minnesota power
AN ALLETE COMPANY

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October 2, 2009

Mr. Darrel Nitschke
Executive Secretary
North Dakota Public Service Commission
600 E. Boulevard Avenue, Department 408
Bismarck, ND 58505-0480

RE: Minnesota Power's Application for a Corridor Certificate and a Route Permit for a 230 kV transmission line in Oliver and Morton counties, North Dakota

Case No. PU-09-587

Dear Mr. Nitschke:

Pursuant to N.D.C.C. §§ 49-22-08, 49-22-08.1 and 49-22-07.2, under the Energy Conversion and Transmission Facility Siting Act, and promulgated rules, Minnesota Power has enclosed the following:

An original and ten copies of an Application for a Corridor Certificate and a Route Permit for a 230 kV transmission line and an Application for a Waiver of Procedures and Time Schedules.

In accordance with the North Dakota Public Service Commission's August 26, 2009 Motion, Minnesota Power previously sent a check for the $65,000 filing fee for this Application.

If you have any questions, or need additional information, please contact me at the above-listed number.

Sincerely,

David R. Moeller

kl
c: Jim Atkinson, Minnesota Power
Ron Gullicks, Minnesota Power
Todd Mattson – HDR Engineering, Inc.

23 PU-09-587 Filed 02/02/2010 Pages: 330
Hearing Exhibit 1 – App. for Cert. of Corridor Compatibility & Rt.Permit
Allete, Inc.

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1.0 INTRODUCTION

Minnesota Power (MP), an operating division of ALLETE, Inc., submits this Application for a Certificate of Corridor Compatibility (Corridor Certificate) and a Route Permit to construct a 230 kilovolt (kV) overhead electrical transmission line from the proposed 34.5/230 kV Bison Substation (Project Substation) in Morton County to the existing 230 kV Square Butte Substation in Oliver County near Center, ND (the Route).

The Project Substation is included in Minnesota Power's application for a Certificate of Site Compatibility for the Bison I Wind Project Case No. PU-09-151. This 76 megawatt (MW) wind project is located on approximately 15 square miles in Morton and Oliver counties, North Dakota (Figure 1). The BNI Wind Project's Substation, which is included in MP's application for a Certificate of Site Compatibility for the BNI Wind Project Case No. PU-08-848, will also tie into the Route. Also a 76 MW wind project, it is located on approximately 10 square miles of reclaimed land previously mined by BNI Coal, Ltd. in Oliver County, ND near Center, ND. The BNI Wind Project application will be filed with the North Dakota Public Service Commission (PSC) in the fall of 2009. The proposed Route allows the Bison I Wind Project and the BNI Wind Project to transmit electricity to the existing 230 kV Square Butte Substation. While this Application focuses on the Route, the Bison I and BNI wind projects and the Route are collectively referred to as the "Project" throughout this Application.

MP provides retail electric service to northeastern Minnesota and wholesale service to 16 municipal customers in Minnesota and two private utilities in Wisconsin. MP has historically maintained an energy resource portfolio of coal, hydro, and biomass. In an effort to meet Minnesota's Renewable Energy Standard (Minn. Stat. § 216B.1691) and diversify its energy resource portfolio, MP has been implementing a renewable development plan that began with 98.6 MW of purchased wind energy from the Oliver I and II Wind Energy Centers in Oliver County, North Dakota. MP's next major project was construction in 2007 and 2008 of the Taconite Ridge I Wind Energy Center (25 MW), located in northeastern Minnesota. Taconite Ridge I began commercial operation in June 2008. Over the past several years, MP engaged in extensive development efforts to identify technically and economically viable renewable projects. MP is committed to minimizing the environmental impact of its facilities.

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 requires an application for a Corridor Certificate and a Route Permit to meet the criteria set forth in North Dakota Century Code (NDCC) 49-22. The siting of a transmission facility is to be made in an orderly manner compatible with environmental preservation and the efficient use of resources (NDCC 49-22-02).

To the extent available, MP has presented information required by the North Dakota Energy Conversion and Transmission Facility Siting Act. MP has considered exclusion areas, avoidance areas, the selection criteria, and the policy criteria in the design of the Route. In addition, sufficient transmission line design and technical information has been provided for a thorough evaluation of the reasonableness of the Corridor studied and the proposed Route. MP's policy is to locate and design the proposed transmission line by minimizing environmental impacts and utilizing existing corridors.

Tables 1-1 and 1-2 outline the information required to fulfill the requirements for a Corridor Certificate and Route Permit with the PSC using the PSC Guidelines and identifying where these requirements are addressed in this document.

1.1.1 Waiver of Procedures and Time Schedules

MP submits this Application for a Waiver of Procedures and Time Schedules and consolidated applications for a Corridor Certificate and Route Permit (collectively, Application) for purposes of siting and constructing an approximately 22.2 mile 230 kV transmission facility. By this Application, MP requests that the PSC, pursuant to NDCC Section 49-22-07.2, waive the following requirements:

1. That the PSC hold a single consolidated hearing on this waiver request and the Consolidated Application for a Certificate of Corridor Compatibility and Route Permit, rather than separate hearings as may be required by NDCC Sections 49-22-08 & -08.1, 49-22-13, and North Dakota Administrative Code (NDAC) Section 69-06-01-02. MP also requests that the PSC shorten the three-month period specified in NDCC Section 49-22-08(5) and the six-month period specified in NDCC Section 49-22-08.1(5).
2. That the PSC waive the requirements of NDCC Section 49-22-08 and NDCC Section 49-22-08.1 insofar as these sections may require the separate filing of applications for a Corridor Certificate and a Route Permit, and insofar as they require the publication of notices of filing applications.
3. That the PSC waive requirements for Mylar maps and stereo-pair aerial photographs as set forth in the PSC's Application Guidelines for a Corridor Certificate and a Route Permit. Geographic Information System (GIS) maps are provided in the Application.

The PSC's Application Guidelines for Waiver of Procedures and Time Schedules require a facility description, need for, cost of, and justification for the request for waiver, together with evidence that the project will produce minimal adverse effects. As demonstrated in the Application, and as summarized below, MP's Waiver Request and the issuance of a Corridor Certificate and Route Permit is justified, as the proposed facility is of such design, location, and purpose that it will produce minimal adverse effects.

Description

MP proposes to construct, own, and operate an approximately 22.2 mile, 230,000 volt (230 kV), three-phase alternating current electric transmission line from the proposed 34.5/230 kV Bison Substation located in Section 4 of T140N, R86W, to the existing 230 kV Square Butte Substation in Section 33 of T142N, R83W. The purpose of the transmission line is to transmit the energy generated by the proposed Bison I and BNI wind projects to the transmission system. Electrical utilities such as MP are instrumental in meeting regional energy needs, stabilizing energy costs, and enhancing energy reliability. North Dakota has a unique opportunity to help meet these energy needs with clean, efficient, renewable energy. The Project offers North Dakota and the surrounding region the opportunity to add to capacity adequacy requirements, stabilize wholesale power prices, and provide electricity from a clean, cost-effective renewable energy generation facility. MP intends for the Project to be a significant source of energy for meeting the region's needs over the next 35 years.

A description of the Project is described in greater detail throughout the Application.

Need

The need for the transmission line and how it will further the public interest is described in greater detail in section 2.0 of the Application.

Cost

The transmission line is estimated to cost approximately $13,000,000.

Justification for Waiver

Waivers of timelines and procedures are needed in order to prevent potentially significant delays in this project. As set forth in section 1.3 of the Application, MP anticipates beginning winter construction in February 2010 and also needs to have the transmission line energized to allow the Bison I Wind Project to be in-service on schedule in late 2010. Section 49-22-07.2 of the Act provides that the PSC may waive procedures and time schedules upon a finding that "the proposed facility is of such length, design, location, or purpose that it will produce minimal adverse effects." Based upon the thorough investigation and analysis set forth in the Application, waivers are appropriate because the proposed facility will produce minimal adverse effects.

In determining whether the proposed facility will result in adverse impacts on the environment, MP evaluated the transmission line using the criteria set forth in the Act, the Rules, and the PSC's Guidelines for Energy Conversion and Transmission Facility Siting (Guidelines). MP evaluated the impacts of the transmission line considering the siting criteria laid out in NDAC 69-06-08 (section 3.0 of the Application) and the factors to be considered in NDCC Section 49-22-09 (section 8.0 of the Application). Impacts associated with the transmission line are summarized in section 5.17 of the Application. Based upon this evaluation and the factors set forth in the Energy Conversion and Transmission Facility Siting Act and PSC Guidelines, it is clear that the proposed facility will produce minimal adverse effects.

State and Federal agencies were consulted to provide input on potential impacts of the proposed Corridor and Route and, in general, concluded that the proposed facility would produce minimal adverse effects. Their findings are summarized in section 8.11 of the Application.

Also, MP's proposal takes into consideration all state and Federal agency concerns and thereby further mitigates any adverse effects associated with the proposed facilities. The designated state agencies and officers listed in NDAC 69-06-01-05 were notified about the proposed project in April of 2009 and MP will continue to work with the Agencies to implement any conditions that may be imposed.

In short, MP submits and believes the evidence demonstrates that it has taken all feasible and prudent actions to minimize and mitigate to the greatest extent possible all known or potential adverse impacts. As a result, the proposed facilities will produce minimal adverse effects. Accordingly, MP respectfully requests that the PSC grant the requested waivers and render an expeditious decision.

1.1.2 Certificate of Corridor Compatibility

Table 1-1 outlines the information required in the PSC Guidelines dated November 1979 for a Corridor Certificate.

Table 1-1
Corridor Certificate Completion Checklist

State Authority	Description	Section
Chapter 49-22	PSC Guidelines: Energy Conversion and Transmission Facility Siting	1.1.1
Section A	Description	1.2
1.	Type: Describe the type of transmission facility addressed in this application. The description shall include the purpose of the facility and the technology to be employed	1.0, 1.2.1
2.	Product: Describe the type, source, and final destination of the product to be transmitted by the proposed facility.	1.2.3
3.	Size and Design:	4.0
a.	Provide a description of the size and design of the ELECTRICAL facility including, but not limited to, the following:	4.1, 4.2.1, 4.2.4
1.	Width of right of way;	4.2.1
2.	Estimated span lengths;	4.2.1
3.	Anticipated type of structure;	4.2.1
4.	Approximate length of facility	Figures, 1.2, 4.1
5.	Voltage; and	4.2.1
6.	The requirement for a general location of any new associated facilities.	4.2.4
b.	Provide a description of the size and design of the pipeline facility including, but not limited to, the following:	N/A
4.	Time Schedule: Provide the anticipated time schedule for the accomplishment of the following events:	1.3
a.	Certificate of Corridor Compatibility;	1.3
b.	Route Application;	1.3
c.	Route Permit;	1.3
d.	Construction start date;	1.3
e.	Construction complete; and	1.3
f.	In-service date.	1.3
Section B	Studies	
	Provide a copy 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 Bison I Wind Project-
Section C	Need for Facility	2.0
1.	An analysis of the need for the proposed facility based on present and projected demand for the product to be transmitted by the facility, including the most recent system studies supporting the analysis of the need.	2.1

State Authority	Description	Section
2.	A description of any feasible alternative methods of serving the need.	2.2
3.	A statement justifying any deviations from the most recent Ten-Year Plan which the proposed facility may present.	2.3
Section D	Location	1.0, 1.2
1.	Select a study area, which includes the proposed corridor, of sufficient width to enable the PSC to evaluate the factors addressed in Section 49-22-09, NDCC.	1.2.1, 6.0
2.	Identify and map the criteria that led to the proposed corridor location within the study area.	Figure 2, 1.2.1, 3.0
3.	Discuss the relative value of each criteria and how the proposed corridor location was selected giving consideration to all criteria.	1.2.1, 3.0
4.	The criteria to be evaluated shall include at a minimum all of the following which are within the study area:	3.0
a.	Exclusion areas;	3.1.1
b.	Avoidance areas;	3.1.2
c.	Selection criteria;	3.1.3
d.	Policy criteria;	3.1.4
e.	Design and construction limitations; and	3.1.5
f.	Economic considerations.	3.1.6
5.	Discuss the general mitigative measures that will be taken to minimize adverse impacts which result from a route location in the proposed corridor.	5.1.3, 5.2.3, 5.3.3, 5.4.3, 5.5.3, 5.6.3, 5.7.3, 5.8.3, 5.9.3, 5.10.3, 5.11.3, 5.12.3, 5.13.3, 5.14.3, 5.15.3, 5.16.3
6.	List the qualifications of the people in the various disciplines that contributed to the corridor location study	9.0
7.	Maps	Figures
a.	Map the criteria within the study area showing the proposed corridor. Several different criteria may be shown on each map, depending on the map scale and the density and nature of the criteria. Minimum map scale shall be ½ inch = 1 mile. All maps shall be at the same scale unless otherwise specified.	Figures
b.	Furnish one set of Mylar maps, separate from the application, of the same scale as the criteria maps and showing the same basic features as the criteria maps, including the study area, but not the proposed facility location.	Figures
Chapter 49-22-09	Factors to be considered in evaluating applications and designation of sites, corridors, and routes.	8.0
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.	8.1

State Authority	Description	Section
2.	The effects of new energy conversion and transmission technologies and systems designed to minimize adverse environmental effects.	8.2
3.	The potential for beneficial uses of waste energy from a proposed energy conversion facility	8.3
4.	Adverse direct and indirect environmental effects which cannot be avoided should the proposed site or route be designated.	8.4
5.	Alternatives to the proposed site, corridor, or route which are developed during the hearing process and which minimize adverse effects.	8.5
6.	Irreversible and irretrievable commitments of natural resources should the proposed site, corridor, or route be designated.	8.6
7.	The direct and indirect economic impacts of the proposed facility	8.7
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.	8.8
9.	The effect of the proposed site or route on existing scenic areas, historic sites and structures, and paleontological or archaeological sites.	8.9
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	8.10
11.	Problems raised by federal agencies, other state agencies, and local entities	8.11

1.1.3 Route Permit Application

Table 1-2 below outlines the information required in the PSC Guidelines dated November 1979 for a Route Permit. Information regarding easements for transmission lines per NDCC 49-22-08.1(f) is also included in the Application in section 3.1.5.

Table 1-2
Route Permit Completion Checklist

State Authority	Description	Section
Chapter 49-22	PSC Guidelines: Energy Conversion and Transmission Facility Siting	1.1.2
Section A	Description	1.2
1.	Type: Describe the type of transmission facility proposed.	1.0, 1.2.2
2.	Product: Describe the product or products to be transmitted.	1.2.3

State Authority	Description	Section
3.	Size and Design: Provide a general description of the proposed size and design, and any alternate size or design, which was considered. Provide one (1) copy of the design data report, separate from the application, for the proposed facility and any associated facilities.	4.0
4.	Time Schedule: Provide the anticipated time schedule for the accomplishment of major events including, at a minimum, the following:	1.3
a.	Route Permit;	1.3
b.	Right-of-way acquisition complete;	1.3
c.	Construction start date;	1.3
d.	Construction complete;	1.3
e.	Test operations; and	1.3
h.	In-service date.	1.3
Section B	Studies	
	Provide a copy 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
Section C	Need for Facility	2.0
1.	An analysis of the need for the proposed facility based on present and projected demand for the product to be transmitted by the facility, including the most recent system studies supporting the analysis of the need.	2.1
2.	A description of any feasible alternative methods of serving the need.	2.2
3.	A statement justifying any deviations from the most recent Ten-Year Plan which the proposed facility may present.	2.3
Section D	Location	1.0, 1.2
1.	Discuss the utility's policies and commitments to limit the environmental impact of its facilities, including copies of board resolutions and management directives.	Appendix A
2.	Discuss the factors listed in Section 49-22-09, NDCC to aid the PSC's evaluation of the proposed route.	All 6.0
3.	Identify and map the criteria that led to the proposed route location within the designated corridor.	Figure 3, 1.2.2, 3.0
4.	Discuss in detail the relative value of each criteria and how the location, construction, and operation of the facility will affect each criteria.	3.0, 5.0-5.16
5.	The criteria to be evaluated shall include at a minimum all of the following which are within the designated corridor:	3.0
a.	Exclusion areas;	3.1.1
b.	Avoidance areas;	3.1.2
c.	Selection criteria;	3.1.3

State Authority	Description	Section
d.	Policy criteria;	3.1.4
e.	Design and construction limitations; and	3.1.5
f.	Economic considerations.	3.1.6
6.	Discuss the mitigative measures that will be taken to minimize adverse impacts which result from the location, construction, and operation of the proposed facility.	5.1.3, 5.2.3, 5.3.3, 5.4.3, 5.5.3, 5.6.3, 5.7.3, 5.8.3, 5.9.3, 5.10.3, 5.11.3, 5.12.3, 5.13.3, 5.14.3, 5.15.3, 5.16.3
7.	List the qualifications of the people in the various disciplines that contributed to the facility route location study.	9.0
8.	Maps	Figures
a.	Map the criteria within the designated corridor showing the proposed route and location of any new associated facilities. Several different criteria may be shown on each map, depending on the map scale and the density and nature of the criteria. Minimum map scale shall be ½ inch = 1 mile. All maps shall be at the same scale unless otherwise specified.	Figures
b.	Furnish one (1) set of Mylar maps, separate from the application, of the same scale as the criteria maps and showing the same basic features as the criteria maps, including the designated corridor, but not the proposed route or location of any new associated facilities.	Figures
c.	Furnish one (1) set of uncontrolled 9x9 inch stereo-pair aerial photographs, separate from the application, with acceptable resolution showing the designated corridor, proposed route and location of any new associated faculties, and Section, Township and Range numbers, at a scale of 1 inch = 2000 feet, together with a flight map at a scale of ½ inch = 1 mile showing each flight line and the beginning and ending photo number of each flight line. Photo mosaic strip maps will also be acceptable. If the applicant can demonstrate that because of the limited size and scope of the project, aerial photographs would not be practical, this requirement may be waived.	Figures
Chapter 49-22-09	Factors to be considered in evaluating applications and designation of sites, corridors, and routes.	8.0
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.	8.1
2.	The effects of new energy conversion and transmission technologies and systems designed to minimize adverse environmental effects.	8.2
3.	The potential for beneficial uses of waste energy from a proposed energy conversion facility	8.3
4.	Adverse direct and indirect environmental effects which cannot be avoided should the proposed site or route be designated.	8.4

State Authority	Description	Section
5.	Alternatives to the proposed site, corridor, or route which are developed during the hearing process and which minimize adverse effects.	8.5
6.	Irreversible and irretrievable commitments of natural resources should the proposed site, corridor, or route be designated.	8.6
7.	The direct and indirect economic impacts of the proposed facility	8.7
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.	8.8
9.	The effect of the proposed site or route on existing scenic areas, historic sites and structures, and paleontological or archaeological sites.	8.9
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	8.10
11.	Problems raised by federal agencies, other state agencies, and local entities	8.11

1.2 PROJECT SUMMARY

MP proposes to construct a 230 kV transmission line on H-frame tangent structures within the Corridor identified in section 1.2.1. A description of the proposed facility is in section 4.2. The Route was selected after addressing the factors identified in NDCC 49-22-09 and evaluating the criteria in NDAC 69-06-08-02. Below is a description of the Study Area, Proposed Corridor, and Proposed Route for the new 230 kV transmission line. The new line will be approximately 22.2 miles in length and will transmit electrical energy from the proposed 34.5/230 kV Bison Substation (Project Substation) to the existing 230 kV Square Butte Substation near Center, North Dakota.

1.2.1 Study Area and Proposed Corridor

Figure 2 presents exclusion and avoidance areas in the Study Area that were analyzed to select the proposed Corridor. MP studied potential wind resource locations in North Dakota for siting a 76-MW wind generation facility and transmission line.

The Bison I Wind Project and BNI Wind Project locations were selected based on good land compatibility and accessibility, excellent wind resources, and proximity to a transmission grid interconnection point. South central North Dakota is well suited for wind development because it features large open terrain without trees. An additional key advantage to wind development in North Dakota is the land area available for wind turbine and transmission line siting. Within 20 miles of Center, there are hundreds of square miles that may be screened for wind development. MP has secured a sufficient amount of wind easement options to support several planned wind projects.

At the Project Substation, the power will be transformed to 230 kV and transmitted via overhead 230 kV transmission lines, interconnecting with the transmission grid at the existing Square Butte Substation. The BNI Project Substation will also tie into the 230 kV transmission line before the point of interconnection at the Square Butte Substation. Electrical energy is converted from AC to DC via a DC converter station within the Square Butte Substation. Electrical energy from the Bison I and BNI wind projects will be transmitted to customers via the existing Square Butte DC Line, which extends from the Square Butte Substation to MP's Arrowhead Substation located near Duluth, Minnesota. MP is in the process of obtaining all necessary regulatory approvals to acquire the Square Butte DC Line from Square Butte Electric Cooperative (see Case # PU-09-631).

In reviewing the Study Area vicinity, the area northwest and southeast of the Study Area is farther from the Project Substation and interconnection point, thus requiring a longer transmission line. The proposed Corridor was selected in the Study Area considering the exclusion and avoidance criteria outlined in NDAC 69-06-08-02.

The proposed Corridor is a 2.23-mile-wide Corridor for the proposed transmission line from the Project Substation to the point of interconnection, the Square Butte Substation. The Corridor consists of the sections, townships, and ranges in Table 1-3 and is represented on the Study Area map shown in Figures 2, 4, and 5. The Corridor chosen complies with NDCC 69-06-04-02, which states that the width of the Corridor must be 10 percent of the length of the line, not less than one mile and not more than six miles in width.

Table 1-3
Corridor Study Area

Township	Range	Sections
140N	86W	1- 5, 9
141N	86W	25 -27, 34-36
140N	85W	1-6
141N	85W	1, 12, 13, 21-36
141N	84W	1-10, 16-20, 29-32
142N	84W	25-28, 31-36
141N	83W	3-6
142N	83W	19-21, 27-34

Following an analysis of the transmission need for the Bison I and BNI wind projects, it was determined that a 230 kV transmission line was required. The factors addressed in NDCC 49-22-09 were considered in evaluating the Corridor for a 230 kV transmission line and are discussed in section 8.0. All exclusion and avoidance criteria within the Study Area were considered in selecting the proposed Corridor. MP avoided wildlife management areas (WMAs), residences, recreational areas, and irrigated land to the extent practicable. MP is interconnecting with existing infrastructure at the Square Butte Substation. This is consistent with NDAC Policy Criteria for transmission corridors and routes (§§69-06-08-02-2e; 69-06-08-02-4i; 69-06-08-02-4g) which encourages applicants to avoid places of residence, maximize benefits by utilizing existing and proposed Route corridors and coordinating facilities.

1.2.2 Proposed Route

Figure 3 identifies the proposed Route. The figure highlights an area 500 feet either side of the proposed Route centerline, which is wider than the right-of-way width discussed in section 4.2.1.2 of the Application. The townships, ranges, and sections comprising the route are shown in Table 1-4.

Table 1-4
Route Location

Township	Range	Sections
140N	86W	3, 4
141N	86W	36
141N	85W	31-36
141N	84W	3-5, 7, 8, 18, 19, 30, 31
142N	84W	34-36
142N	83W	29-33

The average span length of the new transmission line would be approximately 900 feet. The criteria identified in section 1.2.1 as the primary criteria in the decision-making for the location of the proposed Corridor also dictated the selection of the proposed Route within the proposed Corridor. In particular, the avoidance criteria for state designated lands (i.e. WMAs) and residences dictated the location of the line. Additionally, structure locations will be fine-tuned to more specifically avoid residences; wetlands and water bodies; and native vegetation to the extent practicable, as described within this document.

Modifications to the existing 230 kV Square Butte Substation will be required to allow interconnection of the 230 kV transmission line to the electric grid. These modifications are discussed in section 4.2.4.

1.2.3 Product

The transmission line will transmit the electrical energy generated by the Bison I and BNI wind projects from the Project Substation to the Square Butte Substation. The line is intended to carry 230 kV, three-phase, alternating current. The transmission line expected to operate at 629 MW. Electrical energy from the Bison I and BNI wind projects will be transmitted to customers via the existing Square Butte DC Line which extends from the Square Butte Substation to Minnesota Power's Arrowhead Substation located near Duluth, Minnesota and on the existing high voltage AC transmission system as capacity is available.

1.3 PROJECT SCHEDULE

The in-service date is dependent upon permitting approvals and other development activities.

1. Certificate of Corridor Compatibility: MP anticipates the Corridor Certificate will be approved in January 2010.
2. Route Permit Application: The route permit application is included herein.
3. Route Permit: MP anticipates the Route Permit will be approved concurrent with the Corridor Certificate in January 2010. It is critical for MP to receive the Route Permit and Corridor

Certificate as soon as possible, as completing this step will allow MP to move forward with other commitments associated with the Project, including ordering long-lead time materials. A January 2010 issuance of a Route Permit and Certificate of Corridor Compatibility also will allow the Bison I Wind Project to be in-service as scheduled.

4. Right-of-Way Acquisition: MP is responsible for all right-of-way acquisition and is in the process of obtaining the necessary easements from landowners. MP has secured options to purchase easements from all private landowners for the entire Route. MP is presently negotiating easements for the right-of-way on BNI Coal and MinnKota Electric Cooperative properties.
5. Equipment Procurement, Manufacture, and Delivery: MP will order the transmission line components as soon as practicable. Once the components have been ordered, delivery is anticipated within six months.
6. Construction: MP anticipates construction could begin as early as February 2010 in areas that may require winter construction and in mid-May 2010 for the rest of the transmission line. The construction will take approximately four months to complete.
7. Test and Operations: MP expects that testing of the system will occur in August 2010.
8. In-Service Date: The expected in-service date for the transmission line will be September 2010.

No expansions or modifications to the Project are proposed at this time, though MP is planning on building additional wind facilities in North Dakota. The proposed transmission line and Project Substation will be designed for additional capacity to accommodate future wind generation development in the area. MP will submit applications for any future additional wind generation facilities using this substation.

2.0 NEED FOR FACILITY

2.1 NEEDS ANALYSIS

Several states have implemented Renewable Portfolio Standards (RPS) mandates that require the development of renewable energy projects. MP will be using the output from the Bison I and BNI wind projects to meet the state of Minnesota Renewable Energy Standard (RES) under Minn. Stat. § 216B.1691. Under the Minnesota RES, MP is required to generate or procure sufficient electricity generated by an eligible renewable energy technology (which includes wind energy). The following standard percentages of MP's total Minnesota retail electric sales must be generated by eligible energy technologies by the end of the year indicated: 12 percent by 2012, 17 percent by 2016, 20 percent by 2020, and 25 percent by 2025. Currently, approximately 11 percent of MP's total Minnesota retail electric sales are generated by eligible energy technologies. The Bison I and BNI wind projects are an integral part of MP's plans for obtaining 25 percent of its electricity for its retail customers from renewable energy sources by the year 2025.

Electrical utilities such as MP are instrumental in meeting regional energy needs and enhancing energy reliability. North Dakota has a unique opportunity to help meet these energy needs with clean, efficient, renewable energy. The Project offers North Dakota and surrounding region the opportunity to add transmission capacity and provide a transmission outlet for electricity from a clean, cost-effective, renewable energy generation facility. MP intends for the Project to be a significant source of energy for meeting the region's needs over the next 35 years.

While no expansions or additions are proposed at this time for the Bison I or BNI wind projects, the 230 kV transmission line will provide for development of additional wind energy in the vicinity without triggering the need to construct additional transmission line capacity. A 230 kV transmission line voltage was selected to be compatible with the point of interconnection to the transmission grid, the 230 kV Square Butte Substation.

2.2 ALTERNATIVES

The Project Substation is located in Section 4 of T140N, R86W. This point defines the western terminus of the proposed transmission line. The existing 230 kV Square Butte Substation, the point of interconnection to the high voltage electrical grid, defines the eastern terminus of the line. The Route was selected on the following basis:

- The Route is relatively direct minimizing costs of the transmission line facility and minimizing potential impacts to landowners and the environment.
- The Route utilizes the properties of landowners willing to provide options to purchase easements.
- The potential for wetlands and other environmental impacts are minimized to the extent practicable.
- The Route will provide for potential future development of additional wind resources.

2.3 TEN-YEAR PLAN

MP filed a Ten-Year Plan with the PSC in July 2009. This Project is consistent with the Ten-Year Plan on file with PSC.

3.0 TRANSMISSION FACILITY CORRIDOR AND ROUTE CRITERIA

MP evaluated a study area to determine the best locations for a 230 kV transmission line Corridor and Route. The proposed Corridor was identified as the optimal location from an environmental, wind resources and economic perspective (Figure 2). Since the purpose of the line is to transmit energy from the Bison I and BNI wind projects to the existing Square Butte Substation, the transmission line originates at the Project Substation and terminates at the 230 kV Square Butte Substation. The 2.23 mile wide Corridor encompasses an area that has a width of 10 percent or more of the length of the transmission line, which must begin in Section 4 of T140N, R86W and end at the existing Square Butte Substation approximately 19 miles to the northeast. The proposed 22.2 mile Route described in this Application is the result of this Corridor study, which included easement discussions with landowners, identifying known environmentally sensitive areas, considering North Dakota's power plant siting exclusion and avoidance areas, reviewing Morton and Oliver county requirements, and communications with Local, state, and Federal agencies.

MP has reviewed the criteria in Chapter 69-06-08 and has factored these criteria into the Corridor study and the Route design. None of the exclusion and avoidance criteria identified in the Corridor encompass greater than 50 percent of the Corridor width. The criteria listed in Chapter 69-06-08 are discussed in this section.

3.1 EXCLUSION AREAS

Per Section 69-06-08-02-1, the following geographical areas (Table 3-1) shall be excluded in the consideration of a route for a transmission facility, and shall include a buffer zone of reasonable width to protect the integrity of the area. Exclusion areas are mapped for the Corridor and Route in Figures 2 and 3.

Table 3-1.
Exclusion Areas

Exclusion Area	Present within Project Vicinity?	Proposed Buffer		Section Addressed
		Corridor	Route	
Designated or registered national: parks; memorial parks; historic sites and landmarks; natural landmarks; monuments; and wilderness areas	None	None	None	5.7, 5.8, 5.14
Designated or registered state: parks; historic sites; monuments; historical markers; archaeological sites; and nature preserves	None	None	None	5.7, 5.8
County parks and recreational areas; municipal parks; and parks owned or administered by other governmental subdivisions	None	None	None	5.8

Exclusion Area	Present within Project Vicinity?	Proposed Buffer		Section Addressed
		Corridor	Route	
Areas critical to the life stages of threatened or endangered species	None	No areas critical to threatened and endangered species have been identified in the Corridor.	No areas critical to threatened and endangered species have been identified in the Route.	5.16
Areas where animal or plant species that are unique or rare to this state would be irreversibly damaged	None	No unique or rare areas have been identified in the Corridor. MP is working with the U.S. Fish and Wildlife Service (USFWS) and North Dakota Game and Fish Department (NDGFD) to avoid potential impacts.	No unique or rare areas have been identified along the Route. MP is working with the USFWS and NDGFD to avoid potential impacts.	5.16

3.2 AVOIDANCE AREAS

Per Section 69-06-08-02-2, the following geographical areas (Table 3-2) shall not be considered in the routing of a transmission 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, proposed management of adverse impacts; orderly siting of facilities; system reliability and integrity; efficient use of resources; and alternative routes. Avoidance areas are mapped for the Corridor and Route in Figures 2 and 3.

Table 3-2.
Avoidance Areas

Avoidance Areas	Present within Project Vicinity?	Proposed Buffer		Section Addressed
		Corridor	Route	
Designated or registered national: historic districts; wildlife areas; wild, scenic or recreational rivers; wildlife refuges; and grasslands	None	None	None	5.7, 5.12, 5.15
Designated or registered state: wild, scenic, or recreational rivers; game refuges; game management areas; management areas; forests, forest management lands; and grasslands	Present	The 158 acre Wilbur Boldt WMA is partially located within the eastern edge of the Corridor. North Dakota Land Department land, used for grazing, leasing or school trusts, is located in the Corridor.	None	5.12, 5.14

Avoidance Areas	Present within Project Vicinity?	Proposed Buffer		Section Addressed
		Corridor	Route	
Historical resources which are not specifically designated as exclusion or avoidance areas	None identified to date	No historical resources were on record with the North Dakota State Historic Preservation Office (SHPO) that were within the proposed Corridor. In consultation with the SHPO, a professional archaeologist would establish buffer appropriate to resources discovered during the Class III Survey.	No historical resources were on record with the SHPO that were along the proposed Route. In consultation with the SHPO, a professional archaeologist would establish buffer appropriate to resources discovered during the Class III Survey.	5.7
Areas that are geologically unstable	None	No areas that are geologically unstable are within the project Corridor.	No areas that are geologically unstable are along the Route.	5.11
Within 500 feet of a residence, school, or place of business	Present	A buffer of 500 feet from residences was considered in the evaluation of the Corridor. There are several occupied residences identified within the proposed Corridor.	No homes are located within 500 feet of the Route centerline.	5.9
Reservoirs and municipal water supplies	None	No municipal water supplies or reservoirs have been identified in the Corridor. There are likely several domestic wells in the Corridor. No impacts are anticipated	None	5.11
Water sources for organized rural water districts	None	None	None	5.11
Irrigated land. This criterion shall not apply to an underground transmission facility.	Present	The North Dakota State Water Commission's database reveals four irrigation permits were issued within the vicinity of the Route and may or may not be located within the Corridor. MP will avoid these parcels of land once final locations are determined. No buffer has been established and no conflicts are anticipated.	None	5.9
Areas of recreational significance which are not designated as exclusion areas	Present	A tract of Private Land Open to Sportsmen (PLOTS) land is located within the Corridor near the western terminus.	None	5.8

3.3 SELECTION CRITERIA

Per Section 69-06-08-02-3, a corridor or route shall be designated (Table 3-3) only when it is demonstrated to the PSC by the applicant that any significant adverse effects resulting from the location, construction and maintenance of the facility, as they relate to the following, will be at an acceptable minimum or that those effects will be managed and maintained at an acceptable minimum. Figures 7 to 16 identify the selection criteria for the Project as well as other related resources.

Table 3-3.
Selection Criteria

Selection Criteria	Potential Adverse Effects		Section Addressed
	Corridor	Route	
The impact upon agriculture:			
Agricultural production	The structure type proposed will permanently impact approximately 100 ft^2 of land per structure. The placement of 143 structures would impact approximately 0.3 acres, which would result in an insignificant impact to agricultural production.	Approximately 0.3 acre (14,300 ft^2) of land will be permanently impacted due to 143 transmission line structures placed along the Route. This would result in an insignificant impact to agricultural production.	5.9
Family farms and ranches	Land area lost to the construction of the transmission line structures will have a minimal adverse effect to family farms. No family farms will be displaced due to construction in the Corridor.	Land area lost to the construction of the transmission line structures will have a minimal adverse effect to family farms. No family farms will be displaced due to construction of the Route.	5.9
Land which the owner demonstrates has soil, topography, drainage, and an available water supply that cause the land to be economically suitable for irrigation	Where impacts are expected, no owner has expressed concerns related to economically suitable irrigation on their land.	Where impacts are expected, no owner has expressed concerns related to economically suitable irrigation on their land.	5.9
Surface drainage patterns and ground water flow patterns	No impacts to surface drainage patterns or groundwater flow patterns are anticipated.	No impacts to surface drainage patterns or groundwater flow patterns are anticipated.	5.11, 5.12
The impact upon:			
Noise sensitive land uses	The noise sensitive land uses within the Project are the residences near the transmission line. There are 7 homes within the Corridor. No impacts to noise sensitive land uses are anticipated.	The noise level at 300 feet from the proposed transmission line is 33 dBA. Noise impacts are nominal. The nearest sensitive receptor to the proposed route is approximately 700 feet. No impacts to noise sensitive land uses are anticipated.	5.5

Selection Criteria	Potential Adverse Effects		Section Addressed
	Corridor	Route	
The visual effect on the adjacent area	The transmission line will be visible to landowners and residents who live near the line. MP will minimize visual impacts to the extent practicable.	Visual impacts will be most evident to landowners and residents in close proximity to the Route and drivers traveling along State Highway 31 and 25. MP will minimize impacts to the extent practicable. Structures will also avoid sensitive areas to the extent practicable.	5.6
Extractive and storage resources	No impacts are anticipated to extractive or storage resources.	No impacts are anticipated to extractive or storage resources.	5.11
Wetlands, woodlands, and wooded areas	Wetland resources will be avoided to the extent practicable. MP will utilize line designs to avoid and minimize impacts to wetlands in the Corridor. Woodlands are primarily associated with homes in the form of woodlots and windbreaks. If impacts to wetlands and woodlands cannot be avoided, options to minimize impacts will be considered and mitigation will be proposed consistent with regulatory requirements.	An initial review of preliminary layout indicates that one wetland along the proposed Route cannot be spanned using the proposed transmission line design. Wetlands more than 1,100 feet in length, which is the maximum span of the proposed transmission line design, may require that transmission structures be placed in wetlands. As stated above, MP intends to span all wetlands to the extent practicable. MP intends to mitigate these impacts as required by the U.S. Army Corps of Engineers (USACE) and North Dakota Department of Health (NDDH). It is anticipated that less than 4.7 acres of woodlands and windbreaks may be impacted. Trees and shrubs will be replaced at a ratio of 2:1 at the site and will be monitored for survival for three years.	5.9, 5.13
Radio and television reception and other communication or electronic control facilities	No impacts to radio and television reception or other communication or electronic control facilities are anticipated.	No impacts to radio and television reception or other communication or electronic control facilities are anticipated due to the construction of the line in the proposed location (microwave study).	5.3
Human health and safety	Mitigative measures will be implemented as discussed in section 5.4.3, and if maintenance schedules are met, no impacts to human health and safety are anticipated.	Mitigative measures will be implemented as discussed in section 5.4.3, and if maintenance schedules are met, no impacts to human health and safety are anticipated.	5.4

Selection Criteria	Potential Adverse Effects		Section Addressed
	Corridor	Route	
Animal health and safety	No impacts to livestock are anticipated from the operation of the transmission line. Raptors, waterfowl, and other bird species may be affected by the construction and placement of the transmission lines. Avian collisions are a possibility after the completion of the transmission line. Waterfowl are typically more susceptible to transmission line collision, especially if the line is placed between agricultural fields that serve as feeding areas, or between wetlands and open water, which serve as resting areas. Generally, the most difficult part of the structure for the bird to see is the shield wire. Mitigative measures will minimize these impacts.	No impacts to livestock are anticipated from the operation of the transmission line Raptors, waterfowl, and other bird species may be affected by the construction and placement of the transmission lines. Avian collisions are a possibility after the completion of the transmission line. Waterfowl are typically more susceptible to transmission line collision, especially if the line is placed between agricultural fields that serve as feeding areas, or between wetlands and open water, which serve as resting areas. Generally, the most difficult part of the structure for the bird to see is the shield wire. Mitigative measures, as outlined in section 5.15.3, will minimize these impacts.	5.9, 5.15
Plant life	The land is primarily agricultural in nature. Only the areas where the structures will be placed will permanently impact plant life. Other areas where temporary impacts may occur will be restored.	Approximately 0.3 acres (14,300 ft^2) of land will be permanently impacted from the transmission line structure placement for the Route. The land is primarily agricultural in nature. Temporary impacts will be restored.	5.9, 5.14

3.4 POLICY CRITERIA

Per Section 69-06-08-02-4, the PSC may give preference to an applicant that will maximize benefits that result from the adoption of the following policies and practices, and in a proper case may require the adoption of such policies and practices (Table 3-4).

Table 3-4.
Policy Criteria

Policy Criteria	Suitable Policy or Practice of Applicant	Section Addressed
Location and design	MP's policy is to locate and design the proposed transmission line to minimize environmental impacts and utilizing existing corridors where practical.	1.1
Training and utilization of available labor in this state for the general and specialized skills required	MP will use local labor to the extent practicable. MP Project management will meet with local labor well in advance of construction to assure the necessary human resources are available.	5.1

Policy Criteria	Suitable Policy or Practice of Applicant	Section Addressed
Economies of construction and operation	MP will utilize local contractors to the extent practicable.	5.1
Use of citizen coordinating committees	MP has and will continue to work with landowners on the development of the Project.	7.0
A commitment of a portion of the transmitted product for use in this state	Due to the need to transmit and utilize this wind energy in MP's service territory to meet state of Minnesota renewable mandates, MP cannot make this commitment.	1.2, 4.2
Labor relations	No labor relations will be affected.	5.1
The coordination of facilities	Existing facilities and facility corridors were considered in the location of the transmission line and its associated facilities.	1.2.1, 1.2.2
Monitoring of impacts	MP and the construction contractor will employ Best Management Practices (BMPs) during construction to monitor soil impacts and segregate topsoil. MP will monitor tree and shrub replacement for three years, if needed..	5.10, 5.14, 5.15
Utilization of existing and proposed rights of way and corridors	The proposed 230 kV transmission line location was the best location when considering the factors identified by the PSC and MP's policies and project design.	1.2.1, 1.2.2, 3.1.5
Other existing or proposed transmission facilities	The Corridor does not include existing transmission facilities and the Route does not parallel existing transmission lines. The proposed 230 kV transmission line crosses existing transmission facilities and will be designed to provide the required electrical clearances to these existing facilities.	1.2.1, 1.2.2, 3.1.5

3.5 DESIGN AND CONSTRUCTION LIMITATIONS

Design and construction limitations associated with the Project are primarily associated with the proposed location of the transmission line. The points of termination largely dictate the location of the transmission line. The line must originate at the Project Substation and terminate at the existing Square Butte Substation near Center, North Dakota since the purpose of the proposed 230 kV transmission line is to transmit energy from proposed wind projects to the utility grid. The proposed Route is the most direct route while minimizing impacts to the criteria identified in Section 69-06-08-02.

For this particular project, MP will attempt to span all wetlands along the Route. Wetlands more than 1,100 feet in length may require that transmission structures be placed in wetlands. As stated above, MP intends to span all wetlands to the extent practicable MP intends to mitigate unavoidable impacts as required by the USACE and NDDH.

The existing 230 kV Square Butte Substation layout largely dictates where new lines may enter. The configuration of the existing substation equipment and high voltage overhead transmission lines restrict where the new transmission line may enter the substation. The proposed 230 kV transmission line will enter the north side of the 230 kV Square Butte Substation in order to be compatible with the existing configuration. MP will use wood two pole H-frames for tangent structures, steel monopoles for angles in cultivated fields, and either guyed wood multiple pole or steel monopole structures in pasture or grazing land. The use of wood H-frame structures has design limitations. Following geotechnical exploration it

may become necessary to utilize special structures or materials to avoid sensitive environmental features or to accommodate poor soil conditions or other design limitations.

3.6 ECONOMIC CONSIDERATIONS

There many economic considerations in the design and routing of a transmission line. The initial cost of a transmission line increases as the voltage of the line increases. This higher initial cost is offset by a reduction in energy losses for higher voltage lines when compared with lower voltage lines. A 230 kV transmission line was selected for this facility in order to be compatible with the point of interconnection at the 230 kV Square Butte Substation.

In general, minimizing the length of the route and minimizing the number of angle structures decreases the cost of the transmission line by minimizing the material, construction and right-of-way costs. The Route effectively balances the economic considerations of overall length of the line and the number of angle structures required with impacts on the environment, agricultural lands, and landowners.

The selection of materials and structure types also affects the cost of a transmission line. MP proposes to use wood H-frame tangent structures to minimize the cost of the transmission facility. Although steel monopole angle structures are more expensive than guyed multiple wood pole angle structures, MP has committed to the use of steel angle structures in cultivated lands in order to minimize disruption of farming activities.

4.0 ENGINEERING AND OPERATIONAL DESIGN

4.1 PREFERRED ROUTE DESCRIPTION

The transmission line will originate at the Project Substation located within the Bison I Wind Project Site. The Project Substation will be located in Section 4 of T140N, R86W. From this location, the Route will head east for approximately 4.6 miles, where it will turn north for approximately 1 mile and turn east again for 3.4 miles. The Route then proceeds in a slightly northeast direction for 4.5 miles before heading east 1.5 miles, northeast for approximately 1.7 miles, and east for 2.5 miles. In Section 31 of T142N R83W, the Route turns to the northeast for approximately 0.7 miles and proceeds easterly for 0.4 miles, then veers southeast for approximately 2.0 miles, ending at the Square Butte Substation. The Route is presented in Figures 4 and 5.

4.2 DESCRIPTION OF PROPOSED FACILITY

The purpose of the proposed facility is to transmit the energy generated by the Bison I and BNI wind projects to the Square Butte Substation. Electrical energy from the Bison I and BNI wind projects will be transmitted to customers via the existing AC transmission system as available, and on the existing Square Butte DC Line which extends from the Square Butte Substation to Minnesota Power's Arrowhead Substation located near Duluth, Minnesota.

4.2.1 Transmission Structures and Right-of-Way Design

A design data report is attached as Appendix A.

4.2.1.1 Transmission Structures

The proposed transmission line is intended to carry 230 kV, alternating current. It is expected to operate at 629 MW.

MP is proposing to use predominantly single circuit H-frame wood structures for the transmission line. However, final design, corner pole locations, and geotechnical investigations may warrant the use of steel pole or special structures to avoid sensitive areas or accommodate special engineering circumstances. A 0.5 mile portion of the Route in the immediate vicinity of the existing Square Butte Substation may required the use of double circuit structures to accommodate existing and future line entrances to the Square Butte Substation. The double circuit structures are likely to be steel monopoles set on reinforced concrete foundations.

Figure 6 depicts the typical structures that will be used for the transmission line. The structures will be erected and will be directly embedded into the ground. The structures will be up to 130 feet in height with an average span between each structure of 900 feet. The proposed conductor will be 1780 kcmil Aluminum Conductor, Steel Supported (ACSS). The actual size of the conductor will be confirmed once the final design is complete. One 7/16" EHS (7-strand) shield wire will be used in conjunction with one 64mm2/528 optical ground wire (OPGW) to provide lightning protection and communication capability on the transmission line. W. Locations of each structure will be submitted to the PSC once the plan and profiles have been completed, at least seven days prior to the Public Hearing anticipated for this project.

The proposed transmission line will be designed, constructed, operated, and maintained to meet or surpass all relevant state codes, National Electric Safety Code (NESC), Avian Power Line Interaction Committee (APLIC) raptor-safe design standards, and MP company standards. Appropriate safety standards will be met for construction, operation, and maintenance of the facility.

4.2.1.2 Right-of-Way Design

A 130-foot right-of-way will be acquired for the approximately 22.2-mile 230 kV transmission line (Figure 7). This includes 65 feet of right-of-way on each side of the structure centerline for the proposed facility. An additional 100-foot width will accommodate a future 230 kV transmission line. Right-of-way impacts and calculations for this Application are based upon a 130-foot right-of-way and do not include the additional 100-foot width. Development within the additional 100-foot width would require a separate Corridor Certificate and Route Permit.

4.2.2 Right-of-Way Preparation, Construction, Restoration and Maintenance

4.2.2.1 Right-of-Way Preparation

The proposed Route crosses areas that are primarily agricultural land. There are various locations where tree and shrub growth may require right-of-way clearing. Where safety requirements permit, trees and low growing shrubs will remain (generally less than 15 feet). A 130-foot-wide portion of the corridor will be cleared of tall woody vegetation for the 22.2 mile length of the transmission line. It is anticipated that less than 4.7 acres of trees and shrubs may be affected. Significant amounts of grading are not anticipated for preparation of the transmission right-of-way.

4.2.2.2 Transmission Construction Procedures

Construction of the transmission line will begin once all approvals are obtained and easement acquisition is complete. A detailed construction schedule will be developed based upon availability of materials, equipment, and construction labor. The schedule will consider anticipated weather conditions.

Construction of the transmission line will require minimal preparation of the right of way and minimal grading or leveling. Transmission structures will be placed at existing grade elevations. Limited grading may be required to provide level and stable access paths and working surfaces for construction crews at selected structure and wire stringing locations. Once construction is completed, the graded areas will be restored and blended with the original contours to the extent practicable.

Structure components will be delivered to either the staked structure location or to a project storage yard. If the structures are delivered to the location where they will be installed, they will be placed on the right-of-way out of the clear zone of any adjacent roadways or designated pathways. Insulators and other hardware are normally attached while the structure is on the ground. Structures will be assembled and erected at the structure site using mobile cranes or similar heavy-duty equipment. Each pole will be directly embedded and will require a hole dug 10 to 12 feet deep and approximately 3 feet in diameter. The pole will be set within the excavated hole and backfilled with native soils or crushed rock. Structures in poor or wet soil conditions may require specially engineered foundations such as a steel culverts or cast in place reinforced concrete foundations.

Most of the construction activity would be limited to the area immediately around each structure. Little additional ground disturbance is necessary at the structure sites. The total disturbed area in the vicinity of each structure is expected to be confined to an area of 100 ft^2. Temporary impacts due to construction around each structure are estimated at approximately 4,000 ft^2. Access paths will be approximately 10-12 feet wide; however, this impact will be temporary and would require minimal grading or excavation.

Once the structures have been erected, conductors will be installed by establishing stringing setup areas within or adjacent to the right-of-way. Stringing equipment generally consists of sheaves or stringing blocks, wire pullers, tensioners, rope and wire trailers and a bulldozer used for sagging. Stringing operations involve pulling ropes through the stringing sheaves located at every structure site. The rope is then used to pull a steel cable (hard line). The hard line is then used to pull the conductors through the sheaves under sufficient tension to keep the conductor from coming into contact with the ground. Temporary guard structures will be installed as needed over existing distribution or communication lines, streets, roads, highways or other obstructions, after any necessary notifications are made and permits obtained. The guard structures ensure that conductors will not obstruct traffic or contact existing energized conductors or other cables. After pulling the conductor, shield wire, and OPGW to the proper tensions, construction crews access each structure to secure or "clip" the conductors to the insulators and clamp the shield wire and OPGW to the supporting hardware.

Modifications to the existing 230 kV Square Butte Substation will be required to allow interconnection of the 230 kV transmission line to the electric grid. These modifications will include the addition of new circuit breakers, switches, instrument transformers and other electrical equipment, power wiring, underground cable, reinforced concrete foundations, structural steel terminal structure and equipment supports and an electrical equipment enclosure (control house). These modifications will generally be implemented within the existing fenced substation area.

4.2.2.3 Restoration Procedures

During construction, crews will attempt to limit ground disturbance wherever possible and will employ appropriate erosion control measures. Upon completion of construction activities, landowners will be contacted to determine if any additional restoration due to construction is necessary. Disturbed areas will be restored to their original condition to the maximum extent practicable and as negotiated with the landowner. Post-construction reclamation activities include removing and disposing of debris, dismantling all temporary facilities (including staging and lay down areas), leveling or filling tire ruts, and reseeding areas disturbed by construction activities with vegetation similar to that which was removed.

Erosion control measures will be implemented to minimize runoff during construction. Specific measures will be determined once final design of the Route is complete, and a field review is made to determine any areas of concern. Erosion control measures such as silt fence, rock checks, flow diverters, mulching, seeding, or mesh fabric overlay would be installed when and where appropriate. Access routes to structure locations will be reviewed prior to the mobilization of equipment so erosion concerns can be avoided or minimized. Construction crews exercise caution when equipment is within 50 feet of streams and rivers and will not drive equipment through streams or rivers that the transmission line crosses.

Temporary timber mat bridges may be utilized to facilitate crossing of small streams and rivers with construction equipment. These crossing points will be restored and revegetated to their original condition to the maximum extent practicable.

4.2.2.4 Maintenance Procedures

MP will periodically use the right-of-way to perform inspections, to maintain equipment and to make repairs over the life of the transmission line. MP will also conduct routine maintenance to remove undesired vegetation that may interfere with the safe and reliable operation of the proposed line.

4.2.3 Easement/Right-of-Way Acquisition

MP has secured options to purchase easements from all private landowners and is currently in the process of securing easements from BNI Coal and MinnKota Power Cooperative. During the acquisition phase, individual property owners have been advised of construction schedules, needed access to the site, and vegetation clearing required for the transmission line. The right-of-way will be cleared of the amount of vegetation necessary to construct, operate, and maintain the proposed transmission line.

MP will notify the landowners prior to conducting the necessary engineering surveys and soil investigations. Where possible, staging and lay down areas will be located within the right-of-way and limited to previously disturbed or developed areas. When additional property is temporarily required for construction, temporary easements may be obtained from landowners for the duration of construction. These temporary easements will be limited to special construction access needs or additional staging or lay down areas required outside of the proposed right-of-way.

4.2.4 Associated Facilities

There are several facilities associated with the transmission line construction. The Bison I Wind Project, associated operations and maintenance (O&M) facility, electrical collector system, and the Project Substation are included in the application to the PSC for a Certificate for Site Compatibility submitted in May 2009 (Case No. PU-09-151). The new Project Substation will be located in Section 4 of T140N, R86W. The substation will be a 230/34.5kV substation and will facilitate the relaying of the wind-generated energy to the Square Butte Substation along the new 230 kV transmission line. The new Project Substation footprint and O&M building for the Bison I Wind Project will occupy approximately six acres. The BNI Wind Project (Case No. PU-08-848) will tie into the transmission line near the eastern terminus. The attached design data report identifies the general specifications of the new project substation (Appendix A). The existing Square Butte Substation will require upgrades. Modifications to the existing 230 kV Square Butte Substation will be required to allow interconnection of the 230 kV transmission line to the electric grid. These modifications will include the addition of new circuit breakers, switches, instrument transformers and other electrical equipment, power wiring, underground cable, reinforced concrete foundations, structural steel terminal structure and equipment supports and an electrical equipment enclosure (control house). These modifications will generally be implemented within the existing fenced substation area.

5.0 ENVIRONMENTAL ANALYSIS

This section provides a description of the environmental conditions that exist in the Corridor and Route. Conservative impact estimates associated with the proposed Route assumed that the line will be approximately 22.2 miles in length with 900-foot average spans. The approximate number of structures for a line of this length, based on the average spans, is 143. The proposed structure is an H-frame and there are two poles per structure. Each structure will permanently impact approximately 100 ft^2, or 50 ft^2 per pole. The temporary impacts are estimated to include an area of approximately 4,000 ft^2 around each structure and a 10- to 12-foot-wide temporary access road that would extend the length of the Route and would require only limited grading.

General information on land use and vegetation within the Corridor were estimated using the National Land Cover Dataset. Percentages of land use within the Corridor were estimated using the Corridor limits, whereas the land use percentages for the Route were estimated using the proposed right-of-way. The cleared width of the right-of-way for the 230 kV transmission line is 65 feet on either side of the structure centerline.

Consistent with MP's policy that people and conservation of the environment come first in the conduct of their operations, the Project has been designed to limit the environmental impact of the proposed facility.

5.1 DEMOGRAPHICS

5.1.1 Description of Resources

The Project is located within a lightly populated rural area in south-central North Dakota. There is no indication of any new residential construction within the Corridor or Route. Information on demographics and housing for this section was taken from the 2000 U.S. Census.

The population of Morton County is 25,303. The population of Oliver County is 2,065. The county seat of Oliver County is Center, which is the closest town to the Corridor and has a population of 678. Table 5-1 summarizes the population and economic characteristics within the Corridor. The data for the townships is at the Census Tract level, which includes data from surrounding townships and accounts for the ranges given.

According to the 2000 U.S. Census, the largest industry employing residents of Morton County is educational, health, and social services, while the second largest industry is retail trade. The largest industry employing residents of Oliver County is agriculture, with the second largest industry being educational, heath, and social services.

According to the 2000 U.S. Census, the largest industries employing residents of Morton and Oliver counties are agriculture and services.

Table 5-1.
Population and Economic Characteristics

Location	Population	Per Capita Income (dollars)	Percentage of Population Below Poverty Level
Morton County	25,303	17,202	9.6
T140N, R86W	3,580-5,638	10,802-15,839	8-13
T140N, R85W	3,580-5,638	10,802-15,839	8-13
Oliver County	2,065	16,271	14.9
T141N, R86W	889-2,258	15,840-18,893	14-22
T141N, R85W	889-2,258	15,840-18,893	14-22
T141N, R84W	889-2,258	15,840-18,893	14-22
T141N, R83W	889-2,258	15,840-18,893	14-22
T142N, R84W	889-2,258	15,840-18,893	14-22
T142N, R83W	889-2,258	15,840-18,893	14-22

5.1.2 Impacts

5.1.2.1 Corridor

Short-term impacts to socioeconomic resources will be relatively minor. Permanent agricultural land conversion associated with the transmission line structure placement will constitute a small socioeconomic impact to those landowners with structures on their land. There is no indication that any minority or low-income population is concentrated in any one area of the Corridor, or that the transmission line will be placed in an area occupied primarily by any minority group.

The construction of the transmission line and associated substation improvements will provide temporary increases to the total personal income of the area if local contractors are used. Additional personal income will also be generated by circulation and recirculation of dollars paid out by MP 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 counties and the state.

5.1.2.2 Proposed Route

Approximately 39 acres of agricultural land will be temporarily removed from production during transmission line construction. Permanent agricultural land conversion associated with the transmission line structures will be approximately 0.3 acres for the entire Route. Landowner compensation will be established by individual easement agreements. As stated above, agricultural areas surrounding transmission line structures can be returned to production following construction of the line. The transmission line will not cause additional impacts to leading industries along the Route. There is no indication that any minority or low-income population is concentrated in any one area of the Route, or that the transmission line will be placed in an area occupied primarily by any minority group.

5.1.3 Mitigation

5.1.3.1 Corridor

Socioeconomic impacts associated with the transmission line will be primarily positive, with an influx of wages and expenditures made at local businesses during the Project construction and an increase in the county's tax base from the construction of the transmission line. MP will use local labor and contractors to the extent practicable.

Impacts to landowners will be minimized to the extent practicable.

5.1.3.2 Proposed Route

See section 5.1.3.1 above for mitigation associated with the proposed Route.

5.2 LAND USE

5.2.1 Description of Resources

The proposed transmission line would be located in northern Morton County and southern Oliver County, originating approximately eight miles northwest of the city of New Salem. The proposed transmission line will connect the Project Substation for the proposed Bison I Wind Project to the existing Square Butte Substation near Center. The current land use within the Corridor is rural agricultural land used for crops and grazing cattle. The proposed Corridor is not within Center city limits or within an area of military installation.

The development of the proposed transmission line will not displace any residences or existing or planned industrial facilities.

Based on a review of aerial photographs, land use database information, database information, and visits to the Corridor and Route, it was determined that the majority of the land area at the site is agricultural (Figure 8). Table 5-2 identifies current land use in the Corridor and Route.

Table 5-2.
Major Habitats and Their Relative Abundance

Habitat	Transmission Corridor		Transmission Route	
	Acreage	Percent of Corridor	Acreage	Percent of Route
Open Water	1086.2	3.2	94.3	3.4
Developed	1538.5	4.6	218.8	7.9
Barren Land (Rock/Sand/Clay)	176.1	0.5	18.0	0.7
Forest (Deciduous/Evergreen/Mixed)	354.7	1.1	13.3	0.5
Shrub/Scrub	68.5	0.2	7.6	0.3
Grassland/Herbaceous	13,985.0	41.4	1301.9	47.1
Pasture/Hay	3244.1	9.6	428.6	15.5
Cultivated Crops	12,269.0	36.3	617.4	22.3
Woody Wetlands	596.5	1.8	42.0	1.5
Emergent Herbaceous Wetland	450.8	1.3	22.5	0.8
Total	33,769.4	100	2,764.4	100

Eighty-seven percent of the Corridor is used for agricultural purposes. Agricultural land use includes approximately 36 percent cropland, 10 percent hayland, and 41 percent grasslands. Approximately 6 percent of the Corridor is wetland, lake, open water, or riparian area.

Eighty-five percent of the Route is used for agricultural purposes. Agricultural land use includes approximately 22 percent cropland, 16 percent hayland, and 47 percent grasslands. Six percent of the Route is wetland, lake, open water, or riparian area.

5.2.2 Impacts

5.2.2.1 Corridor

Land use in the Corridor is not expected to change as a result of construction of the proposed transmission line. Transmission lines (115 kV, 230 kV, 250 kV, and 345 kV) are already present within the Corridor (Figure 5). Land used for crops is abundant in the Corridor. Ranching activity is also not expected to be impacted by the proposed transmission line located within the Corridor studied. The majority of the area under or adjacent to the transmission line can still be used for agricultural practices following construction of the line.

5.2.2.2 Proposed Route

The majority of the land impacted by the construction of the transmission line is used for agriculture. This land use is abundant along the Route. Ranching activity is also not expected to be impacted by the proposed transmission line. The majority of this area will remain in agricultural use since the land under or adjacent to the line can still be used by the landowner. During construction of the Route, additional areas may be temporarily disturbed for laydown areas.

The proposed land use would not involve any ongoing industrial use of non-renewable resources or emissions into the environment.

5.2.3 Mitigation

5.2.3.1 Corridor

MP will work closely with landowners and agencies in finalizing transmission structure locations and access to the site to minimize land use disruptions and impacts to environmentally sensitive areas to the extent possible. These areas will be graded to original contours and if necessary reseeded with vegetation recommended by the Natural Resources Conservation Service (NRCS). Construction of the transmission line will not change the land use in the Corridor.

5.2.3.2 Proposed Route

See section 5.2.3.1 above.

5.3 PUBLIC SERVICES

5.3.1 Description of Resources

Local Services

The Route is located in a lightly populated, rural area in south-central North Dakota. There is an established transportation and utility network that provides access and necessary services to the light industry, small cities, homesteads, and farms existing in and near the Corridor. The closest town to the Corridor is Center, located approximately one mile north of the northeastern portion of the transmission Corridor. The city provides recreation and parks, a golf course, community pool, and a school library. Additionally, the city's local services include emergency services, a fire department, ambulance service, and a police department. There are also local retail service facilities and institutions.

Electrical Service

There are multiple transmission lines running through the Corridor. Two 115 kV lines intersect the middle portion of the Corridor. Great River Energy owns a 230 kV transmission line that runs north through the northeastern end of the Corridor from the Square Butte Substation. Three 345 kV lines are located near the Square Butte Substation. A 250 kV DC Line currently belonging to Square Butte heads east out of the Corridor from the Square Butte Substation towards Duluth, MN. MP is in the process of obtaining all necessary regulatory approvals to acquire the Square Butte DC Line from Square Butte Electric Cooperative (see Case # PU-09-631).

Roads

County and township (section line) roads characterize the existing roadway infrastructure in and around the Corridor. Approximately 6.7 miles of the Route would be west of State Highway 31 and approximately 16 miles of the Route would be east of State Highway 31. Interstate 94 is approximately six miles south of the southern most section of the Route.

Traffic

The existing traffic volumes on the area's county highways are documented in Table 5-3 and Figure 9. Determining the specific capacity of any highway is a complex process; however, general estimates are used for planning purposes. For purposes of comparison, the functional capacity of a two-lane paved rural highway is approximately 5,000 vehicles per day, or Average Daily Traffic (ADT). In general, the state highways in and near the Corridor and Route carry higher levels of traffic than what is average for rural North Dakota, but represent only a fraction of the capacity of the roadway.

Table 5-3.
Existing Daily Traffic Levels

Roadway Segment	Existing Average Daily Traffic (ADT)
State Highway 31 south of Highway 25	575
State Highway 25 west of Highway 48	750

Source: 2002 Traffic Volumes from NDDOT, Bismarck

Additional county and township roads run through the Corridor, but have no count data available. In general, the North Dakota Department of Transportation (NDDOT) indicated that roads under 100 ADT are rarely counted. As indicated in Table 11, all non-state routes are less than 100 ADT. As per NDDOT, the routes with no counts are likely lower than those with count data.

The Route will cross Highway 31.

Water Supply

The townships have limited public infrastructure services, which is typical of most townships. Homes typically utilize septic systems and water wells for their household needs.

Telephone, Fiber Optic, Microwave, Television and Radio Communications

The potential for impacts on radio and television reception, and other communication or electronic control facilities were evaluated. No radio or television signal interference directly from the transmission of electricity is anticipated because of the differences in frequency of the signals. It is possible that localized interference could occur as a result of electric discharges across small gaps in the transmission system hardware or from the development of partial electric discharges from the line itself (generally referred to as "corona"). While it is unlikely that either of these situations would occur, in the event that radio and television signals are impacted, the use of corona-free hardware and routine transmission line maintenance would eliminate the problem.

Several private land mobile communication sites and microwave towers are present within the Corridor. Two microwave beam paths intersect the Route, one Federal and one non-Federal, running in a northwest-southeast direction through the northeastern edge of the Route in T142N R84W. A summary of the microwave beam path and worst case Fresnel Zone calculations from Comsearch are attached in Appendix B.

5.3.2 Impacts

5.3.2.1 Corridor

Local Services

No negative impacts to local services are anticipated.

Electrical Service

No impact is anticipated to the transmission system; the new transmission line and substation improvements may increase overall service reliability.

Roads

Constructing the transmission line will require temporary access along the Route, which is approximately 22.2 miles in length. The access path will be approximately 10-12 feet wide; no major grading or filling is anticipated since the access road will only be needed during construction.

Traffic

The maximum transmission line construction workforce is expected to generate approximately an average of 20-30 additional vehicle trips per day. Using any combination of state and county highways and other township roads throughout the Project site, the traffic impacts are considered negligible. Since many of the area roadways have minimal ADT currently, the addition of 20-30 vehicle trips represents a large percentage increase (and likely would be perceptible), but would still be less than seasonal variations such as autumn harvest. The capacity of any route and Level-of-Service to the traveling public would not be impacted.

Truck access to the Corridor is served by Interstate 94 and State Highway 31. From Center, Highway 25 to Highway 31 will serve as the primary truck access into the Corridor. Specific additional truck routes will be dictated by the location required for delivery. Additional operating permits will be issued by the state, county, and/or township for over-sized truck movements.

Water Supply

Construction and operation of the transmission line will not significantly impact the water supply. MP anticipates that it may be necessary to abandon one private well located along the Route, located in Section 30 of T141N and R84W. The well is presently not in use. The affected landowner will be compensated for abandonment of the well. During excavation of foundations for the steel monopole structures in unstable soil conditions, it may be necessary to pump water in the excavation to stabilize the soils. Potable water would be utilized for this purpose.

Telephone, Fiber Optic, Microwave, Television and Radio Communications

No impacts to these communication resources are anticipated.

5.3.2.2 Proposed Route

See above, section 5.3.2.1.

5.3.3 Mitigation

5.3.3.1 Corridor

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

Local Services

Construction, operation, and maintenance of the transmission line will not impact local services, and no mitigation is required.

Electrical Service

The construction of the transmission line, including proposed upgrades to the Square Butte Substation, will not negatively impact existing electrical service.

Roads

Impacts from transmission line construction are expected to primarily consist of compaction of agricultural soils. Where necessary, the soil will be disked following construction.

Traffic

No impacts are anticipated, and no mitigation is necessary.

Water Supply

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

Telephone, Fiber Optic, Microwave, Television and Radio Communications

North Dakota One Call will be contacted prior to construction to locate and avoid underground facilities. To the extent project facilities cross or otherwise affect existing telephone or fiber optic lines or equipment, MP will comply with all regulations required to avoid interference with these existing facilities.

Since no impacts to microwave or land based telecom systems are anticipated, no mitigation should be required.

5.3.3.2 Proposed Route

See above, section 5.3.3.1.

5.4 HUMAN HEALTH AND SAFETY

5.4.1 Description of Resources

5.4.1.1 Human Health

The term electromagnetic field (EMF) refers to electric and magnetic fields that are present around any energized electrical device. Electric fields arise from the voltage or electrical charges, and magnetic fields arise from the flow of electricity or current that travels along transmission lines, distribution (feeder) lines, substation transformers, house wiring, and electrical appliances. The intensity of the electric field is related to the voltage of the line and the intensity of the magnetic field is related to the current flow through the conductors (wire). EMF can occur indoors and outdoors.

Considerable research has been conducted throughout the past three decades to examine whether exposure to power-frequency (60 Hz) EMF cause biological responses and health effects. Toxicological studies have shown no statistically significant association or weak associations between EMF exposure and health risks. Some epidemiological studies have indicated an association between power frequency EMF and health effects, while many others have not. The most recent and exhaustive reviews of the health effects from power-frequency fields conclude that the evidence of health risk is weak.

Recent reviews of potential human health effects from transmission line EMF were completed in California (California EMF Program 383) as part of the state of California EMF Program and in Wisconsin for the Arrowhead-Weston Environmental Impact Statement (Arrowhead-Weston 5-21). Both studies have similar conclusions of no discernible health impacts from power lines. Both of these studies recommend the general precaution of minimizing unnecessary contact and advise prudent avoidance to EMF exposure.

5.4.1.2 Human Safety

Proper safeguards will be implemented during construction and operation of the facility. The transmission line and associated facilities will be designed to meet local, state, NESC, and MP safety standards. Construction crews will comply with local, state, NESC, and MP standards regarding the installation of facilities.

The proposed transmission line will be equipped with protective devices such as breakers and relays at the substation to safeguard the public from the transmission line if an accident occurs or if a structure or conductor falls to the ground. The protective equipment at the substation will de-energize the line in the event of an electrical fault. In addition, the Bison I Wind Project Substation will be fenced and access limited to authorized personnel.

5.4.2 Impacts

5.4.2.1 Corridor

Human Health

Decades of research have to date failed to demonstrate that exposure to electric and magnetic fields can cause biological responses or adverse health effects in humans; though research has yet to resolve the issue conclusively. Lacking conclusive findings, some epidemiological agencies recommend reasonable and prudent avoidance to exposure. Based on the long separation distances from occupied residences and other sensitive receptors, the project will not significantly add to public exposure to EMF and therefore have little effect on public health and safety.

5.4.2.2 Proposed Route

Electric Forces and Magnetic Fields from 230 kV Line

The nearest sensitive receptor to the proposed Route is approximately 700 feet, where EMF from the transmission line is predicted to be significantly below background levels.

5.4.2.3 Human Safety

No impacts are anticipated.

5.4.3 Mitigation

5.4.3.1 Corridor

Human Health

In selecting a route that avoids impacts to residences and other occupied structures, MP has limited human exposure to EMF to the extent practicable. No additional mitigation should be needed.

Human Safety

If the proper safeguards and protective measures are implemented as described above, no additional mitigation is required.

5.4.3.2 Proposed Route

See above, section 5.4.3.1.

5.5 NOISE

5.5.1 Description of Resources

Noise is composed of a variety of sounds of different intensities, across the entire frequency spectrum. Humans perceive sound when sound pressure waves encounter the auditory components in the ear. These components convert these pressure waves into perceivable sound. Transmission conductors and transformers at substations produce noise under certain conditions. The level of noise or its loudness depends on conductor conditions, voltage level, and weather conditions. Noise emissions from a transmission line are greatest during heavy rain and wet conductor conditions. In foggy, damp, or rainy

weather conditions, power lines can create a subtle crackling sound due to the small amount of the electricity ionizing the moist air near the wires. During heavy rain the general background noise level is usually greater than the noise from a transmission line. In addition, very few people are out near the transmission line. For these reasons audible noise is not noticeable during heavy rain. During light rain, dense fog, snow, and other times when there is moisture in the air, the proposed transmission lines will produce audible noise higher than rural background levels but similar to household background levels. During dry weather, audible noise from transmission lines is a slight, sporadic crackling sound.

Noise is measured in units of decibels (dB) on a logarithmic scale. Because human hearing is not equally sensitive to all frequencies of sound, certain frequencies are given more "weight." The A-weighted (dBA) scale corresponds to the sensitivity range for human hearing. A noise level change of 3-dBA is imperceptible to human hearing. A 5-dBA change in noise level, however, is clearly noticeable. A 10-dBA change in noise levels is perceived as a doubling of noise loudness. Table 5-4 shows noise levels associated with common, everyday sources, and places the magnitude of noise levels discussed here in context. Low to mid-30 dBA are relatively low background levels and are generally representative of the Corridor. Higher levels exist near roads and other areas of human activity. The windy conditions in this region tend to increase ambient noise levels compared to other rural areas.

Table 5-4.
Common Noise Sources and Levels

Sound Pressure Level (dB)	Typical Sources
120	Jet aircraft takeoff at 100 feet
110	Same aircraft at 400 feet
90	Motorcycle at 25 feet
80	Garbage disposal
70	City street corner
60	Conversational Speech
50	Typical office
40	Living room (without TV)
30	Quiet bedroom at night

Source: Environmental Impact Analysis Handbook, ed. By Rau and Wooten, 1980

5.5.2 Impacts

5.5.2.1 Corridor

The 230 kV transmission line route was modeled using the Bonneville Power Administration Corona and Fields Interactive 1989 Experimental (CFI8X) model to evaluate audible noise from high voltage transmission lines. Where possible, the CFIX8 model was executed in a worst-case manner, to ensure that audible noise was not under-predicted. This involved adjusting the orientation of phase angles used in the CFIX8 model and assuming a wet environment.

5.5.2.2 Proposed Route

Audible noise was modeled from the proposed single circuit 230 kV transmission lines on an H-frame configuration for the Route. This analysis relied on the following assumptions:

- The three conductors were assumed to be approximately 26 feet above the ground, and spaced 19.5 feet apart.
- The conductor diameter was assumed to be 1.445 inches, as defined by the simulation software.
- The line to neutral voltage was calculated to be 132.79 kV.
- Phase angles were modeled as 240, 120, and 0 degrees, respectively.

Table 5-5 presents modeling results for the proposed line in dBA on an L_{50} basis. These levels are predicted to occur at a point five feet above the ground and during wet conditions. The attenuation rate is approximately -3 dB per distance doubled. This rate is typical of noise sources that are characterized as line sources.

Table 5-5.
Predicted Audible Noise from 230 kV lines for Route

Distance from Center of transmission line corridor (feet)											
	-300	-200	-100	-50	-30	0	30	50	100	200	300
Audible Noise, L_{50} (dBA) from Proposed 230 kV line	33	35	38	41	43	45	43	41	38	35	33

5.5.3 Mitigation

5.5.3.1 Corridor

The nearest sensitive receptor to the proposed route is approximately 700 feet, where noise from the transmission line is predicted to be below rural background levels. No mitigative measures are necessary since there will be nominal noise impacts from the Project.

5.5.3.2 Proposed Route

See above, section 5.5.3.1.

5.6 VISUAL IMPACTS

5.6.1 Description of Resources

The topography of the Study Area and Corridor is a mixture of open plains with rolling fields broken by large hills and shallow drainages. Elevations in the Corridor range between 1,878 and 2,355 feet above sea level. A topographic map of the Project area is shown in Figure 5.

Within the project area the dominant land use is pasture. Wetland areas are dominated by cattails, sedges, and reed canary grass. A mix of deciduous and coniferous trees planted for windbreaks typically surrounds farmsteads. Generally, these forested areas are isolated groves or windrows established by the landowner/farmers to prevent wind erosion and shelter dwellings. Typical tree species include box elder, bur oak, and cottonwood.

The Project Substation site near the western terminus of the transmission line is located in the Sweet Briar Creek watershed, which empties into the Heart River. Most of the site consists of isolated basins associated with wetlands or lakes. The few small intermittent creeks that exit the site flow to the west-southwest. Figure 10 shows the typical landscape in the area. The existing Square Butte Substation, which is the eastern terminus of the transmission line, is located in the Square Butte Creek watershed.

5.6.2 Impacts

5.6.2.1 Corridor

The proposed transmission line will be visible to landowners and community residents who live near the proposed line within the Corridor. The predominant structure design will be single circuit wooden H-frame tangent structures which minimize visual impacts.

5.6.2.2 Proposed Route

The visual impact of the new transmission line will have an effect on the visual quality within the vicinity of the Route. The impact to aesthetics will be minimal, due to the existing transmission lines. Figure 10 shows a photo of the existing structures along the Route as well as a photo simulation of the proposed structures.

MP is proposing to use multiple structure types for the Project. The majority will be H-frame, wood structures. Steel monopoles will be used for angles in cultivated fields and either guyed wood multiple pole or steel monopoles structures will be used in pasture or grazing land. Figure 6 depicts the structures that will be used for the transmission line. The structures will be erected and will be directly imbedded into the ground. The structures will be up to 130 feet in height with an average span between each structure of 900 feet.

The Route will be located a 2.5 miles to the south of Center; therefore, it will have minimal visual impacts to the city. The majority of the proposed 230 kV line will be crossing agricultural land and will result in minimal visual impacts to residences. Visual impacts will be most evident to landowners and residents in close proximity to the Route and drivers traveling along State Highway 31 and 25. The line will have a visual impact on landowners and residents that live in close proximity to the proposed Route.

5.6.3 Mitigation

5.6.3.1 Corridor

The proposed Corridor contains an existing 41.6 kV, 115 kV, 230 kV, 250 kV, and 345 kV lines.

5.6.3.2 Proposed Route

Although the transmission line will contrast with the surrounding land uses, these areas have already been impacted visually by the existing 41.6 kV, 115 kV, 230 kV, 250 kV, and 345 kV lines. The proposed Route will minimize the number of residences impacted by the line. Care will also be taken to avoid structure placement, as much as possible, in biologically sensitive areas such as wetlands and high quality native prairies. Placing structures in front of picture windows will also be avoided.

5.7 CULTURAL RESOURCES

5.7.1 Description of Resources

MP contacted the North Dakota State Historic Preservation Office (SHPO) in August 2009 to request a review of potential impacts of the proposed facilities on known or suspected cultural resources (Appendix C). MP has reviewed cultural resources information on file at the SHPO for the data gathering area. The data gathering area is defined as the Route, plus a half-mile buffer area (Study Area). MP has prepared a Class I Literature Search (Appendix B) based on the information gathered for the data gathering area. A review of previous cultural resources studies and cultural resource recordation forms at the SHPO identified 16 previously recorded archaeological resources and nine archaeological site leads within the Study Area (Table 5-6).

Table 5-6.
Previously Identified Archaeological Sites and Leads within the Project Study Area

County	Site Number	Site Type	Location			NRHP Status
			T	R	S	
Oliver	32OL283	Lithic scatter	141	84	8	Not evaluated
Oliver	32OLX179	Lithic scatter	141	84	6	Not evaluated
Oliver	32OL358	Archaeological scatter	141	84	6	Not evaluated
Oliver	32OLX161	Lithic debitage	141	84	5	Not evaluated
Oliver	32OLX163	Lithic debitage	141	84	9	Not evaluated
Oliver	32OL290	Archaeological scatter	141	84	4	Not evaluated
Oliver	32OL289	Rock cairn	141	84	4	Not evaluated
Oliver	32OLX159	Lithic debitage	141	84	4	Not evaluated
Oliver	32OLX160	Lithic debitage	141	84	4	Not evaluated
Oliver	32OLX123	Quarry/mine	141	84	1, 30, 31, 24, 25,36	Not evaluated
Oliver	32OL116	Stone circle	142	84	35	Not evaluated
Oliver	32OL311	Archaeological ruins	142	84	34	Not evaluated
Oliver	32OL307	Lithic debitage	142	84	34	Not evaluated
Oliver	32OL288	Archaeological ruins	142	84	34	Not evaluated
Oliver	32OL298	Stone circles	141	84	3	Not evaluated
Oliver	32OL338	Stone circles/lithic debitage	141	84	5	Not evaluated
Oliver	32OL284	Archaeological ruins	141	84	5	Not evaluated

County	Site Number	Site Type	Location			NRHP Status
			T	R	S	
Oliver	32OL118	Stone circle	142	84	25	Not evaluated
Oliver	32OL287	Lithic scatter	142	84	34	Not evaluated
Oliver	32OLX185	Site form not found at SHPO during time of search	141	84	4	N/A
Oliver	32OLX180	Structure	141	84	7	Not evaluated
Oliver	32OLX0085	Structure/Hendershield Farmstead	141	84	4	Not evaluated
Oliver	32OL346	Structure/Mooseburcker Farm	141	84	5	Not evaluated
Oliver	32OL112	Historic CM Scatter, Depression	142	83	32	Not eligible
Oliver	32OL446	Stone circle, rock cairn	142	83	28, 33	Not evaluated

MP will continue to consult with the SHPO in anticipation of the Class III inventory. MP plans to conduct archeological field investigations of the proposed impact areas throughout the Project study area. These investigations will be conducted by a professional archeologist permitted by the state of North Dakota per NDCC 55-03-01.

5.7.2 Impacts

5.7.2.1 5.7.2.1 Corridor and Proposed Route

The total number of poles and pole placement will determine the potential impacts to cultural resources. Regardless of pole numbers, the placement of poles in moderate to high potential areas may increase the chance of impacts to archaeological resources.

MP does not anticipate adverse impacts to previously identified archaeological resources as a result of the Project. MP will avoid known archaeological resources and any resources identified during the Class III field inventory to the best of their ability.

5.7.3 Mitigation

5.7.3.1 5.7.3.1 Corridor and Proposed Route

MP will avoid impacts to identified archaeological resources to the best of their ability. In the event that an impact would occur, MP would determine the nature of the impact and consult with the SHPO on whether or not the resource was eligible for listing in the National Register of Historic Places (NRHP). Mitigation for Project-related impacts on NRHP-eligible archaeological resources may include an effort to minimize Project impacts on the resource and/or additional documentation through data recovery.

MP will develop and put in place an unanticipated discovery plan before construction in the Project area begins. The plan will detail how to deal with previously unknown archaeological resources or human remains should they be encountered during construction. The plan would outline a communication framework for reporting on such discoveries in an efficient and legally compliant manner. The discovery

plan may include the following topics: construction contractor training, identification of resources in the field, contact information for MP-designated professionals to address a discovery, procedures for avoidance, and associated tasks in the event of work stoppage in a construction area. With regard to a discovery of human remains, procedures would be followed to ensure that the appropriate authorities would become involved quickly and in accordance with local and state guidelines.

5.8 RECREATIONAL RESOURCES

5.8.1 Description of Resources

Recreational opportunities in Morton and Oliver counties include camping, hiking, biking, swimming, golfing, hunting, fishing and nature observation. Review of state and federal databases indicates that no registered national wildlife refuges, state wildlife management areas, state game refuges, game management areas, nature preserves, or county parks are present within the Corridor. The Square Butte Creek Golf Course lies just outside the Corridor, at the northwestern end of Nelson Lake. Nelson Lake, which has fishing and public boat access, is located within the Corridor. The 158-acre Wilbur Boldt WMA is partially within the eastern edge of the Corridor. A tract of PLOTS land is located within the Corridor near the western terminus of the transmission line. These areas are depicted in Figure 15.

5.8.2 Impacts

5.8.2.1 Corridor

In general, recreational impacts will be visual in nature and limited to individuals using public or private property in the Corridor for hiking, hunting, fishing, or nature observation. See section 5.6 for detailed discussion of anticipated visual impacts and proposed mitigative measures. No other significant impacts to recreational resources are anticipated

5.8.2.2 Proposed Route

Recreational impacts will be visual in nature and limited to individuals using public or private property in the Corridor for hiking, hunting, or nature observation. No additional impacts are anticipated.

5.8.3 Mitigation

5.8.3.1 Corridor

Since it is not anticipated that any recreational resources will be removed from service by implementation of the proposed Project, no adjacent land will be converted or dedicated to recreational use or wildlife management. Secondary recreational uses of proposed Project property may be allowable depending on security requirements. No other mitigation is anticipated to be necessary.

5.8.3.2 Proposed Route

The Route will avoid impacts to recreational areas.

5.9 EFFECTS ON LAND BASED ECONOMIES

5.9.1 Description of Resources

Agriculture/Farming

The majority of the Corridor is cultivated farmland, pasture, and grasslands as shown on Figure 11. Cultivated land comprises approximately 12,269 acres of the Corridor and 617 acres of the Route. There may be areas of cultivated land currently enrolled in the Conservation Reserve Program (CRP). Approximately 87 percent of the land in the Corridor and 85 percent of the land in the Route is utilized for agricultural purposes.

According to the 2007 Census of Agriculture, Oliver County is ranked 46th overall in agricultural products sold in North Dakota, and Morton County is ranked 22nd . Combined, Morton and Oliver counties contain 1,109 farms (273 in Oliver County and 836 in Morton County), of which the primary commodity is crops, primarily wheat. Cattle are the primary livestock in the counties. According to the 2007 Census of Agriculture, the amount of land in farms decreased 9 percent in Morton County and decreased 6 percent in Oliver County. The market value of production in Oliver County in 2007 was approximately $53,389,000. Crop sales account for approximately 46 percent of the total value. The market value of production in Morton County in 2007 was approximately $117,251,000. Crop sales account for approximately 52 percent of the total value.

Crops are a large percentage of the value and the land type, such as prime farmland, is important in production. Prime farmland is the land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. The National Resource Conservation Service (NRCS) has two classifications for prime farmland. The first is where all areas of the soil series are classified prime farmland. The second is where only the drained areas of the soil series are prime farmland. The NRCS also identifies farmland of statewide and local importance, which is land that is important for the production of food, feed, fiber, forage, and oilseed crops. Generally, additional farmlands of statewide or local importance include those that are nearly prime and that produce high yields of crops in an economic manner when treated and managed according to acceptable farming methods. Some may produce as high a yield as prime farmland soils if conditions are favorable. Table 5-7 lists the soils considered prime farmland and soils of statewide or local importance within the Corridor and along the Route. Figure 12 shows the prime farmland soil distribution in the Corridor and along the Route.

The North Dakota State Water Commission's database reveals four irrigation permits were issued within the vicinity of the Route and may or may not be located within the Corridor. MP will avoid these parcels of land once final locations are determined. It is unlikely the Route will adversely impact any irrigation permits since it is primarily located adjacent to roads or property boundaries and will therefore not affect mechanical irrigation.

There are seven residences within the Corridor. These residences are identified on Figure 2. There are no residences within 500 feet of the proposed Route (Figure 3). The closest residence is approximately 700 feet from the proposed Route.

Table 5-7.
Prime Farmlands - Morton and Oliver Counties

Corridor Soil Units	All Areas Are Prime Farmland	Soil of Statewide/Local Importance	Prime Farmland Only When Drained
Amor-Arnegard loams, 0 to 3 percent slopes		X	
Amor-Cabba loams, 6 to 9 percent slopes		X	
Amor-Cabba loams, 9 to 15 percent slopes		X	
Amor-Shambo loams, 3 to 6 percent slopes		X	
Arnegard loam, 0 to 2 percent slopes	X		
Arnegard loam, 2 to 6 percent slopes	X		
Arnegard loam, 6 to 9 percent slopes		X	
Beisigl-Flasher loamy fine sands, 6 to 15 percent slopes		X	
Belfield-Daglum silt loams, 0 to 2 percent slopes		X	
Belfield-Daglum silt loams, 2 to 6 percent slopes		X	
Belfield-Grail silty clay loams, 0 to 2 percent slopes		X	
Belfield-Morton silt loams, 0 to 2 percent slopes		X	
Belfield-Morton silt loams, 2 to 6 percent slopes		X	
Belfield-Morton silt loams, 6 to 9 percent slopes		X	
Belfield-Straw loams, 0 to 2 percent slopes		X	
Bowbells loam, 0 to 3 percent slopes	X		
Brandenburg-Cabba-Savage complex, 6 to 70 percent slopes		X	
Cabba-Chama-Arnegard complex, 15 to 70 percent slopes		X	
Cabba-Chama-Sen silt loams, 9 to 15 percent slopes		X	
Chama-Cabba-Sen silt loams, 6 to 9 percent slopes		X	
Daglum-Rhoades complex, 0 to 6 percent slopes		X	
Daglum-Rhoades complex, 6 to 9 percent slopes		X	
Dogtooth-Janesburg silt loams, 0 to 6 percent slopes		X	
Dogtooth-Janesburg-Cabba complex, 6 to 30 percent slopes		X	
Farland silt loam, 0 to 2 percent slopes		X	
Farland silt loam, 2 to 6 percent slopes		X	
Flasher-Vebar-Parshall complex, 9 to 35 percent slopes		X	
Flaxton and Williams soils, 3 to 6 percent slopes		X	
Flaxton-Livona fine sandy loams, 3 to 6 percent slopes		X	
Flaxton-Williams loams, 0 to 3 percent slopes		X	
Flaxton-Williams loams, 3 to 6 percent slopes		X	
Grail silt loam, 0 to 2 percent slopes	X		
Grail silt loam, 2 to 6 percent slopes	X		
Grail silty clay loam, 0 to 2 percent slopes	X		

Corridor Soil Units	All Areas Are Prime Farmland	Soil of Statewide/Local Importance	Prime Farmland Only When Drained
Grail silty clay loam, 2 to 6 percent slopes	X		
Grail-Belfield silty clay loams, 2 to 6 percent slopes		X	
Grassna silt loam, 0 to 2 percent slopes	X		
Harriet silt loam, 0 to 2 percent slopes		X	
Lawther silty clay, 0 to 2 percent slopes		X	
Lawther silty clay, 2 to 6 percent slopes		X	
Linton-Mandan silt loams, 3 to 6 percent slopes		X	
Moreau silty clay, 0 to 6 percent slopes		X	
Morton silt loam, 0 to 3 percent slopes		X	
Morton silt loam, 3 to 6 percent slopes		X	
Morton silt loam, 6 to 9 percent slope		X	
Morton-Cabba silt loams, 3 to 9 percent slopes		X	
Morton-Farland silt loams, 3 to 6 percent slopes		X	
Parshall fine sandy loam, 0 to 6 percent slopes		X	
Parshall loam, 0 to 2 percent slopes		X	
Reeder-Farnuf loams, 3 to 6 percent slopes		X	
Regent silty clay loam, 0 to 3 percent slopes		X	
Regent silty clay loam, 3 to 6 percent slopes		X	
Regent silty clay loam, 6 to 9 percent slopes		X	
Regent-Janesburg complex, 0 to 6 percent slopes		X	
Regent-savage silty clay loams, 6 to 9 percent slopes		X	
Rhoades-Slickspots-Daglum complex, 0 to 9 percent slopes		X	
Savage silty clay loam, 2 to 6 percent slopes		X	
Sen and Amor loams, 0 to 3 percent slopes		X	
Sen and Amor loams, 3 to 6 percent slopes		X	
Sen and Amor loams, 6 to 9 percent slopes		X	
Sen-Chama silt loams, 3 to 6 percent slopes		X	
Shambo loam, 0 to 2 percent slopes		X	
Stady loam, 0 to 2 percent slopes		X	
Straw and Velva soils, channeled, 0 to 2 percent slopes		X	
Straw loam, 0 to 2 percent slopes	X		
Tally-Parshall fine sandy loams, 0 to 6 percent slopes		X	
Temvik silt loam, 0 to 3 percent slopes		X	
Temvik-Williams silt loams, 3 to 6 percent slopes		X	
Tonka and Parnell silt loams, 0 to 1 percent slopes			X
Vebar-Flasher complex, 6 to 9 percent slopes		X	

Corridor Soil Units	All Areas Are Prime Farmland	Soil of Statewide/Local Importance	Prime Farmland Only When Drained
Vebar-Flasher-Tally complex, 9 to 15 percent slopes		X	
Vebar-Parshall fine sandy loams, 0 to 6 percent slopes		X	
Vebar-Tally fine sandy loams, 3 to 6 percent slopes		X	
Vebar-Tally loams, 3 to 6 percent slopes		X	
Velva-Straw fine sandy loams, 0 to 2 percent slopes		X	
Wabek-Cabba-Shambo complex, 6 to 35 percent slopes		X	
Williams loam, 0 to 3 percent slopes		X	
Williams loam, 3 to 6 percent slopes		X	
Williams loam, 6 to 9 percent slopes		X	
Williams-Bowbells loams, 0 to 3 percent slopes		X	
Williams-Bowbells loams, 3 to 6 percent slopes		X	
Williams-Reeder loams, 3 to 6 percent slopes		X	
Williams-Zahl loams, 6 to 9 percent slopes		X	
Zahl-Williams loams, 9 to 15 percent slopes		X	

Woodlands

Economically important forestry resources are not found in the Corridor. Woodlands are primarily associated with homes in the form of woodlots and windbreaks within the Corridor.

5.9.2 Impacts

5.9.2.1 Corridor

Agriculture/Farming

Impacts to agriculture will be nominal. Permanent impacts will be the areas surrounding the transmission line structures. All areas underneath and surrounding the proposed transmission line will be available for agricultural use following construction. Temporary impacts typically include soil disturbance, possible compaction around each pole and crop damage, if construction is during the growing season.

Woodlands

Since a majority of the woodlands are associated with homesteads and windbreaks, few impacts to woodlands are anticipated.

5.9.2.2 Proposed Route

Agriculture/Farming

No impacts are anticipated to animal health and safety due to the construction or operation of the transmission line. Except for the physical locations of the transmission line structures, all the land surrounding the transmission line will be available for grazing.

Actual impacts to agriculture production will be determined once the transmission line alignment is finalized. Each transmission line pole will permanently impact approximately 50 ft^2 of land. Each H-frame structure has two poles. Approximately 0.3 acres (14,300 ft^2) of land will be permanently impacted due to transmission line structure placement. Temporary impacts from transmission line construction include the staging area at each structure and an approximately 10- to 12-foot-wide construction access road that will extend along the transmission line (approximately 22.2 miles). Total temporary impacts from construction staging and the construction access road are approximately 39 acres.

The effect of heavy equipment on agricultural soils was considered. Compaction of soil is a concern where construction equipment is used intensively, even during a relatively short duration such as the construction season needed for transmission line installation.

Even if all the structures were placed within prime farmland areas, only approximately 0.3 acres of prime farmland would be impacted, or 0.04 percent of prime farmland within the Route, which totals 750 acres.

Family farms will be impacted due to the loss of land associated with the construction of the transmission line; permanent impacts are anticipated to be minor as noted above.

Woodlands

It is anticipated that less than 4.7 acres of woodlands and windbreaks will be impacted within the 130-foot corridor along the Route that is cleared of tall, woody vegetation.

5.9.3 Mitigation

5.9.3.1 Corridor

Agriculture/Farming

The transmission line structures will be located so that the most productive farmland (prime farmland) will be avoided as much as possible. Only land used for structures will be unavailable for crop production. MP will work with landowners to minimize impacts to their land. Once the transmission line is constructed, all land surrounding the structures can still be farmed or grazed. Construction staging areas and temporary transmission line access roads will be disked as necessary to relieve excessive compaction caused by construction. Landowners will be compensated for any damage that occurs to crops due to the construction of the transmission line.

Woodlands

Impacts to woodlands will be restricted to those areas necessary for the safe and reliable operation of the line. MP will replace impacted trees and shrubs at a ratio of 2:1 and will monitor replacement vegetation for three years.

5.9.3.2 Proposed Route

See above, section 5.9.3.1.

5.10 SOILS

5.10.1 Description of Resources

The soils in the Corridor are largely composed of four soils associations; Cabba-Williams-Zahl, Regent-Savage-Cabba, Williams-Zahl-Bowbells, Williams-Sen-Cabba, and Amor-Daglum-Regent. A soil association is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on a map (NRCSa 2009).The soil associations are mapped in Figure 13.

Cabba-Williams-Zahl soils are well drained, commonly found on hills, escarpments, and sedimentary plains. These soils support rangeland, pasture, and small grain crops. Regent-Savage-Cabba soils are well drained, commonly found on uplands, alluvial fans, stream terraces, drainageways, sedimentary plains, till plains, hills, escarpments and sedimentary plains. A majority of the Corridor and Route is made up of the Regent-Savage-Cabba soils. These soils support small grains, dryland crops, irrigated crops, and rangeland. Williams-Zahl-Bowbells soils are well drained, commonly found on glacial till plains, moraines, and valley side slopes. Common uses for these soils include small grain crops, range, and pasture. Williams-Sen-Cabba soils are well drained, commonly found on glacial till plains, moraines, upland plains, hills, escarpments, and sedimentary plains. Common uses for these soils include growing small grains, pasture, and rangeland. Amor-Daglum-Regent soils are well drained, commonly found on uplands. Common uses include small grains, range, pasture, flax, and hay (NRCSb 2009).

5.10.2 Impacts

5.10.2.1 Corridor

The permanent impact to soils in the area will be limited to areas removed from agricultural production at transmission line structure locations. Temporary impacts to soils are anticipated during construction in the areas immediately surrounding the transmission line structures.

5.10.2.2 Proposed Route

The permanent impact to soils in the area will be limited to areas removed from agricultural production at transmission line structure locations. These impacts will be relatively minor, totaling approximately 0.3 acres (14,300 ft2) for the approximately 22.2 mile transmission line. During transmission line construction, approximately 39 acres may be impacted temporarily for access roads and staging areas. In isolated cases, grading may be required for access roadway construction. Generally, soil removed in these cases will be on steep slopes and not agriculturally productive. A discussion of impacts to prime farmland soils is in section 5.9.

The potential for wind and water erosion exists in the soil types found within the Corridor. Construction practices will minimize soil erosion during and after transmission line construction and impacts are not expected to be significant.

5.10.3 Mitigation

5.10.3.1 Corridor

Wind and water erosion are potential hazards for the soils found within the Corridor. To minimize erosion during and after construction, BMPs for erosion and sediment control (SN 19389 9/99) will be utilized. Only non-structural practices should be required. These practices include: temporary seeding, permanent seeding, mulching, filter strips, erosion blankets, grassed waterways, and sod stabilization. Top soil will be segregated if cuts are made during construction and reapplied after final contours have been graded.

5.10.3.2 Proposed Route

See above, section 5.10.3.1.

5.11 GEOLOGIC AND GROUNDWATER RESOURCES

5.11.1 Description of Resources

Within the vicinity of the Corridor, the area is underlain by soft, calcareous shales, siltstones, and sandstones of the Fort Union Group, Fox Hills and Hell Creek Formations (MLRA 2009). The principal sources of ground water in the area are found in these units. Impermeable Cretaceous shales from the Colorado and Montana Groups underlie the aquifers. Morton County is characterized by generally low relief with gentle slopes interrupted by low buttes and ridges (Carlson 1983). The near-surface sediment is of Recent, Pleistocene, Tertiary, or Cretaceous age (Carlson 1983). Some areas have glacially modified bedrock topography that have been covered by thin layers of glacial drift.

Mineral resources in Morton County include mainly gravel deposits. In the past, numerous lignite mines were also present. Oliver County has large lignite reserves, some of which are utilized by BNI Coal, Ltd. in its mine near Center, North Dakota,

No areas of geologic instability (e.g., fault zones, karst topography) were identified within the Corridor or along the Route. Geologic-related mineral resources in the Corridor include minor sand and gravel deposits. Review of the Corridor and Route identified seven gravel pits within the Corridor. The Route will avoid these sites.

Regional groundwater resources are obtained from both glacial drift and bedrock aquifers with most of the water obtained from the latter (Carlson 1973). Groundwater likely occurs at shallow depths locally, as evidenced by the presence of multiple isolated wetlands in the Corridor and along the Route. Groundwater flow direction of the water table aquifer varies greatly and generally follows local topography.

Review of the North Dakota State Water Commission database indicates that depths of wells within the Corridor range from approximately 70 to 440 feet. The State Water Commission database only identified observation wells, monitoring wells, and test borings within the Corridor and along the Route. No municipal water supplies, reservoirs, or private wells have been identified in the Corridor. Given the presence of residences in the Corridor, it appears that the majority of the existing wells are not recorded in the State Water Commission database. This indicates that more domestic wells are in the area than have been documented; it is assumed that each residence has at least one water supply well. Domestic

groundwater supply appears to be fairly accessible in the Corridor and along the Route, and is dependent on the occurrences of sand and gravel aquifers at any given area.

5.11.2 Impacts

5.11.2.1 Corridor

Impacts to groundwater resources are not anticipated as water supply needs will be limited to minor construction related activities. The only extractive or storage resources identified within the proposed Corridor are two inactive gravel pits.

5.11.2.2 Proposed Route

As noted in section 5.11.2.1, gravel resource areas are present in the proposed Corridor. The proposed Route avoids known gravel resource sites. No active gravel or sand pits will be impacted by the Route.

5.11.3 Mitigation

5.11.3.1 Corridor

At the Corridor level, there is potential for sand and gravel resources to be made unavailable for future development. If this does occur, mitigation in the form of compensation could be required. No other mitigation is anticipated to be necessary.

5.11.3.2 Proposed Route

Transmission line structure locations will not impact the use of existing domestic wells because the structures will not be sited on or adjacent to occupied structures (where domestic wells are typically located). Transmission line structures will be sited so as to avoid sand and gravel resources identified along the Route. Where sand and gravel resources cannot be avoided, MP will coordinate with landowners regarding impacts and any necessary mitigation. No other mitigation is anticipated to be necessary.

5.12 SURFACE WATER AND FLOODPLAIN RESOURCES

5.12.1 Description of Resources

Surface water and floodplain resources for the Corridor and Route were identified by reviewing U.S. Geological Survey topographic maps, Flood Insurance Rate Maps (FIRM) produced by the Federal Emergency Management Agency (FEMA) and USFWS National Wetlands Inventory (NWI) data. The major surface waters located within the Corridor include Nelson Lake, multiple wetlands (discussed in detail in section 5.13), and intermittent streams. These water resources are shown in Figure 14.

The Corridor lies within the Lower Heart River and Painted Woods-Square Butte Creek watersheds. Review of FEMA floodplain maps indicates the Corridor and its surroundings are not within 100-year or 500-year floodplains. However, parts of the Corridor are within an area of possible but undetermined flood hazards. No flood hazard analysis has been conducted for these areas.

5.12.2 Impacts

5.12.2.1 Corridor

Construction of the transmission line will disturb land along the Route. In general, the transmission line structures will be built on uplands; this will avoid intermittent streams and wetlands located in the lower positions in the landscape. The transmission line construction access road will be built to avoid temporary impacts to surface waters.

5.12.2.2 Proposed Route

Impacts to the intermittent streams along the Route are not anticipated. Impacts to wetlands are addressed below in section 5.13.

5.12.3 Mitigation

5.12.3.1 Corridor

The Route minimizes impacts to waters of the United States to the extent practicable. Permits through the USACE are possible due to the presence of large wetlands in the Corridor. Permits for crossing Nelson Lake will be obtained from the North Dakota State Water Commission. No poles will be placed within Nelson Lake.

Construction access roads adjacent to wetlands or intermittent streams and drainageways will be designed in a manner so runoff from the upper portions of the watershed can flow unrestricted to the lower portion of the watershed. A NPDES permit application and Storm Water Pollution Prevention Plan (SWPPP), will be prepared by MP and submitted to the NDDH prior to the initiation of transmission line construction.

5.12.3.2 Proposed Route

No impacts to intermittent streams and drainageways are anticipated, therefore no mitigation is necessary. Mitigation for surface water impacts will meet or exceed regulatory requirements.

5.13 WETLANDS

5.13.1 Description of Resources

Wetlands within the Corridor and along the Route were initially identified by reviewing NWI Maps (Figure 14). The USFWS uses aerial photographs as a basis for NWI maps. The NWI map provides guidance in determining areas to be evaluated for wetland characteristics, but should not be used as the sole basis for wetland determinations.

A formal wetland delineation of the Route will be completed in September or October 2009. Wetlands range in size from isolated basins less than a few hundred square feet to large lakes covering 500 acres. The vast majority of wetlands in the Corridor are emergent. The NWI wetland types and their acreages within the Corridor are presented in Table 5-8. The NWI Map in Figure 14 and the Approximate Pole Location Maps (Figure 16) identify wetlands in the Corridor.

The Route avoids many of the wetlands identified in the Corridor. The NWI wetlands along the Route are predominantly freshwater emergent wetlands or lakes (Table 5-9). No riverine wetlands were identified along the Route. MP will complete a wetland delineation to verify the presence and type of wetlands along the Route. Some wetlands in farmed areas may have been drained for agriculture

Table 5-8.
NWI Wetland Types and Acreages in Corridor

Cowardin Classification	Acres[1]
Freshwater Emergent Wetland (PEMA, PEMAh, PEMC, PEMCh, PEMCx, PEMFh)	213.6
Freshwater Forested/Shrub Wetland	4.1
Freshwater Pond (PABF, PABFh, PABFx, PUBFx)	120.1
Lake (L1UBGH, L2ABGH, L2USCH)	634.9
Other (PUSCH, PUSCx)	6.1
Riverine (R2UBGx, R4USF)	4.3
Total	983.1

[1] *Wetland acreage is calculated using USFWS NWI data.*

Table 5-9.
NWI Wetland Types and Acreages Along Route

Cowardin Classification	Acres[1]
Freshwater Emergent Wetland (PEMA, PEMC, PEMCh, PEMFh)	23.1
Freshwater Pond (PABFh, PABFx, PUBFx)	14.0
Lake (L1UBGH)	55.9
Other (PUSCx)	0.8
Total	93.8

[1] *Wetland acreage is calculated using USFWS NWI data.*

5.13.2 Impacts

5.13.2.1 Corridor

In general, the transmission line will be designed to span, and thus avoid, wetland areas. Wetlands more than 1,100 feet in length may require that transmission structures be placed in wetlands. Each structure would result in 100 ft^2 of permanent impact.

During construction there is the possibility of sediment reaching surface waters as the ground is disturbed by excavation, grading, and construction traffic. Once the Project is completed, it will have no impact on surface water quality.

5.13.2.2 Proposed Route

MP will conduct a wetland delineation to assure impacts to wetlands are avoided to the extent practicable. Wetlands more than 1,100 feet in length, which is the maximum span of the proposed transmission line

design, may require that transmission structures be placed in wetlands. MP intends to span all wetlands to the extent practicable. Should wetland delineations determine impacts are unavoidable, MP will mitigate those impacts as required by the USACE.

5.13.3 Mitigation

5.13.3.1 Corridor

Wetlands will be avoided to the extent practicable during the construction phase of the Project. If USACE jurisdictional wetland impacts are unavoidable, then a Section 404 and 401 permit application will be submitted to the USACE and state of North Dakota, respectively. Permanent impacts to wetlands and waters will be mitigated according to regulatory requirements.

MP will use BMPs during construction and operation of the transmission line to protect topsoil, adjacent wetland resources and minimize soil erosion. Practices may include containing excavated material, protecting exposed soil, stabilizing restored material and revegetating disturbed areas with native species.

5.13.3.2 Proposed Route

As stated above, any impacts to wetlands will be mitigated according to regulatory requirements. Impacts to the wetland in Section 33 will be mitigated in accordance with USACE Section 404 requirements.

5.14 VEGETATION

5.14.1 Description of Resources

The Project is located in the Northern Great Plains Spring Wheat Land Resource Region and the Rolling Soft Shale Plain Major Land Resource Area (MLRA 2009). Native grasslands are largely replaced by spring wheat, alfalfa, and rangeland areas. This area supports natural prairie vegetation characterized by western wheatgrass (*Pascopyrum smithii*), needle-and-thread (*Hesperostipa comata*), green needlegrass (*Stipa viridula*), and blue grama (*Bouteloua gracilis*). Little bluestem (*Schizachyrium scoparium*), prairie sandreed (*Calamovilfa longifolia*), and sideoats grama (*Bouteloua curtipendula*) are important species on shallow soils. There are numerous temporary and seasonal wetlands with vegetation that includes cattails, cordgrass, rushes, and sedges. Native tree cover in the Corridor and along the Route would have been limited to lake margins and would have been dominated by cottonwoods, willows, green ash, box elder, American elm, and bur oaks. As a result of settlement in the 1800s, the area was converted into farmland and rangeland. Settlement and farming activities were dependent on slope, presence of rocks in soil and wetlands. During this process, the wetland areas were frequently ditched and drained. Trees were planted by landowners for wind blocks (windrows and homestead groves) or were established by natural means, such as being transported to the area by animals, birds, or wind.

Based on a review of aerial photographs, land use database information, USFWS database information, and a visit to the Corridor and Route, it was determined that the majority of the land area is agricultural land use. Table 5-2 (section 5.2.1) identifies current land use. Forty-six percent of the land use within the Corridor is cropland and hayland. Approximately 6 percent of the Corridor is wetland, lake, open water, or riparian area.

Thirty-eight percent of the land use within the Route is cropland and hayland. Approximately 6 percent of the Route is wetland, lake, open water, or riparian area.

The principal crop in Morton and Oliver counties is wheat. Other crops include corn, oats, barley, sunflowers, and hay (USDA 2007). Grasslands are used for range and pasture of cattle. Heavily grazed range typically contains Kentucky bluegrass, quack grass, and brome grasses. Lightly grazed or undisturbed range contains native prairie species. CRP land is typically covered by brome grasses, orchard grass, and alfalfa. CRP may also be planted in native grasses such as big bluestem, little bluestem, and Indian grass. Land is typically put into CRP for 10-year cycles. Additional information on agriculture and farming can be found in section 5.9.

Approximately 354.7 acres of the Corridor and 13.3 acres of the Route are classified as forest, which includes deciduous, evergreen, and mixed forests. Small isolated windrows and homestead groves were found throughout the Corridor and Route. Typical tree species in forested areas include bur oak, cottonwood, aspen, green ash, box elder, American elm, silver maple and introduced conifer species.

5.14.2 Impacts

5.14.2.1 Corridor

Permanent impacts to vegetation will occur at each structure location. Temporary impacts will occur around each pole and along the easement as the transmission line is constructed.

5.14.2.2 Proposed Route

It is anticipated that approximately 143 structures will be required for the Project, which is dependent on the length of approximately 22.2 miles and average spans of 900 feet. Approximately 14,300 ft^2 (0.3 acres) of permanent impacts are anticipated due to structure placement. Temporary impacts will occur during construction and will include ground disturbance by construction equipment around each structure and along the right-of-way as the line is constructed. These impacts are anticipated to be approximately 39 acres. It is anticipated that less than 4.7 acres of woodlands and windbreaks will be impacted.

Temporarily disturbed areas will be reseeded per NRCS recommendations to blend in with existing vegetation.

5.14.3 Mitigation

5.14.3.1 Corridor

MP will work closely with the USFWS during micrositing to minimize impacts to vegetation along the Route. MP will conduct a pre-construction inventory of existing wetlands, native prairie, and forests. MP will work to avoid and to minimize impacts to existing trees and shrubs. If impacts to individual trees and shrubs cannot be avoided, these resources will be mitigated at a ratio of 2:1 and will be kept alive for three years.

If jurisdictional wetland impacts are proposed, then a Section 404 and 401 permit application will be submitted to the USACE and state of North Dakota, respectively. Permanent impacts to jurisdictional wetlands and waters will be mitigated according to USACE requirements.

MP will use BMPs during construction and operation of the transmission line to protect topsoil and adjacent resources and to minimize soil erosion. Practices may include containing excavated material, protecting exposed soil, stabilizing restored material and revegetating rangelands with native species.

5.14.3.2 Proposed Route

See above, section 5.14.3.1.

5.15 WILDLIFE

5.15.1 Description of Resources

Information on the existing wildlife in the wind farm Project site was obtained from a variety of sources including observations during field visits and information from the North Dakota Parks and Recreation Department (NDPRD), NDGFD, and USFWS.

Wildlife in the Project site consists of birds, mammals, fish, reptiles, amphibians, and insects, both resident and migratory, which utilize the Project site habitat for forage, migratory stopover, breeding, and/or shelter. Species present in the Project area are associated with agricultural fields, pasture grasslands, and wetland areas. Common mammals in the Project area include raccoon, mink, skunk, weasel, white-tailed deer, coyote, red fox, badger, porcupine, and rabbit.

5.15.2 Impacts

5.15.2.1 Corridor

Raptors, waterfowl, and other bird species may be affected by the construction and placement of the transmission lines. Avian collisions are a possibility after the completion of the transmission line. Waterfowl are typically more susceptible to transmission line collision, especially if the line is placed between agricultural fields that serve as feeding areas, or between wetlands and open water, which serve as resting areas. Generally, the most difficult part of the structure for the bird to see is the shield wire.

Additionally, large birds, such as raptors, could potentially be impacted by new transmission lines through electrocution. Electrocution occurs when birds with large wingspans come in contact with either two conductors or a conductor and a grounding device.

5.15.2.2 Proposed Route

See above, section 5.15.2.1.

5.15.3 Mitigation

5.15.3.1 Corridor

The following measures will be used, to the extent practicable, to help avoid potential impacts to wildlife along the Route during transmission line design and operation:

- MP will prepare and implement an Avian and Bat Protection Plan during construction and operation of the Route.

- H-frame structures will be used as the primary structure design for the transmission line. H-frame structures put the conductor wires in parallel, making them easier for birds to see.
- The proposed design for the H-frame structures will exceed the recommended safe clearances of 60 inches required for raptors. MP proposes an H-frame design using suspension insulators with a clearance of approximately 84 inches.
- The proposed transmission line will be designed to meet APLIC raptor-safe design standards.
- MP is working with agencies to identify any areas that may require marking transmission line shield wires and/or to use alternate structures to reduce collisions.
- MP is conducting preconstruction inventories of wetlands, native prairies, and woodlands in the vicinity of the proposed transmission line and associated facilities to minimize impacts.
- MP will avoid or minimize disturbance of individual wetlands or drainage systems during construction and operation of the Project.
- MP will protect or replace existing trees and shrubs if impacted at a 2:1 ratio at the site.
- MP will maintain sound water and soil conservation practices during construction and operation of the Project to protect topsoil and adjacent resources and to minimize soil erosion. To minimize erosion during and after construction, North Dakota BMPs for erosion and sediment control (SN 19389 9/99) will be utilized. These practices include: temporary seeding, permanent seeding, mulching, filter strips, erosion blankets, grassed waterways, and sod stabilization.
- MP will revegetate non-cropland and pasture areas with seeding mix as recommended by the USFWS and NRCS.
- MP will inspect and control noxious weeds in the vicinity of the transmission line and associated facilities immediately after construction and periodically for the life of the project.

MP is committed to minimizing wildlife impacts within the Project site. MP continues to consult with the USFWS and NDGFD regarding appropriate mitigation measures for wildlife impacts.

5.15.3.2 Proposed Route

See above, section 5.15.3.1.

5.16 RARE AND UNIQUE NATURAL RESOURCES

5.16.1 Description of Resources

The USFWS, NDGFD, and NDPRD were contacted to review the Project site for threatened and endangered species and unique habitats. These agencies have not yet responded to inquiries sent on April 7, 2009, regarding rare and unique natural resources within the Project site (Appendix C).

No federally-listed endangered, threatened, or candidate plant species are known to occur in the Project site. The USFWS identifies seven federally listed threatened and endangered wildlife species for Morton and Oliver counties (USFWS 2008) (see Table 5-10). Of these seven, the whooping crane and Dakota

skipper have the highest potential, however remote, of occurring in the Project site. Habitat for the other species is either completely lacking or is extremely limited in the Project site.

Table 5-10.
Federally-Listed Threatened and Endangered Species

Species	County	Status
Black-footed Ferret (*Mustela nigripes*)	Morton, Oliver	Endangered
Dakota Skipper (*Hesperia dacotae*)	Oliver	Candidate
Gray Wolf (*Canis lupus*)	Morton, Oliver	Endangered
Interior Least Tern (*Sternula antillarum*)	Morton, Oliver	Endangered
Pallid Sturgeon (*Scaphirhynchus albus*)	Morton, Oliver	Endangered
Piping Plover (*Charadrius melodus*)	Morton, Oliver	Threatened
Whooping Crane (*Grus americana*)	Morton, Oliver	Endangered

Potential direct impacts to the Dakota skipper can be minimized or reduced by avoiding specific types of native grasslands and areas occupied by the species. Potential direct impact to whooping cranes (i.e., mortality) is not likely given the current information provided in the Site Characterization Study done for the Bison I Wind Project (WEST 2009).

The state of North Dakota maintains a list of 100 species of conservation concern. Several of these species have been documented near the Project area during Breeding Bird Surveys conducted by the USGS as well as another wind facility study adjacent to the Bison I Wind Project. Impacts too many of these species can be avoided or minimized by focusing construction activities on cultivated landscapes. In a May 11, 2009 response letter for the Bison I Wind Project, the NDPRD indicated an occurrence of *Ameirus natalis* (yellow bullhead). MP will minimize, to the extent possible, disturbance to the yellow bullhead's habitat. On August 24, 2009 the NDPRD was asked to determine if the North Dakota Natural Heritage Inventory yields any rare animal and plant species or significant ecological communities within the Corridor. The NDRPD responded on September 16, 2009 stating several occurrences have been identified within or adjacent to the Corridor, including yellow bullhead, *Potamogeton vaginatus* (sheathed pondweed), and *Potamogeton amplifolius* (large-weaved pondweed). MP will minimize, to the extent possible, disturbance to sheathed pondweed and large-weaved pondweed habitat.

5.16.2 Impacts

5.16.2.1 Corridor

No impacts to rare and unique natural resources are anticipated.

5.16.2.2 Route

No impacts to rare and unique natural resources are anticipated.

5.16.3 Mitigation

5.16.3.1 Corridor

Mitigative measures will not be necessary, since no impacts are anticipated to rare and unique natural resources.

5.16.3.2 Route

A pre-construction inventory of existing wetlands, native prairie, and woodlands will be conducted along the Route. MP will avoid the resources identified to the extent practicable.

Though no impacts to rare and unique natural resources are anticipated, the following measures will be implemented as part of MP's North Dakota Avian and Bat Protection Plan. MP will:

- mark new transmission lines with bird flight diverters. MP will also mark an equal length of existing and previously unmarked transmission lines within the corridor to help reduce the potential for mortality associated with transmission line collisions;
- implement wildlife friendly on-site habitat management practices;
- contribute to off-site wildlife habitat enhancement efforts; and
- work closely with a number of other wind developers and the USFWS to prepare a regional Habitat Conservation Plan for the whooping crane.

5.17 SUMMARY OF ROUTE IMPACTS

Table 5-11 summarizes the resources that will be impacted as a result of the construction of the transmission line and the appropriate mitigation.

Table 5-11.
Summary of Route Impacts and Mitigation

Resource	Impact	Mitigation
Demographics	Socioeconomic impacts are primarily positive due to increased expenditures during construction and the long-term benefits of an increased tax base of the county due to property taxes. A nominal amount of land will be permanently removed from production due to the construction of the Project.	Impacts are primarily positive, so no mitigation is proposed for socioeconomic impacts. Impacts to landowners will be minimized to the extent practicable.
Land Use	Approximately 0.3 acre of land will be impacted due to the construction of the transmission line. Approximately 3 acres will be used for the Bison I Wind Project substation. Land use is primarily agriculture and will remain in agriculture land use since the land under or adjacent to the line can still be used by the landowner.	MP will work with landowners and regulatory agencies to minimize impacts of the Project.
Public Services	No impacts are anticipated.	The transmission system will be constructed according to the configuration identified by MISO to mitigate any potential impacts. Impacts to existing public services will be avoided to the extent practicable.

Resource	Impact	Mitigation
Human Health and Safety	No impacts are anticipated.	MP will follow "prudent avoidance" methods to minimize EMF exposure and any potential impacts to human health. If proper safeguards are implemented, no additional mitigation is required.
Noise	The noise sensitive land uses along the Route are the residences near transmission line. The noise level at 300 feet from the existing and proposed lines is between 38 and 40 dBA. Noise impacts are nominal. No impacts to noise sensitive land uses are anticipated.	No mitigative measures are proposed. MP will adhere to the avoidance criteria requirement of having a buffer of 500 feet from a residence. This will mitigate any potential impacts due to noise.
Visual	The transmission line will be evident to individuals traveling on Highways 31 and 25 as well as residences and landowners that live in close proximity to the Route.	The Route minimizes the number of residences impacted by the line.
Cultural and Archaeological	No impacts to previously identified cultural resources are anticipated.	MP has completed a Class I Cultural Resources Inventory for the Corridor and Route. MP will conduct a Class III inventory along the proposed Route.
Recreational Resources	Impacts to recreational resources are primarily visual, and limited to individuals using the resources.	The Route will follow existing transmission line routes and will avoid direct impacts to recreational areas.
Land Based Economies	A total of approximately 0.3 acre of land will be permanently impacted by the transmission line construction. Approximately 39 acres of temporary impacts are anticipated. The Project Substation will occupy approximately 3 acres of land. It is anticipated that less than 4.7 acres of woodlands and windbreaks will be impacted.	MP will work with landowners to minimize impacts to their land. Prime farmland will be avoided to the extent practicable.
Soils	A total of approximately 0.3 acre of land will be permanently impacted by the transmission line construction. Approximately 39 acres of temporary impacts are anticipated. The Project Substation will occupy approximately 3 acres of land.	BMPs for erosion and sediment control will be utilized to minimize wind and water erosion along the Route. Only land needed for the transmission line structures will be permanently impacted. Temporarily disturbed areas will be restored.
Geologic and Groundwater Resources	No impacts to geologic and groundwater resources are anticipated.	No mitigative measures are necessary.
Surface Water and Floodplain Resources	No impacts are anticipated to intermittent streams and drainageways.	To minimize impacts during construction an NPDES permit and SWPPP will be prepared and submitted to the North Dakota of Health.
Wetlands	A formal wetland delineation of the Route will be completed in September or October 2009.	MP will mitigate impacts according to USACE requirements. All additional wetlands will be avoided to the extent practicable.

Resource	Impact	Mitigation
Vegetation	A total of approximately 0.3 acre of land will be permanently impacted by the transmission line construction. Approximately 39 acres of temporary impacts are anticipated. The Project Substation will occupy approximately 3 acres of land. It is anticipated that less than 4.7 acres of woodlands and windbreaks will be impacted.	MP will avoid existing trees and shrubs as practicable. MP will use BMPs during construction and operation to minimize impacts. Impacts to individual trees or shrubs will be replaced at a ratio of 2:1 and will be monitored for survival for three years. Temporarily disturbed areas will be reseeded per USFWS and NRCS recommendations.
Wildlife	Impacts to wildlife populations are expected to be minimal. Potential avian and bat collisions may occur, but are anticipated to be relatively small.	A variety of mitigative measures will be implemented, as discussed in section 5.15.3.
Rare and Unique Natural Resources	Impacts to rare and unique natural resources are not anticipated.	No mitigative measures are necessary.

6.0 PUBLIC COORDINATION

Keeping the public informed on the status of the Project is a key component to its success. Principal stakeholders in the Project are landowners that have entered into easement agreements with MP. MP has provided written Project updates to the landowners and will continue to do so as it moves forward. In addition, MP hosted a landowner meeting to provide an update and to answer questions on the Project on April 14, 2009.

MP has also met with Morton and Oliver counties' commissioners representing the Project site and staff to inform them of the Project, discuss local permits, and answer questions. MP representatives have discussed this Project with county planning officials in anticipation of submitting local permit applications for the Project.

In addition, MP has been working with key state and Federal agencies including the NDGFD and the USFWS to inform them of the Project and to address areas of interest particular to each department.

Additionally, letters introducing the Project and requesting feedback were sent on April 7, 2009, to the following agencies and Project stakeholders:

- North Dakota Attorney General
- Governor of North Dakota
- North Dakota Aeronautics Commission
- North Dakota Association of Telecommunication Cooperatives
- North Dakota Department of Transportation
- North Dakota Game and Fish Department
- North Dakota Department of Agriculture
- North Dakota Department of Health
- North Dakota Department of Human Services
- North Dakota Department of Labor
- North Dakota Department of Career and Technical Education
- North Dakota Department of Commerce
- North Dakota Geological Survey
- North Dakota Indian Affairs Commission
- North Dakota Job Service
- North Dakota Office of Management and Budget
- North Dakota Parks and Recreation Department
- North Dakota State Land Department

- North Dakota State Soil Conservation Commission
- North Dakota State Water Commission
- State Historical Society of North Dakota
- U.S. Fish and Wildlife Service
- U.S. Army Corps of Engineers
- Morton County Highway Department
- Morton County Soil and water Conservation District
- Morton County Planning & Development Department
- Oliver County Highway Department
- Oliver County Soil and Water Conservation District
- Oliver County Planning & Development Department

MP is committed to keeping key stakeholders engaged in the Project as it moves forward. MP expects to participate in several additional landowners, agency, or other stakeholder meetings before the PSC's public hearing.

7.0 IDENTIFICATION OF REQUIRED PERMITS/APPROVALS

The Federal and state permits or approvals that have been identified as potentially being required for the construction and operation of the Project are shown in Table 7-1.

Table 7-1.
Possible Permits and Approvals

Agency	Type of Approval	Status*	Need
Federal Approvals			
USACE	Section 404 Permit	Final layout will determine whether permit/approval is needed	Permit required for filling in jurisdictional waters of the U.S. Project will avoid or minimize impacts on waters of the U.S. to the extent practicable. Coverage under an existing Nationwide Permit may be necessary for minor unavoidable impacts.
Environmental Protection Agency	Spill Prevention Control and Countermeasure Plan	Will apply once Certificate is received	Required if the substation facility has greater than 1,320 gallons of oil. A copy of the plan will be maintained on file with the substation's owner/operator and will be reviewed by the certifying engineer every five years.
State of North Dakota			
Public Services Commission	Waiver of Procedures and Time Schedules	Subject of this Application	Included herein.
	Certificate of Corridor Compatibility	Subject of this Application	Included herein.
	Route Permit	Subject of this Application	Included herein.
North Dakota Department of Health	401 Water Quality Certification	Final layout will determine whether permit/approval is needed	Required for fill in jurisdictional waters of U.S.
	NPDES Permit: General Construction Storm Water	Will apply once Certificate is received	Required for disturbance of over 1 acre of land. Must prepare a Storm Water Pollution Prevention Plan (SWPPP).
North Dakota Division of Emergency Management	Emergency Planning and Community Right-to-Know Act Tier II report	Will apply once Certificate is received	Required for owner/operators of facilities containing hazardous materials. A copy of the report must be filed annually by March 1st.
North Dakota State Water Commission	Application For Authorization To Construct A Project within Islands And Beds Of Navigable Streams And Waters	Will apply once Certificate is received	Required to cross Nelson Lake.

Agency	Type of Approval	Status*	Need
SHPO	Section 106 Compliance Approval	Final layout will determine whether permit/approval is needed	Section 106 Compliance Approval is required if there is federal involvement in the Project (i.e. federal funding or wetland fill). Need for approval is not anticipated at this time.
North Dakota Highway Patrol	Oversize/Overweight Permit	Will apply once Certificate is received	Permit required for hauling construction equipment and materials on state highways.
North Dakota Department of Transportation	Road Approach/Access Permit	Will apply once Certificate is received	Permit required for construction of access roads from state highways.
	Utility Permit/Risk Management Documents	Will apply once Certificate is received	Permit required for utility crossings on state highway ROW.
Local Permits			
Oliver County	Conditional Use Permit	Will apply once Certificate is received	Permit required for Project construction.
	Utility Permit	Will apply once Certificate is received	Permit required for Project construction in highway ROW.
Morton County	Special Use Permit and Unified Development Application	Will apply once Certificate is received	Permit required for Project construction.
	Transportation Permit	Will apply once Certificate is received	Permit required for Project construction.
	Utility Occupancy Form	Will apply once Certificate is received	Permit required for Project construction in highway ROW.

8.0 FACTORS CONSIDERED

The North Dakota Energy Conversion and Transmission Facility Siting Act lists 11 factors to guide the PSC in evaluation of the Corridor and Route.

8.1 PUBLIC HEALTH AND WELFARE, NATURAL RESOURCES, AND THE ENVIRONMENT

The preceding sections discuss the research and investigations relating the effects of the proposed facility on public health and welfare, natural resources, and the environment. The effects and mitigation in relation to the Corridor and Route are discussed in the impact and mitigation of section 5.0. Impacts evaluated in the Corridor and Route are minor.

8.2 TECHNOLOGIES TO MINIMIZE ADVERSE ENVIRONMENTAL EFFECTS

MP will utilize the most recent technologies that minimize impacts to the environment. The Corridor study and consequently the Route structures proposed for the project are the most appropriate technologies to minimize adverse environmental effects. This is evident in the minimal environmental effects identified in this application associated with the project.

8.3 POTENTIAL FOR BENEFICIAL USES OF WASTE ENERGY

This factor is not applicable to this project.

8.4 UNAVOIDABLE ADVERSE ENVIRONMENTAL EFFECTS OF THE ROUTE

Unavoidable adverse environmental effects include the visual impacts and physical impacts to the land (primarily agricultural land) associated with the Project. MP will implement measures as described in the environmental analysis herein and as identified by regulatory agencies to minimize these unavoidable adverse environmental effects.

8.5 ALTERNATIVES TO THE PROPOSED CORRIDOR OR ROUTE

Alternatives to the proposed Corridor were not evaluated. The Corridor was selected to convey energy generated from the Bison I Wind Project to the Square Butte Substation.

Alternatives to the Route were considered, but rejected due to the exclusion and avoidance criteria within the Route. The proposed Route presented in this application minimizes and avoids impacts to the exclusion, avoidance, and selection criteria.

8.6 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF NATURAL RESOURCES FOR THE CORRIDOR OR ROUTE

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

Construction resources that will be used include aggregate resources, concrete, steel, and hydrocarbon fuel. These resources will be utilized to construct the Project. During construction vehicles will be traveling to and from the site, utilizing hydrocarbon fuels.

8.7 DIRECT AND INDIRECT ECONOMIC IMPACTS OF THE PROPOSED FACILITY

Direct economic impacts include the impacts associated with up to 0.3 acre of agricultural land being removed from production due to the construction of the transmission line and associated facilities. In general, agricultural areas surrounding each structure can still be farmed, and landowners will be compensated for the land occupied by the transmission line and associated facilities.

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

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

8.8 EXISTING DEVELOPMENT PLANS OF THE STATE, LOCAL GOVERNMENT AND PRIVATE ENTITIES AT OR IN THE VICINITY OF THE CORRIDOR AND ROUTE

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

8.9 EFFECT OF ROUTE ON CULTURAL RESOURCES

MP has reviewed cultural resources information on file at the SHPO for the data gathering area and prepared a Class I Literature Search (Appendix B). A review of previous cultural resources studies and cultural resource recordation forms at the SHPO identified 16 previously recorded archaeological resources and nine archaeological site leads within a half mile of the proposed transmission line corridor centerline. Currently, no impacts are anticipated to known cultural resources on the site. MP is committed to minimizing impacts to these resources and will avoid to the best of their ability these resources and any additional resources identified throughout the life of the Project. If avoidance is not possible, MP will work with the North Dakota SHPO to appropriately mitigate potential impacts.

There may be impacts to paleontological resources because the Project study area is located in the Sentinel Butte, Bullion Creek, Cannonball, Ludlow, and Slope Formations.

8.10 EFFECT OF ROUTE ON BIOLOGICAL RESOURCES

MP has implemented measures to avoid and minimize effects to biological resources at the proposed site. The impact of the Project on wildlife is expected to be minimal. The site will be designed to minimize impacts to avian species.

8.11 PROBLEMS RAISED BY AGENCIES

In April 2009, agencies were contacted to comment on the Bison I Wind Project. In most cases, the comments received for the Bison I Wind Project (Case # PU-09-151) were general enough to be applied to this Project. However, for agency comments that were more specific, MP sent a second letter asking for comments on the transmission line. These additional agency letters included the NDGFD, USFWS, NDPRD, and the NDDH (Appendix C).

8.11.1 North Dakota Game and Fish Department

The NDGFD initially reviewed the Project site for wildlife concerns. Their primary concern is disturbance of native prairie (Appendix C). MP proposes to survey the site for native prairie and will work with the NDGFD and NRCS to restore disturbed areas. Restoration may include reseeding the area with approved NRCS seed mixes. The NDGFD also recommended 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. On August 24, 2009 the NDGFD was contacted again for records of state threatened and endangered species within the Corridor. The NDGFD responded on September 21, 2009, stating their primary concern is the disturbance of native prairie and wetland areas during construction. The NDGFD recommended that overhead lines be marked when placed over perennial streams or sited in close proximity to large wetland complexes to minimize possible avian impacts.

8.11.2 U.S. Fish and Wildlife Service

MP, HDR, and WEST met with the USFWS and NDGFD to discuss wildlife issues on March 17, 2009. In a letter dated May 4, 2009, the USFWS recommended of the following mitigative measures to minimize and/or compensate for impacts to wildlife and existing habitats (Appendix C):

- Develop an Avian and Bat Protection Plan.
- Schedule construction for late summer or fall/early winter.
- Avoid construction or disturbance on native prairie areas, wetlands, wooded draws, and riparian forests.
- Minimize impacts to wildlife and existing habitat.

MP continues to consult with the USFWS regarding appropriate mitigation measures to include as part of this Project. In general, native land cover in most of the Project site, including native grasslands and wetlands, are not unique in the region, but are of concern on a broader scale (i.e., concern regarding loss of native prairie). Project developments in the areas with less wetlands and native grasslands would likely have lower impacts (i.e., displacement) to wildlife, particularly grassland and bird species. On August 24, 2009, the USFWS was contacted specifically for transmission line concerns within the Corridor. MP has not received a response at the time of this filing.

8.11.3 North Dakota SHPO

The SHPO recommended a Class I Literature Search be completed for areas that may be impacted by the Project (Appendix C). They also stated that a Class III Cultural Resources Inventory will be necessary. MP has completed the Class I Literature Search (Appendix B). Twenty-one cultural resources reports were identified within or within a half-mile of the centerline. A review of these reports and cultural resource record forms at the SHPO identified 16 previously recorded archaeological resources and nine archaeological site leads (Table 7.8).

MP continues to consult with the SHPO in preparation for the need for a Class III inventory. The Class I Literature Search has also addressed the probability for archaeological sites within the Project study area and recommends survey strategies to identify additional cultural resources.

8.11.4 North Dakota Geological Survey

MP sent a letter to the North Dakota Geological Survey, April 7, 2009 (Appendix C). No response has been received.

8.11.5 North Dakota Parks and Recreation Department

In a May 11, 2009 response letter for the Bison I Wind Project, the NDPRD indicated an occurrence of *Ameirus natalis* (yellow bullhead). MP will minimize, to the extent possible, disturbance to the yellow bullhead's habitat. The NDPRD also stated all efforts should be made to avoid or minimize impacts to wildlife and their habitats, especially critical habitats. Pre and post construction monitoring for avian and bat species should also be conducted. Any impacted areas should be revegetated with species native to the project area. MP is committed to working with the NDPRD in conjunction with the USFWS, NRCS, and NDGFD to seed disturbed areas with appropriate seed mixes. On August 24, 2009 the NDPRD was asked to determine if the North Dakota Natural Heritage Inventory yields any rare animal and plant species or significant ecological communities within the Corridor. The NDRPD responded on September 16, 2009 stating several occurrences have been identified within or adjacent to the Corridor, including yellow bullhead, sheathed pondweed, and large-weaved pondweed. MP will minimize, to the extent possible, disturbance to sheathed pondweed and large-weaved pondweed habitat.

8.11.6 North Dakota Office of Attorney General

The North Dakota Attorney General's Office was asked to comment on the Project. The Office of Attorney General is prohibited by law from providing legal advice, opinions, or assistance to private businesses (Appendix C).

8.11.7 North Dakota Department of Commerce

MP sent a letter to the North Dakota Department of Commerce, April 7, 2009 (Appendix C). No response has been received.

8.11.8 North Dakota Department of Health

On August 24, 2009, a letter was sent to the NDDH to determine if they own land in or adjacent to the sections affected by the Corridor. In an August 31, 2009 response, the NDDH confirmed they own no

land in or adjacent to the area. The NDDH believes the environmental impacts will be minor and can be controlled by proper construction methods. Included in Appendix C is their letter which provides comments and guidance on fugitive dust emissions, degradation of waterways, storm water management, and noise. MP will implement these measures, as appropriate.

8.11.9 North Dakota Department of Transportation

MP sent a letter to the North Dakota Department of Transportation, April 7, 2009 (Appendix C). No response has been received.

8.11.10 North Dakota State Water Commission

The State Water Commission asked that waste material be disposed of properly. In the NPDES permit required for the Project, MP will address and implement proper disposal of waste materials.

8.11.11 Natural Resources Conservation Service

The NRCS did not identify any problems with the Project. Since there are no federal funds, the Farmland Protection Policy Act (FPPA) does not apply. The NRCS recommended impacts to wetlands be avoided (Appendix C). A discussion of wetlands and potential wetland impacts are included in section 7.14. Temporarily disturbed areas will be reseeded per USFWS and NRCS recommendations to blend in with existing vegetation.

In addition, MP has considered the FPPA in the location of the line and selection of structures. The proposed route does cross prime farmland. However, the impacts are nominal. If all the structures for the line were placed in prime farmland, approximately 0.3 acre of prime farmland would be permanently removed from production. Morton and Oliver counties

8.11.12 North Dakota State Land Department

MP sent a letter to the North Dakota State Land Department, April 7, 2009 (Appendix C). No response has been received.

8.11.13 U.S. Army Corps of Engineers

MP will obtain permits through the USACE and North Dakota Department of Health in accordance with Sections 404 and 401 of the Clean Water Act, respectively. MP will also mitigate the impact as required by these regulatory bodies. No additional issues were raised.

8.11.14 Aeronautics Commission

MP sent a letter to the Aeronautics Commission, April 7, 2009 (Appendix C). No response has been received.

8.11.15 North Dakota Department of Agriculture

MP sent a letter to the North Dakota Department of Agriculture, April 7, 2009 (Appendix C). No response has been received.

8.11.16 North Dakota Department of Human Services

MP sent a letter to the North Dakota Department of Human Services, April 7, 2009 (Appendix C). No response has been received.

8.11.17 North Dakota Department of Labor

MP sent a letter to the North Dakota Department of Labor, April 7, 2009 (Appendix C). No response has been received.

8.11.18 North Dakota Department of Career and Technical Education

MP sent a letter to the North Dakota Department of Career and Technical Education, April 7, 2009 (Appendix C). No response has been received.

8.11.19 North Dakota Governor

MP sent a letter to the North Dakota Governor John Hoeven, April 7, 2009 (Appendix C). No response has been received.

8.11.20 North Dakota Indian Affairs

MP sent a letter to North Dakota Indian Affairs, April 7, 2009 (Appendix C). No response has been received.

8.11.21 North Dakota Office of Management and Budget

MP sent a letter to the North Dakota Office of Management and Budget, April 7, 2009 (Appendix C). No response has been received.

8.11.22 North Dakota Soil Conservation Committee

MP sent a letter to the North Dakota Soil Conservation Committee, April 7, 2009 (Appendix C). No response has been received.

8.11.23 Morton and Oliver Counties Soil Conservation Districts

MP sent letters to the Oliver County Soil Conservation District and Morton County Soil Conservation District, April 7, 2009 (Appendix C). Comments were deferred to the NRCS office in Jamestown, North Dakota. See section 8.11.11.

9.0 QUALIFICATIONS OF CONTRIBUTORS TO SITING STUDY

Name Project Role	Education And Professional Experience
TODD MATTSON Senior Environmental Project Manager HDR Engineering	Mr. Mattson has more than 14 years of experience as an environmental consultant specializing in managing regulatory compliance issues for major energy development projects. His responsibilities include directing project feasibility studies and constraints analyses, state and federal permitting, and Endangered Species Act compliance. Additionally, Mr. Mattson is HDR's National Environmental Lead for its wind energy projects. M.S., Zoology and Physiology (Wildlife Ecology), University of Wyoming, 1994 B.A., Biology, Minnesota State University Moorhead, 1992
LYDIA NELSON Senior Environmental Scientist HDR Engineering	Ms. Nelson has more that 25 years of experience as an environmental project manager and project scientist. Ms. Nelson has extensive hands-on experience in wetland delineation, functional assessment, mitigation design, water resources, prime farmlands, hydric soils, wildlife habitat and endangered species. Additionally, Ms. Nelson has extensive experience working with federal, state and local agencies in the development of NEPA documents and permit applications. B.S., Environmental Sciences/Studies (Soil Science), Oregon State University, 1983 B.S., Biology, Central Michigan University, 1981
TIM CASEY, QEP Environmental Specialist HDR Engineering	Mr. Casey is HDR's Environmental Acoustics Program Manager and has more than ten years of experience leading HDR's Environmental Acoustics efforts. He specializes in noise and vibration monitoring and modeling for stationary and mobile sources including railroads, highways, combustion turbines, diesel generators, pumps, industrial and municipal installations, etc. Extensive use of the FHWA Stamina 2.0/Optima model, FTA transit noise and vibration analysis methodologies, and PC-based GIS technology. Additional training and experience on FHWA Traffic Noise Model 1.0. Mr. Casey's experience includes presentations at public meetings, before city councils, and expert witness testimony for projects in locations throughout the United States and Puerto Rico. Mr. Casey holds the professional certification of Qualified Environmental Professional. B.S., Biological/Life Sciences, Saint Xavier University, 1988 Associate of Science, Science, Valley Community College, 1986
GINA RAMIREZ Acoustics Engineer HDR Engineering	Ms. Ramirez is an acoustic engineer with experience in environmental noise and architectural acoustics. She has experience performing noise and vibration analyses for projects such as wind farms, construction projects, surface transportation systems, and industrial noise. Her primary responsibilities include the monitoring, analysis and modeling of noise producing elements, in for both environmental and architectural projects. B.A., Acoustics, Columbia College, Chicago, IL, 2008
INGRID SCHWINGLER Environmental Scientist HDR Engineering	Ms. Schwingler has more than a year of experience in the wind industry including public involvement, fieldwork, data collection, and data analysis. She has worked as part of multi-disciplinary teams in the preparation of Environmental Impact Statements, Environmental Assessments and other NEPA-related and environmental permitting documents for energy projects across the United States. B.A., Environmental Studies, Political Science, Gustavus Adolphus College, St. Peter, MN, 2007

Name Project Role	Education And Professional Experience
STEPHEN SABATKE Archaeologist HDR Engineering	Mr. Sabatke has seven years of experience working in the cultural resource field. He has worked on a variety of cultural resource projects including: wind power transmission, transmission lines, rail roads, pipeline, recreation use development, prehistoric site preservation, historic building preservation, and historic building rehabilitation. Additionally, he has prepared cultural resource studies for federal and state review. He has reviewed and developed cultural resource plans, cultural resource proposals, conducted meetings with SHPO, led field survey investigations, managed cultural resource contractors, subcontractors, and staff, and has managed cultural resource budgets for projects. M.A., Anthropology, University of Minnesota Twin Cities, 2006 B.A., Anthropology, University of Minnesota Duluth, 2002
MEG DESMOND Senior Technical Editor HDR Engineering	Ms. Desmond brings more than 30 years of writing and editing experience to HDR. She is responsible for managing document production and the document production staff for the Environmental Sciences Section of HDR Minneapolis. She provides day-to-day supervision in terms of adjusting priorities and deadlines, determines consistency and style within technical reports, and edits technical reports and documents. She interacts with professional staff members to clarify the meaning, format, and style of their work. She also assists HDR's Minneapolis marketing department with quality control review of proposals and presentations. B.A., English Language & Literature, University of New Hampshire, 1976
ANJALI MALHOTRA GIS Specialist HDR Engineering	Ms. Malhotra has almost five years of professional experience in the field of Geographic Information Systems (GIS). Ms. Malhotra has provided spatial and data analysis, modeling, and GIS technical support on a variety of wind energy and environmental projects across the United States. Ms. Malhotra is proficient in generating cartographic products, mapping, and graphic presentations using GIS and advanced graphic software. She also has more than two years experience in Urban Planning & Design. Master of Urban and Regional Planning (Specialization: Information Technology and GIS); State University of New York at Buffalo, 2005 Bachelor of Architecture, Pune University, India, 2001

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11.0 DEFINITIONS

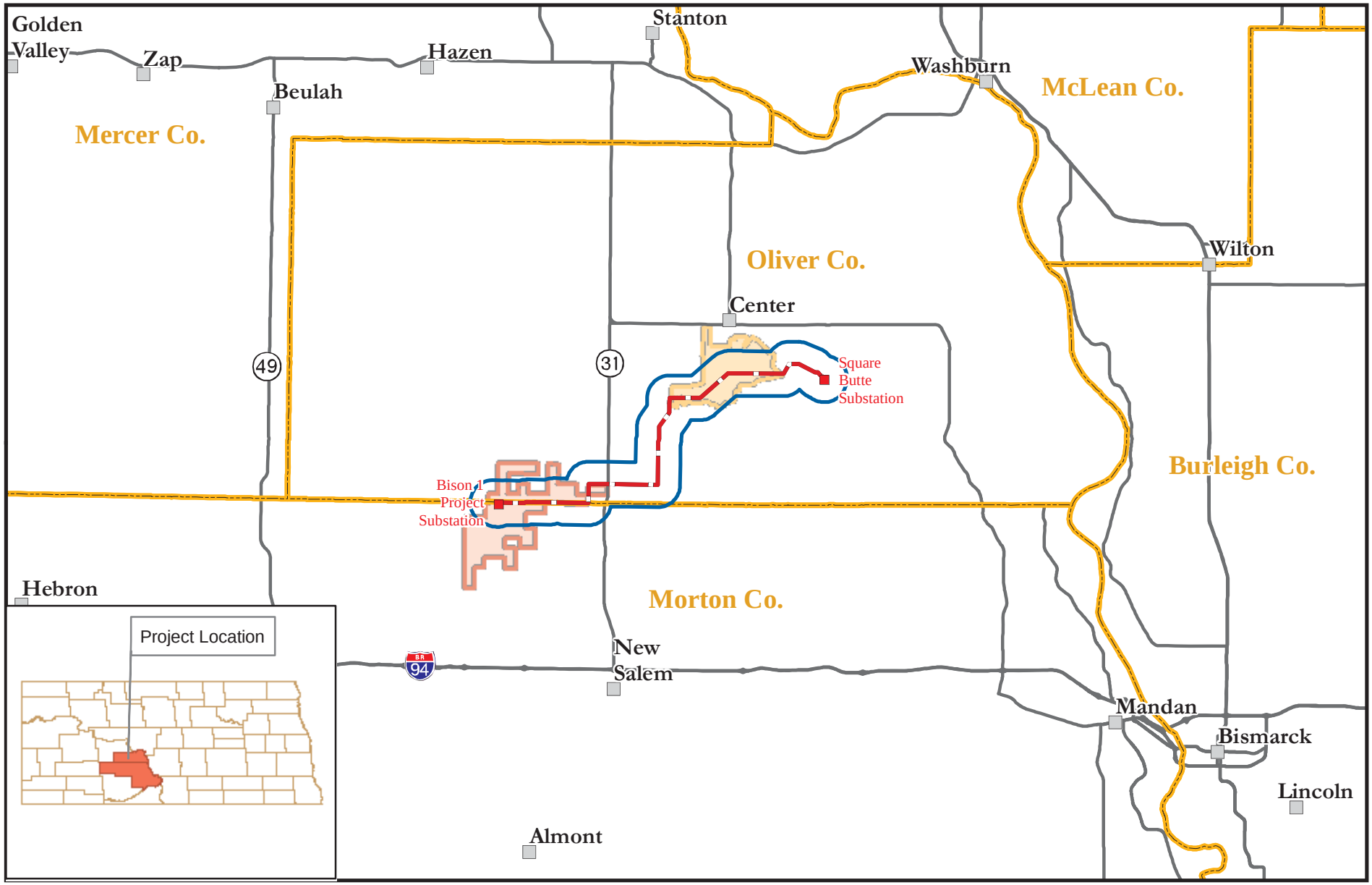
ADT	Average Daily Traffic
APE	Area of Potential Effects
APLIC	Avian Power Line Interaction Committee
Asynchronous generator	A cage-wound generator, also called an induction generator, used to generate alternating current.
BMPs	Best Management Practices; prevents soil erosion and sedimentation
Capacity	The capability of a system, circuit, or device for storing electric charge.
Certificate	Certificate of Site Compatibility
Class I Cultural Resources Inventory	Existing data inventory – a large-scale review and compilation of known cultural resource data.
Class III Cultural Resources Inventory	Intensive field inventory – complete surface inventory of a specific area.
CRP	Conservation Reserve Program
Corridor Certificate	Certificate of Corridor Compatibility
dBA	A-weighted decibel
Distribution	Relatively low-voltage lines that deliver electricity to the retail customer's home or business.
DOE	U.S. Department of Energy
Electromechanical	Of, relating to, or being a mechanical process or device actuated or controlled electrically; especially being a transducer for converting electrical energy to mechanical energy.
EMF	Electric and Magnetic Field
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Maps
FPPA	Farmland Protection Policy Act
Ft	Foot/Feet
GE	General Electric
Gearbox	An assembly of parts including the speed-changing gears and the propeller shaft by which the power is transmitted from an automobile engine to a live axle; the speed-changing gears in such an assembly.

Generator	A machine by which mechanical energy is changed into electrical energy.
Geotechnical	A science that deals with the application of geology to engineering.
GIS	Geographic Information Services
Hub	The central part of a circular object (as a wheel or propeller).
Interconnection	To be or become mutually connected.
kV	kilovolt
kW	kilowatt
MW	megawatt
m	meter
m/s	meter per second
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.
MP	Minnesota Power, an operating division of ALLETE, Inc.
mph	miles per hour
Nacelle	A streamlined enclosure (as for an engine), which houses the gearbox, generator, brake, cooling system and other electrical and mechanical systems.
NDDOT	North Dakota Department of Transportation
NESC	National Electric Safety Code
NDAC	North Dakota Administrative Code
NDCC	North Dakota Century Code
NDDH	North Dakota Department of Health
NDGFD	North Dakota Game and Fish Department
NDPRD	North Dakota Parks and Recreation Department
NHID	Natural Heritage Inventory Database
NPDES	National Pollutant Discharge Elimination System
NRCS	National Resource Conservation Service
NRHP	National Register of Historic Places

NWI	National Wetlands Inventory
O&M	Operations and maintenance facility
Pitch	The action or a manner of pitching; especially an up-and-down movement.
Project, the	Bison I Wind Project
PSC	North Dakota Public Service Commission
PTC	Production Tax Credit
RECs	Recognized Environmental Conditions
RES	Renewable Energy Standard
Resistance	The opposition offered by a body or substance to the passage through it of a steady electric current.
Rotor	The rotor consists of three blades mounted to a rotor hub.
RD	Rotor Diameter: Diameter of the rotor from the tip of a single blade to the tip of the opposite blade.
ROW	Right-of-Way
rpm	Revolutions per minute
RPS	Renewable Portfolio Standards
SHPO	North Dakota State Historic Preservation Office
Step-up transformer	A transformer that increases voltage
Substation	A subsidiary station in which electric current is transformed.
SWPPP	Storm Water Pollution Prevention Plan
Torque	A force that produces or tends to produce rotation or torsion; also a measure of the effectiveness of such a force that consists of the product of the force and the perpendicular distance from the line of action of the force to the axis of rotation: a turning or twisting force.
Transformer	An electrical device by which alternating current of one voltage is changed to another voltage.
Transmission	An assembly of parts including the speed-changing gears and the propeller shaft by which the power is transmitted from an automobile engine to a live axle; the speed-changing gears in such an assembly.
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WEST	Western EcoSystems Technology, Inc

WMA	Wildlife Management Areas
WMD	Wetland Management District
WPAs	Waterfowl Protection Areas
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



Study Corridor (2.23 miles)
Proposed Transmission Route
Substation Location
BNI Wind Farm Project Area
Bison 1 Wind Farm Project Area
County Boundary
Cities
Highways

Miles
0 2 4 8

Figure 1: Project Vicinity Map
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

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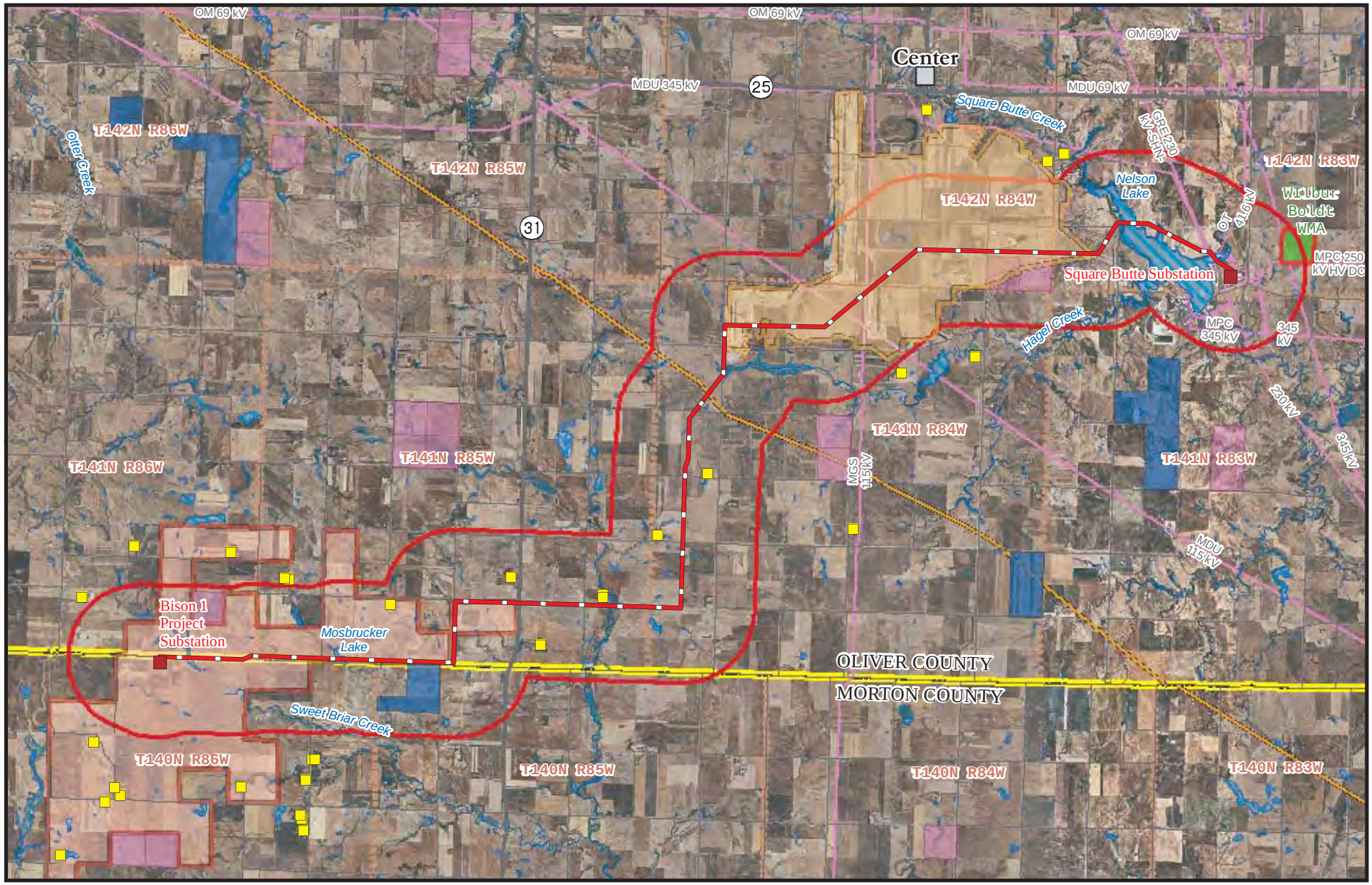

Study Corridor (2.23 miles)
Proposed Transmission Route (230kV)
Substation Location
Existing Transmission Line
Existing Gas Pipeline
Occupied Residence
Bison 1 Wind Farm Project Area
BNI Wind Farm Project Area
State Wildlife Management Area
ND Land Dept. Surface Tracts (NDLD)
Private Lands Open To Sportsmen (PLOTS)
NWI Wetland
County Boundary
Streams
Lakes

Miles
0 0.5 1 2 3

Figure 2: Corridor Exclusion and Avoidance Areas
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

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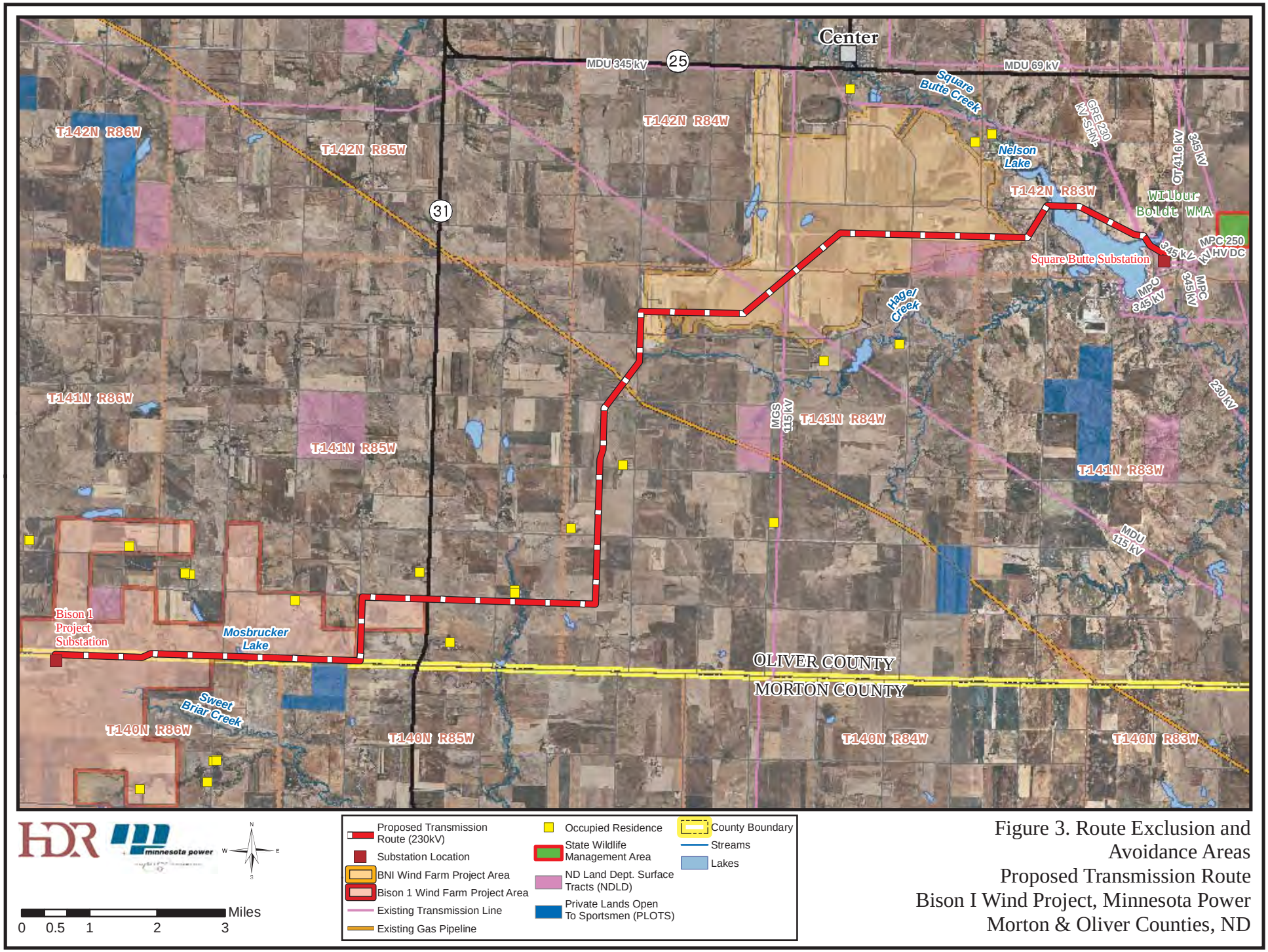

Figure 3. Route Exclusion and Avoidance Areas
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

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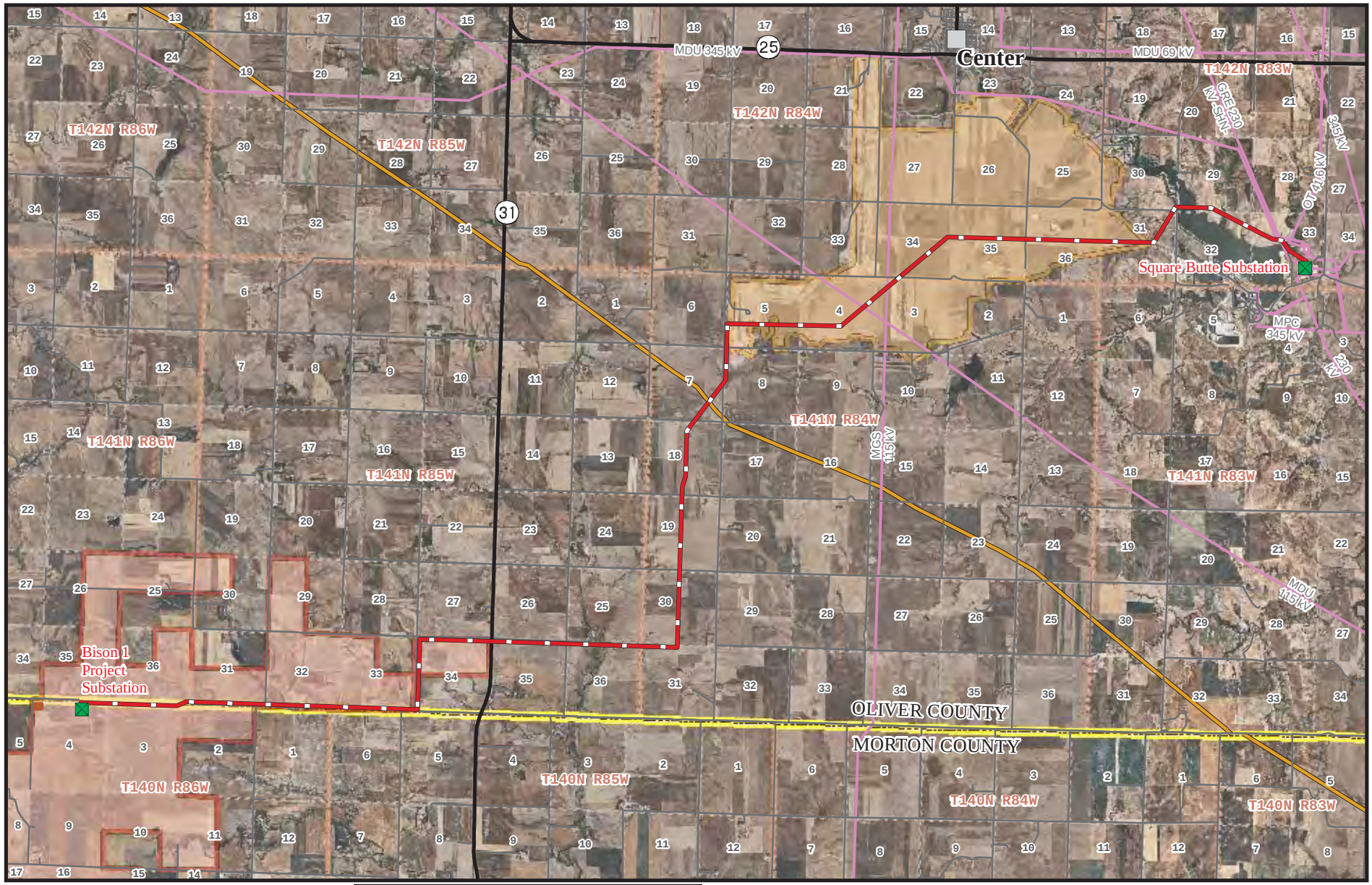

Substation Location
Proposed Transmission Route (230kV)
BNI Wind Farm Project Area
Existing Transmission Line
Existing Gas Pipeline
Bison 1 Wind Farm Project Area
OM Facility
County Boundary

Miles
0 0.5 1 2 3

Figure 4. Project Location Map
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

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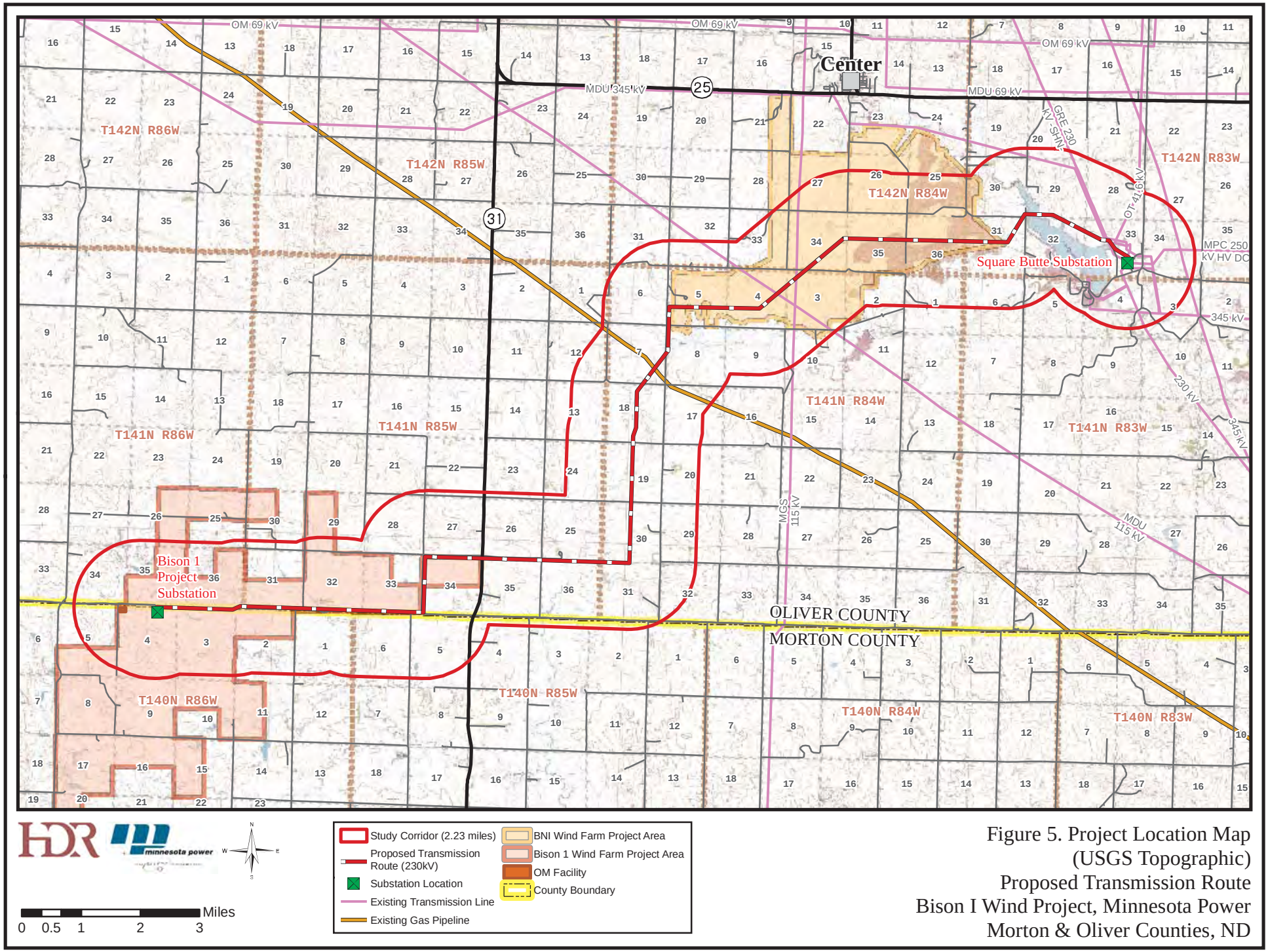

Figure 5. Project Location Map
(USGS Topographic)
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

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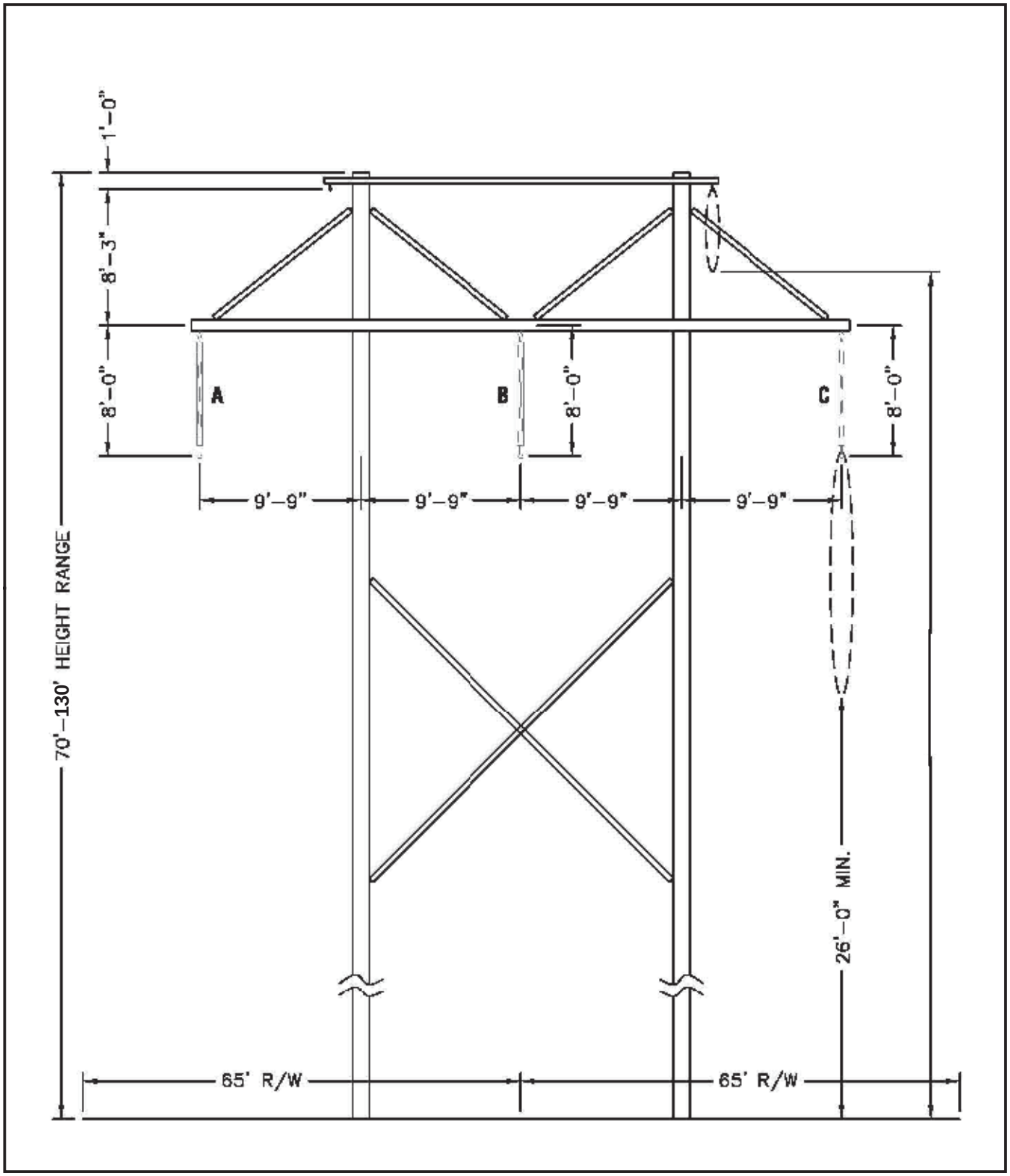

Figure 6. 230 kV Pole Type Drawing
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

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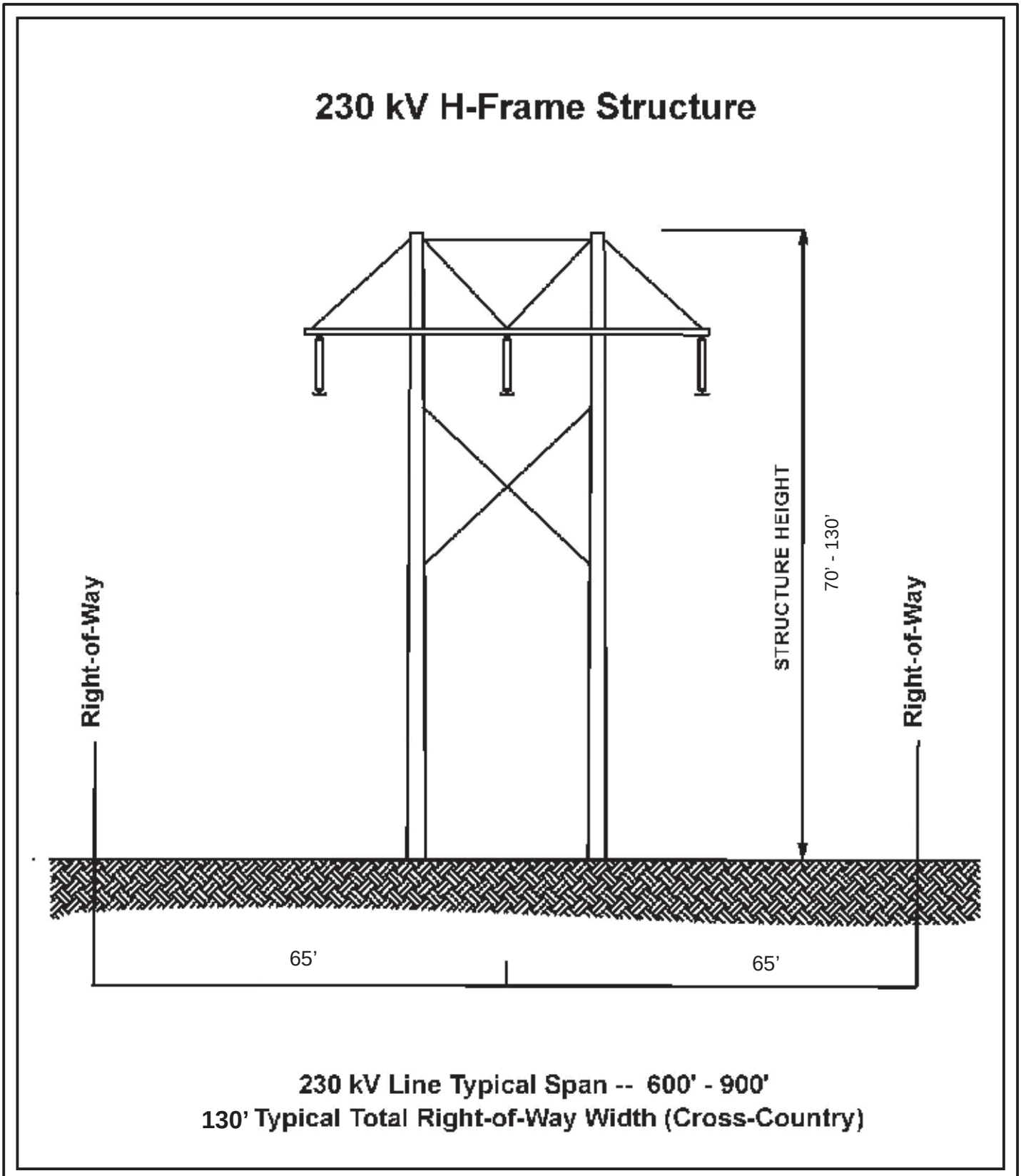

Figure 7. Right of Way Requirements
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

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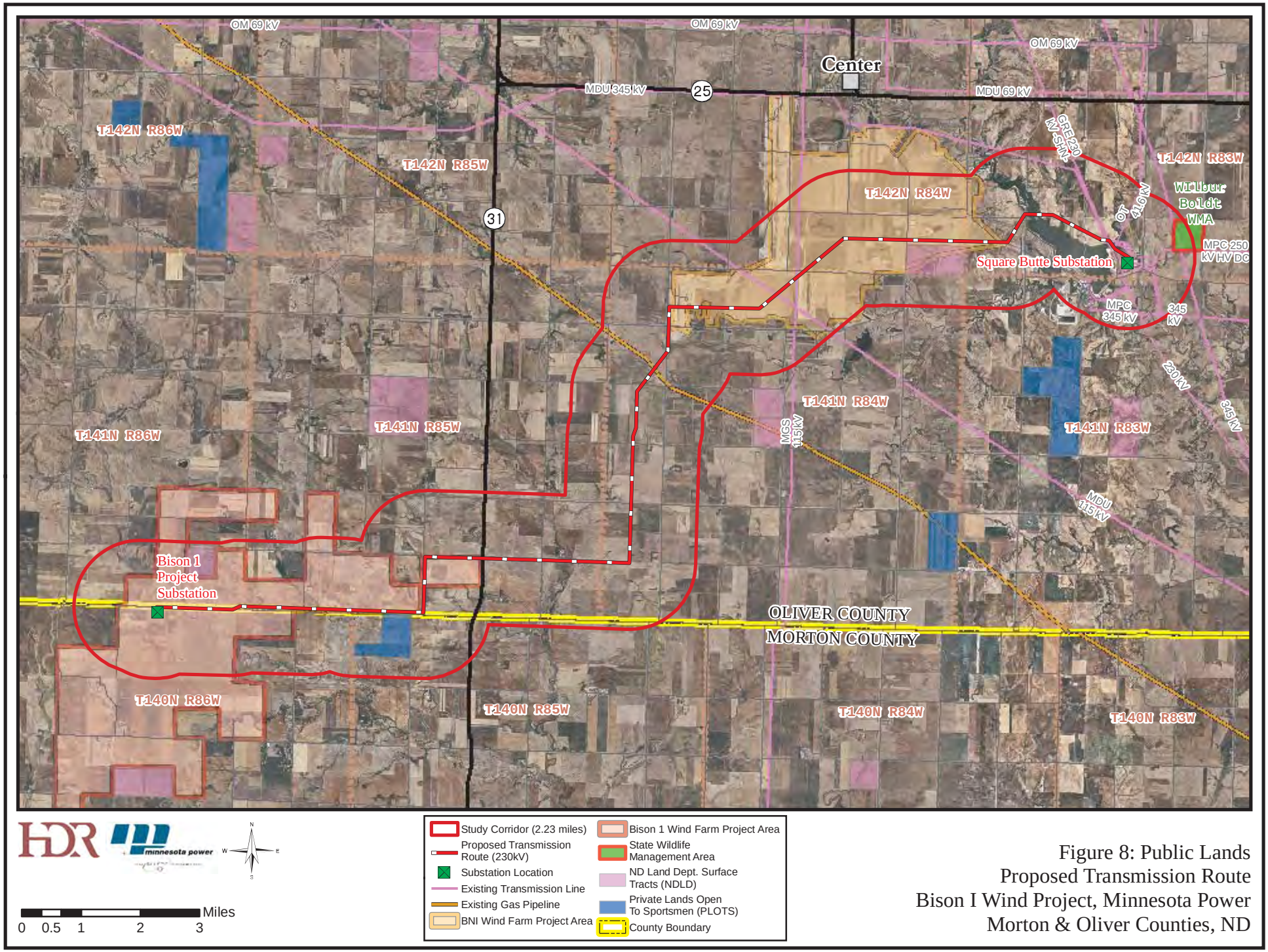

Study Corridor (2.23 miles)
Proposed Transmission Route (230kV)
Substation Location
Existing Transmission Line
Existing Gas Pipeline
BNI Wind Farm Project Area
Bison 1 Wind Farm Project Area
State Wildlife Management Area
ND Land Dept. Surface Tracts (NDLD)
Private Lands Open To Sportsmen (PLOTS)
County Boundary

0 0.5 1 2 3 Miles

Figure 8: Public Lands
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

Map Document: (\\mspe-gis-file\GISProj\MinnPower\106316\map_docs\mxd\OHTRouteApp\Fig8-Public Lands & USFWS Easements.mxd)
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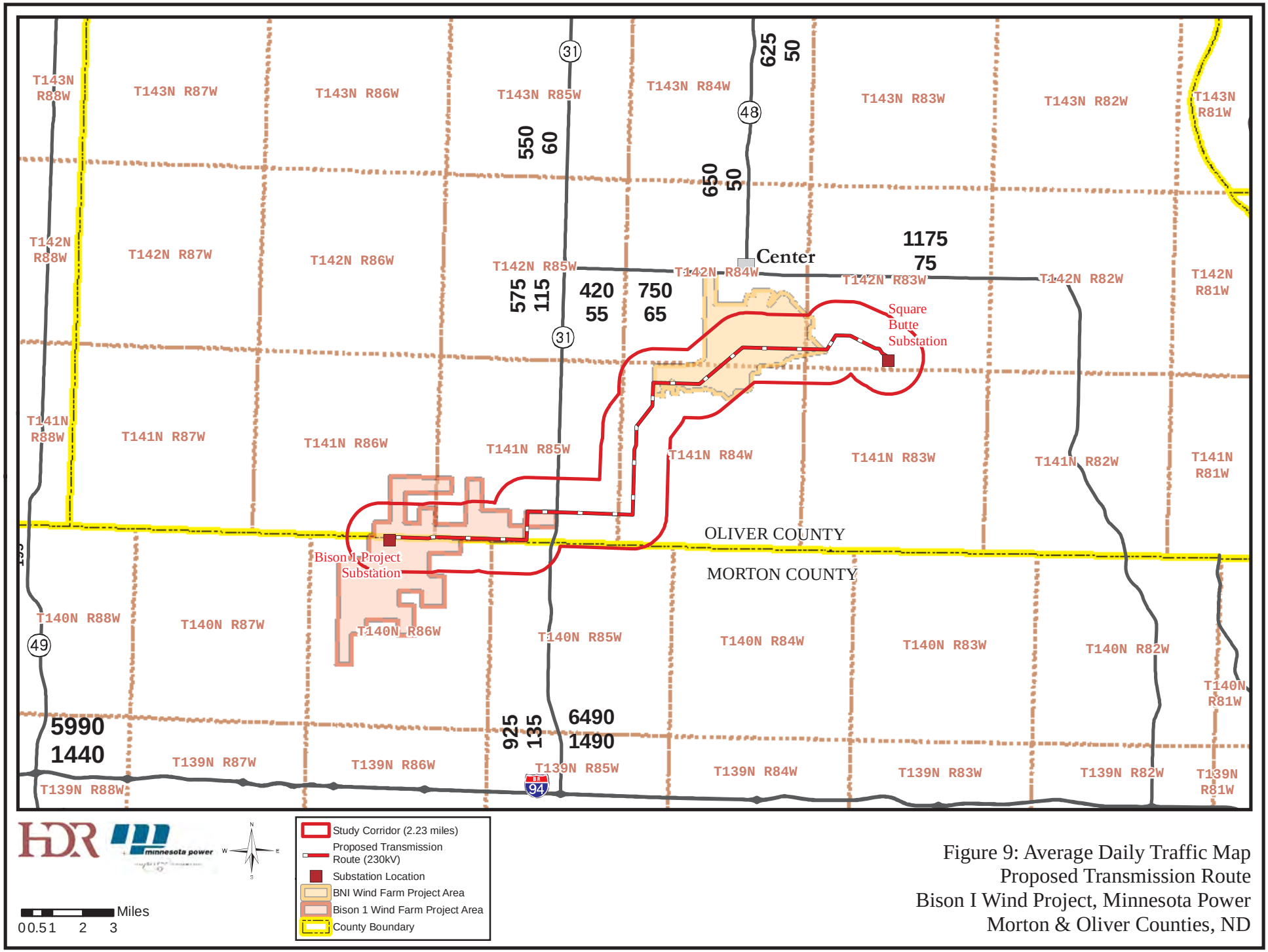

Figure 9: Average Daily Traffic Map
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

Map Document: (\\mspe-gis-file\GISProj\MinnPower\106316\map_docs\mxd\OHTRouteApp\Fig9-AverageDailyTrafficMap.mxd)
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Figure 10: Existing Environment
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

Map Document: (\\mspe-gis-file\GISProj\MinnPower\106316\map_docs\mxd\OHTRouteApp\Fig10-Existing Environment.mxd)
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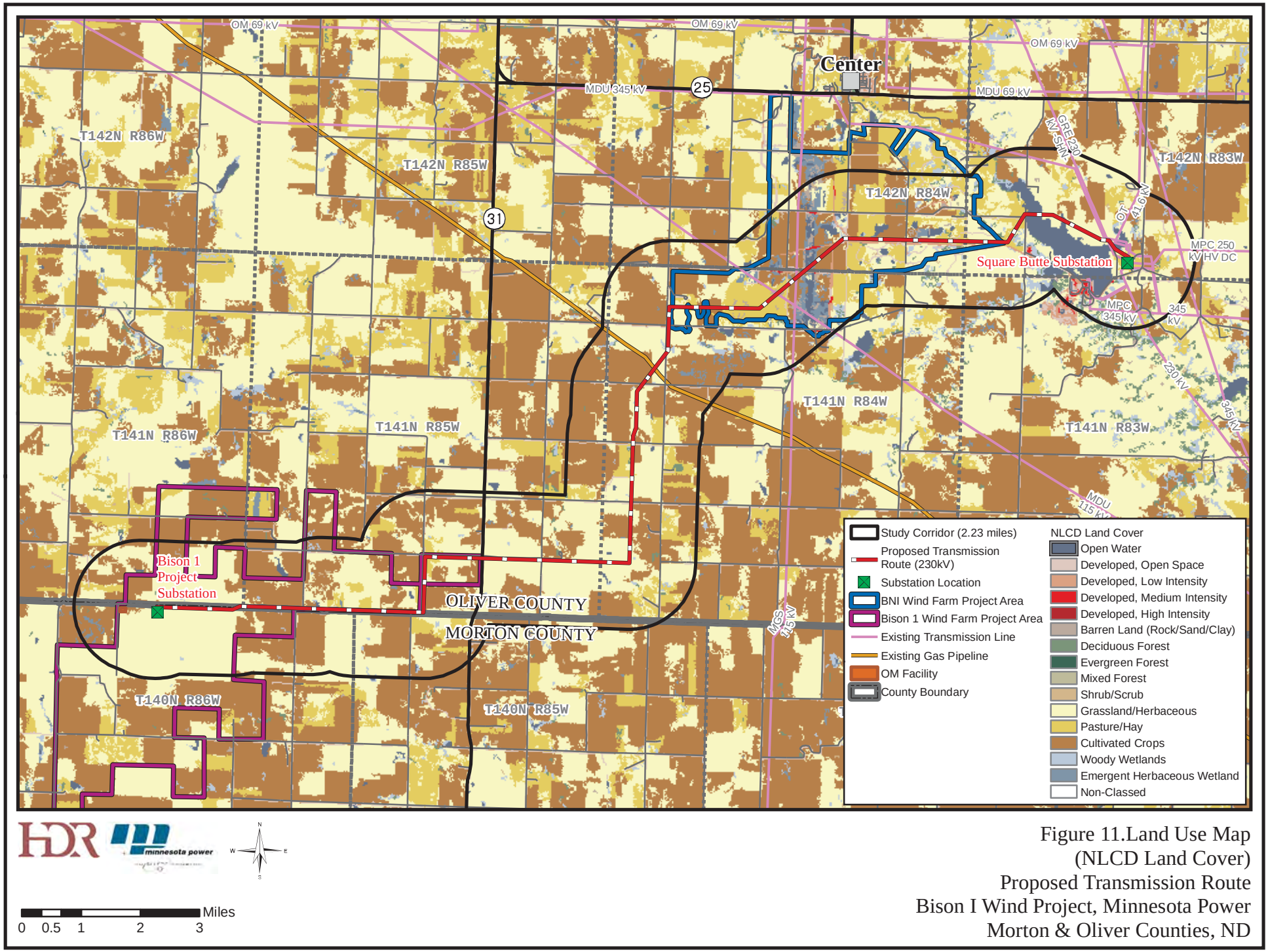

Figure 11.Land Use Map
(NLCD Land Cover)
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

Map Document: (\\mspe-gis-file\GISProj\MinnPower\106316\map_docs\mxd\OHTRouteApp\Fig11-LandUseMap.mxd)
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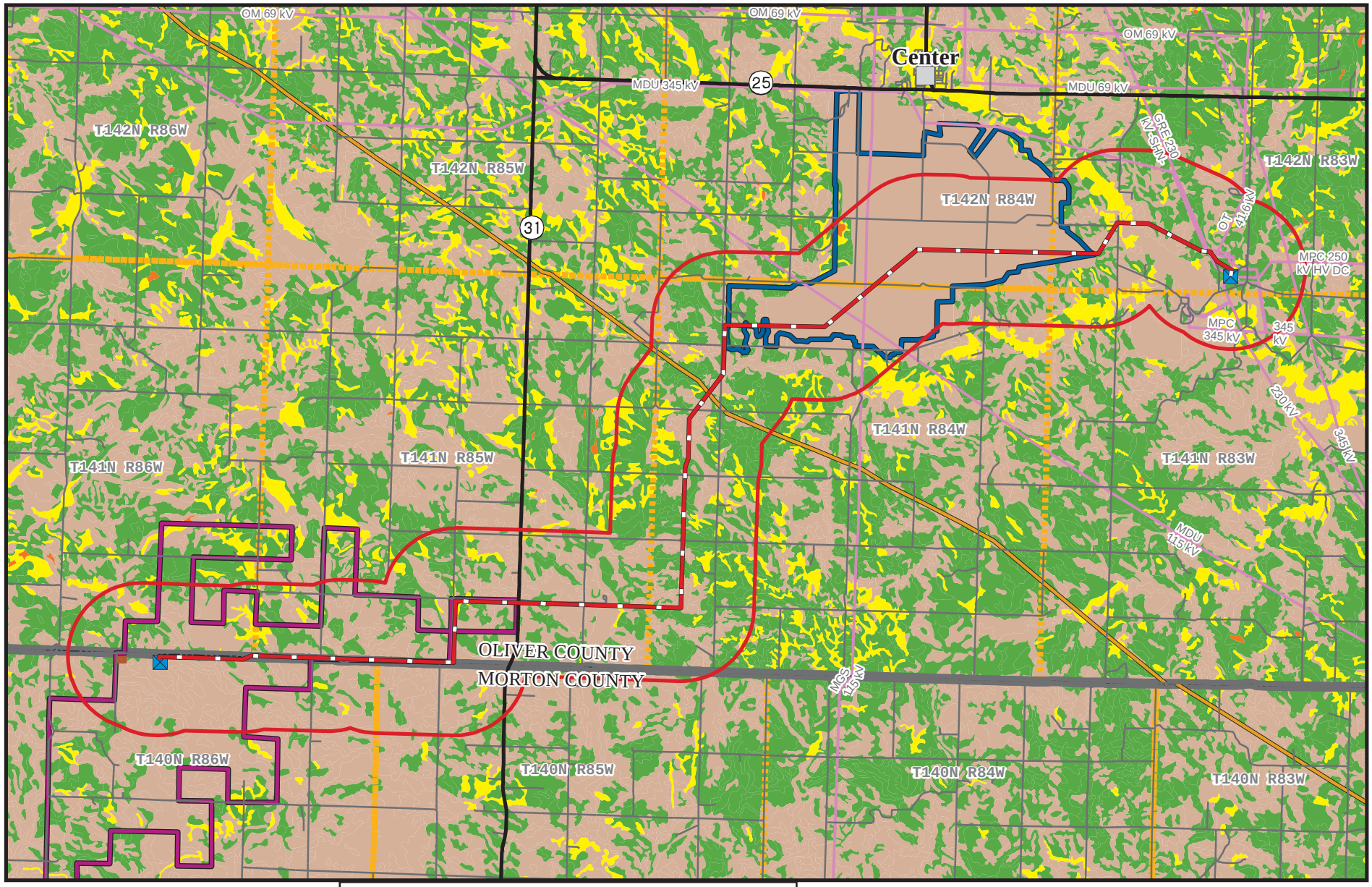

Study Corridor (2.23 miles)
Proposed Transmission Route (230kV)
Substation Location
BNI Wind Farm Project Area
Bison 1 Wind Farm Project Area
OM Facility
Existing Transmission Line
Existing Gas Pipeline

Ssurgo Soil Data
Prime Farmland
Farmland of statewide importance
Prime farmland if drained
Not prime farmland

Miles
0 0.5 1 2 3

Figure 12. Soil Distribution Map
(Ssurgo Soil Data)
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

Map Document: (\\mspe-gis-file\GISProj\MinnPower\106316\map_docs\mxd\OHTRouteApp\Fig12-Ssurgo Soil Map.mxd)
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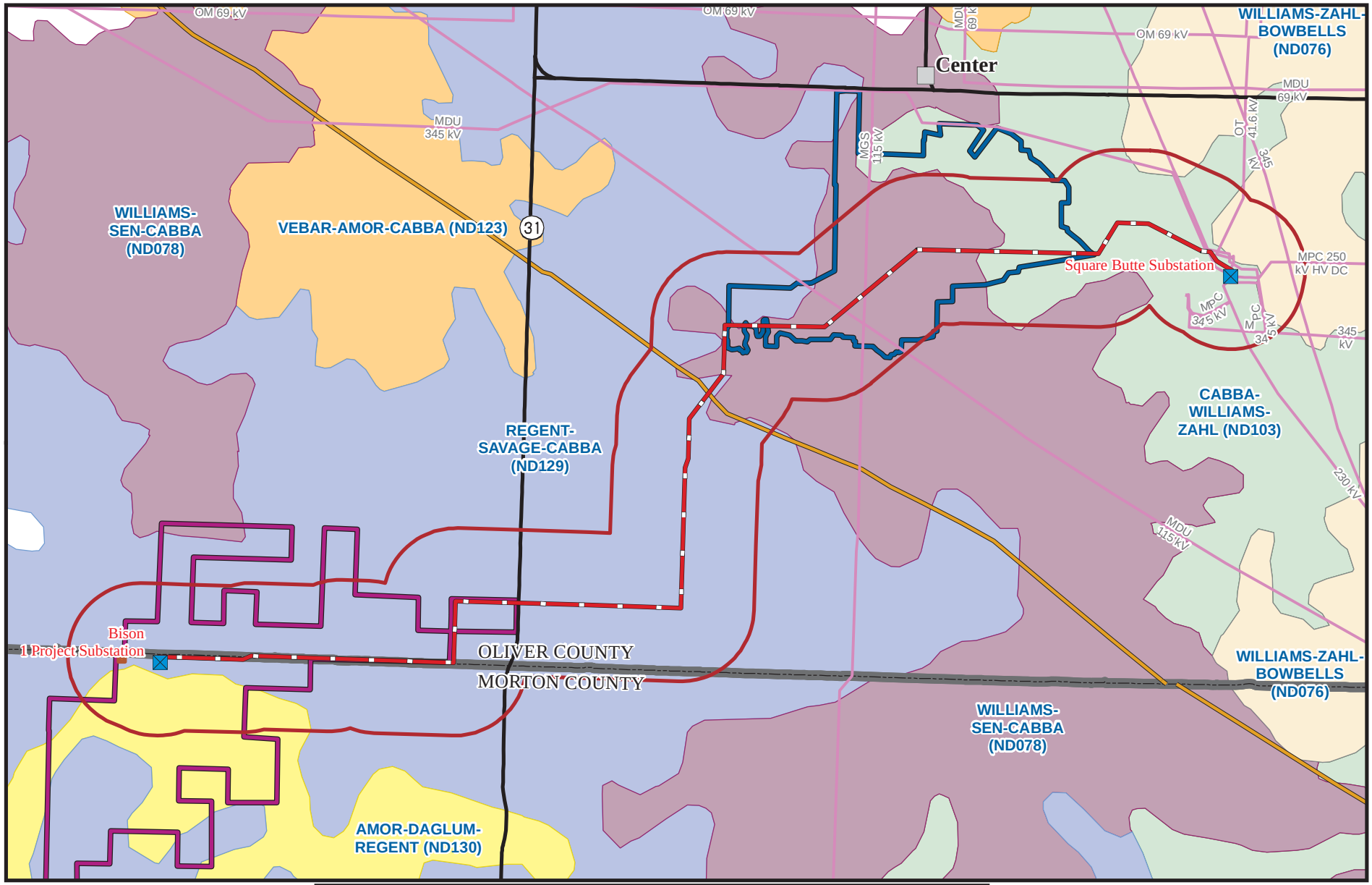

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Study Corridor (2.23 miles)
Proposed Transmission Route (230kV)
Substation Location
BNI Wind Farm Project Area
Bison 1 Wind Farm Project Area
OM Facility

Statsgo Soil Data
AMOR-DAGLUM-REGENT (ND130)
CABBA-WILLIAMS-ZAHL (ND103)
REGENT-SAVAGE-CABBA (ND129)
VEBAR-AMOR-CABBA (ND123)
WILLIAMS-SEN-CABBA (ND078)
WILLIAMS-ZAHL-BOWBELLS (ND076)

Existing Transmission Line
Existing Gas Pipeline

Figure 13. State Soils Associations Map
(Statsgo Soil Data)
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

Map Document: (\\mspe-gis-file\GISProj\MinnPower\106316\map_docs\mxd\OHTRouteApp\Fig13-Statsgo Soil Map.mxd)
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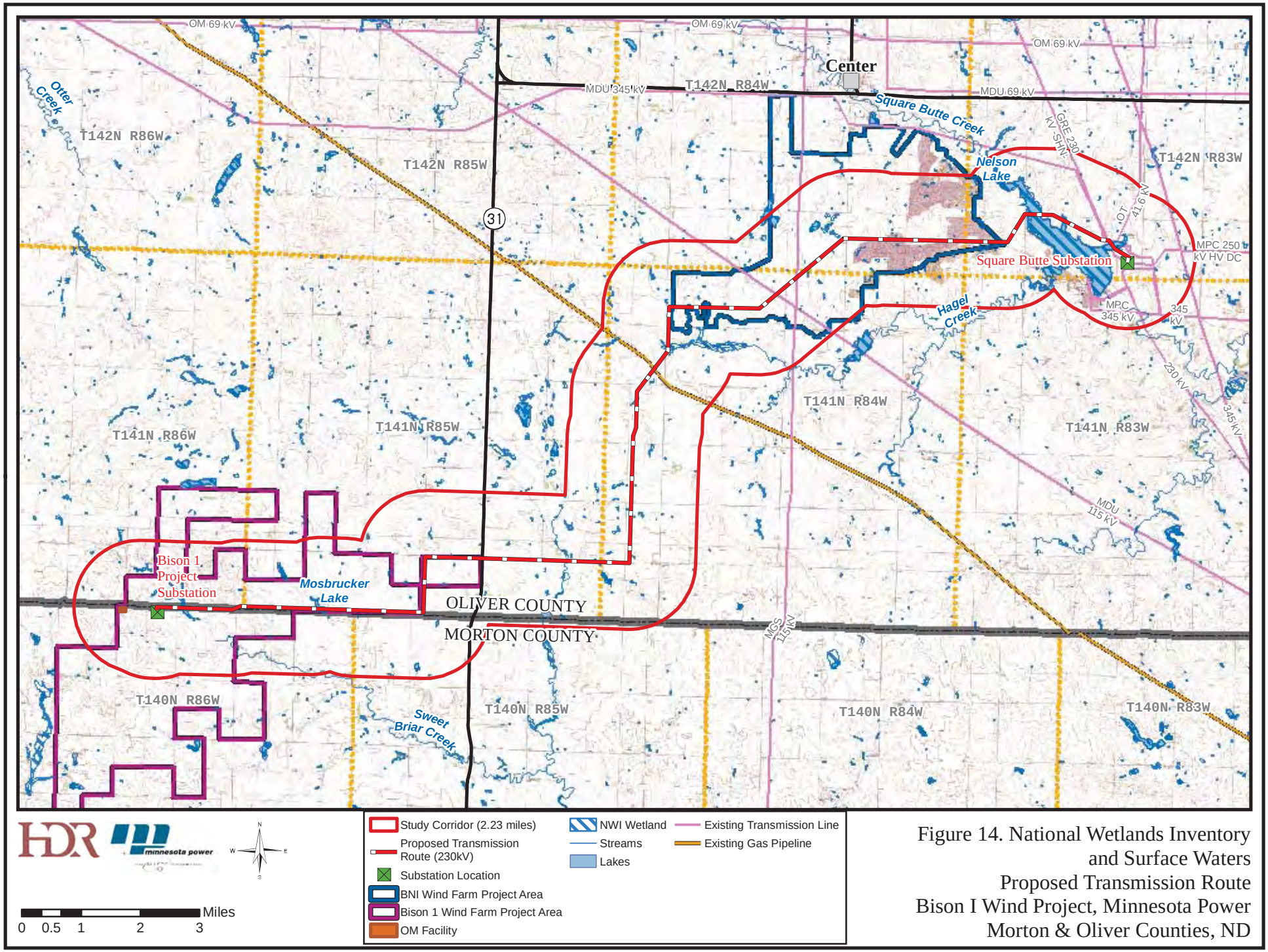

Figure 14. National Wetlands Inventory and Surface Waters
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

Map Document: (\\mspe-gis-file\GISProj\MinnPower\106316\map_docs\mxd\OHTRouteApp\Fig14-NWI and Surface Waters.mxd)
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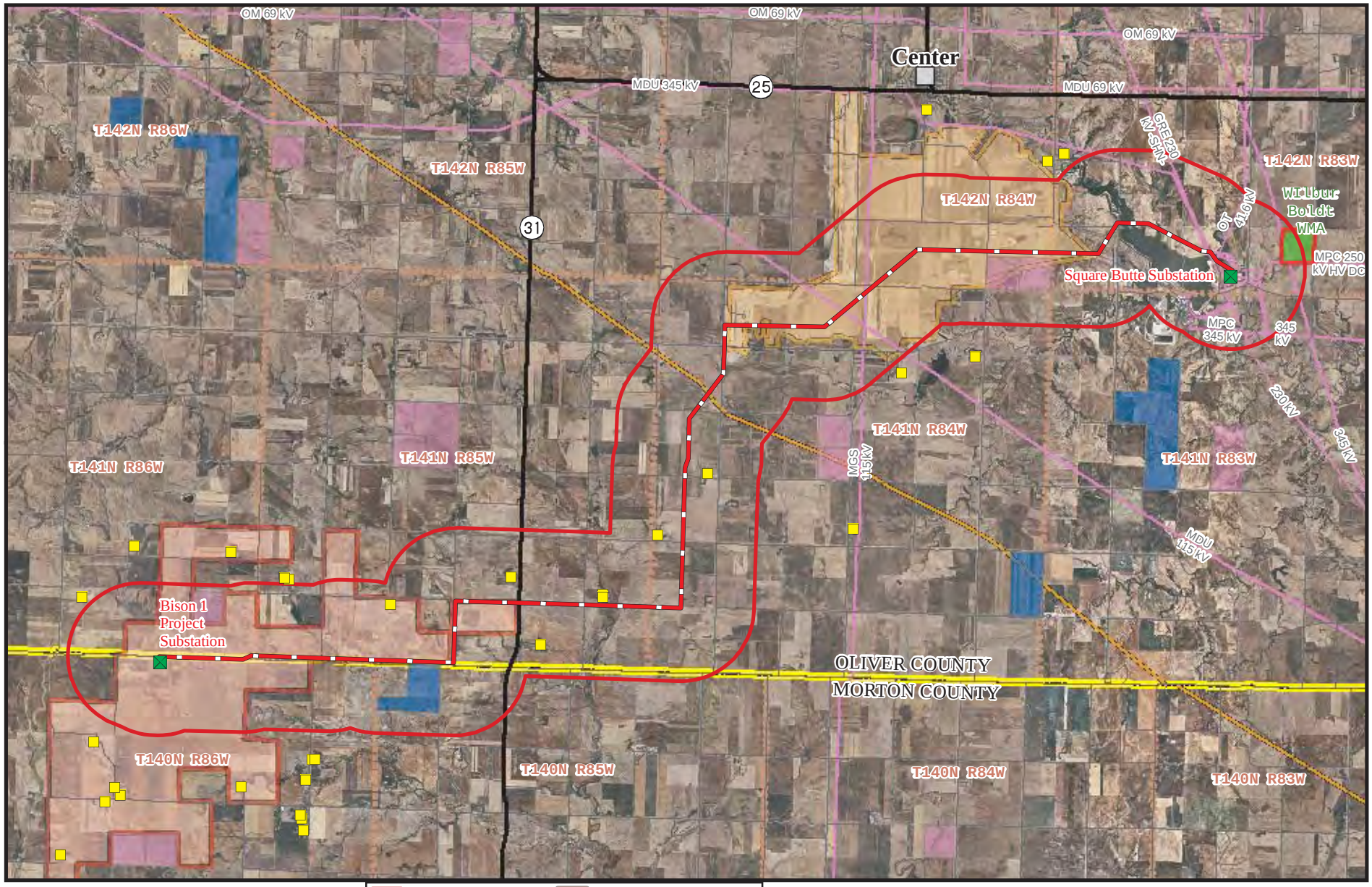

Study Corridor (2.23 miles)
Proposed Transmission Route (230kV)
Substation Location
Existing Transmission Line
Existing Gas Pipeline
Occupied Residence
BNI Wind Farm Project Area
Bison 1 Wind Farm Project Area
State Wildlife Management Area
ND Land Dept. Surface Tracts (NDLD)
Private Lands Open To Sportsmen (PLOTS)
County Boundary

Miles
0 0.5 1 2 3

Figure 15: Public Lands Potentially Available for Recreation
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

Map Document: (\\mspe-gis-file\GISProj\MinnPower\106316\map_docs\mxd\OHTRouteApp\Fig15-Public Lands Potentially Available for Recreation.mxd)
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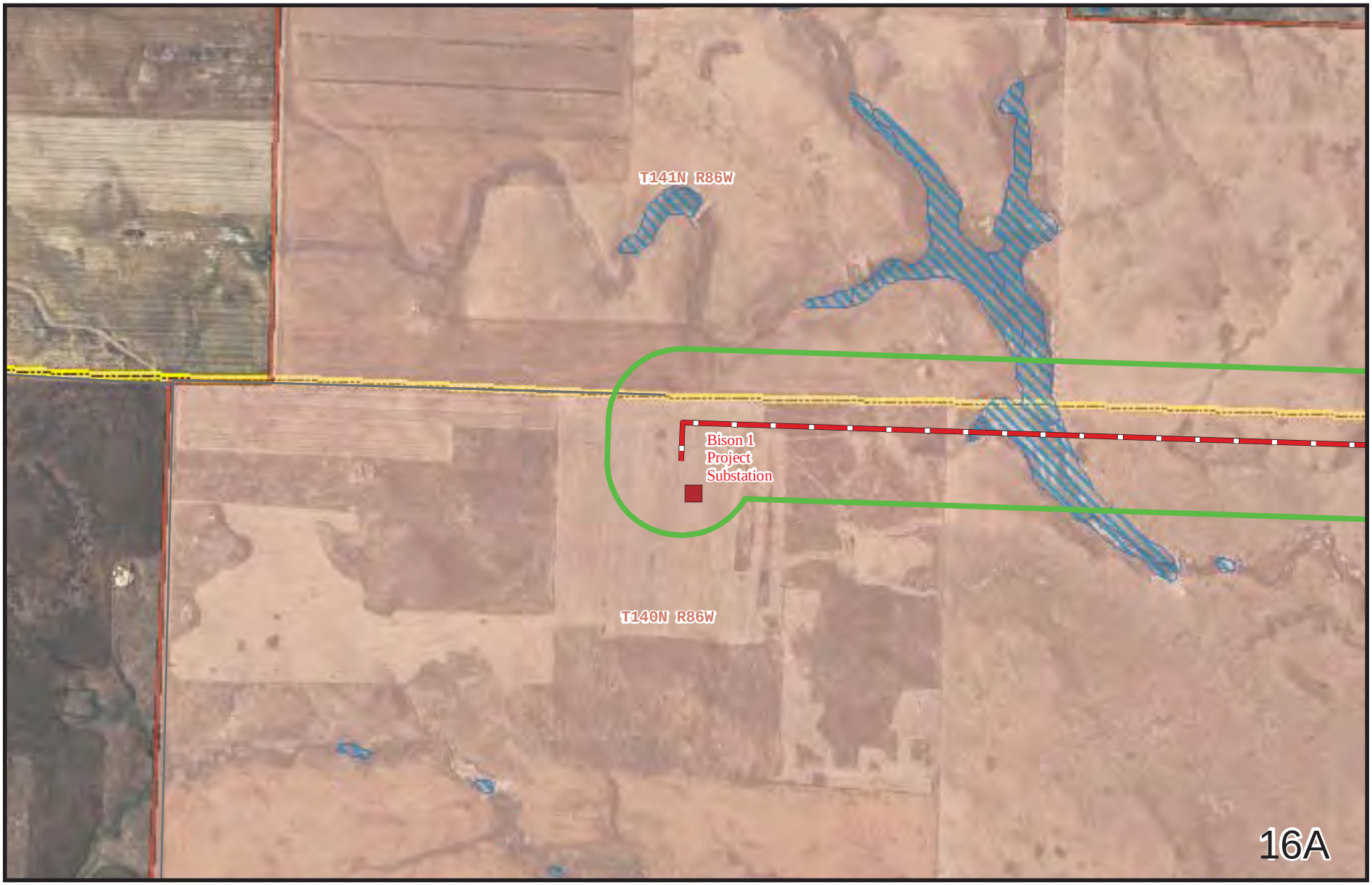

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Proposed Transmission Route (230kV)
Substation Location
BNI Wind Farm Project Area
Bison 1 Wind Farm Project Area
Proposed Transmission Route (1000 Feet)
Occupied Residence
Existing Transmission Line
Existing Gas Pipeline
NWI Wetland
Streams
Lakes
County Boundary

Pole locations will be provided to the PSC in a supplemental filing.

Figure 16. Approximate Pole Location Map
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

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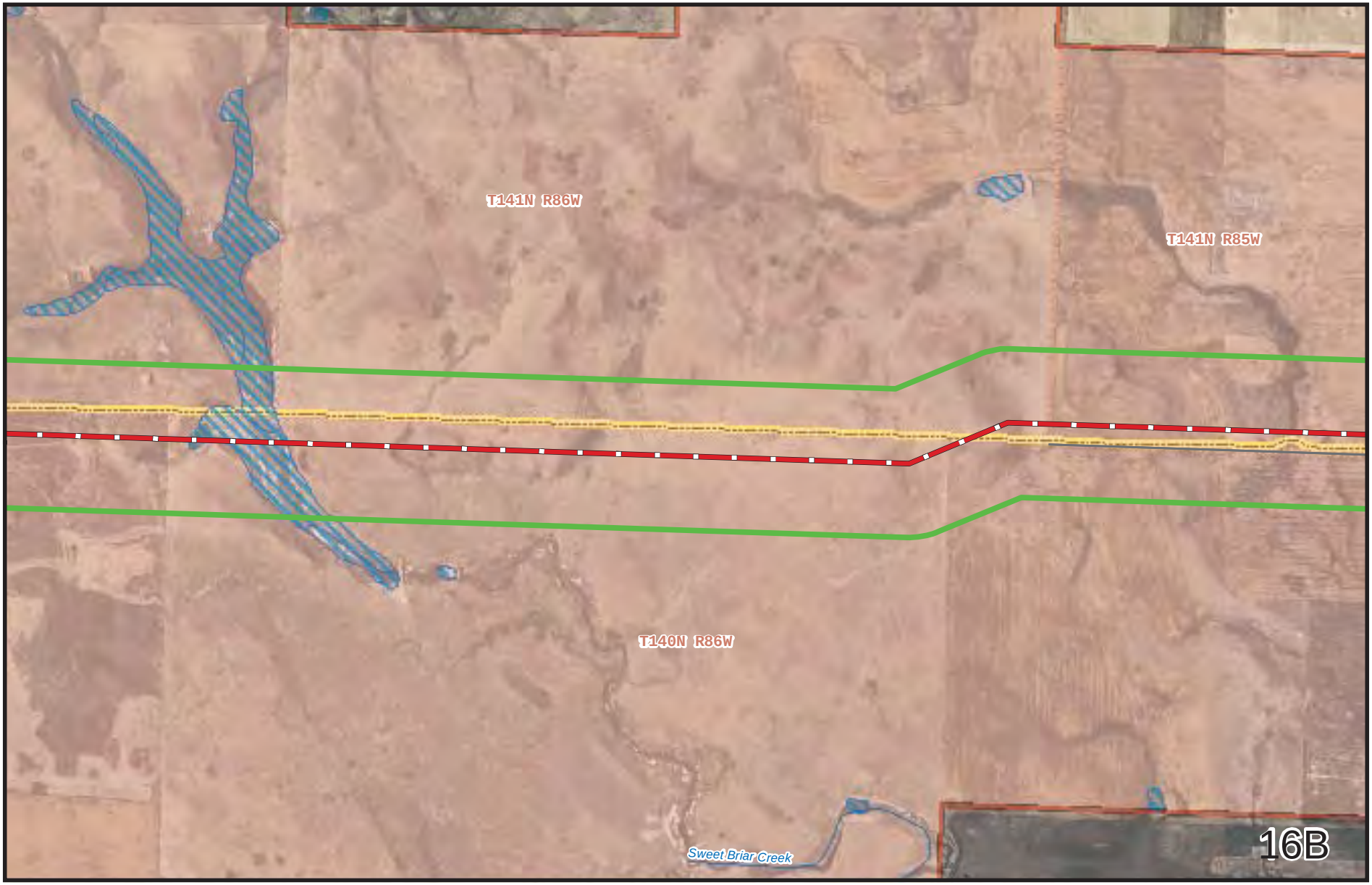

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Proposed Transmission Route (230kV)
Substation Location
BNI Wind Farm Project Area
Bison 1 Wind Farm Project Area
Proposed Transmission Route (1000 Feet)
Occupied Residence
Existing Transmission Line
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Lakes
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Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

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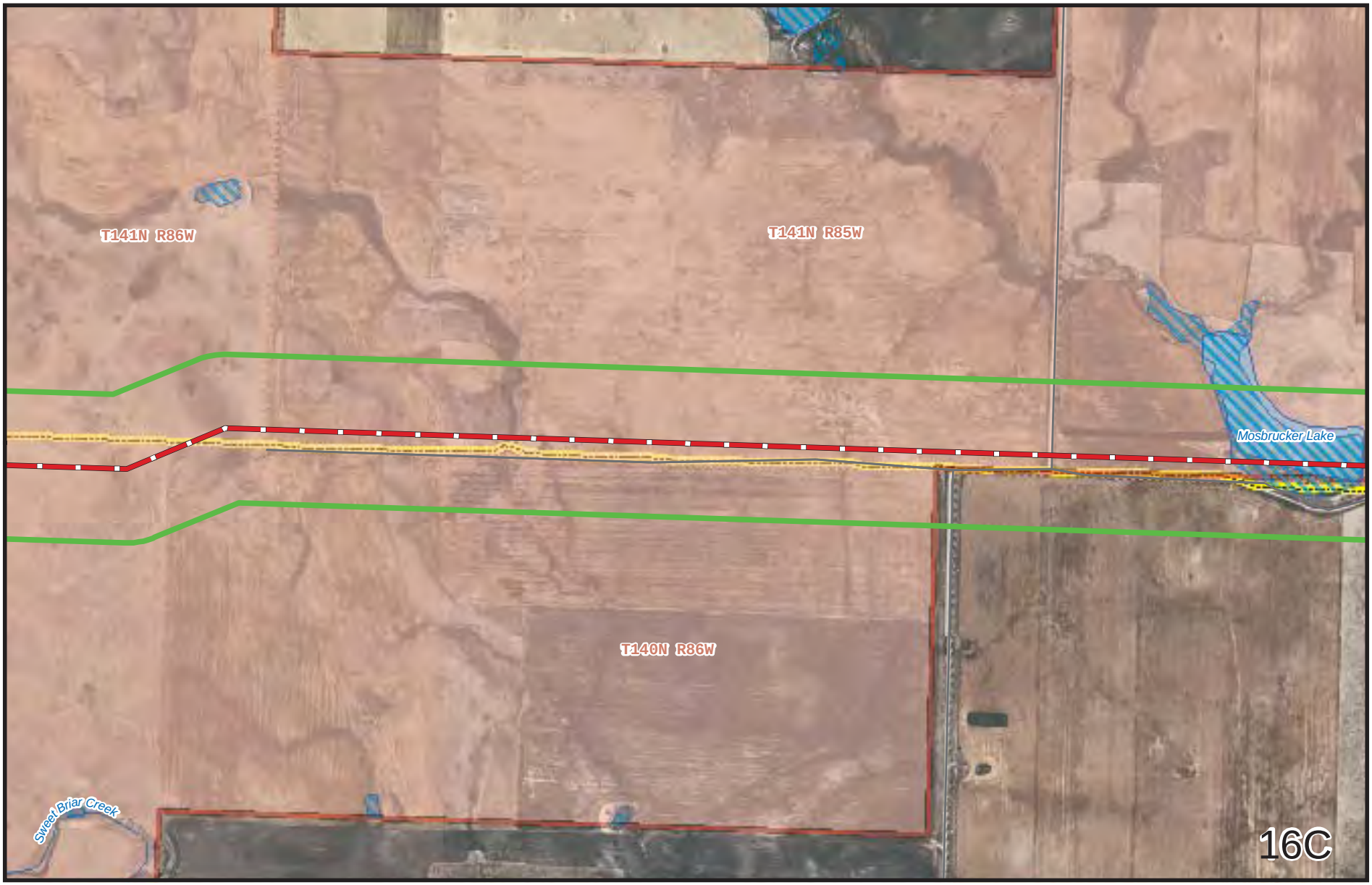

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Proposed Transmission Route (230kV)
Substation Location
BNI Wind Farm Project Area
Bison 1 Wind Farm Project Area
Proposed Transmission Route (1000 Feet)
Occupied Residence
Existing Transmission Line
Existing Gas Pipeline
NWI Wetland
Streams
Lakes
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Figure 16. Approximate Pole Location Map
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

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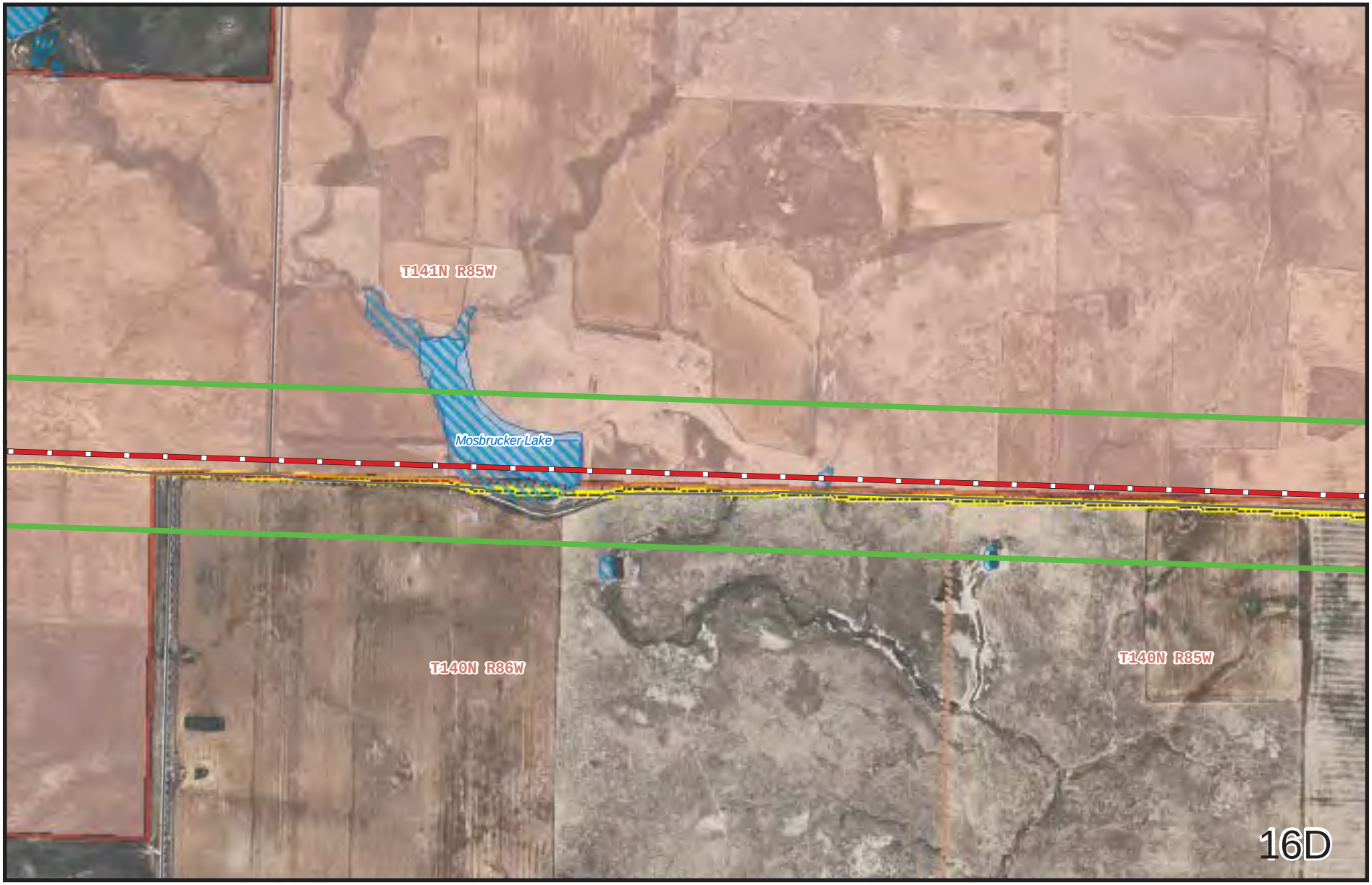

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Proposed Transmission Route (230kV)
Substation Location
BNI Wind Farm Project Area
Bison 1 Wind Farm Project Area
Proposed Transmission Route (1000 Feet)
Occupied Residence
Existing Transmission Line
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Lakes
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Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

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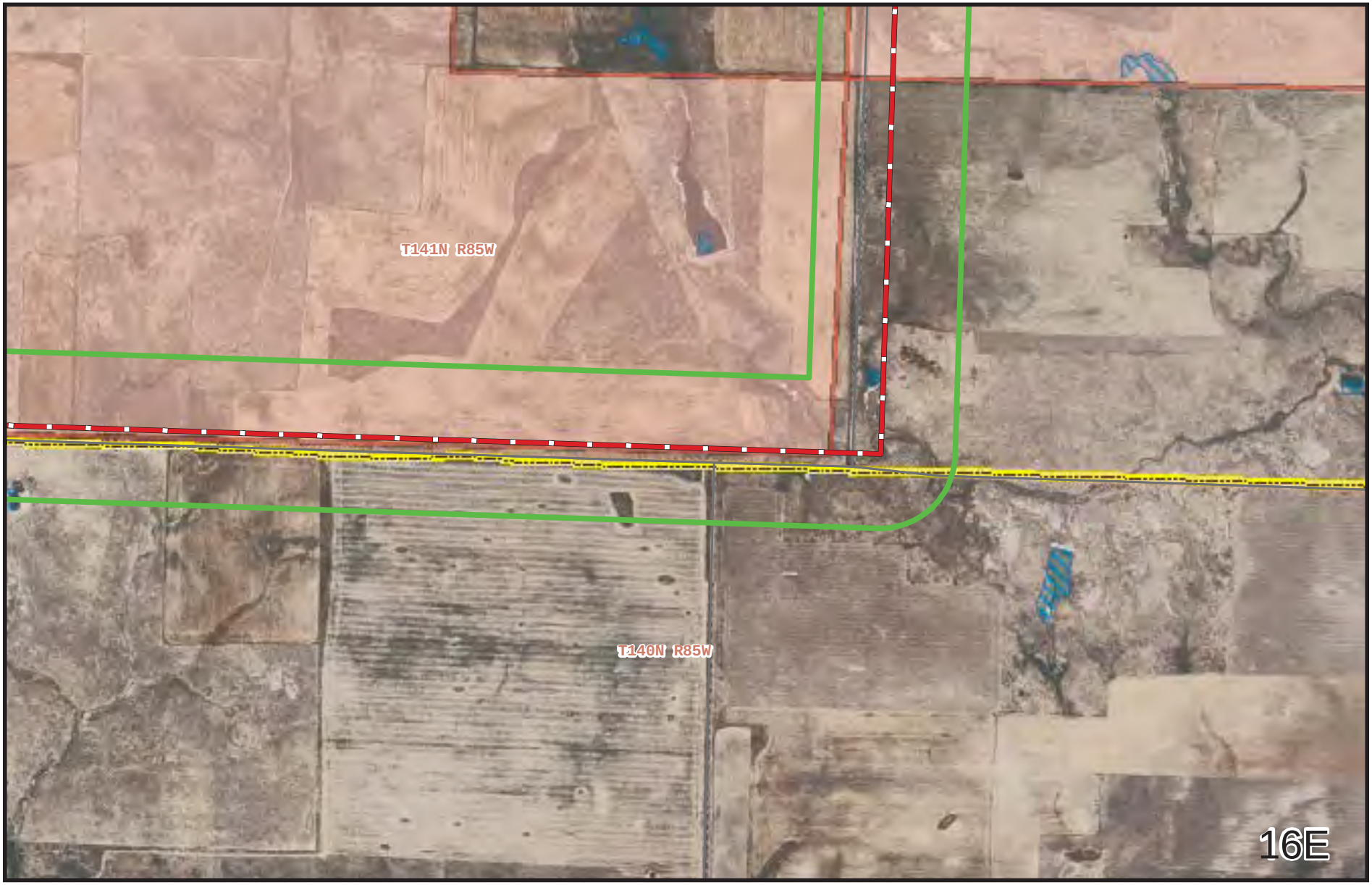

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Proposed Transmission Route (230kV)
Substation Location
BNI Wind Farm Project Area
Bison 1 Wind Farm Project Area
Proposed Transmission Route (1000 Feet)
Occupied Residence
Existing Transmission Line
Existing Gas Pipeline
NWI Wetland
Streams
Lakes
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Figure 16. Approximate Pole Location Map
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

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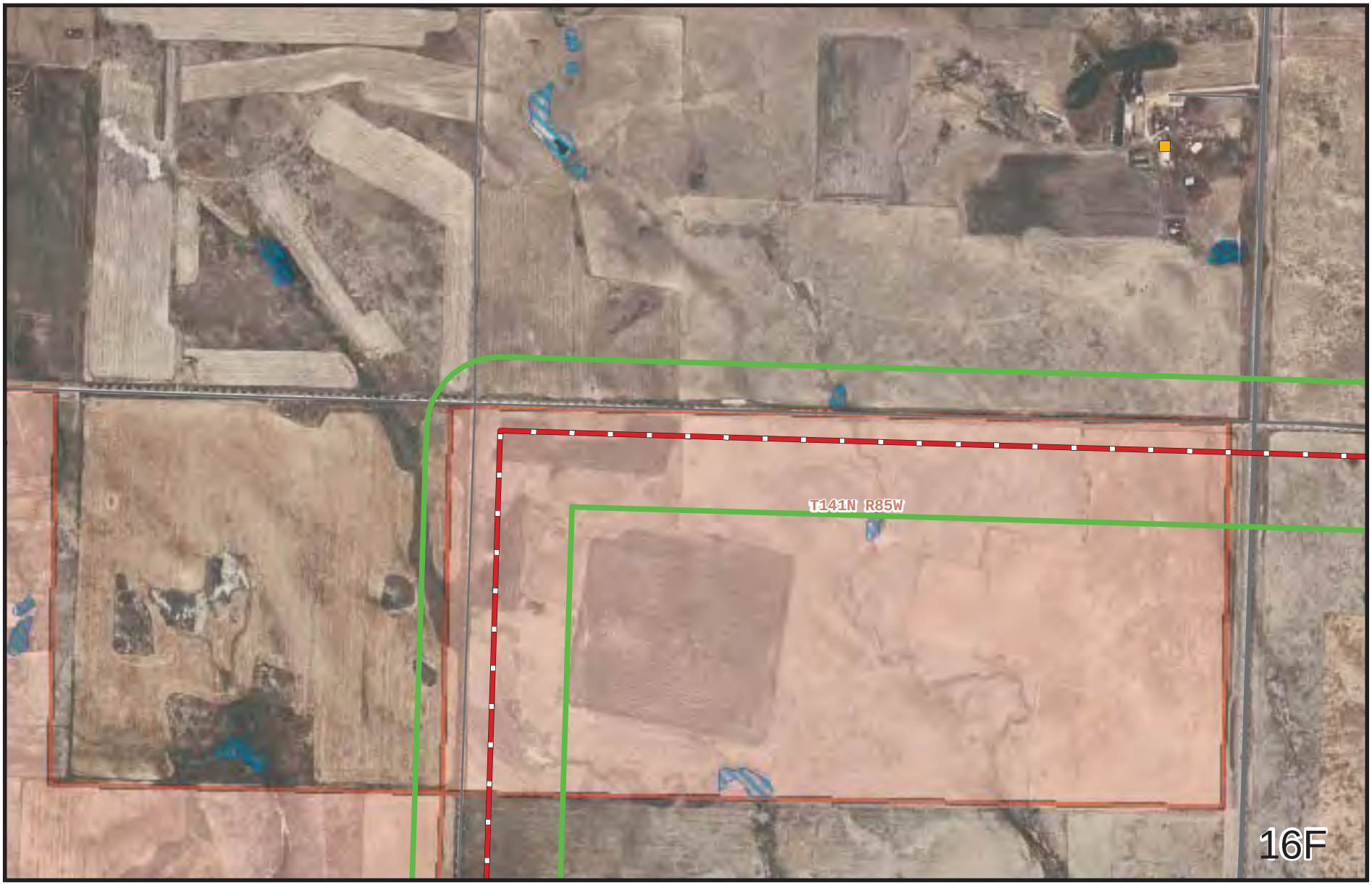

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Proposed Transmission Route (230kV)
Substation Location
BNI Wind Farm Project Area
Bison 1 Wind Farm Project Area
Proposed Transmission Route (1000 Feet)
Occupied Residence
Existing Transmission Line
Existing Gas Pipeline
NWI Wetland
Streams
Lakes
County Boundary

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Figure 16. Approximate Pole Location Map
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

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Proposed Transmission Route (230kV)
Substation Location
BNI Wind Farm Project Area
Bison 1 Wind Farm Project Area
Proposed Transmission Route (1000 Feet)
Occupied Residence
Existing Transmission Line
Existing Gas Pipeline
NWI Wetland
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Lakes
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Figure 16. Approximate Pole Location Map
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

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Proposed Transmission Route (230kV)
Substation Location
BNI Wind Farm Project Area
Bison 1 Wind Farm Project Area
Proposed Transmission Route (1000 Feet)
Occupied Residence
Existing Transmission Line
Existing Gas Pipeline
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Figure 16. Approximate Pole Location Map
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

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Proposed Transmission Route (230kV)
Substation Location
BNI Wind Farm Project Area
Bison 1 Wind Farm Project Area
Proposed Transmission Route (1000 Feet)
Occupied Residence
Existing Transmission Line
Existing Gas Pipeline
NWI Wetland
Streams
Lakes
County Boundary

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Figure 16. Approximate Pole Location Map
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

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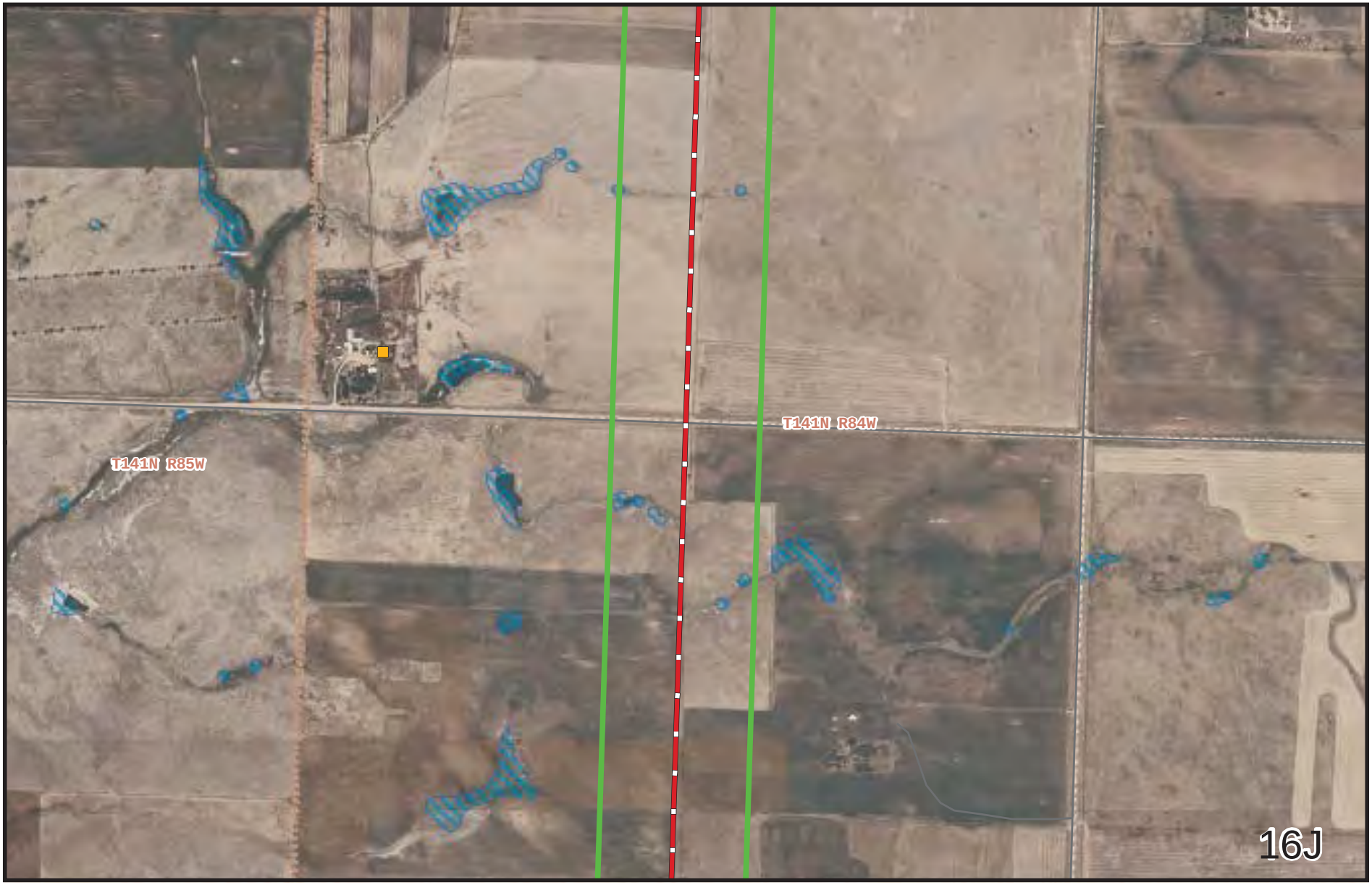

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Proposed Transmission Route (230kV)
Substation Location
BNI Wind Farm Project Area
Bison 1 Wind Farm Project Area
Proposed Transmission Route (1000 Feet)
Occupied Residence
Existing Transmission Line
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NWI Wetland
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Figure 16. Approximate Pole Location Map
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

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Proposed Transmission Route (230kV)
Substation Location
BNI Wind Farm Project Area
Bison 1 Wind Farm Project Area
Proposed Transmission Route (1000 Feet)
Occupied Residence
Existing Transmission Line
Existing Gas Pipeline
NWI Wetland
Streams
Lakes
County Boundary

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Figure 16. Approximate Pole Location Map
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

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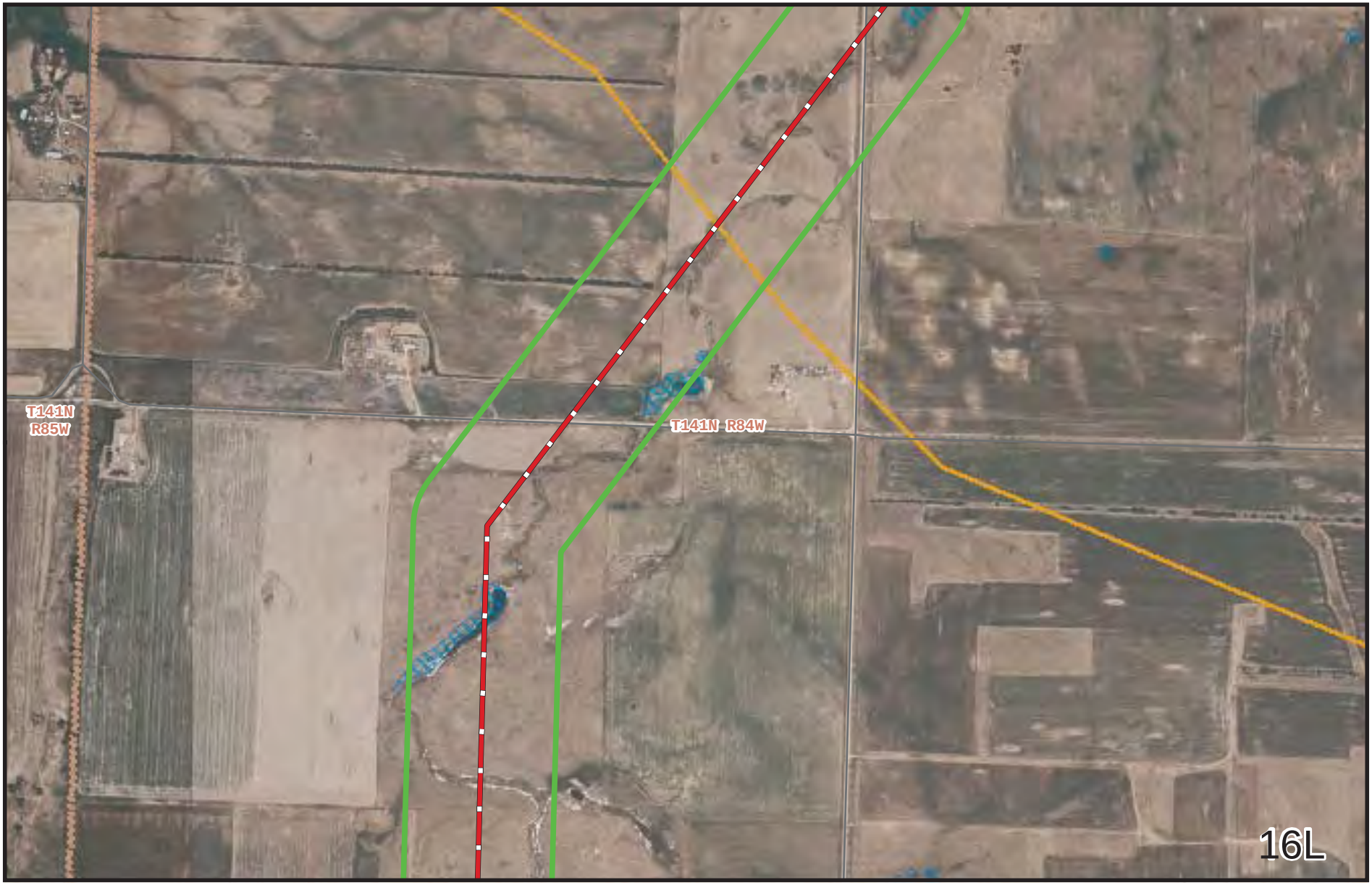

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Proposed Transmission Route (230kV)
Substation Location
BNI Wind Farm Project Area
Bison 1 Wind Farm Project Area
Proposed Transmission Route (1000 Feet)
Occupied Residence
Existing Transmission Line
Existing Gas Pipeline
NWI Wetland
Streams
Lakes
County Boundary

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Figure 16. Approximate Pole Location Map
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

Map Document: (\\mspe-gis-file\GISProj\MinnPower\106316\map_docs\mxd\OHTRouteApp\Fig16-ApproximatePoleLocationMap.mxd)
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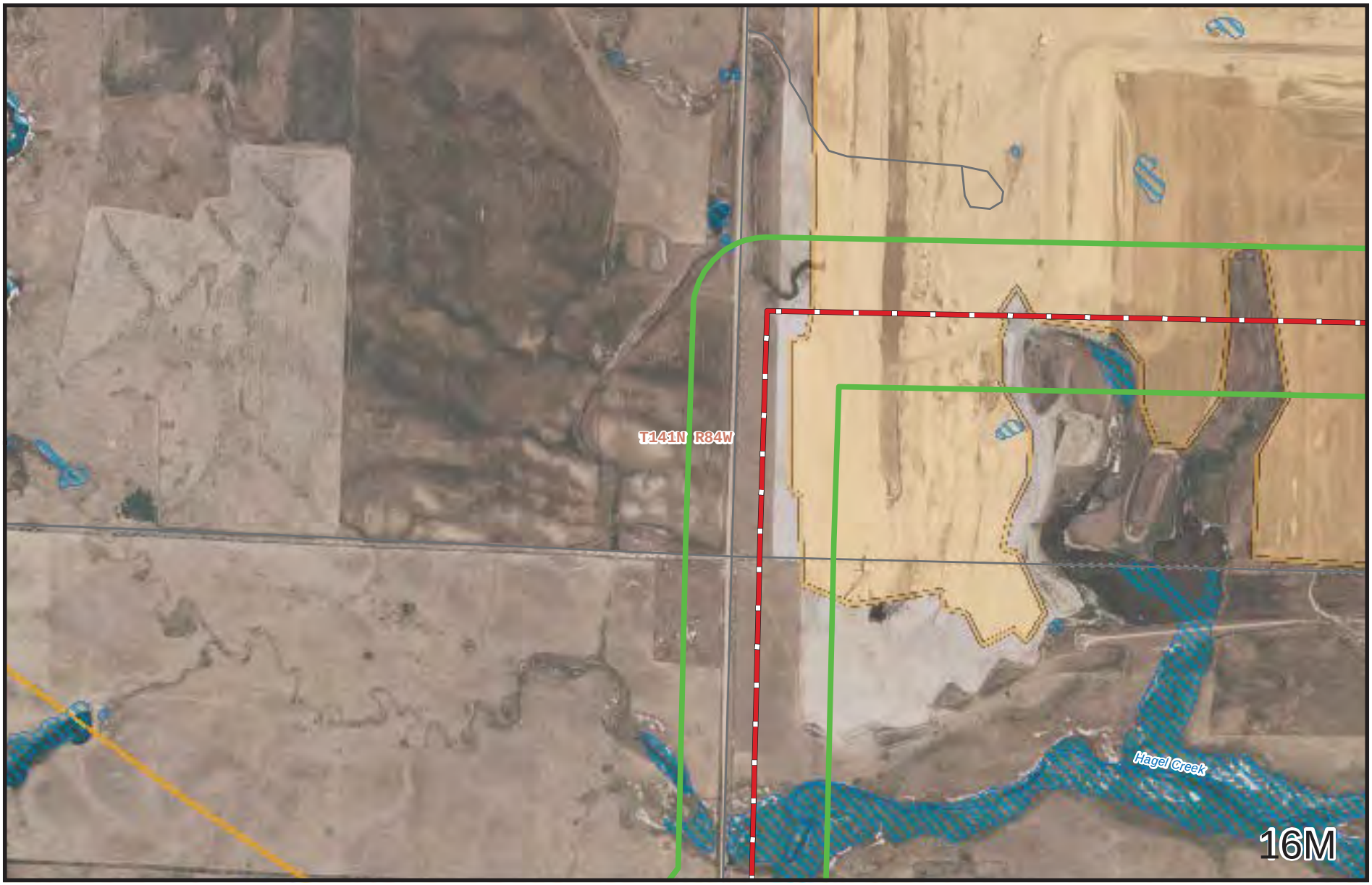

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Proposed Transmission Route (230kV)
Substation Location
BNI Wind Farm Project Area
Bison 1 Wind Farm Project Area
Proposed Transmission Route (1000 Feet)
Occupied Residence
Existing Transmission Line
Existing Gas Pipeline
NWI Wetland
Streams
Lakes
County Boundary

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Figure 16. Approximate Pole Location Map
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

Map Document: (\\msp-gis-file\GISProj\MinnPower\106316\map_docs\mxd\OHTRouteApp\Fig16-ApproximatePoleLocationMap.mxd)
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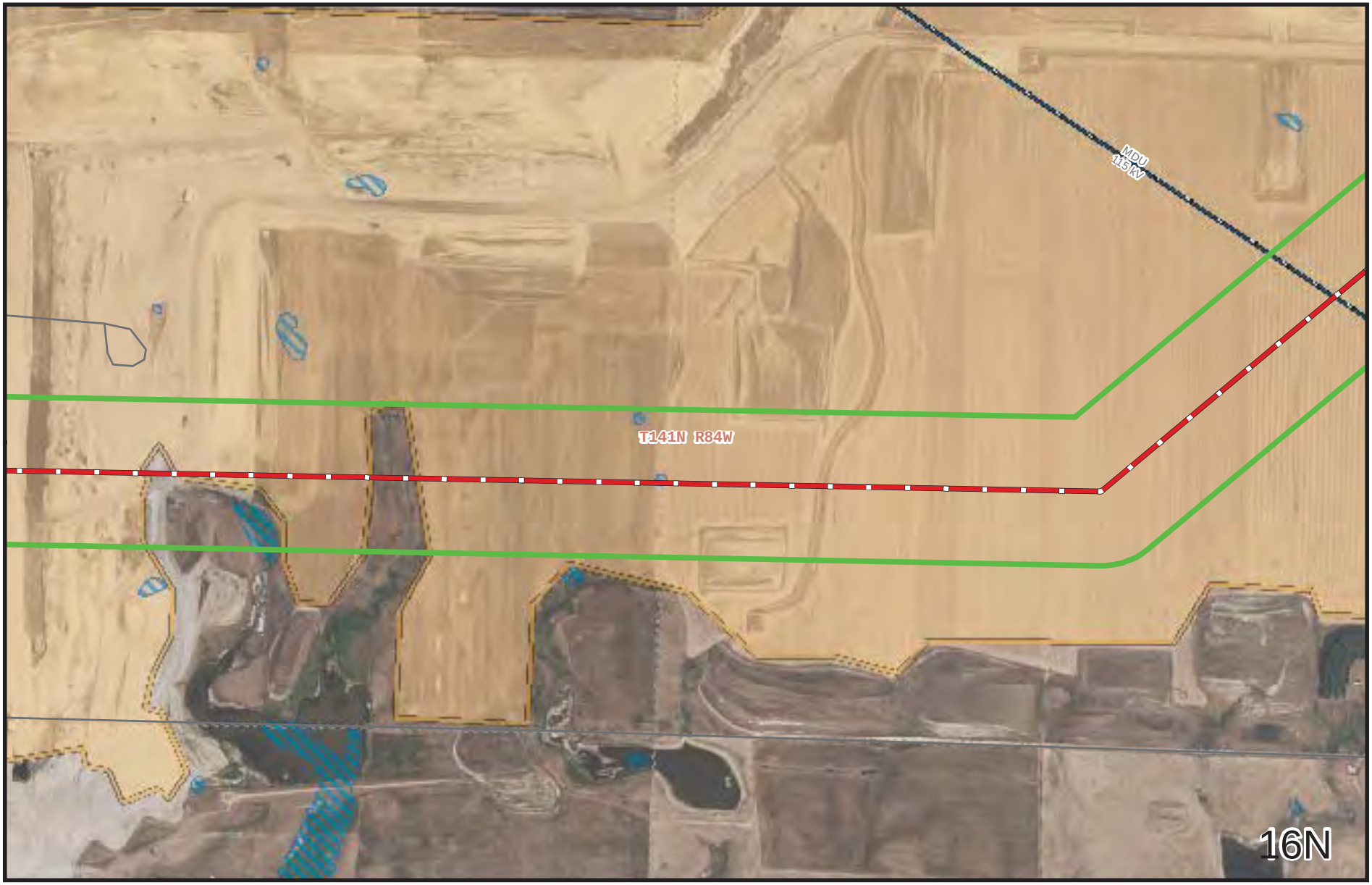

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Proposed Transmission Route (230kV)
Substation Location
BNI Wind Farm Project Area
Bison 1 Wind Farm Project Area
Proposed Transmission Route (1000 Feet)
Occupied Residence
Existing Transmission Line
Existing Gas Pipeline
NWI Wetland
Streams
Lakes
County Boundary

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Figure 16. Approximate Pole Location Map
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

Map Document: (\\mspe-gis-file\GISProj\MinnPower\106316\map_docs\mxd\OHTRouteApp\Fig16-ApproximatePoleLocationMap.mxd)
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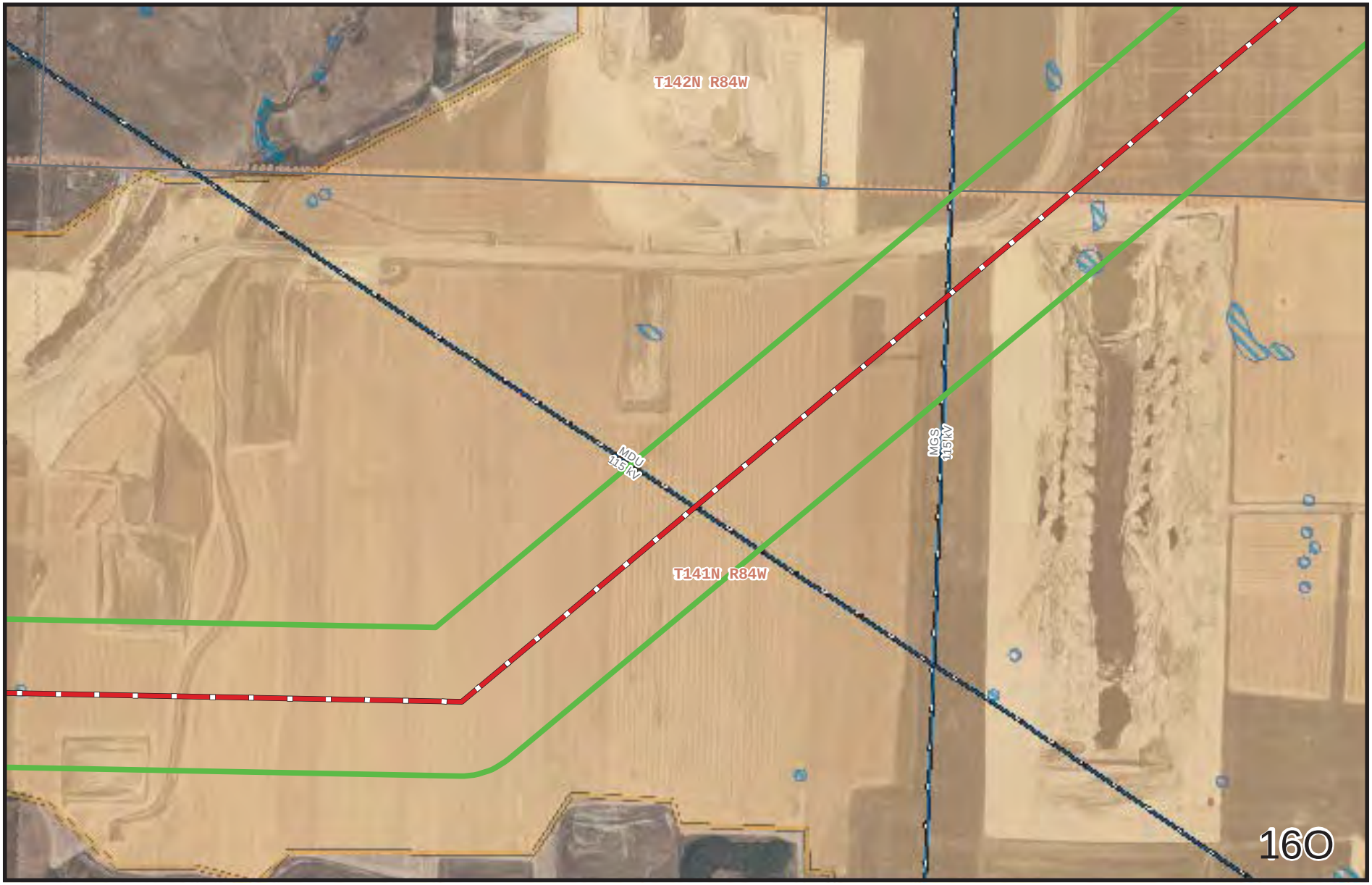

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Proposed Transmission Route (230kV)
Substation Location
BNI Wind Farm Project Area
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Proposed Transmission Route (1000 Feet)
Occupied Residence
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Figure 16. Approximate Pole Location Map
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

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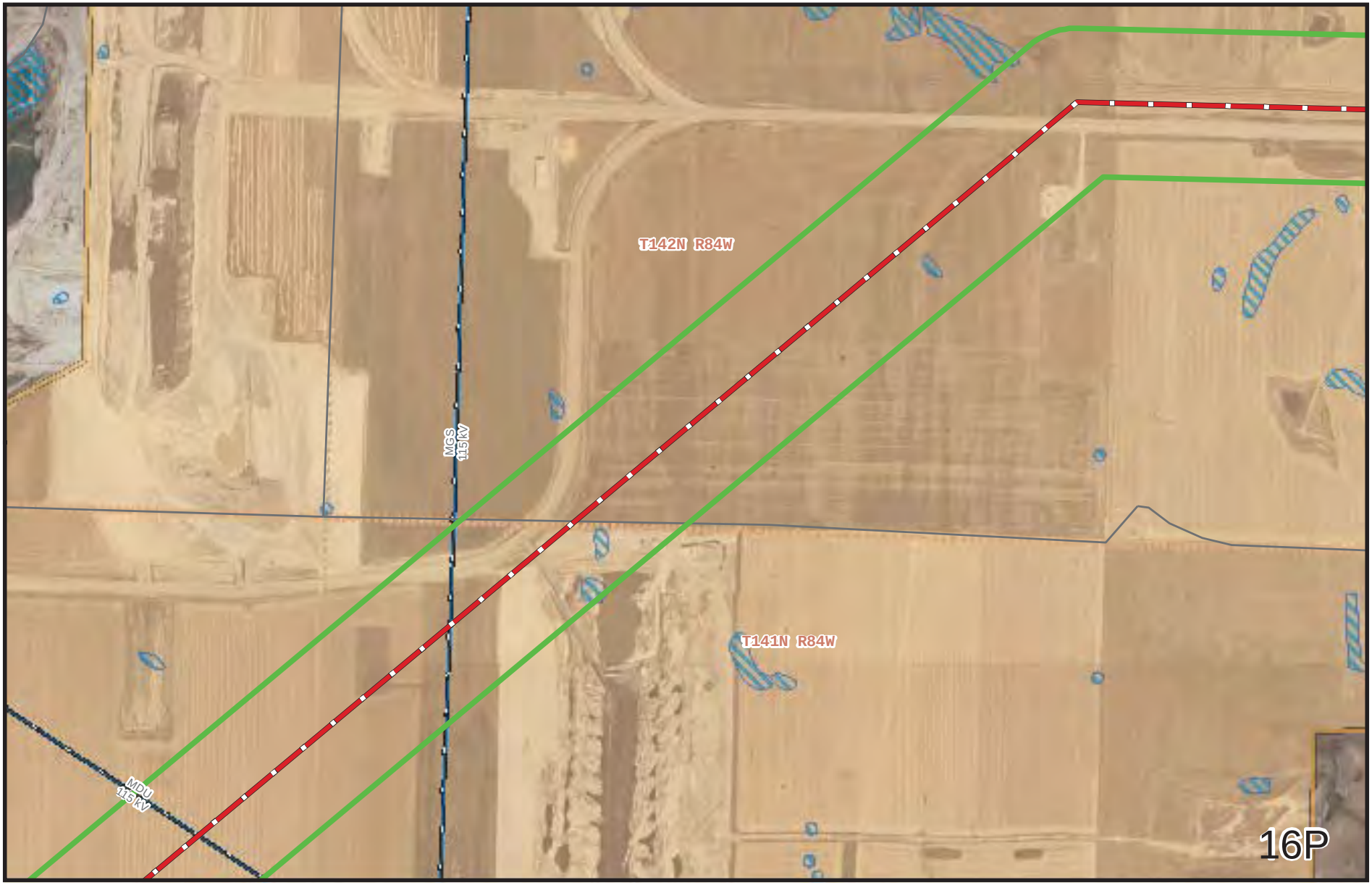

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Proposed Transmission Route (230kV)
Substation Location
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Figure 16. Approximate Pole Location Map
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

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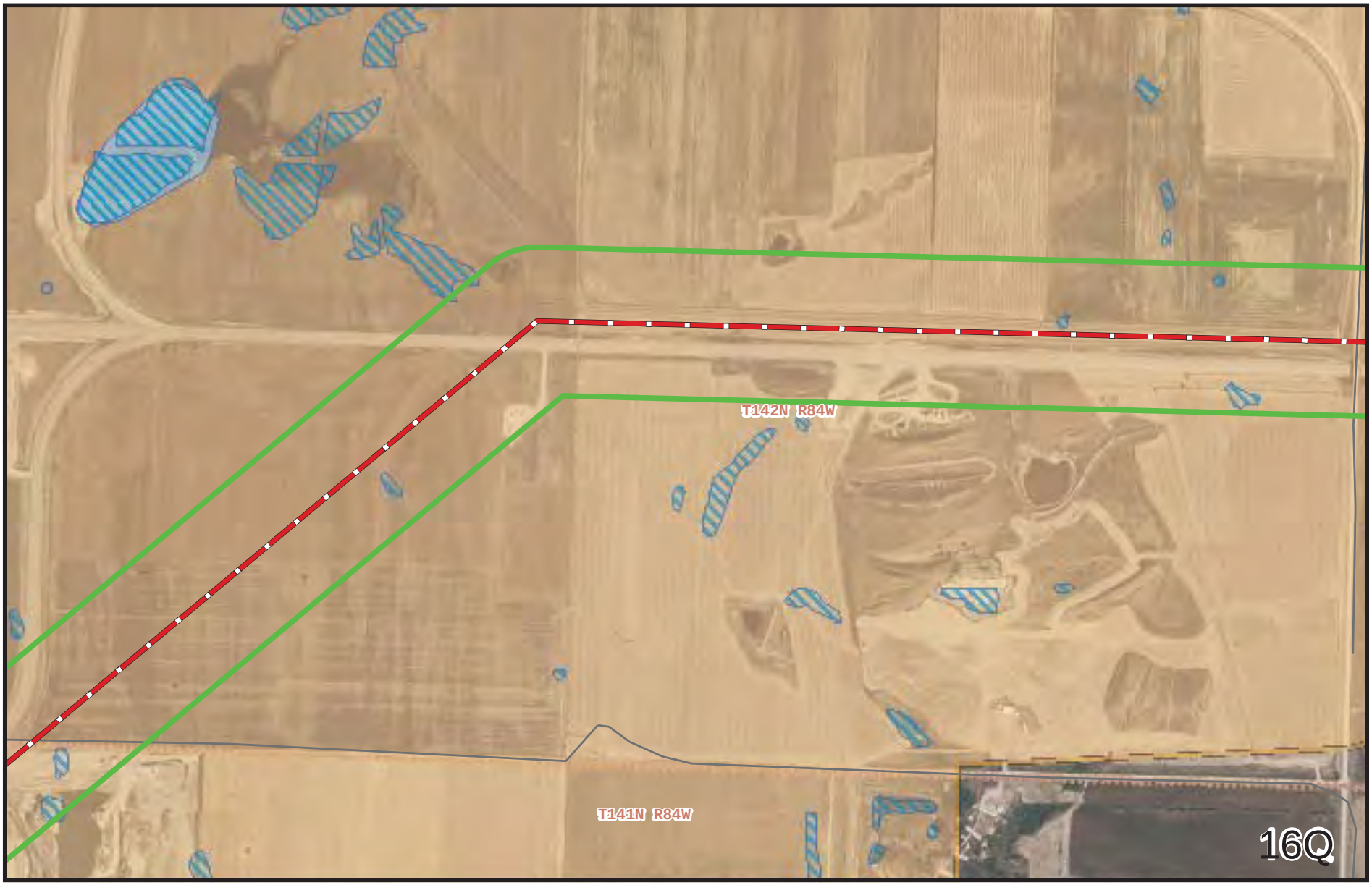

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Proposed Transmission Route (230kV)
Substation Location
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Proposed Transmission Route (1000 Feet)
Occupied Residence
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Figure 16. Approximate Pole Location Map
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

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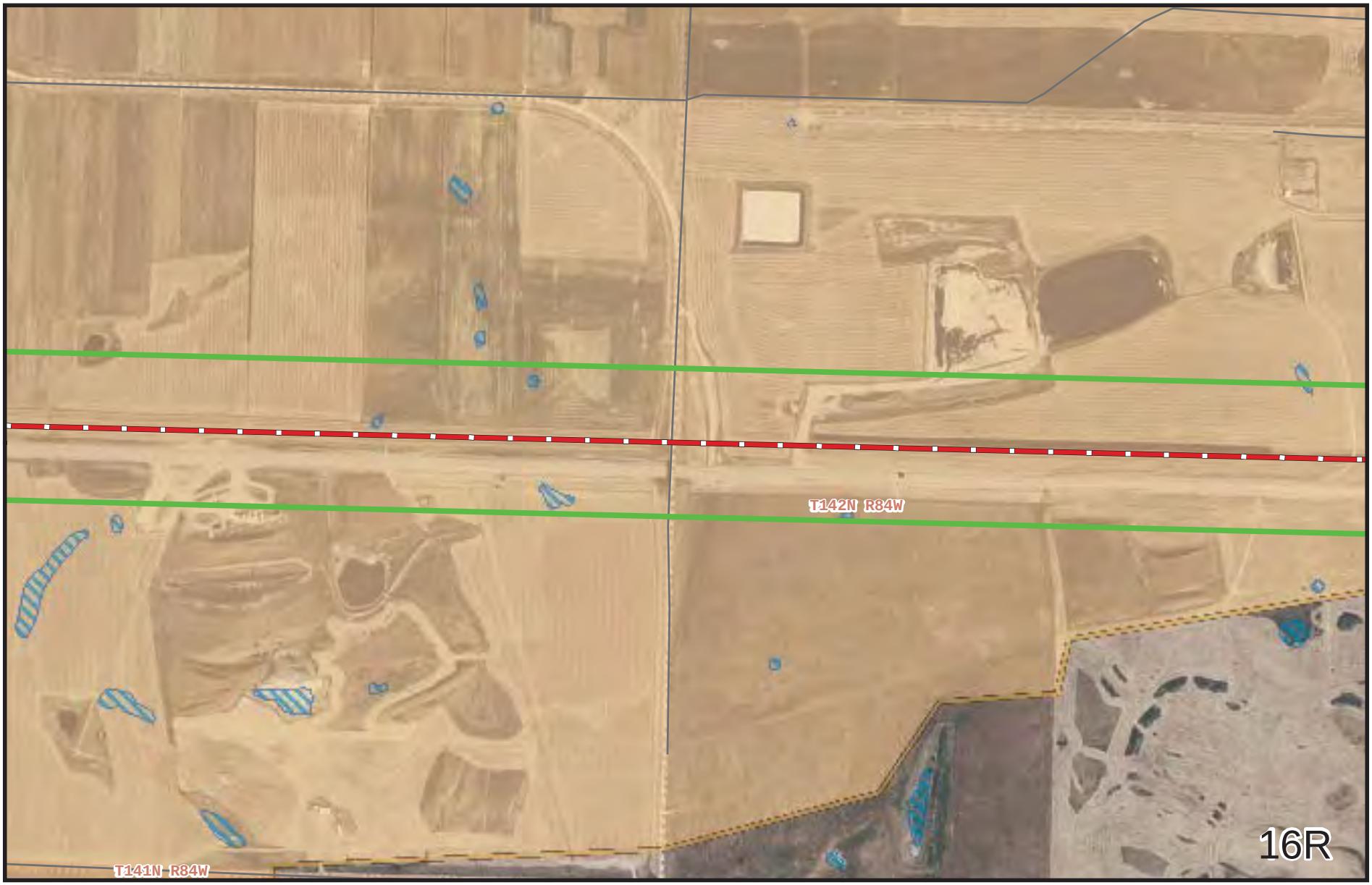

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Lakes
County Boundary

Pole locations will be provided to the PSC in a supplemental filing.

Figure 16. Approximate Pole Location Map
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

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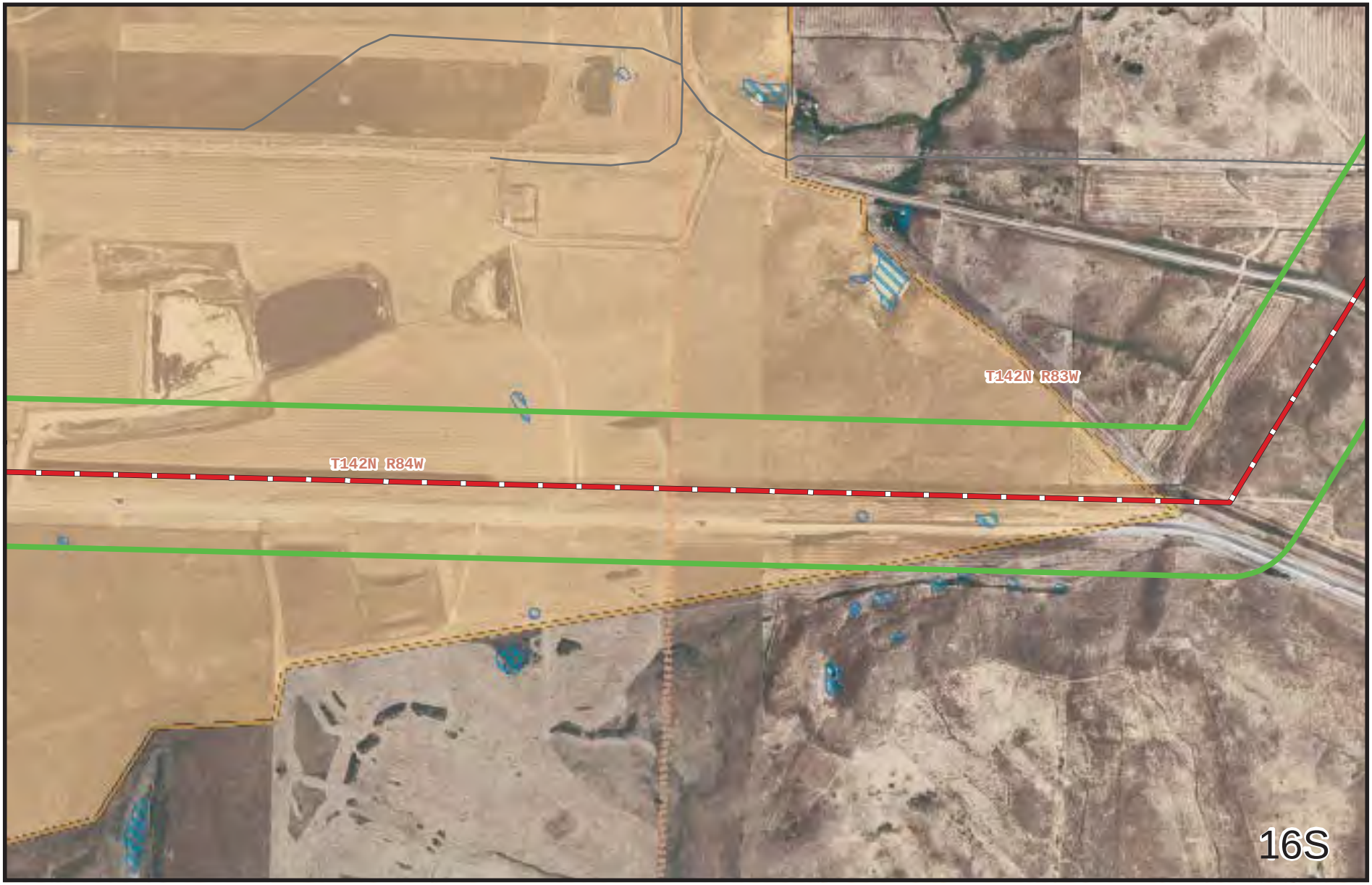

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Proposed Transmission Route (230kV)
Substation Location
BNI Wind Farm Project Area
Bison 1 Wind Farm Project Area
Proposed Transmission Route (1000 Feet)
Occupied Residence
Existing Transmission Line
Existing Gas Pipeline
NWI Wetland
Streams
Lakes
County Boundary

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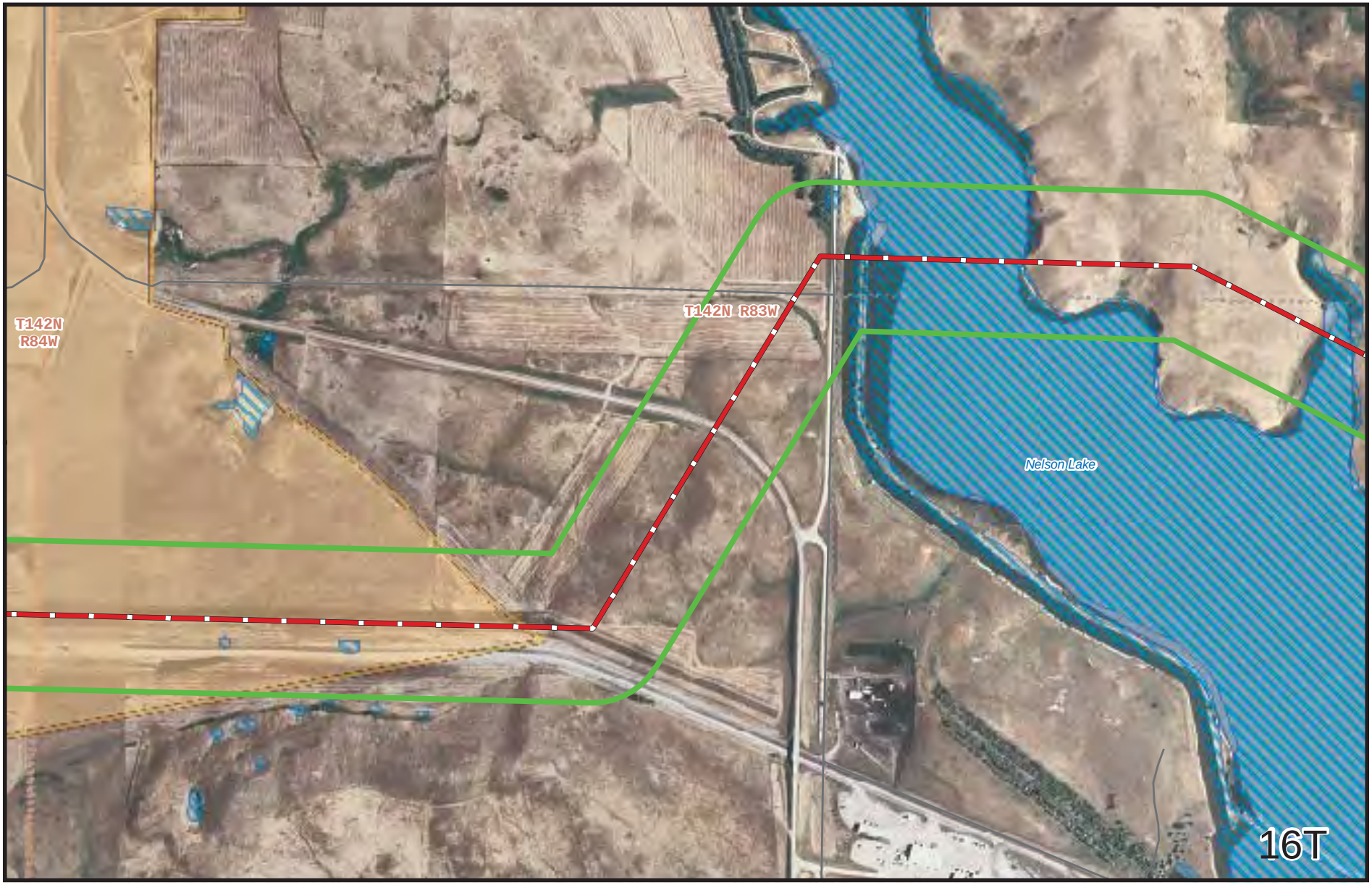

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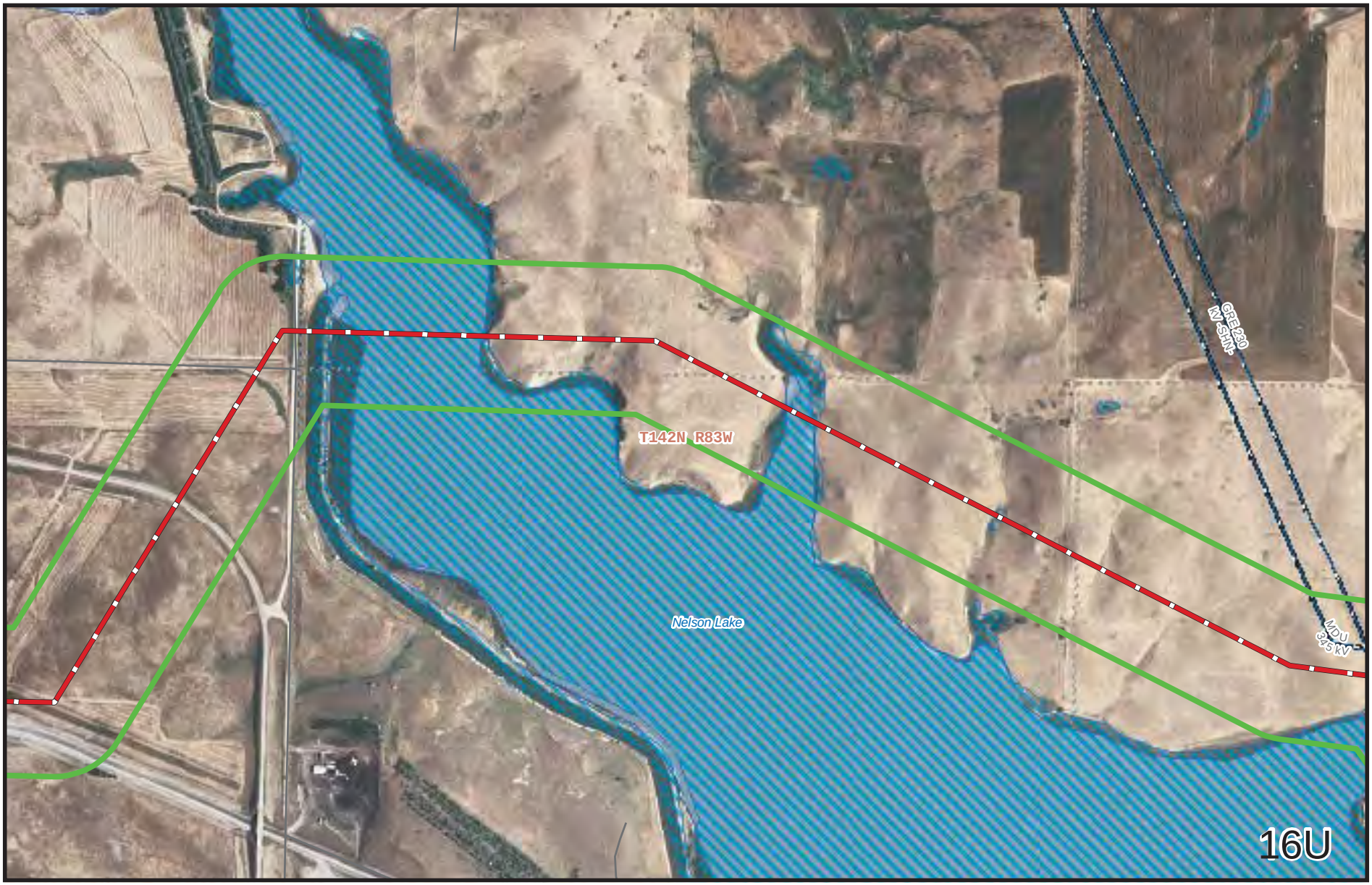

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- Proposed Transmission Route (230kV)
- Substation Location
- BNI Wind Farm Project Area
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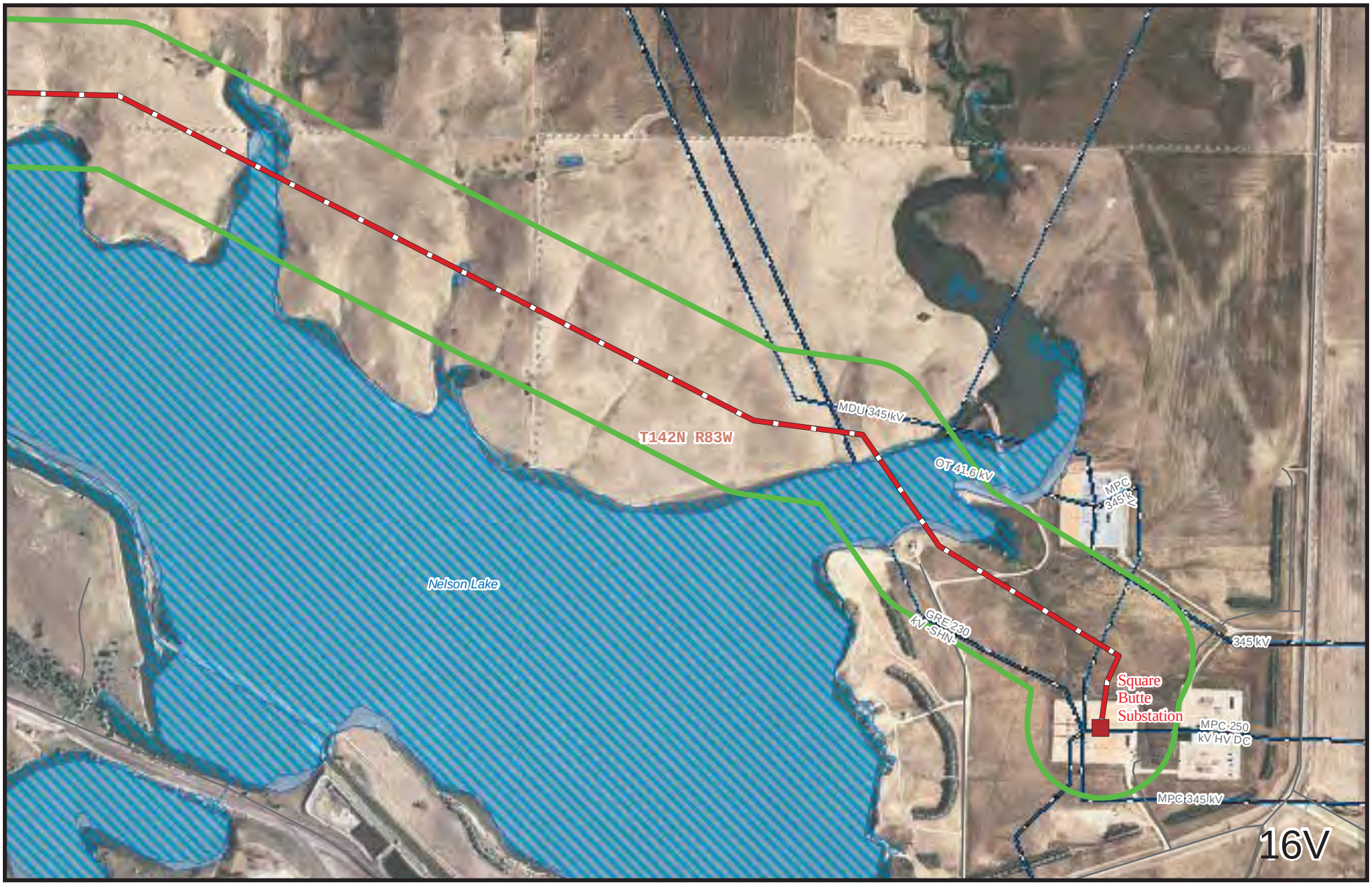

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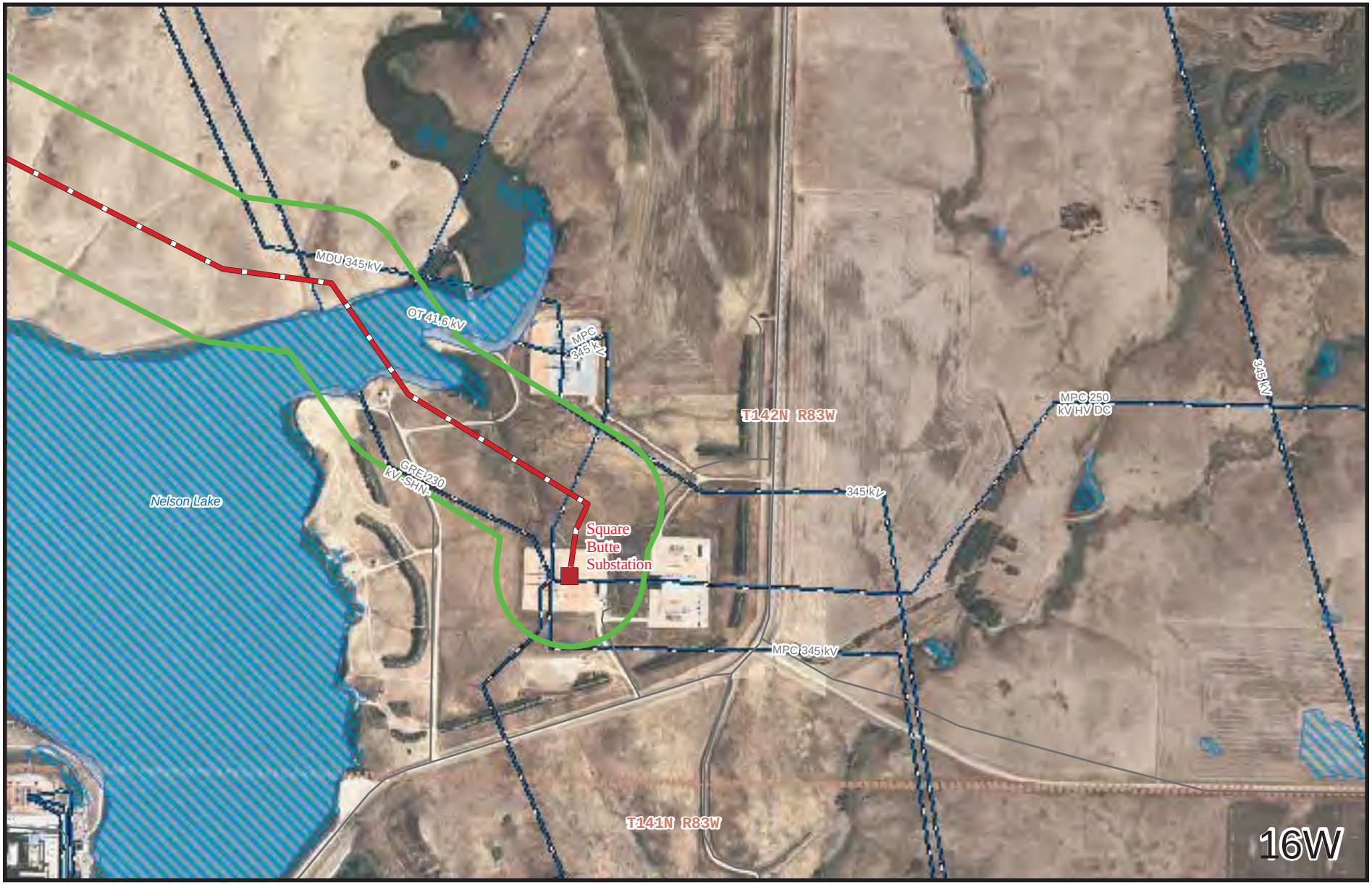

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APPENDIX A

Design Data Report

BISON I WIND PROJECT TRANSMISSION LINE
MORTON AND OLIVER COUNTIES, NORTH DAKOTA

DESIGN DATA REPORT

Project

- Approximately 22.2 mile transmission line.
- Final layout and structure types to be completed after design is finalized.

Transmission Line

GENERAL SPECIFICATIONS

Voltage	230 kV
Height	70 - 130 feet
Operating Capacity	629 MW
Average Span Length	900 feet
Structure Type	H-frame tangent structures
Minimum Conductor Size	1780 kcmil Aluminum Conductor Steel Supported (ACSS)
Shield Wire	7/16 inch
Right-of-Way	130 feet wide, 65 feet of right-of-way on each side of structure centerline and an additional 100 foot width to accommodate a future 230 kV transmission line
Average Pole Depth	10 to 12 feet
Average Pole Diameter	3 feet
Foundation Type	Direct imbed

Associated Facilities

GENERAL SPECIFICATIONS

Project Substation	
Substation Voltage	230 kV/34.5 kV substation
Approximate Substation Footprint	3 acres
Right-of-Way to be acquired (includes operation and maintenance building)	10 acres
Equipment	One 230/34.5 kV transformer, switchgear and control house, circuit breakers, surge arrestors, ring bus
Square Butte Substation Improvements	
Equipment	Addition of high-voltage switches, circuit breakers, power wiring, foundations and supporting structures, conduit, cable, and control equipment all within the existing fenced enclosure

APPENDIX B

Studies and Assessments

Bison I Wind Project Transmission Line: Class I Literature Search for Allete, Inc.'s Bison I Wind Project Transmission Line in Morton and Oliver counties, North Dakota

Author: Stephen Sabatke and Melissa Lundberg

August 28, 2009

10 Pages

Class I Literature Search

County	TWP	R	SEC
Morton	140N	86W	1-4
Oliver	141N	86W	35, 36
Oliver	141N	85W	25-28, 31-36
Oliver	141N	84W	2-8, 17-19, 30, 31
Oliver	142N	84W	25-27, 33-36
Oliver	142N	83W	28-34
Oliver	141N	83W	3, 4

Class I Literature Search for Allete, Inc.'s Bison I Wind Project Transmission Line in Morton and Oliver counties, North Dakota

For

Allete, Inc.
Duluth, Minnesota

By

Stephen Sabatke, M. A.
And
Melissa Lundberg

HDR Engineering Inc
701 Xenia Avenue South
Suite 600
Minneapolis, MN 55416
(763) 591-5400

Project No:106316
August 28, 2009

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Introduction

In March of 2009, HDR began assisting Minnesota Power, a division of ALLETE, Inc., in preparing an application for the North Dakota Public Service Commission (PSC) Certificate of Compatibility for the proposed Bison I Wind Project 230kV Transmission Line in Morton and Oliver counties, North Dakota. The proposed transmission line spans 22.3 miles.

In August 2009 Minnesota Power contacted the North Dakota State Historic Preservation Office (SHPO) to request a review of potential project-related impacts on known or suspected cultural resources within the proposed one-mile wide project corridor. SHPO normally requires 30 days to perform a review and has not yet had adequate time for review of the Transmission Line project. However, based on previous correspondence for the Bison I Wind Project Transmission Line, the applicants anticipate that SHPO will respond, in writing, recommending that Minnesota Power sponsor an archival records search of the project boundary plus a one mile buffer area around the project boundary to identify previous cultural resource investigations and the location of known cultural resources in the proposed project vicinity. SHPO will likely also suggest that a field survey, primarily pedestrian, take place in the proposed construction limits within the project area.

This report documents HDR's cultural resources data collection (Class I Literature Search) for the proposed project. In March 2009 HDR reviewed information on file at the State Historic Preservation Office (SHPO) located in Bismarck, North Dakota, to identify previously recorded cultural properties in the data gathering area (1/2 mile on each side of the proposed transmission centerline) for consideration during project planning. Cultural resource data, housed at the SHPO, consisted of cultural resource site files, cultural resource site leads, and previous professional cultural resource surveys and reports. In addition, HDR reviewed 19th Century Public Land Survey (PLS) maps to identify potential historic-period cultural features in the project area.

Cultural Resource Reports and Sites

HDR reviewed existing cultural resources documentation for specific sections in the following townships for the proposed transmission line at the North Dakota SHPO in Bismarck (Table 1). These township sections are spread across Morton and Oliver counties in North Dakota, and are within a half mile of the centerline of the transmission line.

Table 1. Study Area (Bison I).

County	Township	Range	Section
Morton	140N	86W	1-4
Oliver	141N	86W	35, 36
Oliver	141N	85W	25-28, 31-36
Oliver	141N	84W	2-8, 17-19, 30, 31
Oliver	142N	84W	25-27, 33-36
Oliver	142N	83W	28-34

Oliver	141N	83W	3, 4

The archival report inventory documented 21 previous cultural resource investigations in or within one mile of the project's external boundary. These reports illustrate that a wide variety of investigations have taken place in the data gathering area, including those conducted in support road reconstruction and proposed borrow areas (Table 2).

Table 2. Previous Cultural Resource Investigations in the Study Area

Manuscript Number	Report Date	Manuscript Title	Author(s)/ Association	Associated Sites	Comment
007017	September 1997	Class III Cultural Resource Inventory For a Proposed Oliver County Borrow Area. NDDOT Project #DPI-SC-0179(001)305	Jeffrey W. Kinney/Jeff Kinney & Associates	No sites listed	Field survey of proposed borrow area in Oliver County.
008724	December 2003	2003 Living Snow Fence Survey (B) of 22 Tree Sites in Adams, Grant, Hettinger, Kidder, McIntosh, Oliver, and Stutsman Counties, North Dakota: A Class III Cultural Resource Inventory	William J. Bluemle and Erin E. Salisbury/Metcalf Archaeological Consultants, Inc.	32OLX185	Class III inventory of 22 proposed project areas.
004671	December 1987	32OL285 and 32OL290 Evaluation and Significance	Jeani Borchert and Lawrence Loendorf	32OL290	Survey for proposed mine expansion.
008857	2004	BNI Coal: Data Recovery and Mitigation at the Mosbrucker Rings Site (32OL 338), Oliver County, North Dakota	John O. Pouley and Lynelle A. Peterson/Ethnoscience, Inc.	32OL338	Investigation of the Mosbrucker Rings (32OL338).
003581	September 1984	Cultural Resources Inventory Report (Undar-West # 716)	David Kuehn/University of North Dakota Archaeological Research	No sites listed	Cultural resources inventory of a proposed mine expansion.
004104	September 1986	Archaeological Testing at the Five Sites in the Baukol-Noonan Center Mine Oliver County, North Dakota	Jeani Borchert/Undar-West	32OL283, 32OL287, 32OL289	Testing of five sites in the Center Mine area.
002578	April 1982	Evaluation and Mapping of Five Archaeological Sites(32OL116, 32OL121, 32OL112, 32OL123, and 32OL124), Center Mine, Oliver County, North Dakota	Kent N. Good/Historical and Archaeological Surveys, Inc.	32OL116	Evaluation of cultural resources impacted by a surface mine.
003545	October 1984	A "Class III Intensive Inventory" of 1540 acres at the Baukol-Noonan Center Mine, Oliver County, North Dakota	David D. Kuehn and Angela Hoseth/Undar-West	32OL288	Class III inventory of a proposed mine expansion.
006862	December 1996	BNI Coal Mine: A Cultural Resource Inventory of Sections Located Southwest of Center, North Dakota	Blain Fandrick, George MacDonell, Lynn M. Peterson/Ethnoscience	32OL346	Class III inventory of a proposed coal mine expansion.
006940	June 1997	BNI Coal Mine, Testing and Evaluation of 32OL286 and 32OL388, Two Prehistoric Sites Located Southwest of Center, North Dakota	John Boughton/Ethnoscience	32OL388	Cultural inventory of two prehistoric sites.
007268	December	A Class III Cultural Resource Inventory of Both ROW's of ND Highway 25 From I-94 to Center, N.D.	Jeffery Kinney/ Jeff Kinney &	32OL388	Class III inventory of a

	1998	In Morton and Oliver Counties, N.D. NDDOT Project No. SS-1-025(007)000	Associates		proposed coal mine expansion.
006659	December 1995	Kadrmas, Lee & Jackson's BNI Road Regrading Project Class III Cultural Resource Inventory Oliver County, North Dakota	Dulaney Barclay/Metcalf Archaeological Consultants, Inc.	No sites listed	Cultural resource inventory for a regrade project.
005033	March 1990	Cultural Resources Inventory Report (Undar-West #1211)	Lynelle Peterson, Duane Klinner, Ken Karsmizki/ Undar-West	32OL298	Class III inventory of a proposed coal mine expansion.
004742	June 1989	Cultural Resources Inventory Report (Undar-West #1177)	Jeani L. Borchert/Undar-West	32OL284, 32OL311	Class III inventory of a proposed coal mine expansion.
005145	July 1990	Cultural Resources Inventory Report (Undar-West #1238)	Lynelle A. Peterson/Undar-West	No sites listed	Evaluative inventory of a mine which was pegged from reclamation.
002515	June 1976	Addendum to a Cultural Resources Survey Report entitled, 1976 Archaeological and Historic Site Survey of Baukol-Noonan Incorporated's Center Mine, Limited and Extended Mining Plan Areas, Oliver County, North Dakota, by C.L. Dill Survey Archaeologist, State Historical Society of North Dakota, Bismarck, June 1976.	C.L. Dill/State Historical Society of North Dakota	32OL118	N/A
0308*	1978	Cultural Resources Inventory of the Proposed Transmission Line Route Between Coyote Station and the Milton Young Plant, Oliver Co. ND.	L. O'Brian, L. Loendorf	No sites listed	N/A
2234*	1980	Additional Cultural Resources Work for the Proposed MDU Transmission Line Route Between Coyote Station and the Milton Young Plant, Oliver Co. ND.	J. Borchert, A. Simon	No sites listed	N/A
9675*	2006	Oliver County Wind Farm: A Class III Cultural Resource Inventory in Oliver Co., ND.	E. Stine, A. Kulevsky	No sites listed	N/A
9766*	2006	Addendum to Oliver County Wind Farm: A Class III Cultural Resource Inventory in Oliver County, ND: Substation and Transmission Line	A. Kulevsky	No sites listed	N/A
10296*	2007	FPL Energy's Oliver County Wind Farm II: A Class III Cultural Resource Inventory in Oliver Co., ND.	E. Stine, A. Kulevsky	No sites listed	N/A

* Indicates reports included within the 2008 Beaver Creek Archaeology Inc. report *Class III Cultural Resource Inventory for the Bison I Energy Center in Oliver County, North Dakota*. By Jennifer Pollman and Wade Burns.

Previous investigations in the data gathering area documented 15 archaeological sites and 7 archaeological site leads. All 22 cultural resources sites reported are within a half mile of the centerline of the transmission line.

Table 3. Previously Identified Cultural Resources located in the Study Area

County	Site Number	Site Type	Location			Associated Reports	NRHP Status
			T	R	S		
Oliver	32OL283	Lithic scatter	141	84	8	004104	Not evaluated
Oliver	32OLX179	Lithic scatter	141	84	6	No reports listed	Not evaluated
Oliver	32OL358	Archaeological scatter	141	84	6	No reports listed	Not evaluated
Oliver	32OLX161	Lithic debitage	141	84	5	No reports listed	Not evaluated
Oliver	32OLX163	Lithic debitage	141	84	9	No reports listed	Not evaluated
Oliver	32OL290	Archaeological scatter	141	84	4	004671	Not evaluated
Oliver	32OL289	Rock cairn	141	84	4	004104	Not evaluated
Oliver	32OLX159	Lithic debitage	141	84	4	No reports listed	Not evaluated
Oliver	32OLX160	Lithic debitage	141	84	4	No reports listed	Not evaluated
Oliver	32OLX123	Quarry/mine	141	84	1,30,31, 24,25,36	No reports listed	Not evaluated
Oliver	32OL116	Stone circle	142	84	35	002578	Not evaluated
Oliver	32OL311	Archaeological ruins	142	84	34	004742	Not evaluated
Oliver	32OL307	Lithic debitage	142	84	34	No reports listed	Not evaluated
Oliver	32OL288	Archaeological ruins	142	84	34	003545	Not evaluated
Oliver	32OL298	Stone circles	141	84	3	004104	Not evaluated
Oliver	32OL338	Stone circles/lithic debitage	141	84	5	008857, 006940, 007268	Not evaluated
Oliver	32OL284	Archaeological ruins	141	84	5	004742	Not evaluated
Oliver	32OL118	Stone circle	142	84	25	002515	Not evaluated
Oliver	32OL287	Lithic scatter	142	84	34	No reports listed	Not evaluated
Oliver	32OLX185	Site form not found at SHPO during time of search	141	84	4	008724	N/A
Oliver	32OL112*	Historic CM Scatter, Depression	142	83	32	No reports listed	Not eligible
Oliver	32OL446*	Stone circle, rock cairn	142	83	28, 33	No reports listed	Not evaluated

* Indicates sites included within the 2008 Beaver Creek Archaeology Inc. report *Class III Cultural Resource Inventory for the Bison I Energy Center in Oliver County, North Dakota.* By Jennifer Pollman and Wade Burns.

Previous investigations in the data gathering area documented 3 historic structures. All the historic structures are within a half mile of the centerline of the transmission line.

County	Site Number	Site Name	Location			Comment	NRHP Status
			T	R	S		
Oliver	32OLX180	N/A	141	84	7	N/A	Not evaluated
Oliver	32OLX0085	Hendershield	141	84	4	Farmstead	Not evaluated
Oliver	32OL346	Mosbrucker Farm	141	84	5	Archaeological ruins present	Not evaluated

Public Land Survey Map Review

HDR reviewed Public Land Survey (PLS) maps for the data gathering area (Table 4). The maps illustrate environmental conditions during the 1870s, including elevation variation across the landscape and watercourses. None of the maps show cultural features or locations of historic land use.

Table 4. Public Land Survey Data by Township and Range

Township	Range	Public Land Survey Publish Date	Cultural Feature/Locations
140N	85W	1879	None
140N	86W	1879	None
141N	83W	1883	None
141N	85W	1883	None
141N	86W	1883	None
142N	83W	1883	None
142N	84W	1883	None

Tribal Correspondence

During a conversation between HDR and SHPO in April, SHPO confirmed that tribal consultations would not be needed since there is no federal undertaking defined that would generate consultations under Section 106 of the National Preservation Act. However, SHPO recommends that Minnesota Power submit a notification in good faith to the Indian Affairs Office in Bismarck, North Dakota, as part of other federal, state, and local project notifications.

Implications for Archaeological Resources

After reviewing the information in the SHPO database of recorded cultural resources and previous survey reports, 19th Century Public Land Survey maps (PLS), and after visual

inspection of the project area, HDR believes that the project area has potential to yield additional unrecorded archaeological resources. Examination of the cultural resource information represented in a Geographical Information System (GIS) format has shown that a moderate number of cultural properties exist near or within the project area. The previous intuitive model for this region developed by cultural resource professionals over the years suggests that archaeological resource sites will be located near permanent water sources, on high or prominent landforms, and in areas with significant land use. However, in this area archaeological resource locations are scattered and survey data is scarce, hence, patterning for archaeological resource sites cannot be predicted accurately.

Proposed Class III Archaeological Survey

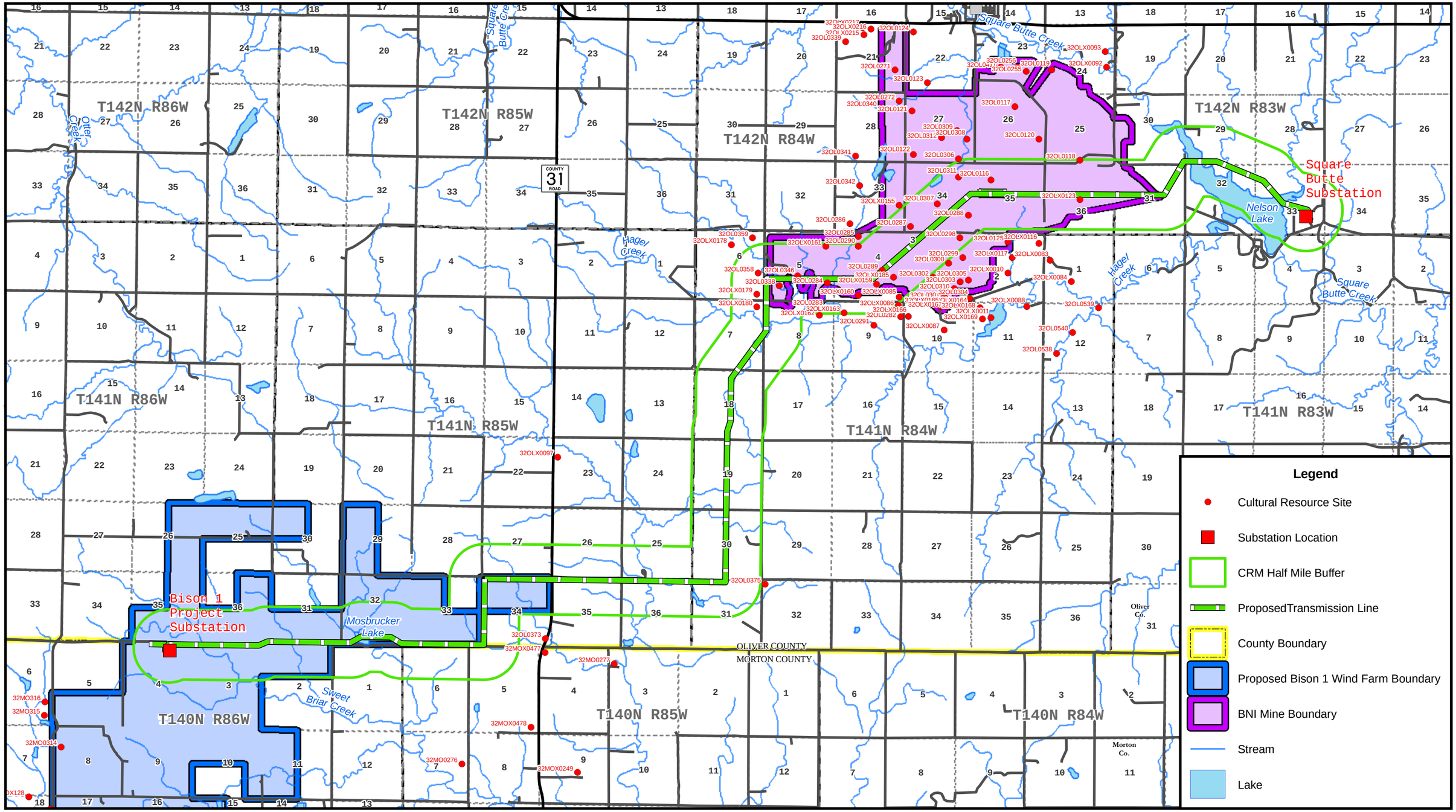
Archaeological reconnaissance survey proposed by HDR will focus on construction locations with marginal or better potential to contain resources. Once the construction footprint for the project is solidified the potential for the project to impact archaeological resources can be examined and evaluated. Minnesota Power, in consultation with HDR, will identify potential NRHP-eligible archaeological resources to the extent practical. Construction of the transmission line, when possible, will be designed to avoid identified sensitive archaeological resources in the project area.

HDR proposes that locations identified as needing survey will be examined using the following techniques. The entire survey route will be visually assessed for archaeological potential. Construction locations with marginal or better potential to contain resources will receive intensive survey.. Archaeological survey will use primarily pedestrian survey techniques when ground surface visibility is 25 percent or greater. Shovel testing will be used to investigate identified areas when ground visibility is 25 percent or less. Excavated soils will be screened through quarter-inch mesh hardware cloth. A hand-held global positioning system (GPS) unit will be used to locate the project area. The GPS unit will also be used to mark locations of interest, resource sites, shovel test areas, and pedestrian survey areas. A digital camera will be used to document areas along the survey route to show the projects existing environment. In addition, any location identified as having an archaeological resource site will be photographed to show the existing environment. Notes will be taken to document the survey of the project area.

Conclusions

The results of the Class I literature search indicate that the project area has the potential for archaeological resources. HDR recommends a Class III intensive archaeological resource inventory of the project's construction footprint. These investigations must be conducted by a professional archaeologist permitted by the State of North Dakota per NDCC 55-03-01. The nature of the archaeological resource inventory will depend on surface exposure and the characteristics of the individual landform being considered for development. The survey archaeologists shall discuss the proposed survey methodology with SHPO prior to implementation. The survey archaeologists also will document the areas proposed for ground disturbance, identify existing archaeological resources within those areas, and offer recommendations for archaeological avoidance and impact minimization.

Appendix A
Map



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Proposed Transmission Corridor
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

Executive Summary – Wind Power GeoPlanner™

Licensed Microwave Search & Worst Case Fresnel Zone

Comsearch performed an analysis to evaluate the potential effects of the planned BNI Wind project in Oliver County, ND on existing non-Federal Government microwave telecom systems.

Microwave Search Results: Comsearch's Wind Power GeoPlanner™ provides a graphical representation of affected microwave paths and provides supporting technical parameters. The microwave path data is overlaid on topographic basemaps. Comsearch identified 4 microwave paths that intersect the project area (see Figure 1 and Table 1 below).

Comsearch then calculated a Worst Case Fresnel Zone (WCFZ) for each microwave path in the project area. The mid-point of a full microwave path is the location where the widest (or worst case) Fresnel zone occurs. Fresnel zones are calculated for each path using the following formula.

$$Rn \cong 17.3\sqrt{\frac{n}{F_{GHz}}\left(\frac{d1d2}{d1+d2}\right)}$$

Where,
R_n = First Fresnel Zone Radius, meters
n = The Number 1
F_{GHz} = Frequency of Microwave Link, GHz
d1 = Distance to Wind Turbine from Microwave Station 1, km
d2 = Distance to Wind Turbine from Microwave Station 2, km

note: For WCFZ calculation d1 = d2

The calculated WCFZ radius, giving the linear path an area or swath, buffers each microwave path in the project area. The distance unit is in meters and can be found in the column attribute "WCFZ." In general, this is the XY area where the planned wind turbines should be avoided, if possible. These areas are shown in Figure 2.

Please note that because the turbine locations were not provided, we could not determine if any potential obstruction cases exist between the planned wind turbines and the microwave systems. If the latitude and longitude values for turbine locations are provided, Comsearch can identify specific microwave telecom paths and turbines where a potential XY conflict exists. Additionally, when wind turbines need to be located inside a WCFZ, Comsearch can provide a detailed clearance study, which considers the vertical Z-height clearance objectives.

Map Projection: The ESRI® Shapefiles contained in the enclosed GeoPlanner CD are in NAD 83 UTM Zone 14 projected coordinate system.

Comsearch Contact:
Denise Finney, Account Manager
Phone: (703) 726-5650 Fax: (703) 726-5595
Email: dfinney@comsearch.com

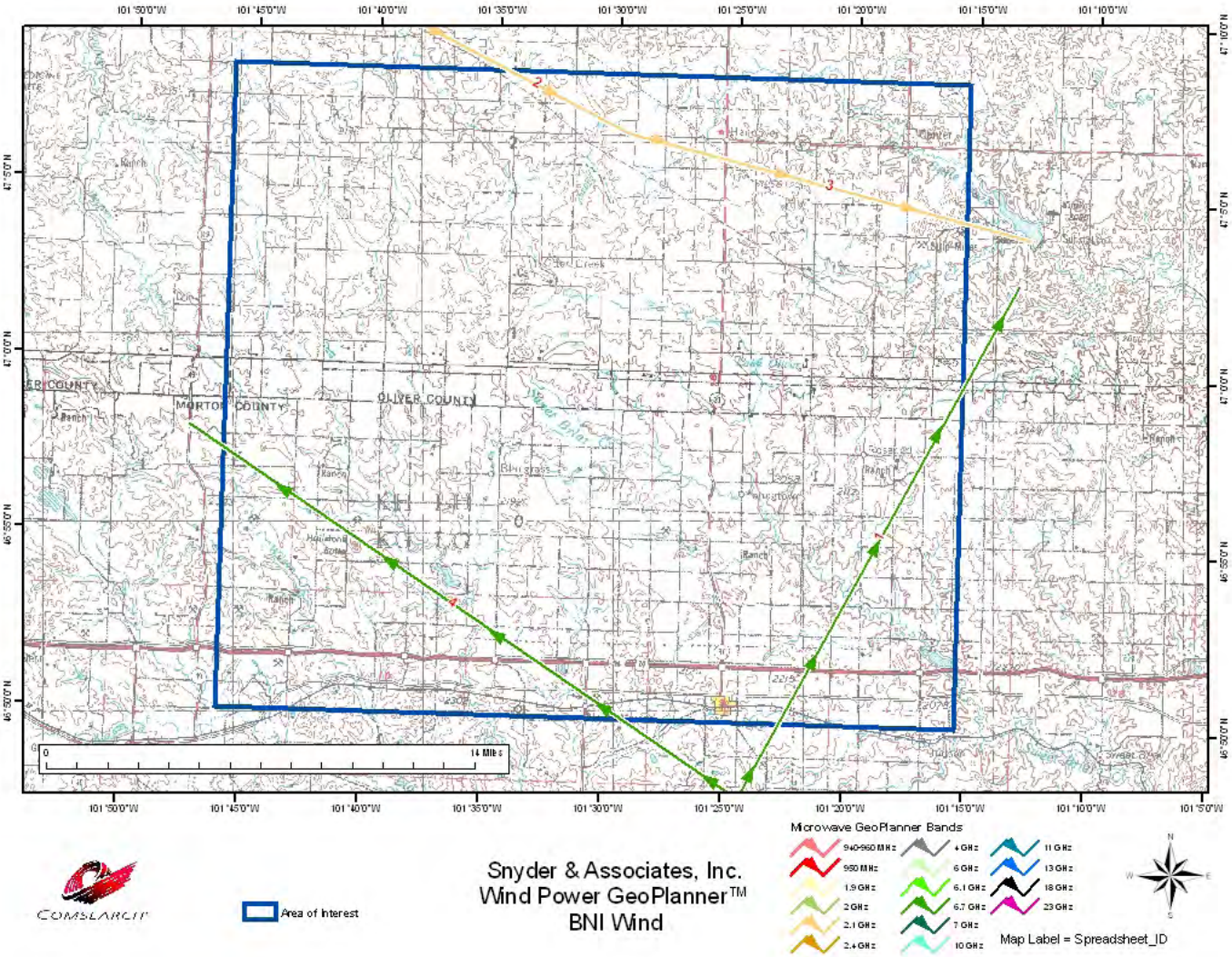

Figure 1 – Wind Power GeoPlanner™

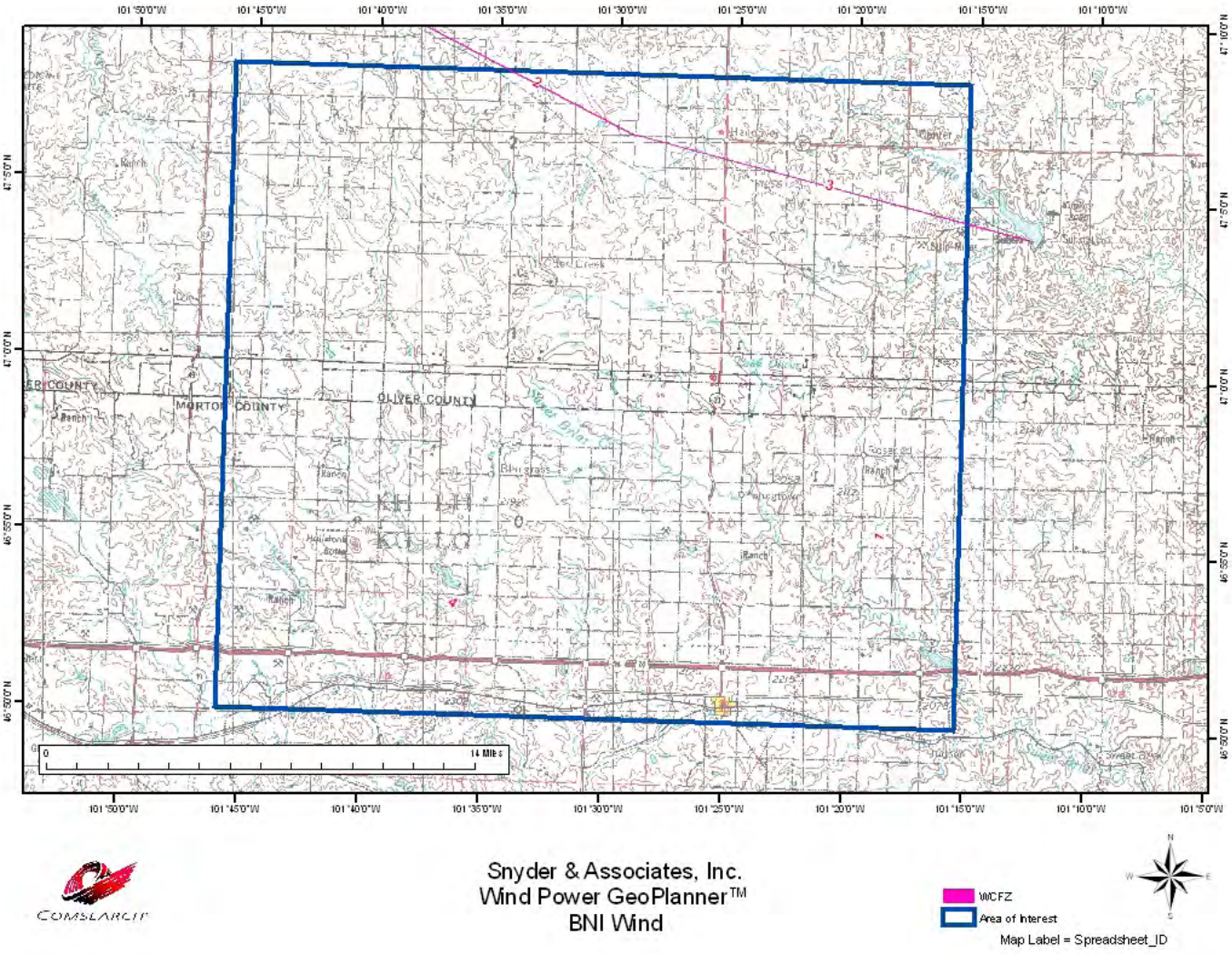

Figure 2 – Wind Power GeoPlanner™ & WCFZ

ID	Name Site 1	Name Site 2	Call Sign Site 1	Call Sign Site 2	Band Name	Licensee	WCFZ (m)
1	NEW SALEM	CENTER RPTR	KVY57	WEE879	Upper 6 GHz	BNSF Railway Company	18.59
2	COYOTE PLAN	HANNOVER	WEH272	WEH273	2.1 GHz	OTTER TAIL POWER COMPANY	30.53
3	HANNOVER	M R YOUNG	WEH273	WEH267	2.1 GHz	MONTANA DAKOTA UTILITIES CO	27.58
4	NEW SALEM	GLEN ULLIN	WEH428	WEH426	Upper 6 GHz	BASIN ELECTRIC POWER COOPERATIVE	19.74

Table 1 – Microwave GeoPlanner Links Considered in Analysis (See enclosed mw_geopl.xls for more detailed information and GP_dict_matrix_description.xls for field description)

APPENDIX C

Agency Letters

C-1 Letters from HDR

August 24, 2009

L. David Glatt, P.E., Chief
Environmental Health Section
North Dakota Department of Health
Gold Seal Center, 918 E. Divide Ave.
Bismarck, ND 58501-1947

Re: 230 kV Overhead Transmission Line for the Bison I Wind Project, Morton and Oliver Counties

Dear Mr. Glatt:

Thank you for your April 28, 2009 comments regarding Minnesota Power's (MP) Bison I Wind Project. MP is an operating division of ALLETE, Inc. MP is incorporating your comments into the development of the Bison I Wind Project.

In addition to the wind project, MP will construct a 22.3 mile 230-kilovolt (kV) overhead transmission line from the Project's substation in Morton County to the interconnection point (Square Butte Substation) near Center, North Dakota. The purpose of the transmission line is to transmit the energy generated by the Bison I Wind Project to the transmission system.

The table below identifies Township sections potentially affected by the overhead transmission line (Figure 1):

Table 1 –Bison I Wind Project Overhead Transmission Line

Township	Range	Sections
140N	86W	1- 5, 9
140N	85W	1-6
141N	86W	25 -27, 34-36
141N	85W	1, 12, 13, 21-36
141N	84W	1-10, 16-20, 29-32
141N	83W	3-6
142N	84W	25-28, 31-36
142N	83W	19-21, 27-34

HDR Engineering, Inc.
701 Xenia Avenue South
Minneapolis, MN 55416-3636
Phone (763) 591-5400
Fax (763) 591-5413
www.hdrinc.com

MP will apply the comments your department previously provided to construction of the overhead transmission line. Additionally, we appreciate any input or information that you might provide at this time in regards to the transmission line. Specifically, does your department own land in or adjacent to the sections affected by the overhead transmission line? Do you have any projects scheduled in the area?

Should you require additional information or have questions regarding the Bison I Wind Project's overhead transmission line, please feel free to call me at (763) 278-5925.

Sincerely,

HDR Engineering, Inc.

Bruce Moreira
Environmental Scientist

cc: Jim Atkinson, ALLETE, Inc.

Attachments: Figure 1 - Project Vicinity Map

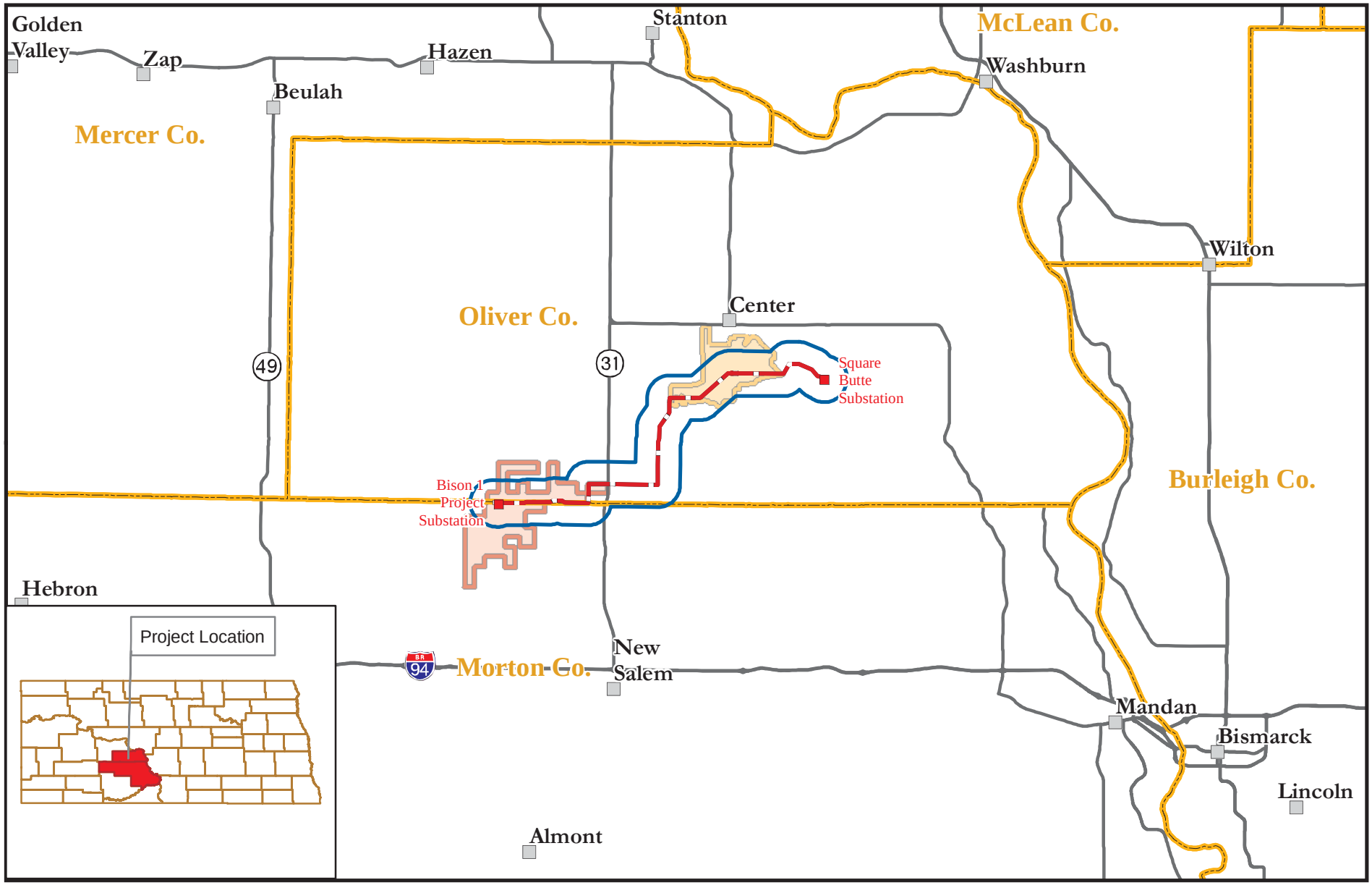

Figure 1: Project Vicinity Map
Proposed Transmission Route
Bison I Wind Project, Minnesota Power
Morton & Oliver Counties, ND

Map Document: (\\mspe-gis-file\GISProj\MinnPower\106316\map_docs\mxd\OHTRouteApp\Fig1-ProjectVicinityMap.mxd)
8/24/2009 -- 1:58:16 PM

August 24, 2009

Michael G. McKenna, Chief
Conservation & Communication Division
North Dakota Game and Fish Department
100 North Bismarck Expressway
Bismarck, ND 58501-5095

Re: 230 kV Overhead Transmission Line for the Bison I Wind Project, Morton and Oliver Counties

Dear Mr. McKenna:

Thank you for your May 5, 2009 comments regarding Minnesota Power's (MP) Bison I Wind Project. MP is an operating division of ALLETE, Inc. MP is incorporating your comments into the development of the Bison I Wind Project.

In addition to the wind project, MP will construct a 22.3 mile 230-kilovolt (kV) overhead transmission line from the Project's substation in Morton County to the interconnection point (Square Butte Substation) near Center, North Dakota. The purpose of the transmission line is to transmit the energy generated by the Bison I Wind Project to the transmission system.

The table below identifies Township sections potentially affected by the overhead transmission line (Figure 1):

Table 1 –Bison I Wind Project Overhead Transmission Line

Township	Range	Sections
140N	86W	1- 5, 9
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Fax (763) 591-5413
www.hdrinc.com

MP will apply the comments your department previously provided to construction of the overhead transmission line. Additionally, we appreciate any input or information that you might provide at this time in regards to the transmission line. Specifically, does your department have any record of threatened or endangered species within the area defined by Table 1?

Should you require additional information or have questions regarding the Bison I Wind Project's overhead transmission line, please feel free to call me at (763) 278-5925.

Sincerely,

HDR Engineering, Inc.

Bruce Moreira
Environmental Scientist

cc: Jim Atkinson, ALLETE, Inc.

Attachments: Figure 1 - Project Vicinity Map

August 24, 2009

Kathy Duttenhefner
Planning and Natural Resources Division
North Dakota Parks and Recreation Department
1600 East Century Avenue, Suite 3
Bismarck, ND 58503-5357

Re: 230 kV Overhead Transmission Line for the Bison I Wind Project, Morton and Oliver Counties

Dear Ms. Duttenhefner:

Thank you for your May 11, 2009 comments regarding Minnesota Power's (MP) Bison I Wind Project. MP is an operating division of ALLETE, Inc. MP is incorporating your comments into the development of the Bison I Wind Project.

In addition to the wind project, MP will construct a 22.3 mile 230-kilovolt (kV) overhead transmission line from the Project's substation in Morton County to the interconnection point (Square Butte Substation) near Center, North Dakota. The purpose of the transmission line is to transmit the energy generated by the Bison I Wind Project to the transmission system.

The table below identifies Township sections potentially affected by the overhead transmission line (Figure 1):

Table 1 –Bison I Wind Project Overhead Transmission Line

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142N	84W	25-28, 31-36
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Minneapolis, MN 55416-3636
Phone (763) 591-5400
Fax (763) 591-5413
www.hdrinc.com

MP will apply the comments your department previously provided to construction of the overhead transmission line. Additionally, we appreciate any input or information that you might provide at this time in regards to the transmission line. Specifically, does the North Dakota Natural Heritage Inventory yield any rare animal and plant species or significant ecological communities for the area defined in Table 1? In addition, does your department coordinate any Land and Water Conservation Fund recreation projects in the area defined in Table 1?

Should you require additional information or have questions regarding the Bison I Wind Project's overhead transmission line, please feel free to call me at (763) 278-5925.

Sincerely,

HDR Engineering, Inc.

Bruce Moreira
Environmental Scientist

cc: Jim Atkinson, ALLETE, Inc.

Attachments: Figure 1 - Project Vicinity Map

August 24, 2009

Jeffrey K. Towner, Field Supervisor
Ecological Services, North Dakota Field Office
U.S. Fish and Wildlife Service
3425 Miriam Avenue
Bismarck, ND 58501

Re: 230 kV Overhead Transmission Line for the Bison I Wind Project, Morton and Oliver Counties

Dear Mr. Towner:

Thank you for your May 4, 2009 comments regarding Minnesota Power's (MP) Bison I Wind Project. MP is an operating division of ALLETE, Inc. MP is incorporating your comments into the development of the Bison I Wind Project.

In addition to the wind project, MP will construct a 22.3 mile 230-kilovolt (kV) overhead transmission line from the Project's substation in Morton County to the interconnection point (Square Butte Substation) near Center, North Dakota. The purpose of the transmission line is to transmit the energy generated by the Bison I Wind Project to the transmission system.

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Table 1 –Bison I Wind Project Overhead Transmission Line

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141N	84W	1-10, 16-20, 29-32
141N	83W	3-6
142N	84W	25-28, 31-36
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HDR Engineering, Inc.
701 Xenia Avenue South
Minneapolis, MN 55416-3636
Phone (763) 591-5400
Fax (763) 591-5413
www.hdrinc.com

MP will apply the comments your department previously provided to construction of the overhead transmission line.

Should you require additional information or have questions regarding the Bison I Wind Project's overhead transmission line, please feel free to call me at (763) 278-5925.

Sincerely,

HDR Engineering, Inc.

Bruce Moreira
Environmental Scientist

cc: Jim Atkinson, ALLETE, Inc.

Attachments: Figure 1 - Project Vicinity Map

April 7, 2009

Mr. Jeffrey Towner
Ecological Services
North Dakota Field Office
3425 Miriam Avenue
Bismarck, ND 58501-7926

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Mr. Towner:

HDR Engineering, Inc. (HDR) is gathering environmental information and stakeholder comments on the Bison I Wind Project proposed by Minnesota Power, an operating division of ALLETE, Inc.(hereinafter "Minnesota Power") in Morton and Oliver Counties, North Dakota. The proposed wind project will include 33 2.3-megawatt (MW) Siemens wind turbines with a total generating capacity of 75.9 MW. The project is under the 100-MW threshold for a required site permit from the North Dakota Public Services Commission (NDPSC). However, Minnesota Power plans to submit an application for a site permit with the NDPSC because the project is the first phase of a larger wind facility. This inquiry only covers the first phase of the project, the Bison I Wind Project. The project area is shown on the enclosed map (Figure 1).

Typically, wind project construction includes erecting wind turbines and constructing associated facilities such as gravel access roads, an underground electrical collector system, electrical collector substations, and overhead transmission lines. Although final locations of the turbines, access roads, and the electrical collector system have not been determined at this time, the table below identifies Township sections potentially affected by the project:

Table 1 – Sections within Bison I Wind Project Boundary

County	Township	Range	Sections
Morton	140N	86W	2-5, 8-11, 15- 17, 20
Oliver	141N	85W	29- 34
	141N	86W	25, 26, 35, 36

HDR welcomes comments the U.S. Fish and Wildlife Service (USFWS) may have on the project at this time. In particular, HDR requests your review of the sections identified in Table 1 for potential effects to federally listed threatened or endangered species or other sensitive natural resources.

HDR also requests that you provide locations of USFWS wetland or grassland easements, and the locations of parcels that the USFWS may be targeting for easements, within the proposed project boundary. Information provided in a GIS format, if available, would be most helpful; however, legal descriptions or hard copy maps would also help Minnesota Power and HDR in reviewing the project.

This project notification and information request precedes filing of the NDPSC Energy Facility Siting Permit application but is not intended to preclude subsequent review and comment. We appreciate any input or information that you might provide at this time. If you require additional information or have questions regarding the Bison I Wind Project, please feel free to call me at (763) 278-5925.

Sincerely,

HDR Engineering, Inc.

Bruce Moreira
Environmental Scientist

Enclosures: Figure 1 - Project Location Map

cc: Jim Atkinson, Allete
Todd Mattson, HDR Engineering
Terry Ellsworth, U.S. Fish and Wildlife Service

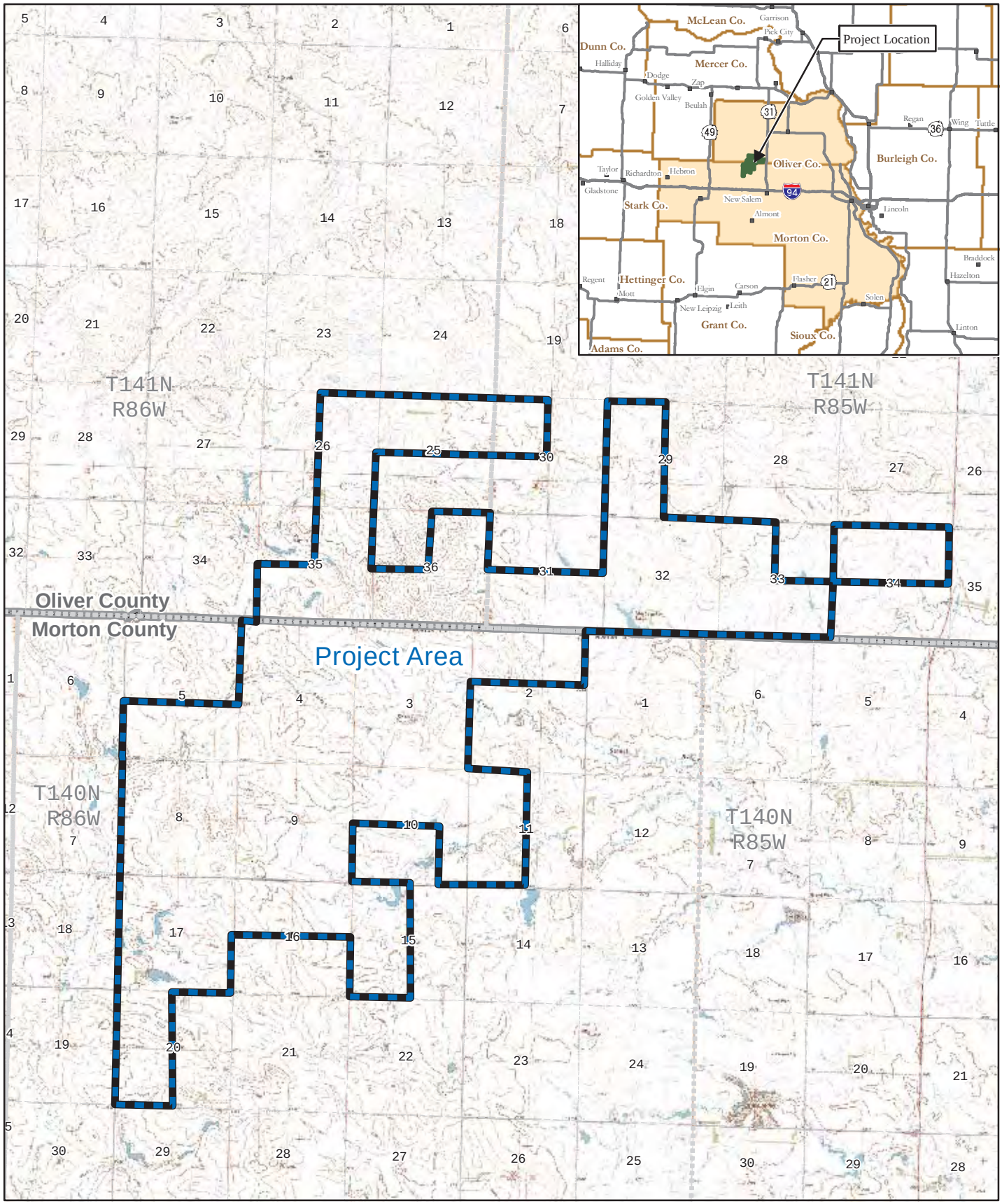

Figure 1: Project Vicinity Map
Bison I Wind Project
Minnesota Power
Morton & Oliver Counties, ND

Legend
Proposed Phase 1 Project Boundary
County Boundary

Miles
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Map Document: (\\mspe-gis-fil\e\gisproj\MinnPower\106316\map_docs\mxd\WindApplicationFigures\Figure1_ProjectVicinityMap.mxd)
3/31/2009 -- 9:56:41 AM

April 7, 2009

Mr. Daniel E. Cimarosti, State Project Manager
U.S. Army Corps of Engineers
North Dakota Regulatory Office
1513 South 12th Street
Bismarck, ND 58504-6640

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Mr. Cimarosti:

HDR Engineering, Inc. (HDR) is gathering environmental information and stakeholder comments on the Bison I Wind Project proposed by Minnesota Power, an operating division of ALLETE, Inc.(hereinafter "Minnesota Power") in Morton and Oliver Counties, North Dakota. The proposed wind project will include 33 2.3-megawatt (MW) Siemens wind turbines with a total generating capacity of 75.9 MW. The project is under the 100-MW threshold for a required site permit from the North Dakota Public Services Commission (NDPSC). However, Minnesota Power plans to submit an application for a site permit with the NDPSC because the project is the first phase of a larger wind facility. This inquiry only covers the first phase of the project, the Bison I Wind Project. The project area is shown on the enclosed map (Figure 1).

Typically, wind project construction includes erecting wind turbines and constructing associated facilities such as gravel access roads, an underground electrical collector system, electrical collector substations, and overhead transmission lines. Although final locations of the turbines, access roads, and the electrical collector system have not been determined at this time, the table below identifies Township sections potentially affected by the project:

Table 1 – Sections within Bison I Wind Project Boundary

County	Township	Range	Sections
Morton	140N	86W	2-5, 8-11, 15- 17, 20
Oliver	141N	85W	29- 34
	141N	86W	25, 26, 35, 36

HDR welcomes comments the U.S. Army Corps of Engineers (USACE) may have at this time or throughout the permit application process. In particular, HDR requests your review of the sections identified in Table 1 for jurisdictional waters or other potential permit requirements for the USACE. Your comments will be incorporated into the NDPSC review process for the project.

This project notification and information request precedes filing of the NDPSC Energy Facility Siting Permit application but is not intended to preclude subsequent review and comment. We appreciate any input or information that you might provide at this time. If you require additional information or have questions regarding the Bison I Wind Project, please feel free to call me at (763) 278-5925.

Sincerely,

HDR Engineering, Inc.

Bruce Moreira
Environmental Scientist

Enclosures: Figure 1 - Project Location Map

cc: Jim Atkinson, Allete
Todd Mattson, HDR Engineering

April 7, 2009

Mr. Merlan E Paaverud, Jr
Director, State Historical Society of North Dakota and State Historic Preservation Officer
North Dakota Heritage Center
612 East Boulevard Avenue
Bismarck, ND 58505

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Mr. Paaverud:

HDR Engineering, Inc. (HDR) is gathering environmental information and stakeholder comments on the Bison I Wind Project proposed by Minnesota Power, an operating division of ALLETE, Inc. (hereinafter "Minnesota Power") in Morton and Oliver Counties, North Dakota. The proposed wind project will include 33 2.3-megawatt (MW) Siemens wind turbines with a total generating capacity of 75.9 MW. The project is under the 100-MW threshold for a required site permit from the North Dakota Public Services Commission (NDPSC). However, Minnesota Power plans to submit an application for a site permit with the NDPSC because the project is the first phase of a larger wind facility. This inquiry only covers the first phase of the project, the Bison I Wind Project. The project area is shown on the enclosed map (Figure 1).

Typically, wind project construction includes erecting wind turbines and constructing associated facilities such as gravel access roads, an underground electrical collector system, electrical collector substations, and overhead transmission lines. Although final locations of the turbines, access roads, and the electrical collector system have not been determined at this time, the table below identifies Township sections potentially affected by the project:

Table 1 – Sections within Bison I Wind Project Boundary

County	Township	Range	Sections
Morton	140N	86W	2-5, 8-11, 15- 17, 20
Oliver	141N	85W	29- 34
	141N	86W	25, 26, 35, 36

At present, there is no federal agency involvement in this project, and Minnesota Power realizes there is currently no requirement to consult under Section 106 of the National Historic

Preservation Act. However, in order for Minnesota Power to acquire the proper permits from the North Dakota Public Services Commission (NDPSC), North Dakota Century Code (NDCC) 49-22-09 requires that effects on historic sites and structures, and paleontological or archaeological sites be considered.

HDR anticipates conducting an archaeological inventory of areas within the project construction footprint that have a high probability for buried resources; we also anticipate an inventory of standing structures in the project construction footprint. Your agency's comments will be incorporated into the cultural resource reports for the project.

As project development and refinement occurs, Minnesota Power will actively consult with you on cultural resources issues.

If you require further information or have questions regarding this matter, please contact me at (763) 278-5992 of Stephen.Sabatke@hdrinc.com

Sincerely,
HDR Engineering, Inc

Stephen Sabatke
Archaeologist

Enclosures: Figure 1 - Project Location Map

cc: Jim Atkinson, Minnesota Power
Todd Mattson, HDR Engineering

April 7, 2009

Mr. Jeb Williams, Wildlife Resource Management Supervisor
North Dakota Game and Fish Department
100 North Bismarck Expressway
Bismarck, ND 58501-5095

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Mr. Williams:

HDR Engineering, Inc. (HDR) is gathering environmental information and stakeholder comments on the Bison I Wind Project proposed by Minnesota Power, an operating division of ALLETE, Inc.(hereinafter "Minnesota Power") in Morton and Oliver Counties, North Dakota. The proposed wind project will include 33 2.3-megawatt (MW) Siemens wind turbines with a total generating capacity of 75.9 MW. The project is under the 100-MW threshold for a required site permit from the North Dakota Public Services Commission (NDPSC). However, Minnesota Power plans to submit an application for a site permit with the NDPSC because the project is the first phase of a larger wind facility. This inquiry only covers the first phase of the project, the Bison I Wind Project. The project area is shown on the enclosed map (Figure 1).

Typically, wind project construction includes erecting wind turbines and constructing associated facilities such as gravel access roads, an underground electrical collector system, electrical collector substations, and overhead transmission lines. Although final locations of the turbines, access roads, and the electrical collector system have not been determined at this time, the table below identifies Township sections potentially affected by the project:

Table 1 – Sections within Bison I Wind Project Boundary

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Oliver	141N	85W	29- 34
	141N	86W	25, 26, 35, 36

HDR Engineering, Inc.
701 Xenia Avenue South
Minneapolis, MN 55416-3636
Phone (763) 591-5400
Fax (763) 591-5413
www.hdrinc.com

HDR welcomes comments the North Dakota Game and Fish Department (NDGFD) may have at this time or throughout the permit application process. In particular, HDR requests your review of the sections identified in Table 1 for potential effects to known threatened or endangered species or other sensitive natural resources. The project boundary is located approximately 3 miles northeast of the Storm Creek Wildlife Management Area. Your comments will be incorporated into the NDPSC review process for the project.

HDR also requests you provide locations of any state easements, and the locations of parcels that the NDGFD may be targeting for easements within the proposed project boundary. Information provided in the format of a GIS layer, if available, would be most helpful; however, legal descriptions or hard copy maps would also assist Minnesota Power and HDR in reviewing the project.

This project notification and information request precedes filing of the NDPSC Energy Facility Siting Permit application but is not intended to preclude subsequent review and comment. We appreciate any input or information that you might provide at this time. If you require additional information or have questions regarding the Bison I Wind Project, please feel free to call me at (763) 278-5925.

Sincerely,

HDR Engineering, Inc.

Bruce Moreira
Environmental Scientist

Enclosures: Figure 1 - Project Location Map

cc: Jim Atkinson, Allete
Todd Mattson, HDR Engineering

April 7, 2009

Ms. Maren Daley, Executive Director
Job Service North Dakota
PO Box 5507
Bismarck, ND 58506-5507

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Ms. Daley:

HDR Engineering, Inc. (HDR) is gathering environmental information and stakeholder comments on the Bison I Wind Project proposed by Minnesota Power, an operating division of ALLETE, Inc.(hereinafter "Minnesota Power") in Morton and Oliver Counties, North Dakota. The proposed wind project will include 33 2.3-megawatt (MW) Siemens wind turbines with a total generating capacity of 75.9 MW. The project is under the 100-MW threshold for a required site permit from the North Dakota Public Services Commission (NDPSC). However, Minnesota Power plans to submit an application for a site permit with the NDPSC because the project is the first phase of a larger wind facility. This inquiry only covers the first phase of the project, the Bison I Wind Project. The project area is shown on the enclosed map (Figure 1).

Typically, wind project construction includes erecting wind turbines and constructing associated facilities such as gravel access roads, an underground electrical collector system, electrical collector substations, and overhead transmission lines. Although final locations of the turbines, access roads, and the electrical collector system have not been determined at this time, the table below identifies Township sections potentially affected by the project:

Table 1 – Sections within Bison I Wind Project Boundary

County	Township	Range	Sections
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HDR Engineering, Inc.
701 Xenia Avenue South
Minneapolis, MN 55416-3636
Phone (763) 591-5400
Fax (763) 591-5413
www.hdrinc.com

This project notification and information request precedes filing of the NDPSC Energy Facility Siting Permit application but is not intended to preclude subsequent review and comment. We appreciate any input or information that you might provide at this time. If you require additional information or have questions regarding the Bison I Wind Project, please feel free to call me at (763) 278-5925.

Sincerely,

HDR Engineering, Inc.

Bruce Moreira
Environmental Scientist

Enclosures: Figure 1 - Project Location Map

cc: Jim Atkinson, Allete
Todd Mattson, HDR Engineering

April 7, 2009

Mr. Mark J. Holzer
North Dakota Aeronautics Commission
PO Box 5020
Bismarck, ND 58502-5020

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Mr. Holzer:

HDR Engineering, Inc. (HDR) is gathering environmental information and stakeholder comments on the Bison I Wind Project proposed by Minnesota Power, an operating division of ALLETE, Inc.(hereinafter "Minnesota Power") in Morton and Oliver Counties, North Dakota. The proposed wind project will include 33 2.3-megawatt (MW) Siemens wind turbines with a total generating capacity of 75.9 MW. The project is under the 100-MW threshold for a required site permit from the North Dakota Public Services Commission (NDPSC). However, Minnesota Power plans to submit an application for a site permit with the NDPSC because the project is the first phase of a larger wind facility. This inquiry only covers the first phase of the project, the Bison I Wind Project. The project area is shown on the enclosed map (Figure 1).

Typically, wind project construction includes erecting wind turbines and constructing associated facilities such as gravel access roads, an underground electrical collector system, electrical collector substations, and overhead transmission lines. Although final locations of the turbines, access roads, and the electrical collector system have not been determined at this time, the table below identifies Township sections potentially affected by the project:

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701 Xenia Avenue South
Minneapolis, MN 55416-3636
Phone (763) 591-5400
Fax (763) 591-5413
www.hdrinc.com

HDR welcomes comments the North Dakota Aeronautics Commission may have at this time or throughout the permit application process. HDR requests your review of the sections listed in Table 1 to identify potential impacts to area flight paths and any permits that may be required for the project. Your comments will be incorporated into the NDPSC review process for the project.

This project notification and information request precedes filing of the NDPSC Energy Facility Siting Permit application but is not intended to preclude subsequent review and comment. We appreciate any input or information that you might provide at this time. If you require additional information or have questions regarding the Bison I Wind Project, please feel free to call me at (763) 278-5925.

Sincerely,

HDR Engineering, Inc.

Bruce Moreira
Environmental Scientist

Enclosures: Figure 1 - Project Location Map

cc: Jim Atkinson, Allete
Todd Mattson, HDR Engineering

April 7, 2009

Mr. Randy Christmann, President
North Dakota Association of Telecommunication Cooperatives
West River Telecommunications
401 3rd Avenue NE
Hazen, ND 58545-4429

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Mr. Christmann:

HDR Engineering, Inc. (HDR) is gathering environmental information and stakeholder comments on the Bison I Wind Project proposed by Minnesota Power, an operating division of ALLETE, Inc.(hereinafter "Minnesota Power") in Morton and Oliver Counties, North Dakota. The proposed wind project will include 33 2.3-megawatt (MW) Siemens wind turbines with a total generating capacity of 75.9 MW. The project is under the 100-MW threshold for a required site permit from the North Dakota Public Services Commission (NDPSC). However, Minnesota Power plans to submit an application for a site permit with the NDPSC because the project is the first phase of a larger wind facility. This inquiry only covers the first phase of the project, the Bison I Wind Project. The project area is shown on the enclosed map (Figure 1).

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HDR Engineering, Inc.
701 Xenia Avenue South
Minneapolis, MN 55416-3636
Phone (763) 591-5400
Fax (763) 591-5413
www.hdrinc.com

HDR welcomes comments the North Dakota Association of Telecommunications Cooperatives (NDATC) may have at this time or throughout the permit application process. HDR requests your review of the sections listed in Table 1 to identify potential impacts to existing telecommunications infrastructure. Your comments will be incorporated into the NDPUC review process for the Bison I project. Please forward this letter to members of the NDATC that have telecommunications infrastructure in the project area.

This project notification and information request precedes filing of the NDPSC Energy Facility Siting Permit application but is not intended to preclude subsequent review and comment. We appreciate any input or information that you might provide at this time. If you require additional information or have questions regarding the Bison I Wind Project, please feel free to call me at (763) 278-5925.

Sincerely,

HDR Engineering, Inc.

Bruce Moreira
Environmental Scientist

Enclosures: Figure 1 - Project Location Map

cc: Jim Atkinson, Allete
Todd Mattson, HDR Engineering

April 7, 2009

Attorney General Wayne Stenehjem
State Capitol
600 East Boulevard Avenue, Department 125
Bismarck, ND 58505

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Attorney General Stenehjem:

HDR Engineering, Inc. (HDR) is gathering environmental information and stakeholder comments on the Bison I Wind Project proposed by Minnesota Power, an operating division of ALLETE, Inc.(hereinafter "Minnesota Power") in Morton and Oliver Counties, North Dakota. The proposed wind project will include 33 2.3-megawatt (MW) Siemens wind turbines with a total generating capacity of 75.9 MW. The project is under the 100-MW threshold for a required site permit from the North Dakota Public Services Commission (NDPSC). However, Minnesota Power plans to submit an application for a site permit with the NDPSC because the project is the first phase of a larger wind facility. This inquiry only covers the first phase of the project, the Bison I Wind Project. The project area is shown on the enclosed map (Figure 1).

Typically, wind project construction includes erecting wind turbines and constructing associated facilities such as gravel access roads, an underground electrical collector system, electrical collector substations, and overhead transmission lines. Although final locations of the turbines, access roads, and the electrical collector system have not been determined at this time, the table below identifies Township sections potentially affected by the project:

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This project notification and information request precedes filing of the NDPSC Energy Facility Siting Permit application but is not intended to preclude subsequent review and comment. We appreciate any input or information that you might provide at this time. If you require additional information or have questions regarding the Bison I Wind Project, please feel free to call me at (763) 278-5925.

Sincerely,

HDR Engineering, Inc.

Bruce Moreira
Environmental Scientist

Enclosures: Figure 1 - Project Location Map

cc: Jim Atkinson, Allete
Todd Mattson, HDR Engineering

April 7, 2009

Mr. Wayne Kutzer, Director and Executive Officer
North Dakota Department of Career and Technical Education
State Capitol 15th Floor
600 East Boulevard Avenue, Department 270
Bismarck, ND 58505-0610

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Mr. Kutzer:

HDR Engineering, Inc. (HDR) is gathering environmental information and stakeholder comments on the Bison I Wind Project proposed by Minnesota Power, an operating division of ALLETE, Inc.(hereinafter "Minnesota Power") in Morton and Oliver Counties, North Dakota. The proposed wind project will include 33 2.3-megawatt (MW) Siemens wind turbines with a total generating capacity of 75.9 MW. The project is under the 100-MW threshold for a required site permit from the North Dakota Public Services Commission (NDPSC). However, Minnesota Power plans to submit an application for a site permit with the NDPSC because the project is the first phase of a larger wind facility. This inquiry only covers the first phase of the project, the Bison I Wind Project. The project area is shown on the enclosed map (Figure 1).

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Table 1 – Sections within Bison I Wind Project Boundary

County	Township	Range	Sections
Morton	140N	86W	2-5, 8-11, 15- 17, 20
Oliver	141N	85W	29- 34
	141N	86W	25, 26, 35, 36

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Sincerely,

HDR Engineering, Inc.

Bruce Moreira
Environmental Scientist

Enclosures: Figure 1 - Project Location Map

cc: Jim Atkinson, Allete
Todd Mattson, HDR Engineering

April 7, 2009

Mr. Roger Johnson, Agriculture Commissioner
North Dakota Department of Agriculture
600 East Boulevard Avenue, Department 602
Bismarck, ND 58505-0020

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Mr. Johnson:

HDR Engineering, Inc. (HDR) is gathering environmental information and stakeholder comments on the Bison I Wind Project proposed by Minnesota Power, an operating division of ALLETE, Inc.(hereinafter "Minnesota Power") in Morton and Oliver Counties, North Dakota. The proposed wind project will include 33 2.3-megawatt (MW) Siemens wind turbines with a total generating capacity of 75.9 MW. The project is under the 100-MW threshold for a required site permit from the North Dakota Public Services Commission (NDPSC). However, Minnesota Power plans to submit an application for a site permit with the NDPSC because the project is the first phase of a larger wind facility. This inquiry only covers the first phase of the project, the Bison I Wind Project. The project area is shown on the enclosed map (Figure 1).

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HDR Engineering, Inc.
701 Xenia Avenue South
Minneapolis, MN 55416-3636
Phone (763) 591-5400
Fax (763) 591-5413
www.hdrinc.com

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Sincerely,

HDR Engineering, Inc.

Bruce Moreira
Environmental Scientist

Enclosures: Figure 1 - Project Location Map

cc: Jim Atkinson, Allete
Todd Mattson, HDR Engineering

April 7, 2009

Mr. Shane Goettle, Commissioner
North Dakota Department of Commerce
1600 East Century Avenue, Suite 2
PO Box 2057
Bismarck, ND 58503

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Mr. Goettle:

HDR Engineering, Inc. (HDR) is gathering environmental information and stakeholder comments on the Bison I Wind Project proposed by Minnesota Power, an operating division of ALLETE, Inc.(hereinafter "Minnesota Power") in Morton and Oliver Counties, North Dakota. The proposed wind project will include 33 2.3-megawatt (MW) Siemens wind turbines with a total generating capacity of 75.9 MW. The project is under the 100-MW threshold for a required site permit from the North Dakota Public Services Commission (NDPSC). However, Minnesota Power plans to submit an application for a site permit with the NDPSC because the project is the first phase of a larger wind facility. This inquiry only covers the first phase of the project, the Bison I Wind Project. The project area is shown on the enclosed map (Figure 1).

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Sincerely,

HDR Engineering, Inc.

Bruce Moreira
Environmental Scientist

Enclosures: Figure 1 - Project Location Map

cc: Jim Atkinson, Allete
Todd Mattson, HDR Engineering

April 7, 2009

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

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Dr. Dwelle:

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HDR Engineering, Inc.

Bruce Moreira
Environmental Scientist

Enclosures: Figure 1 - Project Location Map

cc: Jim Atkinson, Allete
Todd Mattson, HDR Engineering

April 7, 2009

Ms. Lisa Fair McEvers, Commissioner of Labor
North Dakota Department of Labor
600 East Boulevard Avenue, Department 406
Bismarck, ND 58505-0340

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Ms. McEvers:

HDR Engineering, Inc. (HDR) is gathering environmental information and stakeholder comments on the Bison I Wind Project proposed by Minnesota Power, an operating division of ALLETE, Inc.(hereinafter "Minnesota Power") in Morton and Oliver Counties, North Dakota. The proposed wind project will include 33 2.3-megawatt (MW) Siemens wind turbines with a total generating capacity of 75.9 MW. The project is under the 100-MW threshold for a required site permit from the North Dakota Public Services Commission (NDPSC). However, Minnesota Power plans to submit an application for a site permit with the NDPSC because the project is the first phase of a larger wind facility. This inquiry only covers the first phase of the project, the Bison I Wind Project. The project area is shown on the enclosed map (Figure 1).

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Sincerely,

HDR Engineering, Inc.

Bruce Moreira
Environmental Scientist

Enclosures: Figure 1 - Project Location Map

cc: Jim Atkinson, Allete
Todd Mattson, HDR Engineering

April 7, 2009

Ms. Carol K. Olson, Executive Director
North Dakota Department of Human Services
600 East Boulevard Avenue, Department 325
Bismarck, ND 58505-0250

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Ms. Olson:

HDR Engineering, Inc. (HDR) is gathering environmental information and stakeholder comments on the Bison I Wind Project proposed by Minnesota Power, an operating division of ALLETE, Inc.(hereinafter "Minnesota Power") in Morton and Oliver Counties, North Dakota. The proposed wind project will include 33 2.3-megawatt (MW) Siemens wind turbines with a total generating capacity of 75.9 MW. The project is under the 100-MW threshold for a required site permit from the North Dakota Public Services Commission (NDPSC). However, Minnesota Power plans to submit an application for a site permit with the NDPSC because the project is the first phase of a larger wind facility. This inquiry only covers the first phase of the project, the Bison I Wind Project. The project area is shown on the enclosed map (Figure 1).

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Sincerely,

HDR Engineering, Inc.

Bruce Moreira
Environmental Scientist

Enclosures: Figure 1 - Project Location Map

cc: Jim Atkinson, Allete
Todd Mattson, HDR Engineering

April 7, 2009

Mr. Paul Govig, Director
North Dakota Department of Commerce
Division of Community Services
1600 East Century Avenue, Suite 2
PO Box 2057
Bismarck, ND 58503

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Mr. Govig:

HDR Engineering, Inc. (HDR) is gathering environmental information and stakeholder comments on the Bison I Wind Project proposed by Minnesota Power, an operating division of ALLETE, Inc.(hereinafter "Minnesota Power") in Morton and Oliver Counties, North Dakota. The proposed wind project will include 33 2.3-megawatt (MW) Siemens wind turbines with a total generating capacity of 75.9 MW. The project is under the 100-MW threshold for a required site permit from the North Dakota Public Services Commission (NDPSC). However, Minnesota Power plans to submit an application for a site permit with the NDPSC because the project is the first phase of a larger wind facility. This inquiry only covers the first phase of the project, the Bison I Wind Project. The project area is shown on the enclosed map (Figure 1).

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Sincerely,

HDR Engineering, Inc.

Bruce Moreira
Environmental Scientist

Enclosures: Figure 1 - Project Location Map

cc: Jim Atkinson, Allete
Todd Mattson, HDR Engineering

April 7, 2009

Ms. Renee Seibel
North Dakota Department of Transportation
District 1 - Bismarck
218 Airport Road
Bismarck, ND 58504-6003

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Ms. Seibel:

HDR Engineering, Inc. (HDR) is gathering environmental information and stakeholder comments on the Bison I Wind Project proposed by Minnesota Power, an operating division of ALLETE, Inc.(hereinafter "Minnesota Power") in Morton and Oliver Counties, North Dakota. The proposed wind project will include 33 2.3-megawatt (MW) Siemens wind turbines with a total generating capacity of 75.9 MW. The project is under the 100-MW threshold for a required site permit from the North Dakota Public Services Commission (NDPSC). However, Minnesota Power plans to submit an application for a site permit with the NDPSC because the project is the first phase of a larger wind facility. This inquiry only covers the first phase of the project, the Bison I Wind Project. The project area is shown on the enclosed map (Figure 1).

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HDR welcomes comments the North Dakota Department of Transportation (NDDOT) may have at this time or throughout the permit application process. HDR requests your review of the sections listed in Table 1 to identify potential impacts to state and federal roadways and any permits that may be required for the project. Your comments will be incorporated into the NDPSC review process for the project.

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Bruce Moreira
Environmental Scientist

Enclosures: Figure 1 - Project Location Map

cc: Jim Atkinson, Allete
Todd Mattson, HDR Engineering

April 7, 2009

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

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Mr. Murphy:

HDR Engineering, Inc. (HDR) is gathering environmental information and stakeholder comments on the Bison I Wind Project proposed by Minnesota Power, an operating division of ALLETE, Inc.(hereinafter "Minnesota Power") in Morton and Oliver Counties, North Dakota. The proposed wind project will include 33 2.3-megawatt (MW) Siemens wind turbines with a total generating capacity of 75.9 MW. The project is under the 100-MW threshold for a required site permit from the North Dakota Public Services Commission (NDPSC). However, Minnesota Power plans to submit an application for a site permit with the NDPSC because the project is the first phase of a larger wind facility. This inquiry only covers the first phase of the project, the Bison I Wind Project. The project area is shown on the enclosed map (Figure 1).

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We welcome any comments your agency may have on the project at this time or throughout the permit application process.

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Minneapolis, MN 55416-3636
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Bruce Moreira
Environmental Scientist

Enclosures: Figure 1 - Project Location Map

cc: Jim Atkinson, Allete
Todd Mattson, HDR Engineering

April 7, 2009

Governor John Hoeven
State of North Dakota
600 East Boulevard Avenue
Bismarck, ND 58505-0001

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Governor Hoeven:

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Bruce Moreira
Environmental Scientist

Enclosures: Figure 1 - Project Location Map

cc: Jim Atkinson, Allete
Todd Mattson, HDR Engineering

April 7, 2009

Ms. Cheryl M. Kulas, Executive Director
North Dakota Indian Affairs Commission
600 East Boulevard Avenue
1st Floor Judicial Wing Room #117
Bismarck, ND 58505

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Ms. Kulas:

HDR Engineering, Inc. (HDR) is gathering environmental information and stakeholder comments on the Bison I Wind Project proposed by Minnesota Power, an operating division of ALLETE, Inc.(hereinafter "Minnesota Power") in Morton and Oliver Counties, North Dakota. The proposed wind project will include 33 2.3-megawatt (MW) Siemens wind turbines with a total generating capacity of 75.9 MW. The project is under the 100-MW threshold for a required site permit from the North Dakota Public Services Commission (NDPSC). However, Minnesota Power plans to submit an application for a site permit with the NDPSC because the project is the first phase of a larger wind facility. This inquiry only covers the first phase of the project, the Bison I Wind Project. The project area is shown on the enclosed map (Figure 1).

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HDR Engineering, Inc.

Bruce Moreira
Environmental Scientist

Enclosures: Figure 1 - Project Location Map

cc: Jim Atkinson, Allete
Todd Mattson, HDR Engineering

April 7, 2009

Ms. Pam Sharp, Director
North Dakota Office of Management and Budget
1600 East Boulevard Avenue, Department 110
Bismarck, ND 58505-0400

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Dear Ms. Sharp:

HDR Engineering, Inc. (HDR) is gathering environmental information and stakeholder comments on the Bison I Wind Project proposed by Minnesota Power, an operating division of ALLETE, Inc.(hereinafter "Minnesota Power") in Morton and Oliver Counties, North Dakota. The proposed wind project will include 33 2.3-megawatt (MW) Siemens wind turbines with a total generating capacity of 75.9 MW. The project is under the 100-MW threshold for a required site permit from the North Dakota Public Services Commission (NDPSC). However, Minnesota Power plans to submit an application for a site permit with the NDPSC because the project is the first phase of a larger wind facility. This inquiry only covers the first phase of the project, the Bison I Wind Project. The project area is shown on the enclosed map (Figure 1).

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Bruce Moreira
Environmental Scientist

Enclosures: Figure 1 - Project Location Map

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Todd Mattson, HDR Engineering

April 7, 2009

Ms. Kathy Duttenhefner
North Dakota Parks and Recreation Department
1600 East Century Avenue, Suite 3
Bismarck, ND 58503

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Ms. Duttenhefner:

HDR Engineering, Inc. (HDR) is gathering environmental information and stakeholder comments on the Bison I Wind Project proposed by Minnesota Power, an operating division of ALLETE, Inc.(hereinafter "Minnesota Power") in Morton and Oliver Counties, North Dakota. The proposed wind project will include 33 2.3-megawatt (MW) Siemens wind turbines with a total generating capacity of 75.9 MW. The project is under the 100-MW threshold for a required site permit from the North Dakota Public Services Commission (NDPSC). However, Minnesota Power plans to submit an application for a site permit with the NDPSC because the project is the first phase of a larger wind facility. This inquiry only covers the first phase of the project, the Bison I Wind Project. The project area is shown on the enclosed map (Figure 1).

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Bruce Moreira
Environmental Scientist

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Todd Mattson, HDR Engineering

April 7, 2009

Mr. Scott Hochhalter, Soil Conservation Specialist
North Dakota State Soil Conservation Committee
NDSU Extension Service
2718 Gateway Avenue, Unit #104
Bismarck, ND 58503

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Mr. Hochhalter:

HDR Engineering, Inc. (HDR) is gathering environmental information and stakeholder comments on the Bison I Wind Project proposed by Minnesota Power, an operating division of ALLETE, Inc.(hereinafter "Minnesota Power") in Morton and Oliver Counties, North Dakota. The proposed wind project will include 33 2.3-megawatt (MW) Siemens wind turbines with a total generating capacity of 75.9 MW. The project is under the 100-MW threshold for a required site permit from the North Dakota Public Services Commission (NDPSC). However, Minnesota Power plans to submit an application for a site permit with the NDPSC because the project is the first phase of a larger wind facility. This inquiry only covers the first phase of the project, the Bison I Wind Project. The project area is shown on the enclosed map (Figure 1).

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Todd Mattson, HDR Engineering

April 7, 2009

Mr. Jeff Engleson
North Dakota State Land Department
Energy Development Impact Office
PO Box 5523
Bismarck, ND 58506-5523

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Mr. Engleson:

HDR Engineering, Inc. (HDR) is gathering environmental information and stakeholder comments on the Bison I Wind Project proposed by Minnesota Power, an operating division of ALLETE, Inc.(hereinafter "Minnesota Power") in Morton and Oliver Counties, North Dakota. The proposed wind project will include 33 2.3-megawatt (MW) Siemens wind turbines with a total generating capacity of 75.9 MW. The project is under the 100-MW threshold for a required site permit from the North Dakota Public Services Commission (NDPSC). However, Minnesota Power plans to submit an application for a site permit with the NDPSC because the project is the first phase of a larger wind facility. This inquiry only covers the first phase of the project, the Bison I Wind Project. The project area is shown on the enclosed map (Figure 1).

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Table 1 – Sections within Bison I Wind Project Boundary

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Morton	140N	86W	2-5, 8-11, 15- 17, 20
Oliver	141N	85W	29- 34
	141N	86W	25, 26, 35, 36

This project notification and information request precedes filing of the NDPSC Energy Facility Siting Permit application but is not intended to preclude subsequent review and comment. We appreciate any input or information that you might provide at this time. If you require additional information or have questions regarding the Bison I Wind Project, please feel free to call me at (763) 278-5925.

Sincerely,

HDR Engineering, Inc.

Bruce Moreira
Environmental Scientist

Enclosures: Figure 1 - Project Location Map

cc: Jim Atkinson, Allete
Todd Mattson, HDR Engineering

April 7, 2009

Mr. Gary Preszler, Land Commissioner
North Dakota State Land Department
1707 North 9th Street
PO Box 5523
Bismarck, ND 58506-5523

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Dear Mr. Preszler:

HDR Engineering, Inc. (HDR) is gathering environmental information and stakeholder comments on the Bison I Wind Project proposed by Minnesota Power, an operating division of ALLETE, Inc.(hereinafter "Minnesota Power") in Morton and Oliver Counties, North Dakota. The proposed wind project will include 33 2.3-megawatt (MW) Siemens wind turbines with a total generating capacity of 75.9 MW. The project is under the 100-MW threshold for a required site permit from the North Dakota Public Services Commission (NDPSC). However, Minnesota Power plans to submit an application for a site permit with the NDPSC because the project is the first phase of a larger wind facility. This inquiry only covers the first phase of the project, the Bison I Wind Project. The project area is shown on the enclosed map (Figure 1).

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HDR Engineering, Inc.
701 Xenia Avenue South
Minneapolis, MN 55416-3636
Phone (763) 591-5400
Fax (763) 591-5413
www.hdrinc.com

This project notification and information request precedes filing of the NDPSC Energy Facility Siting Permit application but is not intended to preclude subsequent review and comment. We appreciate any input or information that you might provide at this time. If you require additional information or have questions regarding the Bison I Wind Project, please feel free to call me at (763) 278-5925.

Sincerely,

HDR Engineering, Inc.

Bruce Moreira
Environmental Scientist

Enclosures: Figure 1 - Project Location Map

cc: Jim Atkinson, Allete
Todd Mattson, HDR Engineering

April 7, 2009

Mr. Dale Frink, State Engineer
North Dakota State Water Commission
900 East Boulevard Avenue, Department 770
Bismarck, ND 58505-0850

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Mr. Frink:

HDR Engineering, Inc. (HDR) is gathering environmental information and stakeholder comments on the Bison I Wind Project proposed by Minnesota Power, an operating division of ALLETE, Inc.(hereinafter "Minnesota Power") in Morton and Oliver Counties, North Dakota. The proposed wind project will include 33 2.3-megawatt (MW) Siemens wind turbines with a total generating capacity of 75.9 MW. The project is under the 100-MW threshold for a required site permit from the North Dakota Public Services Commission (NDPSC). However, Minnesota Power plans to submit an application for a site permit with the NDPSC because the project is the first phase of a larger wind facility. This inquiry only covers the first phase of the project, the Bison I Wind Project. The project area is shown on the enclosed map (Figure 1).

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Sincerely,

HDR Engineering, Inc.

Bruce Moreira
Environmental Scientist

Enclosures: Figure 1 - Project Location Map

cc: Jim Atkinson, Allete
Todd Mattson, HDR Engineering

April 7, 2009

Mr. Paul E. Trauger
Morton County Planning and Development Department
210 2nd Avenue NW
Mandan, ND 58554

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Mr. Trauger:

HDR Engineering, Inc. (HDR) is gathering environmental information and stakeholder comments on the Bison I Wind Project proposed by Minnesota Power, an operating division of ALLETE, Inc.(hereinafter "Minnesota Power") in Morton and Oliver Counties, North Dakota. The proposed wind project will include 33 2.3-megawatt (MW) Siemens wind turbines with a total generating capacity of 75.9 MW. The project is under the 100-MW threshold for a required site permit from the North Dakota Public Services Commission (NDPSC). However, Minnesota Power plans to submit an application for a site permit with the NDPSC because the project is the first phase of a larger wind facility. This inquiry only covers the first phase of the project, the Bison I Wind Project. The project area is shown on the enclosed map (Figure 1).

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701 Xenia Avenue South
Minneapolis, MN 55416-3636
Phone (763) 591-5400
Fax (763) 591-5413
www.hdrinc.com

HDR welcomes comments the Morton County Planning and Development Department may have at this time or throughout the permit application process. HDR requests your review of the sections listed in Table 1 to identify any permits that may be required for the project. HDR anticipates completing a Conditional Use Permit in 2009 for the proposed project. Your comments will be incorporated into the NDPSC review process for the project.

This project notification and information request precedes filing of the NDPSC Energy Facility Siting Permit application but is not intended to preclude subsequent review and comment. We appreciate any input or information that you might provide at this time. If you require additional information or have questions regarding the Bison I Wind Project, please feel free to call me at (763) 278-5925.

Sincerely,

HDR Engineering, Inc.

Bruce Moreira
Environmental Scientist

Enclosures: Figure 1 - Project Location Map

cc: Jim Atkinson, Allete
Todd Mattson, HDR Engineering

April 7, 2009

Mr. John Wicklund
Oliver County Planning and Development Department
Box 188
Center, ND 58530

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Mr. Wicklund:

HDR Engineering, Inc. (HDR) is gathering environmental information and stakeholder comments on the Bison I Wind Project proposed by Minnesota Power, an operating division of ALLETE, Inc.(hereinafter "Minnesota Power") in Morton and Oliver Counties, North Dakota. The proposed wind project will include 33 2.3-megawatt (MW) Siemens wind turbines with a total generating capacity of 75.9 MW. The project is under the 100-MW threshold for a required site permit from the North Dakota Public Services Commission (NDPSC). However, Minnesota Power plans to submit an application for a site permit with the NDPSC because the project is the first phase of a larger wind facility. This inquiry only covers the first phase of the project, the Bison I Wind Project. The project area is shown on the enclosed map (Figure 1).

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HDR Engineering, Inc.
701 Xenia Avenue South
Minneapolis, MN 55416-3636
Phone (763) 591-5400
Fax (763) 591-5413
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HDR welcomes comments the Oliver County Planning and Development Department may have at this time or throughout the permit application process. HDR requests your review of the sections listed in Table 1 to identify any permits that may be required for the project. HDR anticipates completing a Conditional Use Permit in 2009 for the proposed project. Your comments will be incorporated into the NDPSC review process for the Bison I project.

This project notification and information request precedes filing of the NDPSC Energy Facility Siting Permit application but is not intended to preclude subsequent review and comment. We appreciate any input or information that you might provide at this time. If you require additional information or have questions regarding the Bison I Wind Project, please feel free to call me at (763) 278-5925.

Sincerely,

HDR Engineering, Inc.

Bruce Moreira
Environmental Scientist

Enclosures: Figure 1 - Project Location Map

cc: Jim Atkinson, Allete
Todd Mattson, HDR Engineering

April 7, 2009

Ms. Michele R. Doyle, District Conservationist
Morton County Soil and Water Conservation District
Mandan Service Center
2540 Overlook Lane
Mandan, ND 58554

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Ms. Doyle:

HDR Engineering, Inc. (HDR) is gathering environmental information and stakeholder comments on the Bison I Wind Project proposed by Minnesota Power, an operating division of ALLETE, Inc.(hereinafter "Minnesota Power") in Morton and Oliver Counties, North Dakota. The proposed wind project will include 33 2.3-megawatt (MW) Siemens wind turbines with a total generating capacity of 75.9 MW. The project is under the 100-MW threshold for a required site permit from the North Dakota Public Services Commission (NDPSC). However, Minnesota Power plans to submit an application for a site permit with the NDPSC because the project is the first phase of a larger wind facility. This inquiry only covers the first phase of the project, the Bison I Wind Project. The project area is shown on the enclosed map (Figure 1).

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701 Xenia Avenue South
Minneapolis, MN 55416-3636
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Fax (763) 591-5413
www.hdrinc.com

HDR welcomes comments the Morton County Soil and Water Conservation District (SWCD) may have at this time or throughout the permit application process. Your comments will be incorporated into the NDPSC review process for the Bison I project.

HDR would like to work with your office to identify Conservation Reserve Program (CRP) properties in the project area. Please identify the preferred method of obtaining information from your office on the parcels within the project area that participate in the CRP program.

This project notification and information request precedes filing of the NDPSC Energy Facility Siting Permit application but is not intended to preclude subsequent review and comment. If you require additional information or have questions regarding the Bison I Wind Project, please feel free to call me at (763) 278-5925.

Sincerely,

HDR Engineering, Inc.

Bruce Moreira
Environmental Scientist

Enclosures: Figure 1 - Project Location Map

cc: Jim Atkinson, Allete
Todd Mattson, HDR Engineering

April 7, 2009

Mr. David D. Pfliiger, District Conservationist
Oliver County Soil and Water Conservation District
345 Center Avenue South, Box 87
Center, ND 58530-0087

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Mr. Pfliiger:

HDR Engineering, Inc. (HDR) is gathering environmental information and stakeholder comments on the Bison I Wind Project proposed by Minnesota Power, an operating division of ALLETE, Inc.(hereinafter "Minnesota Power") in Morton and Oliver Counties, North Dakota. The proposed wind project will include 33 2.3-megawatt (MW) Siemens wind turbines with a total generating capacity of 75.9 MW. The project is under the 100-MW threshold for a required site permit from the North Dakota Public Services Commission (NDPSC). However, Minnesota Power plans to submit an application for a site permit with the NDPSC because the project is the first phase of a larger wind facility. This inquiry only covers the first phase of the project, the Bison I Wind Project. The project area is shown on the enclosed map (Figure 1).

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701 Xenia Avenue South
Minneapolis, MN 55416-3636
Phone (763) 591-5400
Fax (763) 591-5413
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Sincerely,

HDR Engineering, Inc.

Bruce Moreira
Environmental Scientist

Enclosures: Figure 1 - Project Location Map

cc: Jim Atkinson, Allete
Todd Mattson, HDR Engineering

April 7, 2009

Mr. Charles A. Mormon
Morton County Highway Department
Building A, Door 3
2916 37th Street NW
Mandan, ND 58554

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Mr. Mormon:

HDR Engineering, Inc. (HDR) is gathering environmental information and stakeholder comments on the Bison I Wind Project proposed by Minnesota Power, an operating division of ALLETE, Inc.(hereinafter "Minnesota Power") in Morton and Oliver Counties, North Dakota. The proposed wind project will include 33 2.3-megawatt (MW) Siemens wind turbines with a total generating capacity of 75.9 MW. The project is under the 100-MW threshold for a required site permit from the North Dakota Public Services Commission (NDPSC). However, Minnesota Power plans to submit an application for a site permit with the NDPSC because the project is the first phase of a larger wind facility. This inquiry only covers the first phase of the project, the Bison I Wind Project. The project area is shown on the enclosed map (Figure 1).

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HDR welcomes comments the Morton County Highway Department may have at this time or throughout the permit application process. HDR requests your review of the sections listed in

Table 1 to identify potential impacts to County roadways and any permits that may be required for the project. Your comments will be incorporated into the NDPSC review process for the Bison I project.

This project notification and information request precedes filing of the NDPSC Energy Facility Siting Permit application but is not intended to preclude subsequent review and comment. If you require additional information or have questions regarding the Bison I Wind Project, please feel free to call me at (763) 278-5925.

Sincerely,

HDR Engineering, Inc.

Bruce Moreira
Environmental Scientist

Enclosures: Figure 1 - Project Location Map

cc: Jim Atkinson, Allete
Todd Mattson, HDR Engineering

April 7, 2009

Mr. Bruce Nelson
Oliver County Highway Department
115 West Main
PO Box 188
Center, ND 58530-0188

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Mr. Nelson:

HDR Engineering, Inc. (HDR) is gathering environmental information and stakeholder comments on the Bison I Wind Project proposed by Minnesota Power, an operating division of ALLETE, Inc.(hereinafter "Minnesota Power") in Morton and Oliver Counties, North Dakota. The proposed wind project will include 33 2.3-megawatt (MW) Siemens wind turbines with a total generating capacity of 75.9 MW. The project is under the 100-MW threshold for a required site permit from the North Dakota Public Services Commission (NDPSC). However, Minnesota Power plans to submit an application for a site permit with the NDPSC because the project is the first phase of a larger wind facility. This inquiry only covers the first phase of the project, the Bison I Wind Project. The project area is shown on the enclosed map (Figure 1).

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HDR Engineering, Inc.
701 Xenia Avenue South
Minneapolis, MN 55416-3636
Phone (763) 591-5400
Fax (763) 591-5413
www.hdrinc.com

HDR welcomes comments the Oliver County Highway Department may have at this time or throughout the permit application process. HDR requests your review of the sections listed in Table 1 to identify potential impacts to County roadways and any permits that may be required for the project. Your comments will be incorporated into the NDPSC review process for the project.

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Sincerely,

HDR Engineering, Inc.

Bruce Moreira
Environmental Scientist

Enclosures: Figure 1 - Project Location Map

cc: Jim Atkinson, Allete
Todd Mattson, HDR Engineering

APPENDIX C

Agency Letters

C-2 Letters to HDR

"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

RECEIVED

MAY 11 2009

HDR Engineering, Inc.

May 5, 2009

Bruce Moreira
Environmental Scientist
HDR Engineering, Inc.
701 Xenia Avenue South
Minneapolis, MN 55416-3636

Dear Mr. Moreira:

RE: Bison I Wind Project – Oliver & Morton Counties, North Dakota

The North Dakota Game and Fish Department (NDGFD) has no record of threatened or endangered species within the proposed project area.

Our primary concern with wind power development is the disturbance of native prairie in conjunction with the 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.

The National Wetland Inventory indicates various wetlands 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 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.

Information regarding NDGFD property and easements is available in various formats at http://gf.nd.gov/maps/. If assistance is needed to access this data, Mr. Brian Hosek, GIS Systems Specialist, can be contacted at (701) 328-6369.

We would appreciate being kept informed as this project progresses, and as other wind power projects are developed in North Dakota. If possible, we would also like the GPS coordinates for each turbine after the site has been established.

Sincerely,

Michael G. McKenna
Chief
Conservation & Communication Division

js

"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

RECEIVED
SEP 24 2009
HDR Engineering, Inc.

September 21, 2009

Bruce Moreira
Environmental Scientist
HDR Engineering, Inc.
701 Xenia Avenue South
Minneapolis, MN 55416-3636

Dear Mr. Moreira:

RE: 230-kV Overhead Transmission Line – Bison I Wind Project
Morton and Oliver Counties, North Dakota

The North Dakota Game and Fish Department has reviewed this project for wildlife concerns. Our primary concern is the possible disturbance of native prairie and wetland areas during construction of the transmission line. We ask that work within these areas be avoided to the extent possible, above-ground appurtenances not be placed in wetland areas, and disturbed areas be reclaimed to pre-project conditions.

The department manages the Wilbur Boldt Wildlife Management Area in section 32 NE, T142N, R83W. A special use permit would be required to cross these lands. For additional information on permit requirements, Mr. Jeb Williams, Wildlife Resource Management Supervisor, can be contacted at 701-328-6686.

We recommend that overhead lines be marked when placed over perennial streams or sited in close proximity to large wetland complexes to minimize possible avian impacts. The publication "Mitigating Bird Collisions with Power Lines: the State of the Art in 1994" provides a range of management options which can be used to reduce avian collisions.

Sincerely,

Michael G. McKenna
Chief
Conservation & Communication Division

js

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
3425 Miriam Avenue
Bismarck, North Dakota 58501

MAY 4 2009

RECEIVED
MAY - 7 2009
HDR Engineering, Inc.

Mr. Bruce Moreira
HDR Engineering, Inc.
701 Xenia Avenue South
Minneapolis, Minnesota 55416-3636

Dear Mr. Moreira:

This is in response to your April 7, 2009, request for environmental information in relation to an investigation into a potential wind energy development project in Morton and Oliver Counties, North Dakota. Minnesota Power proposes to construct and operate the Bison I Wind Power Project, including thirty-three 2.3-megawatt (MW) Siemens wind turbines and associated facilities. The location for the proposed project is approximately seven miles northwest of New Salem, North Dakota. The proposed project is the first phase of a planned larger project. No information was provided as to the specific location of wind turbines that may be constructed. Therefore, our comments are general in nature. We offer the following comments under the authority of and in accordance with the Migratory Bird Treaty Act (16 U.S.C. 703 et seq.), Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668-668d, 54 Stat. 250), Executive Order 13186 "Responsibilities of Federal Agencies to Protect Migratory Birds", the Endangered Species Act (ESA) (16 U.S.C. 1531 et seq.), the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57), and the National Environmental Policy Act (NEPA) (Pub. L. 91-190, 42 U.S.C. 4321-4347, January 1, 1970, as amended).

The U.S. Fish and Wildlife Service (Service) holds certain resources in trust and manages them for the benefit of the American people. These resources include migratory birds, inter-jurisdictional fish, federally-listed threatened and endangered species of plants and animals and their habitats, and units of the National Wildlife Refuge system. One goal of Service policy is that conservation of fish and wildlife resources receive equal consideration with other features of resource development, and that conservation actions are coordinated with those other forms of development. Another goal is to conserve, protect, and enhance fish and wildlife and their habitats, and to facilitate the balanced development of the Nation's natural resources. When planning an activity, project proponents should give careful consideration to potential impacts to these trust resources and compliance with the laws mentioned above. Additional information is provided below.

Migratory Birds

Adequate consideration for avian and other wildlife resources early in the site evaluation process can help to minimize impacts and facilitate project review. Although current wind turbine technology and proper siting can help to minimize the incidence of avian and bat deaths due to blade, aerial line, and tower strikes, the potential for direct mortality of some migratory birds and bats will remain. Wind power developers, in concert with the Service, can help to ensure that projects proceed with as little impact to migratory birds as possible. This can be accomplished by gathering information on avian resources as they relate to project siting and by implementing measures to minimize impacts to migratory birds from the construction and operation of the wind facility. The Service's Interim Wind Turbine Siting Guidelines are enclosed to assist in project planning (enclosure 1). We encourage the project proponents to conduct a Potential Impact Index (PII) analysis on several potential sites within wind resource areas to assist in the selection of a wind power site that minimizes the potential to impact migratory birds. Please inform this office whether or not you plan to use the Service's interim guidelines in selecting your site, and if not, whether you intend to use a different method to assess avian and other wildlife resources.

The Service has coordinated with the Avian Power Line Interaction Committee (APLIC) to develop guidelines to assist companies in formulating Avian Protection Plans (APP). These plans are utility-specific and designed to provide a structured way for a company to reduce avian mortality resulting from interactions with electric utility facilities (e.g. collisions and electrocutions), but we suggest they may be adapted to wind energy facilities as well. The APP can be tailored to each utility's industry-specific and site specific wildlife needs, while in the process furthering avian conservation and improved reliability and customer service. A utility that implements the principles contained in these APP guidelines will greatly reduce avian risk as well its own risk of enforcement under the Migratory Bird Treaty Act (MBTA). The guidelines can be accessed from the Service's website at http://www.fws.gov/migratorybirds/. We strongly encourage the project developer of the proposed wind energy facility to investigate the formulation of an APP or if bats may also be affected by the project, an Avian and Bat Protection Plan (ABPP). An example of a completed ABPP can be found at Iberdrola Renewables' website at http://www.iberdrolarenewables.us/pdf/Signed_ABPP_10-28-08.pdf.

To minimize the electrocution hazard to birds, the Service, with support from the Rural Utilities Service, recommends that new or updated overhead power lines be constructed in accordance with the current guidelines for preventing raptor electrocutions. The recommended guidelines can be found in "2006 Suggested Practices for Avian Protection on Power Lines". To increase power line visibility and reduce bird fatalities resulting from collisions with power lines, the Service recommends all new power lines that cross or run adjacent to rivers or large wetlands be modified according to "Mitigating Bird Collisions with Power Lines: The State of the Art in 1994". Both publications can be obtained by writing or calling the Edison Electric Institute, P.O. Box 266, Waldorf Maryland 20604-0266, (1-800-334-5453) or visiting their website at www.eei.org.

The Migratory Bird Treaty Act prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. While the Act has no provision for allowing unintentional take, the Service realizes that some birds may be killed by wind power towers or power lines even if all reasonable measures to protect them are used. The Service's Office of Law Enforcement carries out its mission to protect migratory birds through investigations and enforcement, as well as by fostering relationships with individuals, companies, and industries that have taken effective steps to minimize their impacts on migratory birds, and by encouraging others to enact such programs. It is not possible to absolve individuals, companies, or agencies from liability even if they implement avian mortality avoidance or similar conservation measures. However, the Office of Law Enforcement focuses its resources on investigating and prosecuting individuals and companies that take migratory birds without regard for their actions or without following recommendations such as this to avoid take. Siting, construction and operating wind facilities, in accordance with the recommendations provided by the Service, and implementing an APP or ABPP that has been reviewed and approved by the Service, are strong indicators of a good faith effort by wind companies to reduce the impacts to migratory birds.

To avoid impacts to migratory birds or other wildlife during the breeding season (February 1 to July 15), schedule construction for late summer or fall/early winter. If work is proposed to take place during the breeding season or at any other time which may result in the take of migratory birds or active nests, the Service recommends that the project proponent arrange to have a qualified biologist conduct a field survey of the affected habitats to determine the absence or presence of nesting migratory birds. If nesting migratory birds are found, we request you contact this office, suspend construction, or take other measures, such as maintaining adequate buffers, to protect the birds until the young have fledged. The Service further recommends that field surveys for nesting birds, along with information regarding the qualification of the biologist(s) performing the surveys and any avoidance measures implemented at the project site, be throughly documented and that such documentation be shared with the Service and maintained on file by the project proponent at least until such time as construction on the proposed project has been completed.

Threatened and Endangered Species

A list of Federally threatened and endangered species that may occur within the proposed project's area of influence is enclosed (enclosure 2). This list fulfills requirements of the Fish and Wildlife Service under the Endangered Species Act.

If a Federal agency authorizes, funds, or carries out a proposed action, the responsible Federal agency, or its designated agent, is required to evaluate whether the action "may affect, likely to adversely affect" listed species. If the Federal agency determines the action "may affect, likely to adversely affect", listed species then the responsible Federal agency shall request formal section 7 consultation with this office, or work with this office to remove the likely adverse effects before proceeding. If the evaluation shows a "no effect" determination on listed species, further

consultation is not necessary. If a private entity receives Federal funding for a construction project, or if any Federal permit is required, the Federal agency may designate the fund recipient or permittee as its agent for purposes of informal section 7 consultation.

Section 10(a)(1)(B) of the ESA allows non-Federal parties planning activities that have no Federal nexus, but which could result in the incidental taking of listed animals, to apply for an incidental take permit. (A Federal nexus exists whenever an activity is conducted, funded, or licensed or permitted by a Federal agency). The application must include a Habitat Conservation Plan (HCP) laying out the proposed actions, determining the effects of those actions on federally-listed fish and wildlife species and their habitats (and may include proposed or candidate species), and defining measures to minimize and mitigate adverse effects.

The Aransas Wood Buffalo Population (AWBP) of whooping cranes is the only self-sustaining migratory population of whooping cranes remaining in the wild. These birds breed in the wetlands of Wood Buffalo National Park in Alberta and the Northwest Territories of northern Canada, and overwinter on the Texas coast. Whooping cranes in the AWBP annually migrate through North Dakota during their spring and fall migrations.

Endangered whooping cranes have been documented using stopover habitat in the vicinity of this proposed wind resource area. The proposed wind project area is located in that portion of the whooping crane migration corridor that includes 75% of all confirmed whooping crane sightings in North Dakota (enclosure 3). The presence of suitable roosting and feeding habitat for whooping cranes documents the potential for whooping crane presence in the proposed project area. A wind energy project in this wind resource area has the potential to affect whooping cranes during their annual spring and fall migration through North Dakota. Potential effects may be direct (e.g. collision mortality) or indirect (e.g. avoidance of the site resulting in cranes seeking alternate habitat). The interactions of whooping cranes with wind turbines and wind farms are currently not fully known, although it is expected that these large birds with relatively low maneuverability are susceptible to mortality via collisions with turbines. Currently, collisions with power lines are the greatest known source of mortality for fledged whooping cranes, and have accounted for the death or serious injury of at least 46 whooping cranes since 1956.

For construction of new overhead power lines located within the main portion of the whooping crane migration corridor (75 percent of confirmed sightings) where your investigation area is located, the Service recommends that the new line be buried to avoid whooping crane and other bird collision mortality. If the new power line cannot be buried, we recommend that all new line and an equal length of existing power line be marked with state-of-the-art visual line marking devices to minimize the potential for whooping crane collision mortality.

The Service does not believe that a determination of "no effect" is appropriate for this wind resource area because of, but not limited to, the potential for migrating whooping cranes to use migration stopover habitat in this area.

Fish and Wildlife Service Property Interests

The Service administers Waterfowl Production Areas owned in fee title as well as wetland and grassland easements throughout North Dakota. A review of Service realty records indicates no Service property interests are located in the planning area.

High Value Habitat Avoidance

The proposed project area is located in the Missouri Slope Upland region of North Dakota and includes areas of native mixed-grass prairie. Since the 1800s, North Dakota has lost approximately 75 percent of its native grasslands, primarily due to crop production. The Service recommends avoiding construction or disturbance on native prairie areas.

Native prairie has significant natural resource values including:

1. Provides habitat for a number of migratory and resident grassland birds whose populations are declining.
2. Provides nesting habitat for millions of waterfowl.
3. Contains 200-300 plant species, which provide genetic diversity important to agriculture and medicine.
4. Provides habitat for thousands of insects including the Dakota skipper, a candidate species for listing under the ESA, and other butterflies (Ex: Regal fritillary, Tawny crescent).
5. Crucial for soil and water conservation.
6. Provides recreational opportunities (hunting, bird watching/wildlife observation, hiking).
7. Living laboratories for scientific research.

Our review of NWI maps indicate that wetland areas are located within the project area. NWI data can be accessed directly by visiting their website at wetlands.fws.gov. Section 404 of the Clean Water Act regulates placement of fill materials in certain wetlands. A Corps of Engineers' 404 permit may be required if fill material will be placed in aquatic sites including wetlands. Contact Mr. Dan Cimarosti, Regulatory Office, Corps of Engineers, 1513 South 12th Street, Bismarck, North Dakota 58504 (701-255-0015), to determine their permit requirements. If a 404 permit is required, the Service will provide recommendations on this project to the Corps.

Other high value wildlife habitat types in North Dakota include wooded draws and riparian forests. We recommend that you avoid construction of wind towers and appurtenant facilities in the above habitat types whenever possible.

Construction activities should be conducted in a manner that will minimize impacts to the wildlife and the existing habitat in the project area. To help avoid impacts, we recommend that you:

- Avoid construction in native prairie, if possible, and reseed disturbed native prairie with a comparable native grass/forb seed mixture. Obtain seed stock from nurseries within 250 miles of the project area to insure the particular cultivars are well adapted to the local climate.
- Minimize grassland disturbance by using fewer, larger turbines and limiting new road construction.
- Use underground transmission lines between turbines, as well as to the primary substation. If construction of overhead transmission lines are unavoidable, install and maintain appropriate visual line marking devices to reduce the potential for avian collision mortality.
- Design meteorological towers to be self standing (no guywires). If towers must be guyed, install and maintain appropriate visual line marking devices to reduce the potential for avian collision mortality
- Locate appurtenant facilities to avoid placement of fill in wetlands along the route.
- Install and maintain appropriate erosion control measures to reduce sedimentation and water quality degradation of wetlands and streams near the project area.
- Replace unavoidable wetland losses with functionally equivalent wetlands.

Wind developers, including power transmission companies, are encouraged to avoid impacts to prairie and other native habitats to the maximum extent practicable. Avoidance of impacts can be most effectively achieved by taking a landscape-scale view, beginning with the process of prospecting for suitable sites for wind power development. Companies should assess not only those factors that indicate favorable conditions for development, such as a consistent wind resource, access to transmission, willing landowners, available financing, etc., but also anticipated impacts to wildlife and their habitats. Equal consideration should be accorded to wildlife resource conservation as to other features of development. When considering a project in a particular wind resource area, companies should use all available tools to ensure they have taken all practicable steps to avoid impacts to native habitats. This can be accomplished by utilizing GIS products depicting significant areas of contiguous prairie to site development in areas that are already impacted or fragmented. This analysis and potential site comparison should be accomplished prior to making any significant financial commitments, including entering into lease agreements with landowners.

Research, Monitoring, and Assessment

We encourage project proponents to conduct collision monitoring studies designed to determine the effect of several factors, such as site selection, turbine designs, the layout of wind plants, wind plant operations, habitat alteration, and changes in available perching and nesting sites, on bird deaths. Annual reports outlining the results of these monitoring studies should be submitted to this office. The Avian Subcommittee of the National Wind Coordinating Committee (NWCC) has developed a guidance document to assist wind energy developers in designing studies that will produce credible and comparable results of avian interaction with wind power plants. The NWCC document, "Studying Wind Energy/Bird Interactions: A Guidance Document. Metrics

and methods for determining or monitoring potential impacts on birds at existing and proposed wind energy sites," can be obtained by contacting the National Wind Coordination Committee, c/o RESOLVE, 1255 23rd Street, Suite 275, Washington, D.C. 20037, or by visiting their website at www.nationalwind.org.

Given the Service requirements and recommendations above, as well as possible unforeseen issues that may arise, we encourage you to build sufficient planning time for coordination with the Service into your project timeline. Thank you for the opportunity to comment. If you require further information as project planning proceeds, please contact Terry Ellsworth of my staff, or contact me directly, at (701) 250-4481, or at the letterhead address.

Sincerely,

Jeffrey K. Towner

Jeffrey K. Towner
Field Supervisor
North Dakota Field Office

Enclosures (3)

cc: Regulatory Office, Army Corps of Engineers, Bismarck
(Attn: D. Cimarosti)
ND Public Service Commission, Bismarck
Director, ND Game & Fish Department, Bismarck
(Attn: M. McKenna)

Enclosure 1

INTERIM GUIDELINES TO AVOID AND MINIMIZE WILDLIFE IMPACTS FROM WIND TURBINES

Introduction

Wind-generated electrical energy is renewable, produces no emissions, and is generally considered to be an environmentally friendly technology. Development of wind energy is strongly endorsed by the Secretary of the Interior, as expressed in the Secretary's Renewable Energy on Public Lands Initiative (May 2002). However, wind energy facilities can adversely impact wildlife, especially birds (e.g., Orloff and Flannery 1992, Leddy et al. 1999, Woodward et al. 2001, Braun et al. 2002, Hunt 2002) and bats (Keeley et al. 2001, Johnson et al. 2002, Johnson et al. 2003). As more facilities with larger turbines are built, the cumulative effects of this rapidly growing industry may initiate or contribute to the decline of some wildlife populations (Manes et al. 2002, Johnson et al. 2002, Manville 2003). The potential harm to these populations from an additional source of mortality or adverse habitat impacts makes careful evaluation of proposed facilities essential. Due to local differences in wildlife concentration and movement patterns, habitats, area topography, facility design, and weather, each proposed development site is unique and requires detailed, individual evaluation.

The following guidance was prepared by the U.S. Fish and Wildlife Service (Service). Like the Service's voluntary guidance addressing the siting, construction, operation, and decommissioning of communication towers (http://migratorybirds.fws.gov/issues/towers/comtow.html) and the voluntary guidance developed in cooperation with the electric utility industry to minimize bird strikes and electrocutions (APLIC 1994, APLIC 1996), this guidance is intended to assist the wind energy industry in avoiding or minimizing impacts to wildlife and their habitats. This is accomplished through: (1) proper evaluation of potential Wind Resource Areas (WRAs), (2) proper location and design of turbines and associated structures within WRAs selected for development, and (3) pre- and post-construction research and monitoring to identify and/or assess impacts to wildlife. These guidelines are based on current science and will be updated as new information becomes available. They are voluntary, and interim in nature. They will be evaluated over a two-year period, and then modified as necessary based on their performance in the field, on comments from the public, and on the latest scientific and technical discoveries developed in coordination with industry, states, academic researchers, and other Federal agencies. After this period, the Service plans to develop a complete operations manual for evaluation, site selection, design, construction, operation, and monitoring of wind energy facilities in both terrestrial and aquatic environments.

Data on wildlife use and mortality collected at one wind energy facility are not necessarily applicable to others; each site poses its own set of possibilities for negative effects on wildlife. In addition, the wind industry is rapidly expanding into habitats and regions that have not been well studied. The Service therefore suggests a precautionary approach to site selection and development, and will employ this approach in making recommendations and assessing impacts of wind energy developments. We encourage the wind energy industry to follow these guidelines and, in cooperation with the Service, to conduct scientific research to provide additional information on the impacts of wind energy development on wildlife. We further encourage the industry to look for opportunities to promote bird and other wildlife conservation when planning wind energy facilities (e.g., voluntary habitat acquisition or conservation easements).

The Service is guided by the Fish and Wildlife Service Mitigation Policy (Federal Register 46 (15), January 1981) in evaluating modifications to or loss of habitat caused by development. This policy follows the sequence of steps recommended in the Council on Environmental Quality's Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (NEPA) in seeking to avoid, minimize, or compensate for negative impacts. Mitigation can involve (1) avoiding the impact of an activity by taking no action; (2) minimizing impacts by limiting the degree of activity; (3) rectifying an impact by repairing, rehabilitating, or restoring an affected environment; (4) reducing or eliminating an impact by conducting activities that preserve and maintain the resources; or (5) compensating for an impact by replacing or providing substitute resources or environments. Any mitigation recommended by the Service

for wind energy development would be voluntary on the part of the developer unless made a condition of a Federal license or permit. Mitigation does not apply to "take" of species under the Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, or Endangered Species Act. The goal of the Service under these laws is the elimination of loss of migratory birds and endangered and threatened species due to wind energy development. The Service will actively expand partnerships with regional, national, and international organizations, States, tribes, industry, and environmental groups to meet this goal.

Projects with Federal involvement may require additional analysis under the National Environmental Policy Act (http://www.fws.gov/r9esnepa), Endangered Species Act (http://endangered.fws.gov), or National Wildlife Refuge System Administration Act (http://www.fws.gov/policyMakers/mandates/index.html#adminact). This includes projects on federally-owned lands (e.g., National Wildlife Refuges, National Forests), lands where a Federal permit is required for development (e.g., BLM-administered lands), or lands where Federal funds were used for purchase or improvement (some State Wildlife Management Areas).

These guidelines are not intended nor shall they be construed to limit or preclude the Service from exercising its authority under any law, statute, or regulation, and to take enforcement action against any individual, company, or agency, or to relieve any individual, company, or agency of its obligations to comply with any applicable Federal, State, or local laws, statutes, or regulations.

The guidelines contain a site evaluation process with checklists for pre-development evaluations of potential terrestrial wind energy development sites (Appendix 1). Use of this process allows comparison of one site with another with respect to the impacts that would occur to wildlife if the area were developed. The evaluation area for a potential development site should include the "footprint" encompassing all of the turbines and associated structures planned for that proposed facility, and the adjacent wildlife habitats which may be affected by the proximity of the structures, but excluding transmission lines extending outside the footprint. All potential development sites within a geographic area should be evaluated before a site is selected for development.

Pre-development evaluations should be conducted by a team that includes Federal and/or State agency wildlife professionals with no vested interest (e.g., monetary or personal business gain) in the sites selected. Teams may also include academic and industry wildlife professionals as available. Any site evaluations conducted by teams that do not include Federal and/or State agency wildlife professionals will not be considered valid evaluations by the Service.

The pre-development evaluation may also identify additional studies needed prior to and after development. Post-construction monitoring to identify any wildlife impacts is recommended at all developed sites. Pre- and post-development studies and monitoring may be conducted by any qualified wildlife biologist without regard to his/her affiliation or interest in the site.

Additional information relevant to these guidelines is appended as follows:

Appendix 2 – Definitions Related to Wind Energy Development and Evaluation
Appendix 3 – Wildlife Laws Relevant to Wind Power Development Projects
Appendix 4 - Research Needs on the Impacts of Wind Power Development on Wildlife
Appendix 5 – Procedures for Endangered Species Evaluations and Consultations
Appendix 6 – Guidelines for Considering Wind Turbine Siting on Easement Lands Administered as Part of the National Wildlife Refuge System in Region 6 (CO, KS, MT, NE, ND, SD, UT, WY)
Appendix 7 – Known and Suspected Impacts of Wind Turbines on Wildlife
Appendix 8 – Literature Cited

Site Evaluation

The site evaluation protocol presented in Appendix 1 was developed by a team of Federal, State, university, and wind energy industry biologists to rank potential terrestrial wind energy development sites by their potential impacts on wildlife. There are two steps to follow:

1. Identify and evaluate reference sites, preferably within the general geographic area of the proposed facility. Reference sites are high-quality wildlife areas where wind development would result in the maximum negative impact on wildlife (i.e., sites selected to have the highest possible rank using the protocol). Reference sites are used to determine the comparative risks of developing other potential sites.

2. Evaluate potential development sites to determine risk to wildlife and rank sites against each other using the highest-ranking reference site as a standard. Although high-ranking sites are generally less desirable for wind energy development, a high rank does not necessarily preclude development of a site, nor does a low rank automatically eliminate the need to conduct pre-development assessments of wildlife resources or post-development assessments of impacts.

Studies to Assess and Monitor Wildlife Impacts

While ranking potential development sites, the site evaluation team referenced above may identify pre-development studies that are needed to better assess potential negative impacts to wildlife. Ranking may also suggest the extent and duration of study required. Developers are encouraged to conduct any studies suggested by the team in coordination with Service and other agency wildlife biologists.

Post-development mortality studies should be a part of any site development plan in order to determine if or to what extent mortality occurs. As with pre-development studies, ranking may suggest the extent and duration of study needed. Studies should be designed in coordination with Federal and other agency biologists.

Site Development Recommendations

The following recommendations apply to locating turbines and associated structures within WRAs selected for development of wind energy facilities:

1. Avoid placing turbines in documented locations of any species of wildlife, fish, or plant protected under the Federal Endangered Species Act.

2. Avoid locating turbines in known local bird migration pathways or in areas where birds are highly concentrated, unless mortality risk is low (e.g., birds present rarely enter the rotor-swept area). Examples of high concentration areas for birds are wetlands, State or Federal refuges, private duck clubs, staging areas, rookeries, leks, roosts, riparian areas along streams, and landfills. Avoid known daily movement flyways (e.g., between roosting and feeding areas) and areas with a high incidence of fog, mist, low cloud ceilings, and low visibility.

3. Avoid placing turbines near known bat hibernation, breeding, and maternity/nursery colonies, in migration corridors, or in flight paths between colonies and feeding areas.

4. Configure turbine locations to avoid areas or features of the landscape known to attract raptors (hawks, falcons, eagles, owls). For example, Golden Eagles, hawks, and falcons use cliff/rim edges extensively; setbacks from these edges may reduce mortality. Other examples include not locating turbines in a dip or pass in a ridge, or in or near prairie dog colonies.

5. Configure turbine arrays to avoid potential avian mortality where feasible. For example, group turbines rather than spreading them widely, and orient rows of turbines parallel to known bird movements, thereby decreasing the potential for bird strikes. Implement appropriate storm water management practices that do not create attractions for birds, and maintain contiguous habitat for area-sensitive species (e.g., Sage Grouse).

6. Avoid fragmenting large, contiguous tracts of wildlife habitat. Where practical, place turbines on lands already altered or cultivated, and away from areas of intact and healthy native habitats. If not practical, select fragmented or degraded habitats over relatively intact areas.

7. Avoid placing turbines in habitat known to be occupied by prairie grouse or other species that exhibit extreme avoidance of vertical features and/or structural habitat fragmentation. In known prairie grouse habitat, avoid placing turbines within 5 miles of known leks (communal pair formation grounds).

8. Minimize roads, fences, and other infrastructure. All infrastructure should be capable of withstanding periodic burning of vegetation, as natural fires or controlled burns are necessary for maintaining most prairie habitats.

9. Develop a habitat restoration plan for the proposed site that avoids or minimizes negative impacts on vulnerable wildlife while maintaining or enhancing habitat values for other species. For example, avoid attracting high densities of prey animals (rodents, rabbits, etc.) used by raptors.

10. Reduce availability of carrion by practicing responsible animal husbandry (removing carcasses, fencing out cattle, etc.) to avoid attracting Golden Eagles and other raptors.

Turbine Design and Operation Recommendations

1. Use tubular supports with pointed tops rather than lattice supports to minimize bird perching and nesting opportunities. Avoid placing external ladders and platforms on tubular towers to minimize perching and nesting. Avoid use of guy wires for turbine or meteorological tower supports. All existing guy wires should be marked with recommended bird deterrent devices (Avian Power Line Interaction Committee 1994).

2. If taller turbines (top of the rotor-swept area is >199 feet above ground level) require lights for aviation safety, the minimum amount of pilot warning and obstruction avoidance lighting specified by the Federal Aviation Administration (FAA) should be used (FAA 2000). Unless otherwise requested by the FAA, only white strobe lights should be used at night, and these should be the minimum number, minimum intensity, and minimum number of flashes per minute (longest duration between flashes) allowable by the FAA. Solid red or pulsating red incandescent lights should not be used, as they appear to attract night-migrating birds at a much higher rate than white strobe lights.

3. Where the height of the rotor-swept area produces a high risk for wildlife, adjust tower height where feasible to reduce the risk of strikes.

4. Where feasible, place electric power lines underground or on the surface as insulated, shielded wire to avoid electrocution of birds. Use recommendations of the Avian Power Line Interaction Committee (1994, 1996) for any required above-ground lines, transformers, or conductors.

5. High seasonal concentrations of birds may cause problems in some areas. If, however, power generation is critical in these areas, an average of three years monitoring data (e.g., acoustic, radar, infrared, or observational) should be collected and used to determine peak use dates for specific sites. Where feasible, turbines should be shut down during periods when birds are highly concentrated at those sites.

6. When upgrading or retrofitting turbines, follow the above guidelines as closely as possible. If studies indicate high mortality at specific older turbines, retrofitting or relocating is highly recommended.

Appendix 1

PROTOCOL TO RANK POTENTIAL TERRESTRIAL WIND ENERGY DEVELOPMENT SITES BY IMPACTS ON WILDLIFE

This protocol was developed by a team of Federal, State, university, and industry biologists to rank potential wind development sites in Montana by their potential for impacts on wildlife (USFWS 2002). It has been modified to apply nationwide. The protocol allows the user to evaluate potential development sites and rank them against a reference site. Objectives are to: (1) assist developers in deciding whether to proceed with development; (2) provide a procedure to determine pre-construction study needs to verify use of potential sites by wildlife; and (3) provide recommendations for monitoring potential sites post-construction to identify, quantify, or verify actual impacts (or lack thereof).

Although this protocol focuses on impacts to wildlife, potential impacts to fish, other aquatic life, and plants should be considered as well. Surveys for rare, threatened, or endangered plants known or suspected to occur in the geographic area should be conducted at all proposed terrestrial development sites having suitable habitat.

This protocol is intended to provide a conceptual framework for initial steps in investigating a site. It is not intended to be all-inclusive relative to objectives, methods, and analysis nor to serve as the definitive reference or directive for any step in wind power related investigations. The Physical Attributes, Species Occurrence and Status, and Ecological Attractiveness groupings in this protocol should serve as a model framework; the terrain features, species, and conditions used in these groupings will be dictated by local conditions and should be developed by wildlife biologists familiar with the region in which this protocol is being used.

Potential Impact Index (PII)

The Potential Impact Index represents a "first cut" analysis of the suitability of a site proposed for development. It does so by estimating use of the site by selected wildlife species as an indicator of potential impact. Emphasis of the PII is on initial site evaluation and is intended to provide more objectivity than simple reconnaissance surveys.

There are two steps to follow in ranking sites by their potential impact on wildlife:

1. Identify and evaluate reference sites within the general geographic area of Wind Resource Areas (WRA's) being considered for development of a facility. Reference sites are areas where wind development would result in the maximum negative impact on wildlife, resulting in a high PII score. Reference sites are used to determine the comparative risks of developing other potential sites.

2. Evaluate potential development sites to determine risk to wildlife, and rank sites against each other using the highest-ranking reference site as a standard. While high-ranking sites are generally less desirable for wind development, a high rank does not necessarily preclude development of a site, not does a low rank automatically eliminate the need to conduct pre-development assessments of wildlife use and impact potential.

The following assumptions are implicit in the PII process:

1. All WRA sites, regardless of turbine design, configuration, placement, or operation present some hazard and risk to wildlife from both an individual and population perspective.

2. Certain sites present less hazard and risk to wildlife than others.

3. No adequate and defensible information exists regarding the appropriateness of the proposed WRA site being evaluated relative to impacts to wildlife.

4. Evaluations will be conducted by qualified biologists without competitive interest in site selection, including those from State and Federal agencies who are familiar with local and regional wildlife.

The PII is designed primarily to evaluate potential impacts on aerial wildlife from collision with turbines and infrastructure. The PII is derived from the results of three checklists (forms are attached). These checklists should be developed and applied as follows:

A. The PHYSICAL ATTRIBUTE checklist considers topographic, meteorological, and site characteristics that may influence bird and bat occurrence and movements.

B. The SPECIES OCCURRENCE AND STATUS checklist includes: Birds of Conservation Concern at the Bird Conservation Region level (http://migratorybirds.fws.gov/reports/reports.html); all federally-listed Endangered, Threatened, and Candidate Species (http://endangered.fws.gov); bird species of high recreational or other value (e.g., waterfowl, prairie grouse); State Endangered, Threatened, and Species of Management Concern; and any additional species of concern listed by State Natural Heritage Programs.

C. The ECOLOGICAL ATTRACTIVENESS checklist evaluates the presence and influence of ecological magnets and other conditions that would draw birds or bats to the site or vicinity.

Each checklist has boxes to be checked for a particular attribute or species found at an evaluation site. The number of boxes in each checklist will vary from region to region due to variations in the number of physical attributes and species of concern in that region. Keep in mind that all boxes in a checklist are very unlikely to be checked at a single evaluation site, because all species and ecological physical conditions potentially occurring in the region would not exist at one site.

Each checklist should be assigned a divisor, which is developed by dividing the number of boxes in a checklist by the total number of boxes in all three checklists. This expands the spread of index values and more dramatically displays the magnitude of differences among sites. For example, if the PHYSICAL ATTRIBUTE checklist has 36 boxes and the total number of boxes in all three checklists is 144, divide 36 by 144 = 0.25, the divisor.

You can change the number of boxes in any of the checklists to fit your geographic area, habitat type, or other selected region (e.g., a state or portion of a state). Remember to recalculate the divisor if you change the number of boxes.

Boxes in a checklist are checked if the condition or species is known or strongly suspected to occur. Criteria for checklist conditions marked with an asterisk (*) are explained on the following page. Conditions that are self-explanatory are not included. Conditions are not weighted. Boxes are checked in the SPECIES OCCURRENCE AND STATUS checklist if presence of the species is unconfirmed but strongly suspected (i.e., WRA is within the range and habitat of the species). This permits more liberal assignment of potential impact, reduces the probability of missing impacts on specific species due to lack of empirical data, and focuses future study and monitoring effort. Totals for each checklist are simple column sums. The PII is calculated from the checklist totals. A completed example from Montana is provided at the end of this Appendix.

Determining Checklist Scores

Checklist scores are determined as follows:

1. Place a check in each box for which an attribute, species, or condition is present or strongly suspected.

2. After completing the three checklists for each site, add the total number of checks in a checklist for an ending sum (each box checked equals one).

Determining PII Score

The Potential Impact Index score is determined as follows:

1. Place the sums from each of the three checklists in the POTENTIAL IMPACT INDEX table sum boxes (Σ column) in the appropriate category.

2. Divide each checklist sum by the previously calculated divisor to adjust the sum for disproportionate numbers of conditions in each checklist, and place this adjusted sum in the Σ/p boxes for each checklist.

3. Add the adjusted checklist sums (Σ/p column) to produce the PII score.

Include any questions, statements, comments, or concerns regarding any checklist cell or category on the SITE SPECIFIC COMMENTS sheet. These comments are critical to determining pre-construction study needs. They will also help identify and refine questions and objectives to be addressed by follow-up study and monitoring. The nature of suspected Significant Ecological Events should be noted on the SITE SPECIFIC COMMENTS sheet.

Ranking PII Scores

PII of each site evaluated is assigned a ranking based on its proportional relationship to the reference site that has the maximum PII score, as shown in Figure 2 in the Montana example. Ranking categories (High, Low, etc.) in the example are arbitrarily set at intervals of 20 percent of maximum.

Rankings are intended as a guide to developers. They are designed to serve as indicators of relative risk to wildlife and thus provide an estimator of the level of impact that may be expected should a site be developed. A high rank does not preclude development, nor does a low rank automatically eliminate the need to conduct pre-development assessments of impacts on wildlife. More intensive pre-construction studies may be needed for both scenarios if development of the site is pursued. Rankings may also suggest the extent of additional study needed.

In the case of federally listed threatened, endangered, or candidate species of wildlife, fish, or plants, consultation with the Fish and Wildlife Service under the Endangered Species Act is required, and may preclude development of a site regardless of its PII score. See Appendix 5 for procedures for obtaining lists of these species that may be present, and for consulting with the Fish and Wildlife Service if species or their habitats are found.

Determining Pre-construction Study Needs

The goals of pre-construction studies are to estimate impacts of proposed wind power development on wildlife by addressing areas of concern identified during the PII process. Objectives, intensity, duration, and methods of pre-construction studies are likely to be site specific, but may be independent of ranking. Regardless of ranking, studies should be designed to address (1) verification of use of WRAs by all species recorded in the "SPECIES OCCURRENCE AND STATUS" checklist, (2) verification of natural conditions (e.g., under "Significant Ecological Events", the magnitude, timing, and location of suspected bird/bat migration), or (3) questions noted in the SITE SPECIFIC COMMENTS sheet for that site. The SITE SPECIFIC COMMENTS sheet may also indicate conditions that need not be investigated. As a result, a site with a low rank may require radar surveillance (e.g., important songbird migration site) while a site with a high rank may require only a single season visual survey (e.g., site potentially contains autumn Whooping Crane habitat). The process should involve a feedback mechanism within an adaptive management strategy (Figure 1). Timely review of study results will determine if data are

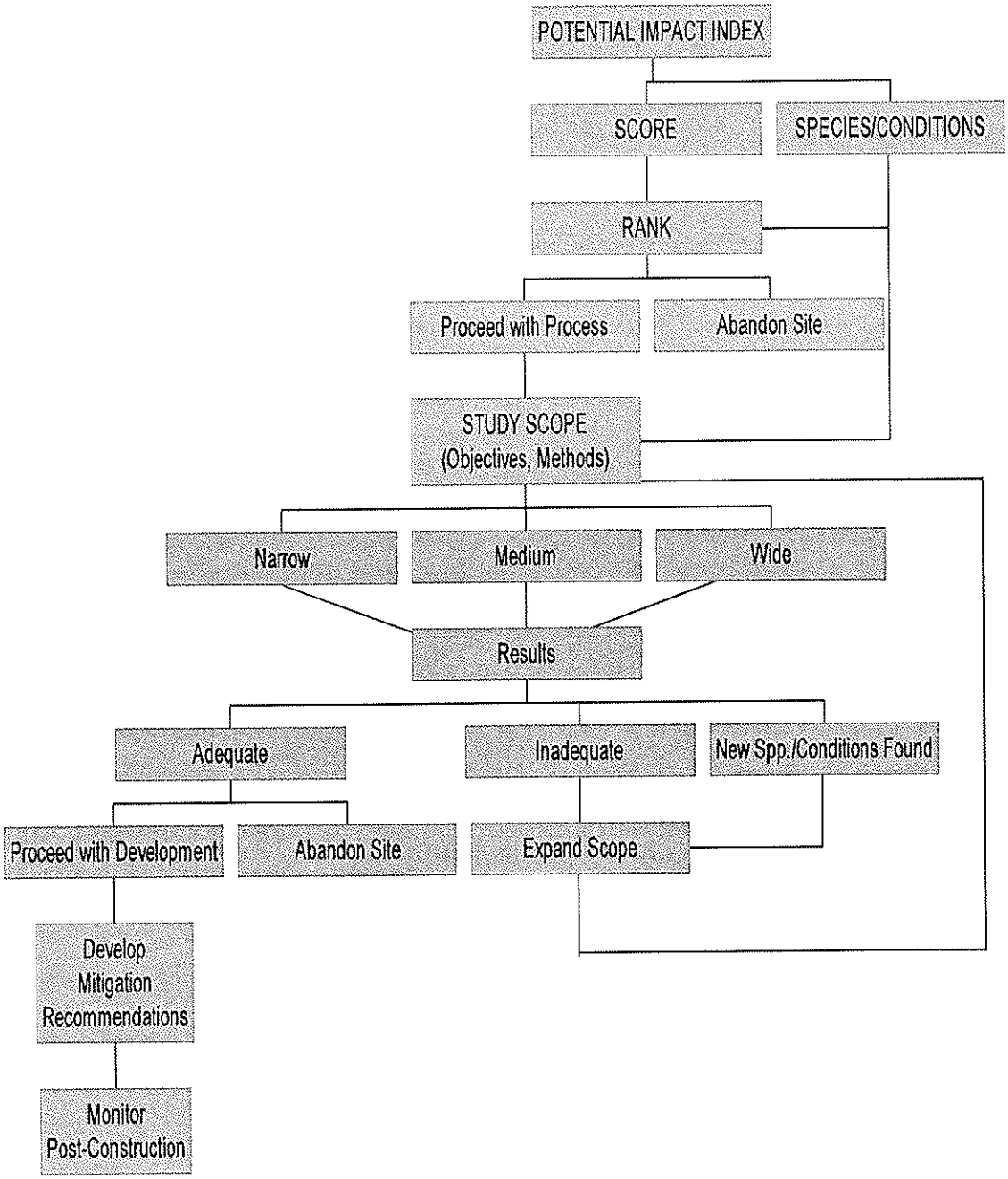


Figure 1. A suggested decision tree for assessing potential development sites. Begin by developing a PII score.

adequate, if conclusions are defensible (Anderson et al. 1999), and if additional investigational effort is required (e.g., if Black-footed Ferrets are found on Mountain Plover searches). Projects with Federal involvement may require additional analysis under the National Environmental Policy Act (http://www.fws.gov/r9esnepa), Endangered Species Act (http://endangered.fws.gov), or National Wildlife Refuge System Administration Act (http://www.fws.gov/policyMakers/mandates/index.html#adminact). Also, the mere existence of a pre-construction study, whether in progress or completed, does not imply Federal sanction for development of a site.

Post-construction Studies

The Service recommends that all sites be monitored for impacts on wildlife after construction is completed. Some sites may be so obviously benign that little more than simple reconnaissance study may be needed and any impact will be revealed during post-construction monitoring. Otherwise, pre-construction studies should be designed to explicitly consider post-construction monitoring that permits statistically valid evaluation of actual impacts. Accordingly, studies should be conducted as much as possible within a Before-After-Control-Impact (BACI) study design (Green 1979). Such design requires investigation of at least two sites (Impact [proposed site] and Control) simultaneously, both pre-construction (Before) and post-construction (After). Because true "Control" sites are seldom available, other sites may be substituted, including reference sites used in developing the PII ranking. In the case of radar surveillance studies, sites within the proposed WRA boundaries may be acceptable (e.g., Harmata et al. 1998). Structuring pre-construction studies within a hypotheses-testing framework will help identify appropriate metrics, focus effort, and permit comparisons with post-construction conditions or other WRAs.

Where feasible, post-construction studies should also be utilized to test measures that may eliminate or reduce impacts on wildlife. See Appendix 4, Research Needs on the Impacts of Wind Power Development on Wildlife.

Metrics and Methods

Metrics and methods are specific tools used to assess wildlife populations and their status (e.g., point counts, line transects, nest success studies, radar surveys, mortality rates, and risk). They can provide important information about birds, bats, and other wildlife at proposed development sites. Metrics and methods may be selected to collect seasonal, group, guild, or habitat specific information, based on data and comments in the SPECIES OCCURRENCE AND STATUS checklist and SITE SPECIFIC COMMENTS sheet. For example, a proposed WRA may be in a narrow north-south oriented valley of relatively monotypic habitat. These conditions suggest a heavy seasonal avian migration corridor but little avian breeding habitat. Accordingly, study emphasis should be on defining use and mortality of migratory birds during autumn or spring or both, with little effort directed at defining use and mortality of breeding birds. Conversely, a potential WRA on a flat plain in diverse habitat would indicate the exact opposite in study emphasis.

While metrics represent specific measurements, concepts, and relationships, methods refer to observational or manipulative study techniques that may be used to verify the location of birds and other wildlife, estimate their numbers, and document their use and behavior (Anderson et al. 1999). Table 1 depicts some commonly used metrics and methods for wildlife studies.

Table 1. Examples of metrics and methods associated with evaluating use and mortality of wildlife at proposed Wind Resource Areas in Montana.

Data Need	Metric	Methods
Use Profile	Individuals/Count	Point Counts (birds) Winter Raptor Surveys Lek Counts (grouse) Migration Counts Ungulate Surveys Spotlight Surveys

	Species/Count	Species/guild/group List Point Counts (birds) Raptor Nesting Surveys Raptor Migration Counts Winter Raptor Surveys Acoustic Surveillance (bats) Pellet Counts Bait Stations Track Boards
	Use per unit of time (e.g., hour, season)	Radar Migration Counts Raptors/watch Area Searches
	Individuals/capture effort	Various techniques for capture
	Productivity	Nests/area Raptor Nesting Surveys Nest Success Ungulate Surveys
	Events/height category (Altitude Profile)	Radar
	Events/distance category (Spatial Profile)	Radar
Mortality	Dead/injured individuals/unit	Transects Spot Searches Carcass Removal Study Observer Detection Efficiency Study

Studies should also strive to generate information to mitigate impacts by properly locating, configuring, or operating turbines (Johnson et al. 2000). Every effort should be made to choose metrics and methods that allow comparisons of pre-construction studies with post-construction studies, other WRAs, and other regions.

Interpreting Metrics

It may be difficult to establish empirically exactly what constitutes high use (i.e., potentially high impact). When looking at the distribution and movements, and local, regional, or range-wide population estimates for particular species, the relative proportions of species, groups, or guilds of wildlife using proposed WRAs may indicate degrees of risk. If baseline population data are unknown, consult with a qualified biologist who can recommend a specific metric.

It is likely that little or no evidence of mortality will be found during pre-construction study. If, however, post-construction mortality is found, and statistical evaluation is not possible, that mortality should be assessed in regard to the species status (e.g., ESA-listed species or Birds of Conservation Concern) or the effect of the loss of individuals of that species on a local, regional, or continental population.

Determining Post-construction Monitoring Needs

Post-construction monitoring is important to the Service, industry, and public because of the limited information available on impacts of wind turbines and WRAs on wildlife. Therefore, post-construction monitoring should be designed to detect major impacts. The intended time frame for post-construction monitoring is not expected to exceed three years, however. Major impacts may be considered as statistically significant decreases in use by species of concern, or limited to statistically significant increases in mortality rates of any wildlife. Monitoring effort may be intensive or cursory, depending on results of pre-construction use and mortality studies. Simple, infrequent mortality surveys on impact and

control plots may be all that is needed at WRAs where recorded pre-construction use by wildlife is low. Documented high use of a proposed WRA may require monitoring methods identical to those employed in pre-construction studies. Anderson et al. (1999) provide specific, detailed direction in post-construction study design and monitoring. Manville (2002) developed a monitoring protocol for use by the U.S. Forest Service at three National Forests in Arizona to monitor the impact of cellular telecommunications towers on migratory birds that could be modified for use at land-based wind turbines.

POTENTIAL IMPACT INDEX CHECKLIST FORMS AND INSTRUCTIONS

PHYSICAL ATTRIBUTE CHECKLIST

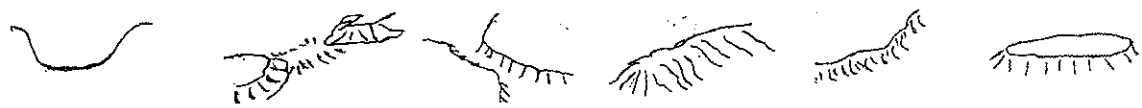
Physical Attribute				Site			
Topography	Mountain Aspect, if mountainous*	Side	W				
			E				
			N				
			S				
		Top					
		Foothill	W				
			E				
			N				
			S				
Wind* Direction	S						
	N						
	E						
	W						
	Updrafts*						
Migratory* Corridor Potential	Latitudinal (N ↔ S)						
	Longitudinal (E ↔ W)						
	Wide Approaches (>30 km)*						
	Funnel Effect	Horizontal					
		Vertical					
Site Size (acres) & Configuration*	<640						
	>640 <1000						
	>1000 <1500						
	Turbine Rows not Parallel to						
Infrastructure To Build	Transmission						
	Roads						
	Buildings*						
	Maintenance						
	Daily Activity						
	Substation						
Increased Activity*							
Totals							

* Criteria on following page

PHYSICAL ATTRIBUTE CRITERIA - categories, max $\Sigma =$, ($p =$).

Topography - Terrain characteristic within the ecological influence of the proposed wind development site, generally, but not restricted to $\pm$ 5 mi. Some examples are:

Valley Pass Gap Ridgetop Bluff Butte



Mountain Aspect - Aspect of topography for site of proposed development. Multiple categories may be checked.

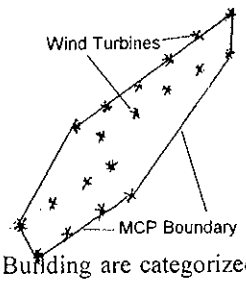
Wind Direction - Compass direction *from* which prevailing winds approach. Multiple categories may be checked.

Updrafts - Do updrafts/upslope winds prevail?

Migratory Corridor Potential - Subjective estimate of area to be a potential avian/bat migratory corridor based strictly on topographical characteristics. Multiple categories may be checked.

- Wide (>20 mi) - Terrain characteristics of approaches to site from each migratory direction, i.e., a large plain, river corridor, long valley. The larger the area that migrant birds/bats are drawn from, the more may be at risk
- Funnel Effect - Is the site in or near an area where migrant birds/bats may be funneled (concentrated) into a smaller area, either altitudinally, laterally, or both?

Site Size & Configuration – Size is estimated as if a minimum convex polygon (MCP) were drawn around peripheral turbines.



Successive boxes are checked to convey relationship of larger size = increased impact to birds/bats, *e.g.*, a 700 acre site will have 2 categories checked while a 1,200 acre site will have all 3 categories checked.

Configuration of turbine rows is usually perpendicular to prevailing wind direction. Rows aligned perpendicular or oblique to route of migration intuitively presents more risk to birds than rows aligned parallel to movement.

Buildings – Building are categorized by relative size and visitation frequency, *i.e.*, structures that are visited daily are usually larger and present more impact than those that are not. If a "Daily Activity" building is required, all Building categories are checked. If a maintenance structure is required, Substation is also checked.

Increased Activity - Will any type of human activity increase? Sites in urban-suburban or otherwise developed areas (oil, gas, mines) will have less impact on wildlife than those in remote or undeveloped areas.

Avian Species of Concern Checklist
(Complete prior to SPECIES OCCURRENCE & STATUS Checklist)

	Site											
Birds (n =)												
Occurrence	B	M/W	Σ	B	M/W	Σ	B	M/W	Σ	B	M/W	Σ
Subtotals												
Total												

Avian Species of Concern Checklist (species, max Σ =)

Column totals of this list are added to appropriate cells in the SPECIES OCCURRENCE & STATUS checklist. Consult Birds of Conservation Concern (http://migratorybirds.fws.gov/reports/reports.html) and Threatened/Endangered Species list (http://endangered.fws.gov), and list other species of high value or management concern such as migratory waterfowl and prairie grouse. Appropriate avian field guides and species accounts should be consulted for confirmation of species distribution and habitat associations. State Natural Heritage Programs may also provide species accounts that include additional information useful in completing checklists.

In addition to species lists (rows), season of occurrence is also indicated (columns). "B" indicates breeding or summer occurrence and "M/W" indicates presence during migration or as wintering species. If occurrence within or in the vicinity of a proposed site is confirmed or suspected, an "X" is entered.

Bat Species Of Concern Checklist
(Complete prior to SPECIES OCCURRENCE & STATUS Checklist)

	Site											
Bats (n =)												
Occurrence	B	M/W	Σ	B	M/W	Σ	B	M/W	Σ	B	M/W	Σ
Subtotals												
Total												

Bat Species Of Concern Checklist (species, max Σ =).

Column totals of this list are added to appropriate cells in the SPECIES OCCURRENCE & STATUS checklist. Appropriate bat field guides and references (Barbour and Davis 1969) should be consulted for confirmation of species distribution and habitat associations. State Natural Heritage Programs may also provide species accounts that include additional information useful in completing checklists.

In addition to species lists (rows), season of occurrence is also indicated (columns). "B" indicates breeding or summer occurrence and "M/W" indicates presence during migration or as wintering species. If occurrence within or in the vicinity of a proposed site is confirmed or suspected, an "X" is entered.

SPECIES OCCURRENCE & STATUS CHECKLIST

Species		Site											
	Occurrence	B	M/W	Σ	B	M/W	Σ	B	M/W	Σ	B	M/W	Σ
Threatened & Endangered (includes wildlife, fish, and plants)													
Candidate*													
Special Concern*	Birds (max Σ=)												
	Bats (max Σ=)												
	Subtotals												
	Total												

* Criteria on following page

SPECIES OCCURRENCE & STATUS Checklist (categories, max $\Sigma =$, ($p =$).

Checklist totals for each column in "Avian Species of Concern List" and "Bat Species of Concern List" are inserted in this checklist.

Threatened & Endangered Species - Species on the Federal List of Endangered and Threatened Species (http://endangered.fws.gov).

Candidate Species - Species being investigated for inclusion in the Federal List of Endangered and Threatened Species (http://endangered.fws.gov).

Species of Special Concern - Species listed in Birds of Conservation Concern; by Natural Heritage Programs that are known or suspected to be rare, endemic, disjunct, threatened or endangered; and species of high value such as migratory or other game birds.

Golden Eagles may be included in this checklist because of special protective status afforded under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d). Other species (e.g., Sage Grouse) may be included because of recent concern over population declines range wide. Bats (other than bat Species of Special Concern) should be included due to generally unknown impacts of wind farms on individuals and populations.

ECOLOGICAL ATTRACTIVENESS CHECKLIST

Ecological Attractor			Site			
Migration Route*	Local					
	Continental*	N				
		S				
		E				
		W				
Ecological Magnets*	Lotic System					
	Lentic System					
	Wetlands					
	Native Grassland					
	Forest					
	Food Concentrated					
	Energetic Foraging					
	Vegetation/ Habitat	Unique				
		Diverse				
Significant Ecological Event*						
Site of Special Conservation Status*						
Total						

* Criteria on following page

ECOLOGICAL ATTRACTIVENESS CRITERIA - categories, max Σ = , (p =).

Migration Route - Indicates predominate direction of movement of seasonal migrations. Multiple categories may be checked.

Local - Some avian populations move only altitudinally & direction may be East-West (Sage Grouse, owls, Bald Eagles).

Continental - Some migratory corridors experience mass movements in only one season/direction annually (e.g., Bridger Mountains autumn eagle migration).

Ecological Magnets - Special, unique, unusual, or super ordinary habitats or conditions within the vicinity of the site that may attract wildlife. Lotic systems include small perennial or seasonal creeks to major rivers. Lentic systems include stock ponds to lakes to marine environments. Multiple categories may be checked.

Vegetation/Habitat - Unique or exceptionally diverse vegetation or habitat in the vicinity may indicate exceptional diversity and abundance of avian species or bats.

Significant Ecological Event - Special, unique, unusual, or super ordinary events that occur or are suspected to occur in the vicinity of the site, e.g., up to one third of the Continental population of Trumpeter Swans visit Ennis Lake, < 2.5 miles from a proposed Wind Resource Area; the Continental migration of shorebirds passes over (many stop) at Benton Lake National Wildlife Refuge) and up to 2,000 Golden Eagles pass over the Bridger Mountains in autumn. If unknown but suspected a "?" is entered. Specifics regarding the cell are then addressed in the appropriate box of the SITE SPECIFIC COMMENTS sheet to focus follow-up investigation and assist in definition of study objectives.

Site of Special Conservation Status - Any existing or proposed covenants, conservation easements, or other land development limitations intended to conserve, protect, or enhance wildlife or habitat. This criterion is weighted (2 entered if true) because of previous financial or other investment in ecological values. Specifics regarding the easement are then addressed in the appropriate box of the SITE SPECIFIC COMMENTS sheet to focus follow-up attention.

POTENTIAL IMPACT INDEX

	Site							
Checklist (p)[1]	Σ	Σ/p	Σ	Σ/p	Σ	Σ/p	Σ	Σ/p
Physical ( )								
Species Occurrence & Status ( )								
Ecological ( )								
Totals								

[1]Proportion of total checklist categories.

Determining PII Score

A. Place the sums from each of the three checklists in the POTENTIAL IMPACT INDEX table sum boxes (Σ column) in the appropriate category.

B. Divide each checklist sum by the previously calculated divisor to adjust the sum for disproportionate numbers of conditions in each checklist, and place this adjusted sum in the Σ/p boxes for each checklist.

C. Add the Σ/p boxes for the three checklists to obtain a total score.

SITE SPECIFIC COMMENTS

Checklist	Site			
Physical				
Species Occurrence				
Ecological				

EXAMPLE SITE ASSESSMENT AND CALCULATION OF POTENTIAL IMPACT INDEX (PII) FROM MONTANA

POTENTIAL IMPACT INDEX CHECKLISTS

Calculating Divisors

A. Each checklist should be assigned a divisor, which is developed by dividing the number of boxes in a checklist by the total number of boxes in all three checklists. In this example, the total number of boxes in all three checklists is 143.

B. Physical Attribute checklist: 36 boxes ÷ 143 = 0.25; Species Occurrence and Status checklist: 91 boxes ÷ 143 = 0.63; Ecological Attractiveness checklist: 16 boxes ÷ 143 = 0.11.

Determining Checklist Scores

A. Place a check in each box for which an attribute, species, or condition is present or strongly suspected.

B. After completing the three checklists for each site, add the total number of checks in a checklist for an ending sum (each box checked equals 1).

PHYSICAL ATTRIBUTE CHECKLIST

Physical Attribute				Site: Snowy Mtn.Range			
Topography	Mountain Aspect	Side	W	X			
			E				
			N				
			S				
		Top					
		Foothill	W	X			
			E				
			N				
			S				
	Valley			X			
	Pass						
	Gap						
	Ridge			X			
	Bluff						
	Butte						
Wind Direction	S						
	N			X			
	E						
	W						
	Updrafts			X			
Migratory Corridor Potential	Latitudinal (N ↔ S)						
	Longitudinal (E ↔ W)			X			
	Wide Approaches (>30 km)						
	Funnel Effect	Horizontal		X			
		Vertical					
Site Size (acres) & Configuration	<640			X			
	>640 <1000			X			
	>1000 <1500			X			
	Turbine Rows not Parallel to						
Infrastructure To Build	Transmission			X			
	Roads			X			
	Buildings			X			
	Maintenance			X			
	Daily Activity			X			
	Substation			X			
Increased Activity				X			
Totals				18			

Avian Species of Concern Checklist
(Complete prior to SPECIES OCCURRENCE & STATUS Checklist)

Birds (n = 12)	Site: Snowy Mtn. R.											
Occurrence	B	M/W	Σ	B	M/W	Σ	B	M/W	Σ	B	M/W	Σ
Nelson's Sharptailed Sparrow	X	X	2									
LeConte's Sparrow	X	X	2									
Baird's Sparrow	X	X	2									
Dickcissel	X		1									
Cassion's Kingbird	X		1									
Blackbacked Woodpecker	X		1									
Yellow-billed Cuckoo	X		1									
Peregrine Falcon	X		1									
Northern Goshawk		X	1									
Ferruginous Hawk		X	1									
Clark's Grebe	X		1									
Common Loon	X		1									
Subtotals	10	5	15									
Total			15									

Bat Species Of Concern Checklist
(Complete prior to SPECIES OCCURRENCE & STATUS Checklist)

Bats (n = 2)	Site											
	Snowy Mtn. Range											
Occurrence	B	M/W	Σ	B	M/W	Σ	B	M/W	Σ	B	M/W	Σ
Fringed Myotis	X		1									
Spotted Bat	X		1									
Subtotals	2		2									
Total			2									

SPECIES OCCURRENCE & STATUS CHECKLIST

Species		Site											
		Snow Mtn. R.											
	Occurrence	B	M/W	Σ	B	M/W	Σ	B	M/W	Σ	B	M/W	Σ
Threatened & Endangered	Bald Eagle		X	1									
Candidate	Columbian Sharp-tailed Grouse	X	X	2									
Special Concern	Birds (max Σ=)			15									
	Bats (max Σ=)			2									
	Subtotals			20									
	Total			20									

ECOLOGICAL ATTRACTIVENESS CHECKLIST

Ecological Attractor			Site: Snowy Mtn. Range			
Migration Route	Local					
	Continental	N	X			
		S	X			
		E				
		W				
Ecological Magnets	Lotic System					
	Lentic System					
	Wetlands		X			
	Native Grassland		X			
	Forest		X			
	Food Concentrated					
	Energetic Foraging		X			
	Vegetation/ Habitat	Unique				
		Diverse	X			
Significant Ecological Event						
Site of Special Conservation Status						
Total			7			

POTENTIAL IMPACT INDEX

	Site							
Checklist (p)[1]	Σ	Σ/p	Σ	Σ/p	Σ	Σ/p	Σ	Σ/p
Physical (0.25) 15÷.25=60	15	60						
Species Occurrence & Status (0.63) 20÷.63=32	20	32						
Ecological (0.11) 7÷.11=64	7	64						
Totals	42	**156**						

[1]Proportion of total checklist categories.

Score is 156, compared to the highest reference site score of 244 (Figure 2).

Determining PII Score

A. Place the sums from each of the three checklists in the POTENTIAL IMPACT INDEX table sum boxes (Σ column) in the appropriate category.

B. Divide each checklist sum by the previously calculated divisor to adjust the sum for disproportionate numbers of conditions in each checklist, and place this adjusted sum in the Σ/p boxes for each checklist.

C. Add the Σ/p boxes for the three checklists to obtain a total score.

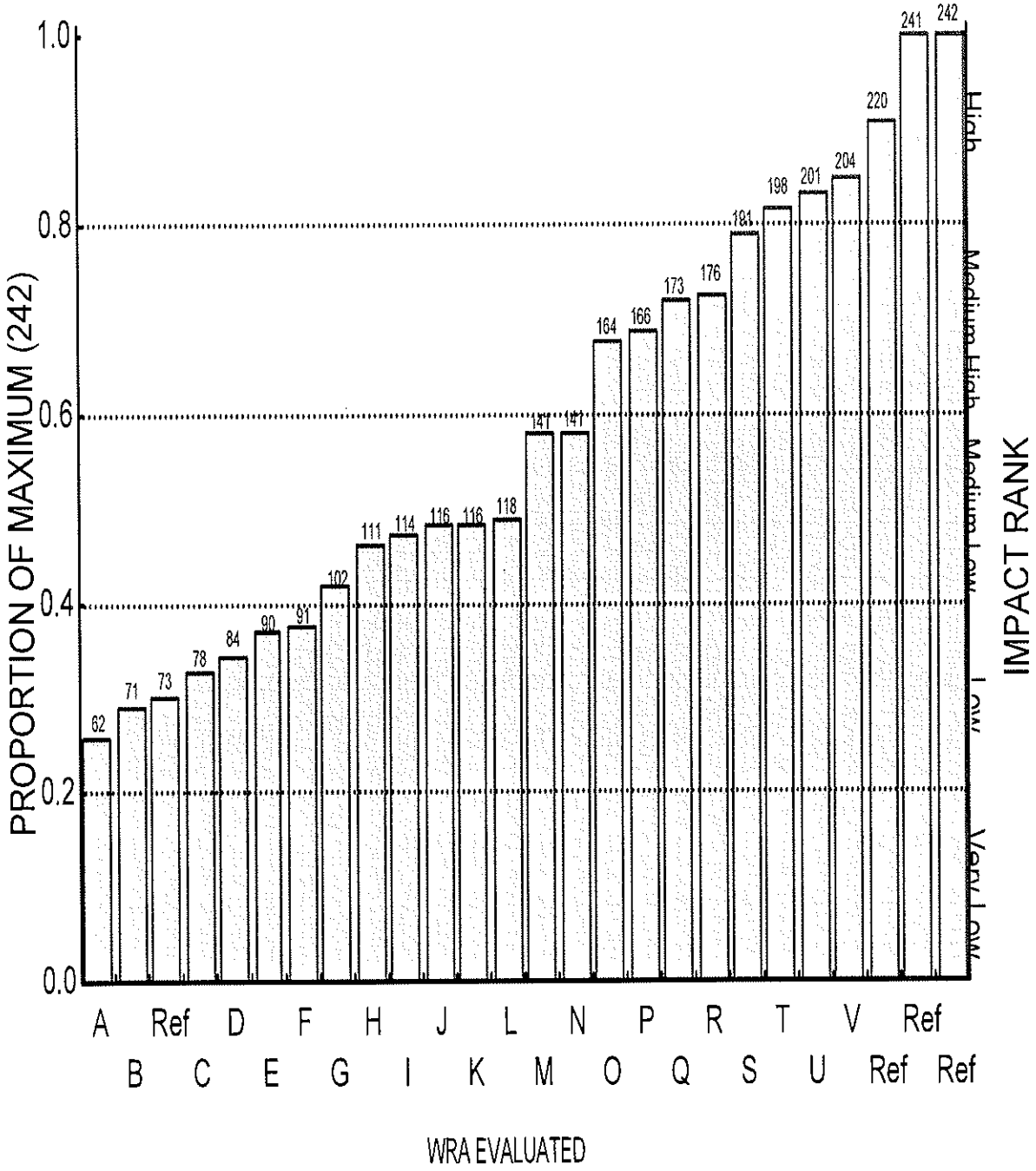


Figure 2. Impact ranks of proposed Wind Resource Areas in Montana. The number above each bar is the PII score. Rank is a function of the proportional relationship of proposed development sites to the maximum score of 4 Reference Sites evaluated.

Appendix 2

DEFINITIONS RELATED TO WIND ENERGY DEVELOPMENT AND EVALUATION

AGL: height above ground level in feet.

Breco Bird Scaring Buoy: a device developed to disperse seabirds at oil spills, which emits some 30 different sounds (including alert calls) up to 130 dB, generally effective in scaring birds at distances up to 200 yards, but may deter birds to 0.5 mile radius. The floating device can be used daytime or night, in fog, wind or storms.

Deterrent Devices: specific equipment, devices, or techniques which are intended to be seen or heard to alert and deter birds from contacting turbine towers, rotors, guy wires, or related equipment. These include diverters installed on turbine or meteorological tower guy wires, dark (e.g., black) paint on single turbine blades or portions of a blade, or noise-making devices that alert (e.g., infrasound) or frighten (e.g., Breco Buoys) birds.

Fish and Wildlife: any member of the animal kingdom, including any bird (including any migratory, non-migratory, or endangered bird for which protection is afforded), mammal, fish, amphibian, reptile, mollusk, crustacean, arthropod, or other invertebrate. Unless otherwise indicated, the Fish and Wildlife Service is particularly concerned about the impacts of wind turbines on birds and bats.

Flyway: a concentrated, predictable flight path of migratory bird species (e.g., particularly water birds such as ducks, geese, large waders, and shorebirds, but also raptors, and sometimes songbirds) from their breeding ground to wintering area. Except along coast lines, the flyway concept may not generally apply to songbirds because they tend to migrate in broad fronts rather than down specific flyways. The term "corridors" has sometimes been used. These frontal movements of songbirds can change within and between seasons and years – as can, for example, movements of waterfowl – making specific designations more difficult. The concept applies both biologically and administratively. For administrative purposes, for example, there are four waterfowl flyways (Atlantic, Pacific, Central, and Pacific and three shorebird flyways (East, Central, and Pacific). "Daily flyways" may also exist between roosting, breeding, and feeding areas.

Lek: A traditional site used year after year by males of certain species of birds (in North America, Greater and Lesser Prairie-chickens, Sage and Sharp-tailed grouse, and Buff-breasted Sandpiper), within which the males display communally to compete for female mates. Dominant males secure the majority of all the matings. Pair bonds are not formed; females leave to nest and raise the young, and males do not take part in parental care.

Passerines: a scientific term for the order of songbirds, many of which winter in tropical areas.

Precautionary Approach: a conservative, scientific approach to conserving and managing habitats and species. Absent definitive data, the approach suggests taking the best steps available to initiate appropriate conservation actions. Those actions should then be refined through the use of principles of adaptive management and sound science. The absence of complete or definitive scientific information should not be used as a reason for postponing or failing to take measures to conserve target species, associated or dependent species, or non-target species and their environments. Specifically, developers should apply a precautionary approach widely to conservation and management of birds, bats, other fauna, flora, and affected habitats. This will protect the resources and preserve Wind Resource Areas by taking account of the best scientific evidence available.

Reference Site: an area of high wildlife value which is used to evaluate the suitability of other areas for wind energy development. Reference sites are selected by biologists familiar with the wildlife in the geographic area and habitat types where wind energy development is contemplated, and evaluated using the Ranking Protocol in Appendix 1. The reference site having the highest score, i.e., the area where wind energy development would have the greatest negative impact on wildlife, is used as the standard against which potential wind energy development sites are ranked.

Riparian Area: The vegetation, habitats, or ecosystems that are associated with streams, rivers, or lakes, or are dependent upon the existence of perennial, intermittent, or ephemeral surface or subsurface water drainage. Relative to other habitats, riparian habitats have a disproportionately high wildlife value in the drier western states due to the

presence of surface water and/or lush vegetation that is typically surrounded by harsher, arid or semi-arid environments.

Rookery: the breeding place of a colony of gregarious birds (e.g., herons) or mammals (e.g., bats).

Rotor-swept Area: generally the vertical airspace within which the turbine blades (usually 3) rotate on a pivot point or drive train rotor. The Area will vary in location depending on the direction of the prevailing wind. While "slower" turbines may operate at speeds less than 30 revolutions per minute (RPMs), turbine speeds at the blade tips can still exceed 220 miles per hour in stiff winds. Recent studies indicate that birds appear unable to recognize blade presence at rotor tips during high blade speed, referred to as the "smear effect."

Staging Area: a traditional site where migratory birds of one or more species congregate in spring and fall for varying periods of time to forage and build up fat reserves prior to launching migratory flights. The term may be used on both the breeding and wintering grounds, as well as at intermediate stopover sites used at any point along the migration route.

Turbine Position within a Row/String: the specific position of a turbine within a string or row of turbines. It may be designated as an end-row, mid-row, or lone row turbine (one not located within a row).

Wind Resource Area: the geographic area or footprint within which wind turbines are located and operated, such as the Altamont Pass, California, WRA, or where location and operation of turbines are anticipated. The term may be used to describe an existing facility, or a general area in which development of a facility is proposed. Existing facilities are known variously as "wind farms," "wind parks," or "energy parks." WRAs are selected based primarily on the reliability and availability of sufficient wind. These areas are designated by the *United States Wind Resource Map*, published by the National Renewable Energy Laboratory, Department of Energy (http://rredc.nrel.gov). The *Map* delineates wind power classifications from "marginal" to "superb" based on a Weibull wind speed index.

Appendix 3

WILDLIFE LAWS RELEVANT TO WIND POWER DEVELOPMENT PROJECTS

The Migratory Bird Treaty Act (16 U.S.C. 703-712; MBTA), which is administered by the Fish and Wildlife Service (FWS), is the cornerstone of migratory bird conservation and protection in the United States. The MBTA implements four treaties that provide for international protection of migratory birds. It is a strict liability statute wherein proof of intent is not an element of a taking violation. Wording is clear in that most actions that result in a "taking" or possession (permanent or temporary) of a protected species can be a violation. Specifically, the MBTA states:

"Unless and except as permitted by regulations ... it shall be unlawful at any time, by any means, or in any manner to pursue, hunt, take, capture, kill ... possess, offer for sale, sell ... purchase ... ship, export, import ... transport or cause to be transported ... any migratory bird, any part, nest, or eggs of any such bird ... (The Act) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior." The word "take" is defined as "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect."

A 1972 amendment to the MBTA resulted in inclusion of Bald Eagles and other birds of prey in the definition of a migratory bird. The MBTA provides criminal penalties for persons who, by any means or in any manner, pursue, hunt, take, capture, kill, attempt to take, capture, or kill, possess, offer for sale, sell, offer to barter, barter, offer to purchase, purchase, deliver for shipment, ship, export, import, cause to be shipped, exported, or imported, deliver for transportation, transport or cause to be transported, carry or cause to be carried, or receive for shipment, transportation, carriage, or export, any migratory bird (including Bald Eagles) as well as possessing Bald Eagles, their parts, nests, or eggs without a permit. A violation of the MBTA by an individual can result in a fine of up to $15,000, and/or imprisonment for up to 6 months, for a misdemeanor, and up to $250,000 and/or imprisonment for up to 2 years for a felony. Fines are doubled for organizations. Penalties increase greatly for offenses involving commercialization and/or the sale of migratory birds and/or their parts. Under authority of the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d; BGEPA), Bald and Golden Eagles are afforded additional legal protection. Penalties for violations of the BGEPA are up to $250,000 and/or 2 years imprisonment for a felony, with fines doubled for an organization.

While these Acts have no provision for allowing unauthorized take, the FWS realizes that some birds may be killed even if all reasonable measures to avoid the take are implemented. The FWS Office of Law Enforcement carries out its mission to protect migratory birds not only through investigations and enforcement, but also through fostering relationships with individuals, companies, and industries who seek to eliminate their impacts on migratory birds. Unless the activity is authorized, it is not possible to absolve individuals, companies, or agencies from liability even if they implement avian mortality avoidance or similar conservation measures. However, the Office of Law Enforcement focuses on those individuals, companies, or agencies that take migratory birds with disregard for their actions and the law, especially when conservation measures have been developed but are not properly implemented.

The Endangered Species Act (16 U.S.C. 1531-1544; ESA) was passed by Congress in 1973 in recognition that many of our Nation's native plants and animals were in danger of becoming extinct. The purposes of the Act are to protect these endangered and threatened species and to provide a means to conserve their ecosystems. To this end, Federal agencies are directed to utilize their authorities to conserve listed species, as well as "Candidate" species which may be listed in the near future, and make sure that their actions do not jeopardize the continued existence of these species. The law is administered by the Interior Department's FWS and the Commerce Department's National Marine Fisheries Service (NMFS). The FWS has primary responsibility for terrestrial and freshwater organisms, while the NMFS has responsibility for marine species such as whales and salmon. These two agencies work with other agencies to plan or modify Federal projects so that they will have minimal impact on listed species and their habitats. Protection of species is also achieved through partnerships with the States, with Federal financial assistance and a system of incentives available to encourage State participation. The FWS also works with private landowners, providing financial and technical assistance for management actions on their lands to benefit both listed and non-listed species.

Section 9 of the ESA makes it unlawful for a person to "take" a listed species. Take means ". . . to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct." The Secretary

of the Interior, through regulations, defined the term "harm" as "an act which actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering." However, permits for "incidental take" can be obtained from the FWS for take which would occur as a result of an otherwise legal activity, such as construction of wind turbines, and which would not jeopardize the species.

Section 10 of the ESA allows for the development of "Habitat Conservation Plans" for endangered species on private lands. This provision is designed to assist private landowners in incorporating conservation measures for listed species with their land and/or water development plans. Private landowners who develop and implement an approved habitat conservation plan can receive an incidental take permit that allows their development to go forward.

The National Environmental Policy Act of 1969 (42 U.S.C. 4371 et seq.; NEPA) requires that Federal agencies prepare an environmental impact statement (EIS) for Federal actions significantly affecting the quality of the human environment. "Federal Actions" are those actions in which a Federal agency is conducting the activity, providing funding for the activity, or licensing or permitting the activity. An EIS must describe the proposed action, present detailed analyses of the impacts of the proposed action and alternatives to that action, and include public involvement in the decision making process on how to proceed to accomplish the purpose of the action. The purpose of NEPA is to allow better environmental decisions to be made. The Council on Environmental Quality, established by NEPA, has promulgated regulations in 40 CFR 1500-1508 that include provisions for 1) preparing EISs and Environmental Assessments, 2) considering categorical exclusions from NEPA documentation requirements for certain agency actions, and 3) developing cooperating agency agreements between Federal agencies.

Other Federal agencies may be required by NEPA to review and comment on proposed activities as a cooperating agency with the action agency under Section 1501.6, or because of a duty to comment on federally-licensed activities for which the agency has jurisdiction by law (Section 1503.4). For the FWS, this would be the MBTA and BGEPA. Other agencies may also be called on for review and comment because of special expertise.

The National Wildlife Refuge System Administration Act (16 U.S.C. 668dd), as amended, serves as the "organic act" for the National Wildlife Refuge System. It consolidates the various categories of lands administered by the Secretary of the Interior (Secretary) through the FWS into a single National Wildlife Refuge System. The Act establishes a unifying mission for the Refuge System, a process for determining compatible uses of refuges, and a requirement for preparing comprehensive conservation plans. The Act states first and foremost that the mission of the National Wildlife Refuge System will be focused singularly on wildlife conservation.

The Act identifies six priority wildlife-dependent recreation uses; clarifies the Secretary's authority to accept donations of money for land acquisition; and places restrictions on the transfer, exchange, or other disposal of lands within the Refuge System. Most importantly, the Act reinforces and expands the "compatibility standard" of the Refuge Recreation Act, authorizing the Secretary, under such regulations as he may prescribe, to "permit the use of any area within the System for any purpose, including but not limited to hunting, fishing, public recreation and accommodations, and access whenever he determines that such uses are compatible with the major purposes for which such areas were established." This section applies to any proposed development of wind energy on Refuge System lands; such development must be compatible with the major purpose for which that Refuge was established.

The National Historic Preservation Act of 1966 (16 U.S.C. 470-470b, 470c-470n) approved October 15, 1966 and repeatedly amended, provides for preservation of significant historical features (buildings, objects, and sites) through a grant-in-aid program to the States. It established a National Register of Historic Places and a program of matching grants under the existing National Trust for Historic Preservation (16 U.S.C. 468-468d). The Act also requires Federal agencies to take into account the effects of their actions on items or sites listed or eligible for listing in the National Register. Thus, the Act functions similarly to NEPA, requiring a determination of the presence of any such items or sites, and an evaluation of the effects of proposed developments (such as wind energy facilities) on them, if the facility would be built, funded, licensed or permitted by a Federal agency. This includes State lands purchased or improved with Federal Aid in Wildlife Restoration funds.

Appendix 4

RESEARCH NEEDS ON THE IMPACTS OF WIND POWER DEVELOPMENT ON WILDLIFE

Representatives of the Fish and Wildlife Service's Wind Turbine Siting Working Group have suggested the following research needs:

- Effects of inclement weather in attracting birds and bats to lighted turbines, e.g., drawing birds and bats to within rotor-swept area of turbines, particularly for passerines during spring and fall migrations.

- Localized effects of turbines on wildlife: habitat fragmentation and loss; effects of noise on both aquatic and terrestrial wildlife; habituation.

- Effects of wind turbine string configuration on mortality, e.g., end of row turbine effect, turbines in dips or passes or draws, setbacks from rim/cliff edges.

- Effectiveness of deterrents: alternating colors on blades (particularly, effect of black/white and UV gel coats on the smear effect); lights (e.g., color, duration, and intensity of pilot warning lights; lasers); infrasound (Breco Buoys, other noisemakers such as predator and distress calls if not irritating to humans, other wildlife, or domestic animals); visual markers on guy wires.

- Utility of acoustic, infrared, and radar technologies to detect bird species presence, abundance, location height, and movement.

- Accuracy of mortality counts: estimate of the number of carcasses (especially of passerines) lost because they have been fragmented and lost to collision momentum and the wind; size and shape of dead bird search areas; possibility of recording collisions acoustically or with radar or infrared monitoring.

- Annual variability (temporal and spatial) in migratory pathways; what is the utility of Geographic Information System to assess migratory pathways and stopovers, particularly for passerines and bats.

- Effectiveness of seasonal wind turbine shutdowns at preventing mortalities, including the feasibility of using "self-erecting" turbines that are easily erected and dismantled without cranes, and taking them down during critical periods such as migrations.

- Impacts of larger turbines versus smaller models.

- Changes in predator-prey relationships due to placing potential perching sites in prairie habitats.

Appendix 5

PROCEDURES FOR ENDANGERED SPECIES EVALUATIONS AND CONSULTATIONS

The Endangered Species Act (ESA) directs all Federal agencies to participate in endangered species conservation. Specifically, section 7(a)(1) of the ESA charges Federal agencies to aid in the conservation of listed species. Section 7 (a)(2) requires Federal agencies to consult with the Fish and Wildlife Service (FWS) to ensure that actions that they fund, authorize, permit, or otherwise carry out will not jeopardize the continued existence of any listed species or adversely modify designated critical habitats. The FWS has developed a handbook describing the consultation process in detail. It is available on the FWS web site at http://endangered.fws.gov/consultations. Consultation may be informal or formal, depending upon the presence of listed species and the potential for the proposed project to affect them.

Before initiating an action, the Federal action agency (the agency authorizing a specific action) or its non-Federal permit applicant, must ask the FWS to provide a list of threatened, endangered, proposed, and candidate species and designated critical habitats that may be present in the project area. This initiates the informal consultation process. If the FWS answers that no species or critical habitats are present, then the Federal action agency or permit applicant has no further ESA obligation under section 7(a)(2), and consultation is concluded. If listed species or critical habitats are present, then the action agency or applicant must determine whether the project may affect those species (known as a *may affect* determination), and informal consultation continues. If the action agency or applicant determines, and the FWS agrees, that the project does not adversely affect any listed species, then the consultation is concluded and the decision is put in writing.

If the action agency or applicant determines that a project *may adversely affect* a listed species or designated critical habitat, the action agency/applicant prepares a *Biological Assessment* and requests formal consultation. There is a designated period of time in which to consult (90 days), and beyond that, another set period of time for the FWS to prepare a *biological opinion* (45 days). An analysis of whether or not the proposed action would be likely to jeopardize the species or adversely modify its critical habitat is determined in the biological opinion. If a *jeopardy* or *adverse modification* determination is made, the biological opinion must identify any reasonable and prudent alternatives that could allow the project to move forward.

The biological opinion will contain an "incidental take statement." "Take" is defined as harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting or attempting to engage in any such conduct. "Harm" is further defined to include significant habitat modification or degradation that results in death or injury to a listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. "Incidental take" is defined as take that is incidental to, and not the purpose of, an otherwise lawful activity. If the FWS issues a *jeopardy* opinion, the incidental take statement will simply state that no take is authorized. If the FWS issues a nonjeopardy opinion, the FWS will anticipate the take that may result from the proposed project and describe that take in the incidental take statement. The statement will contain clear terms and conditions designed to reduce the impact of the anticipated take to the species; these terms are non-discretionary on the action agency or applicant.

When non-Federal activities will result in take of threatened or endangered species, an *incidental take permit* is required under section 10 of the ESA. A habitat conservation plan or "HCP" must accompany an application for an incidental take permit. The habitat conservation plan associated with the permit is to ensure that there are adequate conservation measures to avoid jeopardy to the species.

Examples:

1. **No Effect** – The appropriate conclusion when the action agency or applicant determines that its proposed action will not affect a listed species or designated critical habitat.

   Example: A permit applicant contacts the FWS to request information on listed species. The FWS provides a species list containing 3 plants, 1 fish, and 1 butterfly. The proposed project would be constructed at an upland site on clay soils. The 3 plants are found only on sandy soils. The butterfly's habitat is one of the plants on sandy soil. The nearest sandy soils are 10 miles from the proposed project. The fish is in a stream 5 miles from the proposed project. Conclusion: No effects from the project, either

direct or indirect. Justification: No construction is proposed in listed species habitat or in an area that may affect listed species. In addition, the project proponent has charted a route for heavy equipment moving onto the construction site that avoids listed species habitat.

2. **May Affect, but Not Likely to Adversely Affect** – The appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not (a) be able to meaningfully measure, detect, or evaluate insignificant effects, or (b) expect discountable effects to occur.

   Example: The applicant contacts the FWS to request information on listed species. The FWS provides a species list containing 2 birds and 1 fish. The proposed project would be constructed at an upland site, 200 yards from the stream (fish habitat) and adjoining riparian vegetation (bird habitat). The migratory birds use the riparian vegetation to nest between April 15 and August 15. The uplands are highly erodible soils. The project proponent agrees not to construct during the nesting season. He flags the riparian vegetation to indicate an avoidanee zone and installs silt fencing between the riparian vegetation and the construction site. He states that he will plant the disturbed soils surrounding the project with native vegetation after construction. He also agrees to monitor the vegetation planted for 3 years to assure that it establishes sufficiently to prevent any additional erosion in the project area caused by construction. Conclusion: Although the project proponent is working in very close proximity to listed species habitat, the action is not likely to adversely affect listed species. Justification: The proponent has incorporated sufficient avoidance and other mitigation measures into the project that any effects to listed species would be discountable. The project proponent prepares a Biological Assessment that includes a complete description of the project, all proposed avoidance and other mitigation measures, and the resulting effects of the project on the listed species. The Biological Assessment is sent to the FWS to request concurrence that the project is not likely to adversely affect listed species.

3. **May Affect, and Likely to Adversely Affect** – The appropriate finding in a Biological Assessment (or conclusion during informal consultation) if any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not discountable, insignificant, or beneficial. In the event the overall effect of the proposed action is beneficial to the listed species, but is also likely to cause some adverse effects, then the proposed action "is likely to adversely affect" the listed species. If incidental take is anticipated to occur as a result of the proposed action, an "is likely to adversely affect" determination should be made. This determination requires the initiation of formal section 7 consultation.

   Example: The applicant contacts the FWS to request information on listed species. The FWS provides a species list containing 10 birds. The proposed project would be constructed at an upland site within a significant migratory bird corridor that is utilized by the 10 listed birds. Construction will permanently alter the character of the corridor and will likely cause take of listed birds every year during the migration periods. Conclusion: Formal consultation will be required. The project proponent prepares a Biological Assessment to submit to the action agency to accompany their request to initiate formal consultation. Justification: The project is likely to cause take of listed birds every year during their migration periods.

Appendix 6

GUIDELINES FOR CONSIDERING WIND TURBINE SITING ON EASEMENT LANDS ADMINISTERED AS PART OF THE NATIONAL WILDLIFE REFUGE SYSTEM IN REGION 6

Grassland easements are acquired to protect native and planted grasslands essential for grassland dependent migratory birds and other wildlife. Healthy grasslands provide both nesting and migration habitat necessary to maintain these important populations. Wind energy could severely impact this important program if not developed carefully with as little impact to migratory birds and their habitat as possible.

The following guidelines are to be used when making compatibility determinations for the siting of wind turbines and associated facilities on lands encumbered by U.S. Fish and Wildlife Service (Service) grassland easements and USDA conservation easements administered by the Service in Region 6, particularly in North Dakota, South Dakota, and Montana. These guidelines are intended to provide guidance for considering compatibility determinations during the period while the Service and the wind power industry monitor potential impacts to migratory birds as a result of turbine construction, maintenance, and operation. The following guidelines will be incorporated into rights-of-way permits issued for the construction of turbines, access roads, and other associated activities necessary to make the turbines operational. The intention of these guidelines is to minimize impacts to migratory birds and protect the habitat covered by the easement. The guidelines pertain only to permits issued for the alteration or destruction of grassland habitat as a result of turbine and other associated construction on lands encumbered by Service easements.

Refuge Managers and Wetland District Managers shall use these guidelines for site-by-site consideration of compatibility determinations for individual right-of-way requests for wind turbines on easement lands. These guidelines may be incorporated as needed as right-of-way or permit stipulations.

These guidelines may be revised and modified as a result of the findings of research and monitoring conducted in the future. Wind turbine rights-of-way applications will be reviewed according to these guidelines in conjunction with the Service's compatibility policy and in accordance with 50 CFR 29.21 and the Service Realty Manual. Future right-of-way applications will be reviewed using the guidelines in effect at the time of application. The Service will not make changes to previously issued rights-of-way or easement permits issued under these guidelines.

1) The Service may permit up to one turbine per 160 acres on an individual easement tract. No more than one turbine may be allowed on an individual easement tract of less than 160 acres. Current biological information (Attachment 2) indicates that this density of turbines would not have any significant impact to grassland habitat and its value to migratory birds or other wildlife. This is the upper limit for the density of turbines on easements. However, consideration may be given to clump or consolidate towers within an easement tract(s) to minimize the disturbance to the remaining habitat, i.e., two turbines may be clumped on a tract of 320 acres. Information available at this time indicates that turbine densities at this level will not materially interfere with or detract from the purposes of the easement (Attachment 2). Wind power industry turbine spacing recommendations are 2,000 feet between wind turbines and 2,000 feet from an occupied building. This constraint may limit the ability to clump turbines.

2) Turbines shall not be constructed in wetlands, including lakes, ponds, marshes, sloughs, swales, swamps, or potholes. Similarly, turbine locations should avoid obvious "duck passes" between large (20 acres or greater), semi-permanent (type 4, or cattail/bulrush) wetlands or sloughs. In addition, known migratory bird corridors or flight paths and environmentally sensitive areas such as colonial bird nesting areas or upland game bird leks, should be avoided.

3) Siting recommendations made by the Service for turbines and access roads and turbine lighting recommendations shall be consistent with all general siting and mitigating measures for tower and transmission line construction (Director's September 14, 2000 memorandum, attachment 3, APLIC 1996, and APLIC 1994).

4) Priority should be given to siting turbines on tame, planted, or seeded grasslands in preference to unbroken native prairie when such options are available on a given easement tract.

5) Spoil material from the excavated turbine pad shall not be deposited in wetlands and must be stored or deposited off easement lands using established roads to transport the material off site.

6) Turbines shall be sited as close to existing roads or the edge of the grassland tract as practical. Disturbance of grassland to construct and maintain a wind turbine shall be done in such a manner as to minimize the destruction or alteration of the habitat. Use of existing roads as a means of accessing a turbine within protected habitats is strongly encouraged. Conservation measures shall be used to avoid the impacts of erosion and sedimentation in order to protect grasslands and wetlands during the construction of the access road. Buried transmission lines, electric lines, and other cables shall be co-located on the access road when practical. Turbine construction should be encouraged to occur outside the breeding season for migratory birds when practical.

7) Regardless of a Service permit the developer is responsible for adhering to all local, state, and federal regulations in siting turbine location and construction. In the event that location and construction criteria conflict between the various levels of government, the criteria providing the maximum protection to the habitat shall be the criteria used during turbine location and construction.

8) In the event that a turbine is no longer utilized for power generation and has been abandoned for that purpose, the turbine owner shall remove the turbine at his/her own expense from the easement tract. The turbine site and associated facilities shall be reclaimed by the turbine owner by planting these areas to a grass mixture consistent with the surrounding grassland or such mixture as is mutually agreed upon by the Service and the turbine owner.

9) The turbine owner must update bird strike avoidance equipment on turbines and implement techniques that reduce the disturbance to nesting birds at turbine sites as future research and evaluation by the Service and the industry indicate.

These guidelines provide flexibility for the Service Refuge Manager in evaluating compatibility determinations and to negotiate with the energy company and the easement landowner to allow wind turbine development consistent with the purposes of the conservation easements. Where development is found to be compatible with easement purposes the guidelines will be used to negotiate siting, lighting, and other restrictions to grant rights-of-way and easement permits for wind turbines.

References:

Avian Power Line Interaction Committee (APLIC). 1994. Mitigating bird collisions with power lines: The state of the art in 1994.

Avian Power Line Interaction Committee (APLIC). 1996. Suggested practices for raptor protection on power lines: the state of the art in 1996.

Attachment 2

Potential Effect of Wind Turbine Presence on Numbers of Breeding Grassland Birds and Nesting Ducks on Grassland Easement Properties in North and South Dakota.

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Recently, companies that develop wind-powered electricity generation have begun operations in areas of South Dakota and North Dakota where the U.S. Fish and Wildlife Service has purchased or intends to purchase conservation easements on grasslands. Questions have been raised within the FWS as to whether the placement of wind towers on easement tracts would violate terms of the easement contract, and whether the Service would consider purchasing easements on lands after towers are in place. Before allowing turbines on easement lands, the Service must address the issue of whether placement of wind turbines on grassland easements is compatible with the

goals and purpose of refuge lands as defined by the Refuge Improvement Act, which states that, "A Compatible use means . . . any other use of a National Wildlife Refuge that, based on sound professional judgment, will not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission or the purposes(s) of the National Wildlife Refuge." If birds avoid the area surrounding wind turbines because of noise, disruption of habitat, or disturbance, the biological value of an easement may be compromised. At this time, we do not know if wind turbines are compatible with the purpose of grassland easements, because we do not know if turbines reduce the attractiveness of a site to birds or if turbines affect avian reproductive success. The issue is complicated partly because, if, the FWS restricts certain alternative uses on easements, this may reduce the willingness of landowners to offer to sell easements to the FWS in the future. For example, some landowners believe the potential income derived from wind generators will exceed the income from selling grass easements to the FWS or other conservation organizations. In this respect, the future success of the easement program could be compromised if these restrictions are unnecessary.

Little is known about bird avoidance of grasslands near wind turbines, as previous avian research at wind towers has focused primarily on bird strikes. In one study that did consider avoidance, density of grassland birds was reduced in the immediate vicinity of wind turbines at Buffalo Ridge, Minnesota, (Leddy et al. 1999), although at larger scales no differences were detected (Johnson et al. 2000). However, in the Buffalo Ridge study, wind turbines were placed primarily in Conservation Reserve Program fields with few wetlands and much higher densities of breeding birds than are typically found in native prairie where grassland easements are targeted in the Dakotas, and therefore results from Leddy et al. (1999) may not be applicable here. In the absence of specific data on the effect of wind turbines on birds in North and South Dakota, we used two approaches to assess the potential impact; 1) existing data (Igl and Johnson 1997, D. H. Johnson, unpublished data) was used to estimate the potential impact of wind turbine placement on grassland bird use in quarter-section (160 acre) parcels, and 2) a Mallard productivity model (Cowardin et al. 1988) was used to predict changes in nesting and recruitment rate of ducks on grassland areas with wind turbines in place.

Grassland birds. For the first assessment, abundance of grassland birds, standardized to 160 acres of grassland habitat, was estimated from data gathered on 128 quarter sections in North Dakota during summers of 1992 and 1993 (Igl and Johnson 1997, D. H. Johnson, unpublished data). We estimated the potential impact of wind turbines at two scales representing a five-acre and two-acre loss of habitat for each wind tower, with one wind tower per quarter section. We estimated the two-acre potential area of impact as approximately 4 times the area of road and tower pad (Appendix 1); the five-acre area of impact was estimated using the 80-m reported zone of reduced bird density surrounding towers at Buffalo Ridge (Leddy et al. 1999, Appendix 1). For purposes of our analysis, we assumed that no grassland birds would be present in the area immediately surrounding the tower, which is a worst-case scenario, because (Leddy et al. 1999) showed that birds are present immediately adjacent to turbines, but at reduced densities. Thus, our methods guaranteed we would predict a reduction in birds using easements, however, our intent was to put this change into perspective relative to bird use on the entire easement. Given the high variance associated with the grassland bird data we used, it would be impossible to detect a statistically significant decrease in grassland bird numbers, because the lower 95% confidence limit for population estimates was less than zero for each species (D. H. Johnson, unpublished data). Therefore, we estimated the impact of tower presence by calculating the density of each grassland bird species per 160-acre tract, and then calculating the mean reduction in the number of pairs if 2 acre and 5 acre areas of habitat were considered as unused (Table 1).

Expected reductions were estimated at approximately 1% and 3% of the number of individuals present for each species. As expected, greatest reductions in number of pairs occurred with common species such as the chestnut-collared longspur and horned lark; where, at the 5 acres level, a reduction of less than 1 pair per 160-acre tract would be expected. For all species combined, we estimated the expected maximum reduction would be about 2 pairs per 160 acre area, or about 3 percent of the total population. As mentioned previously, based on variation observed in the existing data set, these levels of change would not be statistically significant. Additionally, because we would expect some bird use of the area near the tower, the actual change would likely be less than the numbers presented in table 1.

Table 1. Mean number of breeding pairs of grassland birds found per 160 acres of grassland and expected reduction in pairs with loss of 5 acres and 2 acres of habitat. Data based on surveys of 128 160-acre parcels in North Dakota during summers of 1992 and 1993 (Igl and Johnson 1997, D. H. Johnson, unpublished data).

	Mean Number (pairs)		Mean Reduction (pairs)	
Species	1992	1993	5 acre	2 acre
Baird's Sparrow	1.424	2.464	0.06075	0.0243
Bobolink	0.336	0.784	0.0175	0.007

Brewer's Sparrow	0	0	0	0
Brown-headed Cowbird	2.88	3.632	0.10175	0.0407
Chestnut-collared Longspur	15.584	19.696	0.55125	0.2205
Clay-colored Sparrow	2.08	1.92	0.0625	0.025
Common Yellowthroat	0.144	0.112	0.004	0.0016
Dickcissel	0.304	0.32	0.00975	0.0039
Ferruginous Hawk	0.032	0.24	0.00425	0.0017
Field Sparrow	0.24	0	0.00375	0.0015
Grasshopper Sparrow	6.368	8.928	0.239	0.0956
Gray Catbird	0	0	0	0
Gray Partridge	0.16	0.128	0.0045	0.0018
Horned Lark	6.88	12.544	0.3035	0.1214
Killdeer	0.544	0.848	0.02175	0.0087
Lark Bunting	8.416	4.16	0.1965	0.0786
Lark Sparrow	0.448	0.128	0.009	0.0036
Le Conte's Sparrow	0	0.192	0.003	0.0012
Northern Harrier	0.304	0.512	0.01275	0.0051
Red-winged Blackbird	1.616	1.248	0.04475	0.0179
Ring-necked Pheasant	0.16	0.368	0.00825	0.0033
Savannah Sparrow	1.184	2.144	0.052	0.0208
Sedge Wren	0.16	0	0.0025	0.001
Sharp-tailed Grouse	0.432	0.464	0.014	0.0056
Sharp-tailed Sparrow	0.032	0	0.0005	0.0002
Short-eared Owl	0.032	0.032	0.001	0.0004
Sprague's Pipit	0.256	0.576	0.013	0.0052
Swainson's Hawk	0.032	0.16	0.003	0.0012
Upland Sandpiper	1.52	1.552	0.048	0.0192
Vesper Sparrow	1.312	0.976	0.03575	0.0143
Western Meadowlark	7.088	11.184	0.2855	0.1142
SUM	**59.97**	**75.31**	**2.11**	**0.85**

Ducks. To assess the impact of wind turbines on ducks, we used the Mallard Productivity Model (Cowardin et al. 1988). The Mallard Model is particularly useful for this exercise because it allowed us to predict any "net" change in nest site selection and recruitment that might occur as a result of simulating the reduction of grasslands available to nesting hens due to the placement of wind turbines. For example, if grassland availability is reduced as a result of disturbance, displaced hens may select other habitat types (e.g., cropland, hayland etc.) in the area for nesting, or they may elect to nest elsewhere in the grasslands protected by easement. If other habitats are selected, this could result in reduced recruitment because, most other habitats are characterized by lower nest success compared to grass habitats. However, if these hens select nest sites in the remaining grasslands outside the influence of the wind turbines, nest success will not change materially and recruitment rate will be the same with-or-without turbines. For this exercise, we selected six study areas from Four Square Mile plots used for breeding population and production surveys (Cowardin et al. 1995) in the Kulm Wetland Management District in North Dakota. Plots were selected that had ≥160 acres of grassland in one unit, and were accessible to ≥60 breeding duck pairs (≥12 mallard pairs) based on the "thunderstorm map" (HAPET 2000) for North Dakota. These criteria are consistent with those used by FWS Realty Office, Bismarck, ND for focusing grassland easements, and the Kulm WMD is representative of areas where the grassland easement program is being targeted. For the purpose of our assessment, all grasslands on study plots selected were treated as protected by easement. This was done to obtain sample acreage similar to easement acreage being purchased. We ran the model on plots with-and-without wind turbines in place and compared the response by mallard hens. The area of influence for turbines was set at 5 acres and was converted to barren habitat which simulated eliminating all nesting activity in that area. To reduce variability, and thus increase the precision of our estimates we conducted eight model runs (1000 hens each) and then scaled the average results to the estimated mallard population on each study plot.

Neither nests initiated or recruitment rates differed significantly between treatment and control model runs (Table 2). The variation shown in nests initiated and recruitment rate between treatment and control runs is due to variation inherent in the biological system being examined. The model predicts that hens displaced by the presence of wind turbines will select nesting sites in the remaining available grass habitat and that recruitment rates will not be influenced.

Summary. Using data collected in North Dakota and South Dakota for grassland birds and ducks, we were able to estimate the magnitude of change that would likely be observed if similar data were collected on grassland easement properties. For some species of grassland birds that have restricted distributions the changes predicted could be underestimated on some sites, but it is unlikely these would be of a different order of magnitude. For ducks, the changes predicted account for differences in geographic distribution. Based on our assessment, the expected impact of wind turbines on grassland nesting species would be negligible with the density of one turbine per 160 acre area.

Table 2. Mallard nests initiated and recruitment rate estimates on six study plots with-and-without wind turbines, based on Mallard Model predictions. ( ) standard errors.

			Without Wind Turbines			With Wind Turbines			
Study plot	Pop. Estimate	Grass Acres	Init. Nests	Recr. Rate	SE	No. Turbines	Init.Nests	Recr. Rate	SE
153	55	761	21	0.67	(.0115)	2	21	0.64	(.0090)
178	60	205	14	0.53	(.0094)	1	13	0.52	(.0064)
329	45	1496	59	0.57	(.0055)	3	59	0.59	(.0124)
330	35	1810	51	0.55	(.0163)	8	52	0.55	(.0118)
331	26	1310	18	0.62	(.0104)	2	18	0.59	(.0120)
332	70	1312	58	0.58	(.0166	2	60	0.58	(.0072)

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APPENDIX 1. Calculations of potential area of impact for wind towers on grassland easements in North Dakota and South Dakota.

Two-acre impact:

40 foot by 40 foot pad for tower		1,600 ft^2
16.5 foot by 1320 foot access road		21,780 ft^2
	total	23,380

Physical disruption of site is approximately 0.54 acre; we multiplied this by four to estimate a zone of potential impact.

Five-acre impact:
80-m zone of reduced density surrounding tower
80 m * 80 m * 3.14 2.0 ha
~ 2.5 acres per ha 5.0 acres

Attachment 3

Memorandum

To: Regional Directors, Regions 1-7

From: Director

Subject: Service Guidance on the Siting, Construction, Operation and Decommissioning of Communications Towers

Construction of communications towers (including radio, television, cellular, and microwave) in the United States has been growing at an exponential rate, increasing at an estimated 6 percent to 8 percent annually. According to the Federal Communication Commission=s *2000 Antenna Structure Registry*, the number of lighted towers greater than 199 feet above ground level currently number over 45,000 and the total number of towers over 74,000. By 2003, all television stations must be digital, adding potentially 1,000 new towers exceeding 1,000 feet AGL.

The construction of new towers creates a potentially significant impact on migratory birds, especially some 350 species of night-migrating birds. Communications towers are estimated to kill 4-5 million birds per year, which violates the spirit and the intent of the Migratory Bird Treaty Act and the Code of Federal Regulations at Part 50 designed to implement the MBTA. Some of the species affected are also protected under the Endangered Species Act and Bald and Golden Eagle Act.

Service personnel may become involved in the review of proposed tower sitings and/or in the evaluation of tower impacts on migratory birds through National Environmental Policy Act review; specifically, sections 1501.6, opportunity to be a cooperating agency, and 1503.4, duty to comment on federally-licensed activities for agencies with jurisdiction by law, in this case the MBTA, or because of special expertise. Also, the National Wildlife Refuge System Improvement Act requires that any activity on Refuge lands be determined as compatible with the Refuge system mission and the Refuge purpose(s). In addition, the Service is required by the ESA to assist other Federal agencies in ensuring that any action they authorize, implement, or fund will not jeopardize the continued existence of any federally endangered or threatened species.

A Communication Tower Working Group composed of government agencies, industry, academic researchers and NGO=s has been formed to develop and implement a research protocol to determine the best ways to construct and operate towers to prevent bird strikes. Until the research study is completed, or until research efforts uncover significant new mitigation measures, all Service personnel involved in the review of proposed tower sitings and/or the evaluation of the impacts of towers on migratory birds should use the attached interim guidelines when making recommendations to all companies, license applicants, or licensees proposing new tower sitings. These guidelines were developed by Service personnel from research conducted in several eastern, midwestern, and southern States, and have been refined through Regional review. They are based on the best information available at this time, and are the most prudent and effective measures for avoiding bird strikes at towers. We believe that they will provide significant protection for migratory birds pending completion of the Working Group=s recommendations. As new information becomes available, the guidelines will be updated accordingly.

Implementation of these guidelines by the communications industry is voluntary, and our recommendations must be balanced with Federal Aviation Administration requirements and local community concerns where necessary. Field

offices have discretion in the use of these guidelines on a case by case basis, and may also have additional recommendations to add which are specific to their geographic area.

Also attached is a Tower Site Evaluation Form which may prove useful in evaluating proposed towers and in streamlining the evaluation process. Copies may be provided to consultants or tower companies who regularly submit requests for consultation, as well as to those who submit individual requests that do not contain sufficient information to allow adequate evaluation. This form is for discretionary use, and may be modified as necessary.

The Migratory Bird Treaty Act (16 U.S.C. 703-712) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. While the Act has no provision for allowing an unauthorized take, it must be recognized that some birds may be killed at structures such as communications towers even if all reasonable measures to avoid it are implemented. The Service=s Division of Law Enforcement carries out its mission to protect migratory birds not only through investigations and enforcement, but also through fostering relationships with individuals and industries that proactively seek to eliminate their impacts on migratory birds. While it is not possible under the Act to absolve individuals or companies from liability if they follow these recommended guidelines, the Division of Law Enforcement and Department of Justice have used enforcement and prosecutorial discretion in the past regarding individuals or companies who have made good faith efforts to avoid the take of migratory birds.

Please ensure that all field personnel involved in review of FCC licensed communications tower proposals receive copies of this memorandum. Questions regarding this issue should be directed to Dr. Benjamin N. Tuggle, Chief, Division of Habitat Conservation, at (703)358-2161, or

Jon Andrew, Chief, Division of Migratory Bird Management, at (703)358-1714. These guidelines will be incorporated in a Director=s Order and placed in the Fish and Wildlife Service Manual at a future date.

Attachment

cc: 3012-MIB-FWS/Directorate Reading File
3012-MIB-FWS/CCU Files
3245-MIB-FWS/AFHC Reading Files
840-ARLSQ-FWS/AF Files
400-ARLSQ-FWS/DHC Files
400-ARLSQ-FWS/DHC/BFA Files
400-ARLSQ-FWS/DHC/BFA Staff
520-ARLSQ-FWS/LE Files
634-ARLSQ-FWS/MBMO Files (Jon Andrew)

FWS/DHC/BFA/RWillis:bg:08/09/00:(703)358-2183
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Attachment

Service Interim Guidelines For Recommendations On Communications Tower Siting, Construction, Operation, and Decommissioning

1. Any company/applicant/licensee proposing to construct a new communications tower should be strongly encouraged to collocate the communications equipment on an existing communication tower or other structure (e.g., billboard, water tower, or building mount). Depending on tower load factors, from 6 to 10 providers may collocate on an existing tower.

2. If collocation is not feasible and a new tower or towers are to be constructed, communications service providers should be strongly encouraged to construct towers no more than 199 feet above ground level, using construction techniques which do not require guy wires (e.g., use a lattice structure, monopole, etc.). Such towers should be unlighted if Federal Aviation Administration regulations permit.

3. If constructing multiple towers, providers should consider the cumulative impacts of all of those towers to migratory birds and threatened and endangered species as well as the impacts of each individual tower.

4. If at all possible, new towers should be sited within existing "antenna farms" (clusters of towers). Towers should not be sited in or near wetlands, other known bird concentration areas (e.g., State or Federal refuges, staging areas, rookeries), in known migratory or daily movement flyways, or in habitat of threatened or endangered species. Towers should not be sited in areas with a high incidence of fog, mist, and low ceilings.

5. If taller (>199 feet AGL) towers requiring lights for aviation safety must be constructed, the minimum amount of pilot warning and obstruction avoidance lighting required by the FAA should be used. Unless otherwise required by the FAA, only white (preferable) or red strobe lights should be used at night, and these should be the minimum number, minimum intensity, and minimum number of flashes per minute (longest duration between flashes) allowable by the FAA. The use of solid red or pulsating red warning lights at night should be avoided. Current research indicates that solid or pulsating (beacon) red lights attract night-migrating birds at a much higher rate than white strobe lights. Red strobe lights have not yet been studied.

6. Tower designs using guy wires for support which are proposed to be located in known raptor or waterbird concentration areas or daily movement routes, or in major diurnal migratory bird movement routes or stopover sites, should have daytime visual markers on the wires to prevent collisions by these diurnally moving species. (For guidance on markers, see *Avian Power Line Interaction Committee (APLIC). 1994. Mitigating Bird Collisions with Power Lines: The State of the Art in 1994. Edison Electric Institute, Washington, D.C., 78 pp*, and *Avian Power Line Interaction Committee (APLIC). 1996. Suggested Practices for Raptor Protection on Power Lines. Edison Electric Institute/Raptor Research Foundation, Washington, D.C., 128 pp.* Copies can be obtained via the Internet at http://www.eei.org/resources/pubcat/enviro/, or by calling 1-800/334-5453).

7. Towers and appendant facilities should be sited, designed and constructed so as to avoid or minimize habitat loss within and adjacent to the tower "footprint"@ However, a larger tower footprint is preferable to the use of guy wires in construction. Road access and fencing should be minimized to reduce or prevent habitat fragmentation and disturbance, and to reduce above ground obstacles to birds in flight.

8. If significant numbers of breeding, feeding, or roosting birds are known to habitually use the proposed tower construction area, relocation to an alternate site should be recommended. If this is not an option, seasonal restrictions on construction may be advisable in order to avoid disturbance during periods of high bird activity.

9. In order to reduce the number of towers needed in the future, providers should be encouraged to design new towers structurally and electrically to accommodate the applicant/licensee's antennas and comparable antennas for at least two additional users (minimum of three users for each tower structure), unless this design would require the addition of lights or guy wires to an otherwise unlighted and/or unguyed tower.

10. Security lighting for on-ground facilities and equipment should be down-shielded to keep light within the boundaries of the site.

11. If a tower is constructed or proposed for construction, Service personnel or researchers from the Communication Tower Working Group should be allowed access to the site to evaluate bird use, conduct dead-bird searches, to place net catchments below the towers but above the ground, and to place radar, Global Positioning

System, infrared, thermal imagery, and acoustical monitoring equipment as necessary to assess and verify bird movements and to gain information on the impacts of various tower sizes, configurations, and lighting systems.

12. Towers no longer in use or determined to be obsolete should be removed within 12 months of cessation of use.

In order to obtain information on the extent to which these guidelines are being implemented, and to identify any recurring problems with their implementation which may necessitate modifications, letters provided in response to requests for evaluation of proposed towers should contain the following request:

> "In order to obtain information on the usefulness of these guidelines in preventing bird strikes, and to identify any recurring problems with their implementation which may necessitate modifications, please advise us of the final location and specifications of the proposed tower, and which of the measures recommended for the protection of migratory birds were implemented. If any of the recommended measures can not be implemented, please explain why they were not feasible."

Appendix 7

KNOWN AND SUSPECTED IMPACTS OF WIND TURBINES ON WILDLIFE

While wind-generated electrical energy is renewable, emission-free, and generally environmentally clean (American Wind Energy Association [AWEA] unpubl. data, <http://www.awea.org>), it does have one significant downside -- rotor blades kill birds, especially raptors (Hunt 2002) and bats. Birds can strike the towers; electrocutions can occur if designs are poor; and wind farms may impact bird movements, breeding, and habitat use.

Wind turbine technology is not new to the United States. In the 1800s, Cape Cod supported over 1,000 working wind turbines (Ferdinand 2002). In the late 1930s, Vermont boasted the world's then-largest turbine, which was likely disabled by high winds due to design flaws. But wind turbine 'farms' and their impacts to birds are a recent phenomenon compared to power lines and communication towers, where mortality has been documented for decades or longer (Boeker and Nickerson 1975, Olendorff et al. 1981, APLIC 1994, APLIC 1996, Harness 1997, Ainley et al. 2001, Manville 2001). The problem in the U.S. surfaced in the late 1980s and early 1990s at the Altamont Pass Wind Resource Area, a facility then containing some 6,500 turbines on 73 mi^2 of gently rolling hills just east of San Francisco Bay, California (Davis 1995). Orloff and Flannery (1992) estimated that several hundred raptors were killed each year due to turbine collisions, guy wire strikes, and electrocutions. The most common fatalities were those of Red-tailed Hawks (*Buteo jamaicensis*), American Kestrels (*Falco sparvarius*) and Golden Eagles (*Aquila chrysaetos*), with fewer mortalities of Turkey Vultures (*Cathartes aura*), Common Ravens (*Corvus corax*), and Barn Owls (*Tyto alba*). The impacts of this wind farm were of most concern to the population of Golden Eagles, which was showing a "disturbing source of mortality" to a disproportionately large segment of the population (Southern Niagara Escarpment [WI] Wind Resource Area unpubl. report). More recent studies indicate that a model previously used to assess Golden Eagle mortality was defective, and that nonbreeding Golden Eagles representing a "floater" population were likely suffering less mortality based on a new model (Hunt 2002). Research continues at this time to further assess the impacts of Altamont turbines on raptors. The Altamont turbines are still estimated to kill 40-60 subadult and adult Golden Eagles each year, as well as several hundred Red-tailed Hawks and American Kestrels – a continuing concern for the FWS. Of the variety of wind turbines at the site, the smaller, faster moving, Kenetech-built, lattice-supported turbines caused most of the mortality. As part of a re-powering effort, these turbines are now being replaced with slower moving, tubular-supported turbines. While Europeans have used tubular towers almost exclusively, the U.S. has almost solely used lattice support, at least until recently (Berg 1996).

Colson (1995) indicated that some 16,000 wind turbines operated in California, making the State the largest concentration of wind energy development in the world. Since 1995, that statistic has changed. While California still boasts the greatest number of turbines in the U.S., many smaller turbines are being replaced by fewer but larger models. Worldwide, an estimated 50,000 turbines are generating power (AWEA unpubl. data; Ferdinand 2002), of which over 15,000 are currently in 29 states in the U.S. Turbine numbers are often difficult to track since statistics are generally presented in megawatts (MW) of electricity produced rather than number of turbines present. The latter statistic is of greater concern to ornithologists. In 1998, for example, Germany was the greatest producer with 2,874 MW of electricity produced by turbines, followed by the U.S. (1,884), and Denmark (1,450); (AWEA unpubl. data). While some project that the number of wind turbines in the U.S. may increase by another 16,000 in the next 10 years, current trends indicate an even greater potential growth. Although the U.S. presently produces less than 1% of its electrical energy from turbines – compared, for example, to Norway's 15% – 2001 was a banner year for U.S. turbine technology, doubling the previous record for installed wind production. Companies installed 1,898 turbines in 26 states, which will produce nearly 1,700 MW, at a cost of $1.7 billion for the new equipment (J. Cadogan, U.S. Department of Energy, 2002, pers. comm.). Over the past decade, wind power has been the fastest growing energy industry in the world. By 2020, the AWEA (unpubl. data) predicts that wind will provide 6% of this nation's electricity, serving as many as 25 million households. Enron Wind Corporation constructed some 1,500 of the 1,898 turbines installed in the U.S. in 2001. Although Enron is now bankrupt, General Electric purchased the company and is now producing wind turbines.

In March 2002, President Bush signed the Job Creation and Worker Assistance Act, extending the production tax credit to the wind industry for another two years. There are presently attempts in Congress to amend the reauthorization of this legislation for five or more years. However, even with a bright future for growth, and with low speed tubular-constructed wind turbine technology now being stressed, larger and slower moving turbines still kill raptors, passerines, waterbirds, other avian species, and bats. Low wind speed turbine technology requires much larger rotors, blade tips often extending more than 420 ft. above ground, and blade tips can reach speeds in excess of 200 mph under windy conditions (J. Cadogan, U.S. Department of Energy, 2002, pers. comm.). When birds

approach spinning turbine blades, "motion smear" – the inability of the bird's retina to process high speed motion stimulation – occurs primarily at the tips of the blades, making the blades deceptively transparent at high velocities. This increases the likelihood that a bird will fly through this arc, be struck by a blade, and be killed (Hodos et al. 2001).

What cumulative impact these larger turbines will have on birds and bats has yet to be determined. Johnson et al. 2002b raised some concerns about the impacts of newer, larger turbines on birds. Their data indicated that higher levels of mortality might be associated with the newer and larger turbines, and they indicated that wind power-related avian mortality would likely contribute to the cumulative impacts on birds. Since little research has been conducted on the impacts of large land-sited and offshore turbines on birds and bats, this newer technology is ripe for research.

Howell and Noone (1992) estimated U.S. avian mortality at 0.0 to 0.117 birds/turbine/yr., while in Europe, Winkelman (1992) estimated mortality at 0.1 to 37 birds/turbine/yr. Erickson et al. (2001) reassessed U.S. turbine impact, based on more than 15,000 turbines (some 11,500 in California), and estimated mortality in the range of 10,000 to 40,000 (mean = 33,000), with an average of 2.19 avian fatalities/turbine/yr. and 0.033 raptor fatalities/turbine/yr. This may be a considerable underestimate. As with other structural impacts, only a systematic turbine review will provide a more reliable estimate of mortality. While some have argued that turbine impacts are small (Berg 1996), especially when compared to those from communication towers and power lines, turbines can pose some unique problems, especially for birds of prey. Mortalities must be reduced, especially as turbine numbers increase. In addition to protections under the MBTA, Bald and Golden Eagles are afforded protections under the ESA for the former and the BGEPA for both raptors. As strict liability statutes, MBTA and BGEPA also provide no provisions for unauthorized "take." Wind farms can affect local populations of Golden Eagles and other raptors whose breeding and recruitment rates are naturally slow and whose populations tend to have smaller numbers of breeding adults (Davis 1995). Large raptors are also revered by Native Americans as well as by many others within the public. They are symbolic megafauna, and provide greater emotional appeal to many than do smaller avian species. Raptors also have a lower tolerance for additive mortality (Anderson et al. 1997). As with all other human-caused mortality, we have a responsibility to reverse mortality trends.

Until very recently, U.S. wind turbines have mostly been land-based. Perhaps following the European lead of siting wind turbines in estuarine and marine wetlands (van der Winden et al. 1999, van der Winden et al. 2000), and perhaps due to an assessment of a large number of potential offshore turbine locations in the U.S. (based on Weibull analyses of "good, excellent, outstanding, and superb" wind speed potentials [National Renewable Energy Laboratory 1987]), a new trend is evolving in North America. Several proposals for huge offshore sites are being submitted for locations on both Atlantic and Pacific coasts. These, at the very least, should require considerable research and monitoring to assess possible impacts to resident and migrating passerines, waterfowl, shorebirds, and seabirds. One site at Nantucket Shoals, offshore of Nantucket Island near Cape Cod, Massachusetts, is proposed by the Cape Wind Association to contain 170 turbines, many over 420 feet high, within a 25 mi^2 area (AWEA unpubl. data, Ferdinand 2002). What impacts this wind farm would have on wintering sea ducks and migrating terns, especially the Federally endangered Roseate Tern (*Sterna dougallii dougallii*), and on Northern Gannets (*Morus bassanus*), is unknown. The Long Island Power Authority is proposing a site offshore of Long Island, New York's south shore, covering as much as 314 mi^2. Other sites are being proposed for Portland, Maine, and Lake Erie. The largest proposed wind farm in North America is being planned for a 50 mi^2 area between Queen Charlotte Island, BC, and Alaska. It is being designed to contain 350 turbines, many exceeding 400 feet in height. The potential for significant offshore turbine impacts on waterbirds is great, virtually no research has been conducted in the United States to quell these concerns, and finding carcasses at sea is very challenging.

Europe presently has 10 offshore wind projects in operation, producing over 250 MW of electricity (British Wind Energy unpub. data, www.offshorewindfarms.co.uk). Many other projects are currently under review. To avoid citizen concerns regarding the "not in my backyard" complex, most European turbines are sited offshore or in estuaries, away from immediate human development (Larsen and Madsen 2000). While Europe is well ahead of the United States regarding turbine research, their study results are still generally inconclusive (T. Bowan, FWS, 2003 pers. comm.). Collision mortality, while generally unknown, is believed to be small because birds appear to avoid offshore wind farms. There are exceptions, including for Whooper Swans (*Cygnus Cygnus*; Larsen and Clausen 2002) that are susceptible to turbine strikes in the early mornings and evenings, especially in inclement weather. The collection of carcasses at offshore sites is more challenging than for land-based turbines since nets generally must be used to collect carcasses, tides and weather affect collection, and fog is a frequent problem. While habitat loss is not believed to be a serious concern, its impacts continue to be assessed. Disturbance may be problematic since some species such as Common Eiders avoid wind farms and may not return to a coastal area for several years (Guillemette and Larsen 2002). Disturbance may lead to displacement, and turbines may serve as barriers to

seaduck movements. Only a few studies have been conducted in Denmark, the Netherlands, and Sweden, so further research is needed. Studies deal mostly with wintering species (Noer et al. 2000, Percival 2001, Langstron and Pullan 2002, Christensen et al. 2002, and Bruns et al. 2002).

In an attempt to begin addressing the bird mortality issue – and ancillary to this, the issue of ESA-listed bat strikes – the National Wind Coordinating Committee was created in 1994 as part of President Clinton's Global Climate Change Action Plan (Colson 1995). Shortly following the creation of the Committee, the Avian Subcommittee (now called the Wildlife Work Group) was formed, co-founded by the Service. In 1999, the Avian Subcommittee published a *Metrics and Methods* document to study turbine impacts on birds (Anderson et al. 1999). The document provides an excellent resource for conducting research on proposed and existing turbines and wind farms.

Appendix 8

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Enclosure 2

FEDERAL THREATENED AND ENDANGERED SPECIES AND DESIGNATED CRITICAL HABITAT FOUND IN MORTON COUNTY, NORTH DAKOTA

May 2009

ENDANGERED SPECIES

Birds

Interior least tern (Sterna antillarum): Nests along midstream sandbars of the Missouri and Yellowstone Rivers.

Whooping crane (Grus Americana): Migrates through North Dakota counties during spring and fall. Prefers to roost on wetlands and stockdams with good visibility. Current flock size of the Aransas - Wood Buffalo migratory population is estimated to be 266 birds.

Fish

Pallid sturgeon (Scaphirhynchus albus): Known only from the Missouri and Yellowstone Rivers. No reproduction has been documented in 15 years.

Mammals

Black-footed ferret (Mustela nigripes): Exclusively associated with prairie dog towns. No records of occurrence in recent years, although there is potential for reintroduction in the future.

Gray wolf (Canis lupus): Occasional visitor in North Dakota. Most frequently observed in the Turtle Mountains area.

THREATENED SPECIES

Birds

Piping plover (Charadrius melodus): Nests on midstream sandbars of the Missouri and Yellowstone Rivers and along shorelines of saline wetlands. More nest in North Dakota than any other state.

DESIGNATED CRITICAL HABITAT

Birds

Piping Plover - Lake Oahe - Critical habitat includes sparsely vegetated shoreline beaches, peninsulas, islands composed of sand, gravel, or shale, and their interface with the water bodies.

FEDERAL THREATENED, ENDANGERED, AND CANDIDATE SPECIES
AND DESIGNATED CRITICAL HABITAT FOUND IN
OLIVER COUNTY, NORTH DAKOTA
May 2009

ENDANGERED SPECIES

Birds

Interior least tern (Sterna antillarum): Nests along midstream sandbars of the Missouri and Yellowstone Rivers.

Whooping crane (Grus Americana): Migrates through North Dakota counties during spring and fall. Prefers to roost on wetlands and stockdams with good visibility. Current flock size of the Aransas - Wood Buffalo migratory population is estimated to be 266 birds.

Fish

Pallid sturgeon (Scaphirhynchus albus): Known only from the Missouri and Yellowstone Rivers. No reproduction has been documented in 15 years.

Mammals

Black-footed ferret (Mustela nigripes): Exclusively associated with prairie dog towns. No records of occurrence in recent years, although there is potential for reintroduction in the future.

Gray wolf (Canis lupus): Occasional visitor in North Dakota. Most frequently observed in the Turtle Mountains area.

THREATENED SPECIES

Birds

Piping plover (Charadrius melodus): Nests on midstream sandbars of the Missouri and Yellowstone Rivers and along shorelines of saline wetlands. More nest in North Dakota than any other state.

CANDIDATE SPECIES

Invertebrates

Dakota skipper (Hesperia dacotae): Found in native prairie containing a high diversity of wildflowers and grasses. Habitat includes two prairie types: 1) low (wet) prairie dominated by bluestem grasses, wood lily, harebell, and smooth camas; 2) upland (dry) prairie on ridges and hillsides dominated by bluestem grasses, needlegrass, pale purple and upright coneflowers and blanketflower.

DESIGNATED CRITICAL HABITAT

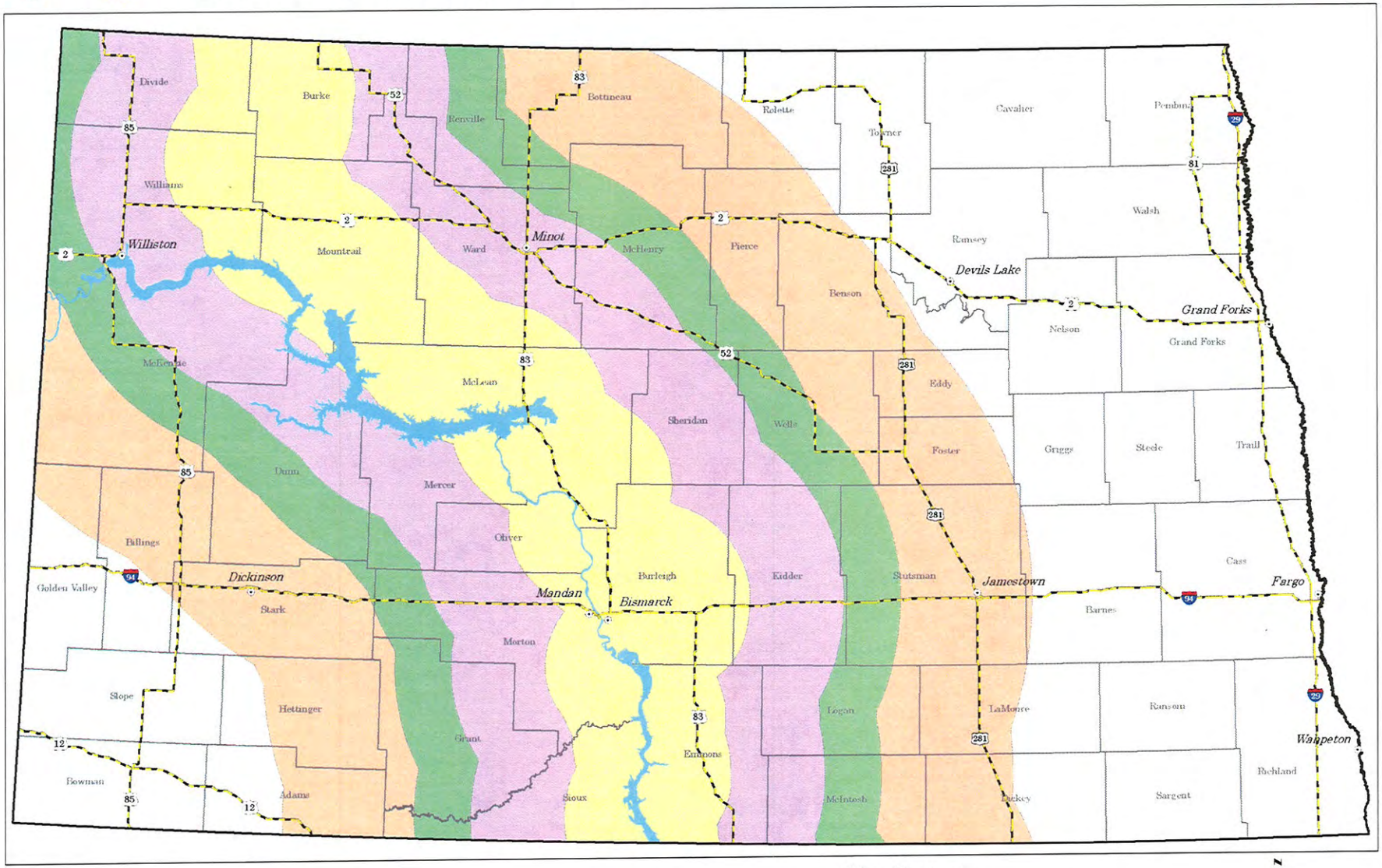
Birds

Piping Plover - Missouri River - Critical habitat includes sparsely vegetated channel sandbars, sand and gravel beaches on islands, temporary pools on sandbars and islands, and the interface with the river.

U.S. Fish & Wildlife Service

Selected Percentages Of Whooping Crane Sightings

North Dakota



PRODUCED BY ECOLOGICAL SERVICES
BISMARCK, NORTH DAKOTA
MAP DATE: 03/18/08
SIGHTINGS THROUGH SPRING 2007
FILE: TOWERS_NOLOCATIONS.MXD

0 12.5 25 50 Miles

0 12.5 25 50 Kilometers

Map Features

- Major Roads
- County Boundaries
- Missouri/Yellowstone River System

Percent Whooping Crane Sightings

- Approx 50% (40 mile corridor)
- Approx 75% (90 mile corridor)
- Approx 85% (120 mile corridor)
- Approx 95% (180 mile corridor)

N

NAD 83
UTM ZONE 14

Enclosure 3

STATE HISTORICAL SOCIETY OF NORTH DAKOTA

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Francis Ziegler
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Department of Transportation

Merlan E. Paaverud, Jr.
Director

Accredited by the American Association of Museums

April 9, 2009

1 6 2009

HDR Engineering, Inc.

Mr. Stephen Sabatke
Project Manager
HDR Engineering, Inc.
701 Xenia Avenue South Suite 600
Minneapolis, MN 55416-3636

NDSHPO REF. : 09-0662 PSC Minnesota Power Bison 1 Wind Farm, Transmission Line(s), and Ancillary Facilities
[T140-141N R85-86W, Morton and Oliver Counties]

Dear Mr. Sabatke:

We have received and reviewed the initial consultation letter for: **09-0662 PSC Minnesota Power Bison 1 Wind Farm, Transmission Line(s), and Ancillary Facilities**, [T140-141N R85-86W, Morton and Oliver Counties]. There is potential for recorded and unrecorded properties in a variety of physiographic settings in the overall Mercer-Oliver County study area. We recommend that a Class I CRI (file and records search) be prepared covering the project area and that it be submitted for review.

Further, we encourage and recommend a Class III CRI (pedestrian survey) of the Area of Potential Effect (APE), including proposed turbine locations, transmission line corridor(s), access roads, and other ancillary facilities, as part of the Environmental Assessment. ***Further, if the project requires permits issued by a federal and/or state agency (e.g., PSC), then the respective agency(ies) are to be consulted regarding their recommendations on the project.***

Thank you for the opportunity to review the project, and we look forward to reviewing documents prepared for the project and to further consultation on it. If you have questions please contact either Susan Quinnell at (701) 328-3576 or Paul Picha at (701) 328-3574. Please include the **NDSHPO REF. :09-0662** in correspondence regarding the project.

Sincerely,

for Merlan E. Paaverud, Jr.
State Historic Preservation Officer (North Dakota)
and
Director, State Historical Society of North Dakota
c: Patrick Fahn, PSC with map enc.

STATE HISTORICAL SOCIETY OF NORTH DAKOTA

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AUG 14 2009
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Director

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August 12, 2009

Mr. Stephen Sabatke
Project Manager
HDR Engineering, Inc.
701 Xenia Avenue South Suite 600
Minneapolis, MN 55416-3636

NDSHPO REF. : 09-0662a PSC Minnesota Power Bison 1 Wind Farm, Transmission Line(s), and Ancillary Facilities: Letter Report
[T140-141N R85-86W, Morton and Oliver Counties]

Dear Mr. Sabatke:

We have received and reviewed the correspondence and letter report documentation for: **09-0662a PSC Minnesota Power Bison 1 Wind Farm, Transmission Line(s), and Ancillary Facilities: Letter Report,** [T140-141N R85-86W, Morton and Oliver Counties].

The Class III CRI (pedestrian survey) of the Area of Potential Effect (APE), including proposed turbine locations, transmission line corridor(s), access roads, and other ancillary facilities as reported meets initial goals/protocols of the project. We look forward to further review of the complete and comprehensive report.

Further, if the project requires permits issued by a federal and/or state agency (e.g., PSC), then the respective agency(ies) are to be consulted regarding their recommendations on the project. Thank you for the opportunity to review the initial project report, and we look forward to reviewing comprehensive and complete documents prepared for the project and to further consultation on it. If you have questions please contact either Susan Quinnell at (701) 328-3576 or Paul Picha at (701) 328-3574. Please include the **NDSHPO REF. :09-0662** in correspondence regarding the project.

Sincerely,

for Merlan E. Paaverud, Jr.
State Historic Preservation Officer (North Dakota)
and
Director, State Historical Society of North Dakota
c: Patrick Fahn, PSC

STATE HISTORICAL SOCIETY OF NORTH DAKOTA

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Director

Accredited by the American Association of Museums

August 31, 2009

Mr. Stephen Sabatke
Project Manager
HDR Engineering, Inc.
701 Zenia Avenue South Suite 600
Minneapolis MN 55416-3636

ND SHPO REF: 09-0662 PSC Ottertail Energy Service Company, Inc. (OTESCO) Proposed Bison Wind Farm Project - 22.3 mile transmission line from the project substation in Morton County to the interconnection point (Square Butte Substation) - Morton and Sheridan Counties, North Dakota

Dear Mr. Sabatke,

We received your letter dated August 27th updated this office on the 22.3 mile transmission line from the project substation in Morton County to the interconnection point (Square Butte Substation) - Morton and Sheridan Counties.
Thank you for your update letter and we look forward to reviewing the reports associated with this project and further consultation.

If you have any questions please contact Susan Quinnell, Review and Compliance Coordinator at (701)328-3576, squinnell@nd.gov or Paul Picha at (701) 328-3574.

Sincerely,

Merlan E. Paaverud, Jr.
State Historic Preservation Officer (North Dakota)
and
Director
State Historical Society of North Dakota

C: Patrick Fahn, PSC

STATE HISTORICAL SOCIETY OF NORTH DAKOTA

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Accredited by the American Association of Museums

September 22, 2009

RECEIVED
SEP 25 2009
HDR Engineering, Inc.

Mr. Stephen Sabatke
Project Manager
HDR Engineering, Inc.
701 Xenia Avenue South Suite 600
Minneapolis, MN 55416-3636

NDSHPO REF. : 09-0662 PSC Minnesota Power, 22.3 mile Transmission Line(s), and Ancillary Facilities, (Square Butte Substation and Bison Wind Project), Morton and Oliver Counties, North Dakota

Dear Mr. Sabatke:

We have received and reviewed the consultation letter for: **09-0662 PSC** "Minnesota Power, 22.3 mile Transmission Line(s), and Ancillary Facilities, Morton and Oliver Counties, North Dakota," and *this is follow-up to our correspondence of August 31, 2009, with minor revisions to entities and locations identified.*

Thank you for the opportunity to review the project, and we look forward to reviewing documents prepared for the project and to further consultation on it. If you have questions please contact either Susan Quinnell at (701) 328-3576 or Paul Picha at (701) 328-3574. Please include the **NDSHPO REF. : 09-0662** in correspondence regarding the project.

Sincerely,

Merlan E. Paaverud, Jr.
State Historic Preservation Officer (North Dakota)
and
Director, State Historical Society of North Dakota

c: Patrick Fahn, PSC

John Hoeven, Governor
Douglass A. Prchal, Director

1600 East Century Avenue, Suite 3
Bismarck, ND 58503-0649
Phone 701-328-5357
Fax 701-328-5363
E-mail parkrec@nd.gov
www.parkrec.nd.gov

RECEIVED
MAY 14 2009
HDR Engineering, Inc.

May 11, 2008

Bruce Moreira
HDR Engineering, Inc.
701 Xenia Avenue South, Suite 600
Minneapolis, MN 55416

Re: Bison I Wind Project Proposal
Oliver and Morton Counties, North Dakota

Dear Mr. Moreira:

The North Dakota Parks and Recreation Department (the Department) has reviewed the above referenced project proposal to construct a wind farm located in Sections 2-5, 8-11, 15-17, and 20; T140N, R86W; Morton County and in Sections 29-34, T141N, R85W; and Sections 25, 26, 35, and 36, T141N, R86W; Oliver County.

Our agency scope of authority and expertise covers recreation and biological resources (in particular rare plants and ecological communities). The project as defined does not affect state park lands that we manage or Land and Water Conservation Fund recreation projects that we coordinate.

The North Dakota Natural Heritage biological conservation database has been reviewed to determine if any plant or animal species of concern or other significant ecological communities are known to occur within an approximate one-mile radius of the project area. Based on this review, an occurrence of *Ameiurus natalis* (yellow bullhead) has been identified within or adjacent to the project area. Please see attached spreadsheet and map for more specific information on this species. We defer further comments regarding animal species to the North Dakota Game and Fish Department and the United States Fish and Wildlife Service.

Because this information is not based on a comprehensive inventory, there may be species of concern or otherwise significant ecological communities in the area that are not represented in the database. The lack of data for any project area cannot be construed to mean that no significant features are present. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources.

The Department recommends that the project be accomplished with minimal impacts and that all efforts be made to ensure that critical habitats not be disturbed in the project area to help secure rare species conservation in North Dakota. Regarding any reclamation efforts, we recommend that any impacted areas be revegetated with species native to the project area.

Given the potential for not only habitat disturbance and disruption but the threat to nesting, feeding and migratory bird and bats in the area we suggest that all efforts be made to avoid impacts to wildlife species and their habitats. In an effort to avoid or minimize impacts to wildlife and their habitats we encourage proper evaluation of all potential wind energy sites. To identify and assess adverse impacts to wildlife we suggest pre and post construction avian and bat monitoring studies be conducted.

It is our policy to charge out-of-state requests for data services including data retrieval, data analysis, manual and computer searches, packaging and collection of data. An invoice for services provided has been enclosed.

Thank you for the opportunity to comment on this project. Please contact Kathy Duttenhefner (701-328-5370 or kgduttenhefner@nd.gov) of our staff if additional information is needed.

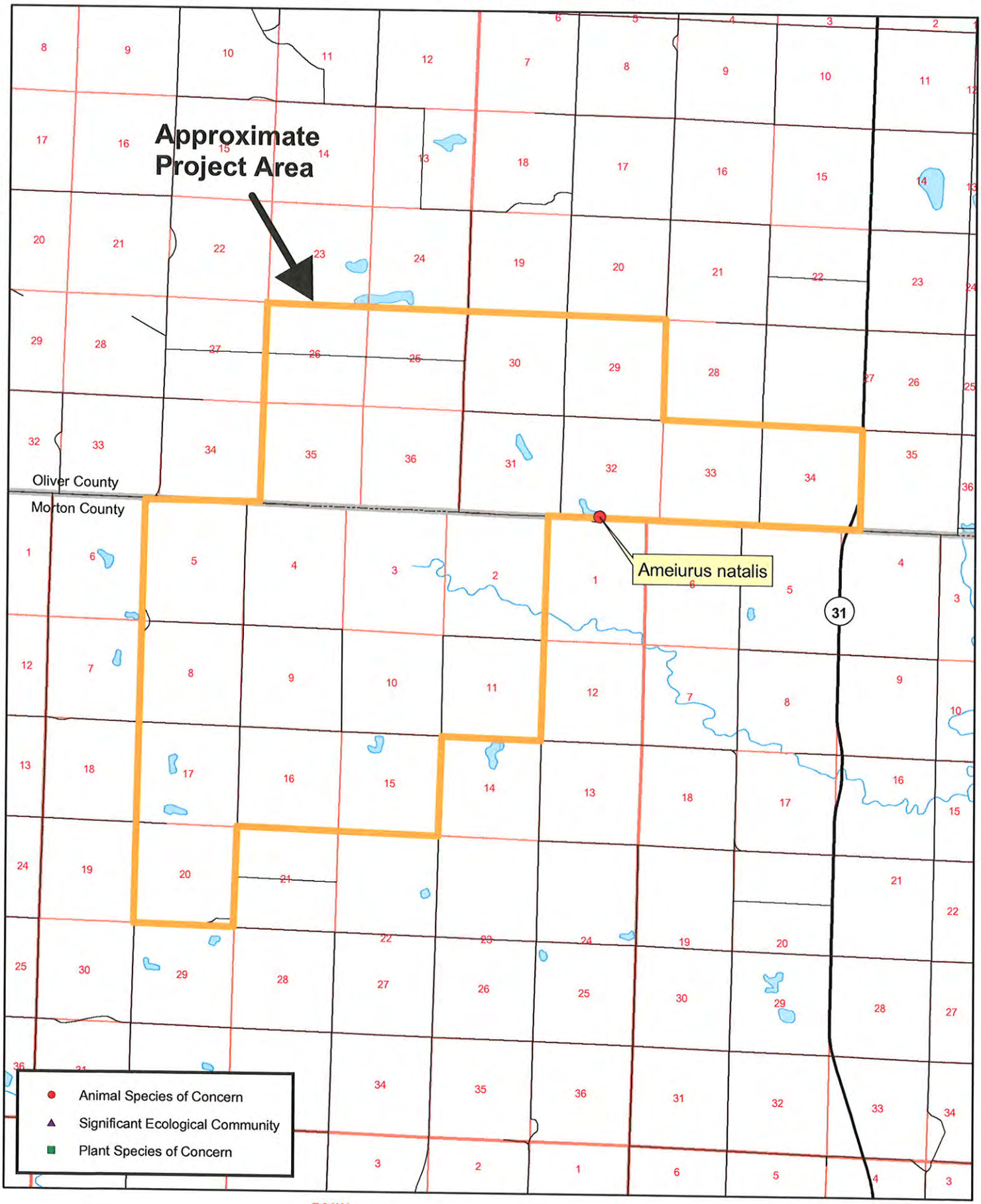
Sincerely,

Jesse Hanson

Jesse Hanson, Coordinator
Planning and Natural Resources Division

R.USNDNHI*2009-092

North Dakota Natural Heritage Inventory
Species of Concern and Significant Ecological Communities



North Dakota Parks & Recreation Department
North Dakota Natural Heritage Inventory
April 2009

North Dakota Natural Heritage Inventory
Rare Animal and Plant Species Significant Ecological Communities

State Scientific Name	State Common Name	Township Range Section	State Rank	Global Rank	Federal Status	Last Observation	Estimated Representation Accuracy	Precision
Ameiurus natalis	Yellow Bullhead	141N085W - 32; 140N086W - 01	SU	G5		1971-06-18		S

North Dakota Natural Heritage Inventory Biological and Conservation Data Disclaimer

The quantity and quality of data collected by the North Dakota Natural Heritage Inventory are dependent on the research and observations of many individuals and organizations. In most cases, this information is not the result of comprehensive or site-specific field surveys; many natural areas in North Dakota have never been thoroughly surveyed, and new species are still being discovered. For these reasons, the Natural Heritage Inventory cannot provide a definite statement on the presence, absence, or condition of biological elements in any part of North Dakota. Natural Heritage data summarize the existing information known at the time of the request. Our data are continually upgraded and information is continually being added to the database. This data should never be regarded as final statements on the elements or areas that are being considered, nor should they be substituted for on-site surveys.

Estimated Representation Accuracy

Value that indicates the approximate percentage of the Element Occurrence Representation (EO Rep) that was observed to be occupied by the species or community (versus buffer area added for locational uncertainty). Use of estimated representation accuracy provides a common index for the consistent comparison of EO reps, thus helping to ensure that aggregated data are correctly analyzed and interpreted.

Very high (>95%)
High (>80%, <= 95%)
Medium (>20%, <= 80%)
Low (>0%, <= 20%)
Unknown
(null) - Not assessed

Precision

A single-letter code for the precision used to map the Element Occurrence (EO) on a U.S. Geological Survey (USGS) 7.5' (or 15') topographic quadrangle map, based on the previous Heritage methodology in which EOs were located on paper maps using dots.

S - Seconds: accuracy of locality mappable within a three-second radius; 100 meters from the centerpoint
M - Minute: accuracy of locality mappable within a one-minute radius; 2 km from the centerpoint
G - General: accuracy of locality mappalbe to map or place name precision only; 8 km from centerpoint
U - Unmappable

John Hoeven, Governor
Douglass A. Prchal, Director

1600 East Century Avenue, Suite 3
Bismarck, ND 58503-0649
Phone 701-328-5357
Fax 701-328-5363
E-mail parkrec@nd.gov
www.parkrec.nd.gov

REC
SEP
HDR Engineering, Inc.

September 16, 2009

Bruce Moreira
HDR Engineering, Inc.
701 Xenia Avenue South
Minneapolis, MN 55416-3636

Re: 310 kV Overhead Transmission Line for the Bison I Wind Project
Morton and Oliver Counties

Dear Mr. Moreira:

The North Dakota Parks and Recreation Department (the Department) has reviewed the above referenced project proposal to construct an overhead transmission line from the substation in Morton County to a substation near the City of Center in Oliver County.

Our agency scope of authority and expertise covers recreation and biological resources (in particular rare plants and ecological communities). The project as defined does not affect state park lands that we manage or Land and Water Conservation Fund recreation projects that we coordinate.

The North Dakota Natural Heritage biological conservation database has been reviewed to determine if any plant or animal species of concern or other significant ecological communities are known to occur within an approximate one-mile radius of the project area. Based on this review, several occurrences have been identified within or adjacent to the project areas including: *Ameiurus natalis* (yellow bullhead), *Potamogeton vaginatus* (sheathed pondweed), and *Potamogeton amplifolius* (large-leaved pondweed). Please see attached spreadsheet and map for more specific information on these species. We defer further comments regarding animal species to the North Dakota Game and Fish Department and the United States Fish and Wildlife Service.

Because this information is not based on a comprehensive inventory, there may be species of concern or otherwise significant ecological communities in the area that are not represented in the database. The lack of data for any project area cannot be construed to mean that no significant features are present. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources.

The Department recommends that the project be accomplished with minimal impacts and that all efforts be made to ensure that critical habitats not be disturbed in the project area to help secure rare species conservation in North Dakota. Regarding any reclamation efforts, we recommend that any impacted areas be revegetated with species native to the project area.

It is our policy to charge out-of-state requests for data services including data retrieval, data analysis, manual and computer searches, packaging and collection of data. An invoice for services provided has been enclosed.

Thank you for the opportunity to comment on this project. Please contact Kathy Duttenhefner (701-328-5370 or kgduttenhefner@nd.gov) of our staff if additional information is needed.

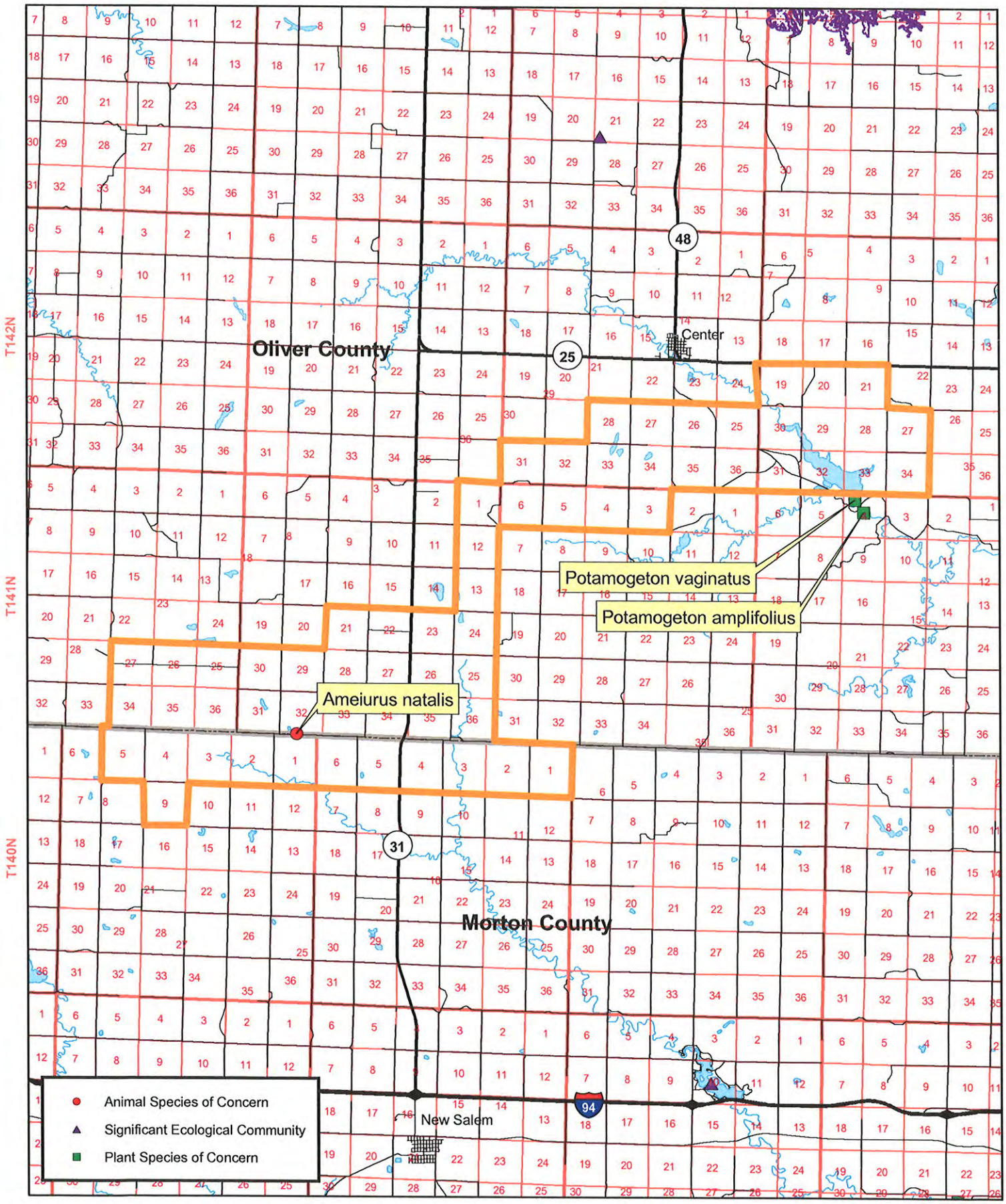
Sincerely,

Jesse Hanson, Coordinator
Planning and Natural Resources Division

R.USNDNHI*2009-239

Play in our backyard!

North Dakota Natural Heritage Inventory
Species of Concern and Significant Ecological Communities



North Dakota Parks & Recreation Department
North Dakota Natural Heritage Inventory
September 2009

North Dakota Natural Heritage Inventory
Rare Animal and Plant Species and Significant Ecological Communities

State Scientific Name	State Common Name	Township Range Section	State Rank	Global Rank	Federal Status	Last Observation	Estimated Representation Accuracy	Precision	County
Potamogeton vaginatus	Sheathed Pondweed	141N083W - 04; 141N083W - 03; 141N083W - 10; 141N083W - 08; 141N083W - 05; 142N083W - 28; 142N083W - 34; 142N083W - 29; 141N083W - 09; 142N083W - 32; 142N083W - 33	S3	G5		7/31/1978		M	Oliver
Potamogeton amplifolius	Large-leaved Pondweed	141N083W - 04; 141N083W - 05; 141N083W - 03; 141N083W - 10; 141N083W - 08; 141N083W - 09; 142N083W - 32; 142N083W - 33; 142N083W - 34	S2S3	G5		7/29/1974		M	Oliver
Ameiurus natalis	Yellow Bullhead	141N085W - 32; 140N086W - 01	SU	G5		6/18/1971		S	Morton, Oliver

North Dakota Natural Heritage Inventory Biological and Conservation Data Disclaimer

The quantity and quality of data collected by the North Dakota Natural Heritage Inventory are dependent on the research and observations of many individuals and organizations. In most cases, this information is not the result of comprehensive or site-specific field surveys; many natural areas in North Dakota have never been thoroughly surveyed, and new species are still being discovered. For these reasons, the Natural Heritage Inventory cannot provide a definite statement on the presence, absence, or condition of biological elements in any part of North Dakota. Natural Heritage data summarize the existing information known at the time of the request. Our data are continually upgraded and information is continually being added to the database. This data should never be regarded as final statements on the elements or areas that are being considered, nor should they be substituted for on-site surveys.

Estimated Representation Accuracy

Value that indicates the approximate percentage of the Element Occurrence Representation (EO Rep) that was observed to be occupied by the species or community (versus buffer area added for locational uncertainty). Use of estimated representation accuracy provides a common index for the consistent comparison of EO reps, thus helping to ensure that aggregated data are correctly analyzed and interpreted.

Very high (>95%)
High (>80%, <= 95%)
Medium (>20%, <= 80%)
Low (>0%, <= 20%)
Unknown
(null) - Not assessed

Precision

A single-letter code for the precision used to map the Element Occurrence (EO) on a U.S. Geological Survey (USGS) 7.5′ (or 15′) topographic quadrangle map, based on the previous Heritage methodology in which EOs were located on paper maps using dots.

S - Seconds: accuracy of locality mappable within a three-second radius; 100 meters from the centerpoint
M - Minute: accuracy of locality mappable within a one-minute radius; 2 km from the centerpoint
G - General: accuracy of locality mappalbe to map or place name precision only; 8 km from centerpoint
U - Unmappable

From: Schwingler, Ingrid
Sent: Tuesday, April 21, 2009 2:14 PM
To: Schwingler, Ingrid
Subject: Message from HDR WEB Visitor

-----Original Message-----
From: McMorris, Michelle
Sent: Tuesday, April 21, 2009 1:23 PM
To: Moreira Bruce B.
Subject: FW: Message from HDR WEB Visitor

-----Original Message-----
From: lbrocker@nd.gov [mailto:lbrocker@nd.gov]
Sent: Tuesday, April 21, 2009 1:21 PM
To: web_gen_locations
Subject: Message from HDR WEB Visitor

The following message was sent by a visitor of HDR's Web site (HDRInc.com). Please respond to the sender in a timely manner.

If you have questions regarding this message, please contact Michelle McMorris, HDR Web Content Manager.

Date Sent: Tuesday, April 21 2009 1:21 PM
Sent To: State: Minnesota Office: Minneapolis Contact: General Inquiries
Subject: Bison I Wind Project in Oliver & Morton Co, ND

Responding to the April 7, 2009, letter from Bruce Moreira. The office of Attorney General is prohibited by law from providing legal assistance or reviewing legal matters for private businesses. Further, this office does not have jurisdiction over wind projects. Accordingly, we will not take any action in response to Mr. Moreira's letter.

Name: Liz Brocker
Title and Company: Executive Assistant, ND Attorney General
Phone: (701) 328-2210
Email: lbrocker@nd.gov

NORTH DAKOTA
DEPARTMENT of HEALTH

ENVIRONMENTAL HEALTH SECTION
Gold Seal Center, 918 E. Divide Ave.
Bismarck, ND 58501-1947
701.328.5200 (fax)
www.ndhealth.gov

April 28, 2009

RECEIVED
MAY - 6 2009
HDR Engineering, Inc.

BRUCE MOREIRA
ENVIRONMENTAL SCIENTIST
HDR ENGINEERING INC
701 XENIA AV SOUTH
MINNEAPOLIS MN 55416-3636

RE: Bison I Wind Project in Oliver and Morton Counties, North Dakota

Dear Mr. Moreira:

This department has reviewed the information concerning the above-referenced project submitted under date of April 7, 2009, 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. All necessary measures must be taken to minimize fugitive dust emissions created during construction activities. Any complaints that may arise are to be dealt with in an efficient and effective manner.

2. 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.

3. 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 Web site or by calling the Division of Water Quality (701.328.5210). Also, cities 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.

4. Noise from construction activities may have adverse effects on persons who live near the construction area. Noise levels can be minimized by ensuring that construction equipment is equipped with a recommended muffler in good working order. Noise effects can also be minimized by ensuring that construction activities are not conducted during early morning or late evening hours.

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.

These comments are based on the information provided about the project in the above-referenced submittal. The U.S. Army Corps of Engineers may require a water quality certification from this department for the project if the project is subject to their Section 404 permitting process. Any additional information which may be required by the U.S. Army Corps of Engineers under the process will be considered by this department in our determination regarding the issuance of such a certification.

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

Sincerely,

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

LDG:mjm

Attach.

NORTH DAKOTA
DEPARTMENT of HEALTH

ENVIRONMENTAL HEALTH SECTION
Gold Seal Center, 918 E. Divide Ave.
Bismarck, ND 58501-1947
701.328.5200 (fax)
www.ndhealth.gov

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
DEPARTMENT of HEALTH

ENVIRONMENTAL HEALTH SECTION
Gold Seal Center, 918 E. Divide Ave.
Bismarck, ND 58501-1947
701.328.5200 (fax)
www.ndhealth.gov

August 31, 2009

RECEIVED
SEP - 4 2009
HDR Engineering, Inc

Mr. Bruce Moreira
Environmental Scientist
HDR Engineering, Inc.
701 Xenia Avenue South
Minneapolis, MN 55416-3636

Re: 230 kV Overhead Transmission Line for Bison I Wind Project
Morton and Oliver Counties, North Dakota

Dear Mr. Moreira:

This department has reviewed the information concerning the above-referenced project submitted under date of August 24, 2009, 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 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.

These comments are based on the information provided about the project in the above-referenced submittal. The U.S. Army Corps of Engineers may require a water quality certification from this department for the project if the project is subject to their Section 404 permitting process. Any additional information which may be required by the U.S. Army Corps of Engineers under the process will be considered by this department in our determination regarding the issuance of such a certification.

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

Sincerely,

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

LDG:cc
Attach.

NORTH DAKOTA
DEPARTMENT of HEALTH

ENVIRONMENTAL HEALTH SECTION
Gold Seal Center, 918 E. Divide Ave.
Bismarck, ND 58501-1947
701.328.5200 (fax)
www.ndhealth.gov

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

RECEIVED

MAY 11 2009

HDR Engineering, Inc.

May 8, 2009

Jim Atkinson
HDR
701 Xenia Avenue S
Minneapolis, MN 55416-3636

Dear Mr. Atkinson:

This is in response to your request for review of environmental impacts associated with the Bison I Wind Project in Oliver and Morton Counties, ND.

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

- The property is not located in an identified floodplain and it is believed the project will not affect an identified floodplain.

- 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.

There are no other concerns associated with this project that affect State Water Commission or State Engineer regulatory responsibilities.

Thank you for the opportunity to provide review comments. If you have any questions, please call me at 328-4969.

Sincerely,

Larry Knudtson
Research Analyst

LJK:ds/1570

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
P.O. Box 2096
Jamestown, ND 58402-2096

RECEIVED
APR 20 2009
HDR Engineering, Inc.

April 15, 2009

Bruce Moreira
Environmental Specialist
HDR Engineering, Inc
701 Xenia Ave S
Minneapolis, Mn 55416-3636

RE: Bison I Wind Project, Oliver and Morton Counties, North Dakota

Dear Mr. Moreira,

Recently David Pfiliger the District Conservationist in Center contacted me about your office requesting comments about how the construction of wind towers impacts parcels of land in Oliver and Morton Counties. Information regarding Conservation Reserve Program properties in the project areas can be obtained by contacting Allison Hoffer, County Executive Director, Oliver County Farm Service Agency, 345 Center Ave S, Center, ND 58530 for Oliver County and Linda Urlacher, County Executive Director, Morton County Farm Service Agency, 2540 Overlook Ln., Mandan, ND 58554 for Morton County. The Natural Resources Conservation Service (NRCS) concerns are in regards to prime farmlands, wetlands, and soil erosion in Oliver and Morton Counties. NRCS policy regarding prime farmlands and wetlands is as follows.

Farmland Protection Policy Act FPPA) – NRCS has a major responsibility with FPPA in documenting conversion of farmland (i.e., prime, statewide, and local importance) to non-agricultural use. If your proposed project does not include any federal funds FPPA does not apply; therefore, no further action is needed. If your project includes, any federal funds, FPPA may apply, and the form AD-1006 must be completed. A fill-able, web based form Farmland Conversion Impact Rating Form AD-1006 is available at http://www.nrcs.usda.gov/Programs/fppa/pdf_files/AD1006.PDF to record the following information. Please complete Part I and Part III and return to me. I will also need a map of the sites at an appropriate scale so I can accurately assess the area (e.g., 1:20,000 or 1:24,000). If the farmland (i.e., prime, statewide, and local importance) is determined to be subject to the FPPA, I will then complete Parts II and IV. NRCS will measure the relative value of the site as farmland on a scale of 0 to 100, according to the information sources listed in CFR 658.5(a). If FPPA applies to this site, Form AD- 1006 will be returned to your agency for completion of Part VI, Site Assessment Criteria.

For the past year, NRCS has been monitoring Farmland Conversion Impact Ratings (Form AD-1006 and Form AD-106). Over this period of time, we have become concerned with how the forms are being completed, particularly Part IV – Site Assessment Criteria, which is consistently being scored below 60 points.

As a general rule, if FPPA applies and the site is in agricultural production, rarely would it be appropriate for it to have a score of less than 60 points. According to CFR 658.4(g), your agency is requested to return a copy of the Form AD-1006, which Page 2 indicates, the final decision, to NRCS so we can meet our reporting requirements and for data collection process.

Wetlands - The Wetland Conservation Provisions of the 1985 Food Security Act, as amended, provide that if a USDA participant converts a wetland for the purpose of, or to have the effect of, making agricultural production possible, loss of USDA benefits could occur.

NRCS has developed the following guidelines for the installation of permanent structures where wetlands occur. If these guidelines are followed, the impacts to the wetland(s) will be considered minimal allowing USDA participants to continue to receive USDA benefits. Following are the requirements: 1) Disturbance to the wetland(s) must be temporary, 2) no drainage of the wetland(s) is allowed (temporary or permanent), 3) mechanized landscaping necessary for installation is kept to a minimum and preconstruction contours are maintained, 4) temporary side cast material must be placed in such a manner not to be dispersed in the wetland, and 5) all trenches must be backfilled to the original wetland bottom elevation.

NRCS would recommend that impacts to wetland(s) be avoided. If the alignment of the permanent structure requires construction in a wetland, NRCS can complete a certified wetland determination, if requested by the landowner/operator. In addition, care should be taken during the construction of the proposed project to minimize soil blowing and water erosion as these may cause negative impacts to adjacent farmlands.

If you have additional questions pertaining to FPPA, please contact me, at (701) 252-1460 EXT 115

Sincerely,

FREDERICK P. AZIZ
Area Resource Soil Scientist

Cc:
David D. Pfliger, DC, NRCS, Center, ND
Michele R. Doyle, DC, NRCS, Mandan, ND
Mike Collins, ASTC (FO), NRCS, Jamestown, ND
Steven J. Sieler, SSL, NRCS, Bismarck, ND

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

May 7, 2009

[NWO-2009-884-BIS]

RECEIVED
MAY 11 2009
HDR Engineering, Inc.

Bruce Moreira
HDR Engineering, Inc.
701 Xenia Avenue South
Minneapolis, MN 55416-3636

Dear Mr. Moreira:

This is in response to your request for Department of the Army, Corps of Engineers comments on the proposed construction of the Bison I Wind Project. This project is located in Morton and Oliver Counties, North Dakota.

Through Section 404 of the Clean Water Act (CWA) the Corps of Engineers regulates the discharge of dredged or fill material into waters of the United States. Waters of the United States may include, but are not limited to, rivers, streams, ditches, coulees, lakes, and their adjacent wetlands. Fill material includes, but is not limited to earth, clay, rock, etc.... Should the proposed projects result in the discharge of dredged or fill material into waters of the United States, a Corps permit may be required. If however, the project and associated work can be accomplished by avoiding a discharge of fill into waters of United States, a Corps permit would not be required.

If you have CWA questions, permitting questions, are unsure as to what constitutes a discharge of fill, and/or are unsure of what constitutes waters of the United States, 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
- application

Printed on Recycled Paper

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 of the responsible party or parties. If the responsible party is an agency, company, corporation or other organization, indicate the 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 (i.e., 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 impactec 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 here.

Block 15. Location of Proposed Project. Enter the county and state 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 Section, Township and Range of the site and/or the latitude anc longitude. 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 dowı from the Highway 14 bridge). If a large river or stream, include the river mile of the proposed project site if known.

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.

Block 18. Nature of Activity. Describe the overall activity or project. Give appropriate dimensions of structures such as wingwalls, 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. Reason(s) 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. Type(s) 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. 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 24. 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 of counties where the project is to be developed.

Block 25. 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 26. 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

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 8 1/2x11 inch plain white paper (tracing paper or film 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.**

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT *(33 CFR 325)*	OMB APPROVAL NO. 0710-0003 Expires December 31, 2004

The Public burden for this collection of information is estimated to average 10 hours per response, although the majority of applications should require 5 hours or less. This includes 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 this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Service Directorate of Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302; and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003), Washington, DC 20503. 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. 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. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a perm 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 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 COMPLETED

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE *(an agent is not required)*
6. APPLICANT'S ADDRESS	9. AGENT'S ADDRESS
7. APPLICANT'S PHONE NOS. W/AREA CODE a. Residence b. Business	10. AGENT'S PHONE NOS. W/AREA CODE a. Residence b. Business

11. STATEMENT OF AUTHORIZATION

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

APPLICANT'S SIGNATURE 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)*
15. LOCATION OF PROJECT COUNTY STATE	

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN, *(see instructions)*

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 20-22 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

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

23. Is Any Portion of the Work Already Complete? Yes____ No___ IF YES, DESCRIBE THE COMPLETED WORK

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

25. List of Other Certifications 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

26. Application is hereby made for a permit or permits to authorize the work described in this application. I certify that the 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.

JOB SERVICE North Dakota
www.jobsnd.com

John Hoeven, Governor • Maren L. Daley, Executive Director

PO Box 5507 • Bismarck, ND 58506-5507

RECEIVED
APR 20 2009
HDR Engineering, Inc.

April 17, 2009

Mr. Bruce Moreira
Environmental Scientist
HDR Engineering, Inc.
701 Xenia Avenue South
Minneapolis, Minnesota 55416-3636

RE: Bison I Wind Project
Oliver and Morton Counties, North Dakota

Dear Mr. Moreira:

Job Service North Dakota administers the employment service and unemployment insurance programs.

We have no comments regarding the proposed project and have no applicable permits that are required from Job Service North Dakota.

Sincerely,

Maren Daley
Executive Director

Job Service North Dakota is an equal opportunity employer/program provider.
Auxiliary aids and services are available upon request to individuals with disabilities.

Morton County Road Department

2916 37th Street NW
Mandan, ND 58554

Administration: Charles A. Morman
E-mail: cmorman@mortoncountynd.org
Assistant Roads & Bridges: Nick Kraft
E-mail: nkraft@mortoncountynd.org
Website: www.co.morton.nd.us
Telephone: (701) 667-3346
Fax: (701) 667-3362

RECEIVED

APR 20 2009

HDR Engineering, Inc.

April 17, 2009

Bruce Moreira
Environmental Scientist
HDR Engineering, Inc.
701 Xenia Avenue South, Suite 600
Minneapolis, MN 55416-3636

Dear Bruce,

This is in response to your letter dated April 7, 2009, regarding the Bison I Wind Project in Oliver and Morton County. At this time it will be difficult to make any comments as to the roads you are going to use because it is not indicated what roads are going to be used as the primary route to get the facilities up and running. It would appear that the two primary routes, one being County Route 86, which is the westerly edge of the project, and number two will be County Route 140, which runs approximately through the center of the project.

We will need in much more detail as to the amount of traffic that is going to come into this particular project, the size of the loads, the number of the loads, the time span of the construction and especially the time of the year that the construction is anticipated to take place. We will be very sensitive to the time of the year especially. We will expect that the dust control be in place when this is being done so that we don't have a lot of complaints from the locals. My office will expect to be kept informed of all phases of the project as it moves forward. In other words, we don't want any surprises when some contractor moves in and starts hauling and we haven't heard a word of this before it is going on. It will be expected that somebody will need to fix whatever damage has been caused to the county roads.

We also expect to see the entire project before it gets started as to the layout of the project and placement of the wind towers and to see the access roads that will be built to get to these access points. We have already been contacted by a contractor concerning access roads, gravel and such, so I don't know if they are already acting in consult with this company and with this project or if they are merely a contractor speculating on bidding for this particular project.. We need to again keep in contact with what is going on with this so we are aware of this. I truly do not like surprises on these projects when this comes up and I would hope that these be kept to a minimal or ideally none at all.

Thank you in advance for your understanding of Morton County's position on this project. We definitely will not stand in opposition to the project and we are willing to work with you in all phases of it. We just need to be involved in decision making concerning the roads and bridges in this particular area to protect the Morton County infrastructure that will be used to build this project and as I understand the continuing projects that will come after this.

Thank you,

Charles Morman
Road Superintendent

I:\Clerical\Letters 2009\letter to Moreira, Bruce re wind tower project April 17, 2009.doc