blades, as well as the coordination of materials receiving, inventory and distribution.

The proposed Development will be constructed under the direct supervision of enXco's on-site construction manager with the assistance of local 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

The enXco construction management team will have staff on site to handle materials purchasing, construction, and quality control. enXco personnel will manage local subcontractors to complete all aspects of construction.

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(s), including ongoing communication with local officials, citizens groups and landowners. Even before the Project(s) becomes fully operational, the operations and maintenance (O & M) staff is integrated into the construction phase of the Project(s). 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.

b. Foundation Design

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(s).

c. 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.
- Trenching for 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.

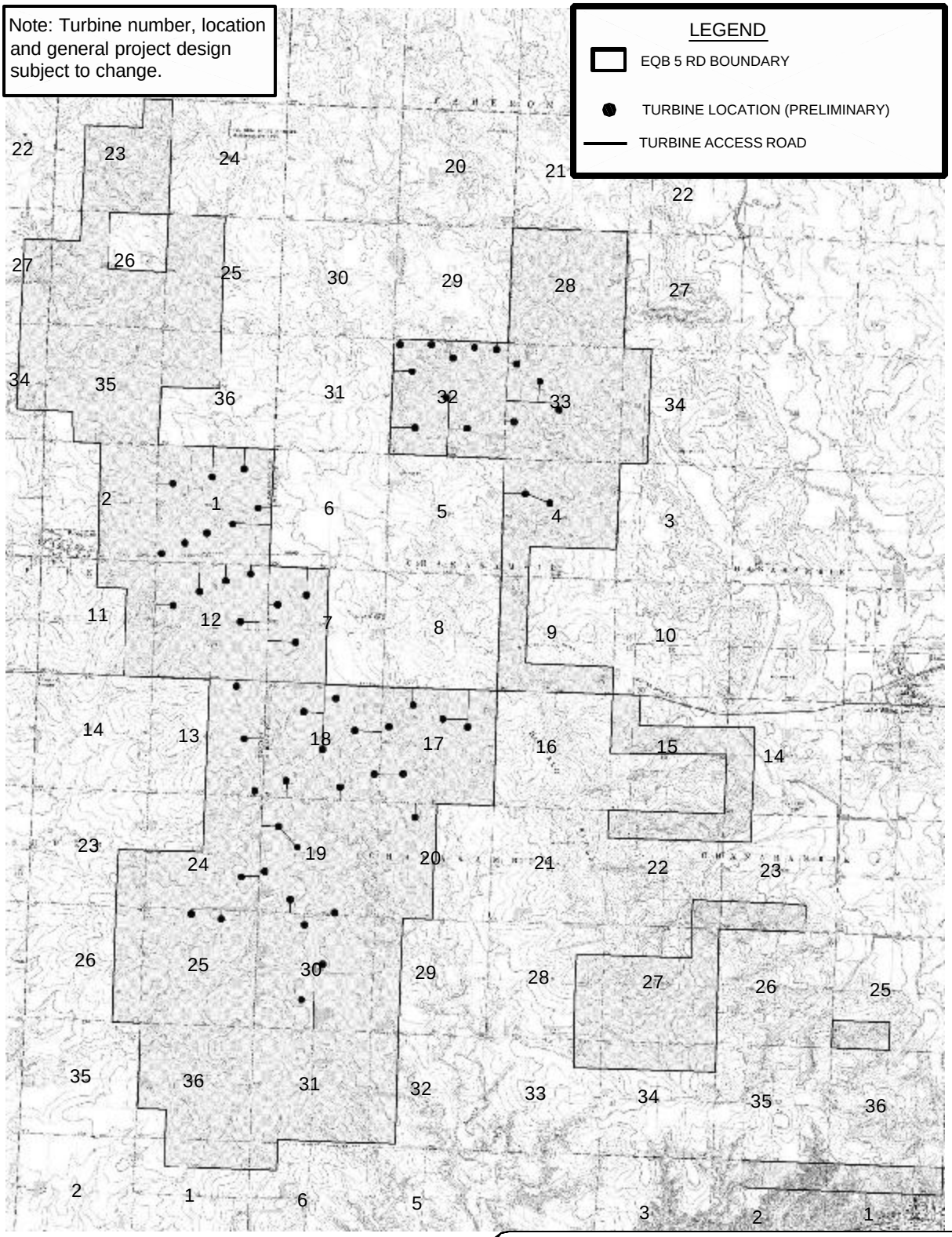
Any improvements to existing roads will primarily consist of re-grading and filling of the gravel Access roads will be constructed along each turbine string, approximately parallel to the wind turbines. Siting roads in areas with unstable soil will be avoided wherever possible. All access roads will 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. Figure 14 illustrate where the turbine access roads are anticipated to be constructed within the Development site.

Electrical and communications wires and cables will be placed in protective trenches. These trenches are generally 4 feet in depth, 1 feet wide, and are backfilled with compacted fill to protect underground wires. Adequate spacing between the communication and electrical wires will ensure no interference between the two. The trench design 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.

d. 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 Development as a whole is achieved through detailed inspection and testing procedures. The manufacturer's inspection criteria applicable to plant components augment this process as wind power plant acceptance is dependent upon the cooperation of each component within the major wind power plant

Note: Turbine number, location and general project design subject to change.



N

TURBINE ACCESS ROADS

enXco WIND POWER PLANT

PIPESTONE / MURRAY COUNTIES, MN
enXco

Project Mngr:	JLM	Project No.	41017725
Designed By:	JLM	Scale:	NO SCALE
Checked By:	MMF	Date:	05/14/02
Approved By:	JLM	Drawn By:	BMS (41)
File Name:	41017725tar.dwg Layout1	Figure No.	14

Terracon
3535 Hoffman Road East
White Bear Lake, MN 55110

DRAWINGS PROVIDED BY enXco

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subsystems (e.g., turbines, communication system, meteorological system, high voltage collection and distribution system, and wind power plant SCADA System.)

11. Operations and Maintenance

enXco and the Facility Owner will enter into a long-term agreement to operate and manage the Project. enXco will be responsible for daily operations, scheduled and unscheduled maintenance as required by the equipment manufacturers, and in accordance with good utility practice.

The Development will be staffed with five to six full time site technicians and a Wind Power Plant Supervisor. 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.

a. 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. As required or deemed appropriate, remote access to the SCADA system can be made available to the local utility and the turbine manufacturers.

b. Maintenance Schedule

The Project(s) 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(s) to produce power.

c. 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 by the purchasing utility. 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 purchasing utility.

Table 6

Preventative Maintenance Schedule

Module/ component	Visual inspection regarding	Function test regarding	Frequency
SWITCH CUPBOARDS (All of them)			
Door and floor plate	imperviousness against humidity and insects	Lockable	annual
Cable clamps		interference fit, contact	annual
CONTROL BOX/TOP CABINET			
Sensors	general condition, fastening	function of all installed components	semi-annual
Emergency stop switch		switching function	semi-annual

Module/ component	Visual inspection regarding	Function test regarding	Frequency
Safety chain with centrifugal switch		function of all installed components (vibrating switch, EMERGENCY STOP, watchdog PLC, rotor lock, yaw transposition centrifugal switch at predefined switching speed)	annual
LOW TENSION MAIN DISTRIBUTION (LTMD)			
Power switch	fire lanes, insects	switching function	semi-annual
CONVERTER CABINETS			
Low tension part	imperviousness against humidity and insects	Lockable	annual
Power switch	fire lanes, insects	switching function	annual
Network contact	contact surfaces O.K.? fire lanes, insects		annual
Emergency stop switch (if available)		switching function	annual
TOWER			
output-/ control cable	interference fit in the cable stocking, sharp bends, cutting rubbing places, residence of the cable protecting tubes, control of the pressing connections, transposition	natural frequency 80 m, 85 m and 100 m hub height	annual
plug/sockets	oil spill, cracks	interference fit	annual
steel tube wall	kinks, corrosion		annual
flange screw	corrosion	breakaway torques	annual
climb protection	damage and fastening track	function	annual
resting platforms	corrosion	fastening and function	annual
WIND DIRECTION TRACKING			
gliding areas	faulting, surfaces, dismantling of a top-hat		semi-annual

Module/ component	Visual inspection regarding	Function test regarding	Frequency
yaw drive	leakage, oil level	tooth bearing – gear rim, noise	semi-annual
yaw position sensor		sensor function, adjustment	semi-annual
cable torsion safety switch		switching function, adjustment	semi-annual
slide bearing	wear, corrosion, adjustment	wear measuring of the coatings (sliding gauge max. 1,5 mm), adjustment of the disk spring pakets	semi-annual
wind flag	adjustment	easy running	semi-annual
anemometer		easy running	semi-annual
mount wind flag/anemometer	corrosion	fastening	semi-annual
ROTOR BLADES			
external by field glasses	fire lanes (lightning), cracks of any kind, damages to the paint work (blowholes, flaking, etc.) corrosion on insulation of the blade flange	noise, quiet running	semi-annual
inside	cracks of any kind humidity corrosion: • cable lightning conductor	solid residence of: • cover plate • cable lightning conductor	semi-annual
blade fastening	corrosion	breakaway torques	annual
ROTOR HUB	cracks, corrosion		annual
rotor shaft fastening	corrosion	breakaway torques	annual
pitch bearing fastening, outer ring	corrosion	breakaway torques	annual
pitch bearing fastening, inside ring	corrosion	breakaway torques	annual
MACHINE STRAP	cracks, corrosion		annual
PITCH MOTORS	carbon brush wear, loose parts, cleanness		annual

Module/ component	Visual inspection regarding	Function test regarding	Frequency
PITCH ADJUSTMENT			
pitch gearing	leakage, oil level	noise, contact pattern of the toothed wheel work	annual
switch cupboards (axle cabinets, conducting cupboard)	fastening, imperviousness against humidity, battery contact, general condition, firm situation, cable condition	lockable, battery voltage supervision	semi-annual
position switch	fastening	switching function	annual
NOSE CONE	general condition, damages, cracks, corrosion, fastening screws	breakaway torques of the front and back hub fastenings	annual
entry to the hub	fastening and general condition, rail, nose cone flaps and hinges, hub cover with kick steps, tilting protection ribbon/door gasket as well as ventilation	lockable nose cone flap and hub lid door	annual
DRIVE LANE			
pillow block	grease leaving	noises, breakaway torques	semi-annual
shaft	cracks, corrosion	position of the clamping set (see. marking)	annual
gear box	leakage, oil level, contact pattern of the toothed wheel work (perhaps taking a photograph)	noises, screws, breakaway torque of the clamping set	semi-annual
oil cooler	leakage, fastening		semi-annual
decoupling for structure-borne noise	characteristics of the gear box at output (movements), Condition of the rubber (possible rubber abrasion)	breakaway torques	annual
coupling	general condition, leakage, damages, cracks, corrosion	breakaway torques flange joint	annual
decoupling for the generator	general condition	breakaway torques	annual

Module/ component	Visual inspection regarding	Function test regarding	Frequency
GENERATOR	The maintenance regulations of the manufacturer of the generator have to be taken into account.		semi-annual
	nuts and pins in the conduit box, faulting of the axial ventilator, centrifugal switch with coupling	noises, bearing warming, vibrations, triggering of the centrifugal switch (2100 r/min)	semi-annual
carbon brushes		change carbon brushes, clean slip ring room	semi-annual
filter unit (optional)		replacing filters	semi-annual
BRAKING HYDRAULICS UNIT			
brake disc	furrows, cracks, change in color, wear		annual
coatings	blow outs, cracks, wear, deformation	least coating strength 19 mm inclusive of base plate, max. air-gap 1 mm	semi-annual
calipers	condition, corrosion, well running, distance to the brake disc, leakage	breakaway torques	annual
HYDRAULICS	oil level, pressures		semi-annual
valves, hydraulics tubes, control block, pipe work	leakage, fastening, condition	switching function, pressures	semi-annual
hydraulic oil	standard		semi-annual
CABLE IN THE MACHINE HEAD AND IN THE TOWER	rubbing places, strain relief and the imperviousness of the screwings, general condition and transfer fastening in the cable stocking		annual
GENERAL	wear, corrosion, noises and other on-settlement dates, reading examining of the badge of the fire extinguisher		annual
handling winch *	Check by an expert or competent person with confirmation in the examining book of the winch.		annual
hazard beacon/emergency generating set (optional) *	hazard beacon, motor general, oil level refrigeration plant, fuel plant, input air/ waste air	testing of the unit for 10 minutes	semi-annual

Module/ component	Visual inspection regarding	Function test regarding	Frequency
transformer station	The maintenance regulations of the transformer supplier have to be taken into account. **The maintenance may only be carried out the transformer supplier or by persons authorized by him.**		semi-annual
SAFETY HARNESSES	Is carried out by a competent person (named by GE Wind Energy).		annual **

* This work doesn't belong to the maintenance of GE Wind Energy. A separate maintenance agreement can be completed with GE Wind Energy.
** Furthermore this maintenance/check has to be carried out after any use of the harness during an accident.

12. Operations/Maintenance Facility

a. Location

The operations and maintenance facility will be the Chanarambie Operations and Maintenance Facility located in Murray County.

b. Size

The operations and maintenance facility will cover approximately one half acre. It will include the following: a prefabricated steel building approximately 40 feet by 60 feet with approximately 900 square feet of finished office space, a gravel covered parking area approximately 50 feet by 100 feet, and a fenced in storage area approximately 100 feet by 100 feet.

c. Functions

The Facility will provide a shop for the Operations and Maintenance Staff, the SCADA System and performing operation and maintenance functions. In addition, there will be an outside fenced-in area for storage of equipment and other material to be used at the Project(s) site.

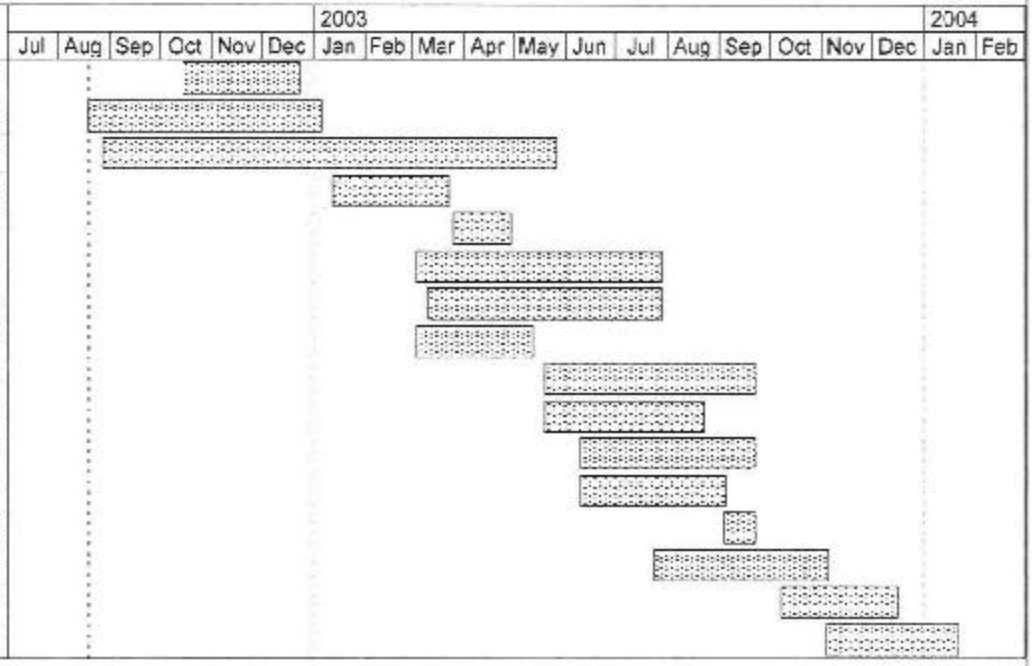
13. Project Schedule

a. Land Acquisition, Installation, Operation, Decommissioning and Restoration

Land acquisition has been completed. The time line for installation, operation, decommissioning, and restoration for the Project is shown on Figure 15.

POWER PARTNERS MIDWEST, LLC

ID	Task Name	Duration
1	ENVIRONMENTAL ASSESMENTS	40 days
2	EQB SITE PERMIT	80 days
3	MISCELLANEOUS PERMITS/OTHER	155 days
4	DETAILED ENGINEERING DESIGN	40 days
5	EPC and Turbine Supply Contracts	20 days
6	**PROCUREMENT (EQUIPMENT & SUBS)**	**84 days**
7	Equipment Supply	80 days
8	Subcontractor Agreements	40 days
9	**CONSTRUCTION**	**71.6 days**
10	CIVIL WORKS	55 days
11	**ELECTRICAL WORKS & INTERCONNECT TO GRID**	**59.6 days**
12	Install 34.5 kV Infrastructure	50 days
13	Electrical Testing & Energization	10 days
14	WTG ERECTION	60 days
15	COMISSIONING/COMMERCIAL OPERATION	40 days
16	PLANT PERFORMANCE TESTING	45 days



Project: PPM project sch aug 02
Date: Mon 8/19/02

Task
Task Progress
Critical Task
Critical Task Progress
Milestone
Summary
Rolled Up Task
Rolled Up Critical Task
Rolled Up Milestone
Rolled Up Progress
Split
External Tasks
Project Summary

PROJECT SCHEDULE

enXco WIND POWER PLANT

PIPESTONE / MURRAY COUNTIES, MN

Project Mngr:	JLM	Project No.	41017725
Designed By:	JLM	Scale:	NO SCALE
Checked By:	JLM	Date:	JULY 2002
Approved By:	MMF	Drawn By:	BMS (41)
File Name:	41017725ps.dwg Layout1	Figure No.	15

Terracon
3535 Hoffman Road East
White Bear Lake, MN 55110

DRAWINGS PROVIDED BY enXco

b. Permits

enXco will be responsible for undertaking all required environmental review and will obtain all permits and licenses that are required by Fall of 2002.

c. Equipment Procurement, Manufacture and Delivery

Equipment procurement and turbine manufacturing will be started prior to commencing construction of the wind power plant and will be completed concurrently with the phased completion of other project construction.

d. Detailed Design Cycle

enXco will be responsible for completing all site design work and determining the optimum wind turbine configuration.

e. Construction

enXco will be responsible for completing all wind power plant construction, including roads, 1.5 MW wind turbines, electrical and communications work. The construction of the roads, turbine foundations, and electrical collection system is anticipated to begin in the fall of 2002 and take approximately three (3) months to complete. The erection of the turbines is anticipated to begin the end of June 2003 and take approximately two (2) months to complete.

f. Construction Financing

enXco will be responsible for financing all pre-development, development and construction activities. enXco anticipates financing the cost of all pre-development activities through internal funds or independent construction financing.

g. Permanent Financing

enXco anticipates obtaining permanent financing from an institutional lender and utility investors prior to commercial operation of the wind plant.

h. Expected Commercial Operations Date

The commercial operation date of the proposed wind power plant will be phased in over a two (2) month period, with segments of the wind plant coming on-line in stages. Full wind power plant commercial operations is anticipated to be achieved by mid-September 2003. A summary of the key events in the Project Schedule is set forth in Figure 15.

14. Decommissioning and Restoration

a. Estimated Decommissioning Costs

Approximately $637,500 total is budgeted for the decommissioning of the Project(s).

b. 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.

c. 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.

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

The independent administrator will report annually to the Project(s) on the status of decommissioning funds. The Project(s) 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.

F. ENVIRONMENTAL ANALYSIS

This section provides a description of the environmental conditions, which exist at the Development site. Consistent with the Minnesota Environmental Quality Board regulations, various exclusion and avoidance criteria have been taken into account in the selection of the project area from a large study area. To support this siting process, surveys and studies of the Development site were undertaken to assess the presence or absence of the following:

- national and state parks, wildlife refuges, wilderness areas, monuments, historic sites and districts and special designation riverways and trails.
- state wildlife management, scientific and natural areas
- nature conservancy preserves
- county and municipal parks
- registered historic sites and districts
- prime farmlands
- wetlands
- avian nesting areas and migration routes
- streams
- residences

1. Demographics/Homes

a. Site Description of Resources

The proposed Development is located within a lightly populated rural area in southwestern Minnesota. The Development site is located in Pipestone and Murray Counties, Minnesota. Information on demographics and housing for this section was taken from the U.S. Census Bureau. The population in Pipestone County has decreased by an estimated 5.7 percent since 1990. There is no indication of any new residential construction occurring in the site area. The estimated 2000 population for Pipestone County is 9,895, the population density is approximately 21.2 people per square mile, the average household size is 2.42, and the total number of households is 4,068. The major employment types in Pipestone County are Retail Trade, Wholesale Trade, Manufacturing, and Agricultural related. Occupations include: sales and farming. The majority of workers in Pipestone County also reside in the county. The 1997 median household income was $31,021.

The population in Murray County has decreased by an estimated 5.1 percent since 1990. There is no indication of any new residential construction occurring in the site area. The estimated 2000 population is 9,165, the population density is approximately 13.0 people per square mile, the average household size is 2.38, and the total number of households is 3,722. The major employment types in Murray County are Retail Trade, Wholesale Trade, Technical Services, and Agricultural related. Occupations include: sales, administrative support and farming. The majority of workers in Murray County also reside in the county. The 1997 median household income was $31,594.

b. Impacts

Demographics and residences are not anticipated to be affected by the proposed construction and operation of the wind power plant.

c. Mitigative Measures

enXco proposes to use a buffer/setback in which wind turbines will be located 500 to 1,000 feet from occupied homesteads and 250 feet from public roads.

d. Occupancy Status of Structures

There are approximately thirty-nine (39) active homesteads within the Development site and approximately twenty-one (21) homesteads that have setbacks that fall within the Development site boundary.

2. Noise

Noise consultants have recommend a maximum noise threshold of 45 dBA at occupied homes. To facilitate planning for this guideline, independent testing of noise emissions from the 1.5 MW turbine has been completed. For this study turbine and background data was collected during the period of July 6th through July 8th, 2000. The Acoustic Noise Test Report for this work is dated November 2nd, 2000. In this study, two methods were used for measuring sound emissions. The first method uses wind speed as measured on a temporary 10-meter meteorological tower upwind of the turbine. The second method derives the wind speed from measurements of turbines power and a power curve obtained from power performance testing. Results indicate source noise from the turbine between 96.8 dBA and 99.7 dBA. Uncertainty is 2.2 dBA for results. The impact of this source noise over distance is illustrated in Figure 16. This diagram illustrates that at distances of 1,000 feet noise will meet the industry standard of 45 dBA at all occupied homes in the project site.

a. Site Conditions

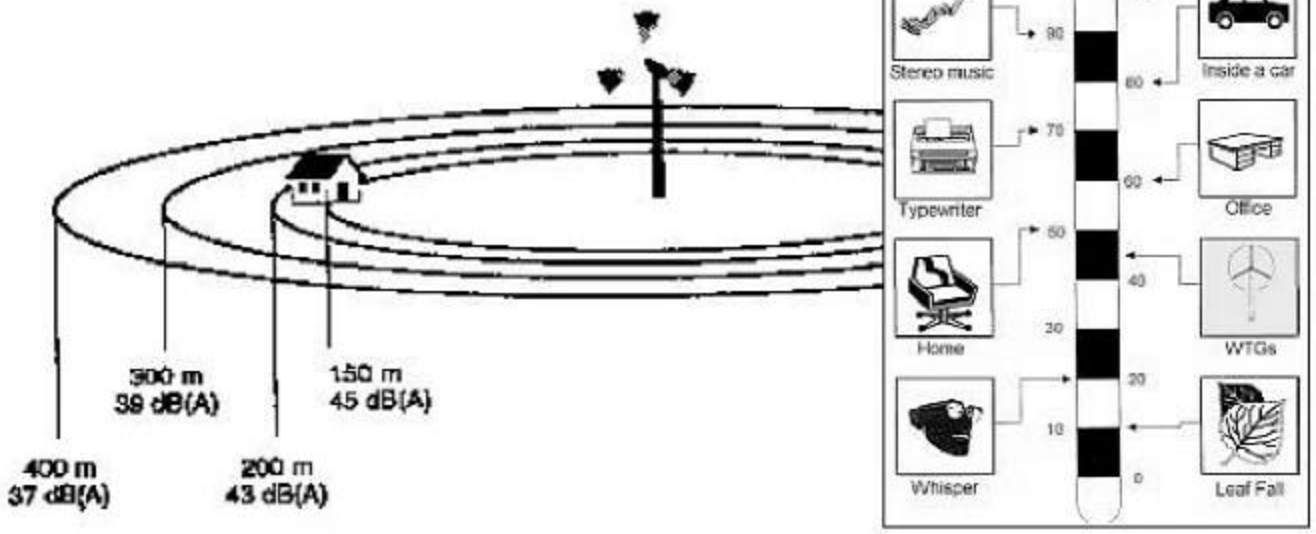
Background noise levels in the Development site area are typical of those in rural settings, where decibel levels are commonly in the low to mid-30 decibels (dBA). These ratings are relatively low background levels and generally representative of the Project site. Higher levels exist near roads and other areas of human activity. In addition, the windy conditions in this region tend to increase ambient noise levels compared to other rural areas.

b. Impact

The wind turbines will be sited so as to comply with or to exceed the existing noise standards established by the Minnesota Pollution Control Agency (MPCA). The maximum noise levels for the Development, as measured at all occupied residences, will be no greater than 45 dBA with no discernible pure tones.

Noise Impacts:

- At 150, 200, 300, 400 meters
  (492, 656, 984, 1312 feet)



Industry Standard: proposed turbines are sited to meet 45 dBA maximum noise at occupied homes

DRAWINGS PROVIDED BY enXco

NOISE IMPACTS
enXco WIND POWER PLANT

PIPESTONE / MURRY COUNTIES, MN

Project Mngr: MMF	Terracon		Project No. 41017725
Designed By: JLM			Scale: NO SCALE
Checked By: JLM	3535 Hoffman Road East		Date: JULY 2002
Approved By: MMF	White Bear Lake, Minnesota		Drawn By: BMS
File Name: 41017725nf.dwg			Figure No. 16

c. Mitigative Measures

Setbacks will be established where the wind turbines will be sited approximately 500 to 1,000 feet from an occupied residence and 250 feet from public roads so as to create a setback or buffer to minimize noise impacts.

3. Visual

a. Site Description

The Development site for the proposed Project(s) is visually dominated by agricultural fields, farmsteads, fallow fields, and large open vistas. The landscape can be classified as rural open space with gently rolling topography. Local vegetation in the area is predominantly pasture with corn, small grains and forage crops, creating a low uniform cover. Farmsteads are typically surrounded by a mix of deciduous and coniferous trees planted for windbreaks. In the swales, there is occasional riparian growth of native willows, cattails, sedges, and rushes. Figure 17 depicts the typical rural setting of the Development site.

The settlements in Pipestone and Murray Counties are residences and farm buildings (occupied and unoccupied) scattered along the rural county roads. These structures are focal points in the dominant open space character of the vicinity. A number of the farm structures date back to the late nineteenth or early twentieth centuries and are representative of that era of Minnesota farm architecture. Typically, the farmsteads and residences are located at lower elevations to avoid winds common to the area.

A 103.5 MW wind power plant consisting of 138 units of the Zond 750 kW wind turbine is located west-northwest of the Development site in Pipestone County (NSP Phase III). Another wind power plant, Woodstock Wind Farm consisting of 17 wind turbines (10.2 MW) is located adjacent west of the Pipestone County portion of the Development site. Chandler Wind Power Plant 1, 2 and 3, consisting of a total of 9 turbines, is located on the south of the town of Chandler, which is south of the Development site. The Chanarambie 80 MW (NSP Phase IV) Project will be located between the Pipestone County and Murray County portions of the Development site. The Development will be located around the 80 MW Project. At a distance, the wind turbines can be distinguished from vertical forms in the landscape, such as overhead transmission lines or trees. Figure 9 depicts an existing wind power plant in the area.

At close range the turbines will be visible from the local county roads and township roads adjacent to the wind plant. All of these local two-lane roads carry limited amounts of traffic, of which most is local. The remote rural character of the area is especially apparent along these roadways. These local county roads typically will not have expansive views of the proposed wind power plant; rather they will have close views of the Development site and vicinity. However, in the general area of the Development site where the roads are at higher elevations, there will be intermittent, expansive views of the area.

TYPICAL VIEW OF RURAL SETTING IN SOUTHWESTERN MINNESOTA

TYPICAL RURAL SETTING IN SOUTHWESTERN MINNESOTA

enXco WIND POWER PLANT
PIPESTONE / MURRY COUNTIES, MN

Project Mngr: MMF	Terracon		Project No. 41017725
Designed By: JLM			Scale: NO SCALE
Checked By: JLM	3535 Hoffman Road East White Bear Lake, Minnesota		Date: JULY 2002
Approved By: MMF			Drawn By: BMS
File Name: 41017725trs.dwg			Figure No. 17

b. Impact

The placement of up to 58 additional turbines in the Buffalo Ridge area will have some impact on the area's visual quality. However, the aesthetic effect is primarily based on a subjective human response. The wind power plant will most likely have a combination of effects on the visual quality/rural character of the area. From one perspective, the proposed Development site might be perceived as a visual intrusion on the natural aesthetic value of the landscape, characterized as 51 tubular steel structures approximately 213 to 262 feet high, standing on formerly undisturbed ridgelines, with approximately 115-foot blades, for an overall height of 328 to 377 feet when one blade is in the vertical position.

On the other hand, wind plants have their own aesthetic quality, distinguishing them from other non-agricultural land uses. First, the wind plant does not generate much traffic or significantly increase day-to-day human activity in the area. Therefore, the Development site will retain the rural nature of the area. Second, although "industrial" in form and purpose, wind turbines are essentially "farming" the wind for energy. The proposed land use would not involve any ongoing use of non-renewable resources or emissions into the environment. Fossil fuels will not be burned for the production of electricity. Emissions or toxic substances will not be produced by the wind plant. Although the turbines are hi-tech in appearance, they are compatible with the natural environment and rural, agricultural heritage of the area.

The installation of the existing wind power plants to the west-northwest and south altered the land use and visual quality of the area. The additional turbines proposed for this Development site will increase the level of this visual change. Because the topography in the Buffalo Ridge area is generally flat and the vegetation cover is uniformly low, the ridgelines of the landform in the area are highly vulnerable to visual disruptions. The existing wind power plants altered the landscape in the area from agricultural to wind plant/agricultural. This Development will add to the visual impact of the area. The cumulative effect of the proposed project will increase both the "industrial" appearance of the wind power plants on Buffalo Ridge and the areas from which they will be seen. Because wind generation development is likely to continue on the ridge, this visual impact is inevitable.

c. Mitigative Measures

The following are proposed mitigative measures:

- Wind turbines and turbine access roads will not be located in Nature Conservancy Land, State Wildlife Management Areas, or Scientific and Natural Areas are not expected to be in native prairies.

- Turbines will not be located in biologically sensitive areas such as wetlands or relic prairies.

- Turbines will not be illuminated unless required by FAA regulations.

- Existing roads will be used for construction and maintenance where possible. Road construction will be minimized.

- Access roads created for the wind power plant will be located on gentle grades to minimize visible cuts and fills.

- Temporarily disturbed areas will be reseeded to blend in with existing vegetation.

Wind power technology requires as much exposure to the wind as possible to attain maximum efficiency. Therefore, the proposed wind turbines are located at higher elevations within the Buffalo Ridge area. Mitigation measures that would result in alternative locations at lower elevations would be less efficient.

4. Public Services/Infrastructures

a. Description of Resources

The proposed Development is located in a lightly populated, rural area in southwestern Minnesota. There is an established transportation and utility network, which provides access and necessary services to the light industry, small cities, homesteads, farmsteads, and the existing wind power plants in the area.

Electrical Service. Xcel Energy provides electrical service to the area. An existing transmission line runs west to east across Buffalo Ridge. An additional line runs west from the Chanarambie Substation, located in T106N, R43W, Section 6. The power collection system will connect to the substation where the power will be stepped up and connected to the transmission system.

Traffic Routing. The major traffic routes to and from the Development site include Minnesota State Highways 30 and 91 and County Highways 18 and 25. In addition, several county and township roads provide access to the Development site, including two-lane paved and gravel roads and minimum maintenance gravel roads. In the agricultural areas, many landowners use single-lane farm roads and driveways on their property.

Water Supply. A majority of the proposed wind power plant is not connected to a municipal water supply system. The area has a rural water system. Wells provide the water needed for human consumption, farming, commercial and industrial uses.

Sanitary Sewer. Sanitary sewer systems are only available to the residences, commercial, and industrial operations located within the cities near the proposed Development site. The majority of the occupants residing within the Development site have individual septic systems to handle their sanitary wastes.

Railroad. An old railroad grade (Casey Jones Trail) runs west to east through the southern edge of Section 1 and 2, T106N, R44W in Burke Township within the Development site. The old railroad grade continues east towards the town of Lake Wilson.

Telephone. Service is provided by Frontier Communications and DTG Telephone Service to the cities, rural developments, and homes in the proposed vicinity of the Development site.

Radio Towers. Radio towers are not located in the Development site.

Radar. The Pipestone Municipal Airport is located in Pipestone, Minnesota approximately 11 miles west of the Development site. According to a Murray County representative, there are no FAA radar installations located within Murray County with the exception of the Slayton Municipal Airport, located in Slayton, Minnesota approximately 11 miles east of the Development site.

b. Impacts

The proposed wind power plant is expected to have minimal effects on the existing public service and infrastructure. The following is a brief description of the impacts, which may occur during the construction, operation, and maintenance of the wind power plant.

Electrical Service. Construction of the project(s) will add the following facilities to the existing electrical service in the proposed Development site: up to 58 1.5 MW wind turbines and associated power collection system, including power collection cable and pad-mounted transformers. Approximately 10.6 miles of underground cable and 15.1 miles of aboveground cable will be installed.

Operation of the wind power plant will require the addition of new high voltage transmission lines. The power generated by the wind turbines and collected at the substation will be routed to the purchasers utility system via the existing transmission lines.

Roads. Construction of the proposed wind power plant will require some local unimproved roads to be upgraded and the addition of new access roads to facilitate the installation, operation, and maintenance of the wind power plant. The access roads will be routed along the wind turbine strings, fence lines, and field edges to minimize disturbance to agricultural activities. They will be installed on gentle slopes or flat areas to reduce their visibility. The typical access road will be approximately 16 feet in width and covered in Class 5 (or similar material). If access roads must be installed across streams or drainage ways, they will be designed with a geo-tech or geo-grid sub-base for strength and will be located and shaped so as not to alter the original water flow or drainage patterns.

During operation and maintenance of the wind power plant, the access roads will be used by operation and maintenance crews while inspecting and servicing the wind turbines. The roads will be maintained by periodic grading.

Water Supply. Construction, operation, and maintenance of the proposed wind power plant will not significantly impact the water supply for the area. The project(s) will not require the appropriation of ground or surface water nor will any dewatering take place into ground or surface waters. The installation or abandonment of any wells is not required for the project. However, in the event wells are abandoned, they will be capped as required by Minnesota Law and the Minnesota Department of Health.

Railroad. Construction of the power feeder system will not require the crossing of active railroads. If a crossing would be required, the appropriate approval and license from the railroad would be obtained. Construction of any such crossings would be done in a way to minimize their impact on the railroad. The operation and maintenance of the wind power plant will not impact the railroad.

Telephone. Construction, operation, and maintenance of the proposed wind power plant will not impact the telephone service to the area.

Radio Towers. Radio towers were not identified within the Development site. There is not expected to be any impact on the telecommunication or commercial radio activities by the operation of the wind power plant.

Radar. Construction and operation of the wind power plant will not impact radar operation in Pipestone or Murray Counties.

Television Reception. Operation of the wind power plant may or may not impact the quality of television reception in the area. Previous work on this subject indicates that in some cases new antenna or tuning of antennas has solved the problem. enXco will attempt to work with the residents in the area of the Development site before and after the project(s) are constructed to document and mitigate any impacts that might occur.

c. Mitigative Measures

Construction, operation, and maintenance of the proposed wind power plant will be in accordance with associated federal and state permits, as well as, industry construction and operation standards. Siting roads in areas with unstable soil will be avoided wherever possible. Because the anticipated impacts on the existing infrastructure during construction, operation, and maintenance of the proposed wind power plant are minor, extensive mitigation measures will not be required for this wind plant.

5. Cultural/Archaeological

The cultural/archaeological information was obtained from maps reviewed at the Minnesota State Historic Preservation Office (SHPO).

a. Description of Resources

One recorded archaeological site was identified within the Development site and twelve were identified within one-mile of the Development site. The Development area is located in rough proximity to lithic scatters and artifacts. The site is located in a range of hills running from North Dakota through the southwest corner of Minnesota to Iowa. The geographical prominence of this ridge made it a significant location for Native Americans, especially the Dakota Indians. The lack of previously recorded sites within certain areas of the Development site is thought to be the result of a sampling bias, as no systematic archaeological surveys have been conducted in these areas.

The recorded archaeological site identified within the Development site is listed in Table 7.

Table 7.

Previously Identified Archaeological Sites within the Development Site

Site Number	Site Name	Legal Location	Site Type	Survey Report Reference
21MU32	Lost Timber Site	T105N, R43W, Section 2	Village Site	Gibbon 1980

Also identified on the maps were a historical geographic feature and several historical structures. The historical geographic feature, Buffalo Ridge, was depicted within the Development site in T106N, R43W, portions of Sections 9, 15, 17, 22, 27, and 28. One historical structure was depicted in the town of Woodstock located west of the Development site and several historical structures were depicted in the town of Chandler located south of the southeast corner of the Development site. .

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

If any 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 Nation 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. Recreation Resources

Recreation resources were obtained from the Minnesota Department of Natural Resources (MDNR) Public Recreation Information Maps of the Worthington and Marshall areas.

a. Description of Resources

Recreational opportunities in Pipestone and Murray Counties include hunting, fishing, snowmobiling, campgrounds, and trails. Hunting is permitted in designated state MDNR wildlife management areas (WMAs), unless posted otherwise.

There are five WMAs located within a 2-mile radius of the Development site and one state trail (Figure 18). WMAs are managed to provide wildlife habitat, improve wildlife production and provide public hunting and trapping opportunities. These MDNR lands were acquired and

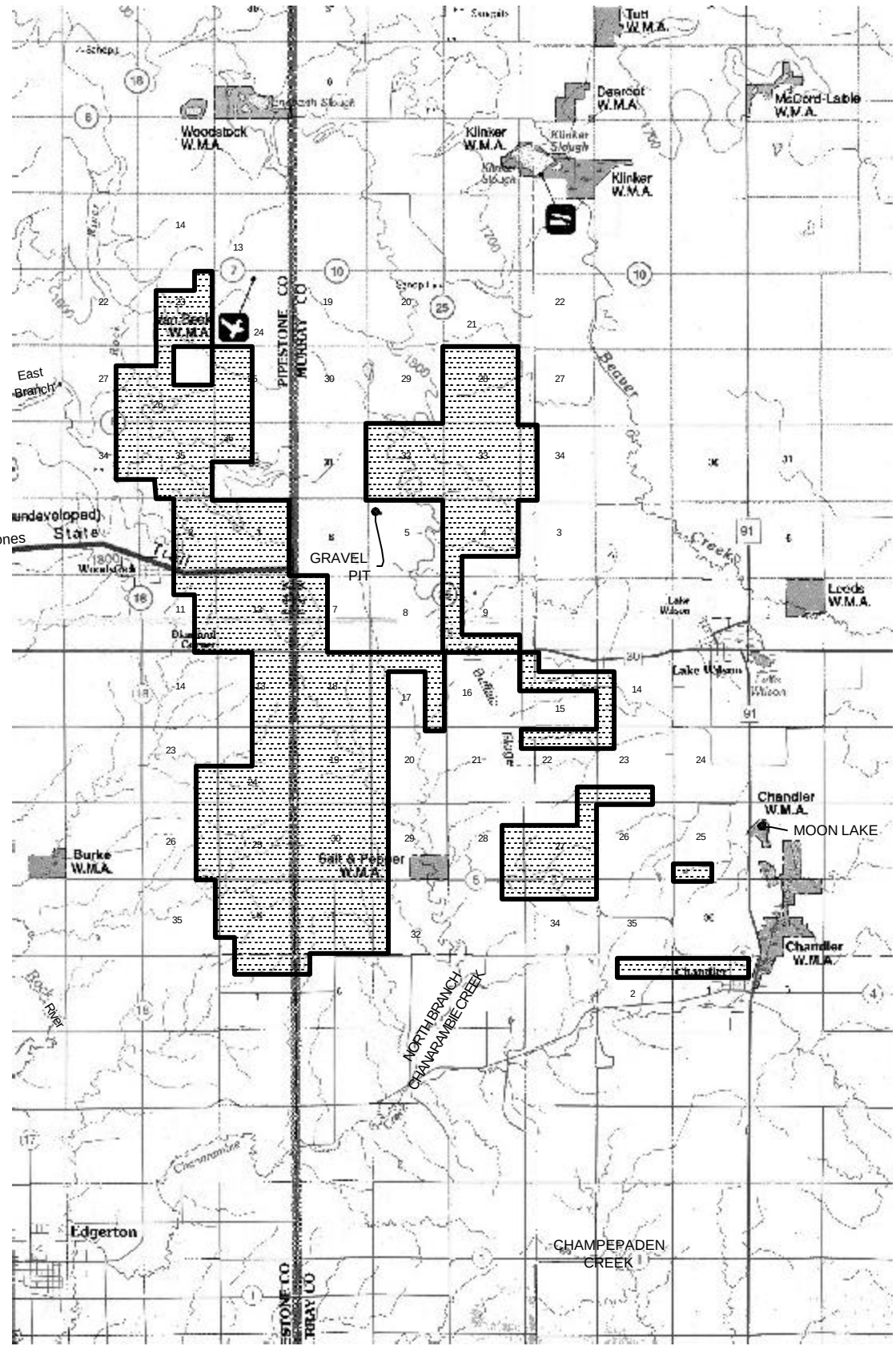


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

PUBLIC RECREATION INFORMATION MAP

enXco WIND POWER PLANT

PIPESTONE / MURRAY COUNTIES, MN

Project Mngr:	MMF	Project No.	41017725
Designed By:	JLM	Scale:	AS SHOWN
Checked By:	JLM	Date:	JULY 2002
Approved By:	MMF	Drawn By:	BMS (41)
File Name:	41017725-rec.dwg Layout1	Figure No.	18

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3535 Hoffman Road East
White Bear Lake, MN 55110

developed primarily with hunting license fees. WMAs are closed to all-terrain vehicles and horses because of potential detrimental effects on wildlife habitat.

WMAs located within 2 miles from the Development site are:

- Van Beek WMA is located adjacent north of a portion of the Development site in Rock Township (NE ¼ of Section 24, T107N, R44W).
- Woodstock WMA is located to the north in Rock Township (S ½ Section 1 and SE ¼ Section 2, T107N, R44W).
- Burke WMA is located to the west in Burke Township (SE ¼ of Section 28, T106, R44W).
- Salt & Pepper WMA is located west and east of portions of the Development site in Chanarambie Township (SE ¼ Section 29, T106N, R43W).
- Chandler WMA is located to the east in Leeds Township (portions of Section 30 and 31, T106, R42W) and a portion of the NW ¼ of Section 6, T105, R42W, in Fenton Township.

State Trail located within the Development site:

- Casey Jones State Trail is located within the Development site in Burke Township running west to east along the southern edge of Section 1 and 2 (T106N, R44W).

b. Impacts

Visual impacts will be the most evident to recreationalists using the WMAs, within a 3-mile radius of the Project site.

c. Mitigative Measures

Locating wind turbines in WMAs, SNAs, or county parks will be avoided.

7. Public Health and Safety

a. Air Traffic, Electromagnetic Fields, Security, and Traffic

Air Traffic. There are no airports located within the proposed Development site. However, the vast majority of the current land use is agricultural, which may require periodic overhead spraying or crop dusting. Crop dusting is typically carried out during the day by highly maneuverable airplanes or helicopters. The installation of the wind turbines in active cropland will create a potential for collisions with crop-dusting aircraft. However, distribution lines are expected to be similar to those which may be already present (located along the edges of fields and roadways) and the wind turbines themselves would be visible from a distance.

The tallest structures of the proposed wind plant are the wind turbines. A three (3) bladed rotor with a diameter of approximately 230-feet will be atop an approximately 213 to 262 foot tower, resulting in a maximum overall height of 328 to 377 feet. Since the highest point of the blade

sweep exceeds 200 feet, notification must be made to the FAA and compliance with any requirements imposed by the FAA must be followed on the wind power plant.

Electromagnetic Fields. Electromagnetic fields (EMF) are invisible lines of force that surround an electrical device and occur where an electric conductor exists with an electrical current flowing through it. Examples of such conditions include high-voltage transmission lines, distribution (feeder) lines, substation transformers, house wiring, and electrical appliances. EMFs also occur in nature, in the form of the earth's direct current magnetic field and in electric and magnetic fields generated during lightning storms.

Exposure to electric fields has not been proven to pose a long-term health threat. Concern has grown over the past 15 years about possible health effects resulting from exposure to magnetic fields. It is not known whether exposure to magnetic fields causes human injury or disease. The study of magnetic fields is complex. Although many studies have been done, the effect of magnetic fields on the human body has not been demonstrated. To date, tests have shown inconsistent responses to different field of strengths. Many of the reports appearing in the popular press linking magnetic field exposure to childhood cancer are based on the results of epidemiological studies. These studies have not been able to demonstrate a direct correlation between magnetic fields and human disease.

Consistently, expert review of panels commissioned by state, national, and foreign regulatory agencies have concluded that the existing body of research does not establish whether EMF poses significant health risks. They recommend more research to analyze issues raised by work done to date. Scientists continue to study magnetic fields and several nationwide research efforts are underway to investigate human exposure risks.

Regardless of the scientific community's determinations regarding EMF and possible health effects, or lack thereof, the typically low EMF field strengths of the 34.5kV distribution lines and the location of the existing and proposed 115kV transmission lines in the proposed project area indicates that these sources should not substantially increase public exposure to EMF, and no adverse impacts to health or safety are expected.

Security. The proposed Development site is located in an area which has a low population density. Construction, operation, and maintenance of the project(s) will have minimal impacts on the security and safety of the local population.

The following measures will be taken to reduce the risk of personal injury and property damage:

- The wind turbines will be attempted to be placed within 500 to 1,000 feet from occupied homesteads and 250 feet from public or developed roads.

- Security measures will be taken during construction, operation, and maintenance of the project(s), including temporary and permanent fencing, warning signs, and locks on equipment and wind power plant facilities.

- Each turbine door will be clearly labeled alphanumerically to identify each unit and a map of the site with the labeling system will be provided to local authorities as part of the fire protection plan.

- In winter months ice may accumulate on the wind turbine blades when the turbines are stopped or operating very slowly. Furthermore, the anemometer may ice up at the same time, causing the turbine to shut down during any icing event. As weather conditions change, any ice will normally drop off the blades in relatively small pieces before the turbines resume operation. This is due to flexing of the blades and the blades smooth surface. Although turbine icing is a very infrequent event, it remains important that the turbines are not sited in areas where regular human activity is expected below the turbines or in the immediate proximity during the winter months.

Traffic. The existing traffic levels for the State Highways and County Roads in the project area are relatively low. The most active routes are State Highways 30 and 91. County and township roads are the least traveled. No significant permanent changes in traffic patterns or volume are expected.

During the construction phase, several types of light, medium, and heavy-duty vehicles will travel to and from the Development site, as well as private vehicles used by the construction personnel. Based on developed experience, the worst-case scenario would be an average of 25 to 30 trips per day. That volume would occur during the peak time when the majority of the foundation work and wind turbine assembly is taking place. At such time, the majority of the heavy equipment and construction personnel will be entering or leaving the site. Other phases of construction would require less equipment and fewer personnel.

The operations and maintenance phase of the project will require approximately six (6) people to monitor and maintain the wind turbines. There would be a slight increase in traffic for occasional turbine repair.

b. Impacts

The Development site is in an area of low population density; primarily a rural area with very little residential, commercial, or industrial development outside of the surrounding city and town boundaries. Wind power technology has no air or water emissions. Impacts of the Development on public health and safety will be minimal

c. Mitigative Measures

Airports are not located within the Development site; however, spraying and crop dusting of the agricultural fields is conducted in the area. Notification of construction and operation of the wind power plant to the FAA will be completed and compliance with FAA requirements will be followed by the wind power plant. The wind power plant should not substantially increase public exposure to EMF; therefore, no adverse impacts to health or safety are expected. Significant permanent changes in traffic patterns or volume are not expected.

8. Land-Based Economics

a. Agriculture/Farming/Forestry/Mining

The land of Pipestone County is used mainly for growing crops with some areas used for grazing. Farming is the most important enterprise in the county. Corn, oats, flax, soybeans, and

hay are the main crops. The main livestock are beef cattle and hogs. Dairy operations and sheep production are also important.

Approximately 92 percent of the land in the Murray County is utilized for agricultural purposes. Corn is the most widely grown crop in the proposed project area, followed by soybeans. Alfalfa, small grains, and pasture are additional crops in the area. The acreage of corn and soybeans has increased over the past 25 years, while the acreage of alfalfa, small grains, and pasture have decreased. Feeding cattle and hogs, raising livestock and dairy farming are also major sources of income in the proposed project area. The number of beef cattle has remained steady, while the number of milk cows has decreased and the number of hogs, sows, and pigs has increased.

The Conservation Reserve Program (CRP) and Reinvest in Minnesota (RIM) Program are other sources of farm income. Cropland is planted to conservation grasses and legumes to protect and improve the soil and cannot be harvested or pastured. Within the Buffalo Ridge area, the trend is toward fewer and larger farms.

Mineral deposits in southwestern Minnesota consist of sand and gravel from unconsolidated surficial deposits, building stone from quartize rock units, and scattered clay/shale deposits for brickmaking. According to the Public Recreation Information Maps for the Marshall and Worthington areas and the U.S. 7.5 Minute Topographic Map Quadrangles of Balaton SW, Chandler, Edgerton NE, and Woodstock, two sand/gravel pit operations are located within the Development site. The pits are located in Rock Township (T107N, R44W, Section 27 north ½ of SE ¼) and Cameron Township (T107N, R43W, Section 20 NE ¼).

b. Impacts

The proposed Development is compatible with existing land use plans. Approximately 24.83acres of land in the Development site will be removed from its current use for the development, construction, operation, and maintenance of the wind power plant. Agricultural activity and grazing will continue between the wind turbines.

Significant impacts to sand and gravel mining are not anticipated. Sand and gravel operations tend to be quite small and other occurrences of these materials are likely to be present in nearby areas, including large commercial operations in the general area.

c. Mitigative Measures

The wind turbines and access roads will be located so that the most productive farmland (prime farmland) will be avoided as much as possible and they will not be located within sand/gravel pit operations.

9. Tourism and Community Benefits

a. Description of Resources

Tourism in southwestern Minnesota's Pipestone and Murray Counties focuses on promoting the areas abundant game and wildlife, lakes, farms, and villages. Other popular attractions are cultural and historical sites (End-O-Line Railroad Park & Museum, Pipestone Monument, etc.)

and recreational activities such as county and state parks, hiking trails, fishing, snowmobiling, golf courses, and skiing. The county hosts a variety of festivities, fairs, and cultural events throughout the year.

b. Impacts

Wind development may become a significant tourism attraction, bringing more visitors to the community. Potentially, the community could benefit from revenues generated by tourism dollars for hotel rooms, restaurants and other goods and services. Wind generation could become a new addition to the community's calendar of events.

10. Topography

Topography information was obtained from U.S. 7.5 Minute Topographic Map Quadrangles Balaton SW, Chandler, Edgerton NE, and Woodstock.

a. Description of Resources

The Development site includes some of the highest elevations in Minnesota. Elevations range between 1,700 and 2,000 feet above sea level, on the Bemis Moraine, which crosses through the center of the Project site from northwest to southeast. The Bemis Moraine is strongly expressed in Cameron and Chanarambie Townships in Murray County and know locally as Buffalo Ridge. The relief of Bemis Moraine is predominately hilly, with slopes that are gently, rolling to steep. A topographic map of the Project site is depicted in Figure 3.

The area northeast of the Bemis Moraine is gently undulating. Slopes are short and irregular and closed depressions are common. South and west of the Bemis Moraine are broad ridgetops and long, smooth gentle slopes that end in drainageways. There are no closed depressions because loess (wind deposited soil) has filled the irregularities of the glacial till plain.

The Bemis Moraine forms the divide between the Mississippi River and Missouri River basins. Streams northeast of the moraine drain into the Mississippi River drainage basin, and those southwest of it drain into the Missouri River drainage basin.

11. Soils

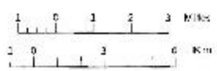
The dominant parent material in Pipestone and Murray Counties is glacial. Most of the soils formed in glacial till that was deposited directly by glacial ice. Other soils formed in deposits derived from glacial till that were sorted and redeposited by wind and water. The soil association map in Figure 19 illustrate the soil associations in the proposed project area. A soil association is a mapping unit used to delineate a landscape that has a distinctive pattern of soils. It is composed of one or more major soils and at least one minor soil and is named for the major soils. The soils in one association may occur in another, but in a different pattern. A soil association map is useful in providing a general idea of the soils in a large tract of land, such as the Project site. It is a useful guide in managing a watershed, a wooded tract, a wildlife area, or in planning engineering works, recreational facilities, and community developments. It is not a suitable map for planning the management of a farm or field, or selecting the exact location of a road, building, or similar structure because the soils in each association differ in slope, depth, stoniness, drainage, or other characteristics that affect their management. Three associations

LEGEND - PIPESTONE

1. Estelline-Lamoure association: Well drained and poorly drained, mainly nearly level soils that formed in wind- and water-deposited silty materials on stream terraces and bottom lands
2. Brookings-Hidewood association: Moderately well drained and somewhat poorly drained, mainly nearly level soils that formed in loess on uplands
3. Kransburg-Vienna association: Well-drained, mainly gently sloping sloping soils that formed in loess and loamy glacial till on uplands
4. Barnes-Buse association: Well-drained, gently undulating to steep soils that formed in loamy glacial till on uplands
5. Barnes-Flom association: Well drained and poorly drained, mainly gently undulating and nearly level soils that formed in loamy glacial till on uplands
6. Ihlen-Rock outcrop association: Well -drained, nearly level an gently sloping soils that formed in loess and rock outcrop on uplands
7. Moody-Trent-Whitewood association: Well drained, moderately well drained, and somewhat poorly drained, nearly level and gently sloping soils that formed in loess on uplands

PIPESTONE

MURRAY



LEGEND - MURRAY

AREAS DOMINATED BY SOILS THAT FORMED IN FRIABLE GLACIAL TILL

1. Barnes-Flom-Vallers association: Well drained and poorly drained, nearly level to moderately steep soils that formed in loamy glacial till
2. Barnes-Buse association: Well drained, gently undulating to very steep soils that formed in loamy glacial till
3. Clarion-Webster-Nicollet association: Well drained, poorly drained, and moderately well drained, nearly level to hilly soils that formed in loamy glacial till
4. Clarion-Storden association: Well drained, undulating to very steep soils that formed in loamy glacial till

AREAS DOMINATED BY SOILS THAT FORMED IN FRIABLE AND FIRM GLACIAL TILL

5. Everly-Letri-Wilmonton association: Well drained, poorly drained, and moderately well drained, nearly level to moderately steep soils that formed in loamy glacial till

AREAS DOMINATED BY SOILS THAT FORMED IN GLACIOLACUSTRINE SEDIMENTS OR GLACIAL TILL

6. Collinwood-Clarion-Waldorf association: Moderately well drained, well drained, and poorly drained, nearly level to sloping soils that formed in clayey lacustrine sediments or loamy glacial till

AREAS DOMINATED BY SOILS THAT FORMED IN LOESS AND GLACIAL TILL

7. Vienna-Hidewood-Lismore association: Well drained, poorly drained, and moderately well drained, nearly level to hilly soils that formed in loess and in glacial till

AREAS DOMINATED BY SOILS THAT FORMED IN GLACIAL OUTWASH AND ALLUVIUM

8. Arvilla-Egeland-Maryland association: Somewhat excessively drained, well drained, and poorly drained, nearly level to moderately steep soils that formed in loamy material over sandy and gravely deposits
9. Lamoure-La Prairie association: Poorly drained and moderately well drained, nearly level soils that formed in silty and loamy alluvial material

N

GENERAL SOIL MAP

enXco WIND POWER PLANT

PIPESTONE / MURRAY COUNTIES, MN

Project Mngr:	MMF	Terracon		Project No.	41017725
Designed By:	MMF			Scale:	AS SHOWN
Checked By:	JLM	3535 Hoffman Road East White Bear Lake, MN 55110		Date:	JULY 2002
Approved By:	JLM			Drawn By:	BMS (41)
File Name:	41017725-so.dwg		Layout1	Figure No.	19

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

are located within the Pipestone County portion of the site: Kranzburg-Vienna, Estelline-Lamoure, and Barnes-Buse. Two associations are located within the Murray County portion of the site: Barnes-Buse and Vienna-Hidewood-Lismore.

a. Description of Resources

Kranzburg-Vienna Association consists of well drained, mainly gently sloping soils that formed in loess and loamy glacial till on uplands. This association consists of broad ridgetops and side slopes that end in drainageways. Most areas of the association are covered by a thin mantle of loess that overlies glacial till. Slopes are long, smooth, and gentle because most irregularities in the glacial till have been filled in and leveled by wind deposited silty material. This association covers about 41 percent of the county. It is about 56 percent Kranzburg soils, 16 percent Vienna soils, and 38 percent minor soils. The surface layer of the Kranzburg soil is black silty clay loam that grades to dark brown, approximately 10 inches thick. The subsoil consists of friable, very dark grayish-brown to dark-brown, brown, and light olive-brown silty clay loam, approximately 22 inches thick. The underlying material is grayish-brown and light olive-brown clay loam glacial till. The surface layer of the Vienna soil is black to very dark gray and grayish-brown silty clay loam containing stones and pebbles, approximately 16 inches think. The subsoil is friable, dark grayish-brown clay loam and dark yellowish-brown and yellowish-brown loam containing stone and pebbles, approximately 11 inches think. The underlying material is yellowish-brown and grayish-brown lam and clay loam.

Minor soils in the association are in the Brookings, Hidewood, Lismore, Buse, and Darnen series.

Erosion is the major limitation to the use of the soils in this association. The long, smooth slopes make these soils well suited to contour farming. Drainage is needed and waterways should be constructed in some the drainageways. Corn, small grain, and alfalfa grow well on these soils if erosion is controlled. Fertility is adequate, and rainfall is ample. Most of the farms are used to raise livestock.

Estelline-Lamoure Association consists of well drained and poorly drained, mainly nearly level soils that formed in wind and water deposited silty materials on stream terraces and bottom lands. This association consists of terraces and bottom lands along streams and creeks in the county. Slopes are mostly nearly level, except where escarpments separate the uplands from the stream terraces and the terraces from the bottom lands. This association covers about 27 percent of the county. It is about 30 percent Estelline soils, 20 percent Lamoure soils, and 50 percent minor soils. The surface layer of the Estelline soils is black silty clay loam that grades to very dark brown, approximately 10 inches thick. The subsoil is friable silty clay loam that is very dark grayish brown in the upper part and dark yellowish brown in the lower part, approximately 20 inches thick. The underlying material is dark grayish-brown and brown sand and gravel. The surface layer of the Lamoure soils is black and very dark gray silty clay loam, approximately 30 inches thick. They underlying material is very dark gray to grayish-brown silty clay loam that contains thin layers of sandy clay loam and loamy sand.

Minor soils of this association are the Renshaw, Sioux, Anthelwold, Trosky, La Prairie, and Rauville series.

Droughtiness is the main limitation to use Estelline soils because the available water capacity is moderate. Wetness and susceptibility to occasional flooding are the main limitations to use the Lamoure soils. Estelline soils are fairly well suited to crops commonly grown in the county, especially when rainfall is timely and adequate. Lamoure soils can be row crops intensively. The frequently flooded areas on bottom lands are used for pasture and range. Most of the farms are used to raise livestock. Estelline soils are a good source of sand and gravel.

Barnes-Buse Association consists of well drained, gently undulating to very steep soils that formed in loamy glacial till. This association is mainly on irregular, complex slopes on end moraines. The elevation is one of the highest in the county. Drainage patterns are complex; the landscape has many short, deep drainage ways. This association consists of 55 percent Barnes soil and 20 percent Buse soil. The surface layer of the Barnes soil is black loam, approximately 9 inches thick. The subsoil consists of dark brown to dark yellowish-brown loam, approximately 25 inches think. The underlying soil to a depth of 60 inches is olive-brown loam. The surface layer of the Buse soil is very dark gray loam, approximately 7 inches thick. The subsoil is dark yellowish-brown loam, approximately 15 inches thick. Beneath the subsoil to approximately 60 inches is yellowish-brown and light olive-brown loam and clay loam.

Minor soils in the association are the Svea, Terril, Flom, Quam, Vallers, and Hamerly series.

Permeability of these soils is moderate and available water capacity is high. Surface runoff is medium to rapid due to slopes. The natural fertility is medium with a moderate to high organic matter content.

Most areas of this association are used for crops, pasture, and range. The major limitation to use these soils for cropland is the susceptibility to erosion. If the range land is well-managed, native grasses are the dominant vegetation, however, if the vegetation is heavily grazed, the native grasses are replaced with the less desirable Kentucky bluegrass.

The Barnes-Buse association has slight to severe limitations for building site development and sanitary facilities. The limitations for building site development and sanitary facilities increase as the slope of the soil increases.

Vienna-Hidewood-Lismore Association consists of well drained, poorly drained, and moderately well drained, nearly level to hilly soils that formed in silty loess and in glacial till. This soil association is found on long slopes on loess-mantled ground moraines. The complex topography of the underlying glacial till was filled in and leveled when loess was deposited. Smooth, convex slopes are dissected by broad, low-gradient drainageways. The drainageways are incised into the underlying glacial till.

This association consists of 45 percent Vienna soils, 15 percent Hidewood soils, and 15 percent Lismore soils. The Vienna soils are gently sloping to hilly and are well drained on long, convex slopes. Typically, the surface layer is black silty clay loam approximately 10 inches thick. The subsoil is dark brown silty clay loam in the upper part, followed by dark yellowish brown clay loam, and dark yellowish brown and pale brown clay loam in the lower part, approximately 17 inches thick. The underlying material is yellowish brown and pale brown clay loam, to approximately 60 inches deep.

The Hidewood soils are nearly level, poorly drained and are in drainageways and on low flats. Typically, the surface layer is silty clay loam approximately 8 inches thick. The subsurface layer is silty clay loam, black in the upper part and very dark gray in the lower part, approximately 13 inches thick. The subsoil is grayish brown, mottled silty clay loam approximately 10 inches thick. The underlying material is olive and light olive gray, mottled loam and clay loam, to approximately 60 inches deep.

The Lismore soils are nearly level, moderately well drained, and are on plane and slightly concave side slopes and in the upper part of drainageways. Typically, the surface layer is black silty clay loam approximately 8 inches thick. The subsurface layer is also black silty clay loam approximately 7 inches thick. The subsoil is clay loam, very dark grayish brown in the upper part and dark grayish brown in the lower part, approximately 16 inches thick. The underlying material is light olive brown clay loam to approximately 60 inches deep.

Minor soils in this association are Buse and Terril soils.

Permeability of the Vienna series is moderate in the upper part of the profile and moderately slow in the lower part. Permeability of the Hidewood series is moderately slow or moderate. Permeability of the Lismore series is moderate in the upper part of the profile and moderately slow in the lower part. Available water capacity for the association is high. Surface runoff is medium and organic matter content is slow to moderate to high.

Most of the acreage in the Vienna-Hidewood-Lismore association is farmed. The main enterprises are growing cash crops, dairying, and feeding beef cattle and hogs. The principle crops are corn, soybeans, small grain, and hay. The steep slopes and frequently flooded bottom land are used mainly as pasture or wildlife habitat.

The association generally is well suited to cultivated crops. Water erosion and soil blowing are the major management concerns on the Vienna and Lismore soils. Wetness in the Hidewood soils is an additional concern. Contour farming and terraces help to control water erosion on the Vienna soils. Conservation tillage reduces the hazard of soil blowing on the Lismore and Vienna soils.

b. Impacts

Construction of the wind turbines, access roads, and related ancillary facilities will increase the potential for soil erosion during construction and convert prime farmland from agricultural uses to industrial uses. Approximately 24.83acres in the Development site will be converted to wind power plant use.

c. Mitigative Measures

The placement of wind turbines, related access roads and ancillary facilities will be planned so that the conversion of prime farmland will be minimal. In addition, care will be taken in the planing and design of the wind power plant to take into account the contour of the terrain so as to minimize erosion. A standard soil erosion and sediment control plan will be developed prior to construction. This plan will address what type of erosion control measures should be implemented during each phase of construction and during the operations and maintenance of the wind power plant to minimize soil erosion and revegetate throughout construction, operation, and maintenance until disturbed areas have been successfully revegetated.

12. Geologic and Groundwater Resources

The geomorphology in southwestern Minnesota is dominated by the Minnesota River Valley, a deep and wide trench, and the Coteau Des Prairies (Coteau), a broad regional topographic highland. The Coteau, of which Buffalo Ridge is part, acts as a divide for the major drainage patterns in southwestern Minnesota. The Development site itself is situated along the ridge and flanks of the Coteau. The southwest side of the Coteau drains into the Big Sioux River and Rock River and the northeast side drains into the Minnesota and the Des Moines Rivers. The northeastern flank of the Coteau consists of regional benches and terraces expressed as poorly drained belts of hummocky terrain, separated by steeper, fairly well-drained areas.

a. Description of Resources

The surficial geology of the Development site consists of ice and stream deposits including Till of the Bemis Moraine, Till of the Verdi position, Stream sediment behind the Bemis Moraine, and Stream sediment beyond the Bemis Moraine.

Till of the Bemis Moraine consists of till with tenses of sorted sediment. Texture of till matrix is loam to clay loam. Yellow-brown where oxidized, gray were unoxidized. The till contains pebbles of carbonate; felsic and mafic igneous rocks; shale; chert; and some lignite.

Till of the Verdi position consists of eroded till having low relief. The matrix texture is loam to clay loam. The pebble assemblage and color are similar to Till of the Bemis Moraine, although the till in this unit is slightly more oxidized and leached and locally covered with a thin layer, approximately five feet thick, of windblown sediment.

Stream sediment beyond the Bemis Moraine consists of sand and gravel deposited by meltwater that issued from Bemis ice front. The texture is generally finer to sand and silt. The unit also includes sediment of contemporaneous nonglacial tributaries and younger postglacial streams.

Three types of bedrock underlie the glacial deposits of the Development site including Sioux Quartzite, Migmatitic gneiss and amphibolite, and Cretaceous Rocks, undivided.

- Sioux Quartzite (Early Proterozoic Era) consists of red and purple to light gray quartzite and related claystone (catlinite).
- Migmatitic gneiss and amphibolite (Middle Archean Rocks) consist of units of younger Archean granite, as well as units of Early Proterozoic gneiss and granite.
- Cretaceous Rocks (Mesozoic Rocks) consist dominantly of marine shale, including some sandstone and lesser amounts of limestone.

Geologic-related mineral resources at the site include groundwater and minor sand and gravel deposits. Groundwater resources at the site are derived from four general hydrogeologic units:

- Quaternary surficial sand and gravel
- Quaternary buried sand and gravel
- Cretaceous sandstone
- Precambrian Sioux Quartzite

Municipal water supplies are obtained from groundwater sources, commonly completed in outwash sand and gravel aquifers. The aquifer produces adequate yields and has a good recharge rate. The aquifer is easily defined; however, there is limited distribution and the aquifer is easily contaminated.

Mineral deposits in southwestern Minnesota consist of sand and gravel from unconsolidated surficial deposits, building stone from quartize rock units, and scattered clay/shale deposits for brickmaking. According to the Public Recreation Information Maps for the Marshall and Worthington areas and the U.S. 7.5 Minute Topographic Map Quadrangles of Balaton SW, Chandler, Edgerton NE, and Woodstock two sand/gravel pit operations are located within the Development site. The pits are located in Rock Township (T107N, R44W, Section 27 north ½ of SE ¼) and Cameron Township (T107N, R43W, Section 20 NE ¼).

b. Impacts

Impacts to geologic and groundwater resources are not anticipated. Water supply needs will be quite limited and local supplies are adequate.

c. Mitigative Measures

Wind turbine locations will not impact the use of existing water wells because the turbines will not be sited within 500 to 1,000 feet of occupied structures.

13. Surface Water and Floodplain Resources

Surface water and floodplain resources for the proposed Development site area were identified by reviewing U.S. Geological Survey Topographic Maps, Wetland Maps, and Flood Insurance Rate Maps (FIRM) produced by the Federal Energy Management Agency (FEMA).

a. Description of Resources

The major surface water located within the Development site include: East Branch Rock River and intermittent streams, Beaver Creek Intermittent Streams, North Branch Chanarambie Creek and intermittent streams, and several unnamed lakes and marsh or swamp areas. Figure 18 depicts the surface water bodies.

According to the Flood Insurance Rate Maps (FIRMs) for Pipestone County the Development site is located within Zone C – areas of minimal flooding. According to the FIRMs for Murray County, the Development site is located within Zone X – areas determined to be outside 500-year flood plain.

b. Impacts

Construction of the wind turbines and access roads will result in the disturbance of approximately 24.83acres. The wind turbines will be built on ridges, which will avoid lakes and streams on the lower positions in the landscape.

c. Mitigative Measures

If access roads are constructed across streams and drainage ways, the access roads will be designed in a manner so runoff from the upper portions of the watershed can flow unrestricted to the lower portion of the watershed. A storm water discharge permit will be acquired prior to the construction of the wind turbines and access roads. Erosion control measures will be installed prior to construction and maintained throughout construction until areas disturbed have successfully revegetated.

14. Wetlands

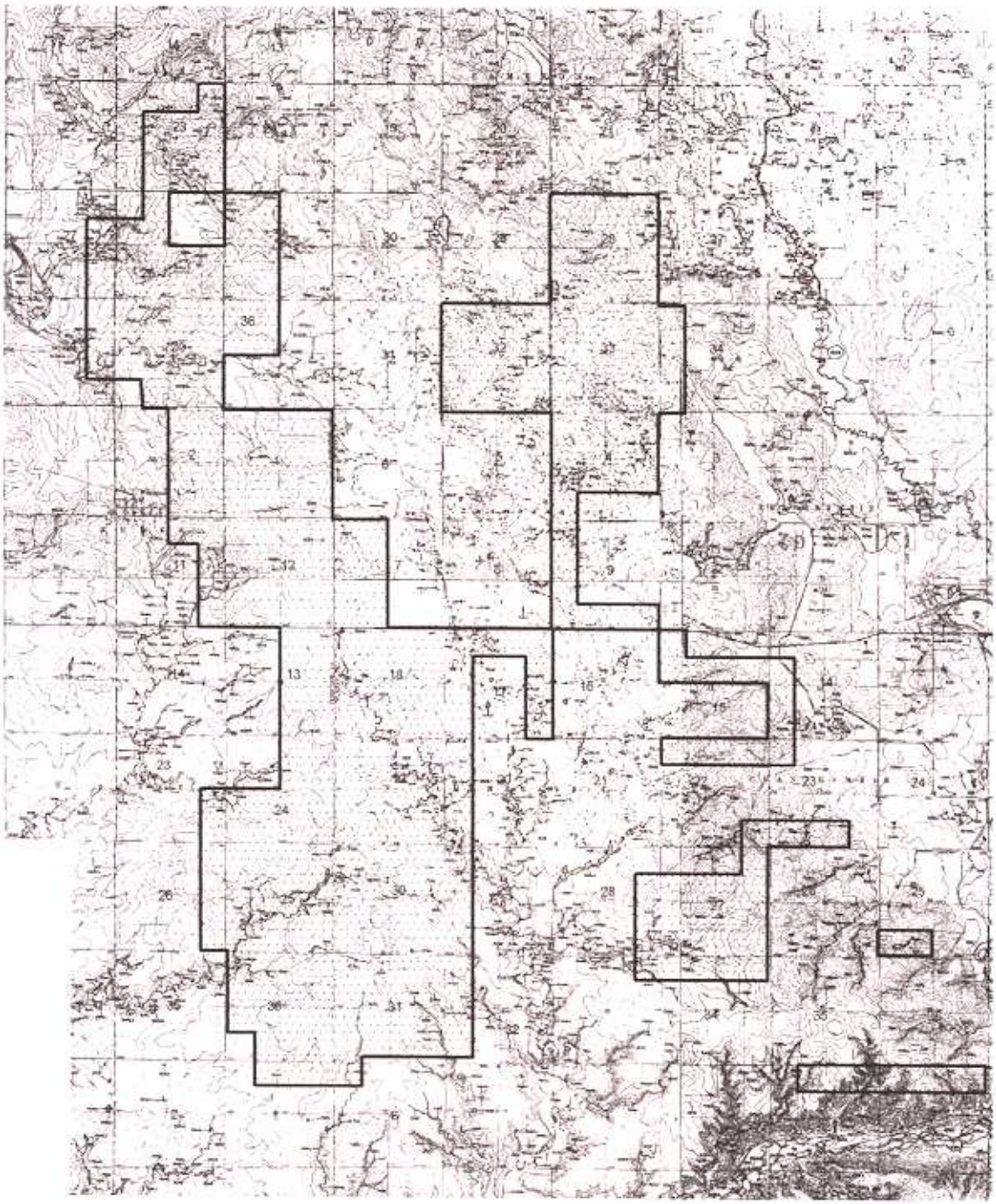
Delineated wetlands for the proposed Project site were identified from reviewing National Wetland Inventory (NWI) Maps developed by the United States Department of the Interior and Fish and Wildlife Service and depicted on U.S. 7.5 Minute Topographic Maps (Figure 20).

a. Description of Resources

The major wetlands within the proposed Project site mainly include: Paulstrine wetlands and small areas defined as a riverine wetland.

The Paulstrine System was developed to group the vegetated wetlands traditionally called by such names as marsh, swamp, bog, fen, and prairie. It also includes the small, shallow, permanent or intermittent water bodies often called ponds. Paulstrine wetlands may be situated shoreward of lakes, river channels, or estuaries; on river floodplains; in isolated catchments; or on slopes. They may also occur as islands in lakes or rivers. The erosive forces of wind and water are of minor importance except during severe floods.

The Riverine System includes all wetlands and deepwater habitats contained within a channel, with two exceptions: wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens and habitats with water containing ocean derived slats in excess of 0.5



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FEET

N

NATIONAL WETLANDS INVENTORY MAP

enXco WIND POWER PLANT

PIPESTONE / MURRAY COUNTIES, MN

Project Mngr:	JLM	Project No.	41017725
Designed By:	JLM	Scale:	AS SHOWN
Checked By:	MMF	Date:	JULY 2002
Approved By:	JLM	Drawn By:	BMS (41)
File Name:	41017725-nw.dwg Layout1	Figure No.	20

Terracon

3535 Hoffman Road East
White Bear Lake, MN 55110

DIAGRAMS FOR GENERAL LOCATION ONLY AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

percent. The Riverine System is bounded on the landward side by upland, by the channel bank, or by wetland dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens. Water is usually, but not always, flowing. Upland islands or Paulstrine wetlands may occur in the channel, but they are not included in the Riverine System. Paulstrine Moss-Lichen Wetlands, Emergent Wetlands, Scrub-Shrub Wetlands, and Forested Wetlands may occur adjacent to the Riverine System, often on a floodplain.

Table 8 lists the wetland types found within the Development site. The information was obtained from the Minnesota Department of Natural Resources Water Division.

Table 8

Wetland Types located within the Development Site

Type	NWI Symbol	Acres in Murray County	Acres in Pipestone County
Type 1 – Seasonally Flooded Basin or Flat	PEMA	1,521	1,264
Type 3 – Shallow Marsh	PEMC, PEMF	11,719	3,221
Type 4 – Deep Marsh	PUBF	450	177
Type 5 – Shallow Open Water	PUBG	1,228	60
Type 7 – Wooded Swamp	PFO1	423	18
Riverine	R4SBF, R4SBC,	80	29

Another wetland type identified with in the Development site is:

- U – Primarily represents upland areas, but may include unclassified wetlands such as man-modified areas, non photo-identifiable areas, and/or unintentional omissions.

b. Impacts

The wind turbines will be built on ridges to capture the wind resource and to avoid wetlands on the lower positions in the landscape. Access roads and ancillary wind power plant features will be designed to minimize impacts on the wetlands.

c. Mitigative Measures

Wetlands will be avoided during the construction phase of the wind power plant. A General Storm Water Permit Application Construction Activity will be submitted to the Minnesota Pollution Control Agency. The General Construction Storm Water Permit requires that temporary and permanent erosion and sediment control plans be developed. The goal of the plan is to prevent erosion from occurring and to keep sediment on the site during construction. Erosion control measures will be installed prior to construction and maintained throughout the construction until areas disturbed have successfully revegetated.

If it appears that wetlands could be affected, enXco will follow the requirements of the applicable program and work with governing entities to reduce or eliminate wetland impact or if necessary, replace or substitute wetland values or resources where avoidance is not feasible.

15. Vegetation

Information on the existing vegetation in the proposed Development site was obtained from the Minnesota Department of Natural Resources.

The following sections do not include any discussion on vegetation species considered by the state to be threatened, endangered, or of special concern. Refer to Section 17 Rare and Unique Natural Resources for information on these resources.

a. Description of Resources

The presettlement vegetation within the Development site consists of medium and tallgrass prairie with wet prairie covering a small proportion of the Development area. Agriculture is the primary land use in the Development site area and few remnants of presettlement vegetation remains.

Fire and drought were the dominant causes of natural disturbance. Fires were very common before settlement, re-energizing the prairie plant communities.

Farmland currently occupies a majority of the Development site. The land consists of pasture, agricultural crops, CRP and RIM lands.

b. Impacts

Construction of the proposed wind power plant will result in the permanent disturbance of approximately 24.83 acres. Some vegetation will be permanently removed and converted to the wind power plant. Some additional acreage will be temporarily disturbed during the construction and operation and maintenance of the wind power plant (contractor staging areas, underground, power lines). The wind turbines require uninterrupted airflow, therefore, they will be constructed on the ridge at a certain distance from forests and groves to maximize wind turbine output and reduce tree removal. Operation and maintenance of the wind power plant will not affect the remaining vegetation in the area.

c. Mitigative Measures

The following measures will be used to help avoid or alleviate potential conflicts and impacts on the vegetation of the area during the final siting of the wind power plant and its subsequent development, operation, and maintenance:

- Conduct a pre-construction inventory of existing wildlife management areas, scientific and natural areas, recreation areas, wetlands, native prairie, and forests.

- Exclude established wildlife management, recreation and scientific natural areas from consideration for wind turbine locations, access roads, or electrical/transmission line placement.

- Avoid disturbance of individual wetlands during construction of the project.

- Protect existing trees and shrubs.

- Maintain sound water and soil conservation practices during construction and operation of the project to protect topsoil and adjacent resources and to minimize soil erosion. Practices may include containing excavated material, protecting exposed soil and stabilizing restored material.

- Revegetate non-cropland and range areas with wildlife conservation species and wherever possible, plant native tallgrass prairie species in cooperation with landowners.

16. Wildlife

Information on the existing wildlife in the proposed Project site was obtained from a variety of sources, including the MDNR, "Birds of Minnesota Field Guide", "Birds in Minnesota", and "The Mammals of Minnesota."

The following sections do not include any discussion on wildlife species considered by the state to be threatened or endangered or of special concern. Refer to Section 17 Rare and Unique Natural Resources for information on these resources.

a. Description of Resources

Wildlife within the Project site consists of birds, mammals, fish, herpetiles, and insects – both resident and migratory – which utilize the area habitat for forage, breeding, and/or shelter. The resident species are representative of Minnesota game and nongame fauna which are associated with upland grass and farm lands with few wetland and forested areas. The majority of the migratory wildlife species are birds including waterfowl, raptors, and song birds. The principle migration routes for the large numbers of waterfowl which pass through Minnesota each year in the spring and fall, to and from northern breeding grounds, lie outside of the project area. However, some migrants do pass over the study area at elevations of 1,000 to 10,000 feet.

Resident Birds

Resident bird species are those that occupy the proposed Project site throughout the year. Table 9 lists the resident bird species, which are expected to occur within the Project site.

Table 9

Resident Bird Species within the Development Site

Common Name	Scientific Name
European Starling	*Sturnus vulgaris*
American Crow	*Corvus brachyrhynchos*
Downy Woodpecker	*Picoides pubescens*
Hairy Woodpecker	*Picoides villosus*
Red-Bellied Woodpecker	*Melanerpes carolinus*
Blue Jay	*Cyanocitta cristata*
House Finch	*Carpodacus mexicanus*
House Sparrow	*Passer domesticus*

Common Name	Scientific Name
Cedar Waxwing	*Bombycilla cedrorum*
Horned Lark	*Eremophila alpestris*
Northern Cardinal	*Cardinalis cardinalis*
American Kestrel	*Falco sparverius*
Mourning Dove	*Zenaida macroura*
Ring-Necked Pheasant	*Phasianus colchicus*
Red-Tailed Hawk	*Buteo jamaicensis*
Great Horned Owl	*Bubo virginianus*
Wild Turkey	*Meleagris gallopavo*
Black-Capped Chickadee	*Parus atricapillus*
White-Breasted Nuthatch	*Sitta carolinensis*
Eastern Screech Owl	*Otus asio*
Rock Dove	*Columba livia*
American Goldfinch	*Carduelis tristis*

The resident bird species include the game birds, which form the most important economic component of this group.

Migratory Birds

Migratory bird species are those which may use the Development site for resting, foraging or breeding activities for only a portion of the year.

Table 10

Migratory Bird Species within the Development Site

Common Name	Scientific Name
Brown-Headed Cowbird	*Molothrus ater*
Red-Winged Blackbird	*Agelaius phoeniceus*
Yellow-Headed Blackbird	*Xanthocephalus xanthocephalus*
Common Grackle	*Quiscalus quiscula*
American Coot	*Fulica americana*
Double-Crested Cormorant	*Phalacrocorax auritus*
Rose-Breasted Grosbeak	*Pheucticus ludovicianus*
Red-Headed Woodpecker	*Melanerpes erythrocephalus*
Bufflehead	*Bucephala albeola*
Black-Crowned Night Heron	*Nycticorax nycticorax*
Tree Swallow	*Tachycineta bicolor*
Indigo Bunting	*Passerina cyanea*
Barn Swallow	*Hirundo rustica*
Eastern Bluebird	*Sialia sialis*
Purple Martin	*Progne subis*
Belted Kingfisher	*Megaceryle alcyon*
Chimney Swift	*Chaetura pleagica*
Chipping Sparrow	*Spizella passerina*
Common Redpoll	*Carduelis flammea*
House Wren	*Troglodytes aedon*

Common Name	Scientific Name
Song Sparrow	*Melospiza melodia*
Dark-Eyed Junco	*Junco hyemalis*
American Tree Sparrow	*Spizella arborea*
White-Crowned Sparrow	*Zonotrichia leucophrys*
Fox Sparrow	*Passerella iliaca*
Harris' Sparrow	*Zonotrichia querula*
Spotted Sandpiper	*Actitis macularia*
Common Nighthawk	*Chordeiles minor*
Brown Thrasher	*Toxostoma rufum*
Killdeer	*Charadrius vociferus*
Lesser Yellowlegs	*Tringa flavipes*
Northern Flicker	*Colaptes auratus*
Pied-Billed Grebe	*Podilymbus podiceps*
Greater Yellowlegs	*Tringa melanoleuca*
Blue-Winged Teal	*Anas discors*
Wood Duck	*Aix sponsa*
Northern Shoveler	*Anas clypeata*
Mallard	*Anas platyrhynchos*
Northern Harrier	*Circus cyaneus*
Eastern Phoebe	*Sayornis phoebe*
Eastern Kingbird	*Tyrannus tyrannus*
Gray Catbird	*Dumetella carolinensis*
American Robin	*Turdus migratorius*
Sharp-Shined Hawk	*Accipiter striatus*
Cooper's Hawk	*Accipiter cooperii*
Franklin's Gull	*Larus pipixcan*
Ring-Billed Gull	*Larus delawarensis*
Canada Goose	*Branta canadensis*
Ruby-Throated Hummingbird	*Archilochus colubris*
Baltimore Oriole	*Icterus galbula*
Foster's Tern	*Sterna forsteri*
Snow Goose	*Chen caerulescens*
Common Yellowthroat	*Geothlypis trichas*
Yellow Warbler	*Dendroica petechia*

Table 10 should not be considered a comprehensive list of the migratory birds occupying the proposed Development site. However, based on the available information, the migratory birds listed represent the majority of species present in the Development site.

Mammals

Table 11 lists the mammal species that are expected to occur within the Development site.

Table 11

Mammal Species within the Development Site

Common Name	Scientific Name
White-Tailed Jackrabbit	*Lepus townsendii*
Eastern Chipmunk	*Tamias striatus*
Woodchuck	*Marmota monax*
Fox Squirrel	*Sciurus niger*
Prairie Deer Mouse	*Peromyscus maniculatus bairdii*
White-footed Mouse	*Peromyscus leucopus*
Northern Grasshopper Mouse	*Onychomys leucogaster*
Muskrat	*Ondatra zibethicus*
Meadow Jumping Mouse	*Zapus hudsonius*
Red Fox	*Vulpes vulpes*
Gray Fox	*Urocyon cinereoargenteus*
Raccoon	*Procyon lotor*
Mink	*Mustela vison*
Badger	*Taxidea taxus*
Eastern Spotted Skunk	*Spilogale putorius*
Striped Skunk	*Mephitis mephitis*
Mule Deer	*Odocoileus hemionus*
White-tailed Deer	*Odocoileus virginianus*
Pronghorns	*Antilocapra americana*

These species use the food and cover available from agricultural fields, grasslands, farm woodlots, wetland areas, and wooded ravines. Agricultural crops provide seasonal food sources for the herbivores and omnivorous species.

Grassland areas and woody vegetation are also habitat for a variety of small mammals including mice, which serve as food base for the larger carnivorous and omnivorous mammals and birds. Natural predator-prey relationships exist between some of the species.

White-tailed deer, an economically important species, have a strong affinity for agricultural crops and use farm woodlots, wooded ravines and intermittent stream bottoms for shelter. Winter yarding is reported in the prairie hills where wooded ravines are present.

Herpetiles

Reptile and amphibian species, which may use the grassland and forested areas within the Project site include: Great Plains Toad, Northern Leopard Frog, Western Chorus Frog, American Toad, Common Garter Snake, Plains Garter Snake, Fox Snake, and Bullsnake. It is unlikely that the water dependent species occur in the Project site because of the lack of significant amounts of surface water.

Insects

While many insect species are important to the indigenous vegetation and wildlife, honey bees are the only species economically important within the Development site.

b. Impacts

Development of the wind power plant(s), including the construction and operation of the project(s), is expected to produce a minimal impact to the wildlife. Based on studies of existing wind power projects in the United States and Europe, the greatest impact to wildlife would occur to migrant and resident avian populations. Previous avian studies have been conducted near the existing wind power plants in the Buffalo Ridge area. Over a period of six months, 66 bird species were observed in the area. The amount of species observed was higher during migration periods. At the time of the study threatened or endangered birds were not seen in the area. Most birds seen during the study flew at heights above or below the height range of the wind turbine blades (70 – 170 feet). Dead birds and bats were found during the survey. It did not appear as if the bird deaths were attributed to collisions with wind turbines. However, the bats probably had died as a result of collisions with the wind turbines.

The impact of the proposed wind power plant(s) on resident wildlife is expected to be minimal. The only measurable impact is a small percentage reduction in the available habitat, which the resident wildlife uses for forage or cover. Operation and maintenance of the wind power plant(s) will not change the existing land use.

c. Mitigative Measures

The following measures will be used to help avoid or alleviate potential conflicts and impacts on the wildlife of the area during the final siting of the wind power plant(s) and its subsequent development, operation, and maintenance:

- Conduct a pre-construction inventory of existing wildlife management areas, scientific and natural areas, recreation areas, wetlands, native prairie and forests.

- Exclude established wildlife management, recreation and scientific natural areas from consideration for wind turbine locations, access road or electrical/transmission line placement.

- Avoid disturbance of individual wetlands or drainage systems during construction of the project(s).

- Protect existing trees and shrubs, which are important to the wildlife present in the area.

- Avoid construction activities within deer-wintering yards during the winter.

- Maintain sound water and soil conservation practices during construction, operation, and maintenance of the wind power plant to protect topsoil and adjacent resources and to minimize soil erosion. Practices may include containing excavated material, protecting exposed soil, and stabilizing restored material.

- Revegetate non-cropland and range areas with wildlife conservation species.

17. Rare and Unique Natural Resources

The Endangered Species Act of 1973, as amended, requires that a consultation pursuant to Section 7 be conducted to insure that a proposed project will not affect the continued existence of any endangered or threatened species or adversely affect their habitats, and that corrective action be taken if adverse impacts may occur. The MDNR maintains a Natural Heritage Database (NHD) through their Natural Heritage and Nongame Research Program, which is the most complete source of data on Minnesota's rare, endangered or otherwise significant plant and animal species, plant communities and other natural features.

a. Description of Resources

The MDNR has accessed the NHD to assess if rare plant or animal species or other significant natural features are know to occur within an approximate one-mile radius of the Development site. Based on the NHD review, there are 34 known occurrences of rare species or natural communities in the area searched. Of the 34 occurrences there were 9 species or natural communities were identified.

Table 12 lists the 7 species, which are considered as legally endangered or threatened species, or of special concern.

Table 12

State Threatened and Endangered Species and Species of Concern Which Occur Near the Development Site

Common Name	Scientific Name	Status
Arogos Skipper	*Atrytone Arogos*	State-Special Concern butterfly
Powesheik Skipper	*Oarisma Powesheik*	State-Special Concern butterfly
Regal Frittilary	*Speyeria Idalia*	State-Special Concern butterfly
Dakota Skipper	*Hesperia Dacotae*	State-listed Threatened butterfly
Pawnee Skipper	*Hesperia Leonardus*	State-Special Concern butterfly
Topeka Shiner	*Notropis topeka*	Federally-listed Endangered and State-Special Concern
Blanding's Turtle	*Emydoidea blandingii*	State-listed Threatened Species

Butterfly Species

The NHD listed five species of butterflies with legal status within and surrounding a majority of the Development site including: Arogos Skipper (special concern), Powesheik Skipper (special concern), Regal Frittilary (special concern), Dakota Skipper (state-listed threatened), and Pawnee Skipper (special concern).

Fish Species

The NDH listed one species of fish with legal status within the Development site, the Topeka Shiner (special concern).

Turtle Species
The NDH listed one turtle species with legal status that possibly exists in the Development site, the Blanding's Turtle (State-listed Threatened Species). A priority area for the turtle exists on the western edge of the Development site.

Rare Communities
The NHD listed two rare natural community occurrences within the Development site, Calcareous Seepage Fen and a Prairie Bank Easement. The Calcareous Seepage Fen community occurs within Moulton Township (T105, R43W, Section 2) and is an extremely rare type of wetland that is critically endangered in Minnesota. The Prairie Bank Easement is a prairie remnant that has been enrolled in Minnesota's Native Prairie Bank Program since 1991. This prairie occurs within Chanarambie Township (T106, R43W, Section 32).

A survey of rare features has not yet been completed for Murray or Pipestone Counties; therefore, there may be rare or otherwise significant natural features for which no records exist on the Development site.

b. Impacts

Construction of the proposed wind power plant(s) will result in the disturbance of approximately 24.83 acres. The vegetation (habitat) will be permanently removed and converted to access roads or wind turbines to support the proposed design for the wind power plant(s). Additional acres will be temporarily disturbed during construction of the wind power plant(s) (contractor staging areas and underground power lines).

The permanent removal of vegetation will result in less habitat available for breeding, forage, or nesting of the state-listed butterfly species. These species are associated with prairie. Habitat loss and degradation is a contributing factor to the decline of these butterflies as they are dependent on specific plant community types for survival.

Operation and maintenance of the proposed wind power plant(s) will not affect the state-listed butterfly species. Wind turbine blades operate at heights which are generally well above the normal flight patterns of the butterfly species listed by the state.

The Topeka Shiner are adversely impacted by actions which alter stream hydrology or decrease water quality, including sedimentation, dredging and filling, stream dewatering, impoundment, eutrophication, channelization, and pollution/contamination. Construction, operation, and maintenance of the wind power plant will not affect the Topeka Shiner. The wind turbines will be constructed on the higher elevations within the Development area therefore; it is unlikely that creeks or streams will be affected.

Many occurrences of Calcareous Seepage Fen are designated as an "outstanding resource value water" in water quality regulations administered by the MPCA, Minnesota Rules part 7050.0180. Calcareous Fens are given statutory protection through Minnesota Rules part 8420.1010–8240.1060. The Wetlands Conservation Act, authorized by Minnesota Statues 103G.223 states that Calcareous Fens may not be filled, drained, or otherwise degraded, wholly or partially, by any activity, except as provided for in a management plan approved by the Commissioner of the DNR. Streams and wetlands are not anticipated to be affected during the construction activities, therefore, fen areas will be avoided.

c. Mitigative Measures

The following measures will be used to avoid or alleviate potential conflicts on the state-listed butterfly, and plant species of the area during the final siting of the wind power plant(s) and its subsequent development, operation, and maintenance:

- Conduct a pre-construction inventory of the Development site to assess the presence of state- or federally-listed species and sensitive habitats (wetlands and native prairie).

- Avoid placing wind turbines and wind power plant facilities in or disturbing those areas identified in the pre-construction survey, which contain state- or federally-listed species, wetlands, or native prairie.

- Measures will be taken to eliminate or minimize the actions that could adversely impact the Topeka Shiner. If it appears that the Topeka Shiner will be affected by the proposed wind power plant construction activities, consultation with the U.S. Fish and Wildlife Service must be conducted.

- The summary of recommendations for avoiding and minimizing impacts to the Blanding's Turtle fact sheet provide by the MDNR will be utilized during construction activities.

18. Adverse Human and Environmental Effects Which Cannot be Avoided.

Aesthetics. The wind turbine arrays will be prominent features in the landscape. By design, these structures are placed in open areas of higher elevations. Some mitigative measures, as described in Section 3, can be implemented to somewhat limit visual impacts. However the wind turbines will be a significant feature on the horizon. The degree to which the visual impacts are considered adverse is subjective, and can be expected to vary depending on the viewer's perspective.

Commitment of Land. The proposed Development will be sited on land for which enXco currently has legal, valid, and binding contracts for wind easements. Approximately 24.83 acres will actually be impacted with turbines and related equipment, access roads, and maintenance facilities. The existing use of this land can continue as agricultural or open fields. Some areas will be affected as the character of the land surface changes from natural vegetation or agricultural field to gravel roads, tower foundations, or maintained grassy areas.

Wind Turbine and Substation Noise. When in motion, the wind turbines emit a perceptible sound. The level of this noise varies with the speed of the wind turbine and the distance of the listener to the turbine. On relatively windy days, the turbines create more noise; however, the ambient, or natural, noise level simply from the wind tends to override the wind turbine noise as distance from the turbines increases. The noise generated by the wind turbines is less than 45 dBA at an average distance of 1,000 feet.

Avian Impacts. Occasional collisions of avian species with turbine blades occur at wind power plants. The frequency of these collisions depends upon the spacing and number of turbines, as well as size of the local and migrating avian species that frequent the project area. Because the wind direction at Buffalo Ridge is relatively variable, the wind turbines must be spaced far apart

to avoid interference or wake effects. This design tends to lower the number of avian collisions. While a number of different species of birds use the project are for habitat, as described in Section 16, Buffalo Ridge does not represent a significant habitat for raptors nor is it a significant migratory route.

G. IDENTIFICATION OF REQUIRED PERMITS/APPROVALS

enXco has identified the applicable regulatory approvals required for the construction and operation of the proposed wind power plant(s). Contacts have been established with appropriate federal, state, and local agencies to discuss the applicable permitting requirements, and to learn of and mitigate any concerns by these agencies early in the development process. The following items summarize applicable permits & licenses for the wind power plant(s):

1. Minnesota Environmental Quality Board

Site Permit

The primary regulatory approval required for the construction and operation of the Project is a Site Permit, which is issued by the Minnesota Environmental Quality Board ("MEQB").

Pursuant to Minnesota Statue 116C.691 through 116C.697 (the "Law"), the MEQB has been given the responsibility for permitting Large Wind Energy Conversion Systems (LWECS) in Minnesota. The Law provides that *"No person may construct an LWECS without a site permit issued by the environmental quality board"* (Section 116C.694(a)). The Law defines an LWECS as any combination of wind turbines and associated facilities with a nameplate rating equal to or greater than 5,000 kW. Furthermore, Section 116C.697 of the Law states that, *"A permit under sections 116C.691 to 116C.697 is the only site approval required for the location of an LWECS. The site permit supersedes and preempts all zoning, building, or land use rules, regulations, or ordinances adopted by regional, county, local and special purpose government*."

Minnesota Rules Chapter 4401 adopted by the MEQB defines the process used for the application, review and approval of a site permit.

Pursuant to 4401.0610 Effect of Permit, Subp. 3 Power Purchase Agreement of the Site Permit Procedures, the completed application for a site permit must include a power purchase contract. enXco will file the completed application for the site permit prior to PPA execution with GRE. Due to the aggressive project schedule, enXco will work with the EQB to submit the application based on a merchant plant scenario and contingent on approval of the power purchase contract with GRE instead of attaching such contract. Upon receipt of the completed application, the MEQB is expected to issue a final site permit for the Project within 60 to 90 days.

2. Department of Natural Resources (DNR)

Utility Crossing of Public Land and Water

In case transmission lines cross state lands, rivers, or streams, a DNR permit would be required. At present enXco does not anticipate any such crossings that would trigger DNR review.

Wetlands Survey

The DNR has a permit program for "public waters wetlands". A wetland survey will be conducted to determine if there are any public waters wetlands on the Project site that may be affected by tower or road placement and construction. If it appears that wetlands could be affected, enXco will strictly follow the requirements of the DNR and work cooperatively with the DNR and all other governing entities to reduce or eliminate wetland impacts, or if necessary, replace or substitute wetland value or resources where avoidance is not feasible or prudent.

3. Minnesota Pollution Control Agency (MPCA)

Water Discharge to Surface Waters (NPDES)

Developer will submit an application for General Storm Water Permit with the Minnesota Pollution Control Agency ("MPCA"). Because Minnesota is an Environmental Protection Agency ("EPA") delegated state, all NPDES requirements will be met upon MPCA approval.

Storm water Discharge

As required by MPCA's General Storm Water Permit, Developer will prepare both a Temporary and a Permanent Soil Erosion and Sediment Control Plan prior to construction. Both the Temporary and Permanent Erosion and Sediment Control Plans will be incorporated into the Project's final plans and specifications. Erosion control plans will be implemented prior to construction and maintained until construction has been completed and disturbed areas have been successfully re-vegetated.

Small Quantity Generator Permit

A Small Quantity Generator Permit from the MPCA will be necessary if any used lubricating oil will be accumulated and temporarily stored on the site. There is no fee for the permit. The permit can be obtained within 45 days after the Project is placed into operation. No permit is required for virgin lubricants.

4. Minnesota Department of Transportation (MNDOT)

Permit for Access Roads

enXco plans to install accessways at each point where the project access roads meet existing state, county, or township roads or highways. enXco will obtain all necessary accessway permits with the appropriate regulatory entity (MNDOT, County, Township).

Routing Permit for Power Lines

enXco plans to run below ground lines within the Project site to the edge of each landowner's property. This collection system will connect to feeder lines that run above or below ground inside road right of ways to the point of interconnection with Xcel Energy. enXco will obtain a routing permit with the appropriate regulatory entity (MNDOT, County, Township) for power line installation for any power lines required outside the Project site boundaries.

5. Pipestone and Murray Counties

Wetlands Conservation Act

Based on previous contacts with representatives of the Minnesota Board of Water & Soil Resources, it was determined that the Wetlands Conservation Act (WCA) is administered at the local (county) level. enXco will coordinate with county procedures relating to the Wetland Conservation Act.

6. Federal Aviation Administration (FAA)

Notice of Proposed Construction or Alteration

enXco is proposing to use tubular towers that will result in a hub height of greater than 200 feet for the wind turbines. Federal Aviation Regulations (FAR), Part 77, states that any structure of more than 200 feet in height requires a formal airspace review. A "Notice of Proposed Construction or Alteration" (FAA Form 7460-1) will be filed with the FAA Great Lakes Regional Office when the location and height of the wind turbines has been finalized. Additionally, the siting of the turbines in the Project will be in compliance with any pertinent setback requirements of FAA. enXco anticipates the installation of FAA approved obstruction lighting on some or all wind turbines. The type of light is anticipated to be a solid red non-flashing light (L-810).

7. Minnesota Historical Society (MHS)

Phase I Archaeology Survey

A Phase I archaeology survey consists of the following tasks: consultation, documentation, and identification. If any archaeological sites are found during the Phase I survey, their integrity and significance should be addressed in terms of the site's potential eligibility to the National Register of Historic Places (NRHP). Any sites recommended as potentially eligible will need to be further tested to determine their eligibility for the NRHP. If such sites are found to be eligible for the NRHP, appropriate mitigative measures will need to be developed in consultation with Minnesota State Historical Preservation Office (SHPO), the State Archaeologist, and consulting American Indian communities.

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*Terracon and enXco jointly provided the information in preparation of this application.