Wenck File #2579-08

DECEMBER 2012

Baldwin Wind Energy Center Construction Inspection Report

Prepared for:

NORTH DAKOTA PUBLIC SERVICE COMMISSION

600 E. Boulevard Avenue
Bismarck, ND 58505-0480

Prepared by:

WENCK ASSOCIATES, INC.

301 1st Street NE, Suite 202
Mandan, ND 58554
(701) 751-3370

Table of Contents

1.0 EXECUTIVE SUMMARY 1-1

2.0 BACKGROUND & SCOPE 2-1

2.1 Introduction 2-1
2.2 Purpose 2-1
2.3 Methods and Scope of Inspection 2-1
2.3.1 Project Compliance Items Identified 2-1
2.3.2 Document Review 2-1
2.3.3 On-Site Inspection 2-2

3.0 FINDINGS 3-1

3.1 Siting & Location of Facility 3-1
3.1.1 Designated Location and Facilities 3-1
3.1.2 County/City Regulations 3-1
3.1.3 Siting Issues 3-1
3.1.4 Land & Agricultural Impacts 3-2
3.1.5 Surrounding Community, Public Services, Safety 3-2
3.1.6 Turbine Setbacks 3-2
3.2 Project Design & Engineering 3-3
3.2.1 Capacity 3-3
3.2.2 Turbine Specifications 3-3
3.2.3 Collection Line & Substation 3-3
3.2.4 National Electric Safety Code 3-3
3.2.5 As-built Drawings and GIS Files 3-3
3.3 Pre-Construction 3-3
3.3.1 PSC-Required Documents 3-3
3.3.2 Permits and Approvals from Other Agencies 3-3
3.3.3 Pre-Construction Conference/Notice of Intent to Start Construction 3-4
3.3.4 PSC Approval of Modifications 3-4
3.4 Cultural Resources 3-4
3.4.1 SHPO Concurrence 3-4
3.4.2 Cultural Site Avoidance 3-4
3.4.3 Reporting 3-4
3.5 Natural Resources 3-5
3.5.1 Whooping Cranes 3-5
3.5.2 Wildlife 3-5
3.5.3 Native Prairie 3-5
3.5.4 Wetlands 3-6
3.5.5 Reporting 3-6
3.5.6 Reclamation & Reseeding 3-6
3.5.7 Tree & Shrub Mitigation 3-6
3.6 Sound & Flicker Mitigation 3-7

Table of Contents (Cont.)

3.6.1 Sound Mitigation 3-7
3.6.2 Flicker Mitigation 3-7
3.7 Construction, Reclamation & Soils 3-7
3.7.1 Construction Management & Safety 3-7
3.7.2 Erosion & Sedimentation 3-7
3.7.3 Minimization of Impacts 3-8
3.7.4 Utility Lines 3-8
3.7.5 Noxious Weeds 3-8
3.7.6 Reclamation & Roads 3-8
3.7.7 Repairs & Waste 3-9
3.8 Operation 3-9
3.8.1 Safety & Record-keeping 3-9
3.8.2 Maintenance 3-9
3.8.3 Public Contact & Safety 3-9

4.0 ISSUES TO RESOLVE AND RECOMMENDATIONS 4-1

4.1 Project Specifications needing Written Verification 4-1
4.2 Erosion Control & Maintenance 4-2
4.3 WIldlife Protection Measures & Monitoring 4-2
4.4 Reseeding Methods 4-3
4.5 Tree & Shrub Replacement 4-3

5.0 CONCLUSIONS 5-1

6.0 REFERENCES 6-1

7.0 SIGNATURES 7-1

Table of Contents (Cont.)

TABLES

Table 2-1: Project Specifications with Written or Site Verification Information 2-3

FIGURES

Figure 1: Project Area and Field Observations Map

APPENDICES

Appendix A: Photographs
Appendix B: Field Observation Points

1.0 Executive Summary

The North Dakota Public Service Commission (PSC) retained Wenck Associates, Inc. (Wenck) to complete a construction inspection of the Baldwin Wind Energy Center (Project) in Burleigh County, North Dakota (ND) owned and operated Baldwin Wind, LLC, an operating division of NextEra Energy Resources, LLC (NextEra). Construction for the Project was completed in November 2010. Wenck reviewed all Project documents to identify those aspects which required compliance and visually inspected the Project area on November 7, 2012.

The Project was well-maintained and appeared to have been constructed as planned with numerous efforts to minimize impacts. However, there were several non-critical issues that may need to be resolved for the Project to be considered complete and in full compliance, including 1) written verification of some items, 2) minor erosion control and maintenance, 3) verification of certain wildlife protection measures, 4) clarification of reseeding seed mix, and 5) tree and shrub replacement. Wenck expects follow-up actions taken by NextEra to address these particular issues can be corroborated in writing or photos and will not require a subsequent site visit. Wenck recommends the PSC take the following steps to resolve these issues.

<u>Recommended Action Steps</u>

→Request Now

- Written verification of "necessary" items (refer to list in Section 4.1).
- Reclamation of the ditch slopes around the substation, including recontouring subsoils or adding topsoil, if necessary (Section 4.2).
- Confirmation of certain planned wildlife measures or explanation of why deemed unnecessary (refer to list in Section 4.3).

→Notify Now

- Continue regular maintenance of minor erosion issues (Section 4.2): edges of access roads, ruts on roads; exposed Geotech fabric on access roads; pooling water on gravel pads around the turbine bases.

→Review Internally, Clarify, Then Request if Needed

- Several "potential" items may need written verification, but the PSC should review first since some of them may not be needed or may be best verified in some other way (refer to list in Section 4.1).
- For reseeding of disturbed areas, determine whether NRCS recommendations should continue to be followed, which may include non-native species, or whether a native seed mix should be required based on requests from other agencies (Section 4.4).

→ Expect Later, Request if Needed

- 2013: Tree and Shrub Survival Report; confirmation that erosion in substation ditch is repaired.
- 2014: Tree and Shrub Survival Report; satisfactory revegetation in substation ditch.

2.0 Background & Scope

2.1 INTRODUCTION

The Baldwin Wind Energy Center (Project) was completed in 2010 in Burleigh County, North Dakota within two miles to the east and four miles to the southeast of the town of Wilton (**Figure 1**). The Project is operated by Baldwin Wind, LLC (Baldwin Wind), a subsidiary of NextEra Energy Resources, LLC (NextEra). The Project had a proposed capacity of 102-megawatts (MW) comprised of 64 turbines. The Project is under the jurisdiction of the North Dakota Public Service Commission (PSC), which issued its Findings of Fact, Conclusions of Law, and Order in Case No. PU-09-668 on July 14, 2010, granting a Certificate of Site Compatibility for Energy Conversion Facility, Certificate No. 16, for the Project.

2.2 PURPOSE

The North Dakota Energy Conversion and Transmission Facility Act (North Dakota Century Code Chapter 49-22) authorizes the Public Service Commission to determine that the location, construction, and operation of jurisdictional energy conversion and transmission facilities will produce minimal adverse effects on the environment and the welfare of citizens of North Dakota. Post-construction inspections ensure that such projects are constructed in compliance with the siting laws (North Dakota Century Code Chapter 49-22) and rules (North Dakota Administrative Code Article 69-06) and the applicable Commission Findings of Fact, Conclusions of Law, and Order (Order). The North Dakota PSC retained Wenck Associates, Inc. (Wenck) to complete a construction inspection of the Project.

2.3 METHODS AND SCOPE OF INSPECTION

2.3.1 Project Compliance Items Identified

Wenck identified a list of "Project Specifications", which the company was obligated or responsible to follow and that can be verified either in written documentation or by an on-site inspection. These items were taken from 1) siting laws and rules, 2) Project activities or specifications proposed in the Application, 3) Project plans described in the Findings of Fact, 4) Orders, and 5) recommendations by other agencies. These Project specifications are listed in Table 2.1 within 9 categories: Siting & Location; Project Design & Engineering; Pre-Construction; Cultural Resources; Natural Resources; Sound & Flicker Mitigation; Construction, Reclamation & Soils; and Operation.

2.3.2 Document Review

Wenck staff reviewed publicly-available Project documents in the PSC Online Case Search (ND PSC 2012) to find written verification of compliance for the Project specifications listed in Table 2.1. If written verification was filed, the findings are described in Section 3 and the source and name of the documentation is listed in Table 2.1, Column 3 (Written Verification). Shaded boxes in the table represent Project specifications that are potentially non-compliant because they have no written verification.

2.3.3 On-Site Inspection

Sara Simmers, Wenck botanist and natural resource scientist, visited the Project site on 7 November 2012. Kurt Hammargren, NextEra Wind Technician Leader, arranged the site visit. Josh Oster, NextEra Wind Technician, accompanied Wenck staff during the site visit and assisted with navigation, pointed out problem areas, and answered questions.

The site was inspected visually using a combination of driving and walking the entire Project area, including the substation, utility line routes, access roads and wind turbines. Digital photographs (Canon Power Shot SD1300 IS, 12 megapixel) were taken showing typical Project infrastructure and documenting problem areas (**Appendix A**). Geographic coordinates were recorded at observation points or potential problem areas using a handheld Global Positioning System (GPS) (Garmin GPSMAP 60CSx; <10m accuracy; NAD83 datum) (**Figure 1; Appendix B**).

If on-site inspection of a Project specification was completed, the findings are described in Section 3 and referenced in Table 2.1, Column 4 (Site Verification). Shaded boxes in the table represent Project specifications that are potentially non-compliant based on site verification.

Table 2-1: Project Specifications with Written or Site Verification Information

Source of Project Specification	Description of Project Specification	Written Verification*	Site Verification*
	SITING & LOCATION		
Findings of Fact 3, 4; Order 2, 3	Designated location in Burleigh Co. in Crofte, Ecklund, Grass Lake Townships. Associated facilities to include access roads, underground electrical and feeder lines, and an electrical substation.	N/A	Section 3.1.1
Findings of Fact 5; Order 4	Compliance with county/city land use, zoning, rules, regulations, ordinances. Conditional Use Permits (CUP) from Ecklund and Grass Lake Townships. Building permit from Burleigh Co. for Crofte Township.	Docket 98-03, Ecklund CUP; Docket 98-07 Grass Lake CUP	N/A
ND Admin. Code Article 69-06-08; Findings of Fact 19, App. p. 3-2 – 3-6, 7-22; Findings of Fact 23	Siting Criteria analysis – exclusion, avoidance, selection, policy. Abandoned coal mines avoided. Avoidance areas: historical resources, woodlands, wetlands.	Docket 5, Application	Section 3.1.3
Findings of Fact 17, 18; App p. 5-1	Total land disturbance about 457 acres. Project will impact approx. 365 acres of agricultural production. Disturbance of prime farmland limited to 9 acres (Project Layout 5-5-2010). No impacts to quality of cropland anticipated. Soil compaction addressed as necessary.	None.	Section 3.1.4
Findings of Fact 22; App. p. 7-2, 7-3	No adverse impacts foreseen to surrounding community, public services, safety. Expected economic benefit.	None.	Section 3.1.5
Findings of Fact 38, 39, 40; App. p. 4-2	Turbine setbacks: 1,400ft. from occupied residence; 1,750ft. from occupied non-participant residences in Crofte Township; 440ft. from existing transmission lines, public roads, railroads, property boundaries.	Docket 40, Distance to Occupied Structure Maps; Docket 115, as-built drawings	Section 3.1.6
	PROJECT DESIGN & ENGINEERING		
Findings of Fact 6; Order 3; Amended App. Docket 10	Authorized up to 102.4MW capacity; up to 64 1.6MW turbines.	Docket 113, Plan of Day 11-19-2010, 64 turbines installed	Section 3.2.1
Findings of Fact 7, 8, 14; App. p. 6-1 – 6-2, 6-4, 7-11	GE 1.6MW turbines, 80m hub height, 82.5m rotor diameter. Turbines with concrete foundation, lighting according to FAA, control panel in turbine base, pad-mounted transformer steps down to collection lines. Turbines to have SCADA and lightning protection.	N/A	Section 3.2.2
Findings of Fact 9; App p. 6-2 – 6-3	Collection line system delivers electricity to substation, stepped up to existing 230kV transmission line.	Docket 115, as-built drawings	Section 3.2.3
ND Century Code Ch. 49-22-24; Findings of Fact 15; Order 11; App. p. 6-3	Compliance with National Electric Safety Code.	None.	N/A
Order 33	As-built engineering design drawings and GIS files within 6mo.	Docket 115, As-builts	N/A

Source of Project Specification	Description of Project Specification	Written Verification*	Site Verification*
	PRE-CONSTRUCTION		
ND Century Code Ch. 49-22-04; ND Admin. Code Article 69-06-02	Ten-year plan (submit before July 1)	None.	N/A
ND Century Code Ch. 49-22-07	Certificate of site compatibility or route permit	Docket 46, Certificate 16, 7-14-2010	N/A
ND Century Code Ch. 49-22-07.1; ND Admin. Code Article 69-06-03	Letter of intent	Docket 1, Letter of Intent; Docket 6, Amended	N/A
ND Century Code Ch. 49-22-08; ND Admin. Code Article 69-06-04	Application for a certificate of site or corridor compatibility	Docket 5, Application; Docket 10, Amended; Docket 114, Correction	N/A
Order 5, 7; App. p. 9-1	Permits and approvals from other agencies, provide copies. Provide copy of final federal EA associated with project.	Docket 98, NDPDES, FAA Permit, Burleigh Driveway Permit/911 Address, NDDOT Utility; Docket 43, Draft EA; Docket 55, FONSI	N/A
Order 8, 9	Conduct pre-construction conference. Provide notice of intent to start construction.	Docket 98-01, Pre-Construction Meeting 7-23-2010; Docket 52, Email notice, construction started July 30, 2010	N/A
Order 36	Inform PSC of plans to modify facility and obtain approval.	None filed to date.	N/A
	CULTURAL RESOURCES		
Findings of Fact 25; Order 6; ND SHPO request (9/30/2009)	Obtain SHPO concurrence of archeologist's report. Provide copy to Commission.	Docket 44, 83, 93 SHPO concurrence letters	N/A
Findings of Fact 24, 25	Avoidance of all identified sites potentially eligible for National Register of Historic Places. Avoidance of all cultural resource features during construction.	None.	Section 3.4.2
Order 13	Report discovery of cultural, archeological, historic sites. Construction stopped, SHPO consulted and clearance required, report to Commission filed.	None reported to date.	N/A
	NATURAL RESOURCES		
Findings of Fact 26, 29; EA p. 24; App p. 7-31	Concerns of USFWS regarding migrating whooping cranes addressed. Measures to minimize potential impact to whooping cranes: stop-construction within two miles of whooping cranes observed; post-	None reported to date.	N/A

Source of Project Specification	Description of Project Specification	Written Verification*	Site Verification*
	construction monitoring (3 yrs) during spring and fall whooping crane migration season; curtailment of turbines within two miles of whooping cranes observed during operation.		
Findings of Fact 26, 30, 31; App. p. 7-27; EA p. 24; USFWS (11-10-2009); NDPR (10-15-2009)	Concerns of USFWS regarding wildlife resources addressed and compliance recommendations from EA followed: implement Avian and Bat Protection Plan and Adaptive Management Plan; avoid construction Feb 1-July 15; bury new electric lines or mark lines near wetlands; self-standing MET towers; down-shielded lighting; minimize vehicle speeds; restrict activities near active raptor nests. NDPR request: avoid impacts to wildlife and habitats.	Docket 51, Plan of Day 8-4-2010, start construction; Docket 113, Plan of Day 11-19-2010 end construction	Section 3.5.2
Findings of Fact 27; App. p. 7-25; NDGF (10-13-2009); USFWS (11-10/2009)	Minimal disturbance of native prairie. Concerns of NDGF and USFWS.	None.	Section 3.5.3
Findings of Fact 33; App. p. 7-24; NDGF (10-13-2009); USFWS (11-10-2009); NRCS (10-19-2009); EA p. 23	All wetlands will be avoided during construction. NDGF, USFWS, NRCS concern. USFWS request: avoid/minimize impacts to USFWS easements; erosion control.	Docket 51, Plan of Day 8-4-2010, example of note to fence off wetlands; Docket 115, as-builts show boring under wetlands	Section 3.5.4
Order 12; Findings of Fact 32; App. p. 6-7; NDGF (10-13/2009); USFWS (11-10-2009); NDPR (10-15-2009); EA p. 24-25	Wildlife Response Reporting System implemented during routine maintenance. NDGF concern: Report presence of T+E species, bald or golden eagles during construction and operation. USFWS request: Three years post-construction mortality monitoring. NDPR: suggest pre and post-construction bat and avian monitoring studies.	None reported to date.	N/A
Order 16; App. p. 7-27; EA p. 23; USFWS (11-10-2009); NDPR (10/15/2009)	Reclamation, fertilization, and reseeding according to NRCS (or landowner if approved). USFWS, NDPR request: reseed with native species.	None.	Section 3.5.6
Order 19; App. p. 7-25	Compliance with “Tree and Shrub Mitigation Specifications”.	Docket 116, Mitigation Plan; Docket 119, 2011 Planting Report; Docket 120, 2012 Survival Report	Section 3.5.7
	SOUND AND FLICKER MITIGATION		
Findings of Fact 35, 38; App. p. 7-13	Average sound levels at occupied residences near project facilities within EPA guidelines, not to exceed 48.6 decibels. Compliance with OSHA standards at noise sensitive areas. Mitigation options for complaints.	None.	N/A
Findings of Fact 37	Participation agreements or alternative turbine locations for 3 occupied residences where shadow flicker exceeds AWEA recommendation of 30 hrs/yr. Complaints of residents mitigated promptly.	None.	N/A

Source of Project Specification	Description of Project Specification	Written Verification*	Site Verification*
	CONSTRUCTION, RECLAMATION & SOILS		
Findings of Fact 13; App. p. 6-4; Order 9, 10, 15	EPC contractor retained for construction management. Construct and operate in accordance with Application and safety requirements. Construction suspended during adverse weather conditions. Provide weekly construction reports.	Docket 86, Plan of Day 9-23-2010, No work due to rain; Docket 103, Plan of Day 10-27-2010, No work due to blizzard. Docket 51, 53-54, 56-82, 84-92, 94-97, 99-113, Plans of Day	N/A
Findings of Fact 41; App. p. 7-19; EA p. 23; NDDH (9/29/2009)	Soil erosion minimized by use of BMPs during and after construction to protect groundwater and soils/topsoils. NDDH concerns: minimize fugitive dust, degradation of waterways, storm water management, noise.	Docket 51, Plan of Day 8-4-2010, example of note to install silt fence	Section 3.7.2
Findings of Fact 41; Order 22; Order 30, App. p. 7-19	Only land needed for facility will be impacted. Staging areas not located on cultivated land unless negotiated with landowners. Topsoil segregated and replaced.	None.	Section 3.7.3
Order 29, 31	Utility line crossings of graded roads bored. Utility lines buried to minimum 48in.	Dockets 56, 57, 65, 69, Plans of Day noting boring under roads	Section 3.7.4
Findings of Fact 42; EA p. 23	Noxious weed management plan during construction and operation.	None.	Section 3.7.5
Findings of Fact 41; Order 14, 24	Temporarily disturbed areas will be restored. Pre-existing roads restored to satisfactory condition. Temporary roads removed. Area around each turbine restored promptly.	Docket 87, Plan of Day 9-28-10; Docket 111, Plan of Day 11-16-2010	Section 3.7.6
Order 20, 21, 23	Repair/replace all damaged fences and gates. Repair/replace damaged drainage tile. Waste removed & disposed regularly.	None.	Section 3.7.7
	OPERATION		
Order 10, 27, 35	Construct and operate in accordance with Application and safety requirements. Extraordinary events (e.g. tower/turbine failure, injuries, wildlife fatalities) reported within 5 business days. Maintain records of compliance with Order and Certificate of Site Compatibility.	None reported to date.	Section 3.8.1
Order 17, App. p. 6-1, 6-6, 6-7; Order 23	Reclamation and maintenance throughout life of facility. Waste removed & disposed regularly.	None.	Section 3.8.2
Order 25, 26, 28, 32	Educational materials, as requested, and notification of possible dangers to landowners. Safety measures for traffic control or to restrict public access. Procedure for handling complaints. Cooperation with landowners/residents to mitigate adverse effects.	None.	Section 3.8.3

***Note: Shaded boxes represent non-compliance or potential non-compliance issues.**

3.0 Findings

3.1 SITING & LOCATION OF FACILITY

3.1.1 Designated Location and Facilities

The Project was built as proposed in the designated project area described in the Application and Order (**Figure 1**). Wenck observed 64 wind turbines; 31 turbines were built in the northern portion of the project area in Grass Lake Township and 33 turbines were built in the southern portion of the project area in Ecklund Township, Burleigh County, North Dakota. Though portions of Crofte Township were included in the proposed project area, no turbines were built in Crofte Township. Associated facilities observed during the site visit included access roads, an electrical substation, and markers indicating the location of underground electrical and feeder lines (**Appendix A; Appendix B**).

A few minor differences in the proposed project layout (dated 5-5-10) compared to the built facility were noted. These include the following:

- West end of access road to Turbines 71 and 72 in the SE ¼ of Section 32, Grass Lake Tshp. runs in a straight east-west direction, slightly north from proposed route.
- Alternate 1 (now Turbine 72) in the SE ¼ of Section 32, Grass Lake Tshp. was built.
- Collection line proposed through north half of Section 33, Grass Lake Tshp., was not built.
- Alternate 6 (now Turbine 102) in the SE ¼ of Section 19, Ecklund Tshp. was built.
- Turbine 2 in the NE ¼ of Section 25, Ecklund Tshp. was not built. The associated access road was routed straight east from 26th St NE to Turbine 1 (now Turbine 98).
- Turbine 33 in the NW ¼ of Section 35, Ecklund Tshp. was not built.

These changes were due to final decisions of planned/alternate turbines and adjustments in access roads and were allowed within the issued Certificate of Site Compatibility. No turbine locations were adjusted.

3.1.2 County/City Regulations

Conditional Use Permits (CUP) were documented from Ecklund (Docket #98-03) and Grass Lake (Docket #98-07) Townships. A CUP or building permit was not documented for Crofte Township, though it was not needed since that portion of the project was not built. The Ecklund CUP included a variance for the Baldwin Substation to be built within the 300 foot setback from township roads 279th Ave NE and 52nd Street (**Appendix A, Photos 3, 6**).

3.1.3 Siting Issues

Siting criteria were analyzed in detail in the Application for the Project (Docket #5). Wenck confirmed during the site inspection that exclusion and avoidance areas were avoided as described in the Application, to the extent possible. Mined areas and abandoned mines identified in the Application were avoided during turbine placement (**Appendix B, Photos 43, 47, 48**), with one exception. The exception was Turbine 126, which was sited in Section 34, Ecklund Tshp. This section was recorded as a section with filled sinkholes and was within a half-section recorded as being mined in the past. However, as described in the Application, micrositing of the turbine included geophysical testing which would have revealed any stability concerns. Wenck did not observe any indications of surface instability or sinkholes

at or near Turbine 126 (**Appendix B, Photo 34**). Historical/cultural resources were avoided (see Section 3.4.2). No natural woodlands were impacted. Trees were removed from shelterbelts; mitigation for this loss is in progress (see Section 3.5.7). Wetlands were avoided (see Section 3.5.4). Wenck also confirmed that impacts to selection and policy criteria were considered and kept at a minimum.

3.1.4 Land & Agricultural Impacts

The Project was built as proposed within the estimated construction limits and right-of-ways. It appeared that the extent of construction and disturbance were within the maximum acreages estimated in the Application. Minor changes from the proposed facility (see Section 3.1.1) would not have greatly altered the extent of disturbance. Crop production did not appear to be reduced surrounding the turbines and access roads or along collection line routes which went through fields (**Appendix A, Photos 7, 8, 9, 22, 26, 28, 39, 40, 45, 46**), indicating that topsoil replacement and soil compaction were satisfactory. The NextEra staff noted that any issues or landowner concerns related to agriculture or cropland are addressed promptly to maintain good rapport with the community.

3.1.5 Surrounding Community, Public Services, Safety

There were no indications during the site inspection that the surrounding community or public were being impacted negatively due to the operation and infrastructure of the wind facility. All turbines were placed along access roads which spurred from main public roads; roads were safe and had appropriate signage (**Appendix A, Photos 8, 13, 26, 45**). The wind facility provides jobs for several people who reside in nearby towns.

3.1.6 Turbine Setbacks

Wenck verified during the inspection that turbines were built at least 1,400 feet from occupied residences. There was one exception from what could be ascertained from the on-site and GIS analysis; an occupied structure in the SW ¼ of Section 29, Ecklund Township, was about 1300ft to the northwest of Turbine 104. There was no written evidence of an agreement with the landowner filed with the PSC, though presumably there is some sort of agreement in place. This structure was identified as being occupied in the latest submitted map of "Distances from Turbine to Occupied Structures" (Docket #40, dated 5-10-10), and the distance on that map states 1,282ft. Wenck recommends verification of the agreement or setback be obtained. No turbines were built in Crofte Township, which had non-participant residences with an added setback.

There are no established setbacks in Burleigh County for wind turbines; however NextEra proposed a setback of 440 feet from existing transmission lines, public roads, and railroads. Furthermore, the Findings of Fact (#40) stated a setback of 440ft from property boundaries, however this was not stated in the Application and it was not part of the Order. This setback distance was followed from transmission lines, public roads, and railroads, but there were several instances where turbines were built within 440 feet from section lines (Turbines 79 & 129) and within 440 feet from property boundaries on quarter section lines (Turbines 67, 68, 76, 78, 83, 90, 96, 97, 107, 115, 126, 130). In these instances, the turbines did not pose a threat to public safety; the boundaries proximate to the turbines were within publicly inaccessible areas. NextEra is technically abiding by current regulations. Wenck does not consider this to be a concern, but the Findings of Fact #40 for the Project may need to be clarified.

3.2 PROJECT DESIGN & ENGINEERING

3.2.1 Capacity

The Project was authorized to build up 64 1.6MW turbines for a total of 102.4 MW capacity. The Plan of the Day for 11-19-2010, which was the final construction account, documented that 64 of the 64 turbines were installed (Docket #113). The 64 turbines were inspected during the site visit (**Appendix A; Appendix B**).

3.2.2 Turbine Specifications

All turbines were constructed as specified, 1.6 MW, 80 m hub height, 82.5 m rotor diameter. Each turbine had a concrete foundation, a control panel in the tower base, a pad-mounted transformer, and lightning protection (**Appendix A, Photos 8, 9, 46**). Turbines were connected to a SCADA system, observed in the O & M Building control area. Lighting was not confirmed since the inspection took place during daylight hours but is assumed to be in compliance with the FAA since FAA approval was granted and documented (Docket #98-04 and #98-05).

3.2.3 Collection Line & Substation

Several points along the collection line system were observed and it appeared to be constructed generally where proposed (**Appendix B**). One exception was that the collection line proposed through the north half of Section 33, Grass Lake Tshp., was routed elsewhere. Points where the collection line were bored under major roads were observed and no concerns were noted (**Appendix A, Photos 6, 12, 18, 23, 24, 27, 42**). Markers were in place. The collection line tied into a 230kV transmission line at the new substation, as proposed (**Appendix A, Photo 1**).

3.2.4 National Electric Safety Code

There was no written verification or certification of compliance with the National Electric Safety Code.

3.2.5 As-built Drawings and GIS Files

As-built engineering design drawings were submitted on June 6, 2011 (Docket #115). This submittal was past the 6 month deadline post-construction, but Wenck does not consider this a concern. The as-builts were signed and dated by a Registered Land Surveyor on January 26, 2011. No associated GIS files were submitted. The as-built drawings were inspected in relation to the on-the-ground infrastructure of the facility and appeared to coincide.

3.3 PRE-CONSTRUCTION

3.3.1 PSC-Required Documents

A letter of intent was received October 5, 2009 (Docket #1) and amended March 10, 2010 (Docket #6) regarding a change in ownership. An Application for a Certificate of Site Compatibility was submitted March 5, 2010 (Docket #5) and amended April 9, 2010 (Docket #10). A correction to the Application was submitted December 21, 2010 (Docket #114). Certificate of Site Compatibility 16 was issued on July 14, 2010 (Docket #46). There was not a ten-year plan on file in the Project docket.

3.3.2 Permits and Approvals from Other Agencies

Several permits and approvals were identified in the Application as potentially required for the Project. Federal approvals submitted to the PSC were the federal Draft Environmental Assessment (EA) (Docket #43) and associated FONSI (Docket #55) and the FAA Determination of No Hazard to Air Navigation (Docket #98). The filed EA was titled “Draft” (dated June 2010) and not “Final”, though it is not clear

whether a later version of the EA was prepared. Additionally, a USFWS Biological Opinion was identified for the Project. Correspondence filed from this agency did not include a final response regarding the Project and its potential impacts. While there were comments from the USFWS during the EA scoping process (Docket #43) and as testimony during the PSC hearing (Docket #28), there was no final concurrence letter or approval considering the Project in compliance filed directly with the PSC. However, the FONSI for the federal EA stated that in a July 16, 2010 letter the USFWS concurred with the finding that the Project may affect, but is not likely to adversely affect, the whooping crane, interior least tern, and piping plover. This letter was not filed with the PSC.

Submitted State and local approvals included the ND Department of Health NDPES Permit (Docket #98), the ND Department of Transportation Utility Permit (Docket #98), and Conditional Use Permits for Ecklund and Grass Lake Townships (Docket #98). A Burleigh County Highway Department Access Driveway Permit was obtained and filed for the substation approach. A ND Highway Patrol Overheight/Overweight Permit was identified as necessary but was not on file.

3.3.3 Pre-Construction Conference/Notice of Intent to Start Construction

Record of the pre-construction meeting was on file (Docket #98-01) and an email notice that construction had begun was provided (Docket #52).

3.3.4 PSC Approval of Modifications

There were no notifications to modify the facility filed to date. None of the minor changes made to the facility after the Project was approved were beyond the scope of the issued Certificate of Site Compatibility (refer to Section 3.1.1).

3.4 CULTURAL RESOURCES

3.4.1 SHPO Concurrence

SHPO concurrence of all archeology reports were provided to the PSC (Dockets #44, 83, 93).

3.4.2 Cultural Site Avoidance

Six prehistoric stone feature sites were documented from the archeology survey in October 2009 in Ecklund and Crofte townships (Docket #21, Class III Cultural Resources Report). These sites were deemed potentially eligible for listing and required avoidance. These features were located on the string for Turbines 126, 127, 128, 129, and 130 in Ecklund Township. The federal EA summarized an additional archeology survey in April 2010 for Grass Lake Township and a Class II architectural survey for the entire project area, though these reports were not on file with the PSC. Thirteen additional prehistoric feature sites were deemed potentially eligible for listing and required avoidance. These features were marked on the final turbine site plan map dated May 5, 2010 (Docket #24) near Turbines 79, 83, 84, 85, 87, 88, and 89 in Grass Lake Township. No architectural features in the project area were considered potentially NRHP-eligible. The Application and federal EA described measures that would be taken to avoid the potentially eligible features, including reroutes, turbine shifts, and fencing during construction. Wenck verified that the potentially eligible cultural sites were avoided by Project facilities (**Appendix A, Photos 31, 51, 52**).

3.4.3 Reporting

No new discoveries of cultural, archeological, or historic sites have been reported to the PSC to date. Presumably no new sites were encountered during construction of the Project.

3.5 NATURAL RESOURCES

3.5.1 Whooping Cranes

Measures identified specifically to minimize potential Project impacts to whooping cranes included: stop-work within two miles of whooping cranes observed during construction; curtailment of turbines within two miles of whooping cranes observed during operation; and post-construction monitoring (3 yrs) during spring and fall whooping crane migration season. No reports of whooping cranes to the USFWS have been filed with the PSC to date; presumably none have been observed within the project area during this time. NextEra has not submitted any reports on post-construction monitoring during spring and fall migration seasons, as indicated in the Findings of Fact and federal EA for the Project.

3.5.2 Wildlife

Additional measures were proposed to minimize impacts to other wildlife in the Project area and Wenck verified several of these measures. Lighting on Project facilities appeared to be down-shielded to minimize attracting nocturnal species (no photo available). Access roads did not have posted speed limits, but NextEra verbally confirmed that the limit on access roads for employees was 15 mph so as to reduce wildlife collisions. All collection lines were buried to avoid bird collisions (**Appendix A, Photos 18, 23, 42**). No additional transmission lines were constructed for the Project. Where overhead lines were necessary at the tie-in to the substation (limited to 240ft), the poles appeared to be perch-resistant, but no bird diverters were visible on the wires (**Appendix A, Photos 1, 3, 4**). Wetland habitat impacts were avoided by siting and boring under wetlands (**Appendix A, Photos 11, 49, 50**). The Plans of the Day accounts of construction confirmed that construction avoided the spring nesting season (Feb 1-July 15) since it began July 30, 2010 (Docket #51) and ended November 19, 2010 (Docket #113).

Some measures proposed by NextEra or recommended by the USFWS were not able to be confirmed. There was no written verification that an Avian and Bat Protection Plan and Adaptive Management Plan was implemented. Restrictions of construction and operation near active raptor nests could not be confirmed; the pre-construction surveys for nests (Docket #10, Application Appendix C) did not include all of the final Project area and there was no written verification that nests were marked to avoid during construction. The federal EA stated an additional avian survey was in progress in 2010 for Grass Lake Township, but this report has not been filed with the PSC. Also, MET towers were not self-standing as recommended by the USFWS, though they did have bird deterrents on the guy wires to help prevent bird collisions (**Appendix A, Photo 36**).

3.5.3 Native Prairie

Most of the turbines were placed in cultivated lands. However, in the final Project configuration, native prairie was disturbed at 7-8 turbines in Ecklund Township (Turbines 106, 121, 122, 126, 127, 128, 129, possibly 104) and at 9-10 turbines in Grass Lake Township (Turbines 79, 81, 83, 84, 85, 87, 88, 89, 95, possibly 82), along with associated access roads (**Appendix A, Photos 20, 30, 31, 34, 51, 52**). NextEra had considered avoidance of native prairie during the siting process (Docket #5, Application) and it appeared during the site inspection that the impact was minimized as feasible, through minimizing the width of roads through these areas and minimizing the area disturbed around each turbine. It was noted however that two turbines were placed on ridges that had been determined to be high quality native prairie (Turbines 121, 122; see Docket #5, Application Appendix C, Native Prairie Report) (**Appendix A, Photo 30**). It was also noted that seeding after disturbance was primarily done with the non-native intermediate wheatgrass (*Agropyron intermedium*), rather than with native species as proposed (**Appendix A, Photos 20, 30, 31**).

3.5.4 Wetlands

During the construction inspection, Wenck confirmed that wetlands were avoided in the Project design (**Appendix A, Photos 11, 50**). No stream crossings or wetland basins were impacted by Project infrastructure. Locations of jurisdictional wetlands were avoided by boring underneath them to install collection lines (**Appendix A, Photo 49**). It did not appear that the vegetation along these wetland margins had been disturbed. Wenck also observed that no Project infrastructure was built on land under USFWS easements, of which three parcels had been identified in the Application near the Project area. There were also numerous remarks in the Plans of the Day reports to fence off wetlands during construction (example Docket #51, Plan of Day 8-4-2010) and the as-built drawings showed where collection lines were bored under wetlands or stream crossings (Docket #115).

3.5.5 Reporting

NextEra on-site staff verbally confirmed that the Wildlife Response Reporting System (WRRS) is in place; any wildlife fatalities observed are recorded and monitored regularly and reports can be obtained if requested. There were no reports filed to date of the presence of threatened or endangered species or bald or golden eagles during construction or operation to date. There were no reports filed to date of post-construction mortality monitoring, as requested by the USFWS and NDPR.

3.5.6 Reclamation & Reseeding

Wenck verified that disturbed areas in non-cropped lands were reclaimed and reseeded after construction (**Appendix A, Photos 15, 17, 20, 30, 31, 34, 50, 51, 52**). In most pastures, the margins of the access roads and the area around the turbine base, the non-native intermediate wheatgrass (*Agropyron intermedium*) was growing in dense stands (**Appendix A, Photos 15, 17, 20, 31, 50**). Erosion and vegetation cover were not a concern, and no annual weed outbreaks were noted. However, the grass is a non-native species that has commonly planted in CRP lands. It is likely that this species was suggested by the NRCS and NextEra followed that recommendation. It also appeared that the non-native legume yellow sweetclover (*Melilotus officinalis*) had been seeded in one area (**Appendix A, Photo 30**). The use of these species does not follow the recommendations of the USFWS or the NDPR, which requested reseeding with native species. In some pastures, intermediate wheatgrass was not present in areas that would have been disturbed (**Appendix A, Photos 34, 51, 52**). Drill rows in the soil were visible, so attempts to reseed had been made. Possible explanations include: 1) intermediate wheatgrass was not used in select pastures (possibly due to landowner's requests), 2) the seeds did not come in in some cases, 3) the grass was grazed more heavily in some pastures and could not be distinguished. Whatever the reason, these pastures did not have erosion or weed problems, despite not being reclaimed/seeded in the same way.

3.5.7 Tree & Shrub Mitigation

There were no natural woodlands within the Project area that were impacted by construction of the project. There were several locations where trees or shrubs were removed from planted tree rows in fields. Wenck verified that in these locations the width of tree/shrub removal was less than the 50ft maximum cut (**Appendix A, Photo 15, 21, 25, 39**). NextEra has submitted a Tree & Shrub Mitigation Plan (Docket #116), a 2011 Tree & Shrub Planting Report (Docket #119), and a 2012 Tree & Shrub Survival Report (Docket #120). Wenck verified that trees and shrubs were planted (**Appendix A, Photo 41**). The mitigation specifications appear to be followed up to this point. The latest report states the survival rate stands at 94%. However, the planting was installed in 2011 and the PSC requires three years of survival monitoring, until 2014, for the mitigation to be considered satisfactory.

3.6 SOUND & FLICKER MITIGATION

3.6.1 Sound Mitigation

There was no explicit requirement for NextEra to submit post-construction sound level information, and none has been filed. No formal complaints have been filed with the PSC. Wenck received verbal confirmation from NextEra staff that landowner and resident concerns are addressed promptly and that NextEra makes every reasonable attempt to alleviate problems caused by the facility.

3.6.2 Flicker Mitigation

Preliminary studies by NextEra found that three occupied residences within the Project area had the potential to receive more than 30hr/yr of shadow flicker impacts (Docket #41, updated Shadow Flicker Study). Findings of Fact 37 stated NextEra was working to get participation agreements from these residents. One of these residences was in Crofte Township which was not built. No participation agreements were filed with the PSC for the remaining two residences. No formal complaints have been filed with the PSC. Wenck received verbal confirmation from NextEra staff that landowner and resident concerns are addressed promptly and that NextEra makes every reasonable attempt to alleviate problems caused by the facility.

3.7 CONSTRUCTION, RECLAMATION & SOILS

3.7.1 Construction Management & Safety

Records from the pre-construction conference and the notice of intent to start construction indicate that an Engineering, Procurement, and Construction (EPC) contractor managed the construction of the Project (Docket #98-01, 52). Plans of the Day were submitted daily in fulfillment of the Order to provide weekly construction reports and these submissions indicated that construction of the Project proceeded in accordance to the Application and safety requirements (Docket #51, 53-54, 56-82, 84-92, 94-97, 99-113). There were two occasions where the Plans of the Day indicate that construction was suspended during adverse weather conditions, as ordered by the PSC, once due to rain (Docket #86, POD 9-23-2010) and once due to a blizzard (Docket #103, POD 10-27-2010).

3.7.2 Erosion & Sedimentation

Best Management Practices (BMPs) were used as part of the construction and maintenance of the Project to minimize erosion and control sediment. Plans of the Day remarks indicated the progress of installing over 3,500ft of silt fence during construction (example Docket #51, 8-4-2010) and indicated when SWPPP inspections were taking place (example Docket #62, 8-16-30). Culverts were installed where necessary to allow for the natural flow of drainage (**Appendix A, Photos 19, 24, 38**). No erosion problems were observed around the utility junction boxes; cement bollards and gravel were in place around each and intermediate wheatgrass had been planted to stabilize soils (**Appendix A, Photos 14, 26, 27, 44**). In general, erosion problems were minor and infrastructure of the Project area was well-maintained. One problem area was the ditch slope to the north of the Project substation. There were signs of active erosion and bare soils (**Appendix A, Photos 3, 5**). NextEra indicated that this area had to be reseeded this past spring 2012 and that the problem was being addressed. The vegetation was not taking and it appeared subsoil was showing in some spots. A more minor erosion concern was that there were a few locations where erosion on the access roads was a problem or where ruts had been formed (**Appendix A, Photos 16, 30, 32, 33, 37**). There were also a few areas where Geotech fabric placed underneath the access road surfacing materials had washed out (**Appendix A, Photo 53**). In some areas this was contributing to further erosion along the road as the fabric was removed by water and sediment flow. On some of the gravel pads around the turbine bases water was not draining properly;

the pads needed to be better-shaped or have gravel added (**Appendix A, Photos 9, 29, 35**). NextEra noted these areas were on the maintenance list and were being addressed.

3.7.3 Minimization of Impacts

In general it appeared during the site visit that measures were taken to minimize the overall impact of the Project and the extent of land and soil disturbance. Areas that would have been disturbed during construction of the project were agricultural fields and pasturelands. Crops were harvested at the time of the survey but showed no indication of poor development or production in areas where the soils would have been disturbed compared to areas not disturbed. Pastures had been reclaimed and reseeded and there were no areas where bare soils or erosion were problems, which would have been an indication of topsoil/subsoil mixing. The staging area for the Project had been located on a 20 acre area to the west and south of the substation on cultivated land, but agreement from the landowner had been secured (**Appendix A, Photos 1, 7**). The area had been reclaimed back to cropland, except for about 4 acres where the substation was located and a small area (less than an acre) to the west of the substation which had a gravel pile (**Appendix A, Photo 2**). NextEra indicated this had been left upon request of the landowner for his use. The cropland had been satisfactorily reclaimed, supported by the fact that the cropland was in use and appeared to be in good condition compared to areas that had not been disturbed. Wenck observed that all topsoil appeared to be replaced to the required depth.

3.7.4 Utility Lines

Wenck verified that all county road and highway crossings had been directionally bored, with the route of the underground utility line indicated by red markers in most, but not all, locations (**Appendix A, Photos 6, 12, 18, 23, 24, 27**). NextEra reported that the bore for each of these crossings began and ended further out in adjacent agricultural fields, not in the road ditches. The vegetation in the ditches did not appear to have been disturbed. The crossings included 253rd Ave, 266th Ave NE, 279th Ave NE, State Highway 36, 318th Ave NE, 331st Ave NE, 26th St NE, 41st St NE, 52nd St NE, 66th St NE, and 89th St NE. There were remarks in the Plans of the Day reports when boring took place across these roads or intersections (example Docket #56, Plan of Day 8-9-2010). All utility lines appeared to be buried at the properly required depth.

3.7.5 Noxious Weeds

NextEra indicated annual and noxious weeds are controlled with herbicide on a regular basis several times throughout the summer months around turbines and the substation. Staff indicated that wormwood (*Artemisia absinthium*), a noxious weed, was a species that requires regular attention at the facility. Wenck did not observe any weed outbreaks or problem areas of noxious weeds. Vegetation was sprayed around the base of each turbine on the gravel pad and at the substation to control weeds (**Appendix A, Photos 4, 9, 29, 46**).

3.7.6 Reclamation & Roads

Areas of the Project which had been disturbed during construction appeared to be properly restored with no long-term concerns. Notes on Plans of the Day reports indicated reclamation began in portions of the facility while construction was still in progress (Docket #87, 9-28-2010, reclamation at turbine string 60-64) and was completed in November 2010 (Docket #111, 11-16-2010, reclamation complete). NextEra reported that there were no temporary roads constructed for the project, though one intersection was temporarily widened and some county roads within the Project area had been improved by adding gravel. The widened intersection was restored to original width and had no problems (**Appendix A, Photo 12**). During the construction inspection, Wenck noted that all county roads and highways within the Project area appeared to be in good condition and properly maintained.

There were small portions of the staging area which were not reclaimed, including an approach and graveled area to the west of the substation and an approach to the south of the substation (**Appendix A, Photos 1, 2, 7**). These areas, along with a gravel pile, were requested to be left by the landowner. As noted in Section 3.7.2, the ditch slope to the north of the substation had some erosion concerns and was not fully restored (**Appendix A, Photo 5**). The gravel pads surrounding the tower structures were all well-maintained and in excellent condition (**Appendix A, Photos 4, 9, 29, 46**). They appeared to have been constructed properly. There was no soil slumping or settling, no open trenches, and no areas of erosion, though there was some ponding water which could be addressed with more gravel or improving grade. Crops were planted as close as possible to the tower bases. None of the crops showed visible signs of poorer production or vigor, which would indicate improper topsoil replacement. Also refer to Section 3.5.6 Reclamation and Reseeding, 3.7.2 Erosion & Sedimentation, and 3.7.3 Minimization of Impacts.

3.7.7 Repairs & Waste

All fences and gates were in place and fully operable. Numerous new gates had been installed for the Project where access roads crossed fencelines (**Appendix A, Photos 15, 19, 20, 26, 30, 51**). Cattleguards were installed at the gates when necessary. NextEra reported there had not been any agricultural fields with drainage tile impacted by construction of the Project. There was no waste, debris, or abandoned equipment observed during the inspection. The site appeared to be regularly maintained and no remnants of the construction phase were noted.

3.8 OPERATION

3.8.1 Safety & Record-keeping

No concerns were identified during the site review that would indicate that Project operation was out of compliance with the Application or safety regulations, other than the minor concerns noted in this report. Examples of operational safety measures observed at the site include: use of personal protective equipment, signs marking safety hazards for employees at the O & M building and at towers, and vehicle safety measures. No reports of extraordinary events were filed to date with the PSC.

3.8.2 Maintenance

Wenck observed that NextEra has in place an on-going maintenance schedule. The primary maintenance issue was upkeep of tower access roads and erosion control, which was discussed in Section 3.7.2. Wenck noted that the gravel pads surrounding the tower structures were all well-maintained and in good condition. Annual weeds were sprayed regularly to keep them under control. Wenck did not observe any areas of exposed soil remaining from construction activity or the on-going operation of the Project that were in need of reclamation. There was no waste, debris, or abandoned equipment observed during the inspection. The site appeared to be regularly maintained.

3.8.3 Public Contact & Safety

No examples of educational materials for landowners or the public were noted at the Project Site or on file with the PSC. However, Wenck noted that danger/safety warnings were in place on junction boxes, tower doors and electric boxes, surrounding the substation, and on markers indicating buried utility lines (**Appendix A, Photos 4, 6, 9, 14, 18, 27**). NextEra reported that there are no security systems in place on the doors to the towers. However the doors are locked and regularly monitored. There was a security fence in place surrounding the substation (**Appendix A, Photo 4**). Wenck did not identify any areas where traffic control signs were necessary within the Project area. There were public access “No Trespassing” signs at all entrances to tower access roads at each intersection with a county road or

highway (**Appendix A, Photos 8, 13, 26, 45, 51**), and on the exit from each road was a stop sign for NextEra staff and landowners (**Appendix A, Photo 10**); none were missing or damaged. These signs also denoted the tower identification numbers for the towers in each string. No formal complaints have been filed with the PSC to date. Wenck received verbal confirmation from NextEra staff that landowner and resident concerns are addressed promptly and that NextEra makes every reasonable attempt to alleviate problems caused by the facility. However there were no formal procedures on file for how NextEra handles complaints or explains of the process for mitigating landowner/resident concerns.

4.0 Issues to Resolve and Recommendations

4.1 PROJECT SPECIFICATIONS NEEDING WRITTEN VERIFICATION

Several components of the Project were asserted in the Application or proposed construction and could be verified in writing, but have not been filed with the PSC. Table 2-1 summarizes these items, which are indicated as those shaded in the "Written Verification" column, indicating no written verification was provided where applicable and necessary. Wenck does not consider any of these items to be critical for Project compliance. However some were more important than others and Wenck suggests they be on file with the PSC to confirm compliance. Wenck recommends the PSC request from Next Era the following list of "Necessary" items, and if the PSC deems appropriate, the list of "Potential" items could also be requested.

Necessary Items

- Written evidence of apparent agreement with the landowner for the one presumed exception from the 1400 feet setback for the occupied structure in the SW ¼ of Section 29, Ecklund Township (or confirmation that the structure is not occupied).
- Copy of participation agreements or description of mitigation for 3 occupied residences where shadow flicker was anticipated.
- Associated GIS files for as-built drawings or final layout of Project on GIS.
- NextEra ten-year plan on file in this Project docket (may have this on file somewhere else for the company).
- If a "final" version of the federal EA was prepared, then this should be filed with the PSC.
- USFWS concurrence letter or approval considering the Project in compliance which was referenced in the FONSI for the federal EA (dated July 16, 2010).
- ND Highway Patrol Overheight/Overweight Permit identified as necessary for Project (or indication the permit was deemed unnecessary).
- Final reports of April 2010 archeology survey for Grass Lake Township and Class II architectural survey for the Project area which were referenced in the federal EA.
- Final report of the additional avian survey in 2010 for Grass Lake Township, as referenced in the federal EA.

Potential Items

- Clarify Findings of Fact #40 for the Project which states the turbines will be setback 440 feet from property boundaries. This contradicts NextEra's Application which did not propose a setback for property boundaries. There are 2 turbines within 440 feet from section lines and 12 within 440 feet from property boundaries on quarter section lines.
- Written verification of compliance with National Electric Safety Code.
- Verification that no new discoveries of cultural, archeological, or historic sites were found during construction.
- Verification that no whooping cranes have been observed within the project area to date. Example of notice which would be provided to USFWS if a whooping crane was observed.

- Verification that no threatened or endangered species or bald or golden eagles were observed within the Project area during construction or during operation to date. Example of notice that would be provided to USFWS if such a species was observed.
- Summary or example of WRRS reports so PSC can confirm they are available, if needed.
- Summary or example of landowner complaints to date regarding sound, flicker, safety, or other concerns and descriptions of how the issues were handled. Or procedures for how NextEra handles complaints and mitigation of landowner/resident concerns.
- Examples of educational materials to be provided to landowners or the public if requested.

4.2 EROSION CONTROL & MAINTENANCE

The primary problem noted on the site during the construction inspection was erosion maintenance. Problem areas included 1) the ditch slope to the north of the Project substation which had signs of active erosion, exposed subsoils, and unsuccessful reseeding attempts, 2) minor erosion on the edges of the access roads or minor ruts on roads, 3) exposed Geotech fabric on access roads, 4) improper drainage (though minor) on the gravel pads around the turbine bases. The erosion on the ditch slope likely stemmed from the construction phase, whereas the other erosion-related issues likely did not. Wenck recommends that NextEra be obligated to fully reclaim the ditch slopes around the substation. This would include recontouring subsoils and hauling in additional topsoil, if necessary. The erosion is relatively minor but will not likely be resolved in the long term without better soil reclamation measures. The other erosion problems are regularly addressed through NextEra's maintenance procedures, which Wenck observed to be in place and sufficient to control these issues. However the PSC may want to bring these minor issues to the attention of NextEra for their information.

4.3 WILDLIFE PROTECTION MEASURES & MONITORING

Several measures to protect wildlife were described as part of the Project in the Application or were requested by agencies in response to the Project, but Wenck could not find evidence that they were being implemented or that there were reasons why they were not implemented. These measures should be addressed or explained in some way to ensure compliance. These measures include the following:

- Description of birdsafe design used on the overhead connections to the transmission line for the Project. Wenck did not observe bird diverters on the line.
- Evidence that the Avian and Bat Protection Plan and Adaptive Management Plan are being implemented.
- Confirmation that construction was restricted near active raptor nests, such as evidence that nests were marked for avoidance or a final map showing the distance of nests from construction activities.
- Reports on post-construction mortality monitoring during spring and fall migration seasons, as indicated in the Findings of Fact and federal EA for the Project and as requested by the USFWS and NDPR.

Note also that several items related to wildlife protection are listed in Section 4.1 above as items that possibly require written verification.

4.4 RESEEDING METHODS

Wenck noted that in the majority of disturbed areas that had to be reseeded as part of reclamation, such as native pastures, it appeared that the non-native intermediate wheatgrass (*Agropyron intermedium*) had been seeded. It also appeared that the non-native legume yellow sweetclover (*Melilotus officinalis*) had been seeded in one area. These species are commonly used for reseeding projects or planted in haylands or CRP lands. It is likely that these species were suggested by the NRCS and NextEra followed that recommendation. However, the use of these species does not follow the recommendations of the USFWS or the NDPR, and concerns of others such as The ND Chapter of The Wildlife Society which presented comments during the PSC hearing for the Project, which requested disturbed areas be reseeded with native species. In the Application and throughout the course of Project planning, it appeared the intention of NextEra was to use only native species for reseeding. While Wenck does not consider NextEra out of compliance regarding this issue, we recommend the PSC review this issue and determine whether NRCS recommendations should continue to be followed or whether a native seed mix should be required based on requests from other agencies.

4.5 TREE & SHRUB REPLACEMENT

The replacement of trees and shrubs to mitigate those removed during construction of the Project had been delayed until this past spring 2011. Wenck verified that the replacement plantings were installed; and the latest report states the survival rate stands at 94%. However survival monitoring is required for the following three years until 2014. Wenck recommends that the PSC proceed with its requirement for the full three years of survival monitoring to ensure 75% survival of the replacement planting.

5.0 Conclusions

Overall, the Project appeared to have been constructed as designed with minimal impacts to the surrounding natural or human environment. The Project site was well-maintained and in good condition. However, Wenck observed several issues that may need to be resolved before the Project is considered complete and in full compliance. This includes provision of written documentation of particular aspects of project implementation, general erosion control and maintenance, confirmation of certain wildlife protection measures and monitoring procedures, reviewing reseeding requirements pertaining to the use of native or non-native species, and continued tree and shrub survival monitoring. None of these are critical issues, but the PSC should determine which are necessary for the company to comply with and then notify the company what actions are required on their part.

6.0 References

North Dakota Public Service Commission (ND PSC). 2012. Online Case Search. Available from: http://www.psc.nd.gov/database/company_case_list.php. Accessed November, December 2012.

7.0 Signatures

The services performed by Wenck scientists for this project have been conducted in a manner consistent with the degree of care and technical skill appropriately exercised by professionals currently practicing in this area under similar time and budget constraints. Recommendations and findings contained in this report represent our professional judgment and are based upon available information and technically accepted practices at the present time and location. Other than this, no warranty is implied or expressed.

Lead Project Manager, Kevin Magstadt and Secondary Project Manager, Sara Simmers, prepared the report.

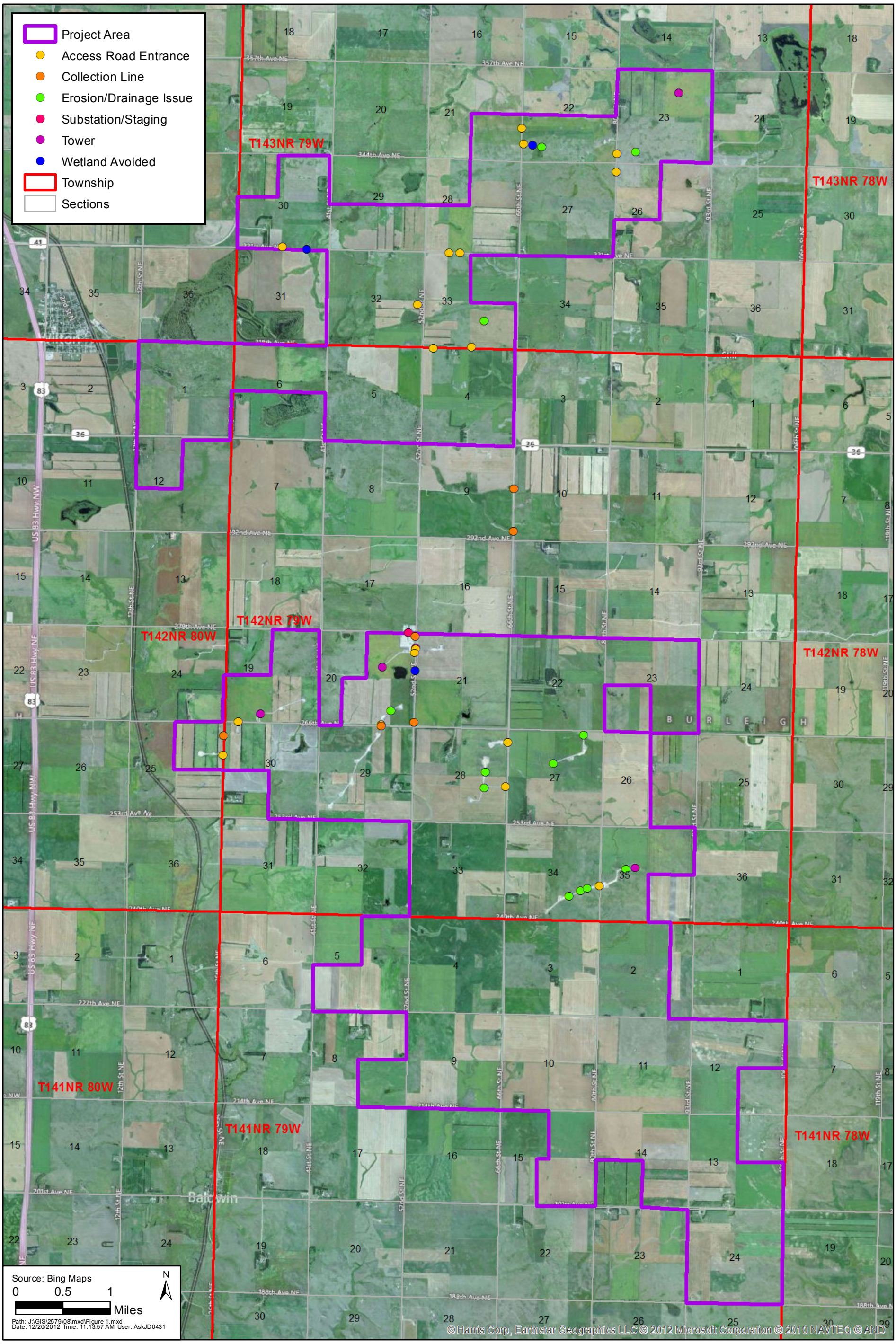
_____ 12/20/2012

Kevin Magstadt, P.E., Associate/Regional Manager Date

_____ 12/20/2012

Sara Simmers, Botanist/Natural Resource Scientist Date

Figures



North Dakota Public Service Commission

Project Area and Field Observations Map

Wenck

Engineers - Scientists
Business Professionals
www.wenck.com

301 1st Street NE
Mandan, ND 58554-3370
701-751-3370

DEC 2012

Figure 1

Appendix A

Photographs

Photo 1. Direction: South. Area to the west side of the substation which had been part of the construction staging area. The area beyond the transmission line pole had been reclaimed to cropland; the area in the foreground was surfaced in gravel due to landowner request. The site was in good condition. Electricity from the substation tied into an existing 230kV transmission line via overhead lines to the transmission line pole on the right of the photo.

Photo 2. Direction: West. Gravel pile to the west of the substation, which remained after construction. The landowner requested that this gravel be left for his use. The ditch had been reclaimed and an approach and culvert had been removed. The ditch was re-vegetated with dense grass cover.

Photo 3. Direction: East. View of north side of substation, taken from an approach on the northwest corner of the substation left after reclamation of the staging area per landowner request. The approach had a culvert which allowed for drainage. Overhead electric lines connected the Baldwin substation to an existing substation across 279th Ave NE to the north. No bird deterrents were visible on the lines.

Photo 4. Direction: Southeast. View of the substation which serves only the Baldwin Wind Energy Center turbines. Overhead lines in the foreground connected to an existing 230kV transmission line. No bird deterrents were visible on the lines. Note the safety fence surrounding the substation. Danger signs were present at regular intervals on all sides of the fence. A locked access gate was located on the east side of the substation.

Photo 5. Direction: South/Southwest. Erosion on the north side of the Baldwin substation on the backslope of the road ditch. Erosion control fabric was present but was not fully functional. The area had been re-planted in spring 2012 because the original planting did not take. Sparse cover of intermediate wheatgrass (*Agropyron intermedium*), annual weeds, and a low, moist area with a few cattail (*Typha* sp.) bases were currently present in the ditch. The vegetation was still not established.

Photo 6. Direction: Northeast. View of ditch from approach on east side of substation. Red marker (indicated by arrow) marked the location of underground electric collection line which had been bored under the gravel roads across the intersection of 279th Ave NE (east-west) and 52nd St NE (north-south).

Photo 7. Direction: South. Approach on west side of 52nd St SE between the substation and the access road to Turbines 112 and 111. During construction, this approach provided access to a portion of the staging area to the south of the substation. The landowner requested that this approach be left rather than reclaimed so he could use it for field access with farming equipment. The adjacent ditch and cropland, which had been disturbed for the staging area, were fully reclaimed and in good condition.

Photo 8. Direction: East. Road to Turbines 113 and 114. Proper safety and public access signage was in place. Cropland adjacent to road was in good condition and had been satisfactorily reclaimed.

Photo 9. Direction: West/Northwest. Tower base of Turbine 112 and adjacent gravel pad. The extension of the pad to the left is used for a crane when necessary for maintenance. Adjacent crops were harvested but showed no signs of being less productive (such as reduced density) where soils had been disturbed. Small temporary water puddles were noted on the pad. The pad-mounted transformer is visible to the left of the base of the tower.

Photo 10. Direction: East. Stop sign on exit from access road to Towers 112 and 111.

Photo 11. Direction: West. Wetland in the NE ¼ of Section 20, Ecklund Township, which was avoided by siting and design of facility (including roads and collection lines).

Photo 12. Direction: South. Intersection of 52nd St NE with 266th Ave NE. The collection line had been bored under the intersection. There was a marker in the ditch but it was damaged from being mown over. This intersection had been widened during construction to bring in the tower components. It had since been reclaimed to the original width. All soils and vegetation were in good condition.

Photo 13. Direction: North. Entrance to access road for Turbines 109 and 110. A "No Trespassing" sign was in place. No problems were noted.

Photo 14. Direction: Northwest. Close-up of junction box (JB61) at entrance to road to Turbines 109 and 110. Cement bollards and gravel were in place around the box with no indication of erosion. Weeds had been sprayed on the gravel area. The tall grass surrounding the box was intermediate wheatgrass, which had been seeded after construction disturbances.

Photo 15. Direction: Northeast. Access leading to Turbine 110, which was within a parcel of planted smooth brome grass (probably CRP land). Note the lighter-colored intermediate wheatgrass on either side of the road going up the hill which had been planted for reclamation. Trees had been removed from the tree row at the fenceline, where an access gate had been installed.

Photo 16. Direction: Northeast. The access road on the hill to Turbine 110 showed signs of erosion on the margin, which was also present on some other access roads.

Photo 17. Direction: North/Northwest. Route of collection line running from Turbine string 109-110 to Turbine string 111-112 across planted grassland (likely CRP land) and cropland. Note the light-colored intermediate wheatgrass which had established well into a dense stand.

Photo 18. Direction: South. Marker (red arrow) in ditch showing route of collection line where it was bored underneath 266th Ave NE.

Photo 19. Direction: Southeast. Approach and gate to access road for Turbine string 108-103 from 266th Ave NE. A culvert was in place underneath the approach. The ditch, vegetation, and cropland were in good condition.

Photo 20. Direction: Southwest. Access road gate at entrance to pasture with Turbines 106-103 in distance. A cattleguard was installed at the gate. The pasture had been reclaimed and seeded to intermediate wheatgrass on the margins of the road and around the turbines. There were no erosion concerns.

Photo 21. Direction: Southwest. Continuation of access road between turbines 105 and 104. Some trees had probably been removed from the tree row from construction of the road, though there were several missing sections in the row due to trees dying from other causes.

Photo 22. Direction: Northeast. Access road to Turbines 101 and 102 from base of Turbine 100. Reclamation and conditions of the facility were good with no concerns.

Photo 23. Direction: South. Collection line crossing of 26th St NE, which had been bored underneath the road. Note marker of line in east ditch (red arrow).

Photo 24. Direction: West. Ditch on approach and access road to Turbine 98. Red marker near field edge marked route of collection line where it crossed 26th St NE. There was also a metal stake in the lower part of the ditch which marked a culvert underneath the approach.

Photo 25. Direction: West. View of access road to Turbine 98, showing where trees were taken out of two tree rows. The edge of the road was muddy in some areas but there were no areas of concern.

Photo 26. Direction: West. Access to Turbine 122 from 66th St NE. Fences were replaced and a gate was installed. Proper signage was in place. The road and adjacent hay crop were in good condition. The junction box (JB71) and the tower facility was in good condition with no erosion, proper signage, grass re-established where soils had been disturbed, and no noxious weeds.

Photo 27. Direction: West. Junction box (JB72) in west ditch of 66th St NE. Red marker indicates where collection line crosses the road toward Turbine string 123-125. There were no concerns noted.

Photo 28. Direction: West. Road to Turbines 119-121, showing Turbine 120 in the distance and road and crop conditions good.

Photo 29. Direction: south. Gravel pad surrounding Turbine 120 with water collecting in depression. Gravel pad is clear of weeds and debris, typical of the facility.

Photo 30. Direction: North. Road going uphill to Turbine 121 in the NE ¼ of Section 28, Ecklund Township. This turbine and Turbine 122 in the distance had been sited within small, fragmented remnants of high quality native prairie on a ridgetop. There were channels of erosion on the road edges, which NextEra had on their maintenance schedule. The non-native plants yellow sweetclover and a wheatgrass species had been used for reseeding. Some native species were retained within the planted area.

Photo 31. Direction: West/Southwest. Road to Turbines 128-126 within rolling hills of native prairie pasture. Cultural sites had been avoided in this area. The edges of the road and the area around the turbine bases had been reclaimed and planted with intermediate wheatgrass (note the light-colored dense tall grass on the edges).

Photo 32. Direction: Southeast. Close-up of erosional channel on access road going uphill between Turbines 128 and 127.

Photo 33. Direction: West. Minor erosion problems on hill toward Turbine 127.

Photo 34. Direction: East/Northeast. From Turbine 126 looking back toward Turbine 127. In this portion of the pasture, the characteristic wheatgrass was not present, though there were indications of seeding drill lines in the soil. Possibly the wheatgrass was planted but did not come up in this area, but it seems more likely that it was not planted and instead the surrounding vegetation was allowed to revegetate naturally.

Photo 35. Direction: Northeast. Cattle had disturbed the gravel pad and soils around Turbine 128.

Photo 36. Direction: Northeast. View of meteorological tower from Turbine 130. Though barely visible in this photo, there were bright orange balls on the tops of the guy wires which served as bird diverters (red arrow).

Photo 37. Direction: West. From base of Turbine 130 downhill to the west with view of access road with minor erosion on edges.

Photo 38. Direction: Southeast. Culvert under road to Turbine string 125-123.

Photo 39. Direction: East. Road to Turbines 117-118.

Photo 40. Direction: West. Road to Turbines 115-116.

Photo 41. Direction: South. One of the tree plantings for a landowner to mitigate for trees and shrubs removed during construction of the facility. Located on either side of the access road to Turbines 115-116.

Photo 42. Direction: North. Collection line markers indicating bore underneath road/approach in foreground going to a Wilton turbine string. In the distance to the north the line continues in the ditch on the west side of 66th St NE towards the portion of the Project in Grass Lake Township.

Photo 43. Direction: Northeast. Scoria pit avoided during siting of the Project facility in the SW ¼ of Section 10, Ecklund Township.

Photo 44. Direction: Southwest. Three junction boxes associated with the Project on the collection line route running north-south in the west ditch of 66th St NE. There were no erosion problems and the disturbed area had been reseeded.

Photo 45. Direction: South. Access road to Turbine 74. Proper signage was in place. All reclamation, roads, and cropland were in good condition, typical of the facility. Note the trees and shrubs spared in the road ditch.

Photo 46. Direction: West. Access road to Turbines 72-71. The conditions of the road, adjacent cropland, and turbine structures were good.

Photo 47. Direction: South. View from approach of Turbine string 67-70 south across 331st St NE toward the man-made hills of the Wilton Mine State Game Management Area, a large area avoided during siting of the facility.

Photo 48. Direction: Southeast. Another view of the mineland area in the distance.

Photo 49. Direction: East. Large jurisdictional wetland complex along 331st Ave NE. Disturbance of the wetland was avoided by boring the collection line underneath the wetland on the north side of the road (photo left). There were no signs that the wetland had been disturbed by trenching.

Photo 50. Direction: West. Example of wetland avoided by siting of the access road and facility to the west of Turbine 81 (on left of photo). This site was within native pasture land, and was planted with intermediate wheatgrass during reclamation.

Photo 51. Direction: East/Northeast. Access road to Turbine string 87-91 which went through rolling, rocky hills of native prairie. There were many cultural sites in this area which were avoided. It appeared there were seeding drill rows in the soil adjacent to the roads and around the turbines, but no intermediate wheatgrass was growing and the vegetation did not appear to have been disturbed.

Photo 52. Direction: Northeast. View of rolling hills and reclaimed vegetation along access road of Turbine string 87-91. Black area was a spot where cattle had disturbed the soil.

Photo 53. Direction: Northeast. An area along the access road of Turbine string 87-91 where the black Geotech fabric underneath the road was surfacing. There was minor erosion on the edges of the road.

Appendix B

Field Observation Points

Appendix B. Field Observation Points (GPS Coordinates)

Point	Feature	Northing (m)*	Easting (m)*	Observation Notes
540	Substation/Staging	5219188.97	370359.51	Parking area at substation not reclaimed, landowner request. Cropland, ditch good.
541	Collection Line	5219122.08	370465.27	Marker for bore under intersection of 52nd St NE & 279th Ave NE.
542	Substation/Staging	5218930.88	370475.96	Approach left from staging area, per landowner request.
543	Access Road Entrance	5218908.21	370478.41	Road to towers 113, 114. Sign, crops, tower good.
544	Access Road Entrance	5218834.51	370454.63	Road to towers 112, 111. Crops good.
545	Tower	5218587.14	369909.54	Tower 111.
546	Wetland Avoided	5218523.54	370468.14	Wetland to west avoided by siting.
547	Collection Line	5217648.31	370447.85	Marker for bore under intersection of 52nd St NE & 266th Ave NE. Intersection had been widened during construction.
548	Access Road Entrance	5217611.90	369895.50	Road to towers 109, 110. JB 61 good.
549	Collection Line	5217586.28	369887.04	Marker for bore under 266th Ave NE. Gate into access road for towers 108-103. Has cattle guard.
550	Tower	5217796.01	367845.28	Tower 100.
551	Access Road Entrance	5217661.13	367454.68	Road to tower 99.
552	Collection Line	5217425.31	367213.88	Marker for bore under 26th St NE.
553	Access Road Entrance	5217098.86	367202.25	Road to tower 98. Trees taken out. No concerns. Marker for bore under 26th St NE.
554	Access Road Entrance	5217314.20	372045.22	Road to tower 122. Gate, road, crops good. JB 71 good. Marker for bore under 66th St NE.
555	Access Road Entrance	5216556.96	372003.66	Road to towers 119, 120, 121. Road, crops good.
556	Access Road Entrance	5214869.26	373603.97	On section line road between access to towers 128-126 and towers 129-130.
557	Erosion/Drainage Issue	5214697.16	373088.46	Minor erosion on road going uphill to turbine 127.
558	Erosion/Drainage Issue	5214786.89	373283.95	Soil disturbance by cattle around turbine 128.
559	Tower	5215174.94	374209.02	Tower 130.
560	Erosion/Drainage Issue	5217437.01	373336.82	No concerns. Example of culvert under access road to tower 125.
561	Erosion/Drainage Issue	5216947.08	372817.62	Water collecting at pad of Tower 123.
562	Collection Line	5220908.36	372134.44	Marker for bore under access road to Wilton turbine string.
563	Collection Line	5221630.05	372149.82	Along collection line route in west ditch of 66th St NE near 3 junction boxes. Condition good.
564	Access Road Entrance	5224040.90	371431.71	Road to towers 93, 94.
565	Erosion/Drainage Issue	5224487.14	371644.63	Washouts/ruts on access road to turbine 94.
566	Access Road Entrance	5224026.77	370783.53	Road to tower 95. Condition good.
567	Access Road Entrance	5225640.31	371232.85	Road to tower 75. Condition good and JB in ditch, good.
568	Access Road Entrance	5225643.25	371043.67	Road to tower 74. No concerns.
569	Access Road Entrance	5224765.31	370507.06	Road to tower 72, 71. Road, crops good. Trees, shrubs taken out near tower 71.
570	Access Road Entrance	5225746.91	368211.39	Road to towers 69, 70.
571	Wetland Avoided	5225704.95	368623.14	Bore under wetland on north side of road. No disturbance visible.
572	Access Road Entrance	5227498.28	372315.73	Road to tower 81. Some erosion.
573	Access Road Entrance	5227769.62	372285.18	Road to towers 79, 80. No problems, field, pastures good.
574	Access Road Entrance	5227026.43	373889.49	Road to 83-85. No concerns.
575	Access Road Entrance	5227332.63	373906.30	Road to 87-91. Some erosion.
576	Tower	5228361.86	374950.65	Tower 91.
577	Erosion/Drainage Issue	5217848.48	370059.55	Erosion on hill on access road.
578	Erosion/Drainage Issue	5216542.57	371647.76	Water collecting on gravel pad near tower 120.
579	Erosion/Drainage Issue	5216811.96	371665.15	Some erosion on edge of road.
580	Erosion/Drainage Issue	5214831.35	373399.00	Minor erosion on edges of road.
581	Erosion/Drainage Issue	5215158.68	374055.25	Some erosion on edge of road on hill.
582	Erosion/Drainage Issue	5227445.21	372619.67	Minor erosion on road.
583	Wetland Avoided	5227471.86	372472.98	Wetland avoided by route of access road.
584	Erosion/Drainage Issue	5227363.98	374220.11	Some erosion on road.