Rough Rider I Wind Project
Rough Rider Wind, LLC
Dickey County, North Dakota

Application to the North Dakota Public Service Commission for a Certificate of Site Compatibility

Prepared for:
NextEra Energy Resources, LLC
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Prepared by:
Tetra Tech EC, Inc.
133 Federal Street
Boston, MA 02110

ROUGH RIDER I WIND PROJECT

Case No.: PU-08-375

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1. INTRODUCTION

Rough Rider Wind, LLC (Rough Rider Wind), a wholly owned subsidiary of NextEra Energy Resources, LLC (formerly FPL Energy, LLC), is submitting this application for a Certificate of Site Compatibility (certificate) to construct the Rough Rider I Wind Project (the Project). NextEra Energy Resources submitted a letter of intent to file this application on June 23, 2008. The Project is located in Dickey County, North Dakota, (Figures 1 through 3) and would be approximately 175 megawatts (MW) in size, consisting up to 116 GE Xle 1.5-MW wind turbine generators. Additional facilities include five meteorological (met) towers, one project substation, an operation and maintenance (O&M) facility, a construction laydown area, access roads up to 32 feet in width, and above and below ground electrical collection systems and cabling.

The Project will include a ring bus/substation in the middle of the project area and inject the power on the existing Montana-Dakota Utilities Co. (MDU) 230-kV transmission line intersecting the project in Section 18, Township 130N North, Range 65 West.

NextEra Energy Resources develops environmentally responsible electric generation projects throughout the United States. According to FPL Group's 2006 Sustainability Report, NextEra Energy Resources entities collectively own and operate 4,016 MW of wind energy generation capacity in 24 states, including projects in Iowa, Wisconsin, Minnesota, North Dakota, and South Dakota, with a combined energy generation of over 750 MW.

1.1 Compliance with the Energy Conversion and Transmission Facility Siting Act Chapter 49-22

The North Dakota Energy Conversion and Transmission Facility Siting Act ("the Act") requires an application for a certificate to meet the criteria set forth in North Dakota Century Code (NDCC) 49-22. The siting of an energy conversion facility is to be made in an orderly manner compatible with environmental preservation and the efficient use of resources (NDCC 39-22-02).

Exclusion and avoidance areas and selection and policy criteria set forth in the Act have been considered by Rough Rider Wind in the design of the Project and have been provided in this application to the extent available. In addition, sufficient project design, wind resource and technical information have been provided for a thorough evaluation of the proposed site. Table 1 outlines the information required to fulfill the requirements for a certificate with the Commission and where these requirements are addressed in this document.

Table 1. Certificate Completion Checklist

State Authority	Description	Section
Chapter 49-22	PSC Guidelines: Energy Conversion and Transmission Facility Siting	1.1
Section A	Description	1.0, 4.4, 6.0-6.6, 9.0
1.	Type: Describe the type of energy conversion facility proposed and provide a diagram of the major process system or a flow diagram.	1.0, 4.1, Figures 6 and 7
2.	Product: Describe in general terms and technical terms the products to be produced by the proposed facility.	1.3.2, 6.1, 6.3, Figure 5
3.	Size and Design: Provide the following description of the production capacity and design	1.3.2, 4.1, 4.2, 4.3, 6.0
a.	Gross design capacity;	1.3.2
b.	Net design capacity;	1.3.2
c.	Estimated thermal efficiency of the energy conversion process and the assumptions upon which the estimate is based;	N/A
d.	The number of acres that the proposed facility will occupy; and	1.3.1, 4.3, 5.1
e.	One (1) copy of all design data reports separate from the application.	Appendix B
4.	Time Schedule: Provide the anticipated time schedule for the accomplishment of the following:	1.4
a.	Certificate of Site Compatibility;	1.4
b.	Land acquisition complete;	1.4
c.	Construction start date;	1.4
d.	Construction complete;	1.4
e.	Test operations;	1.4
f.	Commercial production date;	1.4
g.	100 percent capacity factor; and	1.4
h.	Any expansion or additions.	1.4
Section B	Studies	
	Provide a copy of any evaluative studies or assessments of the environmental impact of the proposed facility submitted to any Local, State or Federal agency.	Appendix C
Section C	Need for Facility	2.0
1.	An analysis of the need for the proposed facility based on present and projected demand for the product or products to be produced by the proposed facility, including the most recent system studies supporting the analysis of the need.	2.1
2.	A description of any feasible alternative methods of serving the need.	2.2
3.	A statement justifying any deviations from the most recent Ten-Year Plan which the proposed facility may present.	2.3
Section D	Location	1.3.1
1.	Select a study area, which includes the proposed facility site, of sufficient size to enable the Commission to evaluate the factors addressed in Section 49-22-09, NDCC.	1.3.1, 1.3.2, 10.0-10.11, Figures 1-3
2.	Discuss the utility's policies and commitments to limit the environmental impact of its facilities, including copies of board resolutions and management directives.	Appendix A
3.	Identify and map the criteria that led to the proposed facility location within the study area.	Figures 2 and 3, 1.2, 3.0

State Authority	Description	Section
4.	Discuss in detail the relative value of each criteria and how the proposed facility location was selected giving consideration to all criteria.	3.0
5.	The criteria to be evaluated shall include at a minimum all of the following which are within the study area:	3.0
	Exclusion areas;	3.1, Figure 4
	Avoidance areas;	3.2, Figure 4
	Selection criteria;	3.3
	Policy criteria;	3.4
	Design and construction limitations; and	3.5
	Economic considerations.	3.6
6.	Discuss the mitigative measures that will be taken to minimize adverse impacts which result from the location, construction, and operation of the proposed facility.	7.2.3, 7.3.3, 7.4.3, 7.5.3, 7.6.3, 7.7.3, 7.8.3, 7.9.3, 7.10.3, 7.11.3, 7.12.3, 7.13.3, 7.14.3, 7.15.3, 7.16.3, 7.17
7.	List the qualifications of the people in the various disciplines that contributed to the facility site location study	11.0
8.	Maps	Figures
	Map the criteria within the study area showing the proposed facility location. Several different criteria may be shown on each map, depending on the map scale and the density and nature of the criteria. Minimum map scale shall be ½ inch = 1 mile. All maps shall be at the same scale unless otherwise specified.	Figures
	Furnish one Mylar map, separate from the application, of the same scale as the criteria maps and showing the same basic features as the criteria maps, including the study area, but not the proposed facility location.	(PSC Staff supports not providing a Mylar map)
NDCC 49-22-09	Factors to be considered in evaluating applications and designation of sites, corridors, and routes.	10.0
1.	Available research and investigations relating to the effects of the location, construction, and operation of the proposed facility on public health and welfare, natural resources, and the environment.	10.1
2.	The effects of new energy conversion and transmission technologies and systems designed to minimize adverse environmental effects.	10.2
3.	The potential for beneficial uses of waste energy from a proposed energy conversion facility	10.3
4.	Adverse direct and indirect environmental effects which cannot be avoided should the proposed site or route be designated.	10.4
5.	Alternatives to the proposed site, corridor or route which are developed during the hearing process and which minimize adverse effects.	10.5
6.	Irreversible and irretrievable commitments of natural resources should the proposed site, corridor, or route be designated.	10.6
7.	The direct and indirect economic impacts of the proposed facility	10.7
8.	Existing plans of the state, local government, and private entities for other developments at or in the vicinity of the proposed site, corridor, or route.	10.8
9.	The effect of the proposed site or route on existing scenic areas, historic sites and structures, and paleontological or archaeological sites.	10.9
10.	The effect of the proposed site or route on areas which are unique because of biological wealth or because they are habitats for rare and endangered species	10.10
11.	Problems raised by federal agencies, other state agencies, and local entities	10.11

1.2 Flexibility in Siting

Wind facility siting is a process through which input is considered from several different entities. When considering where to locate this wind farm in North Dakota, Rough Rider Wind identified the project area for further investigation. Rough Rider Wind then conducted environmental desktop and field studies in the area, the results of which are embodied in the appropriate sections of this application, and further assessed wind resource and transmission. The identified project area is considered optimal from a wind resource perspective.

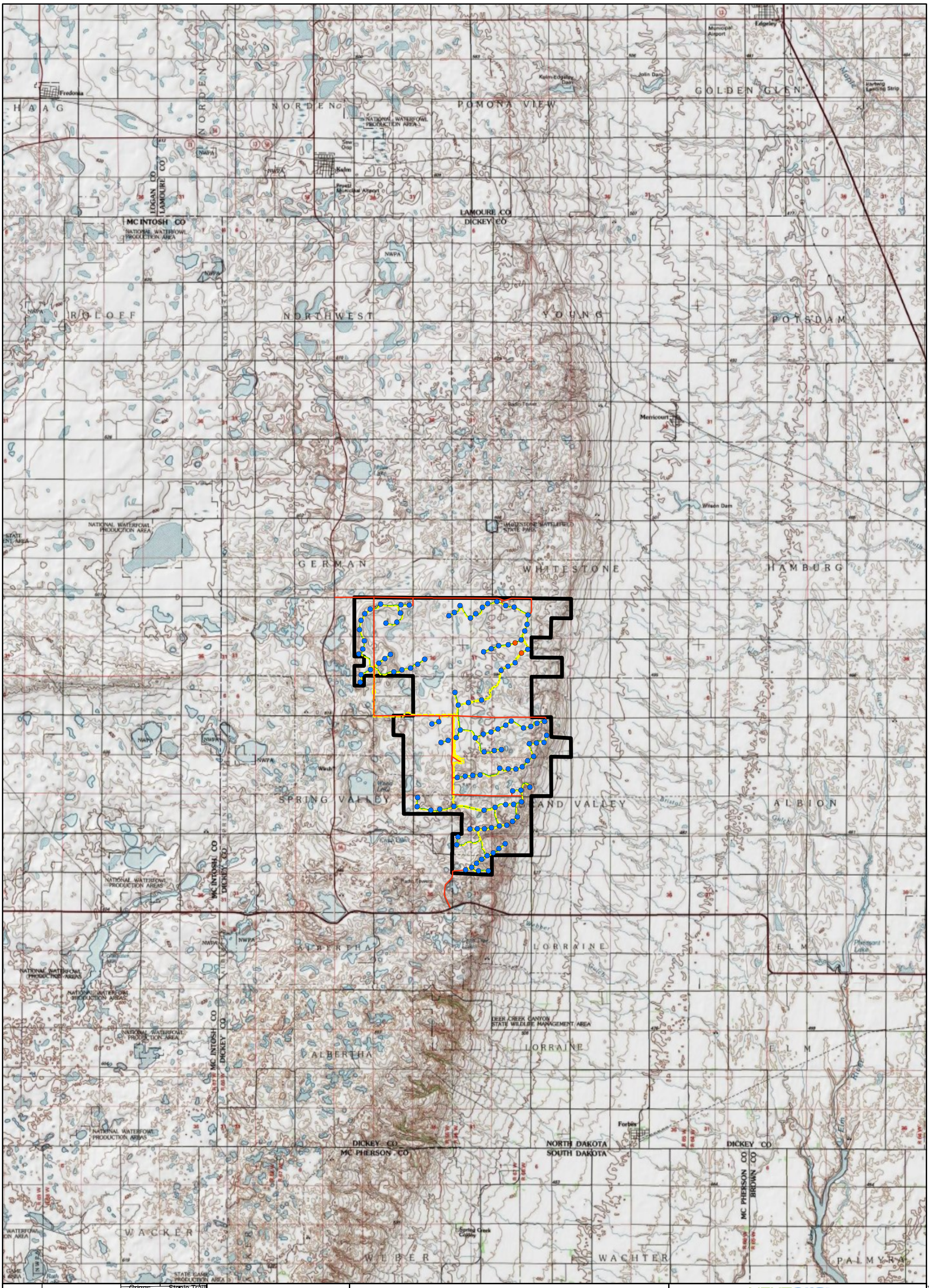
Rough Rider Wind has started the process of entering into agreements with landowners that may be interested in having wind turbines and associated facilities placed on their property. Simultaneously, Rough Rider Wind has identified preliminary turbine locations based on initial site inspection, topographic maps, known environmentally sensitive areas, review of North Dakota's power plant siting exclusion and avoidance areas, and communications with local, state and federal agencies. Preliminary site plans are the commonly accepted standard for applications in other jurisdictions. Rough Rider Wind is not seeking a permit for each wind turbine indicated on Figures 1 through 3. Instead, the preliminary layout indicates areas of the site with good wind resource and no known siting issues.

Rough Rider Wind suggests that the certificate define the site, number of turbines, and structures related to wind generation to be located within the site. Within the permitted site, Rough Rider Wind proposes to located turbines and other structures related to wind generation subject to required setbacks from environmentally sensitive areas, roads, residences, or other setbacks described in the permit.

Once the PSC issues the certificate, Rough Rider Wind will complete any additional studies required by the certificate or Rough Rider Wind's siting process, including geotechnical studies and more detailed wetland, biological, and cultural resource surveys. Rough Rider Wind will also further evaluate the site based on efficient construction of the Project. In addition, Rough Rider Wind will seek further input from landowners regarding the location of wind facilities and associated facilities. Once these additional studies and communications are completed, preliminary turbine locations will be re-evaluated for their appropriateness with the certificate conditions and buffers. A final site plan for the Project will be submitted to the PSC prior to construction and a pre-construction meeting will be held with PSC staff to ensure that the site plan conforms to the certificate requirements.

Wind facility siting is unique in that the Project occupies a large area and must not only conform to certificate conditions but must also optimize the wind resource at the site. Ideally, the certificate provides the parameters within which the developer may optimize the Project layout. With certificate conditions in place, the developer is able to proceed with planning and development. Early approval of a certificate is not only consistent with circumstances unique to wind project siting, but it is also essential to timing, given the uncertainty and limited duration of the Federal production tax credit (PTC) necessary for wind project development (Union of Concerned Scientists, 2006). As of October 2008, the PTC has been extended through end of 2009.

Rough Rider Wind believes that the aforementioned siting process is consistent with North Dakota siting rules and provides Rough Rider Wind with the flexibility necessary to develop a timely, cost-effective project in an environmentally responsible manner.



SOURCE DATA:

- US Topo Maps, 2008: NGS
- Project Components: NextEra Energy

NOTES:

- Turbine Type: GE Xle 1.5 MW

Legend

- Alternate Turbine Location (01-29-09)
- Proposed Turbine Location (01-29-09)
- Access Road (01-29-09)
- Collection System (01-29-09)
- Service Road (01-29-09)
- Project Boundary (12-02-08)

NEXTera ENERGY RESOURCES

FIGURE 1

Project Vicinity Map
Dickey County, North Dakota

Rough Rider I Wind Project
February 2009

TETRA TECH EC, INC.

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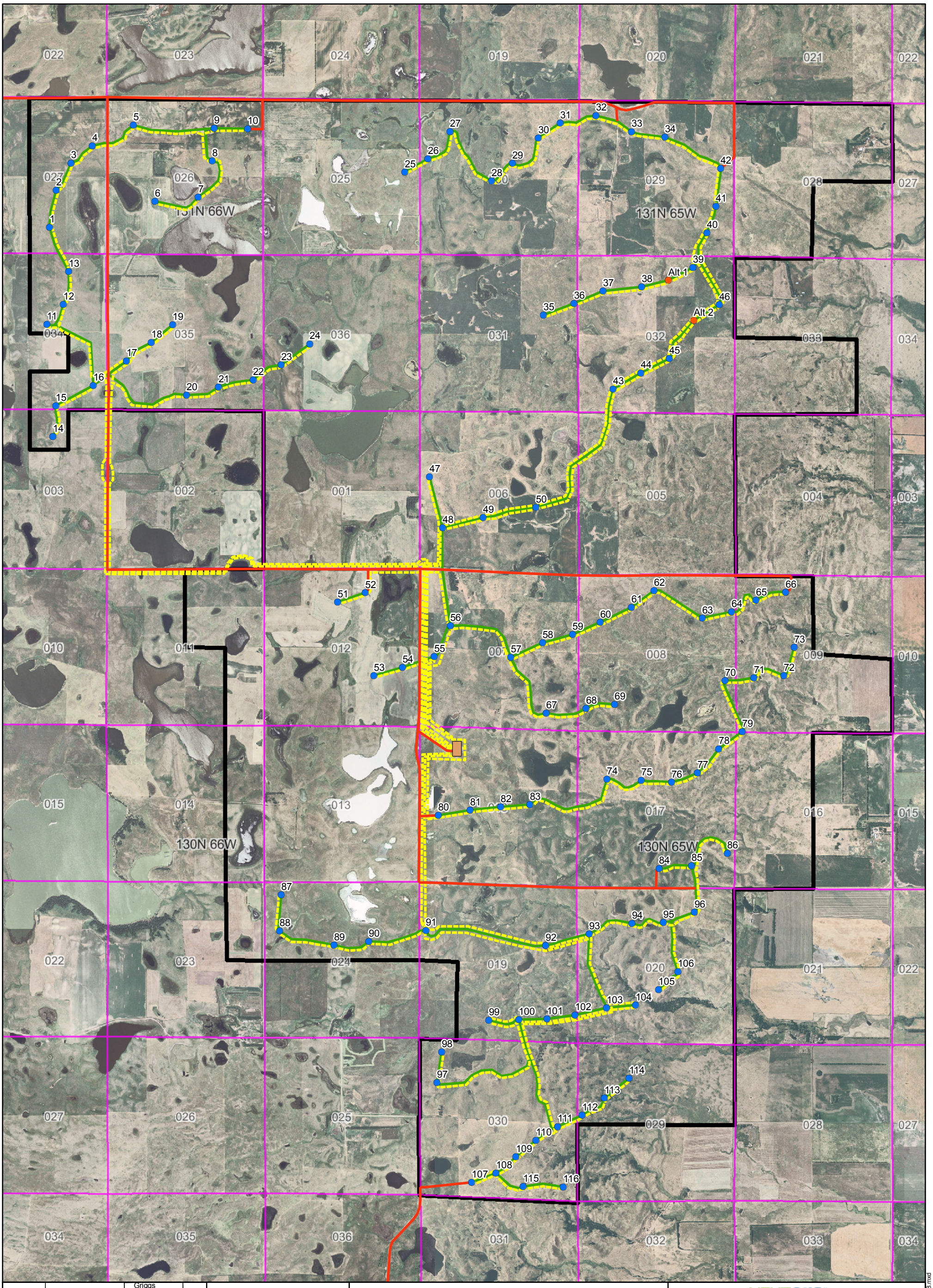

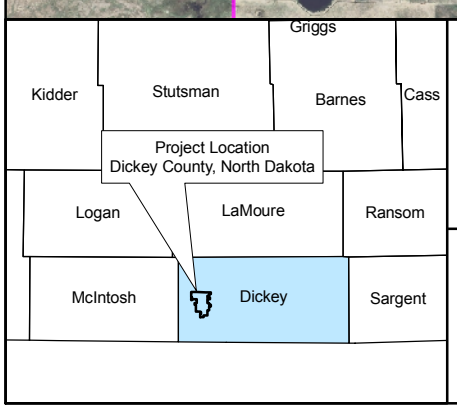

SOURCE DATA:

- NAIP Imagery, 2006: USDA-FSA APFO
- Project Components: NextEra Energy

NOTES:

- Turbine Type: GE Xle 1.5 MW

0 1,000 2,000 4,000

Feet

1 inch = 3,000 feet

Legend

- Alternate Turbine Location (01-29-09)
- Proposed Turbine Location (01-29-09)
- Substation (10-13-08)
- Access Road (01-29-09)
- Collection System (01-29-09)
- Service Road (01-29-09)
- Project Boundary (12-02-08)

NEXTera ENERGY RESOURCES

FIGURE 2

Project Location Map (Aerial)
Dickey County, North Dakota

Rough Rider I Wind Project
February 2009

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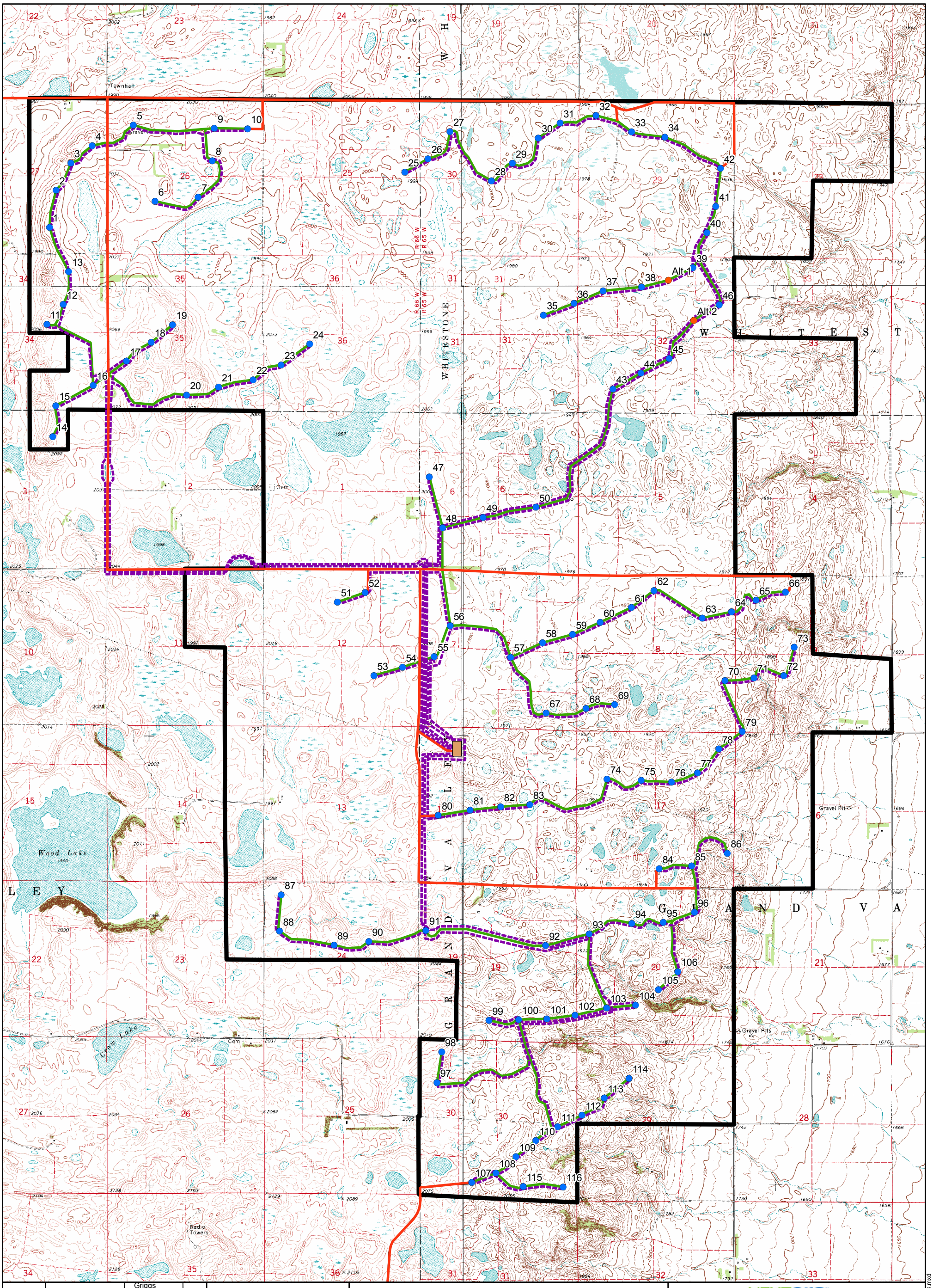

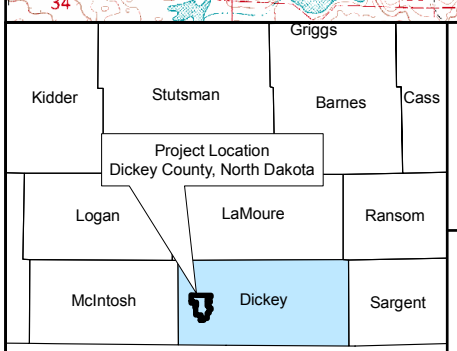

SOURCE DATA:

- USGS 7.5 Minute Topo: USGS
- Project Components: NextEra Energy

NOTES:

- Turbine Type: GE Xle 1.5 MW

0 1,000 2,000 4,000

Feet

1 inch = 3,000 feet

Legend

- Alternate Turbine Location (01-29-09)
- Proposed Turbine Location (01-29-09)
- Substation (10-13-08)
- Access Road (01-29-09)
- Collection System (01-29-09)
- Service Road (01-29-09)
- Project Boundary (12-02-08)

NEXTera ENERGY RESOURCES

FIGURE 3

Project Location Map (Topographic)
Dickey County, North Dakota

Rough Rider I Wind Project
February 2009

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1.3 Project Summary

Rough Rider Wind evaluated wind resources in North Dakota for siting a 175-MW wind generation facility. Based on this review, Rough Rider Wind selected a Project Area approximately seven miles north of Forbes, North Dakota for additional study and preparation of an application for a certificate of site compatibility to the PSC. No other areas were considered for development of the Project. The proposed Project Area was identified as optimal from wind resource, transmission interconnection, environmental, and economic perspectives. The proposed Project Area was selected considering the exclusion and avoidance criteria outlined in North Dakota Administrative Code (NDAC) 69-06-08.

1.3.1 Proposed Site

The Project Area is the location within which leases from landowners may be obtained for the Project. The Project Area was selected to include all areas necessary for Rough Rider Wind to optimize the wind resource while avoiding and minimizing impacts to environmental resources. The Project is located in Dickey County within the following townships, ranges, and sections (Table 2):

Table 2. Project Site Location

Township Name	Township	Range	Sections
Grand Valley	130N	65W	4-9, 16-21, 29-31
Spring Valley	130N	66W	1-3, 9-15, 22-29, 32-36
Whitestone	131N	65W	28-33,
German	131N	66W	25-27, 34-36

The Project Area encompasses approximately 16,118 acres (25 square miles) and the south border of the site is located approximately seven miles north of Forbes, North Dakota. The turbines will be placed throughout the Project Area. However, the Project structures will only occupy 1.45 percent of the total land area. The Project Area and Project layout are shown on Figures 1 through 3.

1.3.2 Projected Output

The Project will have a nameplate (gross) capacity of up to 175 MW. Assuming net capacity factors of between 38 and 45 percent, the projected average annual output is estimated between 499,320 and 591,300 megawatt hours (MWh) per year. As with all wind projects, output is dependent upon wind resource, final design, site-specific features, and equipment.

1.4 Project Schedule

The commercial operation date is dependent upon permitting, equipment deliveries, and other development activities. Rough Rider Wind is targeting construction for July 2009 provided all pre-construction permits and approvals have been obtained.

1. Certificate of Site Compatibility: Rough Rider Wind anticipates the certificate will be approved in May 2009.

2. Land Acquisition: Rough Rider Wind anticipates completion of sufficient easements from landowners in June 2009.

3. Permits: Rough Rider Wind is responsible for undertaking all required environmental studies, and will obtain all permits and licenses that are required following issuance of the certificate. Completing permits is on the "critical path" for the Project and will allow Rough Rider Wind to move forward with other commitments on the Project including ordering long-lead time equipment.

4. Equipment Procurement, Manufacture and Delivery: Rough Rider Wind will order the wind turbine components as soon as practicable.

5. Construction: Construction is scheduled to begin in July 2009, subject to road restrictions and weather. The engineering, procurement, and construction (EPC) contractor will be responsible for completing all project construction, including roads, wind turbine assembly, electrical, and communications work. The construction will take approximately seven months to complete.

6. Test and Operations: Rough Rider Wind anticipates testing and operations to begin October 2009.

7. Commercial Operation: Rough Rider Wind anticipates commercial operation of the Rough Rider I Wind Project to begin December 2009.

As discussed in Section 1.3.2, the capacity factor is dependent upon the final design, equipment and site-specific features. The capacity factor for typical wind farms in the area is approximately 38 to 45 percent.

1.5 Project Ownership

It is anticipated that Rough Rider Wind will manage the construction of all equipment and associated facilities related to the Project. Rough Rider Wind will own the entire Project. Rough Rider Wind will likely select a third-party contractor to perform the majority of the engineering and construction (E&C) of the wind farm. Rough Rider Wind will procure the turbine/tower package directly from a manufacturer.

2. NEED FOR FACILITY

2.1 Need Analysis

According to the Department of Energy, coal generation is the primary energy source in the State. Of the 3,525 MW of energy generated in 2006 in North Dakota, 93 percent was generated using coal-fired facilities (Energy Information Administration, 2006). According to a report prepared for the State of North Dakota Division of Community Services (PanAero Corporation, 1999), "North Dakota is motivated to become a leading state in non-polluting wind generated electricity." North Dakota's goals include the following: general economic development, new wind project investments and construction, new landowner income, and new long-term jobs from broad professional services (such as wind project design, wind resource monitoring, legal and accounting services), from commercial project Operations and Maintenance (O&M), and from the manufacturing of wind turbine components. In support of this effort, Rough Rider Wind is cooperating with regional utilities to add wind generation to their energy portfolios.

North Dakota has been identified as having more available wind for development than any other state. In recent years, the Mid-Continent Area Power Pool (MAPP) has consistently reinforced the regional need for increased generating capacity in the coming decade. Cost fluctuations and reliability problems serve to reinforce the need for sufficient capacity, low-cost energy, and diverse generation sources. Independent power producers such as Rough Rider Wind are widely recognized as essential to meeting regional energy needs, stabilizing energy costs, and enhancing energy reliability. The Project offers North Dakota and the MAPP region the opportunity to add to capacity, to stabilize wholesale power prices, and to provide electricity from a clean, cost-effective renewable energy generation facility.

There is a critical need for additional energy production in the MAPP region. The July 1, 2003, MAPP Load and Capability Report stated that, under the minimum reserve requirements, deficits were expected as soon as 2006. MAPP members were urged to build additional capacity in order to maintain reserve levels higher than the MAPP minimum. The most recent MAPP report, dated June 1, 2008, indicates that deficits are now expected by 2013. Table 3 outlines the MAPP surplus/deficit forecasts through 2017.

Table 3. MAPP Summer Season Surplus/Deficit

Year	MW	Reserve Margin Percentage
2008	1,721	6.5%
2009	1,187	4.3%
2010	665	2.3%
2011	490	1.7%
2012	336	1.1%
2013	-7.5	-0.02%
2014	-261	-0.9%
2015	-977	-3.1%
2016	-1,448	-4.6%
2017	-1,804	-5.6%

Source: Page III-3 of the MAPP 2008 Load and Capability Report (MAPP, 2008).

North Dakota has a unique opportunity to begin providing capacity to meet those forecasted deficits with clean, efficient, renewable energy. Once completed, the Rough Rider I Wind Project will be a significant source of energy for meeting the region's needs over the next 30 years. The addition of the Rough Rider I Wind Project will serve to meet the region's increasing needs as shown in Table 3 above.

2.2 Alternatives

Feasible technology alternatives to wind include electricity generation using coal, natural gas, or biomass. None of these alternatives were considered because these technologies do not meet the state's goal of adding new wind energy.

2.3 Ten Year Plan

Rough Rider Wind will file a Ten-Year Plan with the PSC and the Dickey County auditor by July 1, 2009.

3. SITE SELECTION CRITERIA

Rough Rider Wind is evaluating the proposed 16,118 acre (25 square miles) Project Area to determine the best locations for up to 116 1.5-MW wind turbines. Siting turbines is a process through which input from several different entities is considered. The Project Area was singled out as an optimal site from environmental, wind resource, transmission, and economic perspectives. Cities are considered avoidance areas.

Rough Rider Wind is securing voluntary wind option agreements with landowners and identifying preliminary turbine locations based on site inspection, topographic maps, known environmentally sensitive areas, review of North Dakota's power plant siting exclusion and avoidance areas, review of Dickey County and state wind siting requirements, and communications with Local, State, and Federal agencies. NextEra Energy Resources has used this siting process in recent wind turbine projects, including projects in Minnesota and North Dakota. Through this process, Rough Rider Wind not only addresses environmental issues that commonly arise during project development, but also works within the parameters of State rules. North Dakota has several site selection criteria that are considered by the PSC to determine suitability of the site. Rough Rider Wind has reviewed the criteria in Chapter 69-06-08 and has considered these criteria in site design. These criteria are discussed in this section.

3.1 Exclusion Areas

In accordance with Section 69-06-08-01-1, the geographical areas listed in Table 4 shall be excluded in the consideration of a site for an energy conversion facility. The area of exclusion shall include a buffer zone of a reasonable width to protect the integrity of the area. Exclusion areas are mapped for the Project Area on Figure 4.

3.2 Avoidance Areas

In accordance with Section 69-06-08-01-2, the geographical areas listed in Table 5 shall not be approved as a site for an energy conversion facility unless the applicant shows that, under the circumstances, there is no reasonable alternative. In determining whether an avoidance area should be designated for a facility, the PSC may consider, among other things: the proposed management of adverse impacts; the orderly siting of facilities; system reliability and integrity; the efficient use of resources; and alternative sites. Avoidance areas are also mapped for the Project Area on Figure 4.

Table 4. Exclusion Areas

Exclusion Area	Present within Project Site?	Description and Proposed Buffer	Section Addressed
Designated or registered national areas: parks; memorial parks; historic sites and landmarks; natural landmarks; historic districts; monuments; wilderness areas; wildlife areas; wild, scenic, or recreational rivers; wildlife refuges; and grasslands	Present	Rough Rider is consulting with the USFWS. Rough Rider Wind is maintaining a ¼-mile buffer from the Reinke Waterfowl Production Area (WPA) and over 900 feet from the Rutschke WPA. Although USFWS grasslands and wetland easements exist in the Project Area, grassland easements have been avoided and impacts to the USFWS wetland basins will be minimize and/or avoided (i.e. only boring beneath USFWS wetlands to install collection lines will be conducted in some instances).	7.7, 7.9, 7.13, 7.14, 7.15, Figures 4 and 8
Designated or registered state areas: parks; forests; forest management lands; historic sites; monuments; historical markers; archaeological sites; grasslands; wild, scenic, or recreational rivers; game refuges; game management areas; management areas; and nature preserves.	Present	In consultation with the North Dakota SHPO, a professional archaeologist surveyed the Project Area. The Class III Cultural Resources recommends avoidance of potentially NRHP-eligible archaeological sites. The access road leading into the site from the south goes along an existing road through land owned or leased by the North Dakota Game and Fish Department.	7.7, 7.8, 7.9, 7.15, 7.17, Figures 4 and 8
County parks and recreational areas; municipal parks; parks owned or administered by other governmental subdivisions; hardwood draws; and enrolled woodlands.	None	N/A	7.8
Prime farmland and unique farmland, as defined by the land inventory and monitoring division of the soil conservation service, United States department of agriculture, in 7 C.F.R. part 657; provided, however, that if the Commission finds that the prime farmland and unique farmland that will be removed from use for the life of the facility is of such small acreage as to be of negligible impact on agricultural productions, such exclusion shall not apply.	Present	No buffer is proposed. Prime farmland has been avoided to the extent practicable. None of the turbines or the substation would be located in prime farmland. Impacts to prime farmland (if drained) are expected to be up to 1.63 acres, which is a negligible percentage of the Project Area.	7.9, 7.10, Figures 12, 13, and 14
Irrigated land	None	N/A	7.9

Exclusion Area	Present within Project Site?	Description and Proposed Buffer	Section Addressed
Areas critical to threatened or endangered animal or plant species	Present	Native prairie is critical habitat for the Dakota skipper, a federal candidate species that is documented to occur in adjacent counties. Both the golden eagle and bald eagle were detected during fall surveys. These two species are federally protected under the Bald and Golden Eagle Protection Act (BGEPA). The Project Area is on the edge of the whooping crane migration corridor, and suitable wetland habitat is present.	7.16
Areas where animal or plant species that are unique or rare to this state would be irreversibly damaged.	Present	Native prairie grasslands and wetlands occur in Dickey County. Wetlands are attractants for cranes, waterfowl, and other water-based species. Native prairie is critical habitat for Dakota skipper and prairie grouse. Eight species listed as level I under North Dakota's list of 100 Species of Conservation Priority were detected during fall surveys.	7.13, 7.14, 7.15, 7.16

Table 5. Avoidance Areas

Avoidance Areas	Present within Project Site?	Description and Proposed Buffer	Section Addressed
Historical resources which are not designated as exclusion areas	Present	The cultural survey recommends avoidance of a historic cemetery, historic grave, and standing structure site. SHPO has concurred with survey recommendations.	7.7, Appendix C
Areas within the city limits of a city or the boundaries of a military installation	City limits-None Military-None	N/A	7.3, Figures 1-3
Areas within known floodplains as defined by the geographical boundaries of the 100-year flood	None (unmapped by FEMA)	N/A	7.12
Areas that are geologically unstable	None	N/A	7.11
Woodlands and wetlands	Present	Wetland resources will be avoided to the extent practicable. Woodland impacts are not anticipated.	7.13, 7.14, Figures 4, 12 and 15
Areas of recreational significance which are not designated as exclusion areas	None	N/A	7.8

3.1 Selection Criteria

In accordance with Section 69-06-08-01-3, a site shall be approved in an area only when it is demonstrated to the PSC by the applicant that any significant adverse effects resulting from the location, construction, and operation of the facility in that area, as they relate to the criteria listed in Table 6, will be at an acceptable minimum, or that those effects will be managed and maintained at an acceptable minimum.

3.2 Policy Criteria

In accordance with Section 69-06-08-01-4, the PSC may give preference to an applicant that will maximize benefits that result from the adoption of the policies and practices listed in Table 7, and in a proper case may require the adoption of such policies and practices.

Table 6. Selection Criteria

Selection Criteria	Potential Adverse Effects	Section Addressed
The impact upon agriculture:		
Agricultural production	Assuming 116 1.5-MW turbines, approximately 12.8 acres of land will be impacted due to turbine placement and an additional 216.6 acres due to access roads. An additional 3.5 acres will be permanently impacted due to the O&M facility and project substation. Wind turbine configuration will not result in significant impacts to agricultural production.	7.3, 7.9
Family farms and ranches	No turbines will be placed within 1,400 feet of residences. Land area would be lost to the construction of access roads and turbines; however, wind lease payments to farmers will provide a supplemental source of income.	7.2, 7.3, 7.10, Figure 4
Land which the owner demonstrates has soil, topography, drainage, and an available water supply that cause the land to be economically suitable for irrigation	No owner, where impacts are expected, has expressed concerns related to economically suitable irrigation on their land. Currently no irrigation is occurring within the Project Area.	7.9, 7.10, Figures 13 and 14
Surface drainage patterns and ground water flow patterns	No impacts to surface drainage patterns or groundwater flow patterns will occur.	7.11, 7.12, 7.13, Figure 15
The agricultural quality of the cropland	No impacts to the agricultural quality of the cropland are anticipated. If compaction of soils occurs during construction, Rough Rider Wind will work with the landowners to alleviate the compaction.	7.9, 7.10
The impact upon the availability and adequacy of:		
Law enforcement	No impacts are anticipated.	7.4
School systems and education programs	No adverse effects are expected.	7.4
Governmental services and facilities	Governmental services and facilities will not be impacted.	7.4
General and mental health care facilities	General and mental health care facilities will not be impacted.	7.4
Recreational programs and facilities	No impacts are anticipated.	7.4
Transportation facilities and networks	During construction, an increase in vehicle trips per day is anticipated for the duration of project construction. During facility operation no significant impacts are anticipated.	7.4, Figure 9
Retail service facilities	No adverse impacts anticipated.	7.4
Utility services	Rough Rider Wind will utilize station service from MDU. MAPP will suggest appropriate configurations for the electrical system, and Rough Rider Wind will abide by the recommendations to prevent impacts to the transmission system.	2.0, 6.0, 7.4
The impact upon		
Local institutions	No impacts are anticipated.	7.4

Selection Criteria	Potential Adverse Effects	Section Addressed
Noise sensitive land uses	The noise sensitive land uses within the Project Site are the residences near turbine locations. Dickey County does not currently have noise standards.	7.6, Figure 10
Rural residences and businesses	No turbines will be placed within 1,400 feet of residences.	7.2, 7.3, 7.10, Figure 4
Aquifers	No impacts will occur.	7.11
The impact upon:		
Human health and safety	If mitigative measures are implemented as discussed in Section 7.5.3 and maintenance schedules are met, no impacts to human health and safety are anticipated.	6.3, 6.5.2, 6.5.3, 7.5
Animal health and safety	No impacts to livestock are anticipated from operation of the facility. Species with the highest encounter rates during the 2008 fall avian survey were water fowl and other water birds, none of which were federally or state listed sensitive species. Rough Rider Wind will implement measures to avoid and minimize effects to wildlife at the proposed site by siting facilities away from wetlands and woodlands to the extent practicable. In addition, Rough Rider Wind will implement a post-construction Wildlife Response and Reporting System (WRRS) for the Project in order to monitor avian/turbine interaction.	7.10, 7.16, 7.15, Appendix C
Plant life	Assuming 116 1.5-MW turbines, approximately 233 acres of land will be used for the turbines, the substation, and access/service roads. Land where the turbines will be sited is primarily undeveloped prairie.	7.9, 7.14, Figure 12
Temporary and permanent housing	Temporary housing will be utilized during construction. No adverse impacts are anticipated.	7.2

Table 7. Policy Criteria

Policy Criteria	Suitable Policy or Practice of Applicant	Section Addressed
Temporary and permanent skilled and unskilled labor	No adverse effects are anticipated. Local contractors employed for construction will result in increased wages.	7.2
The cumulative effect of the location of the facility in relation to existing and planned facilities and other industrial development	No impacts are anticipated to existing and planned facilities and other industrial development.	7.3
Recycling of the conversion byproducts and effluents	None	N/A
Energy conservation through location, process, and design	Rough Rider Wind is developing the site to maximize energy output. Rough Rider Wind will develop a site layout that optimizes wind resources while minimizing the impact on land resources and any potentially sensitive areas. Wind-powered electric generation is entirely dependent on the availability of the wind resource at a specific location. The energy available from the wind increases at the third power of the wind speed. In other words, a doubling of the wind speed will increase the available energy by a factor of eight times.	4.2
Training and utilization of available labor in this state for the general and specialized skills required	Rough Rider Wind will use local labor to the extent practicable.	7.2
Use of a primary energy source or raw material located within the state	The energy generated at the site will utilize the wind resources of the state of North Dakota.	5.2

Policy Criteria	Suitable Policy or Practice of Applicant	Section Addressed
Non-relocation of residents	No residents will be relocated as a result of the Project.	6.5, 7.2, 7.3, 7.9
The dedication of an area adjacent to the facility to land uses such as recreation, agriculture, or wildlife management	The Project will not interfere with adjacent land uses. As such, it is not anticipated that areas adjacent will be dedicated to recreation, agriculture, or wildlife management issues.	7.3, 7.8, 7.9, 7.15, Figures 4 and 8
Economies of construction and operation	Rough Rider Wind will utilize local contractors to the extent practicable.	7.2
Secondary uses of appropriate associated facilities for recreation and enhancement of wildlife	None	N/A
Use of citizen coordinating committees	Rough Rider Wind will work with landowners of properties for the Project.	8.0
A commitment of a portion of the energy produced for use in this state	Energy transmitted will be injected into the existing MDU 230-kV line intersecting the project.	2.1, 6.1
Labor relations	No labor relations will be affected.	6.5, 7.2
The coordination of facilities	Existing facilities and facility corridors were considered in the location of the wind farm and the associated facilities.	3.0, 3.6
Monitoring of impacts	Rough Rider Wind and the EPC contractor will employ best management practices (BMPs) during construction to monitor soil impacts and segregate topsoil. All disturbance sites exceeding appropriate size criteria will prepare storm water prevention plans (NDDOH, 2001).	7.11, 7.15, 7.16

3.3 Design and Construction Limitations

In general, there are two design and construction limitations when building any wind farm: wind resources and landowner easements. The wind resource is essential to selecting and designing a wind farm. Rough Rider Wind has conducted an analysis of the proposed Project Area to ensure that the site has ample wind energy to generate revenue for the wind farm. Easements allowing construction of turbine towers and transmission facilities are also critical to the Project. Rough Rider Wind is securing voluntary land agreements with landowners necessary to develop the Project.

Specific to the Project, there are several additional items that are limiting factors when designing and constructing the Project. Currently, Dickey County does not have zoning regulations or building permits. At some point in the future, it may adopt wind energy regulations. Rough Rider Wind proposes setbacks of at least 1,400 feet from residences. Rough Rider Wind must contact the County and the associated townships to identify permits and/or approvals prior to working in road rights-of-way or traveling on roads in the Project Area.

The U.S. Fish and Wildlife Service (USFWS) administers fee title Waterfowl Production Areas (WPA) and wetland and grassland easements on private property as part of their National Wildlife Refuge System. There are limitations to construction on these lands. Rough Rider Wind plans to avoid all USFWS WPAs and grassland easements and will avoid direct impacts to wetland basins within wetland easements. Any direct impacts to wetlands within USFWS wetland easements will result in a compatibility assessment by local USFWS staff. The process considers the magnitude of the impact, the type or quality of the habitat which is impacted, and the feasibility of avoiding the

impact. If compatibility is found, a right-of-way (ROW) permit will be issued for the impact. Figures 4 and 8 identify the USFWS WPAs, grassland easements, and wetland easements within the Project Area.

3.4 Economic Considerations

Economics were considered when selecting a location for the Project. As discussed above, it is important to select a site with a wind resource capable of generating energy. The proposed Project Area takes advantage of the wind resource in the area. Information on the wind resource at the site is discussed in Sections 5.2 and 5.3.

Another economic factor considered is the availability of a transmission system in the vicinity of the Project. Furthermore, having permission to interconnect into an existing transmission system is essential. If no transmission system is present, the cost of interconnection increases due to the need of constructing a lengthy transmission line and large substation to an existing electricity service provider. Power generated from the Project will be distributed via an existing MDU 230-kV transmission line intersecting the Project. Rough Rider Wind filed an interconnect request with MISO in April of 2006. The Project was lumped in with MISO Group Study 6. A SIS report is anticipated in January 2010, however Rough Rider Wind has hired Excel Engineering to run interconnect studies. Rough Rider Wind anticipates having a facility study in the spring of 2009, and is working with MDU to develop an engineering, procurement and construction (EPC) agreement.

One of the most important economic considerations related to the Project is the need to qualify for the Federal production tax credit (PTC). The PTC is approximately 1.8 cents per kilowatt hour (kWh) for 10 years. The Project will not be viable without receiving the PTC, which has been extended through 2009. Approval of permits will help ensure the Project is operational before the 2009 expiration date of the PTC.

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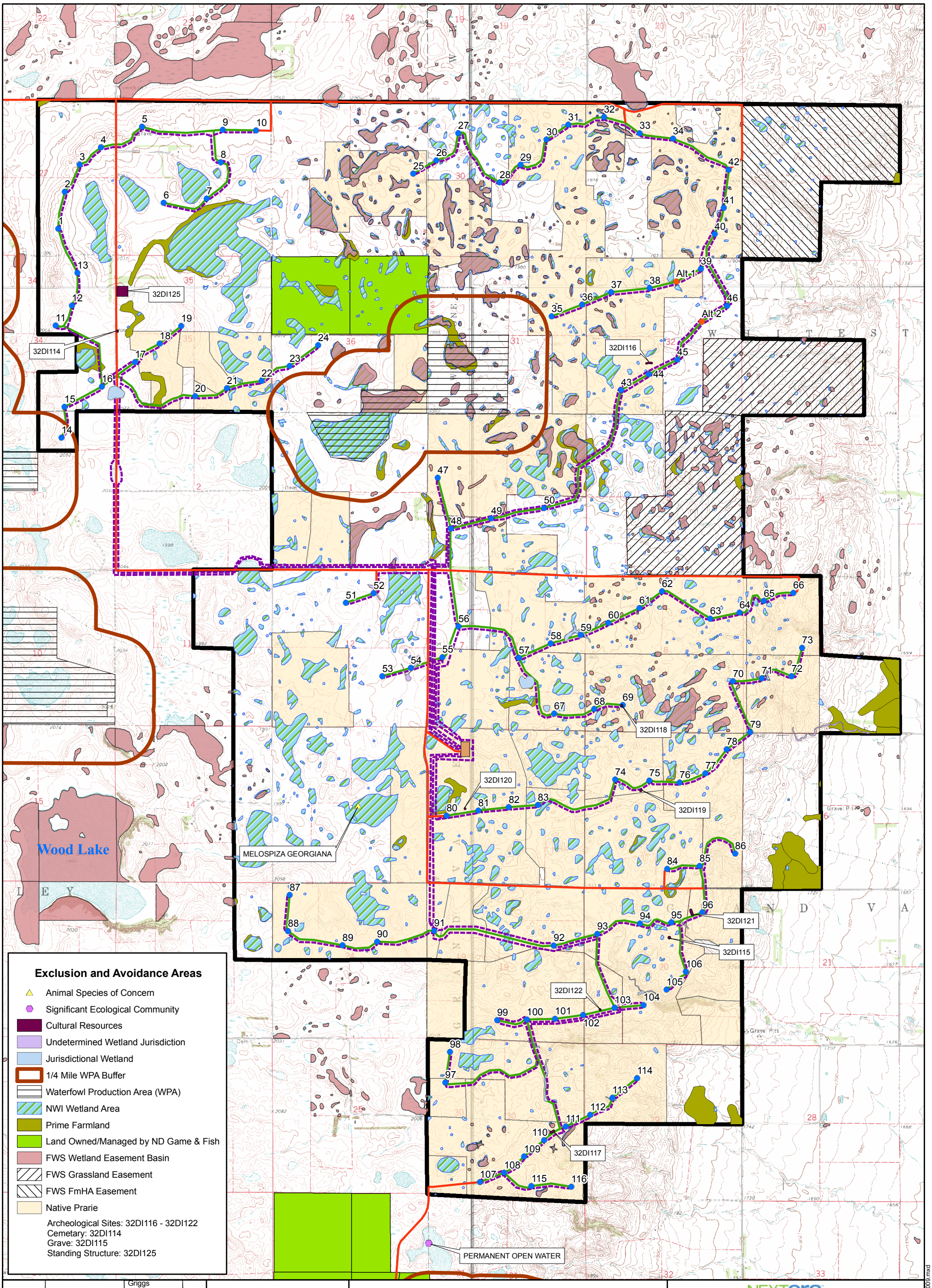
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32DI122
32DI117
MELOSPIZA GEORGIANA
PERMANENT OPEN WATER
Wood Lake
Exclusion and Avoidance Areas
Animal Species of Concern
Significant Ecological Community
Cultural Resources
Undetermined Wetland Jurisdiction
Jurisdictional Wetland
1/4 Mile WPA Buffer
Waterfowl Production Area (WPA)
NWI Wetland Area
Prime Farmland
Land Owned/Managed by ND Game & Fish
FWS Wetland Easement Basin
FWS Grassland Easement
FWS FmHA Easement
Native Prarie
Archeological Sites: 32DI116 - 32DI122
Cemetary: 32DI114
Grave: 32DI115
Standing Structure: 32DI125
Griggs
Kidder
Stutsman
Barnes
Cass
Project Location
Dickey County, North Dakota
Logan
LaMoure
Ransom
McIntosh
Dickey
Sargent
SOURCE DATA:
- USGS 7.5 Minute Topo: USGS
- Project Components: NextEra Energy
NOTES:
- Turbine Type: GE Xle 1.5 MW
0 1,000 2,000 4,000
Feet
1 inch = 3,000 feet
Legend
Alternate Turbine Location (01-29-09)
Proposed Turbine Location (01-29-09)
Substation (10-13-08)
Access Road (01-29-09)
Collection System (01-29-09)
Service Road (01-29-09)
Project Boundary (12-02-08)
NEXTera ENERGY RESOURCES
FIGURE 4
Exclusion and Avoidance Areas
Dickey County, North Dakota
Rough Rider I Wind Project
February 2009
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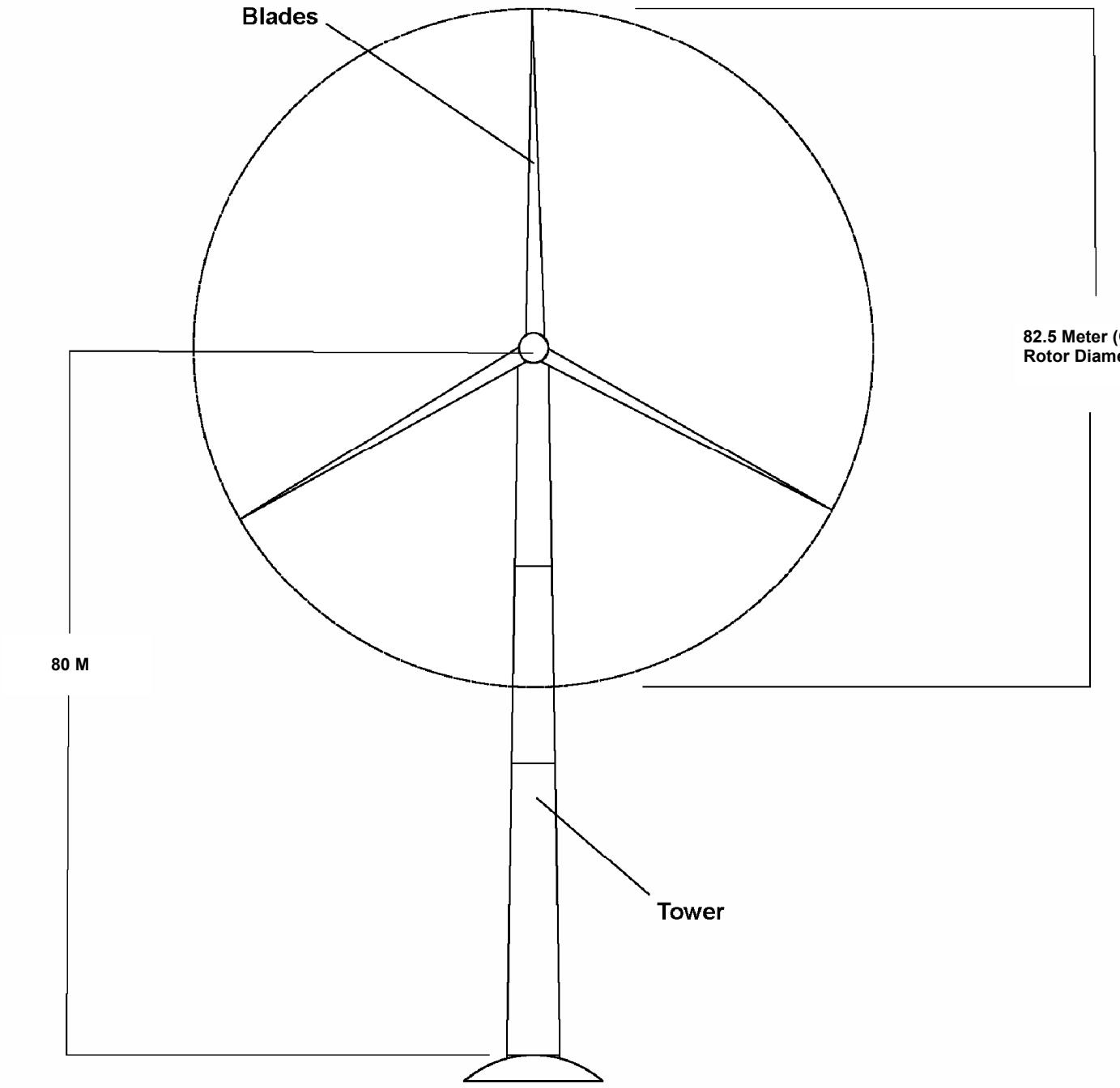

GE Xle 1.5 MW Wind Turbine

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TETRA TECH EC, INC.

FIGURE 5

Wind Turbine Design Features
Rough Rider I Wind Project

Dickey County, North Dakota

February 2009

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4. GENERAL DESCRIPTION OF THE PROPOSED FACILITY

4.1 Wind Power Technology

As the wind passes over the blades of a wind turbine, it creates lift and causes the rotor to turn. The rotor is connected by a hub and main shaft to a system of gears, which are connected to a generator. Exact turbine models are subject to change to ensure selection of a turbine that is both cost effective and optimizes land and wind resources. Rough Rider Wind is proposing to install up to 116 GE Xle 1.5-MW turbines.

The GE Xle 1.5-MW utility-grade wind turbine has a nominal nameplate rating of 1,500 kW. Each turbine will have an 80-meter (262 feet) hub height and a 82.5-meter (271 feet) rotor diameter (RD) (Figure 5). The GE Xle 1.5-MW turbine begins operation in wind speeds of 3.5 meters per second (m/s), or 7.8 mph, and reaches its rated capacity (1.5 MW) at a wind speed of 12.5 m/s (28 mph). The turbine is designed to operate in wind speeds of up to 20 m/s (45 mph).

Each tower will be secured by a concrete foundation that can vary in design depending on soil conditions. A control panel inside the base of each turbine tower houses communication and electronic circuitry. Each turbine is equipped with a wind speed and direction sensor that communicates to the turbine's control system to signal when sufficient winds are present for operation. Turbines feature variable-speed control and independent blade pitch to assure aerodynamic efficiency.

The electricity generated by each turbine is brought to a pad-mounted transformer where the voltage is raised (stepped up) to power collection line voltage of 34.5 kV. The electricity is collected by a system of underground and/or overhead power collection lines within the Project Site (Figure 6). Both power collection lines and communication cables will be direct-buried or may be constructed as overhead lines on private property or public right-of-way. Typically, this infrastructure is run adjacent to the Project access roads or along public right-of-way or easements. In cases where such infrastructure must be sited on property that is not governed by the existing wind easement and land lease options, Rough Rider Wind will obtain easements for the necessary property.

Each wind turbine will be accessible via all-weather, aggregate-surfaced roads up to 32 feet in width which will connect with public roads. At the point where the access and public roads meet, the communication and power lines will continue as underground feeder lines. The feeder system distributes power to the Project substation. Figure 6 is a diagram of the path of energy from the wind farm to energy users and Figure 7 shows a typical wind farm facility layout. At the Project substation, the power will be transformed to 230 kV and transmitted via overhead 230 kV transmission lines, interconnecting with the existing 230-kV MDU line in Section 18, Township 130 North, Range 65 West. The Project substation and 230-kV interconnection into the existing MDU line are associated facilities and will conform to MAPP standards.

4.1.1 Wind Energy Center Layout

Rough Rider Wind will develop a wind farm layout that optimizes wind resource while minimizing the impact on land resources and any potentially sensitive areas. Wind-powered electric generation is

entirely dependent on the availability of the wind resource at a specific location. The energy available from the wind increases at the third power of the wind speed. In other words, a doubling of the wind speed will increase the available energy by a factor of eight times. Analysis of wind direction data suggests that the optimal turbine string alignments are generally from southwest to northeast. Design of the turbine array and collection system will minimize energy loss due to wind turbine wakes and turbulence, and electrical line losses.

Dickey County has established a setback of 200 feet from the roadway for buildings and trees, but no specific setbacks or standards for wind energy facilities. Based on experience with other wind farms, Rough Rider Wind proposes setbacks of 420 feet from transmission lines, roads, and railroads, and will maintain a setback of 1,400 feet from occupied residences, consistent with their policy at other wind energy facilities. Table 8 identifies the minimum setbacks Rough Rider Wind is applying to the Project.

Table 8. Setback Distances for Wind Turbines

Setback Type	Distance
Property Boundary	130 feet
Occupied Residence	1,400 feet
Waterfowl Production Area	900 to 1,320 feet
Overhead Transmission and Distribution Lines	420 feet

4.2 Associated Facilities

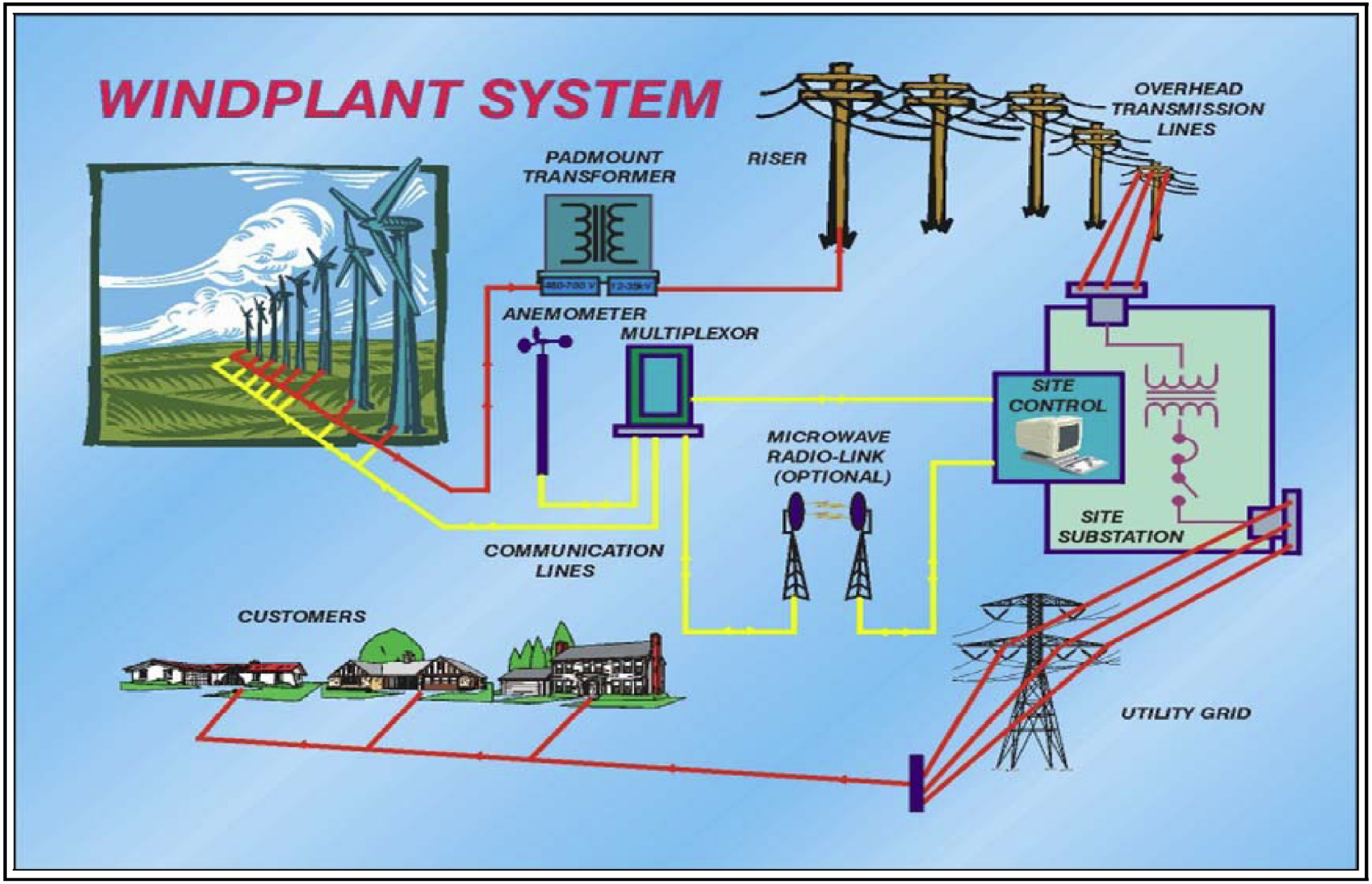
An Operations and Maintenance (O&M) building will be constructed within the Project Site. See Section 6.5.3 for a description of the O&M building.

The electricity generated by each turbine is stepped up to a power collection line voltage of 34.5 kV via a pad-mounted transformer at the base of each turbine. The electricity generated at each turbine is collected by a system of underground and/or overhead power collection lines within the Project Site and brought to the Project substation.

It is anticipated that Rough Rider Wind has erected five meteorological towers within the Project Site boundary.

4.3 Land Rights

Rough Rider Wind is obtaining easements for the proposed 175 MW project. Land rights will encompass the proposed wind farm and all associated facilities, including but not limited to wind and buffer easements, wind turbines, access roads, underground collector and feeder lines, and overhead transmission lines located on public roads when necessary.



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TETRA TECH EC, INC.

FIGURE 6

Path of Energy Diagram
Rough Rider I Wind Project

Dickey County, North Dakota

February 2009

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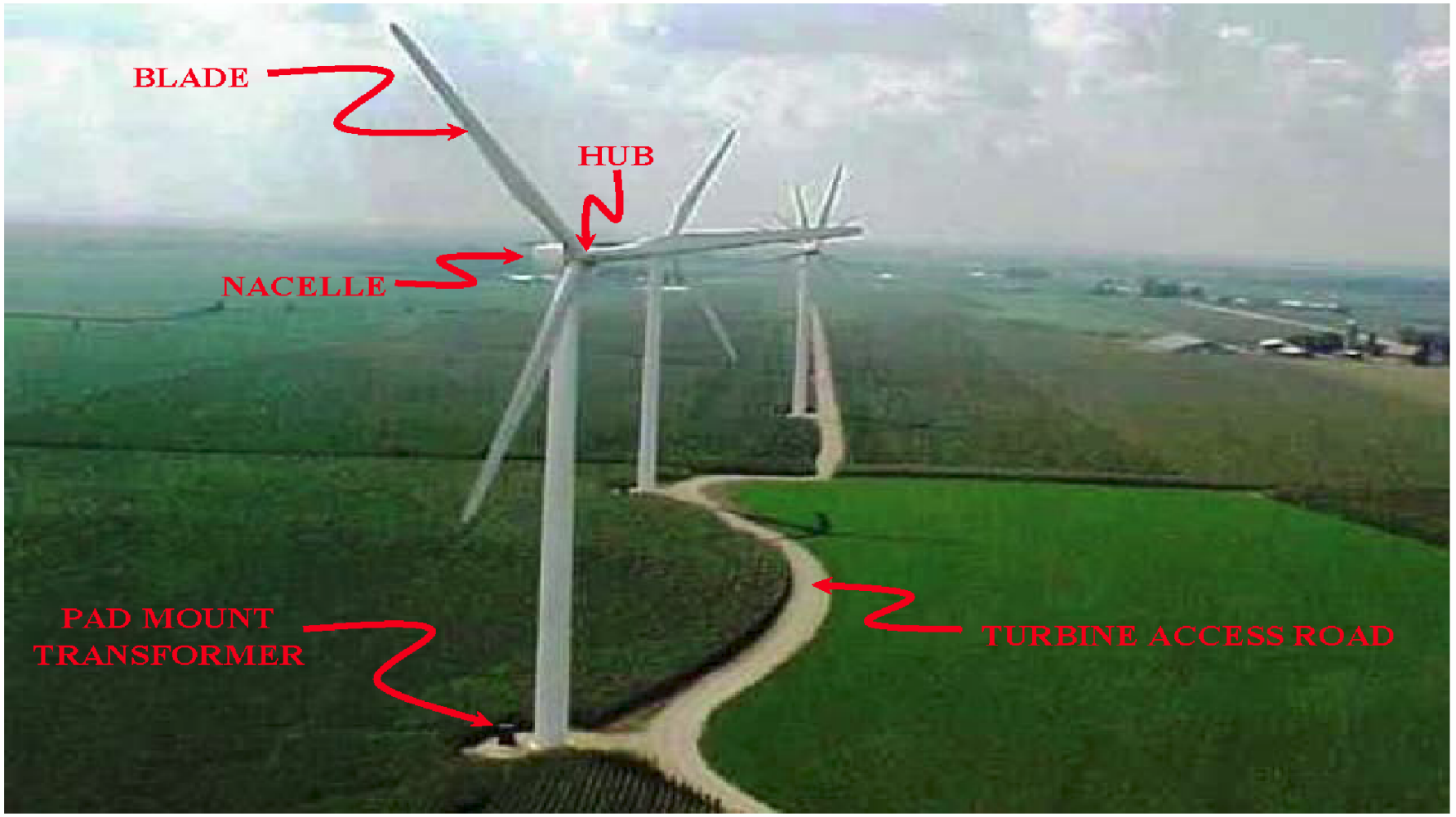

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TETRA TECH EC, INC.

FIGURE 7

Typical Wind Energy Center Layout
Rough Rider I Wind Project

Dickey County, North Dakota

February 2009

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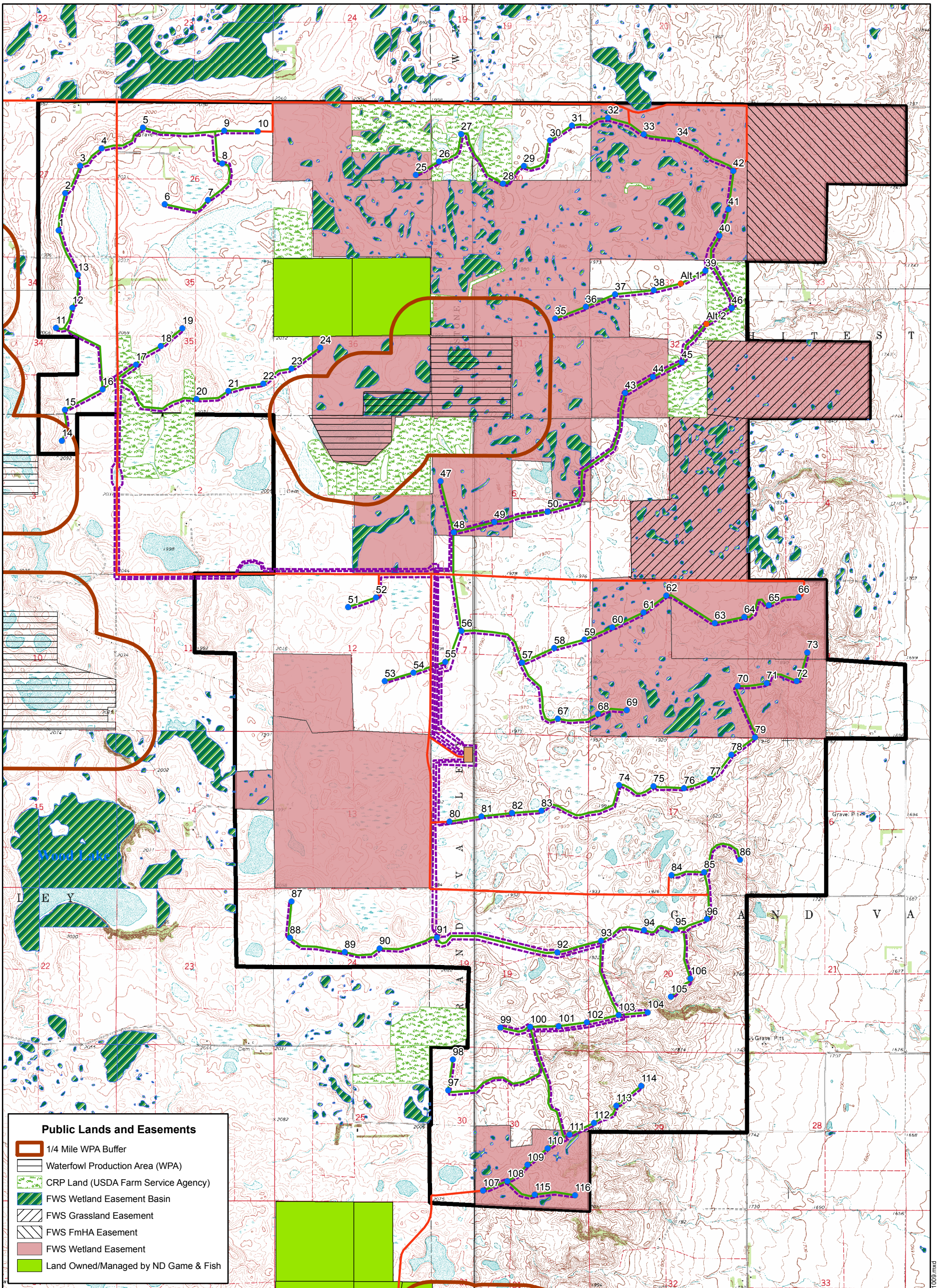

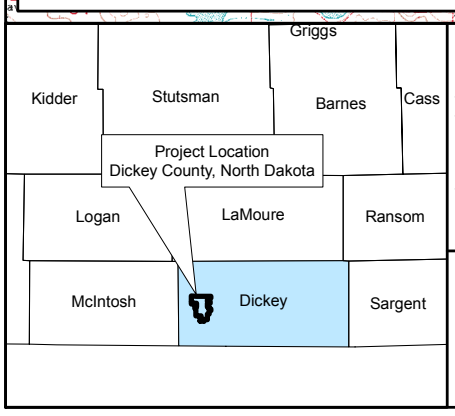

SOURCE DATA:

- USGS 7.5 Minute Topo: USGS
- Project Components: NextEra Energy

NOTES:

- Turbine Type: GE Xle 1.5 MW

0 1,000 2,000 4,000
Feet
1 inch = 3,000 feet

Legend

- Alternate Turbine Location (01-29-09)
- Proposed Turbine Location (01-29-09)
- Substation (10-13-08)
- Access Road (01-29-09)
- Collection System (01-29-09)
- Service Road (01-29-09)
- Project Boundary (12-02-08)

NEXTera ENERGY RESOURCES

FIGURE 8

Public Lands and Easements
Dickey County, North Dakota

Rough Rider I Wind Project
February 2009

TETRA TECH EC, INC.

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5. PROPOSED SITE

5.1 Identification of Project Site

The Project Site was selected based on its wind resource. Land-use patterns and environmentally sensitive features were considered in the site selection criteria. The site boundary encompasses an area of approximately 16,118 acres. However, the land occupied by turbines and other wind farm infrastructure will be approximately 1.45 percent of this area. It is anticipated that the area of direct land use will be: approximately 12.8 acres for the turbines; 216.6 acres for aggregate-surfaced access or service roads up to 32 feet wide; and an additional 3.5 acres for the permanent disturbance of land due to the O&M building and Project substation. Total permanent land disturbance for the wind farm and infrastructure is expected to be up to 233 acres. See Section 7.0 for a detailed description of the Project Site impacts. Figures 1 through 3 show proposed turbine locations, which are subject to change during micrositing.

5.2 Wind Resource Areas – General

The United States Department of Energy (DOE) and the North Dakota Division of Community Services have conducted wind resource assessment studies in North Dakota. The May 2004 DOE wind map for the state of North Dakota indicates that wind resources within the Project vicinity consist of Class 5 winds or greater (DOE, 2004). Class 5 winds have an average annual wind speed of 14 miles per hour.

Rough Rider Wind has reviewed and analyzed meteorological information for Dickey County and the Project Site. This information is described in Section 5.3.

5.3 Wind Characteristics in Project Site

Rough Rider Wind utilized wind data from one 50-meter and four 60-meter meteorological towers on the Project Site which have been collecting data since 2004. The data from the Project Site were supplemented using NDAWN and NOAA. Rough Rider Wind has secured information from other long-term references to aid in correlating the wind data on-site, including 40-year re-analysis data processed by WindLogics. WindPRO and WAsP software were used to analyze the available wind data and make corrections for site effects (topography, surface roughness, and obstacles) to produce a site independent characterization of the local wind climate. The resulting local wind climate was applied in conjunction with the Project Site effects to predict the spatial wind variations at the Project Site. Various site layouts and wind turbine generator parameters can be tested to predict energy production and array efficiency in order to optimize the site layout and turbine selection. Project site data have been compared to regional wind measurements using a parallel time period. There is good correlation between the long-term wind measurements and the short-term Project Site wind measurements.

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6. ENGINEERING AND OPERATIONAL DESIGN ANALYSIS

This section provides a summary description of the Project, which includes a description of the Project layout, turbines, electrical system, and associated facilities. A summary of this information is included in the Design Data Report (Appendix B). Additional design components addressed in this section are Project construction, schedule, operation, and decommissioning of the site. There are other turbines that are feasible choices for the Project site that are available from various manufacturers and Rough Rider Wind wishes to reserve the right to select alternative turbines representative of the 1.5-MW class of machines. Turbine type may affect the number and configuration of the turbine array. Details for the GE Xle 1.5-MW machine are presented below.

6.1 Rough Rider I Project Layout and Associated Facilities

The Project will consist of an array of wind turbines and transformers. The turbines will be interconnected by fiber optic communication cables and 34.5 kV power collection cables within the wind farm.

Land will be graded on-site for the turbine pads. Drainage systems, access roads, storage areas, and O&M facilities will be installed as necessary to fully accommodate all aspects of project construction, operation, and maintenance.

Electrical system design and interconnection details will be determined as a result of studies and discussions with MAPP/MISO. The Project includes a computer-controlled communications system that permits automatic independent operation, and remote supervision, thus allowing the simultaneous control of many wind turbines. Rough Rider Wind will be responsible for project operation and maintenance for the life of the Project and will contract with the most appropriate supplier of operations and maintenance services at the time of operation, to assure timely and efficient operations.

6.2 Description of Wind Turbines

Rough Rider Wind seeks the flexibility to select the most appropriate technology for the Project at the time of construction to ensure optimization of wind and land resources and cost efficiency. Rough Rider Wind will update the site layout, consistent with the parameters laid out in the certificate, when equipment is selected, and if information regarding the wind resource identifies opportunities to further optimize the site.

6.2.1 Turbine

The Project consists of up to 116 1.5-MW turbines. The turbine begins operation in wind speeds of 3.5 m/s (7.8 mph) and reaches its rated capacity (1.5 MW) at a wind speed of 12.5 m/s (28 mph). The turbine is designed to operate in wind speeds of up to 20 m/s (45 mph).

The turbines have active yaw and pitch regulation and asynchronous generators. The turbines use a bedplate drive train design, where all nacelle components are joined on common structures to improve durability.

The turbines have SCADA communication technology to allow control and monitoring of the wind farm. The SCADA communications system permits automatic, independent operation and remote supervision, thus allowing the simultaneous control of many wind turbines. Operations, maintenance and service for Rough Rider Wind will be structured so as to provide for timely and efficient operations. The computerized data network will provide detailed operating and performance information for each wind turbine. Rough Rider Wind will maintain a computer program and database for tracking each wind turbine's operational history.

Other specifications of the turbines include:

1. Rotor blade pitch regulation.

2. Gearbox with three-stage planetary/helical system.

3. Double fed three-phase asynchronous generator and an asynchronous 4-pole generator with a wound rotor.

4. A braking system for each blade (three self contained systems) and a fail-safe disc brake.

5. Yaw systems are electromechanically driven.

6.2.2 Rotor

The rotor consists of three blades mounted to a rotor hub. The hub is attached to the nacelle, which houses the gearbox, generator, brake, cooling system and other electrical and mechanical systems. The preliminary turbine design identifies an 80 m (262 feet) rotor diameter, with a swept area of 5,346 m^2 (57,544 ft^2) and a rotor speed of 10.1-18.7 revolutions per minute (rpm).

6.2.3 Tower

The towers are conical tubular steel with a hub height of up to 80 meters (262 feet). The turbine towers, on which the nacelle is mounted, consist of three to four sections manufactured from certified steel plates. All welds are made by automatically controlled power welding machines and ultrasonically inspected during manufacturing per ANSI specifications. 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.

6.2.4 Lightning Protection

Each turbine is equipped with a lightning protection system. The turbine is grounded and shielded to protect against lightning. The grounding system will be installed during foundation work, and must be designed for local soil conditions. The resistance to neutral earth must be in accordance with local utility or code requirements. Lightning receptors are placed in each rotor blade and in the tower. The electrical components are also protected.

6.3 Description of Electrical System

At the base of each turbine, a step-up transformer will be installed to raise the voltage to the power collection line voltage of 34.5 kV. The power from these transformers will be run through an underground collection system consisting of various sized direct-buried cables that are generally

located alongside the Project access roads. At the point where the access and public roads meet, the collection system will continue as underground lines. Eventually, all the collection system cables will terminate at an on-site collector substation, which raises the Project voltage to 230 kV and provides the necessary protection and control for interconnection to the transmission grid. An interconnect request was filed with MISO in April 2006. Rough Rider Wind anticipates having a system impact study in February 2009 and a facility study in October 2009 from Excel Engineering.

All utility protection and metering equipment will meet Rough Rider Wind and National Electric Safety Code (NESC) standards for parallel operations. The construction manager will ensure that proper interconnection protection is established.

6.4 Rough Rider I Wind Project Construction

Several activities must be completed prior to the proposed commercial production date. The majority of the activity relates to equipment ordering lead-time, as well as design and construction of the facility. Below is a preliminary schedule of activities necessary to develop the Project. Pre-construction, construction, and post-construction activities for the Project include:

- Ordering of all necessary components including towers, nacelles, blades, foundations, and transformers;
- Final turbine micrositing;
- Complete survey to microsite locations of structures and roadways;
- Soil borings, testing and analysis for proper foundation design and materials;
- Complete construction of access roads, to be used for construction and maintenance;
- Construction of overhead or underground feeder lines;
- Design and construction of the Project substation;
- Installation of tower foundations;
- Installation of underground and aboveground cables and transmission lines;
- Tower placement and wind turbine setting;
- Acceptance testing of facility; and
- Commencement of commercial production date.

Private turbine access roads will be built adjacent to the towers, allowing access to the turbines during and after construction. These roads will be 32 feet wide and will have an aggregate surface as cover, and will be adequate to support the size and weight of maintenance vehicles. The specific turbine placement will determine the amount of private roadway that will be constructed for the Project.

During the construction phase, several types of light, medium and heavy-duty construction vehicles will travel to and from the site, as well as private vehicles used by the construction personnel. Rough Rider Wind estimates that there will be approximately 150 additional trips per day in the area during peak construction periods. That volume will occur during the peak time when the majority of the road, foundation and tower assembly are taking place. At the completion of each construction phase this equipment will be removed from the site or reduced in number.

6.4.1 Construction Management

An EPC contractor will be primarily responsible for the construction management of the Project. The EPC contractor will use the services of local contractors, where possible, to assist in Project construction. The EPC contractor, in coordination with local contractors, will undertake the following activities:

- Securing building, electrical, grading, road, and utility permits;
- Perform detailed civil, structural and electrical engineering;
- Schedule execution of construction activities;
- Complete surveying and geotechnical investigations; and
- Forecast Project labor requirements and budgeting.

The EPC contractor also serves as key contact and interface for subcontractor coordination. The EPC contractor will oversee the installation of communication and power collection lines as well as the substation. The EPC contractor will also oversee the installation of roads, concrete foundations, towers, machines, and blades, as well as the coordination of materials receiving, inventory, and distribution. The Project will be constructed under the direct supervision of an on-site construction manager with the assistance of local contractors. The construction consists of the following tasks:

- Site development, including roads;
- Foundation excavation;
- Concrete foundations;
- All electrical and communications installation;
- Tower assembly and machine erection; and
- System testing.

The construction team will be on site to handle materials purchasing, construction, quality control, testing and start-up. The EPC contractor will manage local subcontractors to complete all aspects of construction.

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

6.4.2 Foundation Design

The wind turbines' freestanding 80 meter (262 feet) tubular towers will be connected by anchor bolts to an underground concrete foundation. Geotechnical surveys, turbine tower load specifications and cost considerations will dictate final design parameters of the foundations. Foundations for similar sized turbines are generally octagonal, approximately 40 to 60 feet across at the base, and extend seven to 10 feet below grade. The wind turbine foundation design shall be prepared by a registered professional engineer licensed to practice in the State of North Dakota.

6.4.3 Civil Works

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

- Improvement of existing public access roads to the Project Site;
- Construction of roads adjacent to the wind turbine strings (turbine access roads) to allow construction and continued servicing of the wind turbines;
- Clearing and grading for wind turbine tower foundation installations;
- Installation of underground cabling for connecting the individual wind turbines;
- Installation of an on-site feeder system for connecting wind turbine strings for delivery to the electricity collection/metering location;
- Clearing and grading for the O&M building;
- Installation of any site fencing and security; and
- Restoration and re-vegetation of disturbed land when construction activities are completed.

Any improvements to existing public access roads will consist of re-grading and filling of the surface to allow access in inclement weather. No asphalt or other paving is anticipated. Turbine access roads will be constructed along turbine strings or arrays. These roads will be sited in consultation with local landowners and completed in accordance with local building requirements where these roads intersect with public roads. They will be located to facilitate both construction (cranes) and continued operation and maintenance. Siting roads in areas with unstable soil will be avoided wherever possible. All roads will include appropriate drainage and culverts while still allowing for the crossing of farm equipment. The roads will be 32 feet wide and will be covered with road base designed to allow passage under inclement weather conditions. The roads will consist of graded dirt and will be covered with an aggregate surface. Once construction is completed, the roads will be regraded, filled, and dressed as needed.

6.4.4 Commissioning

The Project will be commissioned after completion of the construction phase. The Project will undergo detailed inspection and testing procedures prior to final turbine commissioning. Inspection and testing will occur for each component of the wind turbines, as well as the communication

system, meteorological system, obstruction lighting, high voltage collection and feeder system, and the SCADA system.

6.5 Project Operation and Maintenance

Rough Rider Wind and the appropriate supplier will control, monitor, operate, and maintain the Project by means of a SCADA computer software program. In addition to regularly scheduled on-site visits, the wind farm may be monitored via computer. The operation of the entire wind farm, including discrete settings for individual turbines, is managed by the centralized SCADA system. The Project will be operated and maintained by Rough Rider Wind Operating Services.

The SCADA system offers access to wind turbine generation or production data, availability, meteorological, and communications data, as well as alarms and communication error information. Performance data and parameters for each machine (generator speed, wind speed, power output, etc.) can also be viewed, and machine status can be changed. There is also a "snapshot" facility that collects frames of operating data to aid in diagnostics and troubleshooting of problems.

The primary functions of the SCADA system are to:

- Monitor wind farm status;
- Allow for autonomous turbine operation;
- Alert operations personnel to wind farm conditions requiring resolution;
- Provide a user/operator interface for controlling and monitoring wind turbines;
- Collect meteorological performance data from turbines;
- Monitor field communications;
- Provide diagnostic capabilities of wind turbine performance for operators and maintenance personnel;
- Collect wind turbine and wind farm material and labor resource information;
- Provide information archive capabilities;
- Provide inventory control capabilities; and
- Provide information reporting on a regular basis.

6.5.1 Maintenance Schedule

Rough Rider Wind will remotely monitor the Project on a daily basis. This will be accompanied by a visual inspection by the on-site operating staff. Several daily checks will be made in the first three months of commercial operation to see that the Project is operating within expected parameters.

Once installed, the Project service and maintenance is carefully planned and divided into the following intervals:

A. First service inspection

B. Semi-annual service inspection

C. Annual service inspection

D. Two years service inspection

E. Five years service inspection

First Service Inspection. The first service inspection will take place one to three months after the turbines have been commissioned. At this inspection, particular attention is paid to tightening all bolts by 100 percent, a full greasing, and filtering of gear oil.

Semi-Annual Service Inspection. Regular service inspections commence six months after the first inspection. The semi-annual inspection consists of lubrication and a safety test of the turbine.

Annual Service Inspection. The annual service inspection consists of a semi-annual inspection plus a full component check. Bolts are checked with a torque wrench. The check covers 10 percent of every bolt assembly. If any bolts are found to be loose, all bolts in that assembly are tightened 100 percent and the event is logged.

Two Years Service Inspection. The two years service inspection consists of the annual inspection, plus checking and tightening of terminal connectors.

Five Years Service Inspection. The five years inspection consists of the annual inspection, an extensive inspection of the wind braking system, checking and testing of oil and grease, balance check, and tightness of terminal connectors.

6.5.2 General Maintenance Duties

O&M field duties include performing all scheduled and unscheduled maintenance, including periodic operational checks and tests, regular preventive maintenance on all turbines, related plant facilities and equipment, safety systems, controls, instruments, and machinery, including:

- Maintenance on the wind turbines and on the mechanical, electrical power, and communications system.
- Performance of all routine inspections.
- Maintenance of all oil levels and changing oil filters.
- Maintenance of the control systems, all Project structures, access roads, drainage systems and other facilities necessary for the operation.

- Maintenance of all O&M field maintenance manuals, service bulletins, revisions, and documentation for the Project.
- Maintenance of all parts, price lists, and computer software.
- Maintenance and operation of Project substation.
- Provide all labor, services, consumables, and parts required to perform scheduled and unscheduled maintenance on the wind farm, including repairs and replacement of parts and removal of failed parts.
- Cooperate with avian and other wildlife studies as may be required, to include reporting and monitoring.
- Manage lubricants, solvents, and other hazardous materials as required by local and/or state regulations.
- Maintain appropriate levels of spare parts in order to maintain equipment. Order and maintain spare parts inventory.
- Provide all necessary equipment including industrial cranes for removal and reinstallation of turbines.
- Hire, train, and supervise a work force necessary to meet the general maintenance requirements.
- Implement appropriate security methods.

6.5.3 Operations and Maintenance Facility

The final location and layout of the O&M facility will be provided prior to construction. Typically, buildings used for this purpose are approximately 5,000 square feet in size and house all the necessary equipment to operate and maintain the Project. The footprint of the O&M facility has been included in the substation acreage calculations. Generally, an associated septic system and a well are installed near the O&M building.

6.6 Decommissioning and Restoration

Rough Rider Wind has a contractual obligation to the landowners to remove the wind facilities, including foundations to a depth of four feet, when the wind easement expires. Rough Rider Wind also reserves the right to explore alternatives regarding Project decommissioning at the end of the Project certificate term. Retrofitting the turbines and power system with upgrades based on new technology may allow the wind farm to produce efficiently and successfully for many more years. Based on estimated costs of decommissioning and the salvage value of decommissioned equipment, the salvage value of the wind farm will exceed the cost of decommissioning.

7. ENVIRONMENTAL ANALYSIS

This section provides a description of the environmental conditions that exist within the Project Area. Consistent with the North Dakota Energy Conversion and Transmission Facility Siting Act, exclusion and avoidance criteria, as well as selection and policy criteria, were considered in the selection and design of the site. To support this siting process, maps of the site were generated that indicate the presence or absence of many of the criteria highlighted in NDCC 69-06-08. NextEra Energy Resources' safety and environmental policy is included in Appendix A.

7.1 Description of Environmental Setting (Introduction)

The project area is located in Dickey County in southeastern North Dakota, a primarily rural agricultural area located seven miles north of Forbes, North Dakota. The economic base of Dickey County consists primarily of employment in education, health and social services, as well as agriculture, forestry, fishing, and hunting (U.S. Census Bureau, 2000).

7.2 Demographics

7.2.1 Description of Resources

The proposed project is located in Dickey County, North Dakota, a primarily rural agricultural county located south of Interstate 94 approximately midway between Bismarck and Fargo, North Dakota, seven miles north of the South Dakota border. There is no indication of any new residential construction on the site. In 2007, the US Census Bureau estimated the county population at 5,356, a decrease of 7.0 percent from the 2000 Census count of 5,757 and a decrease of over 12 percent since the 1990 Census. The county contains 1,131 square miles, with a density of just under five persons per square mile. Approximately 97.8 percent of the population is composed of white persons who are not of Hispanic or Latino origin. The median age of Dickey County residents is 40.7 years. Over 21.3 percent of the county population is 65 years or older while only 5.7 percent of the population is under five years of age (US Census Bureau, 2000).

The Project Area includes portions of four townships: German Township (2000 population 23), Grand Valley Township (2000 population of 29), Spring Valley Township (2000 population of 30), and Whitestone Township (2000 population of 33).

There are several incorporated towns near the proposed project. Cities within Dickey County (and their 2000 Census populations) include Monango (28), Forbes (64), and Ellendale (1,559). Kulm (442) and Edgeley (637) are located north of the proposed project in LaMoure County (US Census Bureau, 2000). Forbes is the closest incorporated city and is located approximately eight miles south-southeast of the Project Area. Merricourt is located approximately six miles to the north-northeast, but is not incorporated and Census data was not available.

According to the 2000 Census, the economy of Dickey County is primarily agricultural, with 17 percent of the workforce involved in agriculture. Almost 25 percent of the workforce works in education, health and social services, and retail trade accounts for over 11 percent of the jobs in the county. Services in the county are limited; motels and restaurants are available in Ellendale. Per capita income in 1999 was $15,846; median family income was over $29,200. Approximately 15

percent of the population lived below the poverty level. According to the 2002 Census of Agriculture (USDA, 2002), total market value of agricultural products produced from 533 farms in Dickey County exceeds $71,990,000, including $50,487,000 in crops and $21,503,000 in livestock and poultry.

7.2.2 Impacts

Short-term impacts to socioeconomic resources will be relatively minor. Up to 233 acres of the total Project Area will be permanently impacted due to conversion to turbine sites, access and service roads, and an O&M facility and project substation. Landowner compensation will be established by individual lease agreements. In general, agricultural areas surrounding each turbine can still be farmed. In addition, in an environment of uncertain and often declining agricultural prices and yields, the supplemental income provided to farmers from wind energy leases will provide stability to farm incomes and thus will help assure the continued viability of farming in the project area. Project construction will not cause additional impacts to leading industries within the project site. There is no indication that any minority or low-income population is concentrated in any one area of the project, or that the wind turbines will be placed in an area occupied primarily by any minority group.

To the extent that local contractors are used for portions of the construction, total wages and salaries paid to contractors and workers in Dickey County will contribute to the total personal income of the region. Additional personal income will be generated for residents in the county as well as the state by circulation and recirculation of dollars paid out by the applicant as business expenditures and state and local taxes. Expenditures made for equipment, energy, fuel, operating supplies and other products and services will benefit businesses in the county and the state.

It is likely that general skilled labor is available either in the county or the state to serve the basic infrastructure and site development needs of the project. Specialized labor will be required for certain components of wind farm development. It is likely that this labor will be imported from other areas of the state or from other states, as the relatively short duration of construction does not warrant special training of local or regional labor. Balancing the use of local contractors and imported specialized contractors will likely alleviate any labor relations issues.

No effects on permanent housing are anticipated. During construction, out-of-town laborers will likely use lodging facilities in and around the city of Ellendale. Operation and maintenance of the facility will require few laborers. Sufficient permanent housing is available within the county to accommodate these laborers.

Long-term beneficial impacts to the county's tax base as a result of the construction and operation of the wind farm will contribute to improving the local economy in this area of North Dakota. The development of wind energy in this region will be important in diversifying and strengthening the economic base of southeast North Dakota. In addition, establishing the southeast region of North Dakota as an important producer of renewable energy, such as wind, may spur the development of wind-related businesses in the area and in turn contribute to the economic growth in the region.

7.2.3 Mitigative Measures

Socioeconomic impacts associated with the project will be primarily positive, with an influx of wages and expenditures made at local businesses during the project construction and an increase in the

county's tax base due to construction and operation of the wind turbines and associated infrastructure. In addition, the lease payments paid to landowners will offset potential financial losses associated with removing land from agricultural production.

7.3 Land Use

7.3.1 Description of Resources

The land in Dickey County within the project area boundary is primarily agricultural with scattered farmstead residences. According to the County's Tax Auditor, some townships in Dickey County have established zoning ordinances.

The project will be located in western Dickey County, seven miles north of Forbes. The project proposes to install approximately 175 MW of wind power, consisting of up to 116 wind turbines within a 25-square mile (16,118-acre) Project Area. Current land use within the Project Area is rural agricultural, supporting both crops and livestock grazing. The project area is not within any city limits or within an area of any known military installation. The development of the Project will not displace any residents or existing or planned industrial facilities. Wind turbines will be sited a minimum of 1,400 feet from occupied residences.

The USFWS has been purchasing grassland easements in the Prairie Pothole Region since 1989. These easements provide perpetual protection of grasslands within the easement boundaries and provide protection important to this valuable habitat. The USFWS holds grassland easements on portions of Section 5 in Township 130 North, Range 65 West and Sections 32 and 33 in Township 131 North, Range 65 West within the Project Area as shown in Figure 4. According to Dave Azure of the USFWS, grassland easements do not conflict with, or preclude development associated with the proposed wind generation projects, as they primarily are in place to manage vegetation treatment and conservation (Azure Pers. Comm., 2004). However, a formal determination of compatibility will be required prior to disturbances in areas held under grassland easements.

The NRCS administers a number of conservation-based programs for private landowners. The Conservation Reserve Program (CRP) conserves soil and water resources and provides wildlife habitat by removing enrolled tracts from agricultural production, generally for a period of 10 years. These tracts cannot be hayed, tilled, seeded, or otherwise disturbed without the authorization of the NRCS. Within the Project Area there are nine sections with portions of their acreage enrolled in CRP, totaling approximately 716 acres, or 4.4 percent of the Project Area (Figure 4); four turbines and 2.68 miles of access/service road would be on CRP land, or approximately 10.48 acres.

Based on a review of aerial photographs, land use database information, general database information, and visits to the project site, it was determined that the majority of the land at the site is undeveloped grassland. Table 9 identifies current land use in the project area based on 2001 U.S. Geological Society (USGS) National Land Cover data. Approximately 60 percent of the project area is grassland, while almost 12 percent is pasture/hay, and approximately nine percent is cultivated cropland. Wetlands and open water account for over eight percent of the project area.

Table 9. Land Cover within the Project Area

Land Cover	Acreage	Percent of Project Area*
Open water	1,127.1	7.0
Developed, open space	257.56	1.6
Developed, low intensity	0.22	0.0
Barren land	1.56	0.0
Deciduous forest	38.92	0.2
Shrub/scrub	1,401.75	8.7
Grassland/herbaceous	9,699.75	60.2
Pasture/hay	1,885.24	11.7
Cultivated crop	1,443.56	9.0
Woody wetlands	5.12	0.0
Emergent herbaceous wetlands	246.64	1.5

*Percentages do not add up to 100 due to GIS analysis limitations.

7.3.2 Impacts

The development of the wind project will not result in a significant change in land use. The area will retain the rural sense and remote characteristics of the vicinity. At other wind developments in the upper Midwest, landowners frequently plant crops and/or graze livestock to the edge of the access roads and turbine pads. The access roads are 32 feet wide and low profile, so they are easily crossed while farming. Rough Rider Wind will work closely with landowners in locating access roads to minimize land use disruptions to the extent possible. Consideration will be taken in locating access roads to minimize impact on current or future row crop agriculture and environmentally sensitive areas. During the construction of the wind power facilities, additional areas may be temporarily disturbed for contractor staging areas and underground power lines. These areas will be graded to original contour and, if necessary, reseeded with appropriate vegetation.

While the permanent site layout has not yet been determined, it is estimated that installation of up to 116 turbines will result in the conversion of up to 12.8 acres of land. It is further estimated that 216.6 acres of land will be converted due to aggregate-surfaced access roads and 3.5 acres of land due to the O&M facility and project substation. Rough Rider Wind is seeking to obtain an easement of approximately 20 acres for laydown and contractor staging areas, which will be temporarily impacted during the construction phase of the Project.

At other wind farms, the public has expressed concerns over potential devaluation of property in and adjacent to proposed wind projects. A study published in October 2002, *"Economic Impacts of Wind Power in Kittitas County, Final Report,"* conducted by Dr. Stephen Grover of ECONorthwest of Portland, OR, summarized survey results as follows:

> "Views of wind turbines will not negatively impact property values. Based on a nationwide survey conducted of tax assessors in other areas with wind power projects, we found no evidence supporting the claim that views of wind farms decrease property values." (Grover, 2002.)

7.3.3 Mitigative Measures

Rough Rider Wind is working closely with landowners, the USFWS, and other agencies in locating wind turbines and access roads to minimize land use disruptions and impacts to environmentally sensitive areas to the extent possible. Operation of the wind farm will not change the land use in the Project Area. The proposed land use will not involve any ongoing industrial use of non-renewable resources or emissions into the environment.

7.4 Public Services

7.4.1 Description of Resources

Local Services

The project is located in a lightly populated, rural area in southeastern North Dakota. There is an established transportation and utility network that provides access and necessary services to the small cities, homesteads, and farms existing near the project site. The closest town to the project site is the community of Merricourt, approximately six miles to the north-northeast. Ellendale, located 14 miles southeast of the Project Area, is the county seat of Dickey County. Ellendale is the largest city near the project site and provides sanitary sewer, water, utility services, educational facilities, and recreational facilities such as a library, golf, an athletic complex, and parks to its residents and visitors. Additionally, Ellendale's local services include emergency services, ambulance service, a hospital, clinics, a landfill, and a police department.

Electrical Service

Electrical service is provided to the region by Montana-Dakota Utilities Co. (MDU).

Roads

County and township (section line) roads characterize the existing roadway infrastructure in and around the project site. The Project Area is accessed via North Dakota State Roads 11 and 56 and other local two-land paved and gravel county roads.

Traffic

Existing traffic volumes on the area's county highways are documented in Table 10 and Figure 9. Determining the specific capacity of any highway is a complex process. However, general estimates are used for planning purposes. For purposes of comparison, the functional capacity of a two-lane paved rural highway is approximately 5,000 vehicles per day, or Average Daily Traffic (ADT). In general, the state highways in and near the project site carry higher levels of traffic than are typical for rural North Dakota but represent only a fraction of the capacity of the roadway.

Additional county and township roads run through the project site, but no vehicle count data are available for them. In general, the North Dakota Department of Transportation (NDDOT) indicated that roads with vehicle counts under 100 ADT are rarely counted. As indicated in Table 10, all non-state routes have vehicle counts less than 100 ADT. According to NDDOT, vehicle counts on routes with no count data are likely lower than those with count data.

Table 10. Existing Daily Traffic Levels

Roadway Segment	Existing Average Annual Daily Traffic (ADT)/Commercial Truck Traffic
Highway 11 at US 181 in Ellendale	1,250/110
Highway 11 east of Highway 56	320/70
Highway 11 west of Highway 56	310/60
Highway 56 1 mile north of Highway 11	110/25

Source: 2007 Traffic Volumes (NDDOT, 2007).

Water Supply

Townships have limited public infrastructure services. Homes typically utilize septic systems and water wells for their household needs.

Telephone, Fiber Optic and Microwave Communications

Potential impacts of the proposed construction and operation of the transmission line on existing telecommunications infrastructure within Dickey County were assessed (Comsearch, 2009). Two federal beam paths cross the Project Area. Rough Rider Wind has taken these paths into account when designing the Project layout. The assessment did not identify any microwave paths within the Project Area. Comsearch calculated a Worst Case Fresnel Zone (WCFZ) for microwave paths in the vicinity of the Project Area. The mid-point of a full microwave path is the location where the widest (or worst case) Fresnel Zone occurs. The calculated WCFZ radius represents the area where planned wind turbines should be avoided, if possible. The microwave interference study and worst case Fresnel Zone calculations from Comsearch are attached as Appendix C.

7.4.2 Impacts

The project is expected to have a minimal effect on the existing services and infrastructure. The following is a brief description of the impacts that may occur during construction and operation of the project.

Local Services

No impact is expected to local services.

Electrical Service

The project will require station service from the local electric provider when the wind project is not generating electricity.

Roads

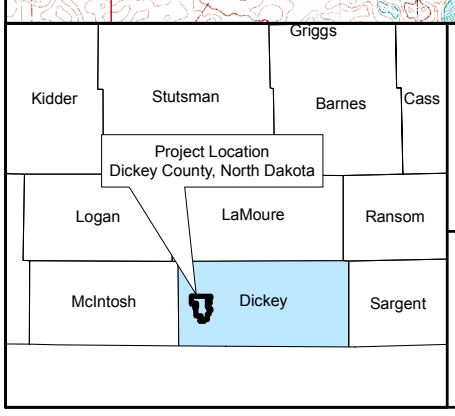
Construction of the project will require up to 50.5 miles of aggregate-surfaced access roads. During operation of the project, the access roads will be used by operation and maintenance crews while inspecting and servicing the wind turbines. The access roads will be between towers, offset as necessary to allow for adequate crane access. One road will be required for each string of turbines. The permanent access roads will be up to 32 feet wide and low profile to allow cross-travel by farm equipment.

750
55

110
25

320
60

1250
110



SOURCE DATA:

- USGS 7.5 Minute Topo: USGS
- Project Components: NextEra Energy

NOTES:

- Turbine Type: GE Xle 1.5 MW

0 1,000 2,000 4,000
Feet

Legend

- Alternate Turbine Location (01-29-09)
- Proposed Turbine Location (01-29-09)
- Major Roads
- Substation (10-13-08)
- Access Road (01-29-09)
- Collection System (01-29-09)
- Service Road (01-29-09)
- Project Boundary (12-02-08)

AADT Label
Average Annual Daily Traffic
Commertial Truck Traffic

NEXTera ENERGY RESOURCES

FIGURE 9

Average Annual Daily Traffic Map
Dickey County, North Dakota

Rough Rider I Wind Project
February 2009

TETRA TECH EC, INC.

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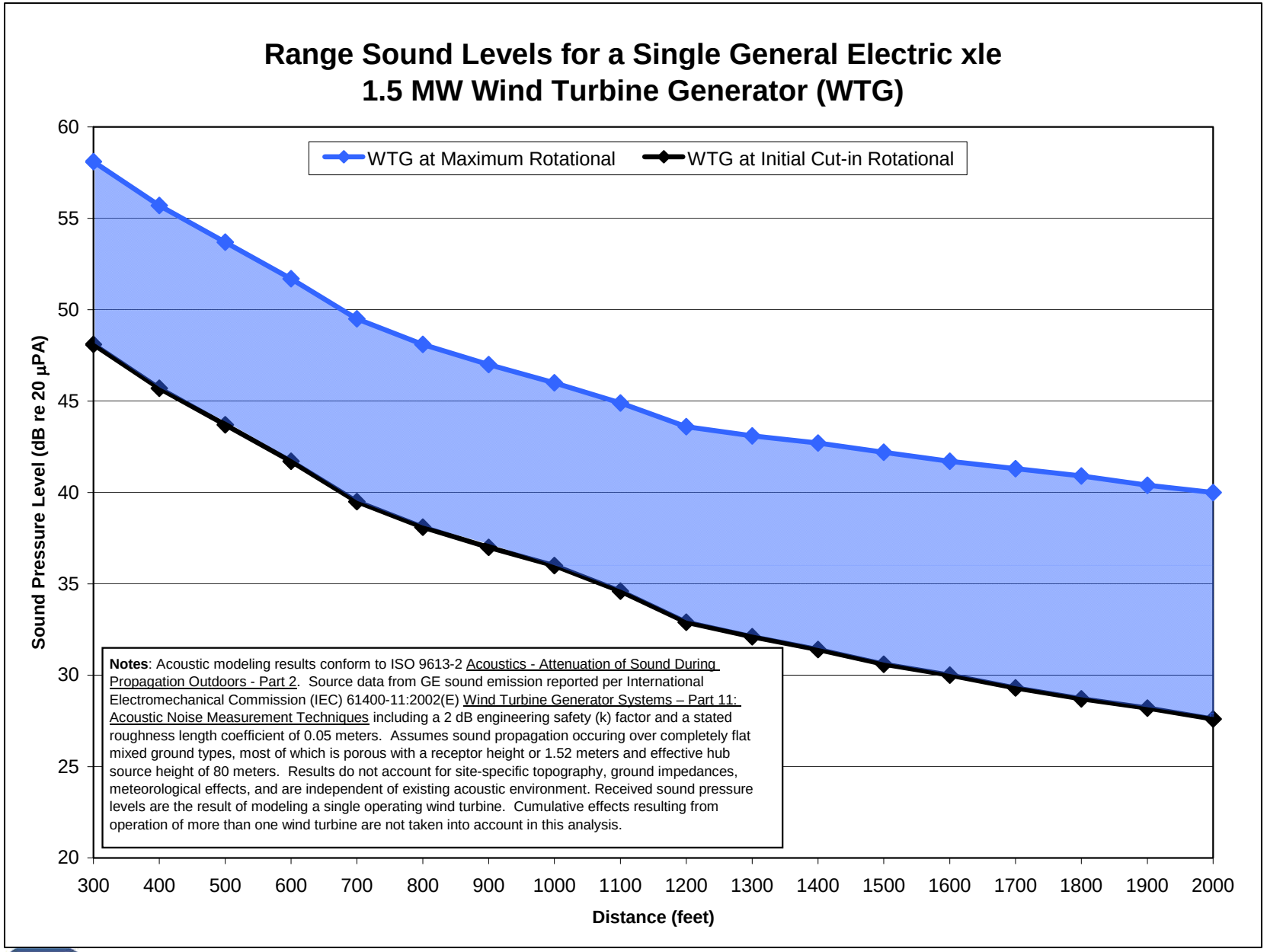

TETRA TECH EC, INC.

Figure 10
Predicted Range of Sound Pressure Levels for GE 1.5 xle from Cut-In to Maximum Operational Conditions (dBA)

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Traffic

The maximum construction workforce is expected to generate approximately 150 additional vehicle trips per day. Using any combination of state and county highways and other township roads throughout the project site, the traffic impacts are considered negligible. Because many of the area roadways have minimal ADT currently, the addition of 150 vehicle trips represents a large percentage increase, and likely will be perceptible. The capacity of any route and level-of-service to the traveling public will not be impacted.

Truck access to the project site is provided by ND-11 from Ellendale, then ND-56 or CR 2 north. Specific additional truck routes will be dictated by delivery location. Additional operating permits will be issued by the state, county and/or township for over-sized truck movements.

Water Supply

Construction and operation of the project will not significantly impact the water supply. The abandonment of any wells is not required for the project. The project will not require appropriation of surface water or permanent dewatering. Temporary dewatering of groundwater may be required during construction of turbine foundations. It is likely that the project will require a single domestic-sized well for the O&M facility.

Telephone, Fiber Optic and Microwave Communications

Telephone and fiber optic cables will be located in the field by the respective utility companies prior to construction and will not be negatively impacted during construction. Two federal beam paths cross the Project Area, but they have been taken into consideration during Project design and will not be adversely affected. The closest non-federal beam path is located over 10 miles southwest of the nearest wind farm infrastructure. Land mobile telecom system impacts are not anticipated.

7.4.3 Mitigative Measures

Construction and operation of the Project will be in accordance with all associated Local, Federal and State permits and laws, as well as industry construction and operation standards. Due to the minor impacts expected on the existing infrastructure during project construction and operation, extensive mitigation measures are not anticipated.

Local Services

With the addition of substation and transmission capacity, no impact to local services is anticipated, and no mitigation is required.

Electrical Service

Rough Rider Wind will purchase station service from MDU or OTP. MAPP/MISO will suggest appropriate configurations for the electrical system and Rough Rider Wind will abide by the recommendations to prevent impacts to the transmission system. Rough Rider Wind has established a setback of 420 feet from existing transmission lines. No additional mitigation is necessary.

Roads

Rough Rider Wind is working closely with the landowners to locate access roads in order to minimize land-use disruptions to the extent possible. A map depicting the preliminary layout of the turbines and access roads is shown in Figures 1 through 3.

Traffic

The capacity of any route and level-of-service to the traveling public will not be impacted and as such, no mitigation is necessary.

Water Supply

In the event wells are abandoned, they will be sealed as required by North Dakota law. If temporary dewatering of groundwater is required during construction activities, discharge of dewatering fluid will be conducted under the requirements of the National Pollutant Discharge Elimination System (NPDES) permit and Storm Water Pollution Prevention Plan (SWPPP).

Telephone, Fiber Optic and Microwave Communications

An underground utilities locator company will be contacted prior to construction to locate and avoid underground facilities. To the extent project facilities cross or otherwise affect existing telephone or fiber optic lines or equipment, Rough Rider Wind will enter into agreements with service providers so as to avoid interference with their facilities. WCFZ identified by Comsearch are not located within the Project Area.

7.5 Human Health and Safety

7.5.1 Description of Resources

Air Traffic

Ellendale Municipal Airport is located approximately 15 miles southeast of the project site. The airport has one asphalt runway and one turf runway oriented in a northwest-southeast direction at an elevation of approximately 1,455 feet above mean sea level. This small airport supports local single-engine airplanes. The nearest airport certified for commercial carrier operations is Aberdeen Regional Airport located approximately 35 miles southeast of the project site.

Electromagnetic Fields

The term electromagnetic fields (EMF) refers to electric and magnetic fields that are present around any electrical device. Electric fields arise from voltage, or electrical charges, and magnetic fields arise from current, or the flow of electricity, that travels along transmission lines, power collection (feeder) lines, substation transformers, house wiring, and electrical appliances. The intensity of the electric field is related to the voltage of the line and the intensity of the magnetic field is related to the current flow through the conductors (wire). EMF can occur indoors and outdoors. However, there are no known discernible health impacts from power lines. Turbines and collector lines will be no closer than 1,400 feet to occupied residences, where EMF will be at background levels.

Hazardous Materials / Hazardous Waste

The site is located in a relatively rural area of North Dakota. Hazardous wastes from large industrial or commercial activities are not likely. Potential hazards may exist in rural areas from old gasoline

facilities, landfill sites, and private activities. A Phase I Environmental Site Assessment (ESA) of the project site will be conducted to identify any recognized environmental conditions that may exist.

Potentially hazardous materials associated with the project include fluids found in association with turbines and substation/transformer equipment. There will be three types of fluids used in the operation of the wind turbines, all of which are petroleum products. These fluids are necessary for the operation of each turbine and include gear box oil, hydraulic fluid, and gear grease. The transformers contain mineral oil.

Security

The project site is located in an area that has a low population density. Construction and operation of the project will have minimal impacts on the security and safety of the local communities.

7.5.2 Impacts

Air Traffic

The installation of wind turbines creates a potential for air traffic collision. However, power collection lines are expected to be similar to distribution lines that are already present (located along the edges of fields and roadways), and the wind turbines and meteorological towers themselves will be visible from a distance. The wind turbines and meteorological towers will have lighting and markings that comply with Federal Aviation Administration (FAA) requirements. In addition, the FAA's review will include the evaluation of any potential interference with air traffic. FAA's response has not been received but is expected soon. The response will be submitted once received.

Electromagnetic Fields

While the general consensus is that electric fields pose no risk to humans, the question of whether exposure to magnetic fields can cause biological responses or health effects continues to be the subject of research and debate. Based on the most current research on electromagnetic fields, and the distance between any turbines or collector lines and houses, the project will have no impact to public health and safety due to EMF (National Institute of Environmental Health Sciences EMF-RAPID Program Staff, 1999).

Hazardous Materials / Hazardous Waste

The Phase I ESA will be used to minimize risk associated with potential recognized environmental conditions (REC), as defined by the American Society for Testing and Materials (ASTM) standard, that may pose a threat to human health and safety. Significant findings are not anticipated due to the known historic uses of the property. The Applicant does not anticipate generating any hazardous wastes.

Security

Project construction and operation will have minimal impacts to the security and safety of the local communities.

7.5.3 Mitigative Measures

Air Traffic

Rough Rider Wind has submitted a request to FAA to determine whether the project layout and lighting will impact navigable airspace or communications technology used in aviation operations. To date, FAA has not responded. The response will be forwarded when received. Wind turbines and meteorological towers will have lighting and markings according to FAA requirements that minimize any potential for air traffic impacts.

Electromagnetic Fields

Rough Rider Wind will follow "prudent avoidance" methods to EMF exposure, such as encouraging conservation and distributed generation, and will continue to monitor EMF research.

Hazardous Materials / Hazardous Waste

Since no significant findings are anticipated, no mitigation is proposed at this time. All petroleum fluids will be contained within the wind turbines and electrical equipment. Any petroleum wastes generated will be handled and disposed of in accordance with Local, State and Federal regulations.

Security

The following security measures will be taken to reduce the chance of physical and property damage, as well as personal injury, at the site:

- The towers will be placed 420 feet from road right-of-way and 1,400 feet from occupied homesteads. These distances are considered to be safe based on developer experience, and are consistent with the required local setbacks. They also serve to reduce noise.

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

- Turbines will sit on solid steel enclosed tubular towers in which all electrical equipment will be located, except for the pad-mounted transformer. Access to the tower is only through a solid steel door that will be locked when not in use.

- Where necessary or requested by landowners, Rough Rider Wind will construct gates or fences such as those around the project substation.

7.6 Noise

7.6.1 Description of Resources

The project area is rural, with isolated residences and no significant sources of noise other than farming equipment and traffic on local roads. As such, the background noise levels are relatively low, at about 35 dB(A), except during periods of high wind when the turbines would be operating (Figure 11). During these times, the background would be about 10 dB(A) higher, at 45 dB(A), due to noises created by the wind. These are primarily the rustling of grass and tree leaves.

T:\GIS\Rough_Rider\MXD\Figure11_Typical_Landscape_020909.mxd

FIGURE 11

Photo of Typical Landscape
Rough Rider I Wind Project

Dickey County, North Dakota

February 2009

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7.6.2 Impacts

The GE Xle 1.5-MW turbine is guaranteed by the manufacturer to produce a maximum noise level of 106 dB(A) at wind speeds ranging from six to 10 m/s, with two dB(A) uncertainty measured at the turbine. The GE expected mean noise level is less than 104 dB(A), at wind speeds between nine and 55 m/s with a two dB(A) uncertainty. The primary source of noise from turbines is due to the wind interacting with the rotor blades, producing a swishing sound that is relatively constant over the wind speed range (Figure 10). However, the level of background noise created by the wind continues to increase as the speed increases. At these higher wind speeds, the turbine noise is masked by wind-generated noise. The Project is designed based on these turbine specifications and setbacks from homes so that the average A-weighted sound level at the outside perimeter of any residence meets or exceeds the industry standard of less than 50 dB.

The equipment located in the nacelle of the turbines also produces noise, but it is controlled through design features and is well contained by the nacelle housing. It is of less significance than the swishing sound from the rotor blades.

Dickey County does not currently have any noise standards. Rough Rider Wind will use the generally accepted average noise impact level for wind turbines of less than 50 dBA at any residence, day or night. The setback distance to achieve 50 dBA or less is 1,400 feet for multiple turbines under worst-case ground absorption conditions.

7.6.3 Mitigative Measures

The primary mitigation measure used for wind turbines is setback distance. Rough Rider Wind is committed to the 1,400-ft setback distance for residences. This setback distance has proven sufficient and acceptable to the communities in North Dakota where NextEra Energy Resources has installed wind farms currently in operation.

Special conditions can occur which are difficult to predict, such as high wind shear events where there is little masking wind noise at surface level but at hub-height there is sufficient wind for energy generation. Residents in homes which are poorly insulated or highly exposed without any vegetation nearby may perceive a higher indoor noise level than those in a typical well-insulated home. If a complaint is registered and sound is measured above the 50 dBA level on more than a rare occasion, Rough Rider Wind can provide improved insulation or landscaping to mitigate these unusual situations. It should be noted that the noise model predicts outdoor noise levels only and assumes no shielding by trees or other vegetation.

7.7 Cultural and Archaeological Impacts

7.7.1 Description of Resources

The project area contains relatively few archaeological, historic, and architectural sites. However, this is likely due to the lack of cultural resource inventories performed in the project area. Areas that have been inventoried have a relatively high site density (see full cultural resources inventory report, Appendix C). A Class I Cultural Resources Inventory (file search/literature review) was conducted by Beaver Creek Archaeology, Inc. (BCA) in November and December of 2008 at the State Historical Society of North Dakota. Based on results of the file search, three manuscripts, three

archaeological site leads, one archaeological site, and one architectural site lead were found within the records.

7.7.2 Impacts

In November 2008, BCA conducted a Class III Cultural Resource Inventory of the proposed Rough Rider I Wind Farm project (see Appendix C). During the course of the inventory, one previously recorded site, three previously recorded site leads (and one previously recorded architectural site were identified within one mile of the APE. None of these sites or site leads will be impacted by the project. Twelve new cultural resource sites were identified within the APE: One stone circle site with a rock cairn, six rock cairn sites, two historic archaeological sites, one Standing Structure Site, one historic cemetery, and one historic grave.

As long as the eight potentially eligible sites are avoided, monitoring takes place at 32DI118, and all construction takes place within the inventoried corridors, a designation of *No Historic Properties Affected* is recommended for this Project. The report produced by BCA was provided to the North Dakota State Historic Preservation Officer (SHPO) for comment, who concurred with the findings in the report in a letter dated February 3, 2009 (Appendix D).

7.7.3 Mitigative Measures

Although none of the newly recorded sites have been formally evaluated to the NRHP, BCA recommends that eight sites, 32DI114, 32DI115, 32DI116, 32DI117, 32DI119, 32DI120, 32DI121, and 32DI122, are potentially eligible for listing in the NRHP, and recommends that these sites should therefore be avoided. Because of the apparent modern disturbance to site 32DI118, it is recommended that monitoring take place during construction.

At the request of Rough Rider I Wind, BCA pin-flagged a 30 meter buffer zone around sites 32DI116, 32DI117, 32DI118, 32DI119, 32DI120, 32DI121, and 32DI122 to avoid accidental disturbance during construction. If project plans do not allow for avoidance of the potential NRHP-eligible sites, a Phase II site evaluation would be recommended by BCA to determine NRHP eligibility. Site 32DI114 was not flagged as a fence is surrounding the site, and signs show its location. Site 32DI115 is located outside of the APE, and was therefore not flagged. The site is, however, fenced in. Newly recorded sites 32DI123, 32DI124, and 32DI125 are recommended not eligible to the NRHP by BCA, and will therefore not need to be avoided during construction.

Should previously unknown archaeological resources or human remains be inadvertently encountered during project construction and/or operation, the discoveries will be reported to the SHPO. With regard to a discovery of human remains, procedures will be followed to ensure that the appropriate authorities become involved quickly and in accordance with local and state guidelines.

Although there are no reservations or Bureau of Indian Affairs trust lands in Dickey County, the following Tribal Historic Preservation Officers (THPO) or Tribal Cultural Preservation Officers (TCPO) may be contacted if archaeological resources or other properties of Tribal interest are identified prior to or during construction:

Tim Mentz, THPO Standing Rock Sioux Tribe Phone: 701.854.2120	Elgin Crows Breast, TCPO Three Affiliated Tribes – Spirit Lake Tribe Phone: 701.996.4477	Ambrose Littleghost, THPO Mandan – Hidatsa & Arikara Nation Phone: 701.627.4781

The Native American Graves Protection and Repatriation Act of 1990 allows tribes to protect American Indian graves and to repatriate human remains. The proponent must comply with this act if a burial site is encountered during construction, as the aforementioned act applies to all developments regardless of the funding source. Any burial site identified, including tribal or pioneer, must be referred to the North Dakota Intertribal Reinterment Committee and the State Historical Society of North Dakota.

The North Dakota Intertribal Reinterment Committee (NDIRC) Ms. Jane Martin Turtle Mountain Housing Authority P.O. Box 620 Belcourt, ND 58301	State Historical Society North Dakota Mr. Paul Picha, Chief Archeologist North Dakota Heritage Center 612 East Boulevard Avenue Bismarck, ND 58505-0830 ppicha@state.nd.us

7.8 Recreational Resources

7.8.1 Description of Resources

Recreational opportunities in Dickey County include fishing, hunting, and wildlife observation. Whitestone Battlefield State Park is located approximately two miles north of the Project Site. Review of state and federal databases indicates that no registered national wildlife refuges, state wildlife management areas, state game refuges, nature preserves, county parks, or formal recreational areas are present within the project site. One USFWS waterfowl production area (WPA) that is managed by the Kulm Wetland Management District, the Reinke WPA, is within the project area. The Rutschke WPA is also located adjacent to the project area but will not be impacted by the project. WPAs are part of the National Wildlife Refuge System and preserve wetlands and grasslands critical to waterfowl and other wildlife. WPAs are open to a variety of public uses, including hunting, trapping, fishing, and wildlife observation and photography.

7.8.2 Impacts

In general, recreational impacts will be visual in nature and limited to individuals using public or private property in the project site for hunting, fishing, or nature observation. None of the project facilities are within a ¼-mile buffer of the Reinke WPA and over 900 feet from the Rutschke WPA; according to the layout dated February 10, 2009, the closest project structure, Turbine #35, is approximately 1,325 feet from the Reinke WPA and Turbine #14 is located approximately 930 feet from the Rutschke WPA.

7.8.3 Mitigative Measures

Since it is not anticipated that any significant recreational resources will be removed from service by implementation of the project, no adjacent land will be converted or dedicated to recreational use or wildlife management. Turbines or other Project infrastructure will not be placed within 900 feet of a WPA.

7.9 Effects on Land-Based Economies

7.9.1 Description of Resources

Agriculture/Farming

The majority of the site is grassland, as shown in the USFWS Land Use Map, Figure 12. Grasslands comprise approximately 9,699.75 acres (approximately 60 percent) of the Project Area. Cultivated land comprises approximately 1,444 acres of the project site.

According to the 2002 Census of Agriculture, soybeans are the most widely grown crop within Dickey County, followed by corn and wheat (USDA, 2002). Barley, corn, sunflowers, hay, oats, and dry edible beans are additional crops harvested in Dickey County. In 2002, Dickey County had 533 farms, for which the primary commodities are cultivated crops, primarily corn and soybeans. Cattle are the primary livestock in the county. According to the 2002 Census of Agriculture, in Dickey County the number of farms decreased from 554 to 533 between 1997 and 2002, while the amount of land in farms increased by 11,318 acres (USDA, 2002). The market value of agricultural products from Dickey County in 2002 was approximately $71,990,000. Crop sales account for approximately 70 percent of the total value of agricultural products sold.

Prime farmland is the land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber and oilseed crops. The National Resource Conservation Service (NRCS) has two classifications for prime farmland. The first is where all areas of the soil series are classified prime farmland. The second is where only the drained areas of the soil series are prime farmland. The NRCS also identifies farmland of statewide and local importance, which is land that is important for the production of food, feed, fiber, forage and oilseed crops. Generally, additional farmlands of statewide or local importance include those that are nearly prime and that produce high yields of crops in an economic manner when treated and managed according to acceptable farming methods. Some may produce a yield as high as prime farmland if conditions are favorable. Table 11 lists the soils considered prime farmland and soils of statewide or local importance within the project site. Figure 13 shows the prime farmland soil distribution in the project site.

There are six prime farmland soils within the Project Area, comprising a total of 143 acres or 0.86 percent of the Project Area; another two soils are considered prime farmland if drained, and comprise 229 acres or 1.4 percent of the Project Area.

According to the North Dakota State Water Commission (NDSWC), Water Permit Retrieval System, there are no properties with any water permits in the project area (NDSWC, 2008).

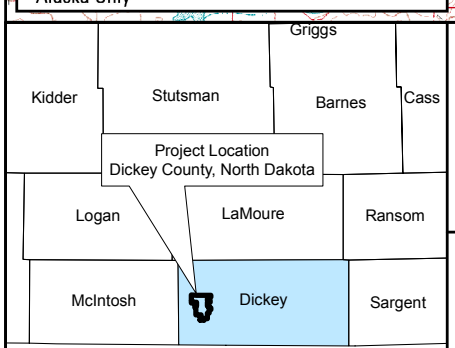
Woodlands

Economically important forestry resources are not found in the project area. According to the 2002 Census of Agriculture, no farms specializing in cut Christmas trees or short-rotation woody crops are located in Dickey County (USDA, 2002). The trees in the one small natural "woodland" patch in Section 20 in the southern portion of the Project Area are mostly green ash (*Fraxinus pennsylvanica*), and some American elm (*Ulmus americana*). There are some woody (shrub-dominated) draws, where dominant species observed were Northern hawthorn (*Crataegus rotundifolia*) and western snowberry (*Symphoricarpos occidentalis*) shrubs.

NLCD 2001 Land Cover Classification Legend

- 11 Open Water
- 12 Perennial Ice/Snow
- 21 Developed, Open Space
- 22 Developed, Low Intensity
- 23 Developed, Medium Intensity
- 24 Developed, High Intensity
- 31 Barren Land
- 41 Deciduous Forest
- 42 Evergreen Forest
- 43 Mixed Forest
- 51 Dwarf Scrub*
- 52 Shrub/ Scrub
- 71 Grassland/ Herbaceous
- 72 Sedge/ Herbaceous *
- 74 Moss *
- 81 Pasture Hay
- 82 Cultivated Crops
- 90 Woody Wetlands
- 95 Emergent Herbaceous Wetlands

* Alaska Only



SOURCE DATA:

- 2001 National Land Cover Data: USGS
- Project Components: NextEra Energy

NOTES:

- Turbine Type: GE Xle 1.5 MW

0 1,000 2,000 4,000

Feet

1 inch = 3,000 feet

Legend

- Alternate Turbine Location (01-29-09)
- Proposed Turbine Location (01-29-09)
- Substation (10-13-08)
- Access Road (01-29-09)
- Collection System (01-29-09)
- Service Road (01-29-09)
- Project Boundary (12-02-08)

NEXTera ENERGY RESOURCES

FIGURE 12

Land Cover Map
Dickey County, North Dakota

Rough Rider I Wind Project
February 2009

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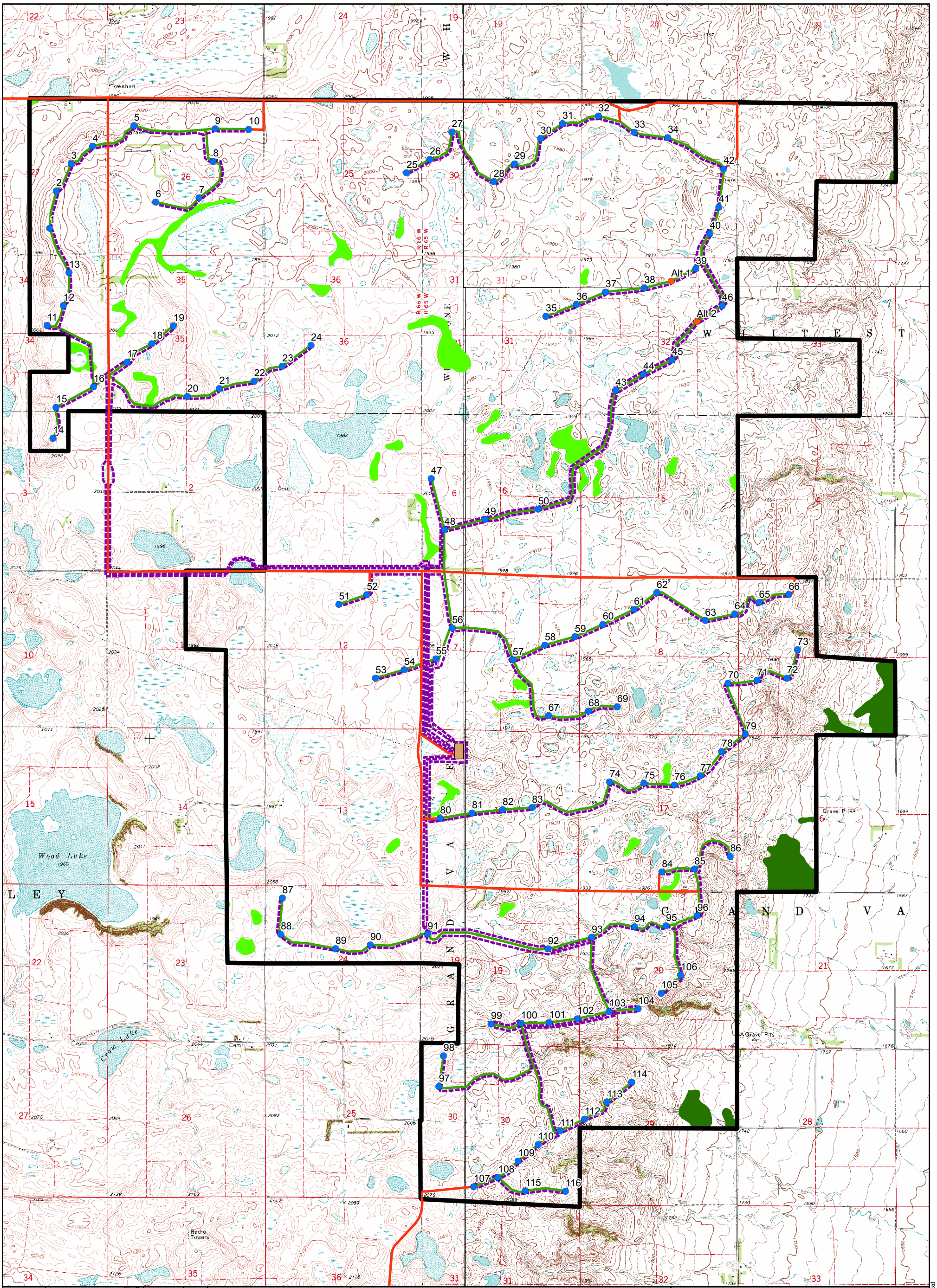

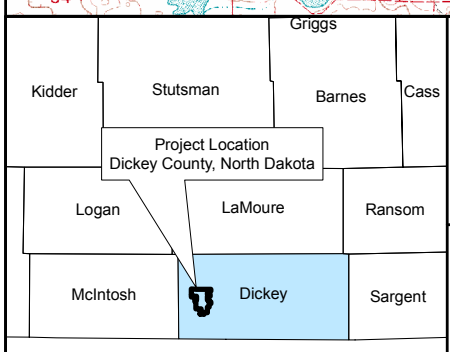

SOURCE DATA:

- Prime Farmland Soil Distribution: USDA-NRCS
- Project Components: NextEra Energy

NOTES:

- Turbine Type: GE Xle 1.5 MW

0 1,000 2,000 4,000

Feet

1 inch = 3,000 feet

Legend

- Alternate Turbine Location (01-29-09)
- Proposed Turbine Location (01-29-09)
- Substation (10-13-08)
- Access Road (01-29-09)
- Collection System (01-29-09)
- Service Road (01-29-09)
- Project Boundary (12-02-08)

Prime Farmland (SSURGO Soils)

- Prime Farmland
- Prime Farmland if Drained

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FIGURE 13

Prime Farmland Soil Distribution Map
Dickey County, North Dakota

Rough Rider I Wind Project
February 2009

TETRA TECH EC, INC.

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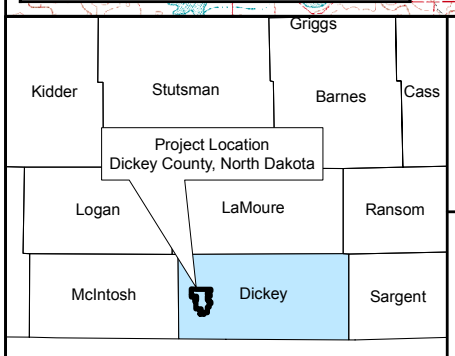
Soil Types

15	8
15B	80
25	81B
35	85B
40	86E
44	90
47	91B
59	92B
6	93C
60B	94C
61D	95B
64	96E
66	97F
7	98D



SOURCE DATA:

- SSUGO Soils Data: USDA-NRCS
- Project Components: NextEra Energy

NOTES:

- Turbine Type: GE Xle 1.5 MW

0 1,000 2,000 4,000

Feet

1 inch = 3,000 feet

Legend

- Alternate Turbine Location (01-29-09)
- Proposed Turbine Location (01-29-09)
- Substation (10-13-08)
- Access Road (01-29-09)
- Collection System (01-29-09)
- Service Road (01-29-09)
- Project Boundary (12-02-08)

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FIGURE 14

State Soils Association Map
Dickey County, North Dakota

Rough Rider I Wind Project
February 2009

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Table 11. Prime Farmlands in Dickey County

Map Symbol	Soil Unit	Prime Farmland	Prime Farmland Only When Drained
9	Bearden silt loam, 0 to 2 percent slopes	X	
14	Barnes-Gardena loams, 0 to 3 percent slopes	X	
15	Barnes-Svea loams, 0 to 3 percent slopes	X	
15B	Barnes-Svea loams, 3 to 6 percent slopes	X	
17B	Barnes-Buse loams, 3 to 6 percent slopes	X	
24	Gardena loam, 0 to 2 percent slopes	X	
25	Divide loam, 0 to 2 percent slopes	X	
26B	Eckman-Gardena silt loams, 2 to 6 percent slopes	X	
27B	Embden fine sandy loam, 0 to 6 percent slopes	X	
29	Glyndon silt loam, 0 to 2 percent slopes	X	
31	Edgeley loam, 0 to 2 percent slopes	X	
31B	Edgeley loam, 2 to 6 percent slopes	X	
35	Fordville loam, 0 to 2 percent slopes	X	
48	La Prairie loam, 0 to 2 percent slopes, rarely flooded	X	
56	Overly silt loam, 0 to 2 percent slopes	X	
64	Sinai silty clay, 0 to 2 percent slopes	X	
66	Spottswood loam, 0 to 2 percent slopes	X	
70	Svea loam, 0 to 1 percent slopes	X	
72	Swenoda fine sandy loam, 0 to 3 percent slopes	X	
74	Swenoda-Barnes complex, 0 to 3 percent slopes	X	
8	Tonka silt loam, 0 to 1 percent slopes		X
22	Colvin silt loam, 0 to 1 percent slopes		X
42	Hamerly-Wyard loams, 0 to 3 percent slopes		X
46	Ludden clay, 0 to 1 percent slopes, occasionally flooded		X
49	Lamoure silt loam, 0 to 1 percent slopes, occasionally flooded		X
50	Wyndmere-Tiffany fine sandy loams, 0 to 2 percent slopes		X
90	Vallers loam, 0 to 1 percent slopes		X

7.9.2 Impacts

Agriculture/Farming

No impacts are anticipated to animal health and safety due to the construction or operation of the wind farm and associated facilities. Except for the physical locations of the turbines and access roads, all the land surrounding the facility will be available for grazing.

Actual impacts to agricultural production will be determined once turbine and road locations are finalized. Exact impact acreages will not be known until turbine siting is finalized, but expected permanent impacts will be approximately 0.11 acres per turbine, for a total permanent land disturbance of 12.8 acres, with an additional 216.6 acres due to access roads and 3.5 acres due to the O&M facility and project substation, for a total of 233 acres of permanent impacts. It is possible that some of this land is not used for agricultural purposes, thus the actual impacts to agricultural production cannot be determined until turbine and road locations are finalized.

The Project will site only a limited amount of project facilities in prime farmlands. The project layout dated February 10, 2009 includes up to 1.63 acres of Project infrastructure in prime farmland if drained, not including the collection lines, which will be buried and would be a temporary disturbance of soil. No prime farmland would be impacted by turbines or by the substation. This would be a negligible impact to agricultural production in the county. As noted earlier, wind lease payments will provide farmers with a supplemental source of income, helping assure that farmers can continue to operate financially viable farms, and thus helping to assure the continuation of farming in Dickey County.

No turbines will be placed within 1,400 feet of family homes. Other impacts to homes are discussed throughout Section 7.0. Family farms will be impacted due to the loss of land associated with the construction of the turbines and access roads. The extent of impacts will not be known until final turbine locations are determined in conjunction with the landowners.

Woodlands

No significant impacts are anticipated to woodlands.

7.9.3 Mitigative Measures

Agriculture/Farming

The wind turbines and access roads will be located so that the most productive farmland (prime farmland) will be avoided as much as possible. Only land for the turbines, substation, and access roads will be unavailable for crop production. Rough Rider Wind will work with landowners to minimize impacts to their land. Once the wind turbines are constructed, all land surrounding the turbines can still be farmed or grazed. All construction areas will be separated from grazing animals by temporary or permanent fencing.

Woodlands

No significant impacts are anticipated to woodlands.

7.10 Soils

7.10.1 Description of Resources

Within the Project Area, USDA NRCS has mapped twenty-eight Soil Survey Geographic (SSURGO) soil map units (Figure 15). Of these, 14 map units comprise more than one percent of the land area, with three of the 14 comprising approximately 70 percent of the Project Area. Soils in the project area are predominantly deep loams that are well-drained to moderately well-drained and derived from fine-loamy glacial till deposits. Table 12 provides a summary of the soil map units occurring within the Project Area, including their acreages and relative percentages of the project area.

Williams-Bowbells loams (3 to 6 percent slopes), Williams-Zahl loams (6 to 9 percent slopes), and Zahl-Williams loams (6 to 25 percent slopes) make up 27.5 percent, 25.2 percent, and 16.3 percent of the Project Area, respectively. Southam silt loam, at 5.5 percent, is the only other soil map unit that comprises greater than 5 percent of the Project Area.

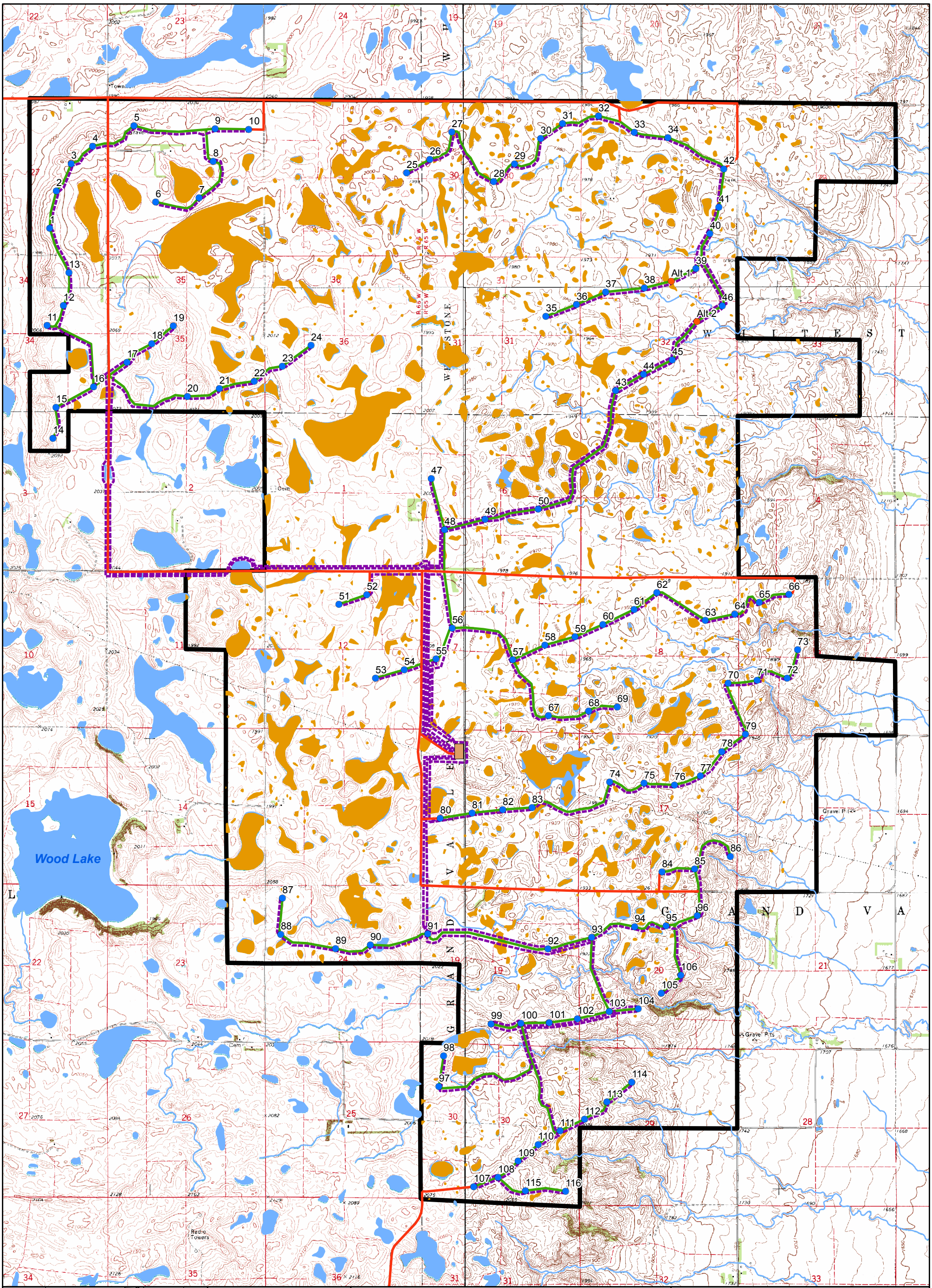
Wood Lake
Project Location
Dickey County, North Dakota
Griggs
Kidder
Stutsman
Barnes
Cass
Logan
LaMoure
Ransom
McIntosh
Dickey
Sargent
SOURCE DATA:
- USGS 7.5 Minute Topo: USGS
- NWI Data: USFWS
- NHD Data: USGS
- Project Components: NextEra Energy
NOTES:
- Turbine Type: GE Xle 1.5 MW
0 1,000 2,000 4,000
Feet
1 inch = 3,000 feet
Legend
Alternate Turbine Location (01-29-09)
Proposed Turbine Location (01-29-09)
Substation (10-13-08)
Access Road (01-29-09)
Collection System (01-29-09)
Service Road (01-29-09)
NWI Wetland Area
National Hydrographic Data
Project Boundary (12-02-08)
NEXTera ENERGY RESOURCES
FIGURE 15
National Wetlands Inventory and Surface Waters Map
Dickey County, North Dakota
Rough Rider I Wind Project
February 2009
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Table 12. SSURGO soil map units within the Project Area

Map Unit Symbol	Map Unit Name	Area (acres)	Percentage of Project Area (16,118 acres)
92B	Williams-Bowbells loams, 3 to 6 percent slopes	4,429.72	27.5%
93C	Williams-Zahl loams, 6 to 9 percent slopes	4,053.92	25.2%
96E	Zahl-Williams loams, 6 to 25 percent slopes	2,622.52	16.3%
7	Southam silt loam	878.77	5.5%
85B	Lehr-Wabek loams, 2 to 6 percent slopes	647.21	4.0%
97F	Zahl-Max loams, 15 to 60 percent slopes	623.24	3.9%
40	Hamerly-Tonka-Parnell complex, 0 to 3 percent slopes	540.48	3.4%
86E	Wabek loam, 6 to 25 percent slopes	375.13	2.3%
94C	Williams loam, 3 to 9 percent slopes, very stony	295.04	1.8%
98D	Williams-Zahl-Parnell complex, 0 to 15 percent slopes	274.97	1.7%
60B	Renshaw-Sioux loams, 0 to 6 percent slopes	231.23	1.4%
6	Parnell silty clay loam	223.80	1.4%
81B	Makoti-Sakakawea silt loams, 3 to 6 percent slopes	194.20	1.2%
8	Tonka silt loam, 0 to 1 percent slopes	165.38	1.0%
61D	Sioux loam, 1 to 15 percent slopes	143.49	0.9%
80	Makoti-Sakakawea silt loams, 0 to 3 percent slopes	102.44	0.6%
91B	Ruso sandy loam, 0 to 6 percent slopes	64.31	0.4%
90	Vallers loam, 0 to 1 percent slopes	63.20	0.4%
66	Spottswood loam, 0 to 2 percent slopes	53.11	0.3%
64	Sinai silty clay, 0 to 2 percent slopes	37.61	0.2%
25	Divide loam, 0 to 2 percent slopes	30.81	0.2%
59	Pits, gravel and sand	26.02	0.2%
15B	Barnes-Svea loams, 3 to 6 percent slopes	15.57	0.1%
44	Harriet loam	13.57	0.1%
15	Barnes-Svea loams, 0 to 3 percent slopes	5.84	<0.05%
35	Fordville loam, 0 to 2 percent slopes	0.19	<0.05%
47	La Prairie loam, channeled, 0 to 15 percent slopes	1.39	<0.05%
95B	Bowbells-Zahl loams, 3 to 6 percent slopes	4.50	<0.05%

Williams-Bowbells loams (3 to 6 percent slopes) are derived from fine-loamy glacial till and are typically located on rises on till plains. This soil type is characteristically deep, moderately well-drained to well-drained, not hydric, and not designated as prime farmland or farmland of statewide importance.

Williams-Zahl loams (6 to 9 percent slopes), which are also derived from fine-loamy glacial till, and are usually located on knolls on till plains. This soil type is also typically deep, well-drained, not hydric, and not designated as prime farmland or farmland of statewide importance.

Zahl-Williams loams (6 to 25 percent slopes) also originated from fine-loamy till, are found on ridges and hills on till plains. Like Williams-Bowbells loams and Williams-Zahl loams, Zahl-Williams loams are usually deep, well-drained, not hydric, and not designated as prime farmland or farmland of statewide importance.

Usually found in depressions on till plains, Southam silt loam is derived from alluvium. This deep soil is very poorly drained and hydric. It is not designated as prime farmland or farmland of statewide importance.

7.10.2 Impacts

The impact to soils within the Project Area will be limited to areas removed from agricultural production by occupancy of project components, including turbines, roads, collection lines, an O&M facility, and a project substation. Turbine foundations are comparatively small and access roads will be 32-foot wide aggregate-surfaced roadways. Road construction and will be relatively minor; however, in isolated cases, grading may be required for roadway construction. Estimated impacts include up to 233 acres of permanent disturbance due to turbine placement, access road construction, an O&M facility, and a project substation.

7.10.3 Mitigative Measures

Wind and water erosion are potential hazards for the soils found in the Project Area. To minimize erosion during and after construction, BMPs for erosion and sediment control will be utilized. Construction sites will maintain sediment control practices in accordance with the Stormwater Pollution Prevention Plan (SWPPP). Since towers will not be located on significant slopes, only non-structural practices should be required. These practices include temporary seeding, permanent seeding, mulching, filter strips, erosion blankets, and sod stabilization. If cuts are made during construction, top soil will be segregated and reapplied after final contours have been graded.

7.11 Geologic and Groundwater Resources

7.11.1 Description of Resources

The western portion of Dickey County is characterized by the topographical transition between the Missouri Coteau on the west and the Glaciated Plains on the east. The Project Area lies immediately west of this transition, which is referred to as the Missouri Escarpment. Areas west of the escarpment may be up to 300 or 400 feet higher in elevation than areas to its east. The topography of the Missouri Coteau is characterized by sloughs, lakes, and closely spaced hills, while the topography of the Glaciated Plains is nearly level to undulating, with some areas of rolling to steep land. The Missouri Escarpment is situated above a thick sequence of sedimentary rocks, mantled by glacial deposits and, in river valleys, alluvium (Bluemle 1979).

According to the North Dakota Geological Survey (2008), the surface geology of Dickey County has been mapped in its entirety on an approximately 1:125,000 scale as part of the NDSWC's County Ground Water Studies program. Surficial deposits within the entire Project area consist of up to three hundred feet of Pleistocene glacial sediments. These surficial materials are mainly collapsed glacial, fluvial, and lake sediment of the Coleharbor Group, and are typically in the range of 30 to 60 meters deep. They comprise a hilly landscape of interspersed with numerous sloughs and lakes (NDGS 2008; Bluemle 1979; North Dakota GIS 2000). Along the eastern boundary of the Project Area, a thin band of Holocene-age fluvial sediments is mapped. These clays and sands are part of the Oahe Formation and may be up to 10 meters deep (North Dakota GIS 2000). The geologic map for Dickey County also indicates a large ice-thrust block roughly centered at the junction of North Dakota State Highways 11 and 56. Although unlikely, sediments associated with some of these features may be prone to mass movements such as slumping, earthflows and creep (NDGS 2008).

The surficial materials in the Project Area are underlain by marine shale of the Cretaceous-age Pierre Formation. This formation, which may be exposed along streams or roadcuts is a noncalcareous shale commonly containing iron concentrations. It is typically highly jointed and fractured several feet below its contact with the overlying Coleharbor Group sediments. This unit is underlain by other Cretaceous shales, including the Niobrara Formation, Carlile Formation, Greenhorn Formation, Belle Fourche Formation. Together, these units may be approximately 1200 to 1800 feet thick (Bluemle 1979). Other than the low potential for mass movements, as discussed above, no areas of geologic instability (e.g., fault zones, karst topography) were identified (Stoeser et al. 2007; Tobin and Weary 2005).

Geologic-related mineral resources in Dickey County are limited to gravel and sand located on stream terraces. Historical hydrocarbon exploration in Dickey County has revealed no evidence of petroleum resources (Bluemle 1979). USGS topographic maps for the Project Area show evidence of some potentially active sand and gravel mining, but no evidence of hydrocarbon wells.

The mean annual precipitation at Ellendale is 21.13 inches. Nearly all of the water of economic importance in Dickey County is derived from precipitation. Drainage on the Missouri Coteau is in an early youthful stage and is poorly developed. Surface runoff is toward undrained or poorly drained depressions. Some of the depressions fill up and overflow into lower ones or drain into tributaries, which eventually lead to the James or Maple Rivers. The rural population of Dickey County is dependent upon ground water for their domestic and most of their livestock needs. Geologic units that contain aquifers of economic importance in Dickey and LaMoure Counties are: (1) Black Island Formation' of Ordovician age; (2) Lakota, Fall River, and Newcastle Formations of Early Cretaceous age; (3) Pierre Formation of Late Cretaceous age; and (4) glacial drift of Quaternary age (Armstrong, 1980).

The Black Island aquifer lies at depths that range from 1,421 feet (433 m) to 3,000 feet (910 m) below land surface. Individual sandstone beds are as much as 18 feet (5.5 m) thick, and aggregate sandstone thicknesses are as much as 57 feet ;17 m) . Properly constructed wells in the aquifer should be capable of producing about 700 gal/min. Samples from two wells believed to tap the aquifer had sodium sulfate type water containing 2,520 and 3,800 mg/ L dissolved solids. The Lakota-Fall River aquifer underlies the two counties at depths ranging from 1,100 feet (335 m) to 2,200 feet (670 m) below land surface. The aquifer ranges from 35 to 276 feet (11 to 84 m) in thickness and has a mean thickness o f about: 106 feet (32 m. Well yields generally are small, but locally yields of up to 1,000 gal/min should be obtainable. Samples from 20 wells in the aquifer had sodium sulfate, calcium sulfate, or sodium chloride type water containing dissolved-solids concentrations that ranged from 2,030 to 4,850 mg/L. The Newcastle Formation underlies the area at depths of 790 (240 m) to somewhat more than 2,000 feet (610 m) and is as much as 300 feet (91 m) thick. The formation is considered as one aquifer system that contains two separate aquifers. Well yields generally are less than 80 gal/min. Samples show that water from the upper aquifer generally is a sodium chloride type, and water from the lower aquifer generally is a sodium sulfate type. Dissolved solids concentrations ranged from 2,060 to 4,590 mg/L. The Pierre aquifer underlies the glacial drift in the western and northern parts of the two counties. It supplies water for farms in areas where glacial drift is thin and glacial aquifers are missing. Individual well yields are as much as 50 gal/min, but generally yields are less than 5 gal/min. Water quality in the Pierre aquifer varies considerably in both type and concentrations; generally sodium is the predominant cation and either

chloride or sulfate is the dominant anion. Dissolved-solids concentrations in six samples ranged from 1,400 to 8,630 mg/L (Armstrong, 1980).

7.11.2 Impacts

Impacts of the proposed project to available geologic resources are likely to limited. In the unlikely event that sand and gravel resources are present and cannot be avoided, Rough Rider Wind will coordinate with landowners regarding impacts and any necessary mitigation.

Impacts to groundwater resources in the vicinity of the Project Area are not anticipated as water supply needs will be limited. It is probable that operations and maintenance water requirements will be satisfied with a single domestic sized water well. Based on the small amount of increased impervious surface area that would be created by proposed project components relative to the total extent of the Project Area and the large distances between project components, the project will likely have minimal impacts to regional groundwater recharge. Depending on groundwater levels within the Project Area, localized impacts to groundwater may occur due to various project construction activities. Given the minor and highly localized character of these impacts, local water supply wells would not be adversely affected. If shallow groundwater is disturbed by the development of turbine foundations, it is anticipated that groundwater would resume its natural course of flow downgradient of the foundations. In addition, each turbine would be located a minimal distance of 1,400 feet away from existing residential structures, thereby minimizing the risk of impacts to private wells in the area, which are assumed to be located in proximity to the structures they serve. Development of the turbine foundations is not likely to require subsurface blasting; therefore, disturbances to groundwater flow from newly fractured bedrock are not anticipated.

7.11.3 Mitigative Measures

Wind turbines will be sited so as to avoid sand and gravel resources identified in the project area. Where sand and gravel resources cannot be avoided, Rough Rider Wind will coordinate with landowners regarding impacts and any necessary mitigation. No other mitigation is anticipated to be necessary.

Wind turbine locations will not impact the use of existing water wells because the turbines will not be sited within 1,400 feet of occupied structures. In the event that subsurface blasting is required, a blasting plan would be developed and implemented to keep the impacts localized and fracture the least amount of bedrock necessary for construction. It may be necessary to pump out any accumulated groundwater in the excavation during construction. All dewatering of the excavation would be discharged to the surrounding surface, thereby allowing it to infiltrate back into the ground to minimize potential impacts.

7.12 Surface Water and Floodplain Resources

7.12.1 Description of Resources

Surface water and floodplain resources for the project area were identified by reviewing U.S. Geological Survey topographic maps, Flood Insurance Rate Maps (FIRM) produced by the Federal Emergency Management Agency (FEMA), and USFWS National Wetlands Inventory (NWI) data. The Project area is located in geographic region referred to as the Missouri Coteau, a region of higher elevation than the Glaciated Plains to the east (Figure 2). This area is characterized as having

hummocky topography and numerous "prairie potholes", small lakes and wetland features forming in basins resulting from collapse of superglacial sediment during the last glaciation. These water resources are shown in Figure 15. In addition, the Elm River is approximately seven miles to the east of the Project Area. The regional elevation ranges from 1450 (ft) above main sea level (amsl) at the lowland regions along the Elm River to the east and to 2240 ft amsl at the upland area immediately southwest of the Project area.

According to FEMA, the project area has not been mapped for floodplains.

7.12.2 Impacts

Construction of the wind turbines, transformer pads, and access roads will disturb land within the project site. The wind turbines will be built on uplands in order to avoid intermittent streams located in the lower elevations of the landscape. Access roads to the turbines will be built to avoid impacts to surface waters.

Assuming that the proposed wind turbines and associated structures are not placed in potential flooding areas, it is reasonable to assume that floodplains will not be impacted and are not a significant issue from a regulatory perspective.

7.12.3 Mitigative Measures

Access roads constructed adjacent to intermittent streams and drainageways will be designed in such a manner that runoff from the upper portions of the watershed can flow unrestricted to the lower portion of the watershed. An application (Notice of Intent) to obtain coverage under the NDPDES general permit for storm water discharges associated with construction activity will be submitted to the North Dakota DOH prior to construction of the project.

7.13 Wetlands

7.13.1 Description of Resources

Wetlands and riparian areas are important resources because they provide habitat utilized by both resident and migratory wildlife. Wetlands also perform a variety of hydrologic (flood attenuation and groundwater recharge) and water quality (sediment attenuation and nutrient removal) functions.

A wetland delineation was conducted for the Rough Rider I Project. Off-site (Desktop) determination methods were first used to identify probable locations of wetlands and waterbodies, while on-site methods were employed to verify wetland identifications and gather information to support the assessment of probable jurisdictional determinations. The final wetland delineation report will be submitted once it is completed.

The Desktop determination methodology was first employed to identify potential impacts to wetland areas from the construction of the proposed array, access roads, underground electrical (UE) collection lines other project features (met towers, operations building, and construction laydown areas) and transmission line corridor. The desktop analysis of wetlands included an assessment of data from the U.S Fish and Wildlife (USFWS) National Wetlands Inventory (NWI) Maps and data depicting the locations of Waterfowl Production Areas (WPA), Natural Resource Conservation Service (NRCS) Wetland Reserve Program (WRP) easements, state fish and wildlife

areas, state parks, nature preserves (public and private), and county or municipal parklands that may have been present in the proposed project area. Information concerning the extent of hydric soils on the property was obtained from the Dickey County Soil Survey or obtained digitally from the Natural Resource Conservation Service (NRCS). Sites of proposed wind farm facilities with the potential to impact wetland areas were identified based on a review of aerial photography obtained from the USGS. Areas of potential wetlands identified during the off-site data review process were also investigated.

Sites related to wind farm facilities were examined through interpretation of aerial photography, study of soils maps and hydric soil lists, study of NWI maps, and field reconnaissance. At most sites, point-specific field data on soils, vegetation, and hydrology was collected and documented during the subsequent field visits. Point-specific data was not collected at sites whose sole proposed activities were limited to those which would result in temporary impacts.

The on-site (field) visit was conducted to verify wetland identifications and gather information to support the assessment of probable jurisdictional determinations. During this effort, sufficient information was collected to allow for preparations of Department of the Army (DA) Clean Water Act Section 404 Nationwide Permit (NWP) application; that is, if the proposed impacts from the project eclipse the notification threshold of the NWP #12 for Utility Line Activities in wetlands deemed subject to U.S. Army Corps of Engineers (USACE) jurisdiction.

Personnel experienced in the identification of wetlands and wetland functions and values as they relate to jurisdictional status performed a field survey of wetlands and other aquatic resources within the AOI of the proposed facilities. Biological and hydrological resources of note were identified and documented in field notes.

Wetlands within the Project area were delineated using the methods described in the 1987 USACE Wetland Delineation Manual (Environmental Laboratory, 1987), the Great Plains Regional Supplement to the 1987 Manual (USACE, March 2008) and supplemental delineation guidance by the USACE, contained in the field memoranda dated February 20, 1992 and March 6, 1992, as well as the Questions and Answer memoranda dated October 7, 1991. These methods incorporate a three-parameter approach using vegetation, soils, and hydrology to identify the presence of freshwater wetland.

The extent of relatively permanent waters (RPWs), other than wetlands, were determined by applying the Corps definition of Ordinary High Water Mark (OHWM) and methods for jurisdictional determinations as detailed in the U.S. Army Corps of Engineers Jurisdiction Determination Form Instructional Guidebook (Corps JD Guidebook) revised on June 5, 2007. Integral to the identification of WUS within the Project Area will be identification of the "ordinary high water mark". The “ordinary high water mark” means that line on shore established by fluctuations of water indicated by physical characteristics. These include presence of a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, presence of litter and debris, or other appropriate means that consider characteristics of surrounding areas.

The wetland and RPW boundaries were marked at 50 to 75-foot intervals (depending on the line of sight) with sequentially numbered pin flags or stakes.

No wild and scenic rivers or other designated special waters are present within the project area.

7.13.2 Impacts

Field reconnaissance confirmed the presence of numerous isolated wetlands and RPWs. Eighty areas were determined to be either USACE jurisdictional wetlands or wetlands currently under easement to the USFWS. Jurisdictional features that occur within project facilities consisted of RPWs, wetlands physically connected to or adjacent to RPWs and isolated wetland basins which no visible surface connection to RPWs. Narrow bands of wetland vegetation were present within the OHWM of some areas classified as RPWs.

A total of 248 locations which exhibited wetland characteristics during the Desktop portion of the wetlands investigation were investigated. Of these 248 locations, twenty-three locations were classified as USACE jurisdictional areas. Eighteen of these locations were classified as seasonal or perennial RPWs. Some perennial streams were flowing at the time of the wetland delineation activities. Five USACE jurisdictional areas were determined to be wetlands adjacent to RPWs. A traceable surface connection to an RPW was in evidence at these five locations.

A total of fifty-one isolated wetland basins were identified within the AOI which are currently under easement to the USFWS. Six wetlands were determined to be USACE jurisdictional wetlands which are also under easement to the USFWS.

Wetland Permitting

The Department of the Army, acting through the USACE has the authority to permit the placement or discharge of dredged or fill materials in waters of the United States (WUS) under Section 404 of the Clean Water Act (CWA). The USACE also has authority for the day-to-day administration of the individual and Nationwide Permit (NWP) program, to conduct and verify jurisdictional determination, to develop and interpret policy and guidance, and to enforce Section 404 provisions. The CWA also established responsibilities of the United State Environmental Protection Agency (USEPA) which include:

- development and interpretation of policy, guidance and environmental criteria used in evaluating permit decisions,
- determination of scope of geographic jurisdiction;
- authority to prohibit, deny or restrict the use of any defined area as a disposal site;
- review and comment on individual permit applications; and,
- enforcement authority of Section 404 provisions.

The USFWS was given the authority to evaluate impacts of any proposed action on fish and wildlife resulting from federally permitted projects under the Fish and Wildlife Coordination Act and to evaluate specific cases or policy issues pursuant to the requirements of Section 404(q).

Individual states were also granted authority in Section 404 permit decisions through State Water Quality Certifications (CWA, Section 401), State Program general permits, or program assumption.

The Kulm Wetlands Management District, under the jurisdiction of the USFWS, manages one waterfowl production area (WPA) within the Project Area and multiple wetland and grassland easements within the Project Area. The WPA and USFWS easements are shown on Figure 4 and Figure 8. The easements provide the USFWS perpetual rights which restrict or prohibit draining, burning, leveling or filling of any wetland basin depicted on the wetland easement maps without a permit issued by the USFWS.

On-site delineation of these features prior to construction identified wetland resources which are considered federal waters subject to the requirements of Section 404 of the CWA.

Based on information from the USACE-Omaha District, no Traditional Navigable Waters are present within the Corridor, therefore no CWA Section 9 or 10 permits will be required. Areas which are determined to be jurisdictional based on the CWA will be avoided where practicable. However, only impacts to wetlands determined to be WUS or direct impacts to wetlands under perpetual easement by the USFWS will require issuance of permits or letters of permission prior to initiation of construction activities. Under the CWA, only the USACE can make a jurisdictional determination and such determinations are generally not made until a permit application is filed or a potential compliance issue exists.

7.13.3 Mitigative Measures

Wetlands will be avoided to the extent practicable during the construction phase of the project. If impacts to CWA jurisdictional waters are unavoidable and less than one-half acre, Rough Rider Wind will seek project authorization under a Section 404 USACE NWP. Permanent impacts to jurisdictional waters will be mitigated according to USACE requirements.

Certain wetlands within USFWS easements on private property are under USFWS jurisdiction. If wetland impacts to these wetland basins in the USFWS easements cannot be avoided, Rough Rider Wind will work with the USFWS to obtain permits or letters of authorization and will conduct mitigation if required. The USFWS requires a compatibility assessment for any direct wetland impacts on easement land (see Section 10.11.2).

Rough Rider Wind will use NWP specific General and/or Regional Conditions prescribed for projects in North Dakota as set forth by the USACE and other BMPs required by the USFWS during construction and operation of the transmission line to protect topsoil, minimize soil erosion and protect adjacent wetland resources from direct and indirect impacts. Practices may include containing excavated material, use of silt fences, protecting exposed soil, stabilizing restored material, and revegetating disturbed areas with native species.

7.14 Vegetation

7.14.1 Description of Resources

The Project Area is a rural location with farming and livestock grazing and related agricultural operations dominating the land use. The site is very representative of the region's prairie pothole topography and wetlands occur in virtually every low-lying area with large bodies frequently connected by small channels. Plant communities within the Project Area are dominated by wetlands and large tracts of native and historically disturbed grasslands with lesser amounts of forested shelterbelt, cultivated cropland and hay land. The grasslands are commonly grazed or hayed on an annual basis. Native grasslands consist primarily of mixed-grass prairie dominated by components of the short and tall-grass prairies including the species big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), Indian grass (*Sorghastrum nutans*), and green needlegrass (*Stipa viridula*), with prairie cordgrass (*Spartina pectinata*) and northern reedgrass (*Calamagrostis stricta*) near wetlands. Common forbs found in the mixed grass prairie communities include: western yarrow (*Achillea millefolium*), pussytoes (*Antennaria spp.*), fringed sagewort (*Artemisia frigida*), milk vetch (*Astragalus spp.*) and purple avens (*Geum rivale*). Grasslands provide valuable habitat to a wide variety of upland bird species and also provide critical nesting and brooding habitat to many species of waterfowl.

Hayland, cropland and pasture are managed for the production of livestock forage and cereal crops. Management may include fertilization, weed and brush control by pesticide application, fallow, and reseeding. Species composition often includes mixtures of introduced grasses, mixes of grasses and legumes, small grain hay or monocultures of legumes such as alfalfa or clover. Croplands are planted in spring wheat, barley or corn with rotations to hayland crops in cycles. Cropped species are not static and tilled areas will fluctuate with market demands and farm-specific operational requirements. Much of the previously disturbed pastureland (i.e., not native grasslands) within the Project Area has not been farmed for many years (Tetra Tech EC, Inc, 2007).

7.14.2 Impacts

The Project Area contains significant amounts of native prairie. Within the Project Area, potential impacts to plant communities due to construction activities were analyzed. Proposed turbine locations, collector and transmission line routes, and access roads were visually inspected. At the time of the survey, the Project Area included 11,209 acres. Native prairie comprised 74 percent of the Project Area and 82 percent of the proposed turbine locations were in native prairie. As of the layout dated January 29, 2009, of the 118 turbines (116 turbines plus two alternates), 85 were located in native prairie, six were located in tame prairie, 10 were located outside of prairie habitat (e.g. in cropland), and 17 turbines were located outside of the surveyed area. According to the layout dated January 29, 2009, 85 turbines, 34.7 miles of collection line, and 27.4 miles of access/service road are located within native prairie.

Access road construction will result in the greatest effects to native vegetation resulting in permanent loss of these habitats where they occur along selected routes. Installation of the proposed buried and overhead collector system will result in some temporary effects to native and non-native grasslands. Where disturbance is significant, effects can be mitigated by reseeding the trenched areas with native grasses and legumes following completion of construction activities.

7.14.3 Mitigative Measures

Rough Rider Wind will work closely with the USFWS and NDGFD during micrositing to minimize impacts to vegetation within the project area. Rough Rider Wind conducted a pre-construction inventory of existing wetlands. The pre-construction inventory report will be filed with the PSC and applicable agencies prior to construction. Rough Rider Wind will avoid impacts to USFWS WPAs and will work with the USFWS to avoid or minimize impacts to wetlands and native grasslands within USFWS easements. Rough Rider Wind will work to avoid and to minimize impacts to existing trees and shrubs.

If direct impacts are proposed within USFWS wetland easements, then the USFWS will perform a compatibility analysis and, if acceptable, issue a Special Use (temporary impact) or ROW Permit (permanent impact). Rough Rider Wind will follow permit conditions for site restoration and replacement. When boring underground collection beneath wetlands within USFWS wetland easements, Rough Rider Wind will inform the USFWS of this action prior to construction.

Rough Rider Wind will use BMPs during construction and operation of the project to protect topsoil and adjacent resources and to minimize soil erosion (NDDOH, 2001). Practices may include containing excavated material, protecting exposed soil, stabilizing restored material, and revegetating rangelands with native species.

7.15 Wildlife

7.15.1 Description of Resources

Information on the existing wildlife in the Project Area was obtained from a variety of sources, including observations during site visits, communication with local residents and information from the North Dakota Game and Fish Department (NDGFD), North Dakota Parks and Recreation Department (NDPRD), North Dakota Natural Heritage Inventory (NDNHI), University of North Dakota (UND) Extension Office and USFWS. A list of species known to be common in the Project Area was compiled for the nearby Edgeley-Kulm Wind Energy Project Environmental Assessment (Western, 2003). Due to the proximity of this project and the comparability of habitats, this species list is assumed to be appropriate for this Project Area as well.

Wildlife in the project site consists of birds, mammals, fish, reptiles, amphibians, and insects, both resident and migratory, which utilize the project site habitat for forage, migratory stopover, breeding and/or shelter. Species present in the project vicinity are associated with agricultural fields, pasture grasslands, and wetland areas. Common mammals in the project vicinity include raccoon (*Procyon lotor*), mink (*Mustela vison*), striped skunk (*Mephitis mephitis*), Least weasel (*Mustela nivalis*), white-tailed deer (*Odocoileus virginianus*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), badger (*Taxidea taxus*), porcupine (*Erethizon dorsatum*), and cottontail rabbit (*Sylvigagus floridanus*).

Avian Species

A fall avian survey was conducted at the Rough Rider I Project Area in order to quantify local avian use within the area and to identify potential avian impacts associated with building and/or operating the proposed facility (Tetra Tech, 2008a). Weekly surveys were performed in Project Area between August 21 and November 11, 2008. Fixed point count surveys (800-meter radius) were conducted at 12 points distributed throughout the Rough Rider I Project Area.

Comparing the publicly available fall mean use rates from existing wind energy facilities throughout the country, the Rough Rider I Project Area ranked highest out of 21 surveys for non-raptor use (primarily due to waterfowl and water birds; see below) and 7th out of 31 surveys for raptor use. Surveys already completed at this project include: fall avian point counts and a native prairie survey. A duck use study is also underway within the Project Area. In addition, the following surveys planned for Spring 2009 include but may not be limited to: spring avian point count, raptor nest survey, a prairie grouse lek survey, and a native prairie survey (in areas not previously surveyed).

Waterfowl and Waterbirds

The very high mean use recorded at the Rough Rider I Project Area was primarily driven by the waterfowl and waterbird groups. These two groups are likely attracted to the Project Area due to the abundant wetlands, waterbodies, native prairies, and agricultural fields which can be found throughout the area.

Many of the species from these two groups, such as the mallard, snow goose, blue-winged teal, Canada goose, and double-crested cormorant, had high encounter rates (rate at which a species flew through the anticipated rotor swept area). The populations of these five species are not in decline within North Dakota; therefore, moderate levels of individual mortality are not likely to have population-level effects. To date, studies of waterfowl have shown that mortalities of geese have been low in proportion to their use. However, no studies have been published that document the relationship between mean use and mortality of ducks, although some duck fatalities have been documented at wind farms. If mortality is proportional to mean use, fatalities at this site could be high; however, if mortality patterns are similar to geese, fatalities at this site could be lower than use indicates. This part of the Dakotas is known as the "duck factory" and impacts to breeding birds should be evaluated further. A study conducted by Ducks Unlimited is currently underway to examine potential impacts of wind energy development on breeding duck pairs in the Prairie Pothole region of North and South Dakota.

Raptors

Encounter rates were low for raptor species. The red-tailed hawk had the highest encounter rate recorded for a raptor species; however, this species' large potentially stable population suggests that impacts with turbines are unlikely to result in population-level consequences. All other raptor species had very low encounter rates, indicating that the potential for negative turbine-related impacts to these species are unlikely.

Listed and Sensitive Species

Three bald eagles and two golden eagles were observed during the surveys. Overall, due to their low use of the area during fall, negative turbine-related impacts are unlikely during this season. In addition, no bald eagles have been found during post-construction mortality monitoring at a wind farm site, indicating that negative turbine-related impacts are unlikely.

Eight species listed as level 1 under North Dakota's list of 100 Species of Conservation Priority were detected during fall surveys: American white pelican, American bittern, Swainson's hawk, ferruginous hawk, Wilson's phalarope, Franklin's gull, black tern, grasshopper sparrow. Except for the American bittern, which was only detected as an incidental and did not have an encounter rate

calculated, these species all had low encounter rates, indicating that negative turbine-related impacts are unlikely for these species.

Bats

Based on a desktop study (Tetra Tech, 2008b), of the 46 bat species in the United States, 10 occur in North Dakota (ASM 2007), of which, three species, the western small-footed myotis (*Myotis ciliolabrum*), long-eared myotis (*Myotis evotis*), and long-legged myotis (*Myotis volans*) are listed by the North Dakota Game and Fish Department as sensitive species (Hagen et al. 2005). Six bat species are likely to occur in the Project Area: the little brown myotis (*Myotis lucifugus*), the northern myotis (*Myotis septentrionalis*), the silver-haired bat (*Lasionycteris noctivagans*), the big brown bat (*Eptesicus fuscus*), the red bat (*Lasiurus borealis*), and the hoary bat (*Lasiurus cinereu*) (Western, 2003). Due to the proximity of this project and the comparability of habitats, this species list is assumed to be appropriate for this Project Area as well.

Bats typically utilize farm buildings, and dead and dying trees with cavities and loose bark as roosting and maternity habitat. Several buildings and dead or dying trees with cavities and loose bark were noted within the Project Area. Potential bat roosting habitat was noted in the following locations:

- The shelterbelt and farm buildings present in Township 130 North, Range 65 West NW ¼ NW ¼ Section 7;
- Abandoned schoolhouse in Township 130 North, Range 65 West, SE ¼ NE ¼ Section 7; and,
- Shelterbelts located Township 130 North, Range 66 West, SE ¼ SW ¼ Section 24.

Snag density in other portions of the Project Area is low or non-existent and offers minimal roosting opportunities for bats using the Project Area. No turbines are proposed in close proximity to the potential roosting and maternity habitat, thereby reducing the potential for bat turbine interaction in these areas.

Bats typically use riparian corridors and wetlands as feeding habitats due to higher nocturnal insect densities in these areas. There is a potential for bat interactions with turbines in many locations of the project due to the relatively high density of wetland habitats within the Project Area.

7.15.2 Impacts

Activities such as road construction can destroy or disrupt wildlife habitat and allow for the introduction of unwanted plant species. Displaced wildlife would likely relocate to nearby unaffected areas within the project area until construction activities have been completed. In areas where disturbance is significant and natural regeneration of onsite plant propagules would not occur, the temporary loss of habitat may be mitigated by reseeding of the affected areas with native prairie plant species.

The North Dakota Parks and Recreation Department has expressed concern over potential impact of project development on the swamp sparrow (*Melospiza georgiana*) because habitat for this species may exist in the vicinity (see Figure 4). It is Tetra Tech's position that the potential impacts of

project development on this species will be minimal. First, no permanent project facilities are proposed in the vicinity of the historical records. Second, no bog-like wetlands (swamp sparrow habitat in North Dakota) will be permanently disrupted by construction activities. Third, the swamp sparrow has only been reported once as a turbine-related fatality during post-construction monitoring throughout its breeding range, and this was a migratory individual following a mountain ridgeline in West Virginia. Fourth, in approximately 52 hours of avian point count surveys (which included point count locations immediately adjacent to the location of the potential habitat), no swamp sparrows were detected in the project area during the summer or fall of 2008.

7.15.3 Mitigative Measures

Best Management Practices (BMPs) that Rough Rider Wind will incorporate into the Project include:

- Siting access roads and turbines away from wetlands, waterbodies, and native prairies to the greatest extent practicable;
- No overhead power lines will be used;
- Minimizing the use of lights on turbines when practicable in accordance with state, federal, and local requirements;
- Restricting construction and/or operation activities due to active raptor nests; mapping and flagging raptor nests found during construction; placing turbines as far away from raptor nests as project and engineering constraints permit and avoid removal of trees.
- Minimizing impacts to native vegetation and wetlands during design and construction of turbines and associated infrastructure.
- Reseeding or planting disturbed areas with native material
- Enhancing existing degraded habitat, where practicable, through the removal and replacement of invasive species with plants native to the site.
- Developing a management plan to prevent the spread of noxious weeds throughout the Project Area or adjacent areas during construction and ongoing operations.

In order to reduce the potential for adverse effects to raptors within the project area, collection lines will be buried. Where overhead lines are constructed, the USFWS recommends that the potential for bird strikes and electrocutions be reduced through implementation of certain established measures (USFWS, 2007). For example, use of guy wires on meteorological towers should be avoided whenever possible. Timing of road construction should be made with consideration given to the nesting of migratory birds. Avoiding construction during sensitive times will reduce the risks associated with violating the Migratory Bird Act.

Spring avian use surveys will be conducted prior to project development to better document the use of the project area and surrounding areas by breeding species, including raptors, and waterfowl, and

will document pre-construction species' presence and density, and possibly assist in identifying sites with elevated potential for avian/turbine interactions.

A spring survey for raptor nests will identify sites of elevated bird-turbine collision risk. Such surveys are best conducted prior to project development so that results may be used to modify construction plans, if necessary.

Rough Rider Wind will implement measures to avoid and minimize effects to bats at the proposed site by siting facilities away from wetlands and woodlands and burying overhead power lines, to the extent possible.

Rough Rider Wind has conducted environmental studies of the project site to aid in the initial placement of turbines, roads, and associated facilities to avoid or minimize impacts to wildlife and habitat. Also, Rough Rider Wind is coordinating with USFWS and NDGFD regarding avian monitoring and minimization of impacts to WPAs and easement areas. The following measures will be used, to the extent practicable, to help avoid potential impacts to wildlife in the project area during selection of the turbine locations and subsequent development and operation:

- Rough Rider Wind will avoid USFWS waterfowl production areas (WPAs) and direct impacts to wetlands within wetland easements.

- Conduct additional pre-construction avian monitoring at the site. Pre-construction avian monitoring protocols are contained in Appendix E.

- Rough Rider Wind has conducted pre-construction inventories of wetlands in the vicinity of proposed turbines, access roads, and associated facilities in order to minimize impacts at the site. Initial site inventories were also conducted and more detailed inventories occurred to assess the construction zone once turbine siting was completed. These inventory reports are included in Appendix C and will be filed with the applicable agencies prior to project construction.

- Rough Rider Wind will implement a Wildlife Response Reporting System (WRRS) once turbine construction is completed. The WRRS will include protocols for field technicians to report and document avian mortalities during routine maintenance operations.

- Rough Rider Wind will construct wind turbines using tubular monopole towers and turbines will be minimally lit according to FAA requirements.

- Rough Rider Wind proposes to place the electrical collection system connecting the turbines to the project substation underground, if site conditions are favorable.

- Rough Rider Wind will avoid or minimize disturbance of individual wetlands or drainage systems during construction and operation of the project.

- Rough Rider Wind will protect existing trees and shrubs where practicable. If impacts are unavoidable, Rough Rider Wind will replace existing trees and shrubs unless directed otherwise by the landowner.

- Rough Rider Wind will maintain sound water and soil conservation practices during construction and operation of the project in order to protect topsoil and adjacent resources and to minimize soil erosion. To minimize erosion during and after construction, BMPs for erosion and sediment control will be utilized (NDDOH, 2001). These practices include, temporary seeding, permanent seeding, mulching, filter strips, erosion blankets, grassed waterways, and sod stabilization.

- Rough Rider Wind will revegetate non-cropland and pasture areas with a seeding mix as recommended by USFWS and NRCS.

- Rough Rider Wind will inspect and control noxious weeds in the vicinity of the turbines, access roads, and associated facilities, immediately after construction and periodically for the life of the project.

Rough Rider Wind is committed to minimizing wildlife impacts within the project area. Rough Rider Wind will design their facility to minimize avian impacts by avoiding high use wildlife habitat, using tubular towers to minimize perching, placing electrical collection lines underground and minimizing infrastructure.

7.16 Rare and Unique Natural Resources

7.16.1 Description of Resources

Federally Listed Species

The Endangered Species Act requires the protection of species which are federally listed as threatened or endangered. Significant changes to the habitats of these species, or projects that have the potential to result in "take," would require special permitting from the USFWS. According to the USFWS (2008), of the federally listed species known to occur within North Dakota, only the whooping crane and gray wolf are known to occur in Dickey County.

Whooping cranes (*Grus americana*), spring and fall migrants in North Dakota, were first federally listed as Threatened in 1967 and federally listed as Endangered in 1970 (Canadian Wildlife Service and USFWS 2005). The primary threats to this species include loss of roosting and foraging habitat and collisions with power lines and fences. In North Dakota, whooping cranes have the potential to occur anywhere suitable feeding and roosting habitat is found; however 94% of all documented whooping crane occurrences have been within 200 mile corridor adjacent to the Missouri River (Austin and Richerts 2001). The Rough Rider I Project Area is located on the eastern edge of the whooping crane migration corridor, and suitable wetland habitat is present.

By the time the gray wolf (*Canis lupus*) was protected by the Endangered Species Act of 1973, only a few hundred remained in extreme northeastern Minnesota and a small number on Isle Royale, Michigan. Gray wolves were listed as endangered in the contiguous 48 States and in Mexico, except that in Minnesota they were listed as threatened. The wolf's comeback nationwide is due to its listing under the Endangered Species Act, resulting in increased scientific research and protection from unregulated killing, along with reintroduction and management programs and education efforts that increased public understanding of wolf biology and behavior. In the northern Rocky Mountains, the U.S. Fish and Wildlife Service reintroduced gray wolves into Yellowstone National Park and U.S.

Forest Service lands in central Idaho in 1995 and 1996. The reintroduction was successful, and the recovery goals for this population have been exceeded. By December 2006 there were about 1,100 wolves in the Yellowstone area and Idaho; in total, at least 1,243 live in the northern Rocky Mountains of Montana, Idaho, and Wyoming. Wolf recovery has been so successful that the Service has proposed removing the gray wolf in the northern Rocky Mountains from the threatened and endangered species list.

The Project Area is located in the gray wolf's historic range; however, the current range is far to the north in the northeast corner of the state and Canada. The most recent recorded sighting in Dickey County occurred in 1985 and resulted in a (shooting) fatality (Licht and Fritts, no date). It is unlikely that the project would have any affect on this species.

Both the golden eagle and bald eagle were detected during fall surveys. These two species are federally protected under the Bald and Golden Eagle Protection Act (BGEPA). The Bald eagle (*Haliaeetus leucocephalus*) was removed from the endangered species list, but is afforded additional legal protections under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. The Bald eagle is listed by the state of North Dakota as a Level II priority, which indicates a moderate to high conservation priority. This species is a permanent resident in the Dakotas and typically resides near large bodies of open water such as lakes, marshes, and rivers with adequate prey and tall trees for nesting and roosting. Bald eagles breed and over-winter in the Dakotas primarily along the Missouri River and other large rivers. Bald eagles have been documented to nest in North Dakota in western Burleigh and southern McLean Counties, along the Missouri River (USFWS, 1995). For breeding, they build large nests in tall trees or other sturdy structures, and are most often found in forested habitats close to water (USFWS, 1995).

In addition, the Dakota skipper, a federal candidate species, is documented to occur in counties adjacent to Dickey County. However, there are no documented observations of the Dakota skipper in Dickey County, and USFWS does not have critical habitat for the Dakota Skipper in Dickey County.

Native Prairie Habitats

Native prairies serve as a vital ecological resource by improving water quality, providing erosion control, and supporting a diverse population of plants and animals. However, due to the native prairies' fertile soils and predominantly flat topography, large portions of the native prairie have been converted to agricultural lands. This wide spread loss of native prairie makes this an ecosystem of conservation concern and one of the most endangered ecosystems in North America (Samson et al. 2004).

Native prairies serve as vital habitat for the Dakota skipper, a species of butterfly which is currently classified as a federal candidate species. The Dakota skipper is classified as a candidate species because, although its historic range once consisted of vast unbroken native prairies in north-central U.S. and south-central Canada, its current range is now limited to scattered remnants of high quality native prairies in Minnesota, North and South Dakota, and southern Manitoba (USFWS 2002). The Dakota skipper population has declined due to sensitivity to disturbances, such as grazing and fire, and the loss of native prairie habitat. The Dakota skipper's classification as a federal candidate species does not entitle it to legal protection under the Endangered Species Act (ESA); however, if a

candidate species becomes listed as threatened or endangered, then protection for that species becomes mandated under the ESA. Immediately upon listing, any projects that impact the Dakota skipper are not "grandfathered" or exempt from providing protection.

Native prairies are also critical habitat used by prairie grouse (e.g., sharp-tailed grouse, greater prairie chicken) for lekking, nesting, brood rearing, and wintering Grouse lek habitat is classified as open, short grass vegetation with minimal amounts of agriculture. Development in grouse lekking habitat could result in direct habitat loss, habitat loss through avoidance, predator facilitation, and construction-related disturbance. Most prairie grouse are considered gamebirds and are often managed locally by state fish and game agencies for hunting purposes.

At the time of the survey, the Project Area was 11,209 acres; since then, the Project Area has increased to 16,118 acres. The results of the survey apply to the original 11,209 acres. A total of 8,308 acres (74% of the Project Area) were classified as native prairie and 905 acres (8.1% of the Project Area) were classified as tame grasslands. An additional 1,996 acres (17.8%) were either active crops (corn, alfalfa, soybeans) or grazing pastures for cattle. The largest contiguous areas of native prairie were found in the southeast region of the Project Area. A total of 17 grasses (4 non-native) and 44 forbs (8 non-natives) species were recorded in native prairie. Three species are listed by the state of North Dakota as being noxious weeds. Tame grasslands consisted of five grasses (all non-native) and 20 forbs (9 non-natives) species. Three of the species found in tame grasslands are state listed noxious weeds. None are species listed by the state of North Dakota or federally protected as endangered, threatened or species of concern.

Of the 9,213 acres classified as either native prairie or tame grassland within the Project Area, 49.9 percent are classified as either good or excellent habitat for the Dakota skipper. Classification for Dakota skipper habitat consisted of 46.7 percent (4,304 acres) rated as good habitat to support the Dakota skipper, 3.2 percent (294 acres) was considered excellent habitat, and 50.4 percent (4,615 acres) was considered fair/poor habitat. The largest portion of continuous grassland habitat classified as excellent for the Dakota skipper is located in the southeast portion of the Project Area. According to the latest project layout dated 01-29-09, of the 91 turbines located in prairie, three were located in high quality habitat for the Dakota skipper, 46 turbines were located in medium quality habitat, and 42 turbines were located in low quality habitat.

With the assistance of the North Dakota office of the USDA – FSA, a total of 825 acres (3%) was identified as CRP lands within the expanded Project Area. Most of the CRP lands are located along the northern project boundary with 88th Street and the northwest boundary of the Project Area along 70th Street and 77th Avenue. A small portion of CRP land is also located in the southern part of the Project Area just south of the 93rd Street and 77th Avenue intersection.

The North Dakota Parks and Recreation Department (NDPRD) maintains a database for plant and animal species of concern or other significant ecological communities in the state. A search of this database was conducted for an area within a one-mile radius of the Project area. According to a response letter received from the NDPRD, records indicate that habitat may exist for *Melospiza georgiana* (swamp sparrow) as well as permanent open water in sections adjacent to the Project area; these are listed in Table 13.

Table 12. North Dakota State Plant Species of Concern

Scientific Name	Common Name	State Rank*	Last Observation
Permanent open water		S2	1977
Melospiza Georgiana	swamp sparrow	S3	

*State Conservation Status Ranks:
S2 = Imperiled—Imperiled in the state because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
S3 = Vulnerable—Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

7.16.2 Impacts

As discussed in Section 7.14.2, at the time of the survey, the Project Area included 11,209 acres. Native prairie comprised 74 percent of the Project Area and 82 percent of the proposed turbine locations were in native prairie. As of the most current layout dated January 29, 2009, of the 118 turbines (116 turbines plus two alternates), 85 were located in native prairie, six were located in tame prairie, 10 were located outside of prairie habitat (e.g. in cropland), and 17 turbines were located outside of the surveyed area. In addition, 34.7 miles of collection line and 27.4 miles of access/service road are located within native prairie.

Under the project's current configuration, four of the proposed turbines and 2.68 miles of access roads are located in lands enrolled within the CRP. Most of these occur between 91st and 88th Street in the northern third of the WRA.

Although the Dakota Skipper is documented to occur in counties adjacent to Dickey County, there are no documented observations of the Dakota skipper in Dickey County, and USFWS does not have critical habitat for the Dakota Skipper in Dickey County. Therefore impacts to the Dakota Skipper are expected to be minimal.

There is suitable roosting and foraging habitat for whooping cranes in the Project Area, so cranes may use the area at some point during the life of the Project. The likelihood of mortality is low, however, because of the small population size of whooping cranes, and because the Project Area is on the edge of the whooping crane migration corridor. Although the primary threats to this species include loss of roosting and foraging habitat and collisions with power lines and fences, only 233 acres (1.45 percent of the Project Area) will be permanently disturbed, and no overhead transmission lines are included in the Project. Indirect effects, if any, are unknown.

It is unlikely that the project would have any affect on the gray wolf because its current range is outside of the Project Area. The golden eagle and the bald eagle, protected under the Bald and Golden Eagle Protection Act, may be occasional visitors to the area and will not likely be affected by this proposed action.

7.16.3 Mitigative Measures

Rough Rider Wind will avoid the resources identified to the extent practicable. Avoidance/ minimization practices that they have committed to include:

- Re-seeding disturbed areas with native seed mix;
- Minimizing the construction footprint;

- Minimizing impacts during crane maneuvering;
- Toolbox training to discuss best management practices (BMPs) with construction personnel; and
- Preparing a disruption minimization manual prior to construction, which will be provided to construction personnel.

7.17 Summary of Impacts

Table 14 summarizes the resources that will be impacted as a result of the Project and the appropriate mitigation.

Table 13. Summary of Impacts and Mitigation

Resource	Impact	Mitigation
Socioeconomics	Primarily positive due to increased expenditures during construction and the long term benefits of lease payments and an increased tax base of the county due to property taxes.	No adverse impacts are anticipated.
Land Use	Assuming all turbines are 1.5 MW, approximately 12.8 acres of land will be impacted for turbine placement and 216.6 acres for aggregate-surfaced access roads up to 32 feet in width. An additional 3.5 acres of land will be permanently impacted for the O&M facility and substation. Temporary impacts for laydown and contractor staging would be approximately 20 acres.	Rough Rider Wind will work with landowners and regulatory agencies to minimize impacts of the Project.
Public Services	No impacts are anticipated.	Rough Rider Wind will utilize station service from the local electrical utility. MAPP will suggest appropriate configurations for the electrical system and Rough Rider Wind will abide by the recommendations to prevent impacts to the transmission system.
Human Health and Safety	No impacts are anticipated.	Turbines will be lighted to comply with FAA requirements. Rough Rider Wind will follow “prudent avoidance” methods to minimize EMF exposure. A variety of security measures will be implemented to reduce the chance of physical and property damage.
Noise	No impacts are anticipated to noise-sensitive resources.	Rough Rider Wind will locate turbines so the maximum level of 50 dBA is not exceeded at occupied residences.
Visual	Visual impacts will occur. The impacts are based on a subjective human response.	Rough Rider Wind will work with landowners and agencies to site turbines. They will not be located in environmentally sensitive areas. Existing infrastructure will be used where possible. Cut and fill areas will be minimized and mitigated as appropriate.
Cultural and Archaeological	No impacts to previously identified cultural resources are anticipated.	Rough Rider Wind has completed a Class III inventory for the proposed project and received a concurrence letter from SHPO.
Recreational Resources	Visual impacts will likely occur.	Visual impacts to recreational resources are likely and are limited to individuals using the resources. No other impacts are expected to recreational resources within the Project Area.

Resource	Impact	Mitigation
Land Based Economies	Assuming all turbines are 1.5 MW, approximately 12.8 acres of land will be impacted for turbine placement and 216.6 acres for aggregate-surfaced access roads up to 32 feet in width. An additional 3.5 acres of land will be permanently impacted for the O&M facility and substation. Temporary impacts for laydown and contractor staging would be approximately 20 acres. Approximately nine percent of the Project Area is cropland, while 12 percent is pasture/hay.	Rough Rider Wind will work with landowners to minimize impact to their land.
Soils	Assuming all turbines are 1.5 MW, approximately 12.8 acres of land will be impacted for turbine placement and 216.6 acres for aggregate-surfaced access roads up to 32 feet in width. An additional 3.5 acres of land will be permanently impacted for the O&M facility and substation. Temporary impacts for laydown and contractor staging would be approximately 20 acres.	BMPs for erosion and sediment control will be utilized to minimize wind and water erosion at the site (NDDOH, 2001). Only land needed for the facility will be impacted. Temporarily disturbed areas will be restored.
Geologic and Groundwater Resources	No impacts to groundwater resources are anticipated. It is possible that sand and gravel resources could be made unavailable.	Wind turbines will be sited to avoid known sand and gravel resources to the extent practicable.
Surface Water and Floodplain Resources	Access roads and turbines will be located and constructed in such a manner that no impacts are anticipated.	Impacts to surface waters will be avoided. Rough Rider Wind will implement BMPs to minimize erosion and sedimentation at the site (NDDOH, 2001).
Wetlands	Minor impacts are anticipated.	Attempts will be made to keep impacts to a minimum. Wetlands will be avoided to the extent practicable.
Vegetation	Assuming all turbines are 1.5 MW, approximately 12.8 acres of land will be impacted for turbine placement and 216.6 acres for aggregate-surfaced access roads up to 32 feet in width. An additional 3.5 acres of land will be permanently impacted for the O&M facility and substation. Temporary impacts for laydown and contractor staging would be approximately 20 acres.	Rough Rider Wind will avoid existing trees and shrubs as practicable. Rough Rider Wind will use BMPs during construction and operation to minimize impacts (NDDOH, 2001). If impacts to trees or shrubs cannot be avoided, the individual trees or shrubs will be replaced. Temporarily disturbed areas will be reseeded per USFWS and NRCS recommendations.
Wildlife	Potential avian and bat collisions may occur, but are anticipated to be relatively small. During the 2008 fall avian survey, there was a low occurrence of raptors, and a high occurrence of waterfowl and waterbirds, none of which are listed or sensitive species. Eight species listed as level 1 under North Dakota's list of 100 Species of Conservation Priority were detected during the fall survey, but all had low encounter rates.	A variety of mitigative measures will be implemented, as discussed in Section 7.15.3. These include designing the facility to specifically minimize avian impacts. Additional pre-construction monitoring will be completed for avian species. Rough Rider Wind's WRRS will be implemented after construction of the Project as described in Section 7.15.3.
Rare and Unique Natural Resources	Federally listed whooping crane and gray wolf are known to occur in Dickey County. Bald and golden eagles were observed during fall avian surveys. According to the layout dated January 29, 2009, 85 turbines, 34.7 miles of collection line, and 27.4 miles of access/service road are located within native prairie. This is critical habitat for Dakota skipper, a federal candidate species.	Under the project's current configuration, four of the proposed turbines and 2.68 miles of access roads are located in lands enrolled within the CRP. Most of these occur between 91st and 88th Street in the northern third of the WRA. Although the Dakota Skipper is documented to occur in counties adjacent to Dickey County, there are no documented observations of the Dakota skipper in Dickey County, and USFWS does not have critical habitat for the Dakota Skipper in Dickey County. Therefore impacts to

Resource	Impact	Mitigation
		the Dakota Skipper are expected to be minimal. There is suitable roosting and foraging habitat for whooping cranes in the Project Area, so cranes may use the area at some point during the life of the Project. The likelihood of mortality is low, however, because of the small population size of whooping cranes, and because the Project Area is on the edge of the whooping crane migration corridor. Although the primary threats to this species include loss of roosting and foraging habitat and collisions with power lines and fences, only 233 acres (1.45 percent of the Project Area) will be permanently disturbed, and no overhead transmission lines are included in the Project. Indirect effects, if any, are unknown. It is unlikely that the project would have any affect on the gray wolf because its current range is outside of the Project Area. The golden eagle and the bald eagle, protected under the Bald and Golden Eagle Protection Act, may be occasional visitors to the area and will not likely be affected by this proposed action.

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8. PUBLIC COORDINATION

Keeping the public informed on the status of the Project is a key component to its success. Principal stakeholders in the Project are landowners that have entered or will be entering into agreements with Rough Rider Wind to provide wind rights for the Project. Rough Rider Wind will continue to meet with County officials as the Project moves forward and Rough Rider Wind seeks any necessary permits (e.g. access permit, sanitary permit) from the County.

Rough Rider Wind and its representatives have been working with key state and federal agencies including the USFWS and the NDGFD to inform them of the Project and to address areas of interest particular to each department.

Rough Rider Wind is committed to keeping key stakeholders engaged in the Project as it moves forward.

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9. IDENTIFICATION OF POTENTIAL PERMITS/APPROVALS

The federal and state permits or approvals that have been identified as potentially required for the construction and operation of the Project are shown in Table 15. Permits dependent on the final site layout will be applied for after receiving PSC approval, but prior to construction.

Table 14. Potential Permits and Approvals Required for Construction and Operation of the Proposed Facility

Agency	Type of Approval	Status	Need
Federal Approvals			
USFWS	Compatibility Analysis of Disturbed Easements	3	If constructing in wetlands within wetland easements or in WPAs, then compatibility analysis by USFWS is required.
	Right of Way Permit	3	If use is compatible, then a Right of Way Permit may be required for permanent disturbance in wetlands within wetland easements.
	Special Use Permit	3	If use is compatible, then a Special Use Permit is required for temporary disturbance in wetlands within wetland easements.
USACE	Section 404 Permit (NWP)	3	Permit required for fill in jurisdictional waters of the US. Further investigation is required to determine USACE jurisdiction of wetlands within the Project Area.
FAA	Form 7460-1, Notice of Proposed Construction	1	Notice and approval are required for structures over 200 feet in height. FAA approval of lighting and marking of turbines is required.
State of North Dakota			
Public Service Commission	Certificate of Site Compatibility	1	Required for construction of generation facility over 100 MW in size.
	Certificate of Corridor Compatibility	N/A	Required for construction of transmission line over 115 kV in size.
	Certificate of Route Compatibility	N/A	Required for construction of transmission line over 115 kV in size.
North Dakota Department of Health	NPDES Permit: General Construction Storm Water	2	Required for disturbance of over 1 acre of land. Must prepare a Storm Water Pollution Prevention Plan (SWPPP).
North Dakota Department of Health – Lake Region District Health Unit	Septic Tank and Drainfield Permit	2	Required for installation of septic system at O&M facility.
State of North Dakota			
North Dakota Highway Patrol	Overheight/Overweight Permit	2	Permit required for hauling construction equipment and materials on State Highways.
North Dakota Department of Transportation	Road Approach/Access Permit	2	Permit required for construction of access roads from State Highways.
	Utility Permit/Risk Management Documents	2	Permit required for utility crossings on State Highway ROW.

Agency	Type of Approval	Status	Need
Local Permits			
No applicable local permits (Dickey County, townships) have been identified.			

* Status Explanation: 1 Applied and/or Decision Pending
2 Will Apply Once Certificate is Received
3 Final Layout will Determine Whether Permit/Approval is Needed

10. FACTORS CONSIDERED

The North Dakota Energy Conversion and Transmission Facility Siting Act lists 11 factors to guide the Commission in the evaluation and designation of the site of the facility.

10.1 Public Health and Welfare, Natural Resources, and the Environment

The preceding sections discuss the research and investigations relating the effects of the proposed facility on public health and welfare, natural resources, and the environment. These effects and the proposed mitigation to minimize these effects are summarized in Section 7.17.

10.2 Technologies to Minimize Adverse Environmental Effects

Rough Rider Wind will utilize the most recent technologies that minimize impacts to the environment. Current wind turbine technologies, including the equipment and siting tools, optimize the wind and land resources.

10.3 Potential for Beneficial Uses of Waste Energy

This factor is not applicable to this Project. No waste energy is created using wind energy.

10.4 Unavoidable Adverse Environmental Effects

Unavoidable adverse environmental effects may include the visual impacts associated with the Project as well as those impacts related to the placement and use of the land within the site. The visual character of the site will be changed due to the construction of the Project. In order to construct the facility, access roads and turbine pads are necessary for the operation and maintenance of the facility. The preliminary turbine and access road layout is expected to impact approximately 216 acres of land. An additional 3.5 acres of land will be impacted due to the O&M facility and project substation. Approximately 20 acres of land will be temporarily impacted due to laydown and contractor staging areas.

10.5 Alternatives to the Proposed Site

No alternatives were considered for the development of the Project. Rough Rider Wind believes that the proposed site is the most viable alternative. Rough Rider Wind is committed to being flexible on the preliminary site layout and will work closely with landowners and regulatory agencies to examine all reasonable alternatives to the preliminary site layout.

10.6 Irreversible and Irretrievable Commitment of Natural Resources

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the use of these resources have on future generations. Irreversible effects primarily result from use or destruction of a specific resource that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action. There are few commitments of resources associated with this Project that are irreversible and irretrievable, but these include those resources primarily related to construction.

Construction resources that will be used include aggregate resources, concrete, steel, and hydrocarbon fuel. Each steel turbine requires the construction of a concrete base 40 to 60 feet across and 7 to 10 feet thick. Access roads will require aggregate resources for their construction and maintenance. During construction, vehicles will be traveling to and from the site, utilizing hydrocarbon fuels.

10.7 Direct and Indirect Economic Impacts

Economic impacts include impacts associated with the temporary conversion of up to 253 acres of land to turbine sites, associated access roads, and associated facilities. Permanent impacts will be lower, at 233 acres. In general, agricultural areas surrounding each turbine can still be farmed, and landowner compensation will be established by individual lease agreements

The remaining direct and indirect economic impacts are primarily positive. To the extent that local contractors are used for portions of the construction, total wages and salaries paid to contractors and workers in Dickey County will contribute to the total personal income of the region. Additional personal income will be generated for residents in the county and the state by circulation and recirculation of dollars paid out by the Applicant as business expenditures and state and local taxes. Expenditures made for equipment, energy, fuel, operating supplies, and other products and services benefit businesses in the county and the state.

Long-term beneficial impacts to the county's tax base as a result of the construction and operation of the wind farm will contribute to improving the local economy in this area of North Dakota. The development of wind energy in this region will be important in diversifying and strengthening the economic base of northeastern North Dakota. Additional revenues are expected from property and income taxes.

Continuing to establish the southern region of North Dakota as an important producer of alternative energy sources may spur the development of wind-related businesses in the area, in turn contributing to economic growth in the region.

10.8 Existing Development Plans of the State, Local, Government and Private Entities at or in the Vicinity of the Site

No conflicts are anticipated with existing state and local government and private entities' development plans.

10.9 Effect of Site on Cultural Resources

In November 2008, BCA conducted a Class III Cultural Resource Inventory of the proposed Rough Rider I Wind Farm project (refer to the protocol in Appendix E). During the course of the inventory, one previously recorded site, three previously recorded site leads (and one previously recorded architectural site were identified within one mile of the APE. None of these sites or site leads will be impacted by the project. Twelve new cultural resource sites were identified within the APE: One stone circle site with a rock cairn, six rock cairn sites, two historic archaeological sites, one Standing Structure Site, one historic cemetery, and one historic grave.

As long as the eight potentially eligible sites are avoided, monitoring takes place at 32DI118, and all construction takes place within the inventoried corridors, a designation of *No Historic Properties Affected* is recommended for this project.

Rough Rider Wind is committed to minimize impacts to these resources and will avoid these resources and any additional resources identified throughout the life of the Project. If avoidance is not possible, Rough Rider Wind will work with the North Dakota SHPO to mitigate potential impacts.

10.10 Effect of Site on Biological Resources

Rough Rider Wind will implement measures to avoid and minimize effects to biological resources at the proposed site. The impact of the Project on wildlife is expected to be minimal. There is potential for avian and bat collisions with facility turbines or meteorological towers. The site will be designed to minimize impacts to those species.

10.11 Agency Comments

Agencies were contacted to comment on the Project. The following summaries of comments received apply to the proposed Rough Rider I Wind Project.

10.11.1 North Dakota Game and Fish Department

Rough Rider Wind submitted a letter to the NDGFD on December 3, 2008. The NDGFD does not maintain a separate list of threatened or endangered species, and defers to the federal list maintained by the USFWS. The NDGFD stated in a response letter dated December 22, 2008 that the agency's primary concern with wind farm development is the disturbance of native prairie associated with project construction. In addition, numerous wetlands occur within the Project area. The agency asks that work within native prairie be avoided, that aboveground appurtenances should not be placed in wetland areas, and no alterations be made to existing drainage patterns. The response letter received from the NDGFD is included in Appendix D.

10.11.2 U.S. Fish and Wildlife Service

A letter to both the USFWS North Dakota Field Office and the Kulm Wetland Management District was sent on December 2, 2008 (Appendix D). The USFWS responded on February 4, 2009 with concerns regarding potential impacts to migratory birds, whooping cranes, grassland and wetland easements, and native prairie (Appendix D). The letter also included Interim Wind Turbine Siting Guidelines.

10.11.3 State Historical Society of North Dakota

Rough Rider Wind sent a letter to the State Historical Society of North Dakota on November 26, 2008. The State Historic Preservation Officer (SHPO) responded on December 2, 2008 and anticipated reviewing the Class II Cultural Resources Inventory for the Project. A copy of the SHPO response letter is included in Appendix D. Rough Rider Wind contracted Beaver Creek Archaeology (BCA), a qualified cultural resources firm in Linton, North Dakota, to conduct a search and review of existing records contained at the State Historical Society of North Dakota (SHSND). Based on the results of the file search, one previously recorded site, three previously recorded site leads (and one previously recorded architectural site were identified within one mile of the APE.

None of these sites or site leads will be impacted by the project. In addition, BCA conducted a Class II/III assessment. Results will be used to microsite turbines. This report was submitted to SHPO. The SHPO concurred with BCA's determinations in a letter sent on February 3, 2009 (Appendix D).

10.11.4 North Dakota Geological Survey

Rough Rider Wind sent a letter to the North Dakota Geological Survey on November 24, 2008. The North Dakota Geological Survey (NDGS) stated that no permits would be required from the agency. The NDGS included some geologic information, which is included in Section 7.11 of this document. A copy of their response letter is included in Appendix D.

10.11.5 North Dakota Parks and Recreation Department

Rough Rider Wind sent a letter to the North Dakota Parks and Recreation Department on November 24, 2008. The North Dakota Parks and Recreation Department (NDPRD) stated that their scope of authority and expertise covers recreation and biological resources (in particular rare plants and ecological communities). Based on the defined project boundary, the project does not affect state park lands that they manage or Land and Water Conservation Fund recreation projects that they coordinate. Based on NDPRD's review of the North Dakota Natural Heritage biological conservation database, habitat may exist for *Melospiza georgiana* (swamp sparrow) and permanent open water in sections adjacent to the Project area. NDPRD recommends that the project be accomplished with minimal impacts and that all efforts be made to ensure that critical habitats not be disturbed in the project area to help secure rare species conservation in North Dakota. Regarding any reclamation efforts, NDPRD recommends that any impacted areas be revegetated with species native to the project area. A copy of NDPRD's response letter is included in Appendix D.

10.11.6 North Dakota Office of Attorney General

Rough Rider Wind sent a letter to the Attorney General on November 24, 2008. A response was received December 8, 2008. The Attorney General and members of his staff are prohibited from giving legal advice, opinions, or assistance to private businesses (Appendix D).

10.11.7 North Dakota Department of Commerce

Rough Rider Wind sent a letter to the North Dakota Department of Commerce on November 24, 2008 (Appendix D). No response has been received.

10.11.8 North Dakota Department of Health

Rough Rider Wind sent a letter to the North Dakota Department of Health on November 24, 2008. The North Dakota Department of Health (NDDOH) sent a response letter stating that the department believes that environmental impacts from the proposed construction will be minor and can be controlled by proper construction methods. The NDDOH requested that measures be taken to minimize fugitive dust emissions, adverse effects on waters of the state, and noise levels during construction activities. The NDDOH also stated that a permit to discharge storm water during construction is required. The NDDOH included with their response a document titled, Construction and Environmental Disturbance Requirements. This document, along with the response received from NDDOH, are included in Appendix D.

10.11.9 North Dakota Department of Transportation

Rough Rider Wind sent a letter to the North Dakota Department of Transportation (DOT) dated November 24, 2008 (Appendix D). In a response letter dated December 15, 2008, the North Dakota DOT stated that the project should have no adverse effect on the North Dakota DOT highways. If the Project required work to be done on highway right-of-way, appropriate permit and risk management document will need to be obtained from the DOT District Engineer. The letter is included in Appendix D.

10.11.10 North Dakota State Water Commission

Rough Rider Wind sent a letter to the North Dakota State Water Commission on November 24, 2008 (Appendix D). No response has been received.

10.11.11 Natural Resources Conservation Service

Rough Rider Wind sent a letter to the Natural Resources Conservation Service dated November 24, 2008 (Appendix D). In a letter dated December 5, 2008, the NRCS responded that the Farmland Protection Policy Act (FPP) would only apply to the Project if it is supported by Federal funding or actions. The letter also recommended that impacts to wetlands be avoided.

10.11.12 North Dakota State Land Department

Rough Rider Wind sent a letter to the North Dakota State Land Department dated November 24, 2008 (Appendix D). No response has been received.

10.11.13 U.S. Army Corps of Engineers

Rough Rider Wind sent a letter to the U.S. Army Corps of Engineers Omaha District (North Dakota Field Office) dated December 1, 2008 (Appendix D). The USACE responded that a permit application should be completed if a Section 10 and/or Section 404 permit is required for the Project.

10.11.1 Aeronautics Commission

Rough Rider Wind sent a letter to the Aeronautics Commission dated November 24, 2008 (Appendix D). No response has been received.

10.11.14 North Dakota Department of Agriculture

Rough Rider Wind sent a letter to the North Dakota Department of Agriculture dated November 24, 2008 (Appendix D). No response has been received.

10.11.15 North Dakota Department of Human Services

Rough Rider Wind sent a letter to the North Dakota Department of Human Services on November 24, 2008 (Appendix D). A response dated December 3, 2008 indicated that the Department is currently unaware of any impact of the proposed Project.

10.11.16 North Dakota Department of Labor

Rough Rider Wind sent a letter to the North Dakota Department of Labor on November 24, 2008 (Appendix D). No response has been received.

10.11.17 North Dakota Department of Career and Technical Education

Rough Rider Wind sent a letter to the North Dakota Department of Career and Technical Education dated November 24, 2008 (Appendix D). No response has been received.

10.11.18 North Dakota Governor

Rough Rider Wind sent a letter to the Governor of North Dakota dated November 24, 2008 (Appendix D). No response has been received.

10.11.19 Job Service North Dakota

Rough Rider Wind sent a letter to Job Service North Dakota on November 24, 2008. The North Dakota Job Service stated that they have no information regarding the boundaries of the tracts within the Project Area. A copy of their response letter is included in Appendix D.

10.11.20 North Dakota Indian Affairs Commission

Rough Rider Wind sent a letter to the North Dakota Indian Affairs Commission dated November 24, 2008 (Appendix D). No response has been received.

10.11.21 North Dakota Office of Management and Budget

Rough Rider Wind sent a letter to the North Dakota Office of Management and Budget dated November 24, 2008 (Appendix D). No response has been received.

10.11.22 North Dakota Soil Conservation Committee

Rough Rider Wind sent a letter to the North Dakota Soil Conservation Committee dated November 24, 2008 (Appendix D). No response has been received.

10.11.23 James River Soil Conservation District

Rough Rider Wind sent a letter to the James River Soil Conservation District dated November 24, 2008 (Appendix D). No response has been received.

11. QUALIFICATIONS OF CONTRIBUTORS TO SITING STUDY

NAME PROJECT ROLE	EDUCATION AND PROFESSIONAL EXPERIENCE
JOHN DIDONATO Executive Director, Project Development NextEra Energy Resources	Project developer representing NextEra Energy Resources in all commercial and regulatory aspects of the project. Bachelor's degree, Kent State University. Master's degree, Florida Atlantic University
JASON UTTON Project Manager, Project Development NextEra Energy Resources	Project developer representing NextEra Energy Resources in all commercial and regulatory aspects of the project.
ALLEN WYNN Environmental Specialist NextEra Energy Resources	Mr. Wynn has over 15 years of experience preparing NEPA documents and permitting for large linear projects.
DICK RAUSCH Construction Project Manager NextEra Energy Resources	Provided input on route from a "constructability" perspective.
TOM FACTOR Land Easement Specialist/ Route Mapping NextEra Energy Resources	Representing NextEra Energy Resources on wind resource, landowner discussions and selection of corridor.
TED WEISSMAN Land Easement Specialist NextEra Energy Resources	Representing NextEra Energy Resources on landowner discussions and selection of corridor.
BRIAN BJELLA Attorney for Applicants Crowley Fleck PLLP	Applicant's counsel. J.D. and Bachelor's degree, both from University of North Dakota.
TRACEY MARTORANO, P.E. Project Manager Tetra Tech EC, Inc.	Ms. Martorano has over nine years in the environmental consulting business. She has experience preparing and securing environmental permits for energy-related facilities, coordinating and managing biological and cultural field surveys, and contributing to National and State Environmental Policy Act (NEPA) documentation. Ms. Martorano manages siting studies, prepares environmental permits, and conducts consultation with local, state and federal stakeholders for wind energy. Bachelor's degree in Civil Engineering, Merrimack College.
ANNE-MARIE GRIGER, AICP Environmental Planner Tetra Tech EC, Inc.	Ms. Griger has over four years in the environmental consulting business. She has experience preparing and securing environmental permits for large infrastructure and energy-related facilities, conducting socioeconomic and environmental justice analyses, and contributing to National Environmental Policy Act (NEPA) documents. She also has public involvement experience. Bachelor's Degree: Environmental Policy & Planning, Master's Degree: Urban & Regional Planning, both from Virginia Polytechnic Institute and State University.

NAME PROJECT ROLE	EDUCATION AND PROFESSIONAL EXPERIENCE
JASON JONES, PH.D. Senior Ecologist Tetra Tech EC, Inc.	Dr. Jones reviewed the 2008 Fall Avian Report and provided input for wildlife and avian sections of this application. Dr. Jones has been with Tetra Tech for 1 year and has over 15 years experience as a wildlife ecologist, with a focus on avian and bat ecology and natural resource management. He has published more than 25 peer-reviewed scientific publications and has given dozens of invited seminars and scientific conference presentations on avian and bat ecology.
DOMINIC OPPEDISANO GIS Analyst Tetra Tech	Mr. Oppedisano has five years of professional experience in geographic information systems including but not limited to site feasibility analysis mapping, environmental impact analysis, spatial analysis, UXO, ecological, and cultural mapping, analysis and mapping for environmental applications such as remedial investigations, scanning, digitizing, georeferencing data, attributing of spatial features, and federal geodata creation and certification. BS, Major: Geography with concentration in GIS and Remote Sensing, 2003, University at Oneonta. NY; Minor: Urban and Regional Land Use Planning.
CHRISTINA BURNS Senior Archaeologist Beaver Creek Archeology	Ms. Burns conducted Class I and Class III Cultural Resources Inventory for the Rough Rider I Wind Project.
GREGORY C. DAWDY Senior Environmental Scientist/Project Manager	Mr. Dawdy led the wetland delineation effort for the Rough Rider I Wind Project. Mr. Dawdy has over 20 years of experience in wetlands delineation/mitigation and permitting, sediment and surface water sampling, biological assessments, preliminary assessments, site investigations and remedial investigations/feasibility studies (RI/FS), Mr. Dawdy has served as project manager and project biologist for numerous wetland delineation/mitigation projects in Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Nebraska, Minnesota, Missouri, New York, North and South Dakota, Wisconsin and Wyoming. He has extensive experience performing water quality and aquatic biota surveys in Lake Michigan and the Mississippi, Illinois, and Ohio River systems. He has also served as field task manager, site safety and health officer and/or environmental scientist for numerous remedial investigations performed for various districts of the U.S. Army Corp of Engineers (USACE) under the Defense Environmental Restoration Program (DERP). Society of Wetland Scientists American Fisheries Society BS, Biological Studies, Southern Illinois University, 1985

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13. DEFINITIONS

ADT	Average Daily Traffic
ANSI	American National Standards Institute
APE	Area of Potential Effects
ASTM	American Society for Testing and Materials
Asynchronous Generator	A cage-wound generator, also called an induction generator, used to generate alternating current
BCA	Beaver Creek Archeology
BMPs	Best Management Practices; prevents soil erosion and sedimentation
Capacity	The capability of a system, circuit, or device for storing electronic charge
Certificate	Certificate of Site Compatibility
Class I Cultural Resources Inventory	Existing data inventory – a large-scale review and compilation of known cultural resource data
Class II/III Cultural Resources Inventory	Field inventory to identify cultural resources that could be affected by project facilities within the Project Area
Aggregate Surface	Road cover used for proposed access roads
Commission or PSC	North Dakota Public Service Commission
CRP	Conservation Reserve Program
Corridor Certificate	Certificate of Corridor Compatibility
DA	Department of the Army
dBA	A-weighted decibel
Distribution	Relatively low-voltage lines that deliver electricity to the retail customer's home or business
DOE	US Department of Energy
Electromechanical	Of, relating to, or being a mechanical process or device actuated or controlled electrically; especially being a transducer for converting electrical energy to mechanical energy
EMF	Electric and Magnetic Field
EPC	Engineering, procurement, and construction
EPCRA	Emergency Planning and Community Right-to-Know Act
ESA	Environmental Site Assessment
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Maps
FPL Energy	Florida Power and Light Energy
FPPA	Farmland Protection Policy Act
Ft	Foot/Feet
GE	General Electric
Gearbox	An assembly of parts including the speed-changing gears and the propeller shaft by which the power is transmitted from an automobile engine to a live axle; the speed-changing gears in such an assembly
Generator	A machine by which mechanical energy is changed into electrical energy
Geotechnical	A science that deals with the application of geology to engineering

GFD	North Dakota Game and Fish Department
Hub	The central part of a circular object (as a wheel or propeller)
Interconnection	To be or become mutually connected
kV	kilovolt
kW	kilowatt
MW	megawatt
M	meter
m/s	meter per second
MAPP	Mid-Continent Area Power Pool
Micrositing	The process in which the wind resources, potential environmentally sensitive areas, soil conditions, and other site factors, as identified by local, state and federal agencies, are evaluated to locate wind turbines and associated facilities.
MISO	Midwest Independent System Operator
mph	miles per hour
Nacelle	A streamlined enclosure (as for an engine), which houses the gearbox, generator, brake, cooling system and other electrical and mechanical systems
NDDOT	North Dakota Department of Transportation
NESC	National Electric Safety Code
NDAC	North Dakota Administrative Code
NDCC	North Dakota Century Code
NDPRD	North Dakota Parks and Recreation Department
NHID	Natural Heritage Inventory Database
NPDES	National Pollutant Discharge Elimination System
NRCS	National Resource Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
NWP	Nationwide Permit
O&M	Operations and maintenance facility
PII	Potential Impact Index
Pitch	The action or a manner of pitching; especially an up-and-down movement
PPA	Power Purchase Agreements
Project, the	Rough Rider I Wind Project
PSC or Commission	North Dakota Public Service Commission
PTC	Production Tax Credit
RECs	Recognized Environmental Conditions
Resistance	The opposition offered by a body or substance to the passage through it of a steady electric current
Rotor	The rotor consists of three blades mounted to a rotor hub
RD	Rotor Diameter: Diameter of the rotor from the tip of a single blade to the tip of the opposite blade
ROW	Right-of-Way
rpm	Revolutions per minute
SCADA	Supervisory Control and Data Acquisitions (communications technology)

SHPO	North Dakota State Historic Preservation Office
Step-up Transformer	A transformer that increases voltage
Substation	A subsidiary station in which electric current is transformed
SWPPP	Storm Water Pollution Prevention Plan
Torque	A force that produces or tends to produce rotation or torsion; also a measure of the effectiveness of such a force that consists of the product of the force and the perpendicular distance from the line of action of the force to the axis of rotation : a turning or twisting force
Transformer	An electrical device by which alternating current of one voltage is changed to another voltage
Transmission	An assembly of parts including the speed-changing gears and the propeller shaft by which the power is transmitted from an automobile engine to a live axle; the speed-changing gears in such an assembly
USACE	US Army Corps of Engineers
USEPA	US Environmental Protection Agency
USFWS	US Fish and Wildlife Service
UT	Unincorporated Township
WMD	Wetland Management District
WPAs	Waterfowl Protection Area
WUS	Waters of the United States
Yaw	To deviate erratically from a course (as when struck by a heavy sea); especially to move from side to side: to turn by angular motion about the vertical axis

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