

**Brady II Wind Energy Center
Brady Wind II, LLC
Hettinger County, North Dakota
(Ancillary Facilities in Stark County)**

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



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Appendix A: Excerpt of NextEra Energy, Inc.'s 2015 Corporate Responsibility Report

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1. INTRODUCTION

Brady Wind II, LLC (Brady Wind II), a wholly-owned, indirect subsidiary of NextEra Energy Resources, LLC (NEER), is submitting this Application for a Certificate of Site Compatibility (Certificate) to construct the Brady II Wind Energy Center (the Project). All Project facilities are proposed to be located in Hettinger County, North Dakota, with the exception of collection lines, which will also be placed in southern Stark County (**Figures 1–3**). The proposed Project will have a nameplate capacity of approximately 150 megawatts (MW), consisting of up to 72 wind turbines using both General Electric (GE) 2.1 MW and GE 1.79 MW Xle wind turbine generators. Additional facilities proposed in this Application include access roads, electrical collection systems and cabling, and meteorological towers (four temporary and one permanent) (**Figure 3**). All wind turbines are proposed to be located in Hettinger County. Facilities proposed to be located in Stark County are limited to underground electrical collection systems and cabling (**Figure 3**).

The proposed Project will be located adjacent to the southern boundary of the proposed Brady Wind Energy Center. An Application for a Certificate of Site Compatibility for the Brady Wind Energy Center is currently under consideration by the North Dakota Public Service Commission (PSC). The proposed Project will utilize the temporary laydown and turbine storage areas identified for the Brady Wind Energy Center during construction, and the Operations & Maintenance (O&M) building proposed for the Brady Wind Energy Center will be shared with the proposed Project. Substation equipment to support the proposed Project will be located within the same 8-acre parcel where the Brady Wind Energy Center substation is proposed to be located (**Figure 4**). The overhead transmission line proposed to serve the Brady Wind Energy Center will also serve the proposed Project. Impacts associated with the laydown area, O&M facility, and the substation are described in a separate Certificate of Site Compatibility Application, submitted to the PSC in December 2015. Impacts associated with the overhead transmission line were described in a separate Certificate of Corridor Compatibility and Route Permit application, which was also submitted to the PSC in December 2015. The proposed Project would not cause additional impacts associated with the laydown area, substation facilities, O&M building, and transmission line other than those already described in those applications. Impacts associated with these facilities are therefore not discussed in this Application.

NEER, through its affiliates, develops renewable projects throughout the United States and Canada. NEER is the largest generator of wind-powered electricity in North America, with nearly 11,300 MW of capacity in 19 states and Canada as of December 2014. In North Dakota specifically, NEER, through its affiliates, owns and operates 851 MW of wind generation and operates an additional 139 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) Chapter 49-22 and North Dakota Administrative Code (NDAC) Article 69-06. 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 49-22-02).

Brady Wind II considered the exclusion and avoidance areas and selection and policy criteria set forth in NDAC Section 69-06-08-01 in the design of the proposed Project and has provided information on such areas in this Application. In addition, sufficient Project design, wind resource, and technical information have been provided for a thorough evaluation of the proposed Project. **Table 1** outlines the information required to fulfill the requirements for a Certificate with the PSC and where these requirements are addressed in this document.

Table 1. Certificate Completion Checklist

State Authority	Description	Section
NDAC 69-06-04-01	Certificate of Site Compatibility Application	
Section 2	Contents	
a.	A description of:	
	(1) The type of energy conversion facility proposed	1.0, 4.0
	(2) The gross design capacity	1.0
	(3) The net design capacity	1.3.2
	(4) The estimated thermal efficiency of the energy conversion process and the assumptions upon which the estimate is based	Not applicable
	(5) The number of acres that the proposed facility would occupy	1.3.1, Table 4
	(6) The anticipated time schedule for:	1.4
	(a) Obtaining the certificate of site compatibility	
	(b) Completing land acquisition	
	(c) Starting construction	
	(d) Completing construction	
	(e) Testing operations	
	(f) Commencing commercial production	
	(g) Beginning any expansions or additions	
b.	Copies of any evaluative studies or assessments of the environmental impact of the proposed facility submitted to any federal, regional, state, or local agency.	Appendix B
c.	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
d.	A description of any feasible alternative methods of serving the need.	2.2

Table 1. Certificate Completion Checklist

State Authority	Description	Section
e.	A study area that includes the proposed facility site, of sufficient size to enable the commission to evaluate the factors addressed in NDCC Section 49-22-09.	1.3.1, 3.0, 7.0-7.17, 10.0-10.12, Figures 1-3, Figures 5-6, Figures 10-12, Figures 14-15
f.	The Application shall contain a discussion of the utility's policies and commitments to limit the environmental impact of its facilities, including copies of board resolutions and management directives.	Appendix A
g.	A map identifying the criteria that provides the basis for the specific location of the proposed facility within the study area.	Figure 6
h.	A discussion of the criteria evaluated within the study area, including exclusion areas, avoidance areas, selection criteria, policy criteria, design and construction limitations, and economic considerations.	3.0-3.6, Table 6, Table 7, Table 8, Table 9, Figure 6
i.	A discussion of the mitigative measures that the application would take 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
j.	The qualifications of each person involved in the facility site location study.	11.0
k.	A map of the study area showing the location of the proposed facility and the criteria evaluated.	Figures 5 and 6, 1.2, 3.0
l.	An 8-1/2 by 11-inch black and white map suitable for newspaper publication depicting the site area.	Provided on CD
m.	A discussion of present and future natural resource development in the area.	7.3.1
n.	Map and GIS requirements. The applicant shall provide information that is complete, current, presented clearly and concisely, and supported by appropriate references to technical and other written material available to the commission.	Figures 1-3, Figures 5 -6, Figures 10-12, Figures 14-15
NDCC 49-22-08	Application for a certificate	
Section 1	An application for a certificate shall be in such form as the commission may prescribe, containing the following information:	
a.	A description of the size and type of facility.	1.0, 1.3.1, 4.0, Table 3, Table 4
b.	A summary of any studies which have been made of the environmental impact of the facility.	7.0
c.	A statement explaining the need for the facility.	2.1
d.	An identification of the location of the preferred site for any energy conversion facility.	1.3.1, Figures 1-3
e.	An identification of the location of the preferred corridor for any transmission facility.	Not applicable
f.	A description of the merits and detriments of any location identified and a comprehensive analysis with supporting data showing the reasons why the preferred location is best suited for the facility.	7.0

Table 1. Certificate Completion Checklist

State Authority	Description	Section
g.	A description of mitigative measures that would be taken to minimize all foreseen adverse impacts resulting 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
h.	An evaluation of the proposed site or corridor with regard to the applicable considerations set out in Section 49-22-09 and the criteria established pursuant to Section 49-22-05.1.	10.0
i.	Such other information as the applicant may consider relevant or the commission may require.	Appendix C
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.	10.12

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, Brady Wind II identified the proposed Project Area (see **Figures 1–3**) for further investigation based on the modeled wind resource and potential offtaker, as outlined in **Section 1.3** below. The identified proposed Project Area is considered optimal from a wind resource perspective, and is located adjacent to the southern boundary of the proposed Brady Wind Energy Center, which is currently under consideration by the PSC. The location of the proposed Project adjacent to the Brady Wind

Energy Center allows Brady Wind II to utilize already-proposed facilities associated with the Brady Wind Energy Center, including the construction laydown and turbine storage areas, O&M facility, substation, and transmission line. Brady Wind II analyzed the available land and initiated discussions with landowners and applied setbacks required by Hettinger County, the PSC, and Brady Wind II's internal setbacks. Although none of the wind turbines and only some collection lines will be located in Stark County, Brady Wind II voluntarily applied Stark County's setbacks to the proposed Project where they were more restrictive. Brady Wind II then conducted environmental desktop and field studies in the Project Area, the results of which are incorporated in the appropriate sections of this application.

Brady Wind II is in the process of negotiating agreements with landowners that are interested in having wind turbines and associated facilities placed on their property. Simultaneously, Brady Wind II 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. Brady Wind II is not seeking a permit for each wind turbine indicated on **Figure 3**; rather, the preliminary layout indicates areas of the site with good wind resources and where there are no known environmental or regulatory siting issues.

Brady Wind II seeks a Certificate of Site Compatibility for the Project Area, as opposed to specific turbine locations. Brady Wind II suggests that the Certificate define the Project Area, number of turbines, and structures related to wind generation to be located within the Project Area based on the information presented in this Application. Within the permitted Project Area, Brady Wind II proposes that conditions be included specifying that final turbine placement be subject to required setbacks from environmentally sensitive areas, and be sufficient to meet required noise levels.

Brady Wind II is currently completing additional required studies, including final cultural resource surveys and wetland delineations, and will complete these studies as soon as land access and weather permits. Brady Wind II will also further evaluate the Project Area based on efficient construction of the proposed Project. In addition, Brady Wind II will seek further input from landowners regarding the location of wind turbines and associated facilities. Once these additional studies and communications have been completed, preliminary turbine locations will be re-evaluated for consistency with anticipated Certificate conditions and buffers. A final site plan for the proposed Project will be submitted to the PSC prior to construction and a pre-construction conference call will be held with PSC staff to ensure that the site plan conforms to the Certificate requirements.

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

1.3 Project Summary

Brady Wind II selected a Project Area adjacent to the southern boundary of the proposed Brady Wind Energy Center for siting a 150 MW wind generation facility. The proposed Project Area will capitalize on the proximity of the proposed Brady Wind Energy Center, and was identified as optimal from wind resource, land acquisition, transmission interconnection, environmental, and economic perspectives. The proposed Project Area was selected considering the exclusion and avoidance criteria outlined in NDAC 69-06-08-01.

1.3.1 Proposed Project Area

The proposed Project Area is the location within which Brady Wind II is in the process of negotiating easements with landowners and where proposed Project facilities are proposed to be located (**Table 2**). The proposed Project Area was selected to include all areas necessary for Brady Wind II to optimize the wind resource while complying with required setbacks and avoiding and minimizing impacts to environmental resources. Brady Wind II currently has acquired many of the easements required for the proposed Project.

Table 2. Project Area Location

County	Township	Range	Sections
Hettinger County	136 N	96 W	1-15, 18, 19, 22-24, 26, 27
	136 N	97 W	1-6, 8-14, 24
Stark County	137 N	95 W	31
	137 N	96 W	25, 26, 31-36
	137 N	97 W	36

The Project Area encompasses approximately 26,316 acres (41 square miles) in northern Hettinger County and southern Stark County. Approximately 19,932 acres (76%) of the Project Area is in Hettinger County, and 6,384 acres (24%) of the Project Area is in Stark County. The collection lines are the only Project facilities proposed to be located in Stark County.

Although the turbines will be placed throughout the participating land within Project Area, the permanent Project structures will only occupy up to 74 acres during operation (See **Tables 3 and 4 below**), or less than 1 percent of the total Project Area. **Table 3** summarizes the assumptions used to calculate impacts by proposed Project facility. Permanent impacts are considered to be the proposed Project footprint during operation. Temporary impacts are considered those impacts that result during construction to accommodate equipment and temporary activities outside the areas that will remain as the permanent Project footprint during operation. **Table 4** summarizes the estimated impact for each proposed Project component for both construction (temporary) and operation (permanent). The Project Area and proposed Project layout are shown on **Figures 1–3**. The impact assumptions are shown on **Figure 5**.

Table 3. Proposed Project Impact Assumptions

Proposed Project Component	Construction Disturbance	Temporary Construction Disturbance to be Reclaimed	Permanent Disturbance (Operation)
Wind Turbines <u>a/</u>	4.5 acres per turbine	4.3 acres per turbine	0.2 acres per turbine
Access Roads <u>b/</u>	50 feet wide per linear foot of road	34 feet wide per linear foot of road	16 feet wide per linear foot of road
Collection Lines <u>c/</u>	50 feet wide per linear foot	50 feet wide per linear foot minus 12 feet x 8 feet for each junction box	12 feet x 8 feet for each junction box
Meteorological Towers <u>d/</u>	1.25 acres per tower	1.25 acres per tower	5 sq. feet per tower
Temporary Crane Paths	80 feet wide per linear foot	80 feet wide per linear foot	0 acres

- a/ Construction impacts assumed a 250-foot construction radius around the turbine, which equates to approximately 4.5 acres per turbine. Impacts during operation account for a 40-foot x 100-foot gravel pad with a 15-foot buffer, or 0.2 acres per turbine.
- b/ Easement width necessary for construction based on turbine types. Temporary and permanent impacts represent a conservative estimate of disturbance. Roads required to support crane access to turbines during operation will remain up to 38 feet wide; other access roads may be built at 16 feet or reduced later to 16 feet. Access road impacts also assume all proposed roads are new access roads and do not consider improvements to existing roads separately.
- c/ Where collection lines run parallel to access roads, the respective impact buffers generally do not overlap.
- d/ Area of impact is 1.25 acres per guyed tower during installation. Once installed, each tower has a 1 square-foot base plate and four 1 square-foot anchor points, or 5 square feet per tower.

Table 4. Proposed Project Impacts

Proposed Project Component	Construction Disturbance (acres)	Temporary Construction Disturbance to be Reclaimed (acres)	Permanent Disturbance (Operation) (acres)
Wind Turbines <u>a/</u> (72 turbines, not 7 alternates)	324	310	14
Access Roads <u>b/</u>	185	126	59
Collection Lines <u>c/</u>	406	405	<0.1 (1,742 sq. ft.)
Meteorological towers <u>d/</u>	6	6	<0.1 (5 sq. ft.)
Temporary Crane Paths <u>e/</u>	126	126	0
Total	1,047	973	74

- a/ Assumes 72 turbines x 4.5 acres of ground disturbance during construction, 0.2 acre/turbine of that remaining as permanent. The 7 alternate turbines were not included in the calculation; calculations for the associated roads and collection lines included all roads and collection lines shown in the layout.
- b/ Assumes a 50-foot wide easement for roads during construction, 16 feet of that remaining during operation. Assumes total of approximately 30.5 linear miles of service roads. The overlapping area for turbines were excluded from the road impact calculations to avoid double counting the same footprint.
- c/ The overlapping areas between the collection line corridor buffer and the access road corridor buffer were removed from impact calculation. Approximately 14 miles of collection lines run parallel to the access roads, with a 150-foot distance designed between the collection line and access road centerlines. The impacts also include approximately 53 miles of collection lines not collocated with access roads. Junction boxes will be located on the ground throughout the Project Area and will each require approximately 12 feet x 8 feet. Currently 18 junction boxes are anticipated to be required.
- d/ Four temporary and 1 permanent meteorological towers x 1.25 acres = 6.25 acres disturbance during construction; 1 permanent meteorological tower, assuming guyed, equals 5 square feet of permanent disturbance.
- e/ At the time of publication, temporary crane paths have not been identified. Access roads and county roads will be utilized for crane travel and new crane paths will be avoided if possible. The estimated impacts assume an 80-foot wide crane path for 13 miles that does not overlap with other infrastructure footprints.

1.3.2 Projected Output

The proposed Project will have a nameplate (gross) capacity of approximately 150 MW. Assuming a net capacity factor of 52.4 percent, the projected average annual output is estimated at 688,536 MW hours per year. As with all wind projects, output is dependent upon wind resource, final design, site-specific features, and equipment.

1.4 Proposed Project Schedule

The commercial operation date is dependent upon permitting, equipment deliveries, and other development activities. Brady Wind II is targeting site construction to begin in July 2016 provided all pre-construction permits and approvals have been obtained. Key schedule milestones include the items described below.

- 1. Certificate of Site Compatibility:** Brady Wind II anticipates and has requested with this filing that the Certificate be issued by July 1, 2016.

2. **Land Acquisition:** Brady Wind II anticipates that all land easement agreements for the wind generation facility will be completed by the end of January 2016.
3. **Permits:** All wind turbines associated with the proposed Project will be located in Hettinger County. Brady Wind II plans to submit an application for a Conditional Use Permit to Hettinger County for operation of the wind energy facility in February 2016, and anticipates approval of that permit in March 2016. Stark County permitting is not required for the proposed Project, because only underground collection lines will be placed in Stark County. Brady Wind II 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 proposed Project and will allow Brady Wind II to move forward with other commitments on the proposed Project.
4. **Equipment Procurement, Manufacture, and Delivery:** Brady Wind II has ordered all long-lead equipment for the proposed Project, including substation equipment, and transformers, and has a purchase order in place with GE for the wind turbines.
5. **Construction:** Construction is scheduled to begin in July 2016. The engineering, procurement, and construction (EPC) contractor will be responsible for completing all project construction, including roads, wind turbine assembly, electrical, and communications work. Construction will take approximately 6 months to complete.
6. **Testing Operations:** Brady Wind II anticipates testing to begin in November 2016.
7. **Commercial Operation:** Brady Wind II anticipates commercial operation of the proposed Project to occur in December 2016.
8. **Expansions or Additions:** NEER is currently developing another wind energy facility adjacent to this Project in Stark County, the Brady Wind Energy Center. The Stark County Commission approved the Conditional Use Permit for the Brady Wind Energy Center on December 22, 2015. An application for that proposed project was submitted to the PSC in December 2015.

1.5 Project Ownership

Brady Wind II will own the entire proposed Project and, as a result, will manage the construction of all equipment and associated facilities related to the proposed Project. Brady Wind II will select a third-party EPC contractor to perform the majority of the engineering and construction of the wind farm. Brady Wind II will procure the turbine/tower equipment directly from a manufacturer.

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2. NEED FOR FACILITY

2.1 Need Analysis

Due partly to high heating demand in winter, North Dakota's per capita energy consumption is among the highest in the nation. Nearly three-tenths of North Dakota households use electricity as their primary energy source for home heating. Most of the coal used for power generation is supplied by several large surface mines in the central part of the state. Energy sources such as coal are finite and their combustion has environmental consequences.

In March 2007, North Dakota enacted legislation (H.B. 1506) adopting a voluntary renewable portfolio objective that aims to have 10 percent of electricity used in the state generated from renewable sources by 2015. According to the Energy Information Administration (EIA 2014), in 2010, 79 percent of North Dakota's net electricity generation came from coal, 16 percent came from wind energy, and 5 percent came from conventional hydroelectric power sources. Consequently, the 10 percent renewable portfolio objective is being met. However, other goals for renewable energy have been established. According to a March 2010 report prepared by the EmPower ND Commission, one of the state energy goals is to increase installed wind energy capacity to 5,000 MW by 2020 (EmPower ND 2010). North Dakota's energy-related goals include the following:

- General economic development and help the nation achieve greater energy independence
- Derive 25 percent of all energy produced in America from renewable sources by 2025
- Provide a fair and responsible regulatory environment that promotes energy development

A regional need exists for renewable energy produced in North Dakota. Eleven of the Midwest Independent System Operator (MISO) states currently have renewable portfolio standards (MISO 2012). According to the MISO Transmission Expansion Plan for 2012, the MISO region needs to add between 4,484 and 11,290 MW of new capacity or 3,865 and 9,733 MW of demand reduction to meet the minimum Planning Reserve Margins in 2022 (MISO 2012). From 2015 onward, 9,912 MW of retirements of fossil-fueled power plants are assumed to occur due to Environmental Protection Agency (EPA) regulations. Depending on the projection scenario, MISO assumes anywhere from 13 to 60 gigawatts (GW) of incremental wind penetration. Seventeen multi-value transmission projects have been integrated into the MISO planning models, which would relieve a major part of MISO's internal future congestion and deliver wind energy more efficiently.

Apart from renewable energy goals, in recent years, the Mid-Continent Area Power Pool (MAPP) has consistently reinforced the regional need for increased generating capacity in the

coming decade. The most recent MAPP report available (2009) indicates that deficits are now expected by 2017 (**Table 5**).

Table 5. MAPP (US) Summer Season Surplus/Deficit

Year	MW
2008	2,377.3
2009	1,522.2
2010	1,044.8
2011	939.5
2012	785.7
2013	502.8
2014	657.8
2015	524.4
2016	227.5
2017	-19.3
2018	-367.3

Source: Page III-5 of the MAPP 2009 Load and Capability Report (MAPP 2009).

The proposed Project will allow North Dakota to continue to provide capacity to meet those forecasted deficits with clean, efficient, renewable energy for at least the projected 30-year life of the proposed Project.

On October 23, 2015, the EPA's final *Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units* (Clean Power Plan) was published in the Federal Register. Under the Clean Power Plan, the EPA established interim and final carbon dioxide emission performance rates for steam electric and natural gas fired power plants, as well as state-specific interim and final goals, based on these limits and each state's mix of power plants. The Clean Power Plan requires each state to develop and implement plans to ensure that the power plants in their state achieve the interim and the final carbon dioxide emission performance rates, and rate-based goals or mass-based goals by 2030. North Dakota's 2012 carbon dioxide emission rate was 2,368 pounds per megawatt-hour (MWh) and its 2030 goal is 1,305 pounds/MWh (EPA 2015a). The EPA anticipates that renewable energy will be a significant strategy for states and existing sources. New renewable energy facilities benefit mass-based states by avoiding emissions from affected fossil fuel-fired electric generating sources. States using a mass-based approach may provide additional support for renewable energy through direct allocations of emission allowances to renewables, or through distribution of proceeds from auctions of emission allowances to renewable energy generators (EPA 2015b). A renewable energy generator installed after 2012 in a rate-based state may be issued Emission Rate Credits (ERCs) for every MWh of zero-emission generation in 2022 and thereafter (EPA 2015b). Additionally, the Clean Power Plan facilitates trading of ERCs for compliance across state lines (EPA 2015b). The proposed Project will contribute to meeting North Dakota's requirements under the Clean Power Plan to meet its interim and final carbon dioxide emission rate goals under either a mass-based or rate-based compliance regime.

In October 2015, Brady Wind II signed a 30-year power purchase agreement with Basin Electric Power Cooperative (Basin) for the proposed Project. Pursuant to this agreement, Basin will purchase all of the electrical output generated by the proposed Project for 30 years. The proposed Project will help to increase the renewable portion of Basin's generating portfolio and help meet Basin members' energy needs while keeping member electricity rates low.

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. In addition, as stated above in Section 2.1, Brady Wind II signed a 30-year power purchase agreement with Basin for the proposed renewable energy project.

Although the proposed Project will include 72 planned turbines, an additional 7 alternate turbine locations have been included in the proposed Project layout to provide siting flexibility based on on-going environmental studies and landowner preferences.

2.3 10-Year Plan

As required by NDCC 49-22-04, Brady Wind II will file a 10-Year Plan with the PSC by July 1, 2016.

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3. SITE SELECTION CRITERIA

Brady Wind II is evaluating the proposed 26,316-acre (41-square-mile) Project Area to determine the best locations for up to 72 wind turbines. Siting turbines is a process through which input from several different entities is considered. The Project Area was identified as an optimal site from wind resource, transmission, landowner participation, economic, and environmental perspectives. An additional 7 alternate turbine locations have been included in the proposed Project layout to provide siting flexibility based on on-going environmental studies and landowner preferences, however, only up to 72 wind turbines will be constructed.

Brady Wind II has secured voluntary wind option agreements with landowners and identified 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 Hettinger County, Stark County, and state wind siting requirements, and communications with local, state, and federal agencies. NEER has used this siting process in developing recent wind turbine projects, including 12 projects in North Dakota. Through this process, NEER addresses environmental issues that commonly arise during project development and 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. Brady Wind II has reviewed the criteria in Chapter 69-06-08 and has considered these criteria in the proposed Project design. These criteria are discussed in this section.

3.1 Exclusion Areas

In accordance with NDAC Section 69-06-08-01(1) and (2), the geographical areas listed in **Table 6** 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 6**.

3.2 Avoidance Areas

In accordance with NDAC Section 69-06-08-01(3) and (4), the geographical areas listed in **Table 7** 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 6**.

Table 6. Exclusion Areas

Exclusion Area	Present within Project Area?	Description	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.	None	N/A	7.7, 7.8, 7.17
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	An archaeological survey is underway; archaeological sites have been identified through a file search and field survey, but the proposed Project layout will avoid all newly documented sites. The sites are not shown on Figure 6 due to confidentiality. The field survey is anticipated to be completed as weather permits in winter 2015/spring 2016.	7.7, 7.8, 7.9, 7.15, 7.17, Figures 6 and 10
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, 7.17
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	The Project Area contains 13,232 acres (50 percent) of soils of statewide importance and 470 acres (approximately 2 percent) of prime farmland soils. Prime farmland has been avoided to the extent practical. Permanent impacts to soils of statewide importance and prime farmland soils from turbine placement and access roads are expected to be up to 34 acres and 0.4 acres, respectively, which is less than 1 percent of the Project Area.	7.9, 7.10, 7.17, Figure 14
Irrigated land	None	N/A	7.9, 7.17
Areas critical to threatened or endangered animal or plant species	None	The Project Area is outside the whooping crane migration corridor.	7.16, 7.17
Areas where animal or plant species that are unique or rare to this state would be irreversibly damaged.	None	N/A	7.13, 7.14, 7.15, 7.16, 7.17
Areas within 1,200 feet of the geographic center of an intercontinental ballistic missile (ICBM) launch or launch control facility.	None	N/A	7.3, 7.17

Table 6. Exclusion Areas

Exclusion Area	Present within Project Area?	Description	Section Addressed
Wind-energy specific exclusion areas	N/A	The proposed Project complies with the following exclusion areas: 1.1 x height of turbine from interstate and state road rights-of-way 1.1 x height of turbine plus 75 feet from centerline of county or maintained township roadways 1.1 x height of turbine from railroad right-of-way 1.1 x height from 115kV or higher transmission lines 1.1 x height from property line of non-participating landowners	4.1.1

Table 7. Avoidance Areas

Avoidance Areas	Present within Project Area?	Description and Proposed Buffer	Section Addressed
Historical resources which are not designated as exclusion areas	Present	Historic farmsteads are present within the Project Area and within 1 mile of the Project Area. All historic resources will be avoided by the Project footprint.	7.7, 7.17
Areas within the city limits of a city or the boundaries of a military installation	None	N/A	7.3, 7.17, Figures 1–3
Areas within known floodplains as defined by the geographical boundaries of the 100-year flood	Present	Approximately 2 percent of the Project Area is within the 100-year floodplain. These areas occur primarily within creek beds and will be avoided or permitted as required by Hettinger County.	7.12, 7.17, Figure 15
Areas that are geologically unstable	None	N/A	7.11, 7.17
Woodlands and wetlands	Present	Permanent impacts to jurisdictional wetlands will be avoided and minimized as practicable. Few woodland impacts are anticipated, and all trees that are removed will be replaced at a 2 to 1 ratio as required by the PSC.	7.13, 7.14, 7.17, Figures 10 and 15
Areas of recreational significance which are not designated as exclusion areas	Present	North Dakota Department of Trust Lands (School Trust Lands) occur within the Project Area and are open to walk-in hunting unless otherwise posted with official State Land Department signage. If Brady Wind II pursues an agreement for development of any Project facilities on this parcel, there would be no impact to recreation on these lands once construction is complete.	7.8, 7.17, Figure 12
Geographic area where, due to operation of the facility, the sound levels within 100 feet of an inhabited residence or a community building would exceed 50 dBA.	None	Noise modeling results indicated that received sound levels are all 50 dBA within 100 feet of an inhabited residence.	7.6.2, 7.17

3.3 Selection Criteria

In accordance with NDAC Section 69-06-08-01(5), 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 8**, will be at an acceptable minimum, or that those effects will be managed and maintained at an acceptable minimum.

Table 8. Selection Criteria

Selection Criteria	Potential Adverse Effects	Section Addressed
The impact upon agriculture:		
Agricultural production	Up to 1,047 acres of land would be temporarily disturbed during construction for turbine installation, road construction, collection line trenching, temporary meteorological tower installation, and temporary crane paths. Approximately 93 percent of the area that is temporarily disturbed would be reclaimed, and approximately 74 acres would have permanent disturbance because of placement of wind turbines, permanent access roads, junction boxes, and the permanent meteorological tower. These impacts represent a minor portion of the land area available for agricultural production. Landowner agreements include compensation for crop damage, if any, during surveys and construction. As a result, the proposed Project would not result in significant impacts to agricultural production.	1.3.1, 7.3, 7.9, 7.17
Family farms and ranches	The proposed Project will comply with state, county, and other voluntary setbacks. Although some land area would be converted to wind turbine foundations and pads and access roads, wind lease payments to farmers would provide a supplemental source of income. As stated above, landowner agreements also include compensation for crop damage, if any, during surveys and construction.	4.1.1, 7.2, 7.3, 7.10, 7.17, Table 10, Figure 5
Land which the owner demonstrates has soil, topography, drainage, and an available water supply that cause the land to be economically suitable for irrigation	Participating landowners have not expressed concerns related to economically suitable irrigation on their land. Currently no irrigation is occurring within the Project Area.	7.9, 7.10, 7.17, Figures 14 and 15
Surface drainage patterns and ground water flow patterns	A wetlands and waters survey is currently underway and will be completed in early 2016 as weather permits. Project infrastructure will be built to avoid impacts to surface waters to the extent practicable, and 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. Temporarily disturbed areas will be returned to their original contours.	7.11, 7.12, 7.13, 7.17, Figure 15
The agricultural quality of the cropland	Minimal impacts to the agricultural quality of the cropland are anticipated. Landowner agreements include compensation for crop damage, if any, during surveys and construction. If compaction of soils occurs during construction, Brady Wind II will work with the landowners to alleviate the compaction.	7.9, 7.10, Figure 14
The impact upon the availability and adequacy of:		
Law enforcement	No adverse impacts to law enforcement are anticipated.	7.4, 7.17
School systems and education programs	No adverse impacts to school systems and education programs are anticipated. The Project will provide revenue for the New England School District.	7.4, 7.17
Governmental services and facilities	No adverse impacts to governmental services and facilities are anticipated.	7.4, 7.17
General and mental health care facilities	No adverse impacts to general and mental health care facilities are anticipated.	7.4, 7.17
Recreational programs and facilities	No recreational programs or facilities will be directly affected by the Project. Recreational impacts would be auditory and visual in nature and limited to individuals using public or private property in and near the Project Area for hunting, fishing, or nature observation.	7.4, 7.8, 7.17

Table 8. Selection Criteria

Selection Criteria	Potential Adverse Effects	Section Addressed
Transportation facilities and networks	An increase in vehicle trips per day is anticipated for the duration construction, but is expected to be temporary and not significant. During facility operation, no significant impacts are anticipated.	7.4, 7.17, Figure 11
Retail service facilities	No adverse impacts are anticipated. Local services such as hotels, restaurants, and convenience stores are likely to experience an increase in business during construction.	7.2, 7.4, 7.17
Utility services	The proposed Project will utilize station service from Slope Electric Cooperative, Inc., which will suggest appropriate configurations for the electrical system, and Brady Wind II will abide by the recommendations to prevent impacts to the transmission system.	1.0, 2.0, 6.0, 7.4, 7.17
The impact upon:		
Local institutions	No adverse impacts are anticipated.	7.4, 7.17
Noise sensitive land uses	The noise sensitive land uses within the Project Area are the residences near turbine locations. The sound impacts from the proposed Project turbines will be within the PSC limit at occupied residences.	7.6, 7.17
Rural residences and businesses	The proposed Project will comply with state and local setbacks.	4.1.1, 7.2, 7.3, 7.17, Figure 5
Aquifers	Based on the small amount of increased impervious surface area that will be created by proposed Project components relative to the separation of these components and the size of the entire Project Area, the proposed Project would likely have minimal impacts to regional groundwater recharge.	7.11, 7.17
The impact upon:		
Human health and safety	No impacts to human health and safety are anticipated based on the implementation of the mitigative measures discussed in Section 7.5.3 and maintenance schedules.	6.3, 7.5, 7.17
Animal health and safety	No impacts to livestock are anticipated from construction or operation of the facility. Based on avian surveys performed to date, mean raptor use was generally low compared to other wind facilities. For other avian species, fatalities from the proposed Project, if any, are not anticipated to have population-level effects. Brady Wind II will implement measures to avoid and minimize effects to wildlife by siting facilities away from active raptor nests and wetlands to the extent practicable. A BBCS will be prepared for the proposed Project. In addition, Brady Wind II will implement a post-construction WRRS and 1 year of post-construction bird and bat mortality monitoring for the proposed Project to monitor avian/turbine interaction.	7.15, 7.16, 7.17
Plant life	The proposed Project will result in up to 74 acres of permanent impact. Land where the turbines will be sited is primarily undeveloped pasture/hay, cropland, and grassland. Areas of highest quality native prairie were avoided. Trees and shrubs will be replaced consistent with PSC requirements.	7.14, 7.17, Figure 10
Temporary and permanent housing	Existing temporary housing, such as hotels, will be utilized during construction. No adverse impacts are anticipated.	7.2, 7.17
Temporary and permanent skilled and unskilled labor	No adverse effects are anticipated. Local contractors employed for construction would benefit the local economy.	7.2, 7.17

Table 8. Selection Criteria

Selection Criteria	Potential Adverse Effects	Section Addressed
The cumulative effect of the location of the facility in relation to existing and planned facilities and other industrial development	Wind energy development is anticipated to have a positive cumulative impact on air quality and minimal impacts to geology, soils, water, noise, safety and health issues, and cultural resources. Socioeconomic impacts are anticipated to be positive, as the rural economy and energy production is diversified. Wind energy development removes less total land from agricultural use than other forms of energy generation development.	7.17, 10.11

3.4 Policy Criteria

In accordance with NDAC Section 69-06-08-01(6), 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 9**, and may require the adoption of such policies and practices as appropriate.

Table 9. Policy Criteria

Policy Criteria	Suitable Policy or Practice of Applicant	Section Addressed
Recycling of the conversion byproducts and effluents	Not applicable.	N/A
Energy conservation through location, process, and design	Brady Wind II is developing the site to maximize energy output and will develop a site layout that optimizes wind resources while minimizing the impact on land resources and any potentially sensitive areas. Developing the Project adjacent to another proposed wind energy facility eliminates the need for a new transmission line, substation, O&M facility, and temporary laydown areas.	4.1, 4.2
Training and utilization of available labor in this state for the general and specialized skills required	Brady Wind II 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, 5.3
Non-relocation of residents	No residents will be relocated as a result of the proposed Project.	7.2.2
The dedication of an area adjacent to the facility to land uses such as recreation, agriculture, or wildlife management	The proposed Project will not interfere with adjacent land uses. It is not anticipated that areas adjacent would be dedicated to recreation, agriculture, or wildlife management, although much of the Project Area is already used for agriculture and hunting areas exist within the proposed Project Area, and these uses could continue once the Project is constructed.	7.3, 7.8, 7.9, 7.15
Economies of construction and operation	Brady Wind II will utilize local contractors to the extent practicable. The proposed Project will be located adjacent to the southern boundary of the proposed Brady Wind Energy Center, and will utilize the temporary laydown and turbine storage areas identified for the Brady Wind Energy Center during construction. The O&M building proposed for the Brady Wind Energy Center will be shared with the proposed Project. Substation equipment to support the proposed Project will be located within the same 8-acre parcel as the Brady Wind Energy Center. The overhead transmission line proposed to	1.0, 1.2, 1.3, 7.2

Table 9. Policy Criteria

Policy Criteria	Suitable Policy or Practice of Applicant	Section Addressed
	serve the Brady Wind Energy Center will also serve the proposed Project.	
Secondary uses of appropriate associated facilities for recreation and enhancement of wildlife	None.	N/A
Use of citizen coordinating committees	Brady Wind II has coordinated with County officials on the location of the proposed Project and is consulting with participating landowners on the proposed Project.	8.0
A commitment of a portion of the energy produced for use in this state	Energy transmitted will be injected into the Belfield to Rhame Transmission Line and will be delivered to Basin's grid system. Basin's service area includes North Dakota.	1.0, 4.0
Labor relations	Brady Wind II will utilize local contractors to the extent practicable.	6.4, 7.2
The coordination of facilities	Existing facilities and facility corridors were considered in the location of the wind farm and associated facilities. The proposed Project will be located adjacent to the proposed Brady Wind Energy Center, and will utilize the temporary laydown and turbine storage areas identified for the Brady Wind Energy Center during construction. The O&M building proposed for the Brady Wind Energy Center will be with the proposed Project. Substation equipment to support the proposed Project will be located within the same 8-acre parcel as the Brady Wind Energy Center substation. The overhead transmission line proposed to serve the Brady Wind Energy Center will also serve the Project.	1.0, 1.2, 1.3, 1.4, 3.0, 3.6
Monitoring of impacts	Brady Wind II and the EPC contractor will employ best management practices during construction to monitor soil impacts and segregate topsoil. A stormwater prevention plan will be prepared for the proposed Project. Brady Wind will conduct 1 year of post-construction bat and bird fatality monitoring and rely on the WRRS system for the life of Project operations.	7.10, 7.11, 7.12, 7.15, 7.16

3.5 Design and Construction Limitations

Key design and construction limitations when building any wind farm are wind resources, landowner easements, regulatory setbacks (local and state), and available transmission. The wind resource is essential to selecting and designing a wind farm. Brady Wind II 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 are also critical to the proposed Project. Brady Wind II is in the process of negotiating land agreements with landowners necessary to develop the proposed Project.

3.6 Economic Considerations

Economics were considered when selecting a location for the proposed 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**.

One of the most important economic considerations related to the proposed Project is the need to qualify for the Federal Production Tax Credit (PTC). The PTC is an income tax credit of 2.3 cents/kilowatt-hour allowed for the production of electricity from utility-scale wind turbines. This incentive was created under the Energy Policy Act of 1992, and has been renewed and expanded many times, most recently in the 2016 spending package passed by Congress on December 18, 2015. The wind energy PTC will now be extended through 2016, and then continue at a decreased value through 2019. Wind projects qualify for the PTC if construction is started before the end of 2019 (AWEA 2015a). Accordingly, the proposed Project should be eligible for the PTC.

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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. Brady Wind II is proposing to install up to 72 wind turbines. The current layout includes 65 GE 2.1 MW and seven GE 1.79 MW Xle turbines. Brady Wind II is seeking flexibility from the PSC to select the most appropriate technology for the proposed Project at the time of construction to ensure optimization of wind and land resources and cost efficiency.

The GE 2.1 MW utility-grade wind turbine has a nominal nameplate rating of 2.1 MW. Each turbine will have an 80-meter (262 feet) hub height and a 116-meter (381 feet) rotor diameter (**Figure 7**). The GE 1.79 MW Xle turbine has a nominal nameplate rating of 1.79 MW, an 80-meter hub height, and a 100-meter (328 feet) rotor diameter. Both turbines begin operation in wind speeds of 3.5 meters per second (m/s), or 7.8 miles per hour (mph), and are designed to operate in wind speeds of up to 25 m/s (56 mph). The 2.1 MW turbine is designed to reach its rated capacity at a wind speed of 11.0/s (24.6 mph), whereas the 1.79 MW turbine is designed to reach its rated capacity at a wind speed of 11.5 m/s (25.7 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 with the turbine's control system to signal when sufficient winds are present for operation. Turbines feature variable-speed control and independent blade pitch to ensure 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 kilovolts (kV). The electricity is collected by a system of underground power collection lines within the Project Area (**Figure 8**). Both power collection lines and communication cables will be buried on private property or public right-of-way.

Each wind turbine will be accessible via all-weather, aggregate-surfaced roads between 16 and 38 feet in width that 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 Brady Wind Energy Center substation facilities. **Figure 8** is a diagram of the path of energy from a wind farm to energy users and **Figure 9** shows a typical wind farm facility layout. The power will be transformed to 230kV at substation facilities that will be located within the proposed substation for the Brady Wind Energy Center, on Section 25 of Township 137 North, Range 96 West. The Brady Wind Energy Center substation

and associated transmission line are being permitted separately in applications pending before the PSC. The proposed Project will not cause additional impacts outside the footprint for these facilities as identified in the separate permit applications.

4.1.1 Wind Energy Center Layout

Brady Wind II is developing a wind farm layout that optimizes the 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 would increase the available energy by a factor of 8. 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 (e.g., adverse impacts of one turbine on an adjacent turbine) and turbulence, and electrical line losses.

The setbacks used in designing the proposed Project are the most restrictive of those required by Hettinger County, Stark County,¹ the PSC, GE, or NEER's internal standards. The proposed Project also complies with or exceeds the following wind energy-specific exclusion areas provided in Section 69-06-08-01 (2):

- 1.1 x height of turbine from interstate and state road rights-of-way
- 1.1 x height of turbine plus 75 feet from centerline of county or maintained township roadways
- 1.1 x height of turbine from railroad right-of-way
- 1.1 x height from 115kV or higher transmission lines
- 1.1 x height from property line of non-participating landowners

Table 10 lists the setbacks utilized in designing the proposed Project layout. The distances are based on the GE 2.1 MW turbine, which has a larger rotor diameter than the GE 1.79 MW Xle turbine model, and has a total turbine height (from the bottom of the turbine tower to the top of the blade when vertical) of 453 feet. Hettinger County land use regulations specify that the proposed Project turbines must not be located within 1,320 feet of occupied dwellings or commercial buildings or publicly-used structures or facilities, or within 200 feet of public roads or above-ground communication or electrical lines. Both Hettinger and Stark counties also specify a setback requirement from the wind energy facility perimeter. Brady Wind II will comply with all applicable county setbacks.

¹ Although no turbines will be located in Stark County and Stark County setbacks therefore do not apply to the Project, because the Project is adjacent to Stark County, Brady Wind II voluntarily adopted Stark County's more restrictive 2,000-foot setback from occupied structures.

Table 10. Setback Distances for Wind Turbines

Setback Type	Distance
PSC Exclusion Areas	
Interstate and state road rights-of-way	1.1 x turbine height (498.3 feet)
Centerline of county or maintained township roadways	1.1 x turbine height plus 75 feet (573.3 feet)
Railroad rights-of-way	1.1 x turbine height (498.3 feet)
115kV or higher transmission lines	1.1 x turbine height (498.3 feet)
Property line of non-participating landowners	1.1 x turbine height (498.3 feet)
Hettinger County Setbacks	
Occupied dwellings, commercial buildings, or publicly-used structure or facilities	1,320 feet (although Stark County's more restrictive 2,000-foot setback was applied to the Project because it is adjacent to Stark County)
Public roads and above-ground communication and electrical lines	200 feet (determined at the center of the existing right-of-way)
Wind Energy Facility Perimeter	2.5 x the rotor diameter of the wind turbine (953 feet for the 2.1 MW turbines and 820 feet for the 1.79 MW turbines)
Other	
GE-provided setback from barns, abandoned houses, and roads (more conservative than PSC setback)	1.5 x turbine height (679.5 feet)

4.2 Associated Facilities

In addition to turbines, the proposed Project includes electrical collection lines, access roads, and meteorological towers. The electricity generated by each turbine is stepped up to a power collection line voltage of 34.5kV via a pad-mounted transformer at the base of each turbine. The electricity generated at each turbine will be collected by a system of underground power collection lines and brought to the substation. Four temporary and one permanent meteorological towers will be installed for the proposed Project. The locations of the four temporary meteorological towers are shown in **Figure 3**. A location for the permanent meteorological tower has not yet been selected.

Equipment will be added within the proposed 8-acre footprint of the proposed Brady Wind Energy Center's substation to accommodate Project needs. The O&M facility and temporary laydown and turbine storage areas proposed for the Brady Wind Energy Center will also be used for the proposed Project.

4.3 Land Rights

Brady Wind II is in the process of negotiating easements in Hettinger and Stark counties for the proposed 150 MW Project. Land acquisition is anticipated to be complete by the end of January 2016. 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 collection lines, and meteorological towers.

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5. PROPOSED SITE

5.1 Identification of Project Area

Brady Wind II selected the Project Area based on its wind resource, location adjacent to another planned wind farm and transmission line, presence of willing landowners, land-use patterns, and low presence of environmentally sensitive features. The Project Area boundary encompasses an area of 26,316 (41 square miles). However, the land occupied by turbines and other wind farm infrastructure during operation will be less than 1 percent of this area. It is anticipated that the area of permanent land use during operation would be up to 74 acres for the turbines, aggregate-surfaced access or service roads up to 16 feet wide, electrical junction boxes, and one permanent meteorological tower. Total temporary land disturbance during construction for the proposed Project is expected to be up to approximately 1,047 acres, including temporary disturbance due to turbine installation, road construction of roads up to 38 feet wide, collection line trenching, four temporary meteorological towers, and temporary crane paths. See **Table 4** in **Section 1.3.1** and **Section 7** for a detailed description of the Project Area impacts. **Figure 3** shows the proposed turbine locations, which are subject to shifts during micro-siting to avoid sensitive resources.

5.2 Wind Resource Areas–General

The U.S. Department of Energy's Wind Program and the National Renewable Energy Laboratory published a wind resource map for the state of North Dakota. This resource map shows wind speed estimates at 50 meters above the ground and depicts the resource that could be used for utility-scale wind development. As a renewable resource, wind is classified according to wind power classes, which are based on typical wind speeds. These classes range from Class 1 (the lowest) to Class 7 (the highest). In general, at 50 meters, wind power Class 4 or higher can be useful for generating wind power with large turbines. The map indicates that North Dakota has wind resources consistent with utility-scale production. Good-to-excellent wind resource areas are located throughout North Dakota; winds within the proposed Project vicinity generally consist of Class 4 and 5 winds (USDOE 2014).

5.3 Wind Characteristics in Project Area

Brady Wind II has utilized wind data from meteorological towers in the vicinity of the Project Area to characterize the wind resource. Brady Wind II has secured information from other long-term references to aid in correlating the wind data on site, including 30-year re-analysis data processed by the National Aeronautics and Space Administration (NASA) and processed by NEER. Industry standard software, such as Windographer, Openwind, WRF, and ArcGIS as well as internal NEER tools 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 Area effects to predict the spatial wind variations in the Project Area. Various site layouts and wind turbine generator parameters can be tested to predict energy production and array efficiency to optimize the site layout and turbine selection.

Proposed Project site data have been compared to regional wind measurements using a parallel time period. Based on analysis by NEER's internal wind resource group, there is good correlation between the long-term wind measurements and the short-term Project-specific wind measurements.

6. ENGINEERING AND OPERATIONAL DESIGN ANALYSIS

This section provides a summary description of the proposed Project, which includes a description of the proposed Project layout, turbines, electrical system, and associated facilities. Additional design components addressed in this section are proposed Project construction, schedule, operation, and decommissioning of the site. There are other turbines that are feasible choices for the Project Area that are available from various manufacturers and Brady Wind II wishes to reserve the right to select alternative turbines representative of the 2.1 MW and 1.79 MW Xle class of wind turbines. Turbine type may affect the number and configuration of the turbine array. Details for the GE 2.1 MW and 1.79 MW Xle turbines are presented below.

6.1 Proposed Project Layout and Associated Facilities

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

Land will be graded on site for the turbine pads. Drainage systems, access roads, storage areas, and construction laydown/turbine storage areas will be installed as necessary to fully accommodate all aspects of construction, operation, and maintenance.

Electrical system design and interconnection details will be determined as a result of studies and discussions with Basin. The proposed Project includes a computer-controlled communications system, the Supervisory Control and Data Acquisitions System (SCADA), which permits automatic independent operation and remote supervision, thus allowing the simultaneous control of many wind turbines. Brady Wind II will be responsible for O&M for the life of the proposed Project and will contract with an appropriate supplier of O&M services at the time of operation, to ensure timely and efficient operations.

6.2 Description of Wind Turbines

The proposed Project is currently designed to include a total of 72 turbines; 65 GE 2.1 MW and 7 GE 1.79 MW Xle turbines. Brady Wind II is seeking flexibility from the PSC to select the most appropriate technology for the proposed Project at the time of construction to ensure optimization of wind and land resources and cost efficiency.

6.2.1 Turbine

Both turbine models will have a hub height of 262 feet (80 meters); the 2.1MW turbines will measure 453 feet from the base of the tower to the tip of the upright blade (**Figure 7**), and the 1.79MW turbines will measure 427 feet.

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 the proposed Project 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. Brady Wind II will maintain a computer program and database for tracking each wind turbine's operational history.

Other specifications of the turbines include:

- Rotor blade pitch regulation
- Gearbox with three-stage planetary/helical system
- Double fed three-phase asynchronous generator and an asynchronous 4-pole generator with a wound rotor
- A braking system for each blade (three self-contained systems) and a fail-safe disc brake
- 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 2.1 MW turbines have a 116-meter (381 feet) rotor diameter, with a swept area of 10,568 square meters (113,753 square feet) and a rotor speed between 8 to 15.7 revolutions per minute (rpm). The 1.79 MW turbines have a 100-meter (328 feet) rotor diameter, with a swept area of 5,346 square meters (57,544 square feet) and a rotor speed of 16.8 rpm.

6.2.3 Turbine Tower

The turbine towers will all be conical tubular steel with a hub height of up to 80 meters (262 feet). The portion of the foundation that is above ground is 15 to 16 feet wide at the base of the tower. 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 American National Standards Institute 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 will be grounded and shielded to protect against lightning. The grounding system will be installed during foundation work, must be designed for local soil conditions, and must be in accordance with local utility or code requirements. Lightning receptors are placed in each rotor blade and in the turbine 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 step up the voltage to the power collection line voltage of 34.5kV. The power from these transformers will be run through an underground collection system consisting of various sized buried cables that are generally located alongside the proposed Project access roads. Collection lines will be buried 42 to 48 inches deep and will not affect farming equipment. At the point where the access and public roads meet, the collection system will continue as underground lines. All the collection system cables will terminate at the proposed Brady Wind Energy Center substation, where additional substation equipment will be installed to accommodate the proposed Project. The substation will include power transformers to step up the voltage from 34.5kV to 230kV and provides the necessary protection and control for interconnection to the transmission grid. The Brady Wind Energy Center substation is proposed to be located along 109th Avenue SW in the northwest quarter of Section 25 in Township 137 North, Range 96 West. The proposed Brady Wind Energy Center substation and transmission line are proposed in separate permit applications currently being reviewed by the PSC.

All utility protection and metering equipment will meet Brady Wind II and National Electrical Safety Code standards for parallel operations. The construction manager will ensure that proper interconnection protection is established.

6.4 Proposed Project Construction

Several activities must be completed prior to the proposed commercial operation 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 proposed Project. Pre-construction, construction, and post-construction activities for the proposed Project include:

- Ordering of all necessary components including turbine 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 underground feeder lines
- Design and construction of the proposed Project substation facilities (to be installed within the proposed Brady Wind Energy Center substation's 8-acre parcel)
- Installation of turbine tower foundations
- Installation of underground and aboveground junction boxes
- Turbine tower placement and wind turbine setting
- Acceptance testing of facility
- Commencement of commercial operation

Private turbine access roads will be built adjacent to the turbine towers, allowing access to the turbines during and after construction. Access roads will be typically 16 feet wide,² 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 proposed 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 construction personnel. Brady Wind II estimates that there would be approximately 50 additional trips per day in the area during peak construction periods. That volume would occur during the peak time when the majority of the road, foundation and turbine tower assembly is 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 proposed Project. The EPC contractor will use the services of local contractors, where possible, to assist in 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
- Forecast 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 modifications. The EPC contractor will also oversee the installation of roads, concrete foundations, turbine towers, 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 Project construction consists of the following tasks:

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

² Roads required to support crane access to turbines during operation would remain up to 38 feet wide; all other roads may be built at 16 feet wide or reduced later to 16 feet.

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 proposed Project development and the construction teams. The on-site Project construction manager will help to coordinate all aspects of the proposed Project, including ongoing communication with local officials, citizens groups and landowners. Even before the proposed Project becomes fully operational, the O&M staff will be integrated into the construction phase of the proposed 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-foot) 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 ten feet below grade. The wind turbine foundation design will be prepared by a registered professional engineer licensed to practice in the State of North Dakota.

6.4.3 Civil Works

Completion of the proposed 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 Area
- 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
- Installation of any site fencing and security
- Restoration and revegetation of disturbed land when construction activities have been completed

Any improvements to existing public access roads would consist of re-grading and filling 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. Turbine access roads 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 16 to 38 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 has been completed, the roads will be re-graded, filled, and dressed as needed.

6.4.4 Commissioning

The proposed Project will be commissioned after completion of the construction phase. The proposed 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.

6.4.5 Proposed Project Operation and Maintenance

Brady Wind II will operate the wind energy facility for the life of the proposed Project. Approximately four to six people will be employed on site to operate and maintain the facility. The O&M staff will have full responsibility for the facility to ensure O&M are conducted consistent with the applicable permits, prudent industry practice, and equipment manufacturer recommendations for the turbines.

In addition to the on-site O&M staff, NEER's Fleet Performance and Diagnostic Center (FPDC) will control, monitor, operate, and maintain the proposed Project remotely by means of a SCADA computer software program. The operation of the entire wind farm, including discrete settings for individual turbines, is managed by the onsite operations staff and remotely via the FPDC.

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
- Provide information reporting on a regular basis

Maintenance Schedule

Brady Wind II's on-site operations staff will be responsible for the maintenance of the proposed Project on a daily basis. This monitoring will be accompanied by visual inspections by the on-site operating staff. Several daily checks will be made in the first 3 months of commercial operation to verify that the proposed Project is operating within expected parameters. Once installed, the proposed Project service and maintenance is carefully planned and divided into the following intervals:

- A. First Service Inspection.** The first service inspection will take place 1 to 3 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.
- B. Semiannual Service Inspection.** Regular service inspections commence 6 months after the first inspection. The semiannual inspection consists of lubrication and a safety test of the turbine.
- C. 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 finding is recorded.
- D. Two-Year Service Inspection.** The two-year service inspection consists of the annual inspection, plus checking and tightening of terminal connectors.
- E. Five-Year Service Inspection.** The five-year inspection consists of the annual inspection, an extensive inspection of the wind braking system, and checking and testing of oil and grease, balance check, and tightness of terminal connectors.

6.4.6 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 of the wind turbines and of 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 proposed Project structures, access roads, drainage systems and other facilities necessary for the Project operation
- Maintenance of all O&M field maintenance manuals, service bulletins, revisions, and documentation for the proposed Project

- Maintenance of all parts, price lists, and computer software
- Maintenance and operation of Project substation facilities (located within the Brady Wind Energy Center Substation being permitted as part of the Brady Wind Energy Center's application)
- Provision of 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
- Cooperation with avian and other wildlife studies as may be required, to include reporting and monitoring
- Management of lubricants, solvents, and other hazardous materials as required by local and/or state regulations
- Maintenance of appropriate levels of spare parts to maintain equipment. Order and maintain spare parts inventory
- Provision of all necessary equipment including industrial cranes for removal and reinstallation of turbines
- Hiring, training, and supervision of a work force necessary to meet the general maintenance requirements
- Implementation of appropriate security methods
- Remote monitoring on a daily basis

6.5 Decommissioning and Restoration

Brady Wind II will develop a Decommissioning Plan in accordance with NDCC 49-02-27, NDAC 69-09-09, and Hettinger County Special Provisions 6.14.8 of the 2012 Land Use Regulations. Additionally, Brady Wind II has a contractual obligation to the landowners to remove the wind facilities, including foundations to a depth of three feet below ground, when the wind easement expires and to restore the area to the same physical condition that existed immediately before the construction of the turbines. Brady Wind II also reserves the right to explore alternatives regarding decommissioning at the end of the proposed Project's Certificate term. For example, 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.

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 Project Area were generated that indicate the presence or absence of many of the criteria highlighted in NDCC 69-06-08-01.

7.1 Description of Environmental Setting

The proposed Project Area is located in northwestern Hettinger County and southern Stark County in western North Dakota, a primarily rural agricultural area located approximately 15 miles south of Dickinson, North Dakota.

7.2 Socioeconomics

7.2.1 Description of Resources

The proposed Project is located in a primarily rural agricultural region in the northwestern portion of Hettinger County and the southern portion of Stark County, North Dakota, and is immediately adjacent to the Slope County boundary to the west. The Project Area is located between U.S. Highway 85 to the west and State Highway 8 to the east; and, State Highway 22 crosses through the west central Project Area. There are no incorporated communities within the Project Area. The Project Area is approximately 3 miles northeast of the small community of New England (2010 population 600) (U.S. Census Bureau 2015a). The unincorporated communities of Lefor and Scheffield (part of the Dickinson Micropolitan Statistical Area, 2010 population 24,982; U.S. Census Bureau 2015a) are located north of the Project Area in Stark County. There are approximately 16 occupied residences in the Project Area.

Hettinger County had a population of 2,477 persons in 2010, a decrease of 8.7 percent from the 2000 population (U.S. Census Bureau 2015a). Recent 2014 estimates indicate the population is increasing (2,660 persons). The county contains 1,134 square miles of land, with a density of approximately 2.2 persons per square mile. The majority of the county population resides in the cities of New England (600) and Mott (721), located approximately 3.5 miles southwest, and 21 miles southeast of the proposed Project, respectively (U.S. Census Bureau 2015a). The population density within the rural area surrounding the Project Area is much lower than the county average. Approximately 96 percent of the population of Hettinger County is composed of white persons who are not of Hispanic or Latino origin. As of 2014, it is estimated that approximately 26 percent of the county population is 65 years or older, while approximately 5 percent of the population is under 5 years of age (U.S. Census Bureau 2015a).

Stark County had a population of 24,199 persons in 2010, a 6.5 percent increase from the 2000 population (U.S. Census Bureau 2015a). The county contains 1,335 square miles of land, with a density of approximately 18 persons per square mile. The majority of the county population and

the Dickinson Micropolitan Statistical Area (73 percent and 72 percent, respectively) resides in Dickinson, located approximately 15 miles north of the proposed Project (U.S. Census Bureau 2015a). The population density within the rural area surrounding the Project Area is much lower than the county average. Approximately 94 percent of the population of Stark County is composed of white persons who are not of Hispanic or Latino origin. As of 2014, it is estimated that approximately 13 percent of the county population is 65 years or older, while approximately 8 percent of the population is under 5 years of age (U.S. Census Bureau 2015a).

According to the 2013 U.S. Census Bureau American Community Survey (U.S. Census Bureau 2015b) over 15 percent of the Hettinger County workforce worked in education, health, and social services, and over 28 percent worked in agriculture, forestry, fishing and hunting, and mining. Retail trade accounted for approximately 12 percent of the jobs in the county. Per capita income estimated in 2013 was \$27,910 and the median household income was \$47,743 (U.S. Census Bureau 2015b). In 2013, approximately 10.7 percent of the county population lived below the poverty level (U.S. Census Bureau 2015b), compared to 15.4 percent nationwide (U.S. Census Bureau 2015c).

According to the 2013 U.S. Census Bureau American Community Survey (U.S. Census Bureau 2015b) over 20 percent of the Stark County workforce worked in education, health, and social services, and over 14 percent worked in agriculture, forestry, fishing and hunting, and mining. Retail trade accounted for approximately 10 percent of the jobs in the county. Per capita income estimated in 2013 was \$31,412 and the median household income was \$62,559 (U.S. Census Bureau 2015b). In 2013, approximately 7.6 percent of the county population lived below the poverty level (U.S. Census Bureau 2015b), compared to 15.4 percent nationwide (U.S. Census Bureau 2015c).

Agriculture continues to play a significant role in both counties' land use and economy. In 2012, there were 494 farms in Hettinger County, comprising approximately 99 percent of the land area. According to the 2012 Census of Agriculture (USDA 2012), total market value of agricultural products produced in Hettinger County was \$159,032,000, 91 percent of which was from crops and 9 percent from livestock sales. The primary livestock is cattle and the principal crops include wheat and spring wheat. Canola, durum wheat, and corn are also grown. In 2012, there were 837 farms in Stark County, comprising approximately 97 percent of the land area. According to the 2012 Census of Agriculture (USDA 2012), total market value of agricultural products produced in Stark County was \$152,583,000, 78 percent of which was from crops and 22 percent from livestock sales. The primary livestock is cattle and the principal crops include wheat and spring wheat. Winter and durum wheat are also grown.

7.2.2 Impacts

No residents will be displaced due to the proposed Project. The proposed Project will have positive economic impacts for the local population, including lease and royalty payments for participating landowners, employment, and property and sales tax revenue.

Brady Wind II estimates that the proposed Project will provide over \$21 million in tax revenue to Hettinger County over 30 years. In addition, the proposed Project will create approximately 200 construction jobs and up to 7 permanent full-time jobs. The proposed Project will also provide over \$24 million in payments to participating landowners over 30 years, which will not only benefit those landowners, but also the local economy as that money is reinvested in local goods and services.

Up to 74 acres of the total Project Area would be permanently affected due to conversion to turbine sites, access roads, junction boxes, and the permanent meteorological towers. Landowner compensation has been established under individual lease agreements, and includes compensation for crop damage during surveys and construction. 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 is expected to provide stability to farm incomes and thus would help ensure the continued viability of farming in the Project Area. Proposed Project construction would not cause additional impacts to leading industries within the Project Area. There is no indication that any minority or low-income population is concentrated in any one area of the proposed Project, or that the wind turbines would 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 Hettinger and Stark counties will contribute to the total personal income of the region. Additional personal income will be generated for residents in the counties 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 counties and the state.

Up to 200 construction workers are expected to be required for approximately 6 months for construction of the proposed Project. It is likely that general skilled labor is available either in the counties or the state to serve the basic infrastructure and site development needs of the proposed 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 Dickinson or the city of New England. Operation and maintenance of the facility is anticipated to require five to seven full-time employees in addition to those employed by the Brady Wind Energy Center, most of whom are expected to reside locally. Sufficient permanent housing is available within the host and surrounding counties to accommodate these new employees.

Long-term beneficial impacts to the counties' tax bases 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 has been important in diversifying and strengthening the economic base of southeast North Dakota. In addition, establishing the central region of North Dakota as an important producer of renewable energy, such as wind, has spurred the development of wind-related businesses in the area and in turn contribute to the economic growth in the region; there are at least four wind energy-related manufacturing facilities in North Dakota (AWEA 2015b).

7.2.3 Mitigative Measures

Socioeconomic impacts associated with the proposed Project would be primarily positive, with an influx of wages and expenditures made at local businesses during the proposed Project construction and an increase in the counties' 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. No mitigation is therefore necessary.

7.3 Land Use

7.3.1 Description of Resources

The land in Hettinger and Stark counties within the Project Area boundary is primarily agricultural with scattered farmstead residences. The proposed Project will be located on privately owned land in northwestern Hettinger County and southern Stark County, approximately 15 miles south of Dickinson, and 3 miles northeast of New England. Brady Wind II proposes to install a 150-MW wind generating facility, consisting of up to 72 wind turbines within a 41-square mile (26,316-acre) Project Area. Current land use within the Project Area is primarily agricultural, supporting both crops and livestock grazing. No city limits are within the Project Area. The Project Area is not within or near any known military installation.

Natural resource development in the Project Area consists primarily of agriculture. There are coal reserve/deposits, clay resource deposits, and one sand and gravel sites within the Project Area. Agricultural production and limited oil/gas production are anticipated to continue in the future.

Table 12 and **Figure 10** identify land cover as an indicator of land uses in the Project Area based on 2011 US Geological Survey (USGS) National Land Cover Database (NLCD). Land cover in the Project Area is dominated by cultivated crops (51 percent), followed by grassland/herbaceous (32 percent). Pasture/hay land and developed, open space land are also present but limited, accounting for 11 and 4 percent of the Project Area, respectively. Forest, shrub/scrub, wetland, and water categories were each 1 percent or less of the Project Area.

Table 12. Land Cover within the Project Area

Land Cover	Acreage	Percent of Project Area
Cultivated Crops	13,435	51%
Grassland/Herbaceous	8,382	32%
Pasture/Hay	2,848	11%
Developed, Open Space	1,077	4%
Shrub/scrub	256	1%
Woody Wetlands	235	1%
Deciduous Forest	49	<1%
Developed, Low Intensity	13	<1%
Emergent Herbaceous Wetlands	12	<1%
Open Water	4	<1%
Evergreen Forest	3	<1%
TOTAL	26,316	

Source: Homer et al. 2015.

The National Resource Conservation Service (NRCS) administers a number of conservation-based programs for private landowners. The Conservation Reserve Program (CRP) is a program administered by the US Department of Agriculture (USDA) Farm Service Agency (FSA) in coordination with NRCS that provides technical and financial assistance to eligible farmers and ranchers to address soil, water, and related natural resource concerns on their lands in an environmentally beneficial and cost-effective manner. The 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. The FSA does not distribute the location of CRP lands without written authorization. According to the USDA FSA, approximately 75,085 acres of land in Hettinger County were active in the CRP program as of December 2015, and 34,198 acres were active in Stark County (USDA FSA 2015). Brady Wind II will confirm enrollment of lands within the proposed Project footprint in the CRP or other NRCS easement programs with participating landowners prior to negotiating final easements.

7.3.2 Impacts

The development of the proposed Project would not result in a significant change in land use. The development of the proposed Project would not displace any residents or existing or planned industrial facilities. Wind turbines will be sited a minimum of 2,000 feet from occupied residences. The area would largely retain the rural characteristics of the vicinity. At other wind developments in North Dakota, landowners frequently plant crops and/or graze livestock to the edge of the access roads and turbine pads. The access roads will be between 16 and 38 feet wide³ and low profile to allow cross-travel by farm equipment. Brady Wind II will work closely with landowners in locating access roads to minimize land use disruptions to the extent

³ Roads required to support crane access to turbines during operation would remain up to 38 feet wide; all other roads may be built at 16 feet wide or reduced later to 16 feet.

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.

It is estimated that installation of up to 72 turbines and the associated access roads, and meteorological towers would result in the permanent conversion of up to 74 acres of land. An additional 973 acres are estimated to be temporarily disturbed during the construction phase of the proposed Project, and would be reclaimed. The temporary disturbance is primarily for installation of the turbines, road construction, collection line trenching, and four temporary meteorological towers.

7.3.3 Mitigative Measures

Brady Wind II is working closely with landowners and seeking input from local, state, and federal 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 would 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 Government Services

The proposed Project is located in a sparsely populated, rural area in western 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 proposed Project. There are no incorporated communities within the Project Area. The closest communities are the small unincorporated community of New England, located approximately 3 miles south/southwest; and the communities of Scheffield and Lefor, located approximately 3 miles northeast and 7 miles north, respectively. New England, Scheffield, and Lefor are located approximately 4 miles, 3 miles, and 4 miles, respectively, from the nearest proposed Project turbines. Dickinson, the county seat of Stark County, is located approximately 15 miles north of the Project Area. Dickinson provides sanitary sewer, water, utility services, educational facilities, and recreational facilities and parks to its residents and visitors. Dickinson's local services include emergency services, ambulance service, a hospital, clinics, a landfill, and a police department. New England provides many of these services for the homes in the Project Area, and the Project Area is located in the New England School District.

Electrical Service

Rural electrical service in the Project Area is provided by Slope Electric Cooperative, Inc.

Roads

County and township (section line) roads characterize the existing roadway infrastructure in and around the proposed Project. The Project Area is accessed via I-94, U.S. Highway 85, State

Highway 22, State Highway 21, State Highway 8, and other local two-lane paved and gravel county roads.

Traffic

Existing traffic volumes on the area's major roadways are documented on **Figure 11**. A select set of existing traffic volumes on roads most likely to be utilized by Project-related traffic is provided in **Table 13**. General estimates of highway capacity 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 Annual Daily Traffic (AADT).

Additional county and township roads run through the Project Area, 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 AADT are rarely counted. According to NDDOT, vehicle counts on routes with no count data are likely lower than those with count data.

Table 13. Existing Daily Traffic Levels

Roadway Segment	Existing AADT/Commercial Truck Traffic
State Highway 22 north of Project Area	1,910/N/A
State Highway 22 south of Project Area	1,835/N/A
State Highway 22 north of New England	1,850/495
12 th Street west of Highway 22	340/N/A
State Highway 22 through New England	1,530/215
State Highway 21 through New England	485/75
3 rd Avenue East north of Elevator Road	100/N/A
50 th Street Southwest east of State Highway 22	50/10
51 st Street Southwest west of State Highway 22	75/10
55 th Street Southwest east of State Highway 22	25/N/A

Source: 2014 Traffic Volumes (NDDOT 2014).

N/A = data not available

Water Supply

The Southwest Water Authority supplies potable water to communities within and near the Project Area. Brady Wind II would likely obtain water for construction from the Southwest Water Authority; water would be trucked to the construction site. Brady Wind II will consult with the Southwest Water Authority to determine the location of Southwest Pipeline Project facilities within the Project Area. If proposed Project facilities cross the Southwest Pipeline Project, Brady Wind II will obtain a Southwest Pipeline crossing permit from the Southwest Water Authority.

Communications

With the switch to digital television in 2009 throughout the United States, the concern of ghost images and flickering that may be caused by wind turbine interference with analog signals is no longer an issue.

In December 2015, Brady Wind II conducted a preliminary telecommunications study to identify all non-federal microwave telecommunication systems within the Project Area. There are several beam paths crossing the Project Area (**Appendix B**).

7.4.2 Impacts

The proposed 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 proposed Project.

Local Government Services

No impact is expected to local services.

Electrical Service

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

Roads

Construction of the proposed Project will require approximately 30.5 miles of new aggregate-surfaced access roads. During operation of the proposed 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 turbine towers, offset as necessary to allow for adequate crane access. One road will be required for each string of turbines. Although a 38-foot wide temporary disturbance area is likely during construction, the permanent access roads will primarily be 16 feet wide and low profile to allow cross-travel by farm equipment.

Traffic

There will be a temporary increase in truck traffic during construction activities. The maximum construction workforce is expected to generate approximately 50 additional vehicle trips per day on each road within the Project Area. Using any combination of state and county highways and other township roads throughout the Project Area, the traffic impacts are considered negligible. Approximately 30 concrete trucks will be required to pour the foundation for each turbine. This is typically completed within two days per foundation. While there may be some noticeable increase in heavy vehicle traffic in discrete locations for limited amounts of time, for the Project Area as a whole, the capacity of route and level-of-service to the traveling public will be negligible as any combination of state and county highways and other township roads throughout the Project Area will be used.

Truck access to the proposed Project site is provided by Highway 22, which runs north and south through the center of the Project Area. Specific additional truck routes will be dictated by delivery location. Additional operating permits will be issued by the state or county for over-sized truck movements.

Water Supply

Construction and operation of the proposed Project will not significantly impact local water supply. Construction of the proposed Project would require approximately 3 million gallons of water for foundations, backfill, and compaction; 5 million gallons of water for road construction and civil infrastructure; and 10 million gallons of water for dust control. Construction water estimates are subject to change due to final site investigation and weather. The construction water would be brought on site via trucks, most likely from the Southwest Water Authority, the city of Dickinson, or the city of New England. Water for operation of the O&M facility would be obtained from the Southwest Water Authority. The abandonment of wells is not required for the proposed Project. The proposed Project will not require appropriation of surface water or permanent dewatering. Temporary dewatering of groundwater may be required during construction of turbine foundations.

Communications

Telephone and fiber optic cables within the Project Area will be located in the field by the respective utility companies prior to construction and would not be negatively affected during construction.

Brady Wind II contacted the National Telecommunications and Information Administration (NTIA) regarding the proposed Project in October 2015. In its response in December 2015, NTIA concluded that after a 45+ day period of review, no agencies had issues with turbine placement in this area stating No Harmful Interference Anticipated (NHIA). This correspondence is included in **Appendix C**.

No impacts to FCC-licensed microwave beams are anticipated from the proposed Project turbines because a setback of blade length (56.9 meters for the 2.1 MW turbines) plus 10 meters (total 66.9 meters, or 219.5 feet) has been incorporated in the turbine layout.

The extent of the interference created by wind turbines on AM and FM radio and television has been gradually diminished over the past decade due to advances in turbine manufacturing and transmitter/receiver antenna design. This has reduced the impact on AM and FM radio systems to the point where only small degradation of signal is noticed a few meters from a turbine location. Coverage of AM and FM radio services are not expected to be impacted by the wind farm because turbines will be constructed a sufficient distance from each dwelling. With the switch to digital television in 2009, the concern of ghost images and flickering caused by wind turbine interference with analog signals is no longer an issue.

7.4.3 Mitigative Measures

Construction and operation of the proposed Project will be in accordance with all applicable local, state, and federal permits and laws, as well as industry construction and operation standards. Given the minor impacts expected on the existing communications infrastructure during construction and operation of the proposed Project, additional mitigation measures are not required.

Local Government Services

With the addition of substation and transmission capacity associated with the proposed Brady Wind Energy Center, no impact to local services is anticipated, and no mitigation is required.

Electrical Service

Brady Wind II will purchase station service from Slope Electric Cooperative, which will suggest appropriate configurations for the electrical system that Brady Wind II will abide by to prevent impacts to the transmission system. Brady Wind II has established a setback of 498.3 feet (110 percent the turbine height) from existing transmission lines (**Table 10**). No additional mitigation is necessary.

Roads

Brady Wind II is working closely with local landowners to locate access roads to minimize land-use disruptions to the extent possible. The preliminary layout of the turbines and access roads is shown in **Figure 3**.

Traffic

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

Water Supply

The abandonment of wells is not required for the proposed Project. However, 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).

Communications

Collection and telecommunication lines will be buried underground to avoid collisions, to the extent practicable. An underground utilities locator company will be contacted prior to construction to locate and avoid underground facilities. To the extent proposed Project facilities cross or otherwise affect existing communications systems, Brady Wind II will enter into agreements with service providers as necessary to avoid interference with their facilities.

7.5 Human Health and Safety**7.5.1 Description of Resources****Air Traffic**

There are no public airports or no private airports/airstrips within 6 nautical miles of the Project Area. Nautical miles are the standard measure for aviation; 1 nautical mile is equal to 1.15 statute miles. The nearest airport certified for commercial carrier operations is the Dickinson–Theodore Roosevelt Regional Airport, located 3.5 miles south of Dickinson and approximately 8.4 nautical miles north of the Project Area.

Federal Radar Interference

Wind turbines may interfere with radar systems and airspace navigation. Tetra Tech queried the online Department of Defense (DoD) Preliminary Screening Tool to obtain a preliminary review of potential impacts to Long Range Radar (FAA 2015). The latitude and longitude of a polygon encompassing the Project Area was submitted for review.

The Federal Aviation Administration (FAA) reviews potential impacts to DoD radar as part of its aviation hazard review of structures that file a Notice of Proposed Construction or Alteration (FAA Form 7460-1). The FAA will request that the DoD and the U.S. Department of Homeland Security (DHS) review the filing and may issue a Notice of Presumed Hazard if the DoD and DHS determine that impacts to radar are considered significant. The impact of a wind energy project on radar systems primarily depends on the distance to the radar, and the number and configuration of the turbines.

Electromagnetic Fields

Use of electricity in our everyday lives creates electric and magnetic fields (EMF). Electric and magnetic fields occur both naturally and from man-made sources. Power lines and utility facilities are among several sources of EMF. People are exposed to EMF from many sources at many different levels and durations throughout their daily environments. These sources include kitchen and home appliances, wiring in buildings, power lines and utility facilities, and electrical equipment and devices used at workplaces. Examples of natural sources of EMF include static electricity and the earth's static magnetic field which guides a compass needle.

Shadow Flicker

A wind turbine's moving blades can cast a moving shadow on locations within a certain distance of a turbine. These moving shadows are called shadow flicker, and can be a temporary phenomenon experienced by people at nearby residences or public gathering places. The impact area depends on the time of year and day (which determines the sun's azimuth and altitude angles) and the wind turbine's physical characteristics (height, rotor diameter, blade width, and orientation of the rotor blades). Shadow flicker generally occurs during low angle sunlight conditions, typical during sunrise and sunset times of the day.

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 farm dumps and agricultural chemicals. A Phase I Environmental Site Assessment (ESA) will be conducted in the Project Area in prior to construction to identify any recognized environmental conditions that may exist.

Potentially hazardous materials associated with the proposed 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 Area is located in an area that has a low population density. Construction and operation of the proposed Project would have minimal impact 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. The wind turbines and meteorological towers will have lighting and markings that comply with FAA requirements and the FAA's review will include the evaluation of any potential interference with air traffic. Brady Wind II will submit Notices of Proposed Construction or Alteration to the FAA for all proposed Project turbines.

Federal Radar Interference

The proposed Project is not anticipated to impact Air Defense and Homeland Security radars. The results of the Preliminary Screening Tool indicate that the entire Project Area appears as green on the map produced by the screening tool (**Appendix B**).

National Weather Service Radar

The results of the Preliminary Screening Tool indicate that no impacts are to Weather Surveillance Radar—1988 Doppler (WSR-88D) weather radar operations. The National Oceanic and Atmospheric Administration will not perform a detailed analysis, but that agency requested that they be made aware of the proposed Project. The entire search area appears as green (no impact) on the map produced by the screening tool (**Appendix B**).

Military Training Routes and Special Use Airspace

From the results of the Preliminary Screening Tool it was determined that impacts to military airspace are unlikely (**Appendix B**).

Electromagnetic Fields

There have been thousands of scientific studies related to EMF. One of the largest EMF research and evaluation programs (\$45 million) was established by the U.S. Congress in 1992 and was completed by the U.S. National Institute of Environmental Health Sciences (NIEHS) in 1999. None of these organizations has found that exposure to power frequency EMF causes or contributes to cancer or any other disease or illness. Low-level power frequency EMF will occur around the wind turbine generators (in the nacelles), around the GSU transformers, along the collection lines and at the proposed Project substation equipment. All proposed Project facilities will be set back from residences as required by state and county regulation. At these distances, EMF levels will not be above background levels. The only exposure would be brief exposure to maintenance workers, primarily at the substation. Based on the above, no significant adverse impacts are anticipated.

Shadow Flicker

Shadow flicker impacts are not regulated in applicable county, state, or federal law, and there is no permitting threshold with regard to hours per year of anticipated impacts to a receptor from a

wind energy project. An analysis of potential shadow flicker impacts from the proposed Project turbine layout dated December 8, 2015, was conducted using the WindPro software package. The WindPro analysis was conducted to determine shadow flicker impacts under realistic impact conditions (actual expected shadow flicker, which accounts for historical sunshine probability, wind speed, and wind direction). This analysis calculated the total amount of time (hours and minutes per year) that shadow flicker could occur at receptors out to 2,500 meters (8,202 feet). The analysis assumes that the receptors all have a direct in line view of the incoming shadow flicker sunlight and does not account for trees or other obstructions that may block sunlight.

A total of 139 structures were identified within and near the Project Area; of these, 89 were determined to be occupied residences and are considered potential shadow flicker receptors for the purpose of this analysis. The predicted shadow flicker impacts are less than 30 hours per year (the industry's generally accepted standard and the standard that has been used by the PSC) at all occupied receptors. The maximum predicted shadow flicker impact at any occupied residence receptor is 20 hours and 59 minutes per year. As a result of the analysis, no significant shadow flicker impacts are anticipated to sensitive receptors.

Hazardous Materials/Hazardous Waste

A Phase I ESA will be conducted and results will be used to minimize risk associated with potential recognized environmental conditions that may pose a threat to human health and safety. Significant findings are not anticipated due to the known historic uses of the property.

Security

Proposed Project construction and operation would have minimal impacts to the security and safety of the local communities because of the setbacks that have been incorporated in the Project design.

7.5.3 Mitigative Measures

Air Traffic

Brady Wind II will submit Form 7460-1 to FAA for each turbine to determine whether the proposed Project layout and lighting would impact navigable airspace or communications technology used in aviation operations. The response from FAA will be submitted to the PSC 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

Because no significant adverse impacts are anticipated, no mitigative measures are proposed at this time.

Shadow Flicker

The primary mitigation measure used to minimize shadow flicker from wind turbines is setback distance. Brady Wind II is committed to a 2,000-foot setback distance from all existing occupied residential structures, which is more conservative than the 1,320-foot setback required by

Hettinger County. Because no significant impacts are anticipated, no additional mitigation is proposed at this time.

Hazardous Materials / Hazardous Waste

Because 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.

As with any construction activity, there is the possibility of accidentally spilling fuel, hydraulic fluid, or other hazardous substances during construction of the proposed Project. The potential of such events will be minimized through implementation of a Spill Prevention, Control, and Countermeasures (SPCC) plan, which will include the following:

- Construction equipment will be equipped with spill cleanup kits.
- Equipment refueling will take place at secure areas, away from wetlands or drainages.
- Workers will be trained in spill cleanup and the use of the spill cleanup kits.

These measures would help ensure that surface and groundwater quality is not degraded through inadvertent spillage of contaminants.

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 turbine towers will be placed at least 200 feet from road right-of-way and 2,000 feet from occupied homes. These distances are considered to be safe based on developer experience, and are consistent with the required local setbacks.
- Security measures will be taken during the construction and operation of the proposed 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 turbine tower is only through a solid steel door that will be locked when not in use.
- Where necessary or requested by landowners, Brady Wind II will construct gates or fences such as those around the collection substation.

7.6 Noise

7.6.1 Description of Resources

The Project Area is primarily rural and agricultural. There are approximately 89 occupied residences in the vicinity of the Project Area, of which 16 are located within the Project Area. The Project Area is approximately 3 miles northeast of the town of New England. There are no populated towns within the Project Area. The acoustic environment is defined primarily by Highway 22, which runs through the Project Area north to south, as well as aircraft flyover

events, farming equipment and local traffic. In addition to anthropogenic noise sources, the windy conditions of this site define a somewhat elevated ambient sound level, which increases with wind speed. Windy conditions can generate noise caused by the rustling of grass and tree leaves.

7.6.2 Impacts

The PSC's rules (NDAC 69-06-08-01(4)) specify that sound levels from a wind facility may not exceed 50 dBA within one hundred feet of an inhabited residence or a community building, unless waived in writing by the owner. According to the Special Provisions (Section 6.8) of the Hettinger County Land Use Regulations, sustained noise of over 75 decibels (dB) during the day and 65 dB at night is prohibited.

Wind turbine generators produce noise through a number of different mechanisms roughly grouped into mechanical and aerodynamic sources. Modern wind turbines include design features that minimize mechanical sound sources. The interaction of air and the turbine blades produces aerodynamic noise through a variety of processes as air passes over and past the blades. Unlike other sound sources, wind turbines generally radiate more noise as wind speed increases. However, at elevated wind speeds the wind tends to generate significant background noise by moving trees and grasses, which can create a masking effect and may aid in reducing the audibility of wind turbine sound.

In December 2015, an acoustic engineering analysis was developed to address sound levels resulting from wind turbine operations, as well as the consideration of sound from the electrical substation and sound generated during construction and maintenance activities.

Wind turbine operation was analyzed for the proposed Project employing the GE 2.1 MW turbine model and the planned Brady Wind Energy Center substation, in the northeast corner of the northwest quarter of Section 12, Township 139 North, Range 94 West. Noise specifications for the GE 2.3 MW turbine were used to represent the sound characteristics of the GE 2.1 MW turbine model in the acoustic model because the noise specifications for the GE 2.1 MW turbine were not available at the time of analysis, and the GE indicated that the sound characteristics of the GE 2.1 MW and 2.3 MW wind turbines would be comparable. Acoustic modeling was completed for the turbine layout dated December 8, 2015, at both wind turbine cut-in and maximum rotational conditions, inclusive of the entire range of future Project operational conditions. Project compliance was assessed at a total of 138 receptors in and near the Project Area, 89 of which were determined to be occupied structures.

The noise modeling results indicate that the received sound levels at all 89 occupied receptors are all below the North Dakota noise requirement (Chapter 69-06-08-01(4)), which prescribes a limit of 50 dBA within 100 feet of an inhabited residence. The highest modeled sound level for an occupied residence was 48 dBA.

Project construction may cause short-term but unavoidable noise impacts. The sound levels resulting from construction activities vary significantly depending on several factors such as the

type and age of equipment, the specific equipment manufacturer and model, the operations being performed, and the overall condition of the equipment and exhaust system mufflers. Sounds generated by construction activities are typically exempt from state and local noise oversight provided that they occur within weekday, daytime periods as may be specified under local zoning or legal codes. Reasonable efforts will be made to minimize the impact of noise resulting from construction activities.

Construction activity will generate traffic having potential noise effects, such as trucks traveling to and from the site on public roads. At the early stage of the construction phase, equipment and materials will be delivered to the site, such as hydraulic excavators and associated spreading and compacting equipment needed to form access roads and foundation platforms for each turbine. Once the access roads have been constructed, equipment for lifting the towers and turbine components will arrive. Traffic noise is categorized into two categories: (1) the noise that would occur during the initial temporary traffic movements related to turbine delivery, haulage of components and remaining construction; and (2) maintenance and ongoing traffic from staff and contractors, which is expected to be minor.

7.6.3 Mitigative Measures

The primary mitigation measure used for wind turbines is setback distance. Setback requirements set by the PSC, Hettinger County, and Stark County are listed in **Table 10**. Brady Wind II has applied a minimum 2,000-foot setback distance from all existing occupied residential structures. This exceeds setback requirements of Hettinger County (Hettinger County Land Use Regulations Section 6.14.6 (2)). It should be noted that the acoustic model conservatively predicts outdoor sound levels and assumes no shielding or attenuation by trees or other vegetation. If a complaint is registered and sound is measured above the 50 dBA level, Brady Wind II can provide improved insulation, landscaping, or other appropriate candidate mitigation measures.

7.7 Cultural and Archaeological Impacts

7.7.1 Description of Resources

Archaeological Resources

Tetra Tech performed a Class I Literature Review for archaeological and architectural resources for the Project Area and a 1-mile buffer around the Project Area. The file review was completed at the State Historical Society North Dakota in July and November 2015. This file review included identifying previously recorded archaeological sites identified during previous surveys, and historic structures, bridges, and cemeteries within the Project Area and within 1 mile of the Project Area.

The literature review identified 8 previously recorded archaeological sites and 7 site leads within the Project Area and a 1-mile buffer around the Project Area (**Table 14**). Site leads refer to resources that lack sufficient information to fully record and complete all necessary data fields on the North Dakota Cultural Resources Survey (NDCRS) site forms. Examples of site leads include: (1) locations recorded from various historic documents, (2) locations reported by a

landowner or other non-professional, (3) isolates, a location with five or fewer surface visible artifacts which, in the professional judgment of the archaeologist, is likely to be a limited surface expression of a former occupation area where most of the artifacts are still buried, and/or (4) locations recorded by a cultural resource specialist outside of their project area(s), and thus not fully recorded.

Of the 15 previously recorded archaeological resources, eight are recorded as prehistoric archaeological sites (cultural material scatters), one is recorded as a prehistoric rock feature site lead, and six are recorded as isolates. Of the previously identified cultural resources, six prehistoric sites and one isolate are located within the Project Area (**Table 14**).

Table 14. Previously Recorded Archaeological Sites and Isolates within the Project Area and within 1 Mile of the Project Area

Smithsonian Number	Resource Type	Description	Avoidance
Archaeological Sites within Project Area			
32HT28	Prehistoric	CM Scatter	Avoid direct impacts to site
32HT32	Prehistoric	CM Scatter	Avoid direct impacts to site
32HT69	Prehistoric	CM Scatter	Avoid direct impacts to site
32HT78	Prehistoric	CM Scatter	Avoid direct impacts to site
32SK86	Prehistoric	CM Scatter	Avoid direct impacts to site
23HTx79	Prehistoric	Other Rock Feature-Effigy	Avoid direct impacts to site
Archaeological Sites within 1 mile of Project Area			
32HT24	Prehistoric	CM Scatter	Avoid direct impacts to site
32HT25	Prehistoric	CM Scatter	Avoid direct impacts to site
32SK81	Prehistoric	CM Scatter	Avoid direct impacts to site
Isolates within Project Area			
32HTx137	Prehistoric	—	No further management necessary
Isolates within 1 mile of Project Area			
32SKx85	Prehistoric	—	No further management necessary
32SKx86	Prehistoric	—	No further management necessary
32SKx163	Prehistoric	—	No further management necessary
32SKx166	Prehistoric	—	No further management necessary
32SLx128	Prehistoric	—	No further management necessary

Note: CM = cultural material

Architectural Resources

The Class I Literature Review identified six architectural resources and four cultural resources leads within the Project Area and a 1-mile buffer around the Project Area. These resources consist of farmsteads, coal mines, and bridges. Of the identified resources, two farmsteads and one coal mine are within the Project Area (**Table 15**).

Table 15. Previously Recorded Architectural Resources within 1 Mile of the Project Area

Smithsonian Number	Resource Type	Description	Avoidance
Architectural Resources within the Project Area			
32HTx138	Euro American – Period Unknown	Abandoned Farmstead	Avoid direct impacts to site
32SK156	Euro-American – ca. 1900 to Present	Farmstead	Avoid direct impacts to site
32SKx89	Euro American - ca.1924	Coal Mine	Avoid direct impacts to site
Architectural Resources within 1 mile of the Project Area			
32HT79	Euro-American – ca. 1913 to Unknown	Abandoned farmstead	Avoid direct impacts to site
32HTx126	Euro-American—Period Unknown	Coal Mine	Avoid direct impacts to site
32SK85	Euro-American— ca. 1900 to Present	Farmstead	Avoid direct impacts to site
32SK113	Euro-American— 1948 to ca. 1995	Bridge	Avoidance is not recommended
32SK157	Euro-American— ca. 1900 to Present	Farmstead	Avoid direct impacts to site
32SK169	Euro-American— ca. 1900 to Present	Farmstead	Avoid direct impacts to site
32SKx201	Euro-American— ca. 1900 to Present	Farmstead	Avoid direct impacts to site

Class III Cultural Resources Inventory

A Class III Cultural Resources Inventory for both archaeology and architectural resources is currently underway. Brady Wind, LLC and Tetra Tech have coordinated with the State Historical Society of North Dakota (SHSND) on the appropriate scope and level of survey for the adjacent proposed Brady Wind Energy Center. The archaeology and architectural survey reports will be submitted to the SHSND for review and concurrence once complete, and will also be provided to the PSC. Brady Wind II will avoid directly impacting all National Register of Historic Places (NRHP)-eligible sites.

Native American Consultation

In November 2015, Brady Wind II sent a letter to the North Dakota Indian Affairs Commission notifying the agency about the proposed Project and the preparation of this application for a Certificate; no response has been received to date.

7.7.2 Impacts

Architectural Resources

An architectural historian conducted a survey of architectural resources within 2 miles of proposed Project turbines in November 2015. The proposed Project would not directly impact any architectural resources. A report that evaluates potential visual effects on historic properties is underway. This report will be submitted to the SHSND when complete for review and concurrence, and will also be submitted to the PSC.

Archaeological Resources

Brady Wind II will avoid newly documented sites and the previously documented cultural resources within the Project footprint. Avoidance buffers will be created for these sites and the buffers will be delineated prior to construction to ensure that historic properties are avoided. The pedestrian survey and shovel probing, if necessary, will be completed as weather permits in winter 2015–spring 2016 and the cultural resources inventory report will be submitted to the SHSND for review and concurrence in the once it is complete.

7.7.3 Mitigative Measures

The sites that will be avoided during construction will be fenced to reduce the potential that they are inadvertently disturbed.

An Unanticipated Discovery Plan will be prepared for the proposed Project that outlines the procedure that will be followed to prepare for and address any unanticipated discoveries of cultural resources, including previously and possible human remains. It will provide direction to on-site personnel and their consultants as to the proper procedure to follow in the event that unanticipated discoveries were to be made during construction of the proposed Project. No significant impacts to undiscovered archaeological sites are, therefore, anticipated from the proposed Project.

In the event that burials or cultural sites with Native American religious values are identified during construction of the proposed Project, construction would stop within 100 feet of the site and the site will be protected until SHSND and the North Dakota Indian Affairs Commission (NDIAC) are consulted, in addition to any involved Tribes that express interest in the proposed Project and identify a potential impact.

If confirmed or potential human skeletal remains are discovered, the Hettinger or Stark County Sheriff's office will be contacted. The Sheriff will call the North Dakota State Forensic Examiner to determine if the remains are associated with a crime scene. If the remains are determined not to be part of an active crime scene or investigation, the North Dakota Chief Archaeologist will be contacted.

7.8 Recreational Resources

7.8.1 Description of Resources

Recreational opportunities in Hettinger and Stark counties primarily include hunting and wildlife observation. The closest park to the Project Area is the Dickinson Reservoir-Edward Arthur Patterson Lake. Other recreation near the Project Area include the Old Red/Old Ten Scenic Byway and the Enchanted Highway. North Dakota Department of Trust Lands (School Trust Lands) are present within the Project Area.

The Dickinson Reservoir-Edward Arthur Patterson Lake is located on the Heart River, approximately 1 mile west of Dickinson and approximately 14 miles north of the Project Area. Recreational activities include boating, fishing, camping, and water sports (USBR 2015). The park is managed by the Dickinson Park and Recreation District.

The Old Red/Old Ten Scenic Byway is a state-designated byway located approximately 15 miles north of the Project Area. The byway is oriented east to west and parallels Interstate 94 east of Dickinson. The North Dakota Scenic Byways and Backways Program is a tourism program managed by the North Dakota Parks and Recreation Department and the NDDOT.

The Enchanted Highway is a local tourist attraction consisting of various roadside art sculpture installations placed along Stark County Highway 100 ½ SW, each with a parking area and kiosk. The Enchanted Highway is oriented north and south and begins at I-94 near Gladstone and terminates 30 miles south in the small town of Regent. The Enchanted Highway is located approximately 6 miles east of the Project Area. The two closest sculptures to the Project Area are Grasshoppers in the Field (six miles northeast). Fisherman's Dream (approximately 6 miles east), and Pheasants on the Prairie (6.7 miles southeast). The Enchanted Highway is not a federal or state designated scenic highway.

The North Dakota Game and Fish Department (NDGF) administers and regulates the Private Lands Open to Sportsmen (PLOTS) program to allow hunting access on private lands through lease agreements with landowners. PLOTS allow for walk-in hunting during legal hunting seasons. Two parcels of North Dakota Department of Trust Lands School Trust Lands occur within the Project Area (**Figure 12**). These lands are open to walk-in hunting unless otherwise posted with official State Land Department signage (North Dakota Department of Game and Fish 2015).

7.8.2 Impacts

No recreational resources will be directly affected by the proposed Project. Recreational impacts would be auditory and visual in nature and limited to individuals using public or private property in and near the Project Area for hunting, fishing, or nature observation. A photo of the typical landscape in the area of the proposed Project is provided in **Figure 13**. The turbines would introduce a new visual element into the landscape, but the area already has transportation and utility infrastructure such as transmission lines, railroads, and Interstate 94. There are also five existing wind farms in the vicinity of the proposed Project, including Thunder Spirit Wind Farm

south of the Project Area near Hettinger in Adams County, and the four-phased Bison Wind Energy Center northeast of the Project Area near New Salem in Oliver and Morton counties. The Brady Wind Energy Center is planned for the area directly north of the Project Area.

The Brady Wind Energy Center is planned to be located between the proposed Project and potential viewers located at the Dickinson Reservoir-Edward Arthur Patterson Lake and the Old Red/Old Ten Scenic Byway. Proposed Project components are not anticipated to be noticeable to the casual observer from these viewing locations because of distance, existing infrastructure, and topography.

Stark County's zoning ordinance includes a 1-mile setback from the Enchanted Highway for structures greater than 30 feet in height. This setback is significantly exceeded for the proposed Project: The easternmost Project Area boundary is approximately 6 miles west of the Enchanted Highway. Views of the proposed Project from the Grasshopper sculpture would be completely screened by an existing windrow located west of the parking area. Visual impacts are not anticipated for the Fisherman's Dream and Pheasants on the Prairie sculptures because viewers would be looking east towards the art installation and the Project Area would be located behind them. The proposed Project may be visible to travelers along the Enchanted Highway; however, views would be screened by topography and/or vegetation and would appear in the background. Portions of the proposed Project components that are visible may be noticeable to the casual observer, but at this distance they would appear as subordinate features in the landscape; therefore, the proposed Project would have no adverse effect to the Enchanted Highway.

The proposed layout does not have any Project facilities located on School Trust Lands, however, if Brady Wind II pursues an agreement for development of any Project facilities on this parcel, there would be no impact to recreation on these lands once construction is complete.

7.8.3 Mitigative Measures

Because the proposed Project is not anticipated to result in significant adverse impacts to recreational resources, no mitigative measures are proposed.

7.9 Effects on Land-Based Economies

7.9.1 Description of Resources

Agriculture/Farming

The majority of the Project Area is either pasture/hay or cropland (**Figure 10**). The principal crops include wheat and spring wheat; and alfalfa, canola, durum wheat, and corn are also grown.

Agriculture has historically played a dominant role in the local economy, and continues to play a significant role in the counties' land use and economy. In 2012, there were 494 farms in Hettinger County, comprising approximately 97 percent of the land area; approximately 78 percent of the land in farms is cropland, and 18 percent is pasture. According to the 2012 Census of Agriculture (USDA 2012), total market value of agricultural products produced in

Hettinger County was \$159,032,000, 91 percent of which was from crops and 9 percent from livestock sales. In 2012, there were 837 farms in Stark County, comprising approximately 97 percent of the land area; approximately 60 percent of the land in farms is cropland, and 36 percent is pasture. According to the 2012 Census of Agriculture (USDA 2012), total market value of agricultural products produced in Stark County was \$152,583,000, 78 percent of which was from crops and 22 percent from livestock sales. For both counties, the primary livestock is cattle and the principal crop is wheat.

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 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 16** lists the soils within the Project Area, including those considered prime farmland and soils of statewide or local importance. **Figure 14** shows the prime farmland soil distribution in the Project Area.

Four prime farmland soils occur within the Project Area, comprising 470 acres or 2 percent of the Project Area; 31 soil types are considered farmland of statewide importance, totaling 13,232 acres or 50 percent of the Project Area.

Woodlands

Economically important forestry resources are not found in the Project Area. Trees and shrubs in the Project Area are sparse, and limited to windbreaks around residential properties and between fields, or those found in and along drainages and wetlands. Trees observed on-site include plains cottonwood (*Populus deltoids*), green ash (*Fraxinus pensylvanica*), peach-leaved willow (*Salix amygdaloides*), coyote willow (*Salix exigua*), Siberian elm (*Ulmus pumila*), wild plum (*Prunus americana*), blue spruce (*Picea pungens*), and boxelder (*Acer negundo*).

7.9.2 Impacts

Agriculture/Farming

Wind energy development removes less total land from agricultural use than other forms of development. 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 proposed Project facilities will be available for grazing. Cattle have been observed using shade from turbines as a refuge at other wind energy projects.

Anticipated permanent impacts from the Project would be approximately 74 acres, primarily from turbine foundations and access roads (**Table 4**). It is possible that some of this land is not used for agricultural purposes, thus the actual impacts to agricultural production may be less.

The proposed Project would permanently disturb approximately 0.4 acre of soils classified as prime farmland and approximately 34 acres in farmland soils of statewide importance, not including the collection lines, which would be buried and would be a temporary disturbance of soil, except where junction boxes are located. 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 ensure that farmers can continue to operate financially viable farms, and thus helping to ensure the continuation of farming in Stark and Hettinger counties.

No turbines will be placed within 2,000 feet of occupied homes. Other impacts to homes are discussed throughout **Section 7**. Family farms will be affected due to the minimal 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) would be avoided as much as practicable. Only land for the turbines and access roads will be unavailable for crop production and grazing. Brady Wind II will work with landowners to minimize impacts to their land. Once the wind turbines have been 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

If trees are removed as part of the proposed Project, they will be replaced per PSC's Tree and Shrub Mitigation Specifications.

7.10 Soils

7.10.1 Description of Resources

USDA has mapped over 70 soil map units within the Project Area (USDA 2015). These soils are primarily well-drained loams, silt loams, and to a lesser extent fine sandy, and sandy loams. These soils are primarily derived from the underlying bedrock that consist of sandy and clayey unconsolidated materials including alluvium derived from mudstone, weathered mudstone, and, to a lesser extent, siltstones and sandstones. Nineteen soil types comprise approximately 81 percent of the Project Area. The most extensive of these are the Cabba-Amor-Savage complex (9.0 percent of the Project Area), Belfield-Grail clay loams (5.0 percent), Amor-Cabba loams (9.0 percent of the Project Area), Belfield-Daglum complex (7.0 percent), and Regent-Savage silty clay loams (8.0 percent). Table 16 provides a summary of the soil map units within the Project Area, including their acreages and percentages of the Project Area.

Table 16. Soil Map Units Within the Project Area

Map Unit Name*	Area (acres)	Percentage of Project Area	Farmland Classification
Amor-Arnegard loams	243	1	Farmland of statewide importance
Amor-Cabba loams	2,264	9	Not prime farmland
Amor-Shambo loams	1,032	4	Farmland of statewide importance
Arnegard loam	276	1.0	All areas are prime farmland
Arnegard loam, saline	31	<1	Not prime farmland
Barkof-Janesburg complex	4	<1	Not prime farmland
Beisigl-Flasher-Telfer loamy fine sands	9	<1	Not prime farmland
Beisigl-Lihen loamy fine sands	118	<1	Not prime farmland
Belfield-Daglum clay loams, saline	241	1	Not prime farmland
Belfield-Daglum complex	1,740	7	Not prime farmland
Belfield-Grail clay loams	1,312	5	Farmland of statewide importance
Belfield-Grail-Arnegard complex, saline	249	1	Not prime farmland
Belfield-Savage-Daglum complex	752	3	Farmland of statewide importance
Cabba-Amor-Savage complex	2,279	9	Not prime farmland
Cabba-Chama-Sen silt loams	39	<1	Not prime farmland
Cabba-Chama-Shambo loams	467	2	Not prime farmland
Chama-Cabba-Sen silt loams	811	3	Not prime farmland
Chama-Sen-Cabba silt loams	450	2	Farmland of statewide importance
Cherry silt loam	70	<1	Farmland of statewide importance
Daglum fine sandy loam	5	<1	Not prime farmland
Daglum-Rhoades complex	297	1	Not prime farmland
Dimmick silty clay	9	<1	Not prime farmland
Ekalaka-Parshall-Desart fine sandy loams	12	<1	Not prime farmland
Farfeld-Cedarpan loams	69	<1	Not prime farmland
Felor loam	1,807	6	Farmland of statewide importance
Flasher-Vebar-Parshall complex	172	1	Not prime farmland
Grail silty clay loam	212	1	All areas are prime farmland
Grail-Savage silty clay loams	29	<1	Farmland of statewide importance
Harriet loam, occasionally flooded	86	<1	Not prime farmland
Heil silty clay loam	33	<1	Not prime farmland
Korchea-Fluvaquents complex, channeled, frequently flooded	496	2	Not prime farmland
Korell-Daglum-Fluvaquents complex, channeled, frequently flooded	102	<1	Not prime farmland
Korell-Rhoades-Daglum complex	22	<1	Not prime farmland
Lefor fine sandy loam	2,017	7	Farmland of statewide importance
Lefor fine sandy loam	28	<1	Not prime farmland
Lihen-Parshall complex	28	<1	Not prime farmland
Manning-Schaller-Wabek complex	11	<1	Not prime farmland
Moreau-Barkof silty clays	261	1	Farmland of statewide importance
Moreau-Regent complex, very stony	21	<1	Not prime farmland

Table 16. Soil Map Units Within the Project Area

Map Unit Name*	Area (acres)	Percentage of Project Area	Farmland Classification
Moreau-Wayden silty clays	11	<1	Not prime farmland
Morton-Farland silt loams	103	<1	Farmland of statewide importance
Parshall fine sandy loam	72	<1	Farmland of statewide importance
Parshall fine sandy loam, saline	54	<1	Not prime farmland
Parshall, gravelly substratum-Manning fine sandy loams	15	<1	Farmland of statewide importance
Reeder-Farnuf loams	1,178	4	Farmland of statewide importance
Regan silt loam, saline, occasionally flooded	32	<1	Not prime farmland
Regent-Janesburg complex	806	3	Not prime farmland
Regent-Moreau-Cabba complex	416	2	Not prime farmland
Regent-Savage silty clay loams	1,906	8	Farmland of statewide importance
Rhoades-Daglum complex	144	1	Not prime farmland
Savage silty clay loam	1,202	5	Farmland of statewide importance
Savage-Daglum complex	29	<1	Not prime farmland
Savage-Grail silty clay loams	277	1	Farmland of statewide importance
Sen-Janesburg silt loams	117	<1	Not prime farmland
Shambo loam	468	2	Farmland of statewide importance
Stady loam	6	<1	Farmland of statewide importance
Stady-Lehr loams	11	<1	Farmland of statewide importance
Straw loam	19	<1	All areas are prime farmland
Vebar-Cohagen fine sandy loams	475	2	Not prime farmland
Vebar-Flasher-Tally complex	472	2	Not prime farmland
Vebar-Parshall fine sandy loams	191	1	Farmland of statewide importance
Wayden-Moreau silty clays	71	<1	Not prime farmland
Yegen-Parshall fine sandy loams	41	<1	Farmland of statewide importance

Source: USDA 2015. *Where possible, soil map units with different slope ranges and the same name were combined.

Fifty-two percent of the soils within the Project Area are prime farmland or farmland of statewide importance. Approximately 17 percent of the soils in the Project Area (with the exception of areas mapped as “Water”, which are unrated) have high susceptibility to erosion by water (i.e., K-factors of 0.37 or greater). Thirty-one percent of the soils also have high susceptibility to wind erosion (i.e., USDA Wind Erosion Groups of less than 6) (USDA 2015).

7.10.2 Impacts

The impact to soils within the Project Area will be limited to areas removed from agricultural production by occupancy of proposed Project components, including turbines, roads, collection lines, and a permanent meteorological tower. Construction disturbance activities including grading for roads and turbine footprints, excavation for turbine foundations and underground lines and other infrastructure has the potential to contribute to soil erosion through exposure of

soils that were previously vegetated or stable. Access roads will be 16- to 38-foot wide⁴ aggregate-surfaced roadways. Impacts include permanent operations disturbance to soils due to turbine placement, access road construction, placement of junction boxes associated with collection system, and the permanent meteorological tower. If cuts are made during construction, topsoil will be segregated and reapplied after final contours have been graded.

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, best management practices (BMPs) for erosion and sediment control will be utilized. Construction sites will maintain sediment control practices in accordance with the SWPPP. A Project-specific erosion control protocol based on the SWPPP will be developed to treat disturbed and exposed soil surfaces and prevent erosion and contamination of natural water resources. Because turbine 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. In addition, during construction and operation, vehicle speed will be limited to 25 miles per hour (mph) on proposed Project roads to minimize dust.

7.11 Geologic and Groundwater Resources

7.11.1 Description of Resources

Southwestern North Dakota and the area of the proposed Project lie within the Unglaciaded Missouri Plateau section of the Great Plains physiographic province and on the south-central flank of the Williston Basin, a broad structural depression underlying parts of North and South Dakota, Montana, Manitoba, and Saskatchewan (USGS 1975). The Project Area is located southwest of the glaciaded area of North Dakota, and within the Rolling Soft Shale Plain major land resource area (MLRA) which is an old, moderately dissected, rolling plain with local badlands, buttes, and isolated hills (NRCS 2006). Gentle slopes characterize most of the Project Area and local relief ranges from less than 2,670 to over 2,920 feet (see **Figure 3**). The rolling plateau surface of the Project Area is highly dissected by erosion. Scattered buttes, capped by resistant sandstone, limestone, or scoria beds, are remnants of sedimentary strata that once covered the area more extensively (USGS 1975).

Unconsolidated surface deposits include alluvium and terrace deposits of the Oahe Formation of Pleistocene age. These surficial sediments are underlain by the Tertiary Age bedrock Sentinel Butte and Golden Valley Formations (USGS 1975, NDGS 1980). The Sentinel Butte formation is mapped within the entire Project Area and consists of layers of silt, clay and sand with interbedded sandstone, lignite, baked clay, and limestone. The formation forms rolling topography over broad areas and has been eroded to badlands near rivers. The Golden Valley formation consists of clayey and sandy layers that are commonly found on hills, along the sides

⁴ Roads required to support crane access to turbines during operation would remain up to 38 feet wide; all other roads may be built at 16 feet wide or reduced later to 16 feet.

of buttes, and over upland areas (USGS 1975). Recent/Pleistocene landslide and mass movement deposits are not mapped within or in the surrounding area (NDGS 2015a).

North Dakota Geological Survey (NDGS) maps (Anderson 2010) indicate one potential viable sand and gravel resource area within the south-central Project Area in Hettinger County (NW Section 13, T136N, R97W). This site is noted as a prospective sand and gravel borrow site, previously identified and characterized for road construction uses by NDDOT.

NDGS clay maps (NDGS 2013) indicate that 27 percent (7,020 acres) of the Project Area are mapped as potential clay resources. The deposits are known to occur within the Golden Valley Formation that is present in western and central portions of the Project Area. The alumina content of clays is an indicator of the quality of the clay for use in ceramic production; and the content ranges from 16 to 23 percent in the Project Area. However, these deposits are not currently mined in the area of the Project, but are noted as a potential viable mineral resource.

Desktop data from the North Dakota Department of Mineral Resources oil and gas database (NDDMR 2015a) lists 2 exploration wells in the vicinity of the Project Area. These wells are listed as “dry and permit now cancelled”.

Lignite (coal) is known to occur in the Sentinel Butte Formation. There is an extensive economically viable mapped lignite reserve area mapped within and surrounding the Project Area based on a review of available NDGS maps (NDGS 2015b). Approximately 1,447 acres of the reserve is located within the Project Area. The lignite reserve is located along the edges of the Project Area within Sections 5, 8, 9, 10, 11, and 13, T136N, R97W. There are no historic mining operations mapped within the Project Area according to the same map. No coal mines were observed in site visits to the Project Area.

According to the USGS, North Dakota is located in an area of very low seismic risk (USGS 2014). There are no known active tectonic features or faults known to generate earthquakes with magnitudes of 6 or greater in North Dakota (USGS 2015). Related geologic hazards, such as soil liquefaction, are therefore also unlikely.

Thick beds of sandstone in the lower part of the Sentinel Butte formation are important sources of groundwater in the Project Area (USGS 1975). These beds are also referred to as the Sentinel-Tongue River aquifer. The Tongue River formation is approximately 500 feet below ground surface in the Project Area and has a thickness from less than 50 to 200 feet. The Sentinel Butte sandstone aquifer can reach as much as 245 feet in thickness (USGS 1975). Water levels below ground surface are about 20 feet in the Sentinel Butte aquifer and yields can reach up to 100 gallons per minute (gpm). The Hell Creek formation is also a source of groundwater in the Project Area; and occurs at depths of 800 feet and greater and has a thickness of 220 to 510 feet. The formation consists of sandstone, siltstone, shale, and claystone; and well yields are generally less than 10 gpm. The Golden Valley aquifer system and Quaternary deposits are also sources of shallow water in the Project Area. Well yields are generally 25 to 75 gpm.

Review of driller logs available from the North Dakota State Water Commission database (NDSWC 2015) indicates that only one well has been drilled within the Project Area. The well is listed as a plugged observation well and additional well log information was not available.

7.11.2 Impacts

Impacts of the proposed Project to available mineral resources are likely to be very limited. No coal resources are known to be actively or historically mined in the Project Area, however an economic deposit of lignite coal is present within the Project Area. Currently there are only six operations mining 32 million tons of coal annually in North Dakota (NDGS 2015c). Four operations are mining coal to feed steam boilers for electric generating plants in North Dakota. Two smaller operations are mining Leonardite (oxidized lignite) to be used in soil stabilization and as drilling fluid additives. Per landowner agreements, Brady Wind II will coordinate with landowners to facilitate the compatibility of any future coal resource development. Based on the lignite reserve map, the Project will not affect to the coal resource area.

One viable sand and gravel resource occurs within the south central portion of the Project Area. Per landowner agreements, Brady Wind II will coordinate with landowners to facilitate the compatibility of any future development of these resources. Even if the proposed Project affects any of these sand and gravel deposits, the regional supply of these materials would not incur adverse effects, because the resource is abundant in the area.

A large area of viable clay resources occurs within western and central portions of the Project. Based on the available clay map, the Project will permanently impact 10 acres of these clay resources. Per landowner agreements, Brady Wind II will coordinate with landowners to facilitate the compatibility of any future development of these resources. Even if the proposed Project affects any of these clay resource deposits, the regional supply of these materials would not incur adverse effects, because the resource is abundant in the area. In addition, clay mining and alumina processing do not currently take place in this area of North Dakota.

The Project Area is located in a region of low seismic risk and landslide areas are not located in the Project Area based on review of available landslide information (NDGS 2015a). Consequently, geologic hazards are unlikely to impact the proposed Project, and the proposed Project is not likely to affect geologic hazards. No significant impacts to geology are, therefore, be anticipated.

Impacts to groundwater resources in the Project Area are anticipated to be minimal. Major withdrawals of groundwater will not be necessary due to the limited water supply needs of the proposed Project. Water sources for the proposed Project will be obtained from the Southwest Water Authority in Dickinson or the city of New England. Based on the small amount of increased impervious surface area that will be created by proposed Project components relative to the separation of these components and the size of the entire Project Area, the proposed Project will likely have minimal impacts to regional groundwater recharge. There are only a small number of private wells in the Project Area and proposed Project construction activities such as excavation and construction of foundations are unlikely to affect groundwater quality or

flow patterns. Brady Wind II is coordinating with participating landowners to ensure that private water wells are not directly or indirectly impacted by the proposed Project. In addition, each turbine will be located a minimal distance of 2,000 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 may require subsurface blasting, which could potentially fracture bedrock and affect groundwater flow in the immediate vicinity of the disturbance. In the event that subsurface blasting is required, potential disturbances due to blasting will be localized and temporary, with groundwater likely to resume its natural course of flow down gradient of the foundation. Although it is not anticipated, if dewatering of excavations is necessary, water would be discharged to the surrounding surface, allowing it to infiltrate back into the ground to minimize potential impacts and in compliance with a stormwater permit.

7.11.3 Mitigative Measures

Brady Wind II is coordinating with land owners and mineral rights owners to identify potential future development issues. However, these resources are relatively abundant in Hettinger County and southwestern North Dakota, and it is expected that impacts to these resources would not result in overall adverse impacts to development of sand and gravel, and coal resources in the greater region.

Wind turbine locations will not impact the use of existing water wells because the turbines will not be sited within 2,000 feet of occupied structures. In the event that subsurface blasting is required, a blasting plan will be developed and implemented to keep the impacts localized and fracture the least amount of bedrock necessary for construction.

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, Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps, and US Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) data, and surface water features were surveyed for proposed Project facilities. There are numerous intermittent, unnamed tributaries within the Project Area (see **Figure 15**). The northern portions of the Project Area are primarily drained to the north by small unnamed intermittent streams into Antelope Creek. The Antelope River flows into the Heart River to the east/southeast. The Heart River is a major river that is a tributary of the Missouri River. The southern/western portion of the Project Area is drained to the south/southeast by small unnamed intermittent streams into the Cannonball River. The upper reaches of Thirtymile Creek drain the very eastern portion of the Project Area. Thirtymile Creek is a tributary of the Cannonball River which flows east/southeast to eventually join the Missouri River.

According to electronic data from FEMA, approximately 2 percent of the Project Area is within 100-year floodplains (**Figures 6 and 15, Appendix C; FEMA 2015**). These areas occur along

Thirtymile Creek and tributaries to Thirtymile Creek in the eastern portion of the Project Area; and along small streams and drainages that drain northward toward Antelope Creek in the northern portion of the Project Area. The 100-year floodplain is defined as the area that would have a 1-percent chance to be inundated by a flood event in any given year.

7.12.2 Impacts

Construction of the wind turbines, transformer pads, and access roads will disturb land within the Project Area. The wind turbines will be located to avoid Thirtymile Creek, intermittent streams/drainages, and 100-year floodplains. The current Project layout shows approximately 0.03 acres of permanent impacts from access roads in floodplains in Hettinger County; Brady Wind II will coordinate with the appropriate Hettinger County official to determine whether a floodplain permit is required. Access roads to the turbines will be built to avoid impacts to surface waters to the extent practicable.

7.12.3 Mitigative Measures

Access roads constructed adjacent to Thirtymile Creek, intermittent streams/drainages, and 100-year floodplains 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 NPDES general permit for stormwater discharges associated with construction activity will be submitted to the North Dakota DOH prior to construction of the proposed Project.

7.13 Wetlands

7.13.1 Description of Resources

Wetlands are an important natural resource providing a number of critical ecosystem functions. Some of these functions include flood flow attenuation, streambank stabilization, discharge and recharge of ground water, detention and removal of sediments, and the detention, removal, and transformation of nutrients and contaminants. Wetlands also may provide habitat for wildlife and sites for human recreation, education, and aesthetic enjoyment.

Desktop analysis was employed to identify probable locations of wetlands and waterbodies prior to field work. Desktop analysis included review of NWI maps (USFWS 2014a), aerial photo imagery (USDA NAIP 2014), web soil survey maps (NRCS 2013), and national hydrography dataset (USGS 2010).

The initial desktop analysis was followed by a site visit to microsite turbine locations in November 2015. Wetland delineations conducted for the proposed Project began in November 2015. The delineations are being conducted using the methodologies cited in the US Army Corps of Engineers (USACE) Jurisdictional Determination Form Instruction Guidebook (USACE and EPA 2007), including the December 2, 2008 revised Rapanos guidance (EPA and USACE 2008). The survey included approximately 65 percent of proposed Project features where easements have been negotiated, and the remainder of the proposed Project will be surveyed in

early 2016 as weather allows. Delineated features will be avoided where feasible. A report of findings will be provided upon completion.

7.13.2 Impacts

Brady Wind II has committed to minimizing impacts to jurisdictional wetlands or other water of the United States (WoUS) to the extent practicable. Based on desktop analysis and preliminary field surveys, the proposed Project is not expected to have any “single and complete project” that would meet or exceed the 0.10-acre impact threshold that would require a preconstruction notification (PCN) to the USACE Bismarck Regulatory Office. “Single and complete project” refers to each discrete intersection between proposed Project infrastructure and jurisdictional wetlands and other WoUS. Horizontal directional drilling may be used where necessary to avoid impacts to wetlands from collection line trenching during construction.

Based on discussions with the USACE, the proposed Project would likely meet the authorization criteria for a Section 404 Nationwide Permit (NWP) 12 (Utility Line Activities) and/or NWP 14 (Linear Transportation Projects). No Section 404 written permit is anticipated to be required as a result of construction of this proposed Project because it is not anticipated that the proposed Project would exceed the 0.10-acre threshold for PCN for NWP 12 or NWP 14. Nevertheless, if the proposed Project does cause minor impacts less than 0.10-acre in jurisdictional wetlands/WoUS, then general and state of North Dakota NWP requirements will be adhered to. These requirements are included in the USACE response letter in **Appendix C**.

A wetland survey report is underway and will be submitted upon completion.

Brady Wind II will obtain a stormwater runoff permit from the North Dakota Department of Health prior to construction. Compliance with the conditions of this permit and those of the associated stormwater pollution prevention plan will ensure that surface water will not be adversely affected by runoff from areas disturbed by proposed Project construction activities.

7.13.3 Mitigative Measures

Brady Wind II has committed to avoiding and minimizing impacts to potentially jurisdictional wetlands and other WoUS, as practicable. Wetlands will be delineated and flagged prior to construction when in close proximity to proposed Project features.

7.14 Vegetation

7.14.1 Description of Resources

The Project Area is in a rural location with farming and livestock grazing and related agricultural operations dominating the land use. According to the NLCD data, 94 percent of the Project Area land use is either cultivated crops (51 percent) or grasslands/herbaceous (32 percent) or hay/pasture (11 percent; Homer et al. 2015). A desktop native prairie assessment for the proposed Project was conducted in July 2015 and updated in December 2015. Areas identified during the July 2015 desktop assessment were field verified in August 2015 where possible from public rights-of-way.

7.14.2 Impacts

Areas of highest quality native prairie were avoided. Access road construction would 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 collection lines would result in some temporary effects to native and non-native grasslands. Brady Wind II will minimize impacts to existing trees and shrubs.

7.14.3 Mitigative Measures

Trees and shrubs anticipated to be cleared will be inventoried for replacement. Tree replacement will be on a 2-to-1 basis with 2-year-old saplings; shrub replacement will be on a 2-to-1 basis with stem cuttings. Trees and shrubs will be replaced by the same species or similar species, according to the PSC Tree and Shrub Mitigation Specifications.

Impacts to grassland vegetation will be mitigated by reseeding the temporary construction areas with native grasses following completion of construction activities, in accordance with landowner preferences. Areas currently in crop will be replaced with crop in accordance with landowner preferences.

7.15 Wildlife

7.15.1 Description of Resources

Although wind energy provides a clean, renewable, energy source, wind energy facilities have the potential to negatively impact wildlife, especially birds and bats, which can be killed or injured as a result of colliding with turbine blades. To address these concerns, field studies to document wildlife and habitat within the Project Area in accordance with the voluntary USFWS Land-Based Wind Energy Guidelines (USFWS 2012a), are currently planned or underway. Desktop habitat assessments for bats and whooping crane (*Grus americana*) are being prepared. Bat acoustic monitoring, avian point-count surveys, and grouse lek surveys will be conducted in spring 2016. Biweekly eagle use surveys began in November 2015 and are scheduled to continue through summer 2016. An aerial fall raptor nest inventory was conducted in mid-November 2015, after the deciduous trees lost their leaves. An aerial and follow-up ground-based raptor nest occupancy survey will be conducted during the breeding season, in January and March 2016.

Avian Species

Based on the location of the Project Area and the habitat present, it is expected that the majority of avian species present within the Project Area would be those typically associated with agriculture and grassland habitats. The most common species observed during fall avian surveys were red-winged blackbird (*Agelaius phoeniceus*), horned lark (*Eremophila alpestris*), American crow (*Corvus brachyrhynchos*), western meadowlark (*Sturnella neglecta*), American robin (*Turdus migratorius*), barn swallow (*Hirundo rustica*), and common grackle (*Quiscalus quiscula*). Additionally, other birds migrating between breeding and wintering grounds may also pass through the Project Area given its position within the Central Flyway (USFWS 2015a).

Bats

Based on available information, five bat species (big brown bat (*Eptesicus fuscus*), little brown bat (*Myotis lucifugus*), eastern red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), and silver-haired bat (*Lasionycteris noctivagans*) are expected to have a moderate or high potential to occur within, or in the vicinity of the Project Area. Migratory tree-roosting bats, such as eastern red bats, silver-haired bats, and hoary bats, travel long distances at altitudes that may overlap with the height of wind turbine blades, making them particularly susceptible to direct mortality from wind turbines. These species have been the predominant species found during post-construction mortality studies at operational wind energy facilities in North America (Arnett et al. 2013). The remaining bat species found in North Dakota are expected to have a low potential of occurrence.

Suitable natural roosting habitats in the Project Area are limited to individual trees, windrows, woodlots, buildings, bridges, and riparian zones. The availability of tree-roosting habitat in the Project Area is limited due to the small size and fragmented nature of the wooded habitat and accounts for approximately 1 percent of the Project Area. Farmstead buildings (houses, barns, etc.) could also provide potential roosting locations within the Project Area; however, the suitability of these man-made structures has not been evaluated. There are no known abandoned mines within the Project Area that bats could use for roosting (PSC 2013). Therefore, bat use of the Project Area is likely to be low given the limited availability of roosting habitat.

7.15.2 Impacts

Potential impacts from the proposed Project to avian and bat species include collisions with wind turbines, and guyed meteorological towers, as well as loss of habitat.

Avian Collisions

The collision risk for birds at the proposed Project would likely be low based on records of fatalities at other wind energy facilities in the Region. Recent meta-analyses relevant to the proposed Project have estimated an average all-bird (mostly small birds) fatality rate of 1.81 birds/MW/year in the Great Plains (Loss et al. 2013) and 2.29 small birds/MW/year in the Prairie biome (Erickson et al. 2014). Discrepancies between the two rates are most likely due to differences in the way geographic areas were defined in the studies; however, both regions encompassed the Project Area and it is likely that rates of collision at the proposed Project would be similar to rates reported by these studies.

Bat Collisions

The collision risk for bats at the proposed Project would likely be low based on records of fatalities at other wind energy facilities in the Great Plains which average 3.07 bats/MW/year and range from 0.12 to 10.85 bats/MW/year (Hein et al. 2013).

Habitat Loss

As stated in the USFWS voluntary wind energy guidelines, a species of habitat fragmentation concern is a species “for which a relevant federal, state, tribal, and/or local agency has found

that separation of their habitats into smaller blocks reduces connectivity such that the individuals in the remaining habitat segments may suffer from effects such as decreased survival, reproduction, distribution, or use of the area” (USFWS 2012a). The USFWS North Dakota field office has developed a list of species of habitat fragmentation concern for the state (USFWS 2013a). The range for seven of the eleven species of habitat fragmentation concern includes the Project Area – Baird’s sparrow (*Ammodramus bairdii*), chestnut-collared longspur (*Calcarius ornatus*), grasshopper sparrow (*Ammodramus savannarum*), northern harrier (*Circus cyaneus*), sharp-tailed grouse (*Tympanuchus phasianellus*), Sprague’s pipit (*Anthus spragueii*), and upland sandpiper (*Bartramia longicauda*) (USFWS 2013a). Habitat fragmentation from the construction of a wind energy project may potentially reduce habitat available for these species. However, because the proposed Project would be largely located in already disturbed agricultural areas that are generally considered suboptimal habitat for most avian species, habitat fragmentation is likely to be minimal for most species. Some short-term displacement in grassland areas would be expected, but the effects would be mostly limited to the construction period and the immediate area around the turbines cease (Pearce-Higgins et al. 2012, Shaffer and Buhl 2015). For bats, the limited and highly fragmented nature of existing habitat in the Project Area suggests that development of the Project will be unlikely to reduce or fragment bat habitat.

Potential impacts to sensitive species are discussed in more detail in **Section 7.16.2 below**.

7.15.3 Mitigative Measures

Brady Wind II is conducting environmental studies of the Project Area to aid in the final placement of turbines, roads, and associated facilities to avoid and minimize impacts to wildlife and native habitat. The following measures will be used, to the extent practicable, by Brady Wind II to help avoid potential impacts to wildlife in the Project Area during selection of the turbine locations and subsequent development and operation:

- Siting access roads and turbines away from wetlands and waterbodies to the greatest extent practicable.
- Burying collection lines from the turbines to the collection substation to avoid collision risk following the APLIC (2006) suggested practices, if practicable.
- Temporarily disturbed areas will be reseeded or restored to crop, depending on original conditions and landowner preference. Native prairie will be avoided to the extent practicable, and will be reseeded using a native prairie mix in accordance with landowner preferences.
- Implementing a Wildlife Response and Reporting System (WRRS) once turbine construction has been completed. The WRRS would include protocols for field technicians to report and document bird and bat mortalities during routine maintenance operations. If any dead or injured birds or bats are found within the proposed Project boundaries by Project personnel, its location will be marked and reported promptly to the on-duty Plant Lead/Site Supervisor. Dead or injured birds or bats will not be moved by any unpermitted individual.

- Conducting post-construction bird and bat mortality surveys for 1 year following construction of the proposed Project.
- Developing a voluntary Bird and Bat Conservation Strategy (BBCS), which includes an adaptive management approach, so that information gathered and experience gained from post-construction monitoring can be used to inform future management decisions at the proposed Project.
- Proposing in its lighting plan to use the minimum number of aviation hazard lights acceptable to the FAA to avoid attracting migrating birds and bats to the turbines. Brady Wind II will also install motion-activated lighting or down-shielded lighting on other proposed Project facilities that require lighting at night (i.e., the collection substation) to avoid the potential to draw birds and bats toward the facility.
- During construction and operation, limiting vehicle speed limited to 25 mph on proposed Project roads to minimize wildlife collisions.

7.16 Rare and Unique Natural Resources

7.16.1 Description of Resources

The Endangered Species Act (ESA), as administered by the USFWS, mandates protection of species federally listed as threatened or endangered and their associated habitats. Candidate species receive no statutory protection from the USFWS unless they are formally listed.

The following federally listed species have potential to occur within Hettinger and Stark counties and potentially the Project Area: whooping crane, black-footed ferret (*Mustela nigripes*), northern long-eared bat, and gray wolf (*Canis lupus*) (USFWS 2015b). Although the USFWS is not aware of occurrences of Dakota skipper (*Hesperia dacotae*) in Hettinger or Stark counties (WAPA and USFWS 2015), Brady Wind II is coordinating with USFWS to review updated known occurrences to evaluate if Dakota skippers occur in the vicinity of the Project Area (K. Shelley, USFWS, pers. comm.).

Additionally, there is potential for bald and golden eagles (*Haliaeetus leucocephalus* and *Aquila chrysaetos*, respectively) to occur within the Project Area; both species are protected under the Bald and Golden Eagle Protection Act (BGEPA).

These federally protected species are described in greater detail below in taxonomic order.

Black-footed Ferret (Federally Endangered)

The black-footed ferret, a medium-sized member of the weasel family, was listed as endangered in 1967 (USFWS 2014b). The black-footed ferret is an obligate predator of prairie dogs and occurs exclusively in prairie dog colonies which it depends upon for food and shelter (USFWS 2014b). Previously believed extinct, 18 individuals were discovered in 1986 and were then used to develop a breeding and reintroduction program (USFWS 2010). It is estimated that over 1,000 black-footed ferrets occur in the wild with another 300 within breeding facilities (USFWS 2014b). Although it is thought to be extirpated from the state (NDGF 2012), there was an unconfirmed report of a black-footed ferret sighting near the town of Dickinson, north of the Project in 2012. The USFWS is not aware of any black-footed ferrets in the vicinity of the Project

(K. Shelley, USFWS, pers. comm.). No reintroductions of black-footed ferrets have been made in North Dakota (USFWS 2014b). Reintroductions were once considered in the area southwest of the town of New England, but this area is no longer under consideration for reintroductions (K. Shelley, USFWS, pers. comm.).

Although there is potential for prairie dog colonies to occur with the Project Area, the grassland habitat within the Project Area is highly fragmented. Black-footed ferrets only occur in large, contiguous prairie dog colonies. Although no formal prairie dog surveys have been conducted, no prairie dog colonies have been observed in the Project Area incidental to ongoing eagle and avian surveys. Based on the range, known reintroduction locations of black-footed ferrets, and habitat within the Project Area, it is unlikely the black-footed ferret would occur within the Project Area.

Northern Long-eared Bat (Federally Threatened)

The northern long-eared bat was listed as threatened with an interim 4(d) rule effective May 4, 2015 (USFWS 2015c). The interim 4(d) rule limits the prohibition of take to areas affected by white-nose-syndrome (WNS) and an additional 150-mile buffer around this area. Under the interim 4(d) rule, all other take incidental to other lawful activities would be allowed in those areas of the northern long-eared bat range. North Dakota, and the Project Area specifically, fall outside of the area where take is prohibited as currently mapped by the USFWS. Brady Wind II expects that the interim 4(d) rule will either be affirmed or amended by May 2016.

Northern long-eared bats have been found from Maine to North Carolina on the Atlantic Coast, westward to eastern Oklahoma and north through the Dakotas, reaching into eastern Montana and Wyoming (USFWS 2013b). The northern long-eared bat is considered common only in discrete portions of its western range, including the Black Hills of South Dakota (USFWS 2013b). This species roosts in trees during the spring, summer, and fall (USFWS 2013b). The species prefers large, contiguous tracks of upland forested habitat during the summer residency period. Natural roosting habitats in the Project Area are limited to individual trees, wind breaks and woodlots. Northern long-eared bats do not undertake long-distance seasonal migrations between summer and winter ranges, but do undertake shorter distance movements between summer roosts and winter hibernacula. These seasonal movements are generally between 35 miles and 55 miles, but may be substantially longer in some areas, perhaps as great as 168 miles (USFWS 2013b). Information on habitat use during migration is limited, but individuals in transit are likely to use foraging habitats at least part of the time. Northern long-eared bats spend winter hibernating in caves and mines. However, there are no known wintering hibernacula within North Dakota (USFWS 2013b).

The northern long-eared bat has a low likelihood to occur in the Project Area during the summer residency period (approximately May 15–August 15) because of the lack of large contiguous woodlots and due to the species being uncommon in the far western extent of its range, which includes the Project Area. The species has been detected in Billings and Hettinger counties (Gilliam and Barnhart 2011, WAPA and USFWS 2015), and could occur in the Project Area during seasonal movements to and from hibernacula; however, no hibernacula are known to

occur in the state. Therefore there is a low overall likelihood that the northern long-eared bat occurs within the Project Area.

Gray Wolf (Federal Endangered)

The gray wolf was listed as endangered in 1974 (USFWS 2014c, USFWS 2014d). Gray wolves previously inhabited a large portion of the United States in a variety of habitats including tundra, forests, grasslands and deserts. Although the gray wolf has been reported in Hettinger and Stark counties (USFWS and Western 2015), the Project Area lacks forested areas known to support wolf pack establishment and persistence (USFWS 2012b, NatureServe 2014).

Therefore, there is a low to moderate likelihood of the species transiting the Project Area, but it is unlikely to maintain a local resident population.

Whooping Crane (Federally Endangered)

The whooping crane listed as threatened with extinction in 1967 and endangered in 1970 – both listings were ‘grandfathered’ into the ESA of 1973 (CWS and USFWS 2007). The whooping crane population belonging to one flock that migrated between Wood Buffalo National Park in Canada and the Aransas National Wildlife Refuge in Texas was reduced to 16 individuals during the winter of 1941-42. With conservation efforts the Aransas-Wood Buffalo National Park population, the single self-sustaining wild population, has been steadily rising with the population estimate at 304 individuals (with a 95 percent probability of actual flock size being between 267-350 birds) during the 2014-2015 winter census (USFWS 2015d). A 200-mile wide migration corridor has been delineated for this population that contains 95 percent of all verified sightings. Spring migration occurs primarily in April and May whereas fall migration occurs primarily in October and November (Lewis 1995). Stopover habitat during migration includes a variety of croplands with roosting occurring in shallow, freshwater inland wetlands (Lewis 1995). Four additional areas associated with major stopover areas are designated as critical habitat: Quivira National Wildlife Refuge and Cheyenne Bottoms State Wildlife Management Area in Kansas; a section of the Platte River in Nebraska; and the Salt Plains National Wildlife Refuge in Oklahoma (USFWS 2012a). Wind energy development has been identified as a threat to the species due to the potential for displacement due to the presence of the turbines, and potential for collisions with operational wind turbines and new power lines (USFWS 2012a).

A desktop likelihood assessment for whooping crane is currently being prepared for the Project Area. The Project is outside the whooping crane migration corridor, although there is foraging and roosting habitat available within the Project Area. The likelihood of whooping cranes occurring within the Project Area is low based on the location of the Project Area being outside of the migration corridor.

Bald Eagle (Federally Protected under BGEPA)

Bald eagles occur throughout the contiguous United States, Alaska, and Canada (Buehler 2000). Bald eagles may occur in North Dakota as breeders, winter residents, migrants or year-round residents. The nesting period in North Dakota begins with nest building or maintenance in February and ends when the young fledge, typically in July (Johnson 2010). Nests are relatively close to water, typically less than 2 miles. Although bald eagle nests have historically been

found primarily along the Missouri River and Red River (Johnson 2010), the number of bald eagle nests has increased in North Dakota over the last 20 years as the species continues to recover from population declines, primarily due to environmental contaminants. Nesting bald eagles now occur in more than half of the counties in the state (Dyke et al. 2015) growing steadily to 140–150 active bald eagle nests to date (Johnson 2015). Most of the nests occur near streams and mid- to large-sized lakes, but bald eagles are also initiating nests in areas not considered traditional nesting habitat such as cottonwood trees surrounded by cropland or grassland (Dyke et al. 2015). The home range of bald eagles is variable. Populations in Oregon and Washington have home ranges of 2.7 to 18.1 square miles, with an average of 8.5 square miles (Watson et al. 1991), and in Montana the average home range size was 3.5 square miles (Stangl 1994). Along the Mississippi River in Minnesota, nests were located an average of 0.94 mile from the nearest neighboring nest (Mundahl et al. 2013).

During the non-breeding season (September through January; USFWS 2013c), bald eagles concentrate near large bodies of water where the water remains unfrozen and roost up to 20 miles from foraging sites, depending on abundance of prey (Buehler 2000). Bald eagles are opportunistic foragers that prey primarily on fish but also feed on other aquatic and terrestrial vertebrates, as well as on carrion (Buehler 2000).

No bald eagle nests were found within the Project Area or 2-mile buffer surrounding the Project Area during a nest inventory conducted in November 2015. There is one known bald eagle nest within 10 miles of the Project Area. The nest was located during spring 2015 aerial raptor nest surveys conducted in support of another proposed wind energy facility (now canceled) approximately 15 miles to the northeast of the Project Area. The bald eagle nest is located approximately 8.5 miles to the east of the proposed Project in an isolated stand of trees surrounded by agricultural habitat. No additional bald eagle nests are known to occur within 10 miles of the Project Area based on a query to NDGF in May 2015 (NDGF 2015).

Bald eagles have a low likelihood of occurring in the Project Area during the winter given the absence of large bodies of water that remain unfrozen within or near the Project Area. Although bald eagles have a low likelihood of breeding within the Project Area due to a lack of suitable nesting habitat, bald eagles nesting in the vicinity of the Project could occur in the Project Area when foraging or migrating.

Golden Eagle (Federally Protected under BGEPA)

Golden eagles are common in western North America west of the 100th meridian with small populations also present in the eastern portions of Canada and the United States (Kochert et al. 2002). Golden eagles in the western U.S. are most commonly associated with open and semi-open habitats such as shrublands, grasslands, woodland-brushlands, and coniferous forests as well as in farmland and riparian habitats (Kochert et al. 2002). Both year-round and migratory golden eagles occur in North Dakota (Dyke et al. 2015). Golden eagles nest on cliffs, utility poles, and in large trees in open areas from late January through August (Kochert et al. 2002). Golden eagles in North Dakota nest mainly west of the Missouri River (Johnson 2015) and egg-laying occurs from late March to early May (Stewart 1975, DeLong 2004). The species feeds

upon a wide variety of prey species but tends to hunt small to medium-sized mammals such as hares, rabbits, ground squirrels, marmots, and prairie dogs depending upon local availability (Bloom and Hawks 1982, Kochert et al. 2002).

No golden eagle nests were found within the Project Area or 2-mile buffer surrounding the Project Area during a nest inventory conducted in November 2015. In response to a May 2015 request for locations of known eagle nests within 10 miles of the Project Area, NDGF provided locations of two known golden eagle nests within 10 miles of the Project Area (NDGF 2015). The nests are located on large sandstone bluffs and are among a group of six nests approximately 9.7 to 10.8 miles to the northwest of the Project Area.

Golden eagles have a low likelihood of breeding within the Project Area due to a lack of suitable nesting habitat. Golden eagles nesting in the vicinity of the Project Area could occur in the Project Area when foraging or migrating, although the prey base appears to be limited (e.g., no prairie dog towns have been observed within the Project Area during eagle surveys).

Dakota Skipper (Federal Threatened)

The Dakota skipper (*Hesperia dacotae*) is a small butterfly found in the tallgrass and mixed-grass prairies of the Northern Great Plains. On October 24, 2014, the USFWS listed the Dakota skipper as a threatened species (USFWS 2014a). Although its historic range once consisted of vast, unbroken native prairie in the north-central U.S. and south-central Canada, its current range is now limited to scattered remnants of high quality native prairie in Minnesota, North Dakota, South Dakota, and southern Manitoba and Saskatchewan (USFWS 2015a). The Dakota skipper population has declined due to sensitivity to disturbances, such as grazing and fire, and the loss of native prairie habitat. The USFWS proposed to designate 50 units, ranging in size from 31 acres to 2,887 acres, in North Dakota, Minnesota, and South Dakota as critical habitat (USFWS 2014b). The closest proposed critical habitat to the proposed Project Area is approximately 70 miles to the north in McKenzie County. The Dakota skipper is not known to occur in Hettinger or Stark counties (USFWS and Western 2015); however, the two counties are on the western extent of the species' range (USFWS 2015a), and as a result, there is a low likelihood for the species to occur within the proposed Project Area. Brady Wind II has evaluated potential habitat for the Dakota skipper within the Project Area and has identified 177 acres (less than 1 percent of the Project Area) of excellent habitat and 7,776 acres (30 percent of the Project Area) of good habitat. Approximately 965 acres (4 percent of the Project Area) were classified as undetermined (i.e., could not be determined from desktop analysis or verified in the field due to access limitations).

7.16.2 Impacts

Based on operational data from the WRRS protocol in use at NEER's 12 operating wind farms in North Dakota, there have been no fatalities of any federally-listed species. Per the WRRS protocol, if a dead or injured federally protected species is found, it must be left undisturbed and reported to USFWS.

Black-footed Ferret

Based on the limited range, lack of reintroduction locations of black-footed ferrets, and lack of habitat within the Project Area, and given that NDGF believes that the black-footed ferret is extirpated from the state (NDGF 2012), it is unlikely that the proposed Project would affect the black-footed ferret.

Northern Long-eared Bat

The northern long-eared bat is considered to be uncommon in North Dakota and the Project Area is located at the edge of the species' range (USFWS 2013b, Dyke 2014). There is little suitable roosting or foraging habitat in the Project Area and no known hibernacula in North Dakota for the northern long-eared bat. The species could potentially collide with operational turbines during the spring and fall periods when migrating between summer roosts and winter hibernaculum. Although northern long-eared bat fatalities have occurred at wind energy facilities, there have only been 41 confirmed records, all of which occurred at wind energy facilities located east of the Mississippi River (USFWS 2015c). No northern long-eared bat fatalities from wind energy facilities have been documented in North Dakota (USFWS 2015c). Therefore, there is a low likelihood that the proposed Project would affect the northern long-eared bat.

Gray Wolf

As gray wolves are unlikely to establish a resident population within the Project Area, it is unlikely the Project will impact the gray wolf. This conclusion is based on the high degree of agricultural use of the Project Area and the roadways associated with this use, which create a combination of human and road density that is less than optimal for wolves (e.g., Mech et al. 1988, Fuller et al. 1992, Erb and Sampson 2013).

Whooping Crane

Collisions with turbines, meteorological towers, or transmission lines are a potential impact from the proposed Project. However, the Project is outside of the whooping crane migration corridor and cranes exhibit avoidance behavior, which minimizes the potential for collisions. Sandhill cranes, which often accompany whooping cranes during migration, have been documented altering flight direction in response to turbines at a wind facility in South Dakota (Nagy et al. 2012), and multiple studies have documented sandhill cranes gradually climbing as they approach marked power lines (Morkill and Anderson 1991, Murphy et al. 2009). Furthermore, no whooping crane fatalities have been recorded at wind facilities to date, suggesting that likelihood of collision may be low.

The potential for indirect impacts resulting from habitat loss is likely to be low, because the Project Area is outside the whooping crane migration corridor and less than one percent of the Project Area is suitable stopover habitat (**Table 12**).

Based on location of the Project Area outside of the migration corridor and the avoidance and minimization measures discussed in Section 7.16.3 (e.g., buried collection systems), there is a low likelihood that the proposed Project would impact the whooping crane.

Bald Eagle

Six bald eagle mortalities associated with wind energy facilities within the United States were reported from 1997 through June 2012 (Pagel et al. 2013). To date, one bald eagle mortality has been reported at a wind energy facility in North Dakota (Public Prairie Broadcasting 2015). Bald eagles are believed to be at less risk of turbine collision than golden eagles because they tend to focus their hunting efforts for fish and waterfowl in lakes and rivers (Buehler 2000). Although the landscape within the Project Area does not support any large waterbodies or an abundance of smaller waterbodies that would attract bald eagles for nesting or foraging, there is one known bald eagle nest located approximately 8.6 miles to the northeast of the Project Area. The presence of occupied bald eagle nests in the vicinity of the Project Area suggests that the species may potentially forage in or pass through the Project Area during the breeding season. Eagle use surveys are underway to evaluate risk of proposed Project activities to bald eagles.

Golden Eagle

Seventy-nine golden eagle mortalities associated with wind energy facilities within the United States were reported from 1997 through June 2012, excluding the Altamont Pass Wind Resource Area in California (Pagel et al. 2013.); however, to date no golden eagle mortalities have been reported at wind energy facilities in North Dakota. Golden eagles are believed to be more at risk of turbine collision than bald eagles because they hunt for land-based prey along topographic contours where turbines are often located (Kochert et al. 2002).

Six known or potential golden eagle nests occur on sandstone bluffs within 10 miles of the Project Area. The landscape within the Project Area lacks any buttes or rock or dirt cliff faces suitable to support eagle nests; therefore, it is unlikely that golden eagles would nest within the Project Area. Golden eagles may forage in or pass through the Project Area; however, there are no known features that would concentrate golden eagles within the Project Area compared to the surrounding area. Eagle use surveys are underway to evaluate risk of proposed Project activities to golden eagles.

Dakota Skipper (Federal Threatened)

The Dakota skipper is not known to occur in Hettinger and Stark counties, and the Project Area is on the western extent of the species' range. Approximately 30 percent of the proposed Project Area was classified as Excellent/Likely or Good/Possible potential Dakota skipper habitat and approximately 4 percent was undetermined. Brady Wind II has avoided locating Project facilities on lands classified as Excellent/Likely, and has avoided locating Project facilities on lands classified as Good/Possible where practicable. Therefore, the impacts of the Project on the Dakota skipper are likely to be low.

7.16.3 Mitigative Measures

General avoidance and minimization practices for vegetation and wildlife are discussed in **Sections 7.14.3** and **7.15.3**, respectively. Brady Wind II has committed to the following additional avoidance and minimization measures which are specific to potential impacts to federally threatened and endangered species:

- In addition to the training provided via the WRRS (see **Section 7.15.3**), Brady Wind II will provide all construction and maintenance staff with training in federally listed species identification and will provide identification guides for whooping cranes to be kept in all vehicles.
- If an injured or dead endangered or threatened animal is found in the Project Area, Brady II employees will promptly immediately notify the USFWS after completing the WRRS documentation process.

7.17 Summary of Impacts

Table 17 summarizes the resources that would be affected as a result of the Project and the appropriate mitigation.

Table 17. 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.	N/A
Land Use	Up to 74 acres of land would be permanently disturbed by turbines, associated access roads, junction boxes associated with collection lines, and a permanent meteorological tower. Temporary impacts during construction for turbine installation, road construction, cable trenching, laydown and contractor staging, and turbine storage would require an additional 973 acres.	Brady Wind II will work with landowners and regulatory agencies to minimize impacts of the proposed Project.
Public Services	Minimal impact to existing services and infrastructure.	Construction and operation of the proposed Project will be in accordance with all associated local, state, and federal permits and laws, as well as industry construction and operation standards. Due to the minor impacts expected, additional mitigation measures are not required.
Human Health and Safety	No adverse impacts are anticipated. No occupied residences are predicted to have more than 30 hours per year of shadow flicker.	Turbines will be lighted to comply with FAA requirements. A variety of security measures will be implemented to reduce the chance of physical and property damage.
Noise	No adverse impacts are anticipated to noise-sensitive resources (occupied residences).	Noise modeling results indicated that received sound levels are all below the North Dakota noise requirement (Chapter 69-06-08-01(4)), which prescribes a limit of 50 dBA within 100 feet of an inhabited residence.
Cultural and Archaeological	No impacts to previously identified cultural resources are anticipated. An archaeological survey is underway, and the proposed Project layout will avoid all newly documented sites. The field survey is anticipated to be completed in winter 2015 or spring 2016, weather permitting.	Sites near the Project will be fenced prior to construction. An unanticipated discoveries plan will be prepared prior to construction.

Table 17. Summary of Impacts and Mitigation

Resource	Impact	Mitigation
Recreational Resources	No direct impacts to recreational resources are anticipated.	No mitigation measures are proposed at this time.
Land Based Economies	Up to 74 acres of land would be permanently affected. An additional 973 acres would be temporarily disturbed for turbine installation, road construction, cable trenching, and other construction activities.	Brady Wind II has worked with landowners to minimize impact to their land.
Soils	Impacts to soils limited to 74 acres of permanent disturbance and 973 acres of temporary disturbance.	BMPs for erosion and sediment control will be utilized to minimize wind and water erosion at the site in association with the Project SWPPP. Only land needed for the facility will be permanently affected. Temporarily disturbed areas will be restored.
Geologic and Groundwater Resources	Impacts to groundwater resources in the Project Area are anticipated to be minimal	N/A
Surface Water and Floodplain Resources	Access roads, turbines, and other proposed Project facilities will be located and constructed in such a manner that impacts to surface waters will be avoided to the extent practicable.	Brady Wind II will implement BMPs to minimize erosion and sedimentation at the site in association with the Project SWPPP.
Wetlands	Impacts to wetlands and WoUS will be avoided and minimized to the extent practicable.	Wetlands in close proximity to the construction easement will be delineated and flagged prior to construction. Horizontal directional drilling will be used where necessary to avoid permanent impacts to wetlands from collection line trenching during construction.
Vegetation	Up to 74 acres of land would be permanently affected. An additional 973 acres would be temporarily disturbed during construction. Areas of highest quality native prairie were avoided. Brady Wind II will minimize impacts to existing trees and shrubs as practicable and will use BMPs during construction and operation to minimize impacts.	If impacts to trees or shrubs cannot be avoided, the individual trees or shrubs will be replaced per PSC regulations. Temporarily disturbed areas will be reseeded or restored to crop, depending on original conditions and landowner preference. Native prairie will be reseeded using a native prairie mix in accordance with landowner preferences.
Wildlife	Potential avian and bat collisions may occur, but are anticipated to be relatively few. Habitat fragmentation is likely to be minimal for most avian species; the Project is unlikely to fragment bat habitat.	A variety of mitigative measures will be implemented, as discussed in Section 7.15.3. The proposed Project's WRRS will be implemented after construction of the proposed Project as described in Section 7.15.3 and Brady Wind II will complete 1 year of post-construction mortality monitoring. Brady II will prepare a Project-specific BCS that documents these measures.
Rare and Unique Natural Resources	The Project is unlikely to affect the black-footed ferret and gray wolf; there is a low likelihood for the Project to affect the northern long-eared bat, whooping crane, and Dakota skipper. Additional studies are planned to evaluate potential impacts to bald eagles and golden eagles.	O&M staff will be trained to identify federally protected species. Dead or injured federally protected species will be promptly reported to USFWS.

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8. PUBLIC AND AGENCY COORDINATION

8.1 Public Outreach

Principal stakeholders in the proposed Project are landowners that have entered into agreements with Brady Wind II to provide wind rights for the proposed Project.

A public open house was held in November 2015 for the Brady Wind Energy Center, which included discussion of the possibility of developing the Brady II Project.

8.2 Agency Coordination

Per Section 69-06-01-05 of the PSC's administrative rules, Brady Wind II and its representatives have contacted key local, state, and federal agencies in November 2015 to inform them of the proposed Project and for assistance in identifying concerns or issues within the Project Area. Agency correspondence and responses received as of January 8, 2016, are included in **Appendix C; Table 18** summarizes the responses received from agencies to date.

Brady Wind II will continue to meet with county officials as the proposed Project moves forward and Brady Wind II seeks any necessary local permits (e.g. building permit).

Table 18. Summary of Agency Responses

Agency	Response Date	Response Summary a/
USACE	11/24/15	If a Section 10 and/or Section 404 permit is required, a permit application must be submitted to USACE. Permit application form and instructions were provided.
U.S. Department of Commerce NTIA	12/17/15	After a 45+ day period of review, no agencies had issues with turbine placement in this area stating NHIA.
USFWS	-	No written response received as of December 16, 2015. Brady Wind II is actively coordinating with USFWS to discuss the proposed Project and potential impacts to wildlife.
State Historical Society of North Dakota	11/27/15	Recommends Class I file search and Class III Intensive Cultural Resources Inventories for archaeological sites and historic structures.
NDGS	12/04/15	Coal and clay deposits are present within the Project Area.
ND Department of Health	12/07/15	The agency believes the environmental impacts of the Project will be minor. Fugitive dust emissions should be minimized during construction. Impacts to streams should be avoided and disturbed areas should be revegetated. Projects disturbing one or more acres must have a permit to discharge stormwater runoff. Noise from construction activities can be minimized by ensuring that construction equipment is equipped with a working muffler. The agency believes the proposed activities are consistent with the State Implementation Plan for the Control of Air Pollution for the State of North Dakota.
ND Parks and Recreation Department	-	No response received as of December 16, 2015.

Table 18. Summary of Agency Responses

Agency	Response Date	Response Summary ^{a/}
ND State Water Commission	12/08/15	There are floodplains in the Project Area. There is Southwest Pipeline Project infrastructure in the area; contact information for the Southwest Water Authority was provided. All waste materials associated with the Project must be disposed of properly and not placed in floodway areas. No sole-source aquifers have been designated in North Dakota.
NDGF	12/28/15	Requests avoidance of native prairie and suggests use of USFWS Land-Based Wind Energy Guidelines; recommends avoidance of wetland impacts and maintaining existing drainage patterns, and replacing wetlands that are affected. Requests burying of collection lines, marking overhead lines near streams or wetlands; recommends conducting aerial surveys for raptor nests prior to construction and implementing a ½ mile buffer around active eagle nest sites, as well as contacting the agency for locations of eagle nests; recommends monitoring for avian and bat mortality, and requests GPS coordinates of turbines once Project is constructed.
NDDOT	-	No response received as of December 16, 2015.
ND Aeronautics Commission	-	No response received as of December 16, 2015.
ND Department of Agriculture	-	No response received as of December 16, 2015.
ND Indian Affairs Commission	-	No response received as of December 16, 2015.
ND Department of Trust Lands	12/08/15	Identified lands owned by the North Dakota School Trust in NW3 and SE4 of section 16, T136N, R96W in Hettinger County and provided a map of those lands. Reports that if School Trust land is included in the wind farm, or School Trust lands are crossed with access roads, collection lines or transmission lines, an online application must be completed. Trust Lands uses its own easement for wind tower sites and appurtenances.
Central Stark & Western Soil Conservation District	-	No response received as of December 16, 2015.

^{a/} The Project Area was expanded into Stark County after letters were sent to agencies listed in Table 18.

9. POTENTIAL PERMITS/APPROVALS

The federal and state permits or approvals that have been identified as potentially required for the construction and operation of the proposed Project are shown in **Table 19**. Permits dependent on the final site layout will be applied for after receiving PSC approval, but prior to construction.

Table 19. Potential Permits and Approvals Required for Construction and Operation of the Proposed Facility

Agency	Type of Approval	Status*	Need
Federal Approvals			
USACE	NWP 12 and 14	3	Wetland surveys are currently underway to ensure that the proposed Project minimizes impacts to WoUS and stays below the pre-construction notification threshold.
FAA	Form 7460-1, Notice of Proposed Construction	2	Notice and approval are required for structures over 200 feet in height. FAA approval of lighting and marking of turbines is required.
EPA	SPCC	2	Required if more than 1,320 gallons of oil are stored on site.
State of North Dakota			
PSC	Certificate of Site Compatibility	1	Required for construction of generation facility over 0.5MW in size.
SHSND	Concurrence with effect determinations	2	Class I File Search is complete and a Class III Intensive Cultural Resources Inventory for archaeology is underway; a Class III Cultural Resources Inventory for historic structures is also underway. The reports will be submitted to SHSND for review when complete.
North Dakota Department of Trust Lands	Wind Energy Lease	3	A wind lease is required for construction of wind turbines or associated facilities on state trust land.
North Dakota Department of Health	NPDES Permit: General Construction Storm Water	2	Required for disturbance of over 1 acre of land. Must prepare a SWPPP.
North Dakota Highway Patrol	Overheight/Overweight Permit	2	Permit required for hauling construction equipment and materials on State Highways.
NDDOT	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 right-of-way.
ND State Water Commission	Drainage Permit	3	Required if draining a wetland with a drainage area of 80 acres or more.
Local Permits			
Hettinger County	Wind Energy Facility Siting Permit	2	Brady Wind II is planning to submit the application in January 2016.
	Conditional Use Permits	2	Permits required for SCADA meteorological tower.

Table 19. Potential Permits and Approvals Required for Construction and Operation of the Proposed Facility

Agency	Type of Approval	Status*	Need
	Building Permit	2	Permits required for wind turbines and SCADA meteorological tower.
	Road Crossing Agreement	3	Required for impacts to cross county rights-of-way.
	Road Haul Agreement	3	Required for impacts to county roads during construction of the proposed Project.
Stark County	Road Crossing Agreement	3	A utility permit granting permission to install collection lines across county right-of-way will not be required. Any crossings identified will be permitted by amendment to the crossing agreement developed for the Brady Wind Energy Center.
Southwestern Water Authority	Pipeline Crossing Permit	3	Required if proposed Project facilities cross the Southwest Pipeline Project.

* Status Explanation:

- 1 Applied and/or Decision Pending
- 2 Would Apply Prior to Construction
- 3 Final Layout would 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 PSC 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 to 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

Brady Wind II will utilize the most current 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 the proposed Project. No waste energy is created using wind energy.

10.4 Unavoidable Adverse Environmental Effects

Unavoidable adverse environmental effects are described for each resource area in Section 7. The proposed Project is expected to impact up to 74 acres of land during operation, and this acreage would not be available for other uses. An additional 973 acres of land would be temporarily affected due to turbine pad construction, road construction, collection line trenching, laydown and contractor staging areas, turbine storage, and temporary meteorological towers. Additional unavoidable effects include visual effects and increased habitat fragmentation.

10.5 Alternatives to the Proposed Site

Brady Wind II believes that the proposed site is the most viable alternative. Brady Wind II is committed to being flexible on the preliminary site layout and will work closely with landowners and 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 timeframe. 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 the proposed Project that are irreversible and irretrievable, but these include those resources primarily related to construction.

Labor and natural resources will be used in the fabrication and preparation of construction materials. These materials are usually not retrievable. 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. These resources are not in short supply, and their use would not have an adverse effect on the availability of these resources. In addition, the overall anticipated environmental and economic benefits of the proposed Project would balance the irretrievable commitment of resources resulting from the construction of the proposed Project (see **Section 10.7**).

10.7 Direct and Indirect Economic Impacts

Economic impacts include impacts associated with the temporary disturbance of up to 1,047 acres of land during construction; of this, approximately 973 acres would be reclaimed. Permanent impacts would be lower, at approximately 74 acres. In general, agricultural areas surrounding each turbine can still be farmed, and landowner compensation has been established in individual lease agreements.

The remaining direct and indirect economic impacts are primarily positive. Wind energy development removes less total land from agricultural use than other forms of development. The rural economy and energy production in the county and state is diversified. To the extent that local contractors are used for portions of the construction, total wages and salaries paid to contractors and workers in Hettinger County and surrounding areas would 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 would be important in diversifying and strengthening the economic base of western North Dakota. Additional revenues are expected from property and income taxes.

Continuing to establish the central 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

As described in **Section 7.7**, a Class I Literature Review was conducted and a Class III Cultural Resources Inventory for archaeology is underway in the proposed Project footprint and will be completed in winter 2015 or spring 2016, as weather permits. The literature review results identified a total of 12 previously recorded archaeological sites and 16 cultural resource leads that are recorded within the proposed Project Area and within 1 mile of the Project Area.

Brady Wind II will avoid newly documented sites and the previously-documented cultural resources within the direct effects APE. The pedestrian survey and shovel probing, if necessary, would be completed as weather permits in winter 2015–spring 2016 and the cultural resources inventory report will be submitted to the SHSND for review and concurrence once it is complete.

The Class I Literature Review identified a total of ten architectural resources and five cultural resource leads within the proposed Project Area and within 1 mile of the Area. A Class III Cultural Resources Inventory for historic structures is underway. The architectural survey report will be submitted to SHSND for review and concurrence once complete, and will also be provided to the PSC. Brady Wind II will avoid directly impacting all NRHP-eligible sites.

10.10 Effect of Site on Biological Resources

The impact of the proposed Project on wildlife is expected to be low. Brady Wind II has sited the proposed Project following the voluntary USFWS Wind Energy Guidelines (USFWS 2012a) and designed the proposed Project following suggested APLIC practices (APLIC 2006). There is potential for avian and bat collisions with facility turbines, power lines, and meteorological towers, as well as the potential for habitat loss and fragmentation; however, Brady Wind II will implement measures to avoid and minimize potential impacts to biological resources from the proposed Project. Electrocutation risk is avoided by using pad-mounted transformers and burying the collection system lines per APLIC 2006 recommendations. Risks of collision would be minimized by siting facilities away from wetlands and burying collection lines. Similarly, risk of impacts to habitat would be avoided and minimized by reseeding or planting temporarily disturbed grassland areas with native material, depending on landowner preference.

The Project is unlikely to affect the black-footed ferret, northern long-eared bat, gray wolf, and Dakota skipper; there is a low likelihood for the Project to affect whooping cranes. Eagles use surveys and raptor nest surveys are underway to evaluate risk of proposed Project activities to bald and golden eagles. Brady Wind II will prepare a Project-specific BBCS documenting all avoidance, minimization, and mitigation commitments.

Detailed discussion of potential impacts and proposed mitigation measures on biological resources is provided in **Section 7.14** (Vegetation), **Section 7.15** (Wildlife), and **Section 7.16** (Rare and Unique Natural Resources).

10.11 Cumulative Effects

Activities that currently exist within the Project Area and vicinity are primarily limited to agriculture. The exploitation of oil is an existing industrial component of the landscape in Stark County, with approximately 26 percent of the county covered by oil fields (NDDMR 2015a). Oil production is expected to increase in Stark County (NDDMR 2015b). Oil production in Hettinger County is not significant at this time. In addition to the proposed Project, there are six existing wind farms in the vicinity of the proposed Project, including Sunflower Wind Project northeast of the Project Area near Hebron in Stark/Morton counties, Thunder Spirit Wind Farm south of the Project Area near Hettinger in Adams County, and the four-phased Bison Wind Energy Center northeast of the Project Area near New Salem in Oliver and Morton counties. The proposed Project is located adjacent to the southern boundary of the proposed Brady Wind Energy Center. It is likely that wind energy development would continue in southwestern North Dakota.

Wind energy development is anticipated to have a positive cumulative impact on air quality, and minimal impacts to geology, soils, water, noise, safety and health issues, and cultural resources. Socioeconomic impacts are anticipated to be positive, as the rural economy is stimulated and local energy production is diversified. The potential negative cumulative impacts are anticipated to be primarily on land use, mineral resources, vegetation, and wildlife.

With the increase in the amount of land being used for wind energy generation activities, farming activities may decrease slightly. This potential shift in land use in rural communities that have historically made their living from agricultural activities may lead to a cumulative impact; however, the additional income to farmers from wind development may make it more feasible for them to keep most of their land in agricultural uses rather than being developed for residential, commercial, or industrial uses. By enabling farmers to keep land in agriculture, wind energy development may lead to a net positive cumulative impact as less total land from agricultural use than other forms of development.

With regard to the potential cumulative impacts to wildlife resources, there is potential for the proposed Project to affect local wildlife both directly (mortality) and indirectly (habitat loss and fragmentation). Both direct and indirect potential impacts would be avoided and minimized to the extent practicable, and therefore, are not expected to cause cumulative impacts. Although the wind turbines would contribute to the utility/industrial component of the existing landscape, the area would remain primarily agricultural in nature. As these agricultural lands are of minimal value to wildlife compared to native vegetation, the proposed Project is not expected to result in a cumulative loss of quality wildlife habitat. Based on the existing land use, location of existing and planned facilities, and known impacts from similar wind facilities in the area, it is expected that the proposed Project would have minimal cumulative impacts to wildlife.

10.12 Agency Comments

Agency coordination and potential permits/approvals are discussed in **Section 8** and **Section 9**, respectively. A copy of agency response letters is included in **Appendix C**.

11. QUALIFICATIONS OF CONTRIBUTORS

Name Project Role	Education and Professional Experience
MELISSA HOCHMUTH Project Manager, Development NEER	Ms. Hochmuth joined NEER in August 2008 and serves as NEER's lead developer for North Dakota. Melissa has 7 years of experience in various roles with NEER. She spent 5 years in the environmental compliance and regulatory departments and began her role as lead developer for wind projects in North Dakota in October 2013. Melissa is responsible for managing and coordinating key functions of project development including site prospecting, meteorological tower deployment, financial analysis, land acquisition, contract negotiations including leases and obtaining all state, local, and environmental permits. Melissa holds a BA, Masters of Educational Administration and Law Degree from the University of Florida.
KIMBERLY WELLS, PH.D. Environmental Services Project Manager NEER	Dr. Wells has 15 years of environmental permitting experience including experience as both a consultant and environmental manager in the renewable industry. Her primary expertise is technically challenging and interdisciplinary projects on private and public land, with a focus on large environmental impact assessment and permitting projects with the National Environmental Policy Act (NEPA) and state equivalents; the ESA, the Clean Water Act, and associated natural resource laws. She is a certified wildlife biologist and wetland delineator, and obtained her BS in Natural Resource Management from the University of Arizona, her MS in Fisheries and Wildlife Ecology from Oklahoma State, and her PhD in Fisheries and Wildlife Sciences from the University of Missouri – Columbia. Dr. Wells is the environmental permitting manager for the Mid-Continent Region that includes North Dakota.
JASON UTTON Director Development NEER	Mr. Utton currently directs all wind energy development efforts in the Midwest ISO and PJM markets. Jason joined NEER in 2007. While with NEER, he has successfully developed over 500 MW of clean, renewable energy, which reflects a total company investment of over \$2.0B. Jason is the lead negotiator for all commercial contracts in North Dakota.
CHRIS WESTRICK Sr. Project Manager Construction NEER	Mr. Westrick is responsible for the management and oversight of early stage phases of project planning, engineering, and construction of wind projects. Duties also include budget development, contract execution, procurement, logistical planning, and ultimately transition to the construction execution team. Chris has over 10 years of experience in construction and project management.
BRIAN BJELLA Attorney for Applicants Crowley Fleck PLLP	Applicant's counsel. J.D. and Bachelor's degree, both from University of North Dakota.
ANNE-MARIE GRIGER, AICP Project Manager Tetra Tech, Inc.	Ms. Griger has 10 years of experience in environmental planning and permitting, including NEPA compliance, for large-scale infrastructure projects including wind energy generating facilities, solar energy facilities, and highways. She serves as Project Manager for wind energy projects in Kansas, North Dakota, South Dakota, and Texas. Master's in Urban and Regional Planning and Bachelor's degree in Environmental Policy and Planning, both from Virginia Tech.
TARA LOW Environmental Planner Tetra Tech, Inc.	Ms. Low has more than 12 years of experience in environmental planning, policy, and regulation with an emphasis in transmission line, power generation, and pipeline siting and permitting. Ms. Low received her Master of Science degree in the Environmental Sciences from the University of Colorado, and her Bachelor of Science degree in Zoology and Environmental Biology from Michigan State University.

Name Project Role	Education and Professional Experience
<p>JAKE ENGELMAN GIS Analyst Tetra Tech, Inc.</p>	<p>Mr. Engelman prepared the application figures, impact calculations, and other GIS tasks in support of this permit application. He is a GIS specialist with 4 years of experience in environmental resource and utility planning projects. His skills include geographic information systems (GIS), cartographic and graphic design, remote sensing, natural and cultural environmental resource mapping, and global positioning system (GPS) data collection. He uses these skills to produce high-quality graphic products of proposed projects, ranging from generation scale utility projects to single parcel substations. Mr. Engelman received his Bachelors of Science in Geography at Minnesota State University-Mankato.</p>
<p>ADAM HOLVEN Archaeologist Tetra Tech, Inc.</p>	<p>Mr. Holven led the Class I and Class III Cultural Resources Inventory for archaeology for the Project. He has extensive archaeological field experience, including large-scale multi-square mile cultural resource surveys for wind farms in North Dakota, South Dakota, and Minnesota. Mr. Holven obtained his Master's off Arts in Anthropology at Iowa State University, his Bachelors of Arts in Anthropology at University of Northern Iowa, and his Bachelors of Science in Geology at University of Northern Iowa.</p>
<p>CHRIS ANSARI Wetlands Biologist Tetra Tech, Inc.</p>	<p>Mr. Ansari led the wetlands delineation surveys for the Project. He is a certified wetland delineator and has 15 years of experience as a biologist and environmental scientist in the environmental consulting field working in both the private and public sectors. Mr. Ansari obtained his Bachelor of Science in Recreation Management at Appalachian State University.</p>
<p>RICH YOUNG Wildlife Biologist Tetra Tech, Inc.</p>	<p>Mr. Young is a wildlife biologist with over 20 years of experience. He has overseen the avian and eagle surveys for the Project. Mr. Young specializes in biological assessments of sensitive and rare wildlife, inventories and censuses of wildlife populations, habitat restoration and management, and impacts of anthropogenic disturbance. He has managed and supervised a variety of field-intensive projects involving the inventory and assessment of sensitive species and habitats. Mr. Young received his Bachelor of Science in Fisheries and Wildlife Biology at Iowa State University.</p>

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13. DEFINITIONS

AADT	Average Annual Daily Traffic
BBCS	Bird and Bat Conservation Strategy
BGEPA	Bald and Golden Eagle Protection Act
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
CRP	Conservation Reserve Program
Distribution	Relatively low-voltage lines that deliver electricity to the retail customer's home or business
DoD	Department of Defense
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	Electromagnetic Field
EPC	Engineering, procurement, and construction
ERC	Emission Rate Credit
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
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
hub	The central part of a circular object (as a wheel or propeller)
interconnection	To be or become mutually connected
kV	kilovolt
mph	miles per hour
MW	megawatt
MWh	megawatt-hour
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
NDDOT	North Dakota Department of Transportation
NDAC	North Dakota Administrative Code
NDCC	North Dakota Century Code
NDGF	North Dakota Game and Fish Department
NDGS	North Dakota Geological Survey
NEPA	National Environmental Policy Act
NHIA	No Harmful Interference Anticipated

NLCD	National Land Cover Database
NPDES	National Pollutant Discharge Elimination System
NRCS	National Resource Conservation Service
NRHP	National Register of Historic Places
NTIA	National Telecommunications and Information Administration
NWI	National Wetlands Inventory
NWP	Nationwide Permit
O&M	Operations and Maintenance
pitch	The action or a manner of pitching; especially an up-and-down movement
PLOTS	Private Lands Open to Sportsmen
Project, the	Brady II Wind Energy Center
PSC	North Dakota Public Service Commission
PTC	Production Tax Credit
rotor	The rotor consists of three blades mounted to a rotor hub
rpm	Revolutions per minute
SCADA	Supervisory Control and Data Acquisitions (communications technology)
SHSND	State Historical Society of North Dakota
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
USDA	US Department of Agriculture
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
WoUS	water of the United States
WRRS	Wildlife Response and Reporting System
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














Figures

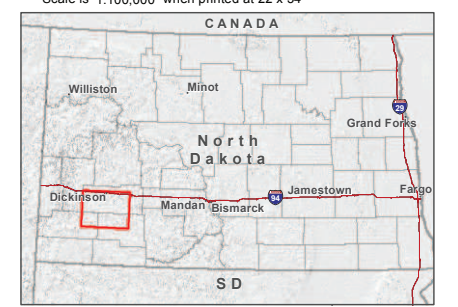
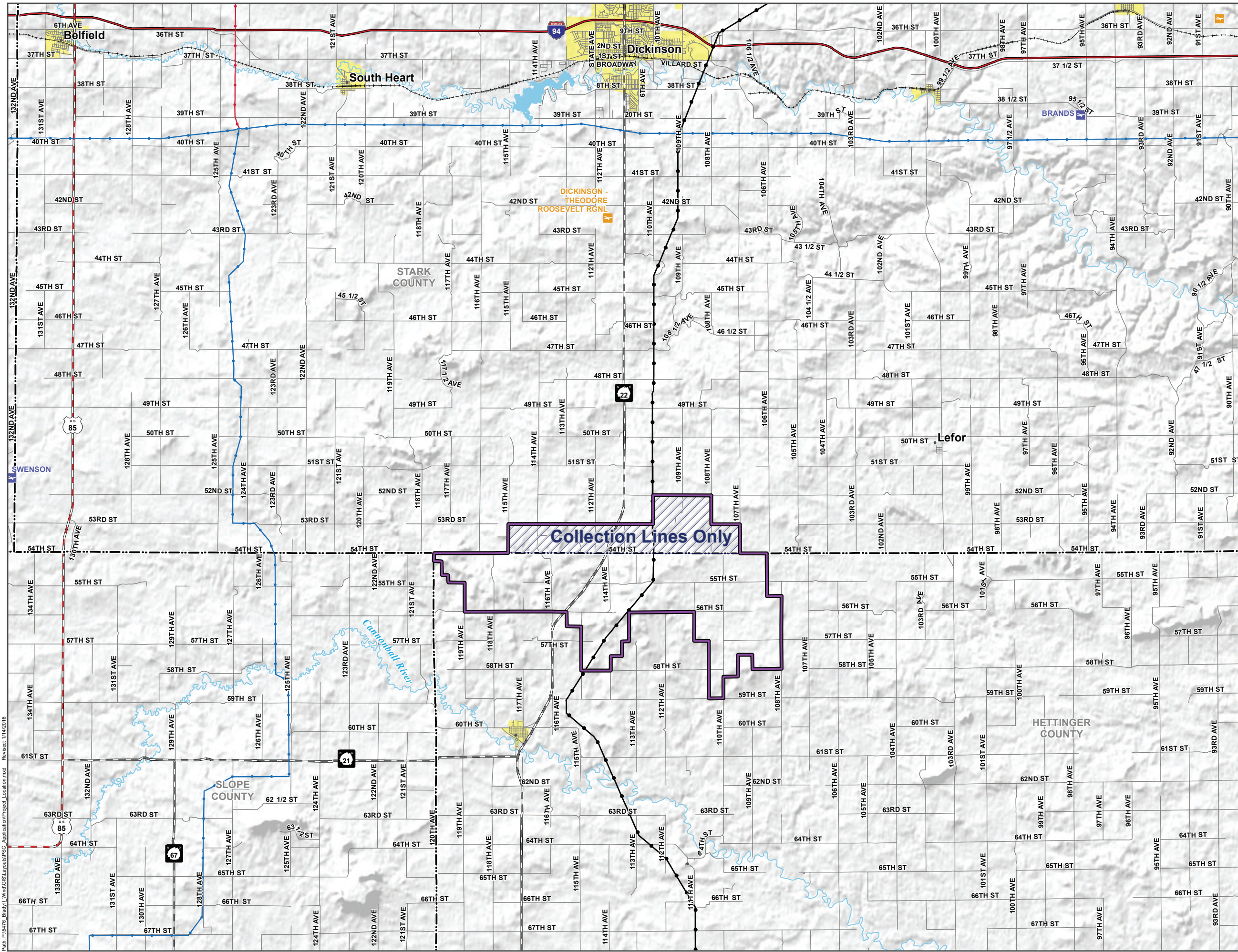
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Brady II Wind Energy Center

Hettinger County, ND
(Ancillary Facilities in Stark County)

Legend

-  Proposed Project Area (01/06/16)
-  County Boundary
-  Major River
-  Municipal Boundary
- Existing Electrical Transmission (Ventyx 2015)**
-  115kV Transmission Line
-  230kV Transmission Line
-  345kV Transmission Line
- Transportation (BTS 2013)**
-  Public Airport
-  Private Airport
-  Interstate Highway
-  U.S. Highway
-  State Highway
-  Rail



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Figure 1: Project Location

Brady II Wind Energy Center

Hettinger County, ND
(Ancillary Facilities in Stark County)

Legend

 Proposed Project Area (01/06/16)

 County Boundary

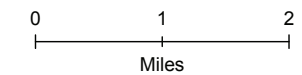
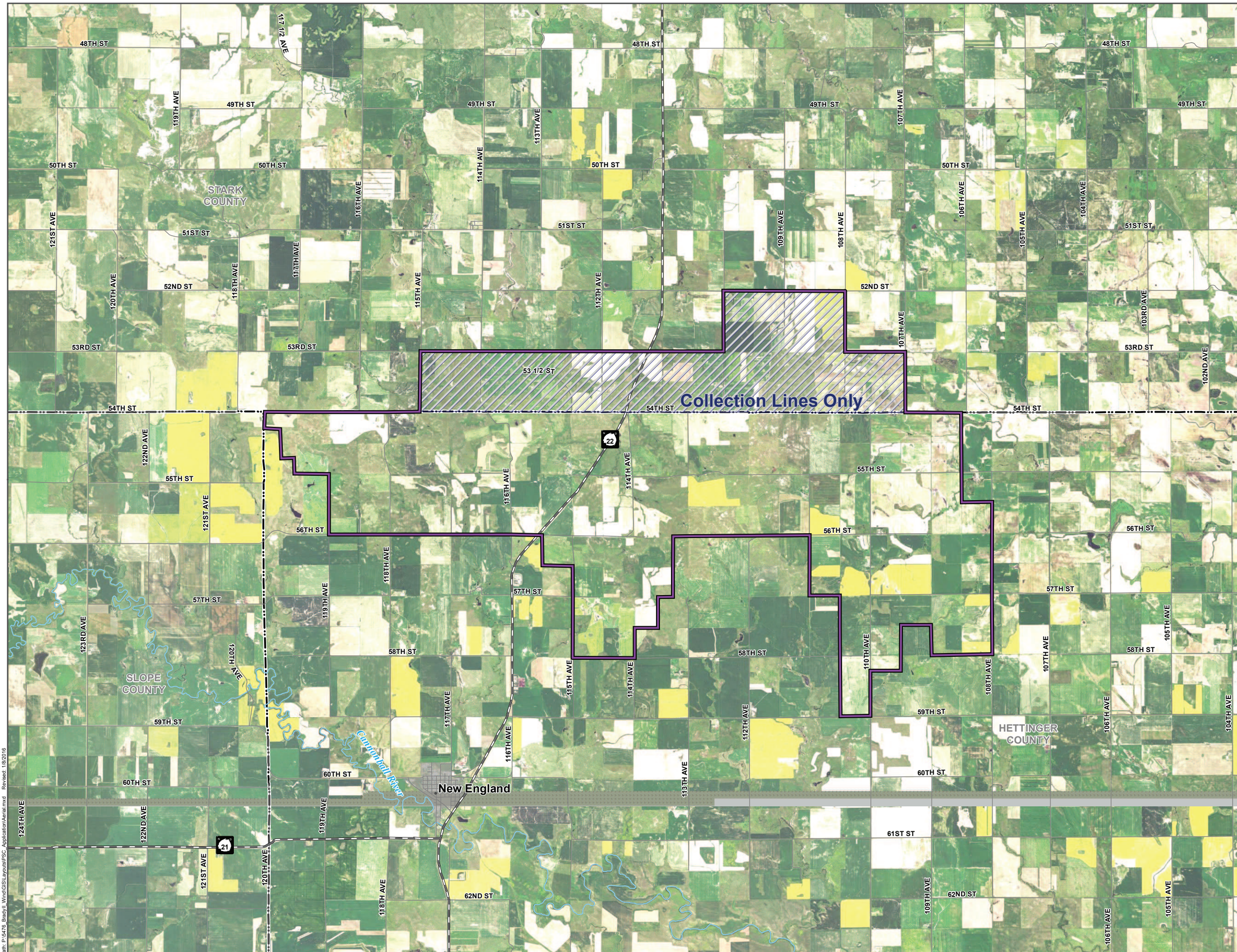
 Major River

Transportation

 State Highway

 County Road

*NAIP 2014 Aerial Imagery



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Figure 2: Project Area (Aerial)

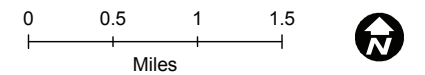
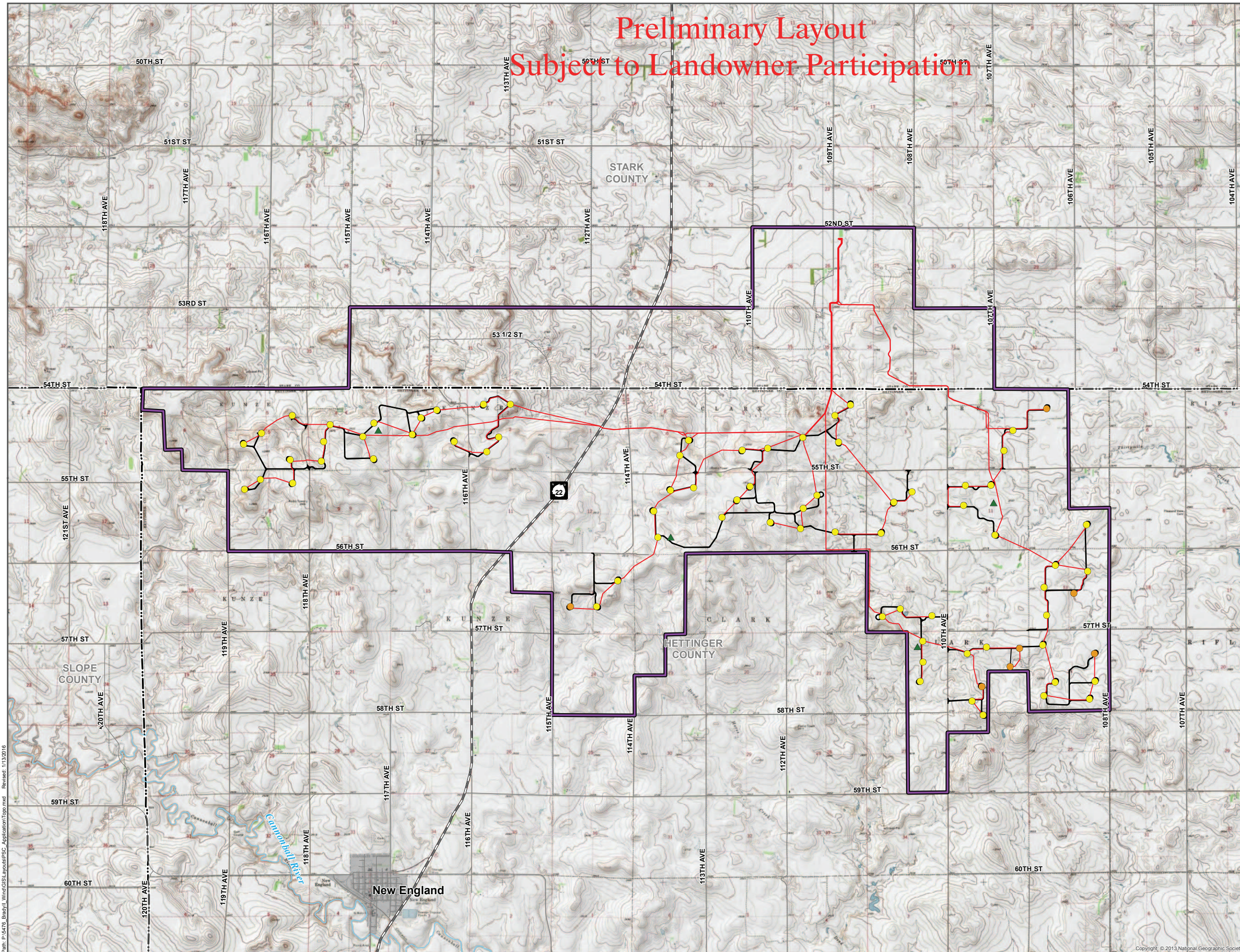
Preliminary Layout Subject to Landowner Participation

Brady II Wind Energy Center

Hettinger County, ND
(Ancillary Facilities in Stark County)

Legend

- Proposed Project Features**
- ▲ Temporary Met Tower
 - Proposed Turbine (12/08/15)
 - Alternative Turbine (12/08/15)
 - Collection System (12/11/15)
 - Service Roads (12/14/15)
 - Project Area (01/06/16)



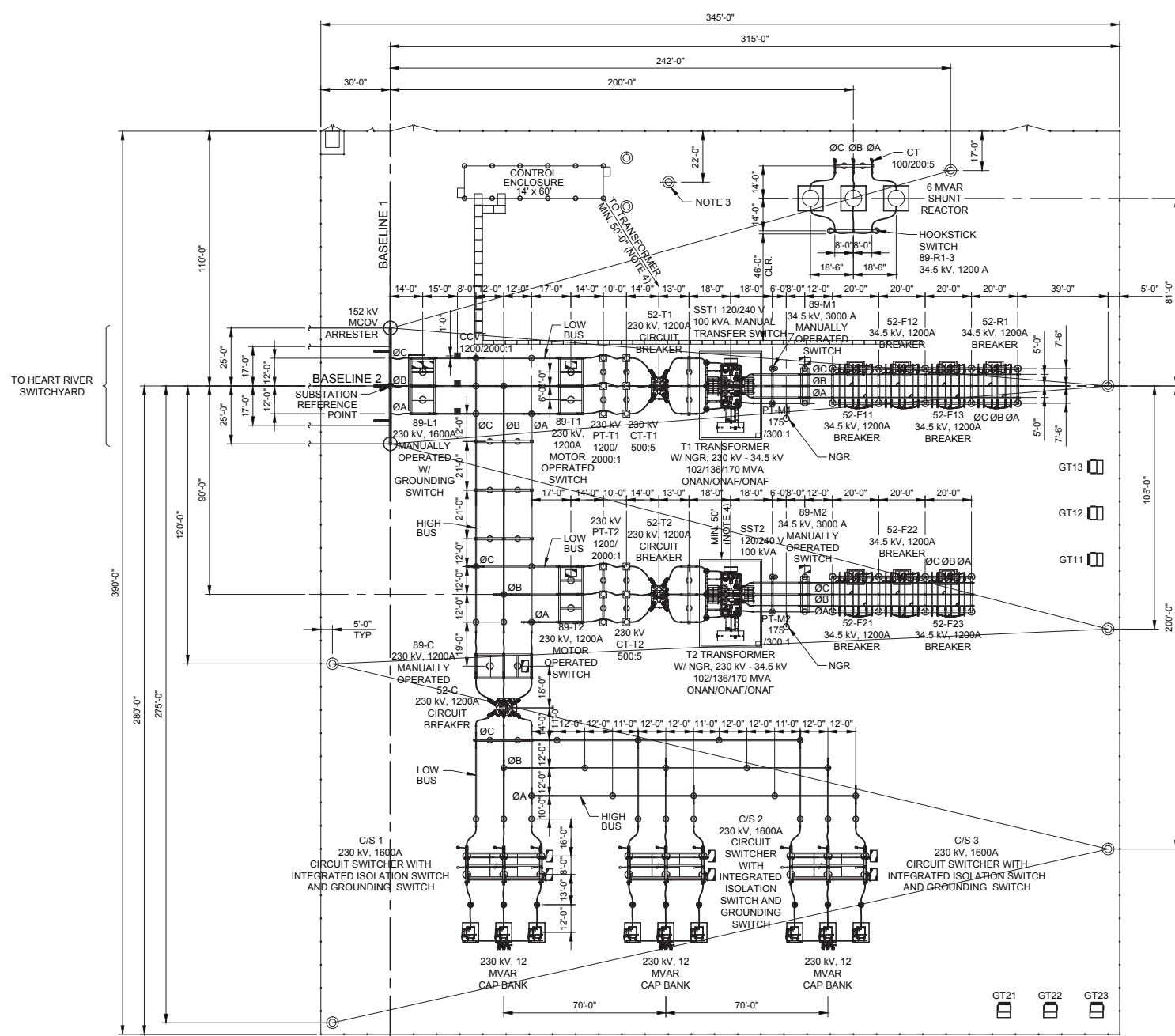
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Figure 3: Project Area (Topographical) and Proposed Facilities

REVISIONS				
REV	DESCRIPTION	DSN	CHK	DATE
A	PRELIMINARY	ADR	SMA	11/17/14
B	ISSUED FOR REVIEW	PD	PSF	11/21/14
C	REVISED PRELIMINARY	ADR	JW	12/17/14
D	REVISED SUBSTATION CONFIGURATION	GLJ	PSF	01/05/15
E	ADDED FUTURE LINE BREAKER	ADR	JW	01/13/15
F	ISSUED REVISED DRAWING PACKAGE FOR REVIEW	ADR	JW	02/12/15
G	ADDED 230 KV CAPACITOR BANK AND 34.5 KV REACTORS	ADR	JW	02/24/15
H	ISSUED FOR DESIGN REVIEW	ADR	JW	03/06/15
J	ISSUED FOR BID	GLJ	PSF	05/04/15
K	PRE-CONSTRUCTION, FINAL DESIGN RELEASE	ADR	JW	06/11/15
L	ISSUED FOR CONCEPTUAL REVIEW	GLJ	CCG	10/02/15
M	ISSUED FOR REVIEW	ADR	JW	10/16/15
N	ISSUED FOR REVIEW	ADR	JW	11/09/15



LEGEND

- NEW CONSTRUCTION
- NEW SUBSTATION FENCE
- FUTURE CONSTRUCTION
- FUTURE SUBSTATION FENCE

NOTES

1. REFERENCE DRAWING G.101 FOR EQUIPMENT RATINGS.
2. REFERENCE DRAWING Q.100 FOR DETAIL OF BUSHINGS AND PHASING.
3. COMMUNICATION TOWER PROVIDED BY BASIN ELECTRIC.
4. NFPA 850 RECOMMENDS A MINIMUM SEPARATION DISTANCE BETWEEN ADJACENT TRANSFORMERS AND BETWEEN THE BUILDING AND TRANSFORMER OF 50'-0".

SCALE VERIFICATION

THIS BAR IS 1 INCH IN LENGTH ON ORIGINAL DRAWING

SCALE: 1" = 30'

ORIGINAL DRAWING SIZE IS 24 x 36

IF IT'S NOT 1 INCH ON THIS SHEET ADJUST YOUR SCALES ACCORDINGLY

GENERAL ARRANGEMENT

BRADY SUBSTATION



FOR REVIEW

PROJECT NO.	20153420	G.102
ISSUE DATE	10/16/15	
CURRENT REVISION	N	
DESIGNED BY	A. RICHARDSON	
DRAWN BY	G. JEFFERSON	
CHECKED BY	J. WENDELBURG	
APPROVED BY	P. FIELD	SHEET

DRAFT

Figure 4: Substation Site Plan

CADD FILE: W:\2015\3420_15\Brady_Substation\G.102_GENERAL_ARRANGEMENT.dwg LAYOUT: G.102_GENERAL_ARRANGEMENT.plt PLOTTED: 11/09/2015 3:04 PM BY: adam.mccord

Brady II Wind Energy Center

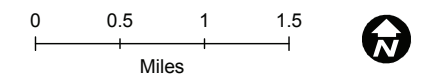
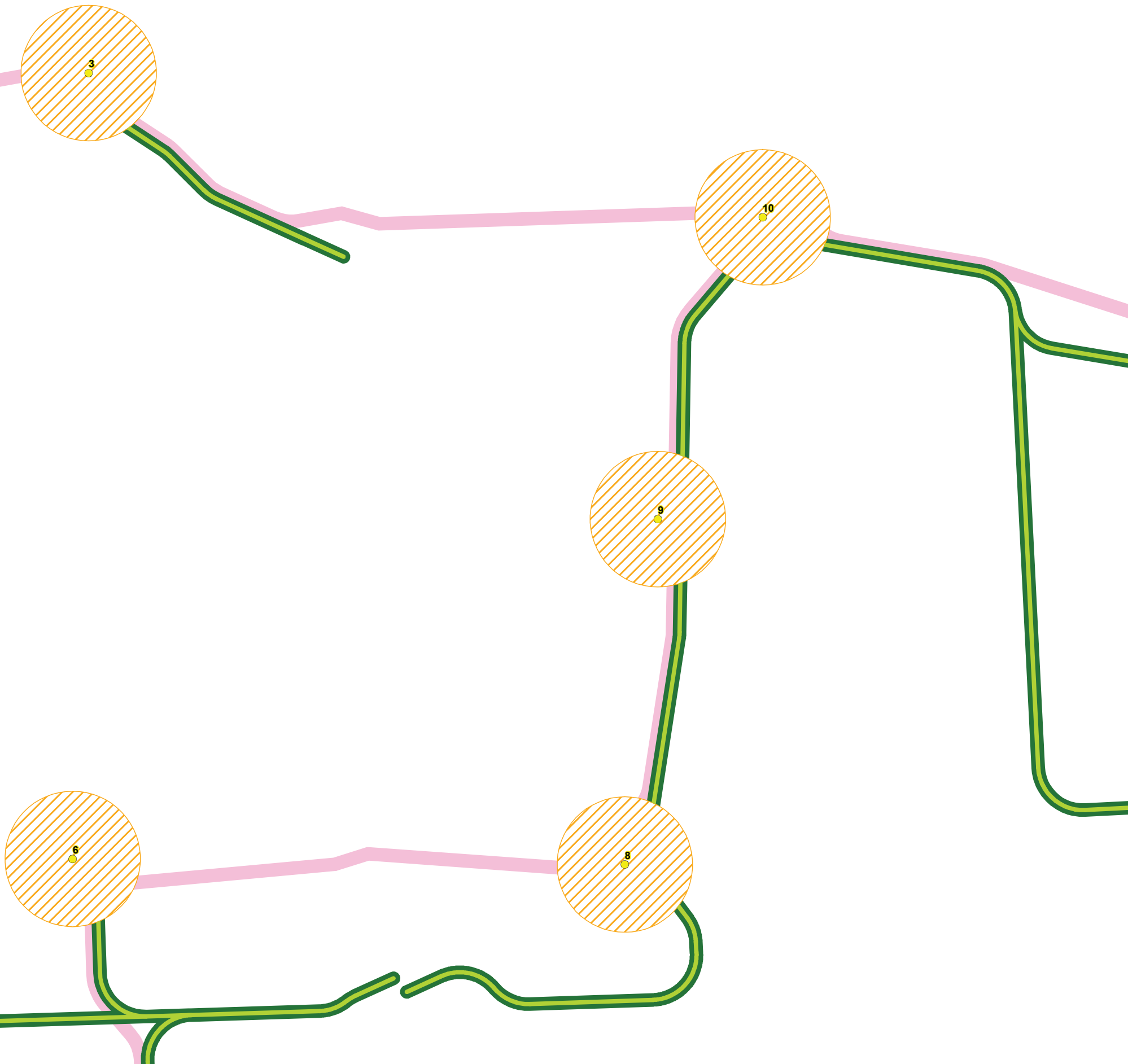
Hettinger County, ND
(Ancillary Facilities in Stark County)

Legend

Proposed Impact Assumptions

- Temporary Service Road Impact Buffer
- Temporary Turbine Impact Buffer
- Temporary Collection Line Buffer
- Permanent Turbine Impact Buffer
- Permanent Service Road Impact Buffer

*Permanent impacts from collection lines are limited to junction boxes.



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Figure 5: Project Impact Assumptions

Preliminary Layout Subject to Landowner Participation

Brady II Wind Energy Center

Hettinger County, ND
(Ancillary Facilities in Stark County)

Legend

Proposed Project Features

- ▲ Temporary Met Tower
- Proposed Turbine (12/08/15)
- Alternative Turbine (12/08/15)
- Collection System (12/11/15)
- Service Roads (12/14/15)
- Project Area (01/06/16)

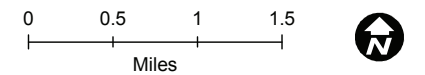
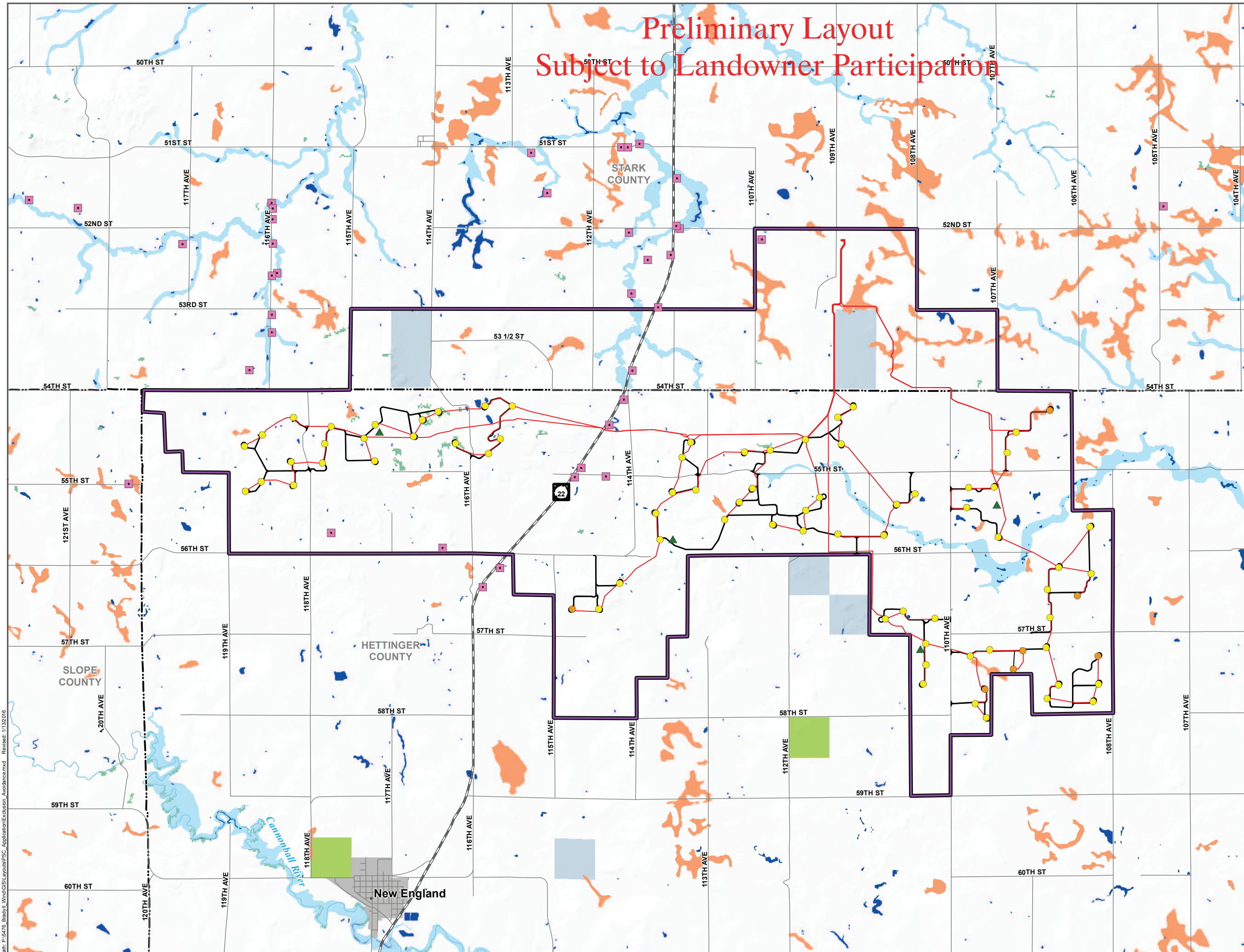
Exclusion* (NRCS SSURGO 2013)

- Prime Farmland

*Archaeological Sites are not shown due to confidentiality.

Avoidance (NLCD 2011, NWI 2014, FEMA 2014, NDIS Hub 2014)

- Historical Resources
- 100-year Floodplain
- NLCD Forest
- NWI Wetland
- North Dakota Game & Fish
Conservation PLOTS Recreational
Easement (Private Land Open to Sportsmen)
- State Trust Land
*parcels are open to hunting unless otherwise
posted with official North Dakota State Land
Department signage

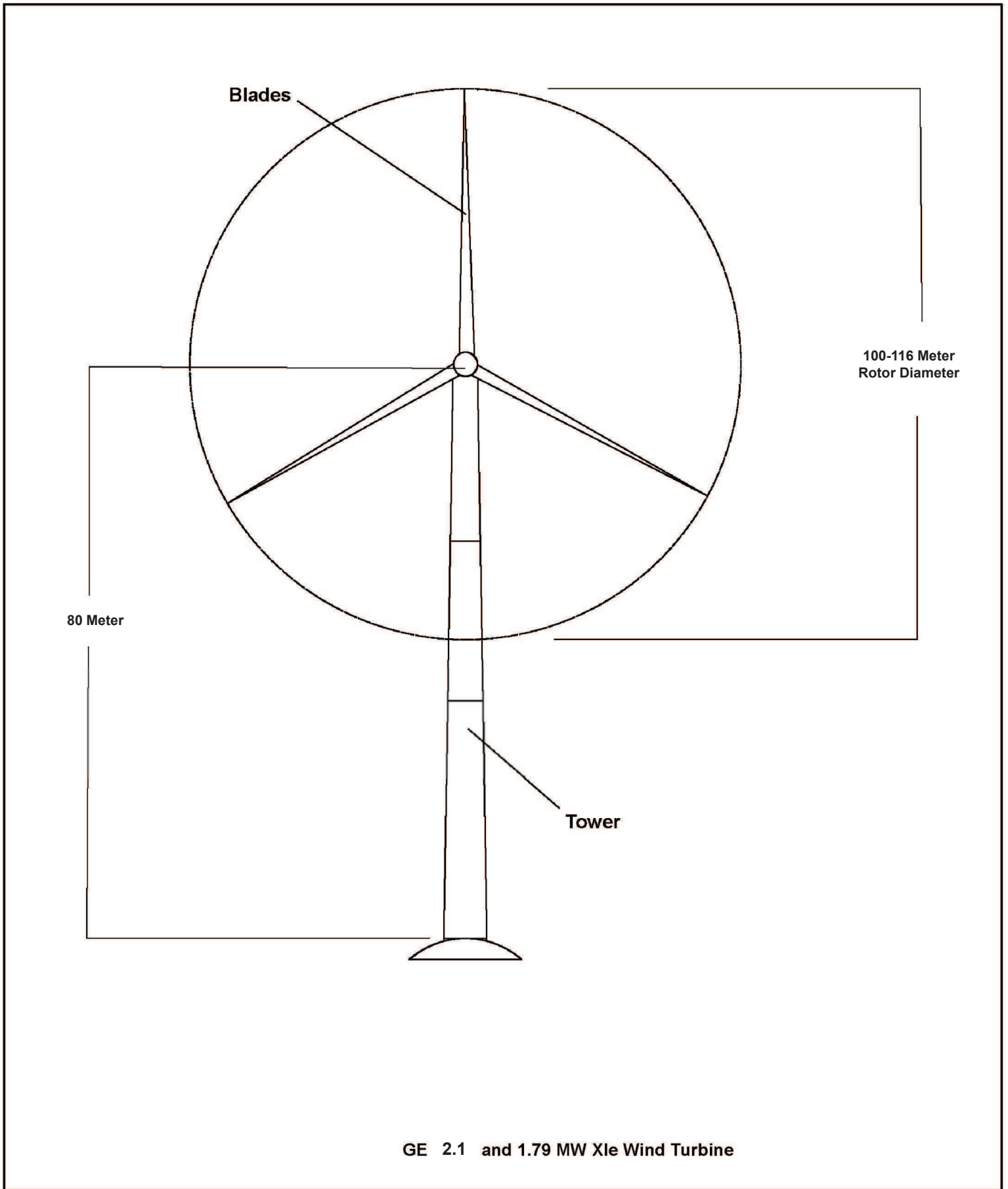


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Figure 6: Exclusion and Avoidance Areas



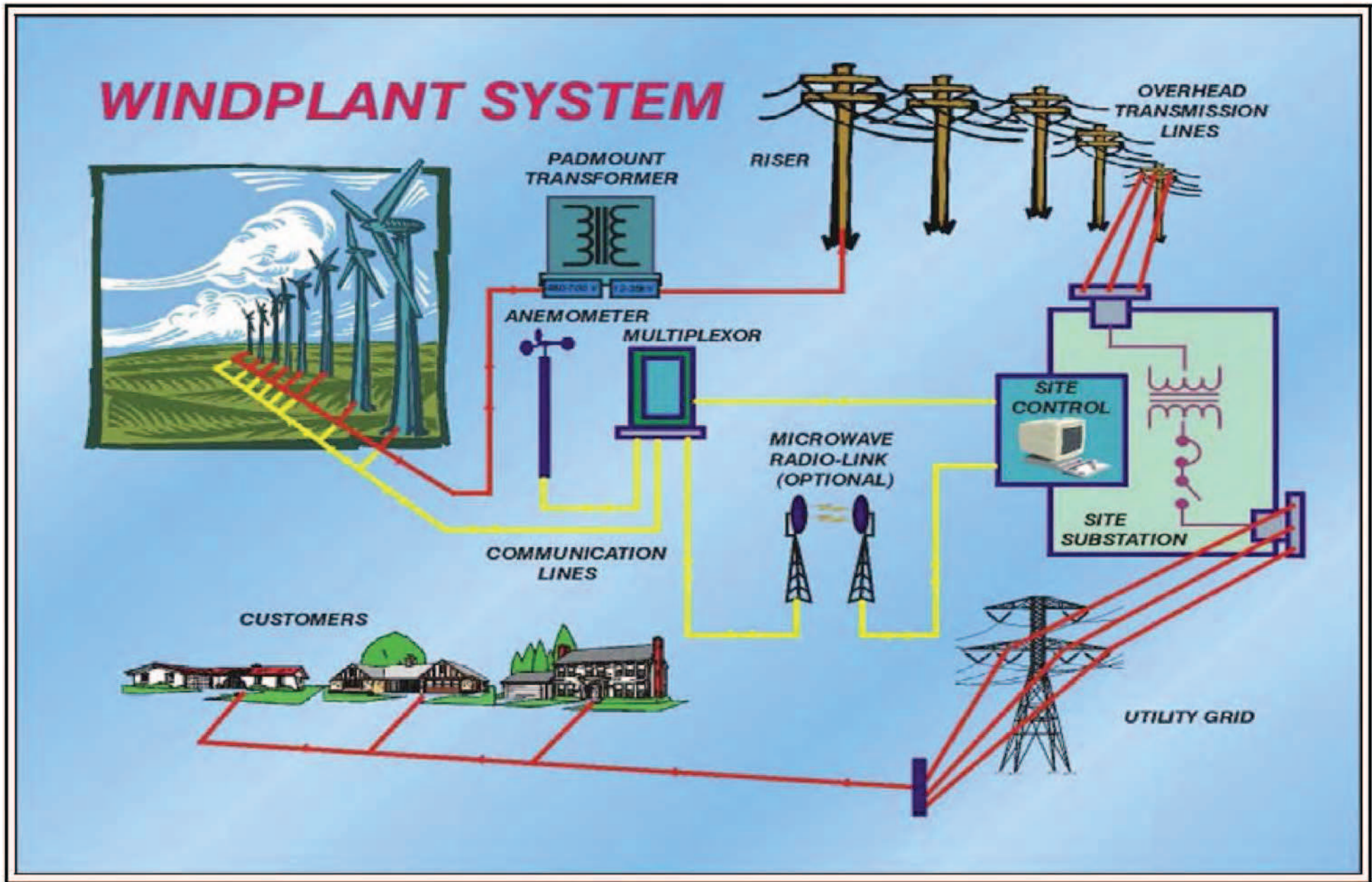


Figure 8
 Path of Energy Diagram
 Brady II Wind Energy Center

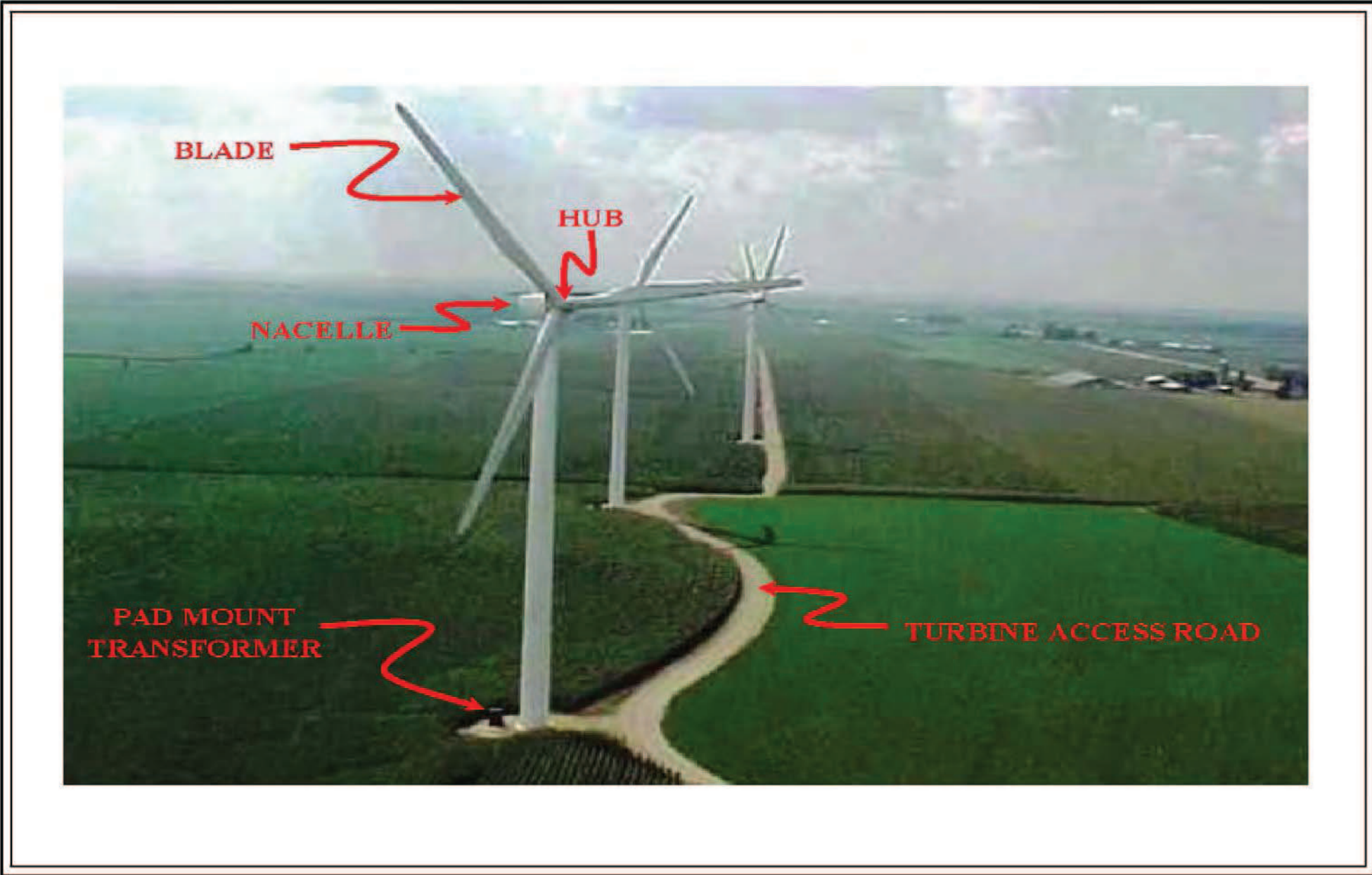


Figure 9
Typical Wind Energy Center Layout
Brady II Wind Energy Center

Brady II Wind Energy Center

Hettinger County, ND
(Ancillary Facilities in Stark County)

Preliminary Layout
Subject to Landowner Participation

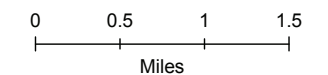
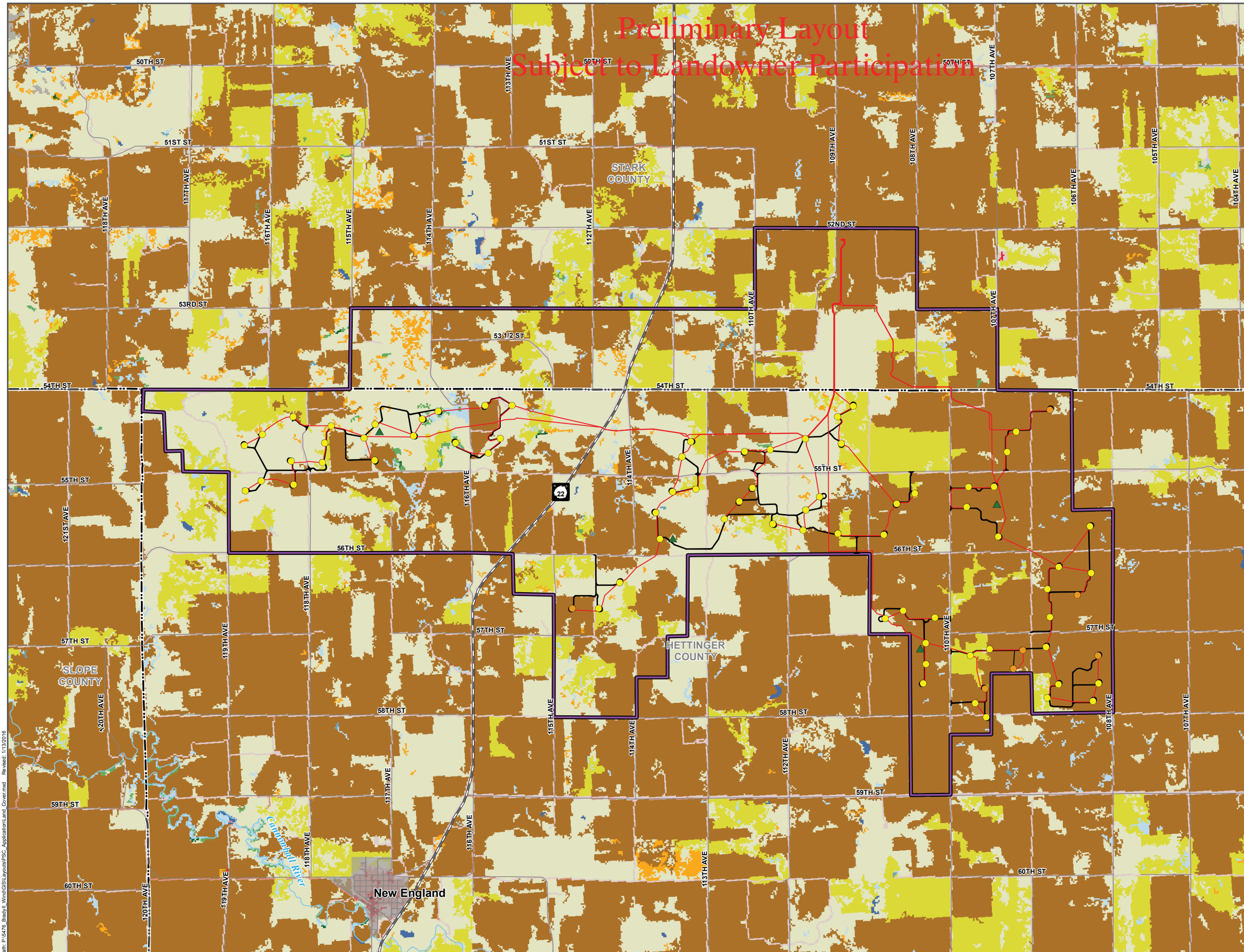
Legend

Proposed Project Features

- Temporary Met Tower
- Proposed Turbine (12/08/15)
- Alternative Turbine (12/08/15)
- Collection System (12/11/15)
- Service Roads (12/14/15)
- Project Area (01/06/16)

NLCD Land Cover (NLCD 2011)

- Open Water
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity (24)
- Barren Land (Rock/Sand/Clay)
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Shrub/Scrub
- Grassland/Herbaceous
- Pasture/Hay
- Cultivated Crops
- Woody Wetlands
- Emergent Herbaceous Wetlands



Scale is 1:36,000 when printed at 22 x 34



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Figure 10: Land Cover Map







Brady II Wind Energy Center

Hettinger County, ND
(Ancillary Facilities in Stark County)

Preliminary Layout
Subject to Landowner Participation

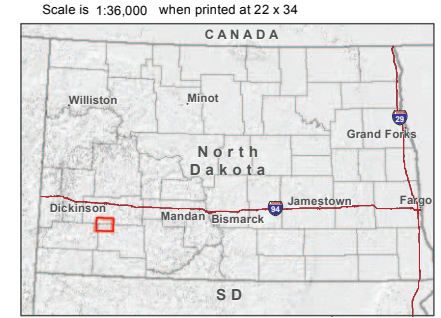
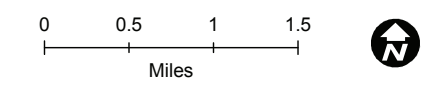
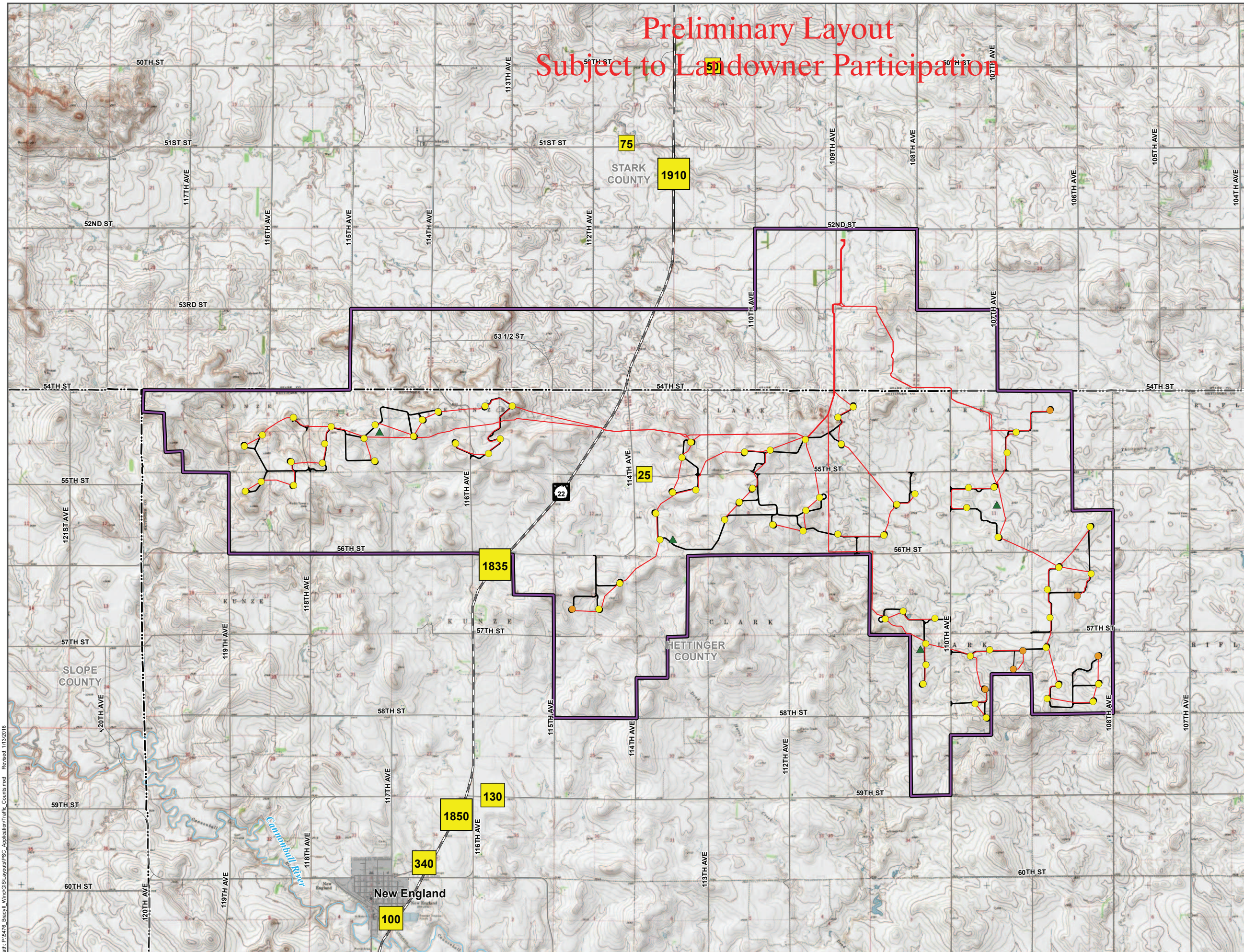
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Proposed Project Features

-  Temporary Met Tower
-  Proposed Turbine (12/08/15)
-  Alternative Turbine (12/08/15)
-  Collection System (12/11/15)
-  Service Roads (12/14/15)
-  Project Area (01/06/16)

Transportation (NDOT 2014, BTS 2013)

-  State Highway
-  County Road
-  Average Daily Traffic Count



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Figure 11: Average Daily Traffic Map

Preliminary Layout Subject to Landowner Participation

Brady II Wind Energy Center

Hettinger County, ND
(Ancillary Facilities in Stark County)

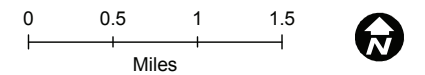
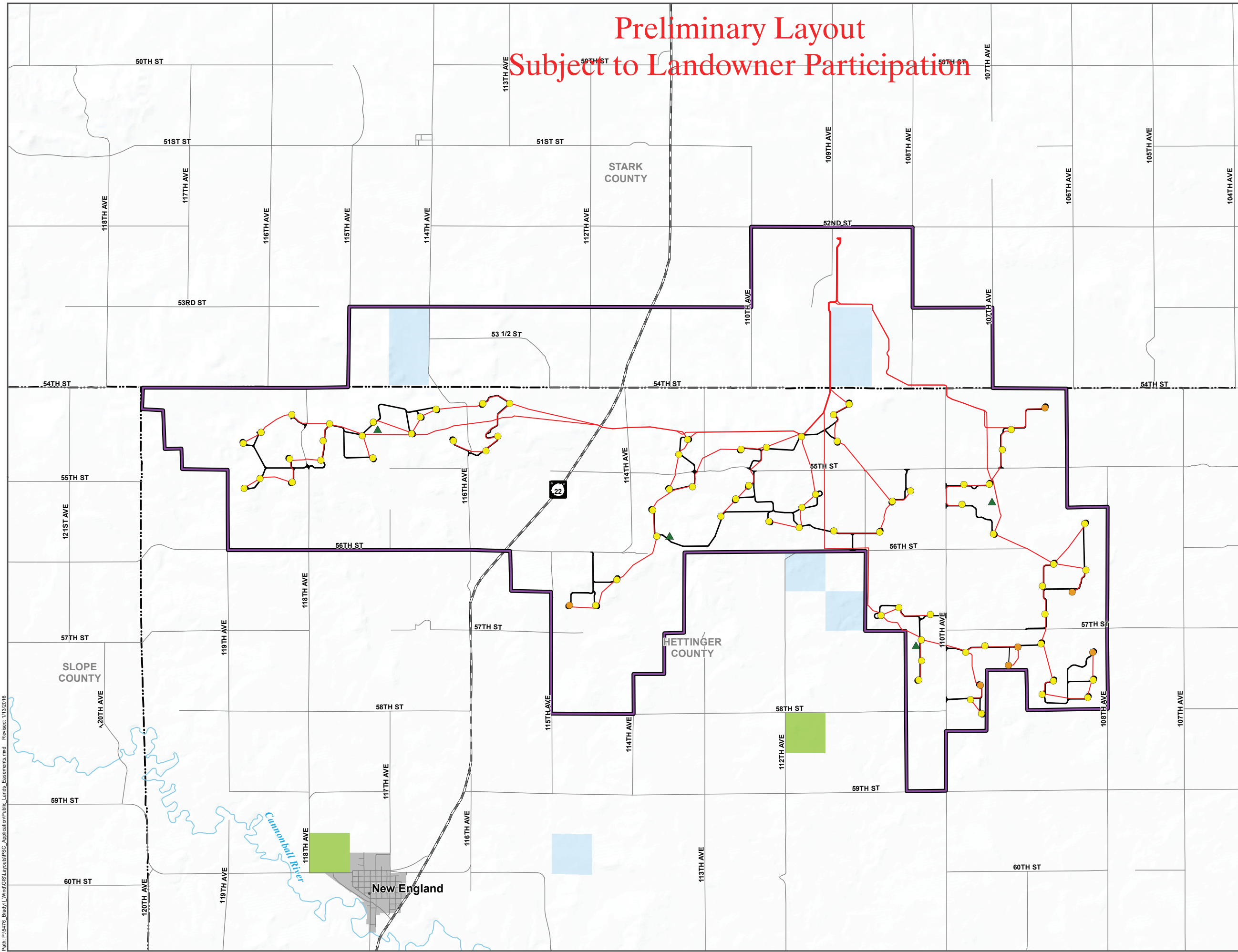
Legend

Proposed Project Features

- ▲ Temporary Met Tower
- Proposed Turbine (12/08/15)
- Alternative Turbine (12/08/15)
- Collection System (12/11/15)
- Service Roads (12/14/15)
- Project Area (01/06/16)

Jurisdiction (ND GIS Hub 2014)

- State Trust Land
- Other
North Dakota Game & Fish
Conservation PLOTS Recreational
Easement (Private Land Open to Sportsmen)



Scale is 1:36,000 when printed at 22 x 34



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Figure 12: Public Lands and Easements



Figure 13: Photo of Typical Landscape

Preliminary Layout Subject to Landowner Participation

Brady II Wind Energy Center

Hettinger County, ND
(Ancillary Facilities in Stark County)

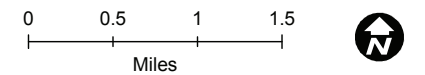
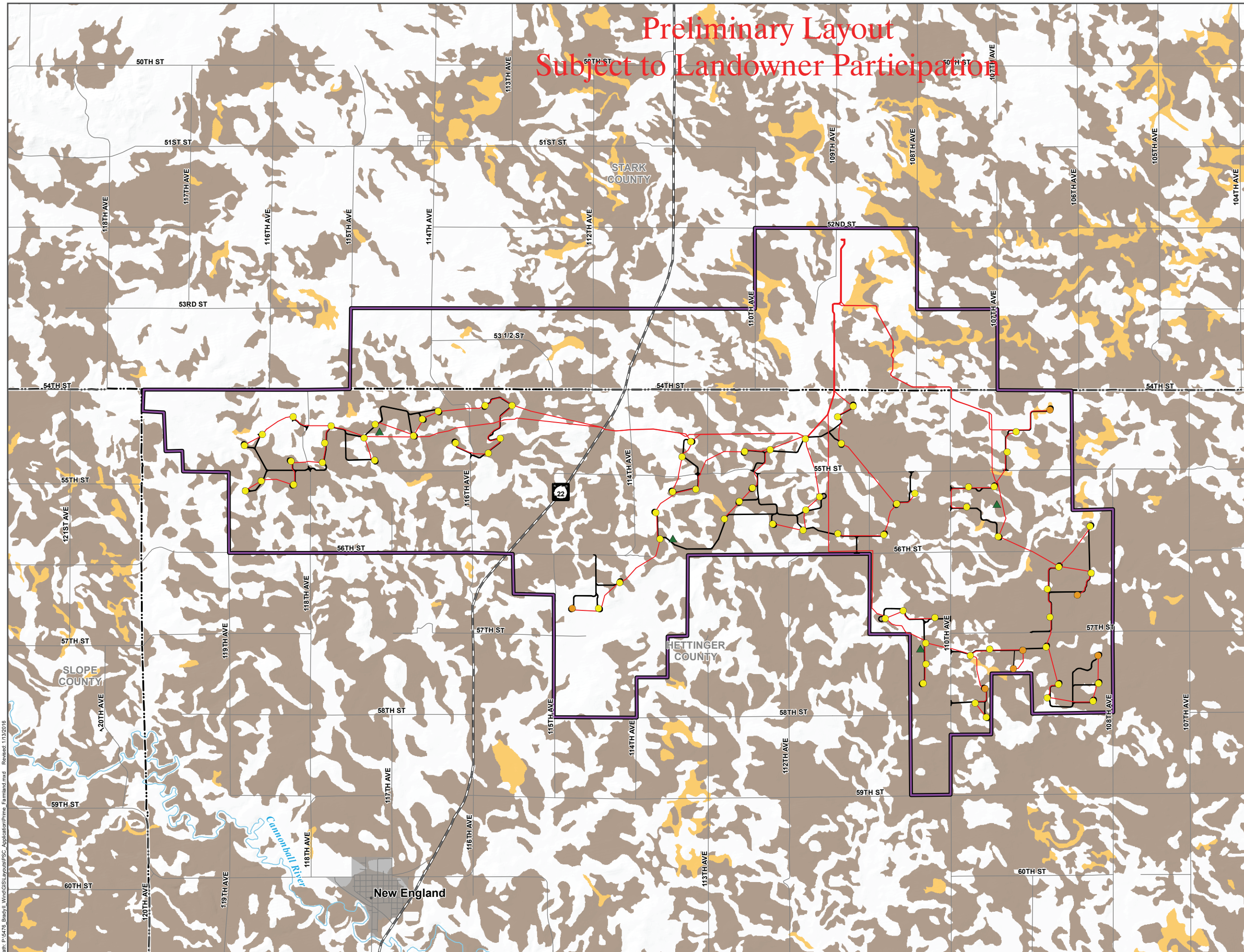
Legend

Proposed Project Features

- ▲ Temporary Met Tower
- Proposed Turbine (12/08/15)
- Alternative Turbine (12/08/15)
- Collection System (12/11/15)
- Service Roads (12/14/15)
- Project Area (01/06/16)

Prime Farmland (NRCS SSURGO 2013)

- Prime Farmland
- Farmland of Statewide Importance



Scale is 1:36,000 when printed at 22 x 34



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Figure 14: Prime Farmland Soil Distribution Map

Preliminary Layout Subject to Landowner Participation

Brady II Wind Energy Center

Hettinger County, ND
(Ancillary Facilities in Stark County)

Legend

Proposed Project Features

- ▲ Temporary Met Tower
- Proposed Turbine (12/08/15)
- Alternative Turbine (12/08/15)
- Collection System (12/11/15)
- Service Roads (12/14/15)
- Project Area (12/08/15)

Hydrology (NHD 2014)

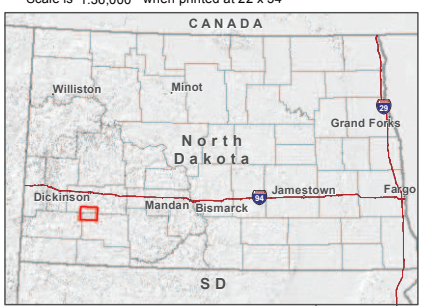
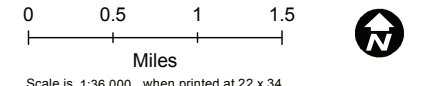
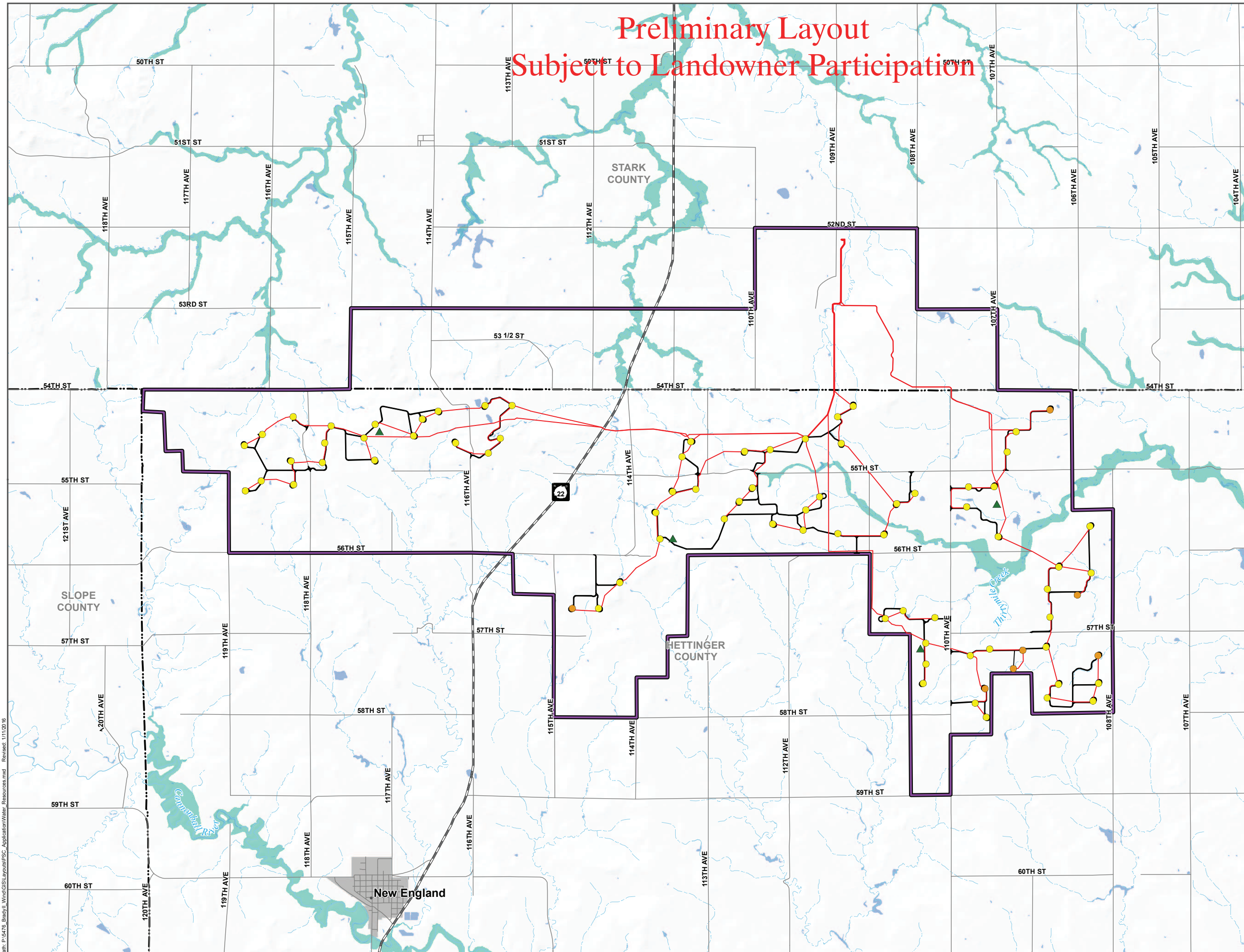
- Perennial Stream
- - - Intermittent Stream

Wetlands (NWI 2014)

- NWI Wetlands

FEMA Floodplains (FEMA 2014)

- 100-year Floodplain



Path: P:\5476_BradyII\Wind\GIS\Layouts\FSC_ApplicationWater_Resources.mxd Revised: 11/12/16

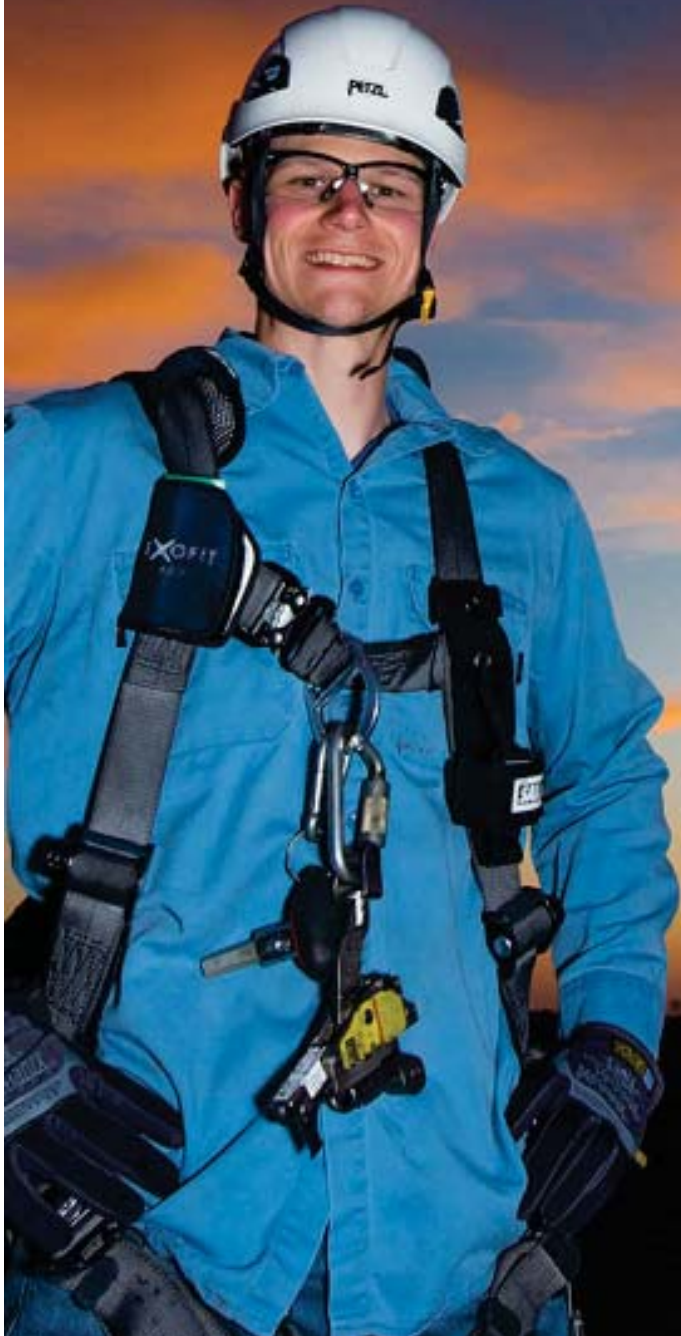
Figure 15: National Wetlands Inventory and Surface Waters Map

**Appendix A:
Excerpt of NextEra Energy, Inc.'s
2015 Corporate Responsibility Report**

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2015 | CORPORATE RESPONSIBILITY
SUSTAINABILITY REPORT

**SOLVING AMERICA'S ENERGY CHALLENGES:
SUSTAINABLY AND RESPONSIBLY**



NEXtera
ENERGY 

Our Story

At NextEra Energy, we're proud of the role we're playing in helping solve America's energy challenges and in creating a more affordable clean energy future ... sustainably and responsibly.

To us, being sustainable and responsible means respecting our environment, investing in customer value, sustaining and growing our communities, investing in our team, and growing shareholder value.

As we continue to pursue our vision of becoming America's clean energy leader, we do so with a commitment to ensuring we are providing benefits daily for our environment, our customers, our communities, our employees and our shareholders.

We're pleased you've taken the time to learn about the NextEra Energy story, and we invite you to join us in our journey to create a more affordable clean energy future we can all be proud of.

Delivering for OUR ENVIRONMENT



Highlights

1. NextEra Energy achieved its lowest-ever emissions rates of SO₂, NO_x and CO₂ in 2014 – rates that were 97-, 79- and 55-percent lower, respectively, than our industry's averages
2. We installed more than 1,600 MW of wind and solar power in 2014
3. We committed to interacting with nature in a positive manner and have developed wildlife protection programs to protect a number of species and their habitats, including eagles, kestrels, sea turtles, crocodiles, and ospreys

Environmental Stewardship

At NextEra Energy, we're committed to being an industry leader in environmental protection and stewardship. As citizens, we're all stakeholders of our earth's environment. As an energy company, we recognize that environmental protection and stewardship are essential to the way we do business and critical to the value we deliver for our stakeholders.

Our Environmental Policy establishes our core environmental expectations and provides actionable guidance for all employees as we strive to foster a culture of environmental excellence and challenge ourselves to continuously improve. The policy is incorporated in our Code of Business Conduct & Ethics and Supplier Code of Conduct, which apply to our employees and suppliers, respectively. Everyone at NextEra Energy understands that protecting the environment is a collective responsibility. It's why our senior executives are actively involved in our environmental accountability, management and stewardship programs that are intended to:

- Design, construct, operate and maintain our facilities in an environmentally sound and responsible manner;
- Prevent pollution, minimize waste and conserve natural resources;
- Avoid, minimize and/or mitigate impacts to habitat and wildlife; and
- Engage stakeholders to build trust and partner toward common goals for environmental stewardship and protection.

We want to be the first and best source of information for our stakeholders to learn about our environmental performance and programs. That's what it means to be the clean energy leader. And that's how we deliver for the environment.



The protection of our natural environment is a fundamental part of our goal to be America's clean energy leader. We are committed to meeting our energy needs, while protecting the air, water, land and wildlife, and our exceptional environmental performance record and clean energy portfolio demonstrate just how well we are doing. These commitments are important to our employees, customers and communities and are what further enable us to deliver outstanding value to our customers and shareholders.

-Randy LaBauve, vice president of environmental services

Toward Cleaner Air

At NextEra Energy, we're committed to being an industry leader in environmental protection and stewardship, and one of the key ways in which we've demonstrated this commitment is by making business decisions to invest in emissions-free and clean generation. This enables us to reduce our impact on the air we all breathe. In fact, NextEra Energy's generation fleet has significantly lower rates of emissions of CO₂, SO₂ and NO_x compared to the U.S. electric power industry as a whole.

At year-end 2014, NextEra Energy Resources was the world's largest generator of renewable energy from the wind and the sun. We ended 2014 with more than 11,400 megawatts of wind generation capacity and nearly 1,000 megawatts of solar generation capacity.

At FPL, we are continuing to modernize our fossil generation fleet by replacing older, inefficient oil-fired generation with state-of-the-art combined-cycle, natural gas generation. Since 2001, FPL's investments in clean, fuel-efficient power plants have saved customers more than \$7.5 billion in fuel costs and helped reduce the company's use of foreign oil by 99 percent. Because of these modernization efforts, FPL has been able to avoid more than 40 million barrels of oil, using less than 1 million barrels of oil for generation in 2014. These investments have also enabled FPL to significantly reduce power plant emissions rates and have prevented more than 85 million tons of carbon emissions to date. FPL now operates one of the most modern, clean, fuel-efficient and low-carbon generation fleets in the nation.

At NextEra Energy, we have positioned our business well to meet the challenges of new federal environmental regulations. We anticipate these new rules will significantly advance the need for low-emitting and zero-emitting electric generation. At NextEra Energy, we've positioned our business to manage the opportunities and risks presented by these new regulations while simultaneously lowering emissions.

Reducing Our Emissions

SO₂ Emissions Rate

NEXTERA ENERGY VS. INDUSTRY:

97% lower
SO₂ emissions rate*



*Source for Electric Sector: U.S. Department of Energy

*The environmental attributes of NextEra Energy's electric generating facilities, such as renewable energy credits, emissions reductions, offsets, allowances and the avoided emission of greenhouse gas pollutants, have been or likely will be sold or transferred to third parties, who are solely entitled to the reporting rights to any federal, state, foreign or voluntary trading program and to ownership of such environmental attributes.

NO_x Emissions Rate

NEXTERA ENERGY VS. INDUSTRY:

79% lower
NO_x emissions rate*



*Source for Electric Sector: U.S. Department of Energy

*The environmental attributes of NextEra Energy's electric generating facilities, such as renewable energy credits, emissions reductions, offsets, allowances and the avoided emission of greenhouse gas pollutants, have been or likely will be sold or transferred to third parties, who are solely entitled to the reporting rights to any federal, state, foreign or voluntary trading program and to ownership of such environmental attributes.

CO₂ Emissions Rate

NEXTERA ENERGY VS. INDUSTRY AVERAGE:

55% lower CO₂ emissions rate*



*Source for Electric Sector: U.S. Department of Energy

*The environmental attributes of NextEra Energy's electric generating facilities, such as renewable energy credits, emissions reductions, offsets, allowances and the avoided emission of greenhouse gas pollutants, have been or likely will be sold or transferred to third parties, who are solely entitled to the reporting rights to any federal, state, foreign or voluntary trading program and to ownership of such environmental attributes.



- In 2014, FPL brought into service its Riviera Beach Next Generation Clean Energy Center – one of the cleanest, most energy-efficient plants in the nation. Over its operational lifetime, the new, fuel-efficient plant is expected to provide FPL customers with hundreds of millions of dollars in fuel and other savings. This is part of FPL's focus on modernizing its power plant fleet by replacing oil-fired plants with clean, highly efficient, combined-cycle natural gas plants such as this one. It's also a big reason parent company NextEra Energy in 2014 recorded its lowest-ever air emissions rates.

In 2014, 97 percent of the power produced by NextEra Energy facilities was generated from a diverse mix of clean or renewable sources, including wind, solar, combined-cycle natural gas and nuclear. By implementing our strategy to become America's clean energy leader, we have been able to reduce our emissions rates of SO₂, NO_x and CO₂ by 98 percent, 93 percent and 33 percent, respectively, since 1990, while at the same time growing our generation fleet by approximately 274 percent.

FPL Powers Formula E Electric Race with Clean Solar Energy; Student Focus Garneres Statewide Honors

FPL powered the vehicles racing in the country's first-ever electric car race, held in downtown Miami in March 2015. Part of the FIA Formula E Championship, the Miami ePrix featured the highest class of competition for electrically powered racing cars.

"Our partnership with Formula E and the Miami ePrix is another example of our commitment to advancing zero-emissions solar energy and the use of electric vehicles in Florida," said Eric Silagy, president and CEO of FPL. "By the end of 2016, we will triple the energy we are able to produce from the sun, furthering our mission to provide low-cost, reliable and clean energy to our 4.8 million customers."

FPL announced its partnership with Formula E at its Martin Next Generation Solar Energy Center, along with famed race car driver Michael Andretti and drivers in the Miami ePrix. During the announcement event, electric race cars were charged with power generated from the Martin Next Generation Solar Energy Center, one of three solar power plants operated by FPL. Earlier in the year, FPL announced plans to install more than 1 million solar panels at three additional solar power plants by the end of 2016. These new plants, combined with community-based solar installations and other small-scale arrays that FPL is installing, would total more than 225 megawatts of new solar capacity. This would effectively triple FPL's solar capacity, which currently totals approximately 110 megawatts.

"The Formula E Miami ePrix is all about sharing our passion for electric vehicles," said Alejandro Agag, CEO of Formula E Holdings. "The race series is exciting, it's entertaining, and we hope it will turn the world's attention to the potential electric vehicles have to change the way we power transportation. We are pleased to partner with FPL – a company that shares our vision for powering the future with affordable, clean energy."

"It's an honor for us to have been selected as one of the 10 founding Formula E teams for the inaugural season," said Michael Andretti, chairman and CEO of Andretti Sports Marketing.

Formula E hosts races in 10 cities around the world, including London, Beijing, Monaco and Buenos Aires. The Miami ePrix was the first Formula E race in the United States.

Education tie is applauded

As part of its Formula E partnership, FPL also sponsored a student electric vehicle race. Students from schools throughout FPL's service area who are involved in science, technology, engineering and

math (STEM) programs assembled 10 electric kit cars. The student teams competed in the Formula E School Series, racing on the same track as the Miami ePrix. The grand prize was \$5,000, second-place \$2,500 and third-place \$1,500. All prizes support STEM or robotics initiatives of the winning school teams.

The effort was hailed by Miami-Dade County Public Schools Superintendent Alberto M. Carvalho, who chose FPL for the Florida Commissioner of Education's Corporate Business Recognition Award. "Miami-Dade County Public Schools and its students have benefitted tremendously from FPL's support of STEM initiatives," said Superintendent Carvalho. "Their commitment has enriched the learning environment by providing additional resources in our classrooms and giving students invaluable real-life learning experiences."

"We are proud of our long-time partnership with Miami-Dade County Public Schools and of the difference we are making in our classrooms," said Eric Silagy, president and CEO of FPL. "FPL is honored to be recognized for our involvement inside and outside the classroom. Together with the school district, we are making Miami an even better place to work and raise a family."

Wildlife and Habitat Preservation

At NextEra Energy, we're committed to being an industry leader in environmental protection and stewardship, and that includes wildlife and habitat protection. We have operations across the U.S. and Canada, so we are keenly aware of the potential impacts that existing and future operations may have to wildlife and their habitat. This is why we have environmental policies and programs in place at both the corporate and local levels to avoid and minimize these impacts and to address any remaining impacts through appropriate mitigation measures. Here's what we do:

- Before we build a power plant or other electric facilities, we work hard to make sure we understand the local ecosystem and what it takes to be a partner in its preservation and to be a good neighbor to all the species that live there.
- As part of that work, we consider the presence of any threatened or endangered species and the proximity to valuable wildlife corridors, wetlands or other ecologically important areas. We make efforts to avoid these areas entirely. If we can't do that, we seek to minimize and mitigate the impact of our developments to affected areas.
- Once a project is operating, we continue to monitor potential impacts to biodiversity that may occur. For example, at wind sites, we implement a voluntary Wildlife Response and Reporting System (WRRS) to monitor long-term avian and bat interactions. We also voluntarily adhere to the FWS Wind Energy Guidelines that were issued in 2012, and conduct a minimum of one year of formal post-construction mortality monitoring at all U.S. wind sites constructed after March 2012.
- In Ontario, our company complies with Ministry of Natural Resources guidance, which requires that we perform a minimum of three years of post-construction mortality monitoring for birds and bats, in addition to other project-specific monitoring conditions.

We have long adhered to numerous policies and programs to protect threatened and endangered species. We follow all federal and state regulations including the Endangered Species Act (ESA), which is administered by the U.S. Fish and Wildlife Service (FWS) and the U.S. National Marine Fisheries Service (NMFS). We also go above and beyond those regulations by making important contributions to protect a number of vulnerable species and habitat areas. Some examples of our wildlife-related programs are featured below.



- FPL has donated 130 concrete power poles to an artificial reef program managed by St. Lucie County, Florida. The poles provide additional habitat for marine life. Area fishing and diving businesses also benefit.

Eagle Nest Platforms



- For many centuries, eagles have represented strength, courage and power. That's been true not only in the U.S. ? where the bald eagle has been our national symbol since the late 1700s ? but in countries the world over.
- During early construction of NextEra Energy's Summerhaven Wind Energy Centre in Ontario in late 2012, Canada, a pair of eagles began building a new nest within the project area. For three years prior, the area had been monitored and no nest had been found.
- After consulting with the Ontario Ministry of Natural Resources and receiving their approval, we removed the tree and nest in January 2013 to eliminate a potential hazard to the eagles and to give the birds time to build a new nest or find another one prior to their breeding season.
- From early January through late February 2013, a team of experts installed five eagle platforms near the Lake Erie shoreline in the general vicinity of the original nest, but at a safe distance from the turbines, to provide alternative nesting sites for this pair of eagles and other pairs in the local eagle population.
- To our delight, a pair of eagles was documented to have successfully raised young in one of these nests in the summer of 2013. The eagles returned in 2014 and successfully raised two chicks.
- See the following website for more information, including photographs and a video of the eagles.

Nesting platform success in Florida



- Bald eagles are found in all 50 U.S. states, including throughout FPL's service territory in Florida.
- In the fall of 2013, a bald eagle built its nest on a 230-kV transmission line in Volusia County, Fla. To protect the nest and the eagles that would be raising their family in it, and because the surrounding area lacked viable nest trees, FPL for the first time ever constructed an independent pole and platform to provide the birds with a nearby nest location. With input from the Florida Fish and Wildlife Conservation Commission and

the U.S. Fish and Wildlife Service, the platform was designed to provide long-term support of the nest. Within 45 days of the nest transfer, a pair of eagles began to add onto and occupy the nest, and in 2014, a baby eaglet hatched in the nest!

Duette Preserve – Kestrel Boxes



- The colorful Southeastern American Kestrel is the smallest falcon in North America. Unfortunately, its numbers have dwindled so much that researchers cannot say how many of the threatened species still exist in Florida.
- In March 2013, while installing new, more storm-resilient power line poles and replacing old wooden poles in an area of its service territory, FPL identified an opportunity to assist the kestrel. Line workers attached kestrel boxes to four of the new poles - a first for the company - and also preserved the old wooden poles that contained inactive nests.
- In 2015, as FPL continues to upgrade the poles in this area of Kestrel habitat, we've included nest boxes on an additional 20 poles. We're also working with the Audubon Society toward a program to monitor the boxes for nesting success.

We're No. 1 in Wind

At NextEra Energy, we're the No. 1 owner of wind energy in North America. We operate approximately 11,400 MW of emissions-free wind energy, enough to power a city the size of Chicago - the "Windy City." Our wind program helps us deliver reliable and affordable energy to customers with a focus on environmental stewardship. Wind energy is an especially attractive source of electric power because:

- wind farms can be constructed quickly,
- they use no water and produce no solid waste or air emissions,
- there are no fuel costs because wind is free,
- many customers are requesting electricity produced only from renewables such as wind, and
- the price of wind energy is low and competitive with other forms of power generation.

NORTH AMERICA'S LARGEST GENERATOR OF WIND POWER

107 wind facilities

**9,899 individual
wind turbines**

**19 U.S. states and
4 Canadian provinces**

Avoided CO₂ emissions of
30 million tons
due to wind generation

In 2012, we set an aggressive goal for additions to our U.S. wind portfolio, and through diligence and hard work, we exceeded it. We commissioned roughly 1,500 MW of wind in the United States, a milestone no other company has ever achieved. In fact, we celebrated the commissioning of our 10,000th MW of wind at our 400-MW Limon Wind Project in Colorado in December 2012. Not only did this record building program result in 1,500 MW of zero-emissions generation, it also helped us

deliver for our communities by creating more than 3,000 construction jobs, 90 full-time jobs, and new tax revenue that state and local governments use to meet pressing community needs.

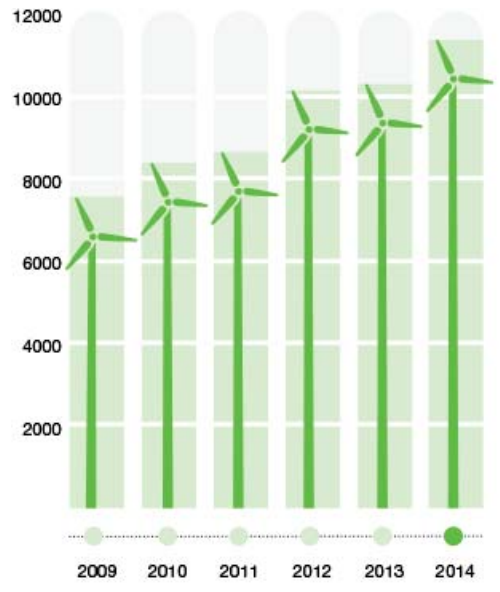
Roughly
1,500 MW
of wind
commissioned in 2012
— a milestone
no other company
has ever achieved

At NextEra Energy Resources, our wind portfolio grew in 2014 by approximately 1,300 MW, including facilities in Oklahoma, Colorado and Texas, as well as four wind sites in Ontario, Canada.

We now have wind projects in 19 states and four Canadian provinces, representing a total capital investment of more than \$20.1 billion and a fleet size that is comparable to the generation capacity of a top-15 utility.

WIND ENERGY PORTFOLIO

CUMULATIVE MW



- Enough emissions-free wind energy can be generated at our Vasco Wind Energy Center in California to power more than 19,500 homes.

**Appendix B:
Studies and Assessments**

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January 2016

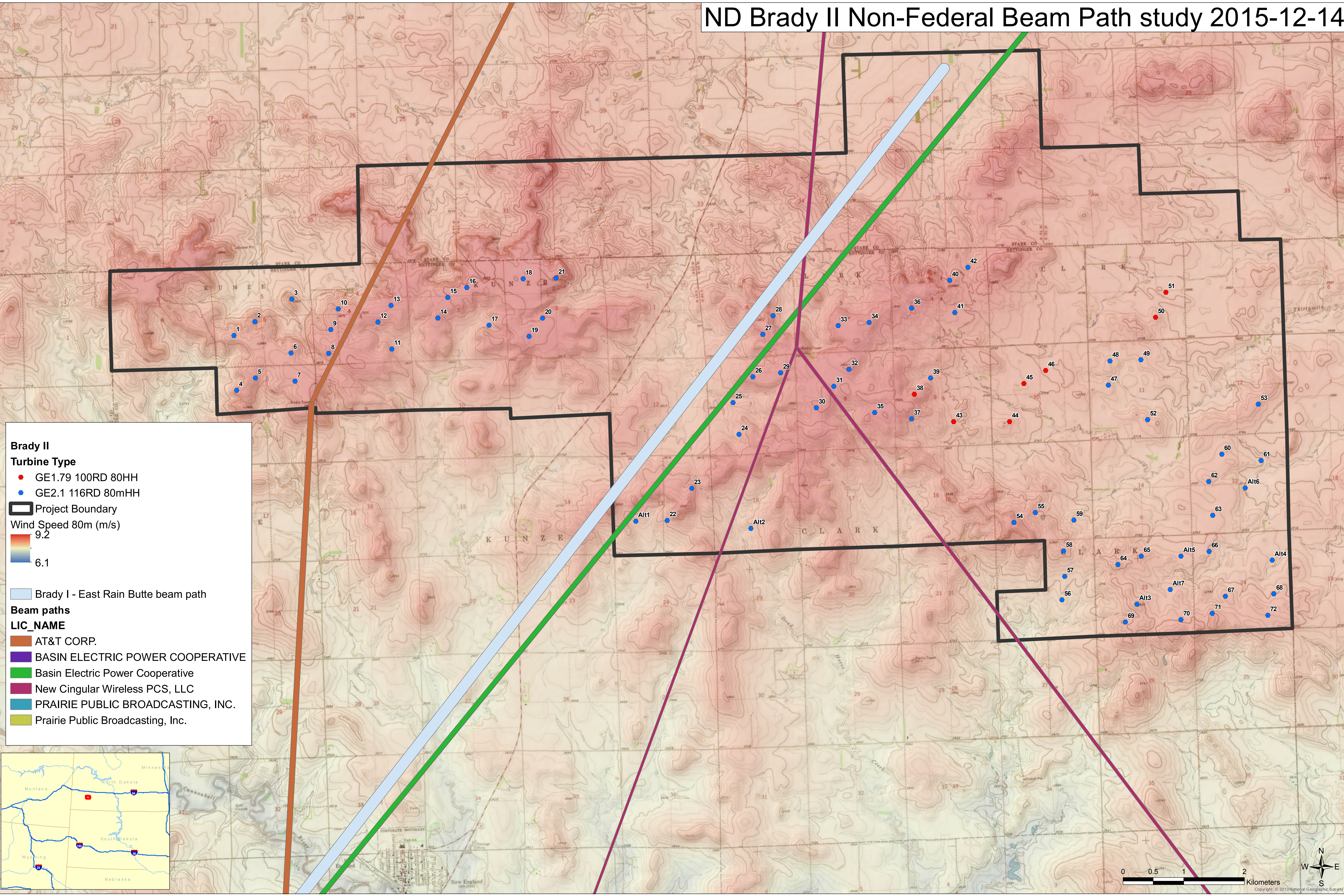
Brady II Wind Energy Center
Certificate of Site Compatibility

Non-Federal Beam Path Study



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ND Brady II Non-Federal Beam Path study 2015-12-14



Brady II

Turbine Type

- GE1.79 100RD 80HH
- GE2.1 116RD 80mHH

Project Boundary

Wind Speed 80m (m/s)

9.2

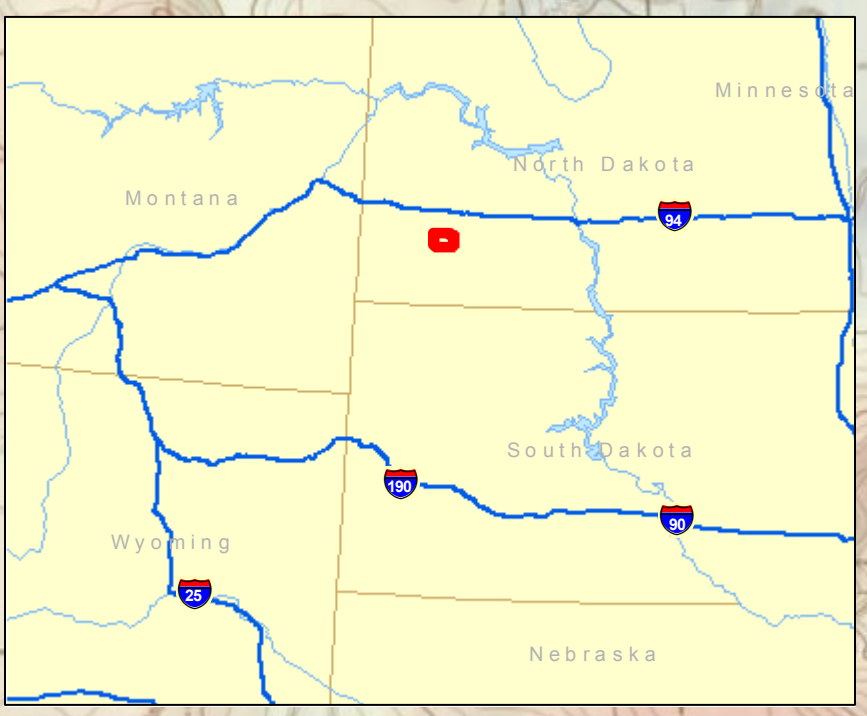
6.1

Brady I - East Rain Butte beam path

Beam paths

LIC_NAME

- AT&T CORP.
- BASIN ELECTRIC POWER COOPERATIVE
- Basin Electric Power Cooperative
- New Cingular Wireless PCS, LLC
- PRAIRIE PUBLIC BROADCASTING, INC.
- Prairie Public Broadcasting, Inc.



January 2016

Brady II Wind Energy Center
Certificate of Site Compatibility

DoD Preliminary Screening Tool



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Federal Aviation Administration

FAA Advisory Circular 70/7460-1L, Obstruction Marking Lighting was published on 12/4/2015, and is effective as of that date. The document may be viewed at http://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/1028657

<< OE/AAA

Circle Search For Airports Results

Records 1 to 1 of 1

Page 1 of 1

Locator Id	Name	Site Type	City	State	Latitude	Longitude	Distance(NM)	Azimuth
DIK	DICKINSON - THEODORE ROOSEVELT...	Airport	DICKINSON	ND	46° 47' 50.40" N	102° 48' 6.70" W	8.41	170.51°

Rows per Page: 20

Records 1 to 1 of 1

Page: 1

Page 1 of 1



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DoD Preliminary Screening Tool

[DoD Preliminary Screening Tool - Desk Reference Guide V_2014.2.0](#)

Disclaimer:

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Instructions:

- Select a screening type for your initial evaluation. Currently the system supports pre-screening on:
 - Air Defense and Homeland Security radars(Long Range Radar)
 - Weather Surveillance Radar-1988 Doppler radars(NEXRAD)
 - Military Operations
- Enter either a single point or a polygon and click submit to generate a long range radar analysis map.
- Military Operations is only available for a single point.
- At least three points are required for a polygon, with an optional fourth point.
- The largest polygon allowed has a maximum perimeter of 100 miles.

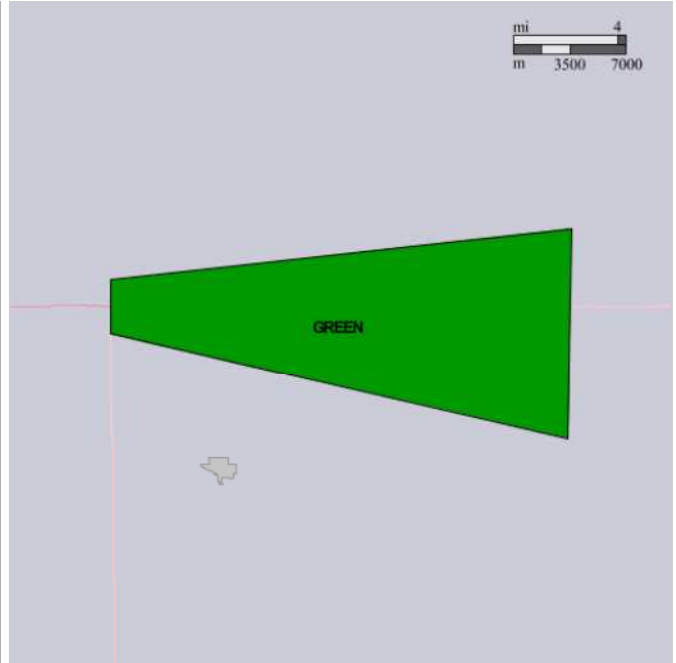
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2	<input type="text" value="46"/>	<input type="text" value="40"/>	<input type="text" value="22.19"/>	<input type="text" value="N"/>	<input type="text" value="102"/>	<input type="text" value="40"/>	<input type="text" value="26.19"/>	<input type="text" value="W"/>
3	<input type="text" value="46"/>	<input type="text" value="33"/>	<input type="text" value="28.81"/>	<input type="text" value="N"/>	<input type="text" value="102"/>	<input type="text" value="40"/>	<input type="text" value="32.1"/>	<input type="text" value="W"/>
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Horizontal Datum:

Map Legend:

- Green:** No anticipated impact to Air Defense and Homeland Security radars. Aeronautical study required.
- Yellow:** Impact likely to Air Defense and Homeland Security radars. Aeronautical study required.
- Red:** Impact highly likely to Air Defense and Homeland Security radars. Aeronautical study required.





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DoD Preliminary Screening Tool - Desk Reference Guide V_2014.2.0

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Screening Type: Geometry Type:

Point	Latitude			Dir	Longitude			Dir
	Deg	Min	Sec		Deg	Min	Sec	
1	46	40	22.19	N	102	40	26.19	W

Horizontal Datum:

The preliminary review of your proposal does not return any likely impacts to military airspace. Please contact Dr. Thomas (Thom) H. Rennie at the USAF Regional Environmental Coordinator at (214)767-4678 for confirmation and documentation.

The preliminary review of your proposal does not return any likely impacts to military airspace. Please contact the US Navy Representative, FAA Central Service Area at the USN Regional Environmental Coordinator at (817) 222-5930 for confirmation and documentation.

The preliminary review of your proposal does not return any likely impacts to military airspace. Please contact LTC Owen B. Castlemain at the USA Regional Environmental Coordinator at (817) 222-5921 for confirmation and documentation.

The preliminary review of your proposal does not return any likely impacts to military airspace. Please contact the US Navy Representative, FAA Central Service Area at the USMC Regional Environmental Coordinator at (817) 222-5930 for confirmation and documentation.

This is a preliminary review of your proposal and does not preclude official FAA processes.

Your search data is not retained and the privacy of all your searches is assured.



Any questions interpreting the map, please email Steve Sample with your question/s and phone number at steven.sample@pentagon.af.mil



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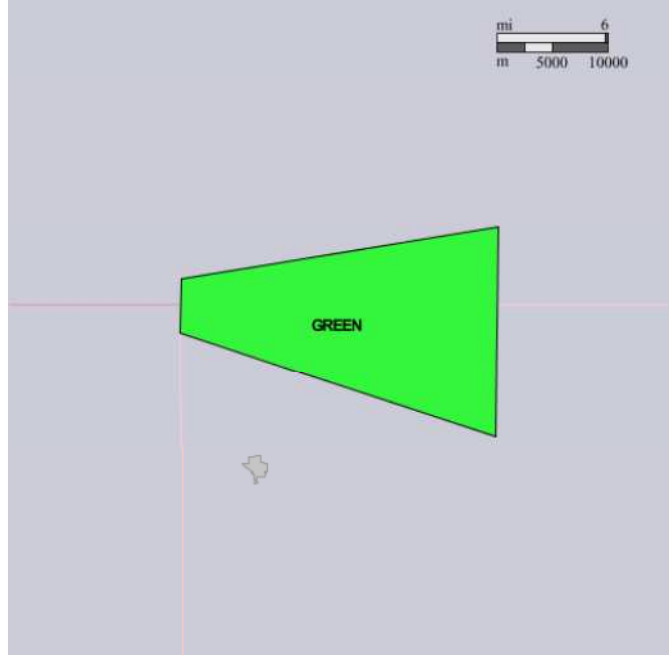
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	Deg	Min	Sec	Dir	Deg	Min	Sec	Dir
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2	<input type="text" value="46"/>	<input type="text" value="40"/>	<input type="text" value="22.19"/>	<input type="text" value="N"/>	<input type="text" value="102"/>	<input type="text" value="40"/>	<input type="text" value="26.19"/>	<input type="text" value="W"/>
3	<input type="text" value="46"/>	<input type="text" value="33"/>	<input type="text" value="28.81"/>	<input type="text" value="N"/>	<input type="text" value="102"/>	<input type="text" value="40"/>	<input type="text" value="32.1"/>	<input type="text" value="W"/>
4	<input type="text" value="46"/>	<input type="text" value="36"/>	<input type="text" value="53.76"/>	<input type="text" value="N"/>	<input type="text" value="102"/>	<input type="text" value="55"/>	<input type="text" value="37.89"/>	<input type="text" value="W"/>

Horizontal Datum:

Map Legend:

- Green: No Impact Zone.** Impacts not likely. NOAA will not perform a detailed analysis, but would still like to know about the project.
- Dk Green: Notification Zone.** Some impacts possible. Consultation with NOAA is optional, but NOAA would still like to know about the project.
- Yellow: Consultation Zone.** Significant impacts possible. NOAA requests consultation to discuss project details and to perform a detailed impact analysis. NOAA may request mitigation of significant impacts.
- Orange: Mitigation Zone.** Significant impacts likely. NOAA will likely request mitigation if a detailed analysis indicates that the project will cause significant impacts.
- Red: No-Build Zone.** Severe impacts likely. NOAA requests developers not build wind turbines within 3 km of the NEXRAD. Detailed impact analysis required.



Because the NEXRAD can detect wind turbines occasionally at great distance, NOAA would like to know the location of all wind farm projects so that corrupted radar data can be flagged. Send project information directly to NOAA at wind.energy.matters@noaa.gov or through the National Telecommunications & Information Administration (NTIA) in the Dept. of Commerce. NOAA protects all wind project information as proprietary and sensitive.



FAA Advisory Circular 70/7460-1L, Obstruction Marking Lighting was published on 12/4/2015, and is effective as of that date. The document may be viewed at http://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/1028657

<< OE/AAA

DoD Preliminary Screening Tool

DoD Preliminary Screening Tool - Desk Reference Guide V_2014.2.0

Disclaimer:

- The DoD Preliminary Screening Tool enables developers to obtain a preliminary review of potential impacts to Long-Range and Weather Radar(s), Military Training Route(s) and Special Airspace(s) prior to official OE/AAA filing. This tool will produce a map relating the structure to any of the DoD/DHS and NOAA resources listed above. The use of this tool is **100 % optional** and will provide a first level of feedback and single points of contact within the DoD/DHS and NOAA to discuss impacts/mitigation efforts on the military training mission and NEXRAD Weather Radars. **The use of this tool does not in any way replace the official FAA processes/procedures.**

Instructions:

- Select a screening type for your initial evaluation. Currently the system supports pre-screening on:
 - Air Defense and Homeland Security radars(Long Range Radar)
 - Weather Surveillance Radar-1988 Doppler radars(NEXRAD)
 - Military Operations
- Enter either a single point or a polygon and click submit to generate a long range radar analysis map.
- Military Operations is only available for a single point.
- At least three points are required for a polygon, with an optional fourth point.
- The largest polygon allowed has a maximum perimeter of 100 miles.

Screening Type: Geometry Type:

Point	Latitude			Dir	Longitude			Dir
	Deg	Min	Sec		Deg	Min	Sec	
1	46	38	41.16	N	102	55	37.8	W

Horizontal Datum:

The preliminary review of your proposal does not return any likely impacts to military airspace. Please contact Dr. Thomas (Thom) H. Rennie at the USAF Regional Environmental Coordinator at (214)767-4678 for confirmation and documentation.

The preliminary review of your proposal does not return any likely impacts to military airspace. Please contact the US Navy Representative, FAA Central Service Area at the USN Regional Environmental Coordinator at (817) 222-5930 for confirmation and documentation.

The preliminary review of your proposal does not return any likely impacts to military airspace. Please contact LTC Owen B. Castlemain at the USA Regional Environmental Coordinator at (817) 222-5921 for confirmation and documentation.

The preliminary review of your proposal does not return any likely impacts to military airspace. Please contact the US Navy Representative, FAA Central Service Area at the USMC Regional Environmental Coordinator at (817) 222-5930 for confirmation and documentation.

This is a preliminary review of your proposal and does not preclude official FAA processes.
Your search data is not retained and the privacy of all your searches is assured.



Any questions interpreting the map, please email Steve Sample with your question/s and phone number at steven.sample@pentagon.af.mil



FAA Advisory Circular 70/7460-1L, Obstruction Marking Lighting was published on 12/4/2015, and is effective as of that date. The document may be viewed at http://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/1028657

<< OE/AAA

DoD Preliminary Screening Tool

[DoD Preliminary Screening Tool - Desk Reference Guide V_2014.2.0](#)

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**Appendix C:
Agency Correspondence**

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November 12, 2015

Mr. Kevin Shelley
Acting ND Field Supervisor
USFWS North Dakota Field Office
3425 Miriam Avenue
Bismarck, North Dakota 58501-7926

Subject: Information Request for the Proposed Brady II Wind Energy Center in Hettinger County, ND

Dear Mr. Shelley:

Tetra Tech has been contracted by Brady Wind II, LLC, an indirect, wholly-owned subsidiary of NextEra Energy Resources, LLC, to prepare an application for a Certificate of Site Compatibility for the proposed Brady II Wind Energy Center (the Project), in accordance with North Dakota Century Code (NDCC) Section 49-22-07. As part of that application, we are conducting an investigation of property in Hettinger County north of the city of New England. This proposed Project would consist of approximately 150 megawatts (MW). The Project area shown in the attached figure is the primary focus of our investigation.

Per Section 69-06-01-05 of the North Dakota Public Service Commission (PSC)'s administrative rules, we are consulting your agency for assistance in identifying concerns or issues within the boundaries of the tracts listed below that would influence a decision regarding the use of the land, as well as applicable permits that may be required from your office.

Township	Range	Sections
136 N	96 W	1-29
136 N	97 W	1-13
136 N	95 W	6,7, 18, 19, 30

This information will be used to help guide Project development in a manner that identifies and avoids impacts to sensitive resources where practicable. We have sent similar query letters to other agencies including, but not limited to, the U.S. Army Corps of Engineers and North Dakota Game and Fish Department.

NextEra Energy is developing the Project following the voluntary Final Land-Based Wind Energy Guidelines. Desktop habitat analyses for bats and whooping crane are underway as part of Tier 1 and Tier 2 assessments for the Project. Tier 3 assessments that are currently planned or underway for the Project include native prairie identification, fall and spring avian migration surveys, biweekly eagle use surveys, raptor nest and grouse lek surveys, and bat acoustic monitoring.

We would appreciate a response by December 31, 2015. Please contact me at (512) 213-8501 if you have any questions. Thank you for your assistance.

Respectfully submitted,

A handwritten signature in blue ink that reads "AnneMarieGriger". The signature is written in a cursive, flowing style.

Anne-Marie Griger, AICP
Tetra Tech, Inc
8911 N. Capital of Texas Hwy, Bldg 2 Suite # 2310
Austin, TX 78759



November 12, 2015

Mr. Terry Steinwand
Director
North Dakota Game and Fish Department
100 N. Bismarck Expressway
Bismarck, ND 58501-5095

Subject: Information Request for the Proposed Brady II Wind Energy Center in Hettinger County, ND

Dear Mr. Steinwand:

Tetra Tech has been contracted by Brady Wind II, LLC, an indirect, wholly-owned subsidiary of NextEra Energy Resources, LLC, to prepare an application for a Certificate of Site Compatibility for the proposed Brady II Wind Energy Center (the Project), in accordance with North Dakota Century Code (NDCC) Section 49-22-07. As part of that application, we are conducting an investigation of property in Hettinger County north of the city of New England. This proposed Project would consist of approximately 150 megawatts (MW). The Project area shown in the attached figure is the primary focus of our investigation.

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Respectfully submitted,

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Anne-Marie Griger, AICP
Tetra Tech, Inc
8911 N. Capital of Texas Hwy, Bldg 2 Suite # 2310
Austin, TX 78759

Brady II Wind Energy Center

Hettinger County, ND

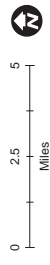
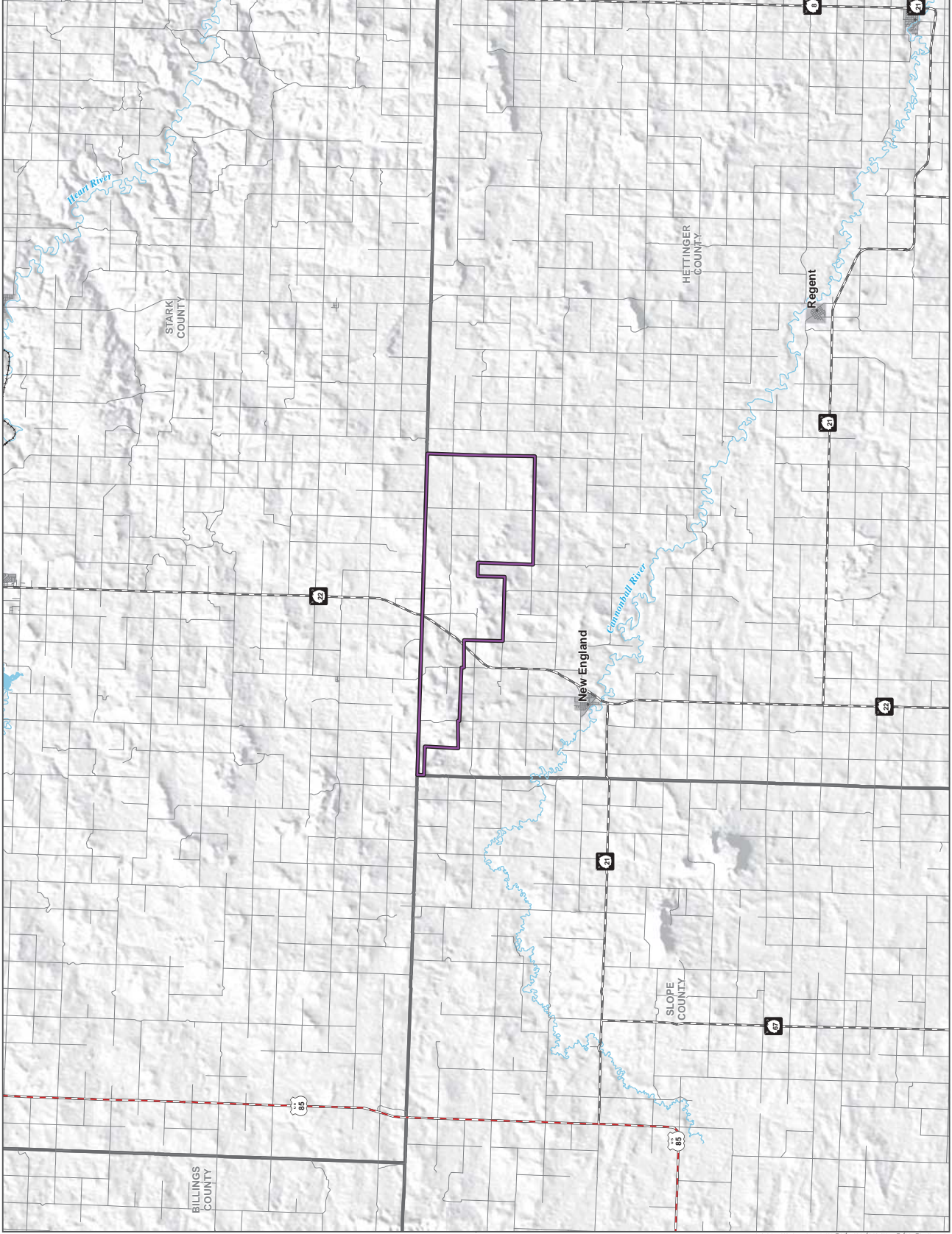
Project Location

Legend

- Project Area
- County Boundary
- Major River
- Municipal Boundary

Transportation

- U.S. Highway
- State Highway
- Rail



Scale is 1:100,000 when printed at 22 x 34



Agency List for Brady II PSC Application Inquiry Letters

Mr. Kyle C. Wanner
Director
North Dakota Aeronautics Commission
P. O. Box 5020
Bismarck, North Dakota 58502-5020

Mr. Doug Goehring
Agriculture Commissioner
North Dakota Department of Agriculture
600 East Boulevard Avenue, Department 602
Bismarck, North Dakota 58505-0020

Dr. Terry Dwelle, M.D., M.P.H.T.M.
State Health Officer
North Dakota Department of Health
600 East Boulevard Avenue
Bismarck, North Dakota 58505-0200

Mr. Larry Gangl
District Engineer
North Dakota Department of Transportation, Dickinson District
1700 Third Avenue West, Suite 101
Dickinson, ND 58601-3009

Mr. Lance D. Gaebe
Commissioner
North Dakota Department of Trust Lands
P. O. Box 5523
Bismarck, North Dakota 58506-5523

Mr. Todd Sando
State Engineer
North Dakota State Water Commission
900 East Boulevard, Dept. 770
Bismarck, North Dakota 58505-0850

Mr. Edward C. Murphy
State Geologist
North Dakota Geological Survey
600 East Boulevard Avenue
Bismarck ND 58505-0840

Mr. Scott Davis
Executive Director
North Dakota Indian Affairs Commission
600 East Boulevard Avenue
1st Floor – Judicial Wing, Room #117
Bismarck, North Dakota 58505

Mr. Mark Zimmerman
Director
North Dakota Parks and Recreation Department
1600 E. Century Ave, Suite 3
Bismarck, North Dakota 58503
Ms. Julie Hoff
Central Stark & Western Soil Conservation District
2948 4th Ave. West, Room "C"
Dickinson, ND 58601

Claudia J. Berg
Director
State Historical Society of North Dakota
612 East Boulevard Avenue
Bismarck, ND 58505

Mr. Daniel Cimarosti
Regulatory Program Manager
U.S. Army Corps of Engineers Omaha District, North Dakota Regulatory Office
1513 South 12th Street
Bismarck, ND 58504

Mr. Kevin Shelley
Acting ND Field Supervisor
USFWS North Dakota Field Office
3425 Miriam Avenue
Bismarck, North Dakota 58501-7926

Mr. Terry Steinwand
Director
North Dakota Game and Fish Department
100 N. Bismarck Expressway
Bismarck, ND 58501-5095



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
NORTH DAKOTA REGULATORY OFFICE
1513 SOUTH 12TH STREET
BISMARCK ND 58504-6640

November 24, 2015

North Dakota Regulatory Office

[NWO-2015-2207-BIS]

Ms. Anne-Marie Griger
Tetra Tech, Inc.
8911 N. Capital of Texas Highway
Building 2, Suite # 2310
Austin, Texas 78759

Dear Ms. Griger:

This is in response to your letter dated November 24, 2015 requesting comments on the proposed Brady II Wind Energy Center. The project is located in several sections of Township 136 North, Ranges 95, 96, and 97 West, Hettinger County, North Dakota.

U. S. Army Corps of Engineers Regulatory Offices administer Section 10 of the Rivers and Harbors Act (Section 10) and Section 404 of the Clean Water Act (Section 404). A Section 10 permit would be required for work impacting navigable waters, this includes work over, through, or under Section 10 waters. Section 10 waters in North Dakota are the Missouri River (including Lake Sakakawea and Lake Oahe), Yellowstone River, James River (south of the railroad tracks in Jamestown, North Dakota), Bois de Sioux River, Red River of the North, and Upper Des Lacs Lake. A Section 404 permit would be required for the discharge of dredge or fill material (temporarily or permanently) in waters of the United States. Waters of the United States may include, but are not limited to, rivers, streams, ditches, coulees, lakes, ponds, and their adjacent wetlands. Fill material includes, but is not limited to, rock, sand, soil, clay, plastics, construction debris, wood chips, overburden from mines or other excavation activities and materials used to create any structure or infrastructure in waters of the United States.

Complete the enclosed application and mail it to the letterhead address if the project requires a Section 10/404 permit.

If we can be of further assistance or should you have any questions regarding our program, please do not hesitate to contact this office by letter or phone at (701) 255-0015.

Sincerely,

Daniel E. Cimarosti
Regulatory Program Manager
North Dakota

Enclosure

**Instructions for Preparing a
Department of the Army Permit Application**

Blocks 1 through 4. To be completed by Corps of Engineers.

Block 5. Applicant's Name. Enter the name and the E-mail address of the responsible party or parties. If the responsible party is an agency, company, corporation, or other organization, indicate the name of the organization and responsible officer and title. If more than one party is associated with the application, please attach a sheet with the necessary information marked Block 5.

Block 6. Address of Applicant. Please provide the full address of the party or parties responsible for the application. If more space is needed, attach an extra sheet of paper marked Block 6.

Block 7. Applicant Telephone Number(s). Please provide the number where you can usually be reached during normal business hours.

Blocks 8 through 11. To be completed, if you choose to have an agent.

Block 8. Authorized Agent's Name and Title. Indicate name of individual or agency, designated by you, to represent you in this process. An agent can be an attorney, builder, contractor, engineer, or any other person or organization. Note: An agent is not required.

Blocks 9 and 10. Agent's Address and Telephone Number. Please provide the complete mailing address of the agent, along with the telephone number where he / she can be reached during normal business hours.

Block 11. Statement of Authorization. To be completed by applicant, if an agent is to be employed.

Block 12. Proposed Project Name or Title. Please provide name identifying the proposed project, e.g., Landmark Plaza, Burned Hills Subdivision, or Edsall Commercial Center.

Block 13. Name of Waterbody. Please provide the name of any stream, lake, marsh, or other waterway to be directly impacted by the activity. If it is a minor (no name) stream, identify the waterbody the minor stream enters.

Block 14. Proposed Project Street Address. If the proposed project is located at a site having a street address (not a box number), please enter it here.

Block 15. Location of Proposed Project. Enter the latitude and longitude of where the proposed project is located. If more space is required, please attach a sheet with the necessary information marked Block 15.

Block 16. Other Location Descriptions. If available, provide the Tax Parcel Identification number of the site, Section, Township, and Range of the site (if known), and / or local Municipality that the site is located in.

Block 17. Directions to the Site. Provide directions to the site from a known location or landmark. Include highway and street numbers as well as names. Also provide distances from known locations and any other information that would assist in locating the site. You may also provide description of the proposed project location, such as lot numbers, tract numbers, or you may choose to locate the proposed project site from a known point (such as the right descending bank of Smith Creek, one mile downstream from the Highway 14 bridge). If a large river or stream, include the river mile of the proposed project site if known

Block 18. Nature of Activity. Describe the overall activity or project. Give appropriate dimensions of structures such as wing walls, dikes (identify the materials to be used in construction, as well as the methods by which the work is to be done), or excavations (length, width, and height). Indicate whether discharge of dredged or fill material is involved. Also, identify any structure to be constructed on a fill, piles, or float-supported platforms.

The written descriptions and illustrations are an important part of the application. Please describe, in detail, what you wish to do. If more space is needed, attach an extra sheet of paper marked Block 18.

Block 19. Proposed Project Purpose. Describe the purpose and need for the proposed project. What will it be used for and why? Also include a brief description of any related activities to be developed as the result of the proposed project. Give the approximate dates you plan to both begin and complete all work.

Block 20. Reasons for Discharge. If the activity involves the discharge of dredged and/or fill material into a wetland or other waterbody, including the temporary placement of material, explain the specific purpose of the placement of the material (such as erosion control).

Block 21. Types of Material Being Discharged and the Amount of Each Type in Cubic Yards. Describe the material to be discharged and amount of each material to be discharged within Corps jurisdiction. Please be sure this description will agree with your illustrations. Discharge material includes: rock, sand, clay, concrete, etc.

Block 22. Surface Areas of Wetlands or Other Waters Filled. Describe the area to be filled at each location. Specifically identify the surface areas, or part thereof, to be filled. Also include the means by which the discharge is to be done (backhoe, dragline, etc.). If dredged material is to be discharged on an upland site, identify the site and the steps to be taken (if necessary) to prevent runoff from the dredged material back into a waterbody. If more space is needed, attach an extra sheet of paper marked Block 22.

Block 23. Description of Avoidance, Minimization, and Compensation. Provide a brief explanation describing how impacts to waters of the United States are being avoided and minimized on the project site. Also provide a brief description of how impacts to waters of the United States will be compensated for, or a brief statement explaining why compensatory mitigation should not be required for those impacts.

Block 24. Is Any Portion of the Work Already Complete? Provide any background on any part of the proposed project already completed. Describe the area already developed, structures completed, any dredged or fill material already discharged, the type of material, volume in cubic yards, acres filled, if a wetland or other waterbody (in acres or square feet). If the work was done under an existing Corps permit, identify the authorization, if possible.

Block 25. Names and Addresses of Adjoining Property Owners, Lessees, etc., Whose Property Adjoins the Project Site. List complete names and full mailing addresses of the adjacent property owners (public and private) lessees, etc., whose property adjoins the waterbody or aquatic site where the work is being proposed so that they may be notified of the proposed activity (usually by public notice). If more space is needed, attach an extra sheet of paper marked Block 24.

Information regarding adjacent landowners is usually available through the office of the tax assessor in the county or counties where the project is to be developed.

Block 26. Information about Approvals or Denials by Other Agencies. You may need the approval of other federal, state, or local agencies for your project. Identify any applications you have submitted and the status, if any (approved or denied) of each application. You need not have obtained all other permits before applying for a Corps permit.

Block 27. Signature of Applicant or Agent. The application must be signed by the owner or other authorized party (agent). This signature shall be an affirmation that the party applying for the permit possesses the requisite property rights to undertake the activity applied for (including compliance with special conditions, mitigation, etc.).

DRAWINGS AND ILLUSTRATIONS

General Information.

Three types of illustrations are needed to properly depict the work to be undertaken. These illustrations or drawings are identified as a Vicinity Map, a Plan View or a Typical Cross-Section Map. Identify each illustration with a figure or attachment number.

Please submit one original, or good quality copy, of all drawings on 8½ x11 inch plain white paper (electronic media may be substituted). Use the fewest number of sheets necessary for your drawings or illustrations.

Each illustration should identify the project, the applicant, and the type of illustration (vicinity map, plan view, or cross-section). **While illustrations need not be professional (many small, private project illustrations are prepared by hand), they should be clear, accurate, and contain all necessary information.**

**U.S. ARMY CORPS OF ENGINEERS
APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT**
33 CFR 325. The proponent agency is CECW-CO-R.

*Form Approved -
OMB No. 0710-0003
Expires: 31-AUGUST-2013*

Public reporting for this collection of information is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of the collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters, Executive Services and Communications Directorate, Information Management Division and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE
--------------------	----------------------	------------------	------------------------------

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME First - Middle - Last - Company - E-mail Address -			8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required) First - Middle - Last - Company - E-mail Address -		
6. APPLICANT'S ADDRESS: Address- City - State - Zip - Country -			9. AGENT'S ADDRESS: Address- City - State - Zip - Country -		
7. APPLICANT'S PHONE NOS. w/AREA CODE a. Residence b. Business c. Fax			10. AGENTS PHONE NOS. w/AREA CODE a. Residence b. Business c. Fax		

STATEMENT OF AUTHORIZATION

11. I hereby authorize, _____ to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

SIGNATURE OF APPLICANT DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)			
13. NAME OF WATERBODY, IF KNOWN (if applicable)		14. PROJECT STREET ADDRESS (if applicable) Address	
15. LOCATION OF PROJECT Latitude: °N Longitude: °W		City -	State- Zip-
16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions) State Tax Parcel ID Municipality Section - Township - Range -			

17. DIRECTIONS TO THE SITE

18. Nature of Activity (Description of project, include all features)

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type Amount in Cubic Yards	Type Amount in Cubic Yards	Type Amount in Cubic Yards
-------------------------------	-------------------------------	-------------------------------

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres
or
Linear Feet

23. Description of Avoidance, Minimization, and Compensation (see instructions)

24. Is Any Portion of the Work Already Complete? Yes No IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

a. Address-

City - State - Zip -

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT

DATE

SIGNATURE OF AGENT

DATE

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than \$10,000 or imprisoned not more than five years or both.



**STATE
HISTORICAL
SOCIETY
OF NORTH DAKOTA**

Jack Dalrymple
Governor of North Dakota

November 27, 2015

North Dakota
State Historical Board

Ms. Anne-Marie Griger, AICP
Tetra Tech Inc
8911 N Capital of Texas Hwy, Building 2, Suite 2310
Austin, TX 78759

Margaret Puetz
Bismarck - President

ND SHPO REF: 16-0443 ND PSC - Proposed Brady II Wind Energy Center by Brady Wind II, LLC an indirect, wholly-owned subsidiary of NextEra Energy Resources, LLC in Hettinger County, North Dakota

Gereld Gerntholz
Valley City - Vice President

Albert I. Berger
Grand Forks - Secretary

Dear Ms. Griger,

Calvin Grinnell
New Town

Thank you for your preliminary information on ND SHPO REF: 16-0443 ND PSC - Proposed Brady II Wind Energy Center. As you know, there is potential for unrecorded and recorded cultural resource properties in a variety of physiographic settings in the overall project area. As a potential federal/state undertaking, we encourage early agency consultation as part of the review process. Early consultation should also include tribal nations, and North Dakota Indian Affairs.

Diane K. Larson
Bismarck

Chester E. Nelson, Jr.
Bismarck

A. Ruric Todd III
Jamestown

We recommend a Class I (file search), and a Class III survey by a permitted architectural historian for standing buildings and structures (including cemeteries) over 50 years old in the visual Area of Potential Effect (APE). This is within a 2 mile radius of individual turbine locations, but that APE may be modified larger or smaller, depending on those specific turbine locations. When the wind farm project develops to the point that turbine locations are defined, we want to see a map of the turbine locations to see if there need to be any modifications to the APE.

Sara Otte Coleman
Director
Tourism Division

Kelly Schmidt
State Treasurer

Class III archeological (pedestrian) surveys will be warranted for all areas directly impacted by the project, including crane paths, met towers, access roads, staging areas, transmissions lines and turbine pads. As part of the Class III Inventory, NDCRS site updates should be submitted on all sites resurveyed. If the project APE changes, we will request additional inventories, surveys and consultation.

Alvin A. Jaeger
Secretary of State

Mark Zimmerman
Director
Parks and Recreation
Department

Thank you for the opportunity to review this project to date. We look forward to further review of cultural resource surveys and site forms, and updates as the project siting occurs. If you have any questions please contact Paul Picha, Chief Archaeologist (701) 328-3574 or Susan Quinnell, Review and Compliance Coordinator at (701) 328-3576, e-mail squinnell@nd.gov

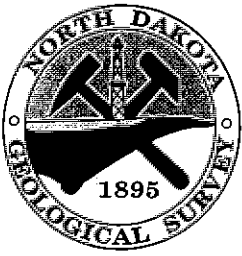
Grant Levi
Director
Department of Transportation

Claudia J. Berg
Director

Sincerely,

Accredited by the
American Alliance
of Museums since 1986


 Claudia J. Berg, State Historic Preservation Officer (North Dakota) and Director State
 Historical Society of North Dakota.



North Dakota Geological Survey

Edward C. Murphy - State Geologist

Department of Mineral Resources

Lynn D. Helms - Director

North Dakota Industrial Commission

<https://www.dmr.nd.gov/ndgs/>

December 4, 2015

Ms. Anne-Marie Griger
Tetra Tech, Inc
8911 N. Capitol of Texas Highway, Bldg 2 Suite # 2310
Austin, Texas 78759

RE: Proposed Brady II Wind Energy Center

Dear Ms. Griger,

Please find links to our maps of the coal and clay deposits that occur within the area proposed for the Brady II Wind Energy Center in Hettinger County, North Dakota. Clay:

https://www.dmr.nd.gov/ndgs/Claymap/100K%20clay%20maps/dksn_100k_al.pdf Coal:

https://www.dmr.nd.gov/ndgs/Coalmaps/pdf/100K/dksn_100k_c.pdf I typically also send links to landslide maps, but we have not had the opportunity to undertake an inventory of landslides in this area.

As with our August 2015 review, I wanted you to be aware of the known mineral deposits within the proposed area.

Please contact me if you have any questions.

Sincerely,

Edward C. Murphy
State Geologist



December 7, 2015

Anne-Marie Griger, AICP
Tetra Tech, Inc.
8911 N. Capital of Texas Hwy, Bldg 2, Suite 2310
Austin, TX 78759

Re: Proposed Brady II Wind Energy Center
Hettinger County, North Dakota

Dear Ms. Griger:

This department has reviewed the information concerning the above-referenced project submitted under date of November 18, 2015, with respect to possible environmental impacts.

This department believes that environmental impacts from the proposed construction will be minor and can be controlled by proper construction methods. With respect to construction, we have the following comments:

1. Care is to be taken during construction activity near any water of the state to minimize adverse effects on a water body. This includes minimal disturbance of stream beds and banks to prevent excess siltation, and the replacement and revegetation of any disturbed area as soon as possible after work has been completed. Caution must also be taken to prevent spills of oil and grease that may reach the receiving water from equipment maintenance, and/or the handling of fuels on the site. Guidelines for minimizing degradation to waterways during construction are attached.
2. Projects disturbing one or more acres are required to have a permit to discharge storm water runoff until the site is stabilized by the reestablishment of vegetation or other permanent cover. Further information on the storm water permit may be obtained from the Department's website or by calling the Division of Water Quality (701-328-5210). Also, cities or counties may impose additional requirements and/or specific best management practices for construction affecting their storm drainage system. Check with the local officials to be sure any local storm water management considerations are addressed.

The department owns no land in or adjacent to the proposed improvements, nor does it have any projects scheduled in the area. In addition, we believe the proposed activities are consistent with the State Implementation Plan for the Control of Air Pollution for the State of North Dakota.

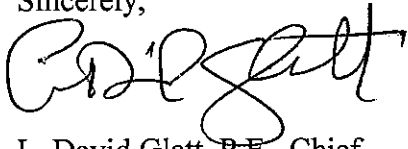
Anne-Marie Griger

2.

December 7, 2015

If you have any questions regarding our comments, please feel free to contact this office.

Sincerely,

A handwritten signature in black ink, appearing to read "L. David Glatt". The signature is fluid and cursive, with the first name "L. David" and the last name "Glatt" clearly distinguishable.

L. David Glatt, P.E., Chief
Environmental Health Section

LDG:cc
Attach.



Construction and Environmental Disturbance Requirements

These represent the minimum requirements of the North Dakota Department of Health. They ensure that minimal environmental degradation occurs as a result of construction or related work which has the potential to affect the waters of the State of North Dakota. All projects will be designed and implemented to restrict the losses or disturbances of soil, vegetative cover, and pollutants (chemical or biological) from a site.

Soils

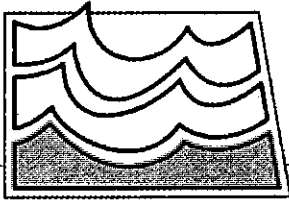
Prevent the erosion of exposed soil surfaces and trapping sediments being transported. Examples include, but are not restricted to, sediment dams or berms, diversion dikes, hay bales as erosion checks, riprap, mesh or burlap blankets to hold soil during construction, and immediately establishing vegetative cover on disturbed areas after construction is completed. Fragile and sensitive areas such as wetlands, riparian zones, delicate flora, or land resources will be protected against compaction, vegetation loss, and unnecessary damage.

Surface Waters

All construction which directly or indirectly impacts aquatic systems will be managed to minimize impacts. All attempts will be made to prevent the contamination of water at construction sites from fuel spillage, lubricants, and chemicals, by following safe storage and handling procedures. Stream bank and stream bed disturbances will be controlled to minimize and/or prevent silt movement, nutrient upsurges, plant dislocation, and any physical, chemical, or biological disruption. The use of pesticides or herbicides in or near these systems is forbidden without approval from this Department.

Fill Material

Any fill material placed below the high water mark must be free of top soils, decomposable materials, and persistent synthetic organic compounds (in toxic concentrations). This includes, but is not limited to, asphalt, tires, treated lumber, and construction debris. The Department may require testing of fill materials. All temporary fills must be removed. Debris and solid wastes will be removed from the site and the impacted areas restored as nearly as possible to the original condition.



North Dakota State Water Commission

900 EAST BOULEVARD AVENUE, DEPT 770 • BISMARCK, NORTH DAKOTA 58505-0850
701-328-2750 • TDD 701-328-2750 • FAX 701-328-3696 • INTERNET: <http://swc.nd.gov>

December 8, 2015

Anne-Marie Griger
Tetra Tech, Inc.
8911 N Capital of Texas Hwy
Bldg 2 STE 2310
Austin TX 78759

Dear Ms. Griger:

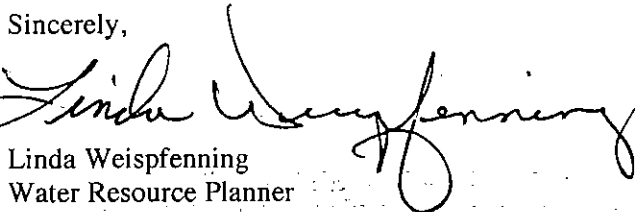
This is in response to your request for review of environmental impacts associated with the Brady II Wind Energy Center project located in Hettinger County, ND. The project will be located in Township 136 N, Range 96 W, Sections 1-29; Township 136 N, Range 97 W, Sections 1-13; and Township 136 N; Range 95 W, Section 6, 7, 18, 19, 30.

The proposed project has been reviewed by State Water Commission staff and the following comments are provided:

- There are floodplains identified and/or mapped where the proposed project is to take place. The areas are designated to be in Zone A. North Dakota has no formal "permitting" authority as a state entity in National Flood Insurance Program (NFIP) identified floodplain areas. The permitting is always done by the local entity, which has jurisdiction in the area in question. Please work closely with the County Floodplain Administrator. The Floodplain Administrator for Hettinger County is: Ilene Hardmeyer; 336 Pacific Ave.; Mott, ND 58646; 701-824-4227. The NFIP maps used to make this determination are: Panel #38041C0275D and 38041C0250D, Date: 3/2/2012. The NFIP maps are enclosed.
 - Please contact the Southwest Water Authority at 701-225-0241, regarding possible Southwest Pipeline Project infrastructure located in the area.
 - It is the responsibility of the project sponsor to ensure that local, state and federal agencies are contacted for any required approvals, permits, and easements.
 - All waste material associated with the project must be disposed of properly and not placed in identified floodway areas.
-
- No sole-source aquifers have been designated in ND.

Thank you for the opportunity to provide review comments. If you have any questions, please call me at 701-328-4967.

Sincerely,



Linda Weispfenning
Water Resource Planner

LW:dm/1570
Encls.



MAP SCALE 1" = 2000'



NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP
HETTINGER COUNTY,
NORTH DAKOTA
AND INCORPORATED AREAS

PANEL 250 OF 960
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
HETTINGER COUNTY, Incorporated Areas	360263	0250	D
NEW ENGLAND, CITY OF	360242	0260	D

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

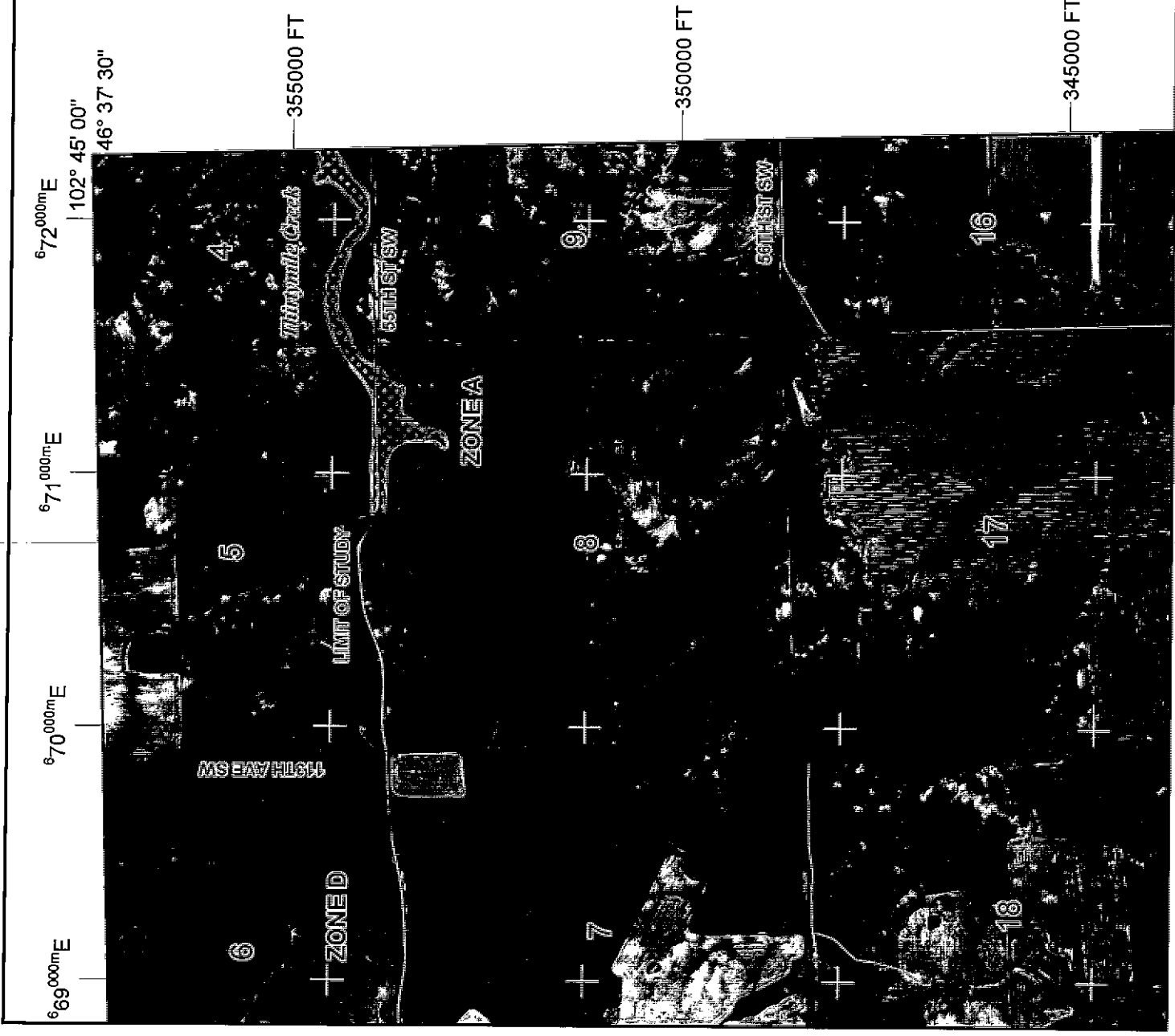
MAP NUMBER
38041C02500

EFFECTIVE DATE
MARCH 2, 2012

Federal Emergency Management Agency



This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



JOINS PANEL 0075



MAP SCALE 1" = 2000'



NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0275D

FIRM
FLOOD INSURANCE RATE MAP
HETTINGER COUNTY,
NORTH DAKOTA
AND INCORPORATED AREAS

PANEL 275 OF 950
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:
COMMUNITY NUMBER 380293
HETTINGER COUNTY
Unincorporated Areas
PANEL 0275
SUFFIX D

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.



MAP NUMBER
38041C0275D
EFFECTIVE DATE
MARCH 2, 2012

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



Low, Tara

From: Griger, Anne Marie
Sent: Tuesday, December 08, 2015 3:48 PM
To: Low, Tara
Subject: Proposed Brady II Wind Energy Center - ND School Trust Lands - Hettinger County ND
Attachments: ROW Info.pdf

From: Haupt, Michael L. [mailto:mhaupt@nd.gov]
Sent: Tuesday, December 08, 2015 11:58 AM
To: Griger, Anne Marie <Anne-Marie.Griger@tetrattech.com>
Subject: Proposed Brady II Wind Energy Center - ND School Trust Lands - Hettinger County ND

Anne-Marie,

Good morning! The North Dakota School Trust owns surface in the NW4 and SE4 of section 16, T136N, R96W, Hettinger County. If NextEra Energy Resources wishes to include this School Trust land in their wind farm, or propose to cross these tracts with access roads, collection lines or transmission lines, they must submit an online application on our web site at <https://land.nd.gov/surface/Right-of-Way.aspx>. Trust Lands uses its own easement for wind tower sites and appurtenances. Let me know if you have questions. Thanks.

Michael L. Haupt

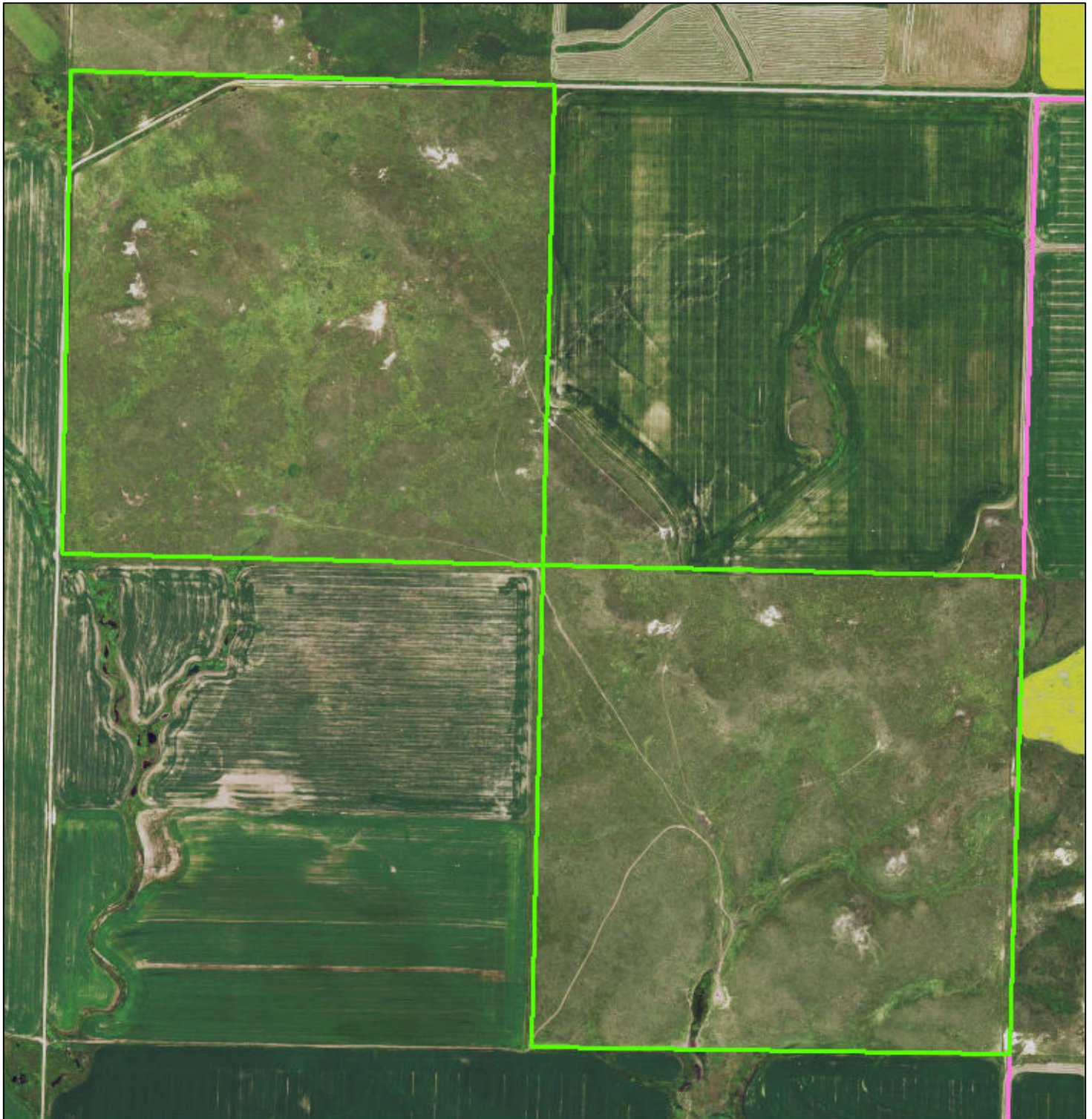
Land Management Professional, CPRM
North Dakota Department of Trust lands
1707 Nth 9th Street
Bismarck ND 58506-5523
701-328-1916
mhaupt@nd.gov

Note: You can track the real time status of your right-of-way application 24/7 at <http://www.land.nd.gov/surface/right-of-way.aspx> using either the ROW number or by entering at least the first three letters of the company name. By checking this site you can find the name, telephone number and email address of the person working on the application as well as its current status in real time.

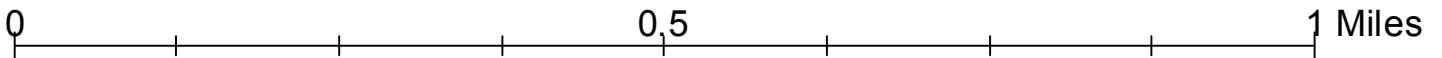
16-T136-R96

Hettinger County

Township: Clark



Map Datum is WGS 84 (same as NAD 83)



Printed: 12/8/2015 -- ND State Land Dept.

Griger, Anne Marie

From: Ananthanarayanan, Sriganesh <Sriganesh.Ananthanarayanan@fpl.com>
Sent: Thursday, December 17, 2015 2:18 PM
To: Hochmuth, Melissa
Cc: Griger, Anne Marie
Subject: FW: **WindMill Response Letter** Brady I and II Projects: Stark & Hettinger Counties, ND
Attachments: BradyI &II_R.pdf

Melissa/Anne-Marie,

Please see below and attached.
Anne-Marie – can you use this as well for the PSC application?

Thanks,
Sriganesh

From: Henry, Joyce [mailto:JHenry@ntia.doc.gov]
Sent: Thursday, December 17, 2015 2:59 PM
To: Ananthanarayanan, Sriganesh
Subject: **WindMill Response Letter** Brady I and II Projects: Stark & Hettinger Counties, ND

This is an EXTERNAL email. Exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email.

Dear Sriganesh:

Please see attached the NTIA Response Letter for the Brady I and II Wind Projects, located in Stark and Hettinger Counties, North Dakota.

After a 45+ day period of review, we received responses from [DOA \(Agriculture\)](#), [DOC \(Commerce\)](#), [DOJ \(Justice\)](#) and [DON \(Navy\)](#), stating [No Harmful Interference Anticipated \(NHIA\)](#).

In the event that an agency has expressed concerns, we encourage you to work with the agency representatives directly to resolve all issues. If issues cannot be resolved, you may contact our office via phone or e-mail for resolution.

*Joyce Countee Henry
Admin Assistant
Department of Commerce (DOC)
National Telecommunications
Information Administration (NTIA)
Office of Spectrum Management (OSM HQ)
Wk: 202-482-1850*

202-482-2215 (private line)
Fax: 202-482-4396



UNITED STATES DEPARTMENT OF COMMERCE
National Telecommunications and
Information Administration
Washington, D.C. 20230

DEC 17 2015

Mr. Sriganesh Ananthanarayanan
Resource Modeling Analyst
WindLogics
700 Universe Blvd.
Juno Beach, FL 33408

Re: Brady I and II Projects: Stark & Hettinger Counties, ND

Dear Mr. Ananthanarayanan:

In response to your request on October 23, 2015, the National Telecommunications and Information Administration provided to the federal agencies represented in the Interdepartment Radio Advisory Committee (IRAC) the plans for the Brady I and II Wind Projects, located in Stark and Hettinger Counties, North Dakota.

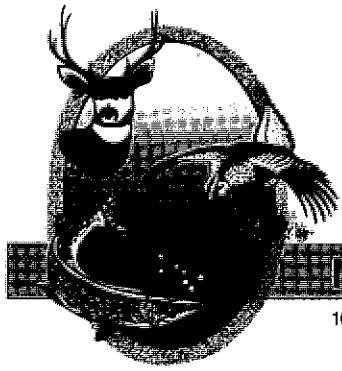
After a 45+ day period of review, no agencies had issues with turbine placement in this area.

While the IRAC agencies did not identify any concerns regarding radio frequency blockage, this does not eliminate the need for the wind energy facilities to meet any other requirements specified by law related to these agencies. For example, this review by the IRAC does not eliminate any need that may exist to coordinate with the Federal Aviation Administration concerning flight obstruction.

Thank you for the opportunity to review this proposal.

Sincerely,

Peter A. Tenhula
Deputy Associate Administrator
Office of Spectrum Management



"VARIETY IN HUNTING AND FISHING"

NORTH DAKOTA GAME AND FISH DEPARTMENT

100 NORTH BISMARCK EXPRESSWAY BISMARCK, NORTH DAKOTA 58501-5095 PHONE 701-328-6300 FAX 701-328-6352

December 28, 2015

Anne-Marie Griger, AICP
Tetra Tech, Inc.
8911 N. Capital of Texas Hwy
Bldg. 2, Suite #2310
Austin, TX 78759

Dear Ms. Griger:

RE: Proposed Brady II Wind Energy Center
Hettinger County, North Dakota

The North Dakota Game and Fish Department has reviewed this project for wildlife concerns.

A primary concern with wind power development is the disturbance of native prairie associated with construction of turbines, access roads, and other associated facilities. We ask that work within native prairie be avoided to the extent possible. This could include micro-siting turbines onto adjacent previously disturbed land, locating access roads on existing section line trails rather than across undisturbed native prairie, etc. Avoidance of native prairie areas reduces impacts to a variety of grassland species including Sprague's pipit and Dakota skipper. We also suggest the US Fish and Wildlife Service Land-Based Wind Energy Guidelines be implemented as appropriate during the development of this project.

The National Wetland Inventory indicates various wetlands located within the proposed project area. We recommend that any unavoidable wetland impacts be replaced in kind, above-ground appurtenances not be placed in wetland areas, and no alterations be made to existing drainage patterns.

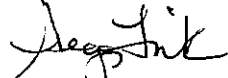
We ask that collection lines be buried whenever possible, and any necessary overhead lines be marked when placed over perennial streams or sited in close proximity to wetland complexes to minimize possible avian impacts. The publication "Reducing Avian Collisions with Power Lines: the State of the Art in 2012" provides a range of management options which can be used to reduce avian losses.

Aerial surveys should be conducted for raptor nests before construction begins. A ½-mile construction buffer should be implemented around active eagle nest sites (known occupied

within the past 5 years). Ms. Sandra Johnson, Conservation Biologist, can be contacted at 701-328-6327 for additional information on eagle nest sites in the state.

We also recommend that routine monitoring for avian and bat mortality be included as part of the facility maintenance plan for the life of the project. We would appreciate being kept informed as this project progresses, and if possible, we would like the GPS coordinates for each turbine after the site has been established.

Sincerely,



Greg Link

Chief

Conservation & Communication Division

js