WENCK File #B2579-20
October 2017

Courtenay Wind Farm Project
Post-Construction Inspection Report
PU-15-174/PU-13-064




Prepared for:

North Dakota Public Service Commission

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WENCK
Responsive partner.
Exceptional outcomes.

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APPENDICES

1.0 Executive Summary

The North Dakota Public Service Commission (PSC) retained Wenck Associates, Inc. (Wenck) to complete a post-construction inspection of the Courtenay Wind Farm (Project) in Stutsman County, North Dakota (ND). Northern States Power, doing business as Xcel Energy, acquired the Courtenay Wind Farm from Geronimo Energy (Geronimo). Wenck reviewed Project documents to identify those aspects that required compliance, and visually inspected the Project Area on 30 August 2017.

The Project was well-maintained and appeared to have been constructed as planned with numerous efforts to minimize impacts. Several issues need written verification for the Project to be considered complete and in full compliance. Wenck recommends the PSC take the following steps to resolve these issues.

Recommended Action Steps

- **Request Now**
  - As-built maps and associated GIS/CAD files
  - Documentation of Tree and Shrub Replacement/Mitigation Plan, Planting Report, and annual Survival Reports for three years following planting
  - Documentation on coordination with USFWS about active eagle nest in Project Area

- **Review Internally, Clarify, Then Request if Needed**
  - Several items may need written verification, but the PSC should review since some may not be needed or may be best verified in some other way, including:
    - Post-construction aviation monitoring studies and Bird and Bat Conservation Plan (BBSC)
    - Documentation of USACE wetland permit/easement coordination
    - Photo documentation of reseeded grassland areas

2.0 Background and Scope

2.1 INTRODUCTION

The Courtenay Wind Farm (Project) is located in Stutsman County, North Dakota. Northern States Power Company (NSP), doing business as Xcel Energy (Xcel), submitted to the North Dakota Public Service Commission (PSC) an Application for a Certificate of Convenience and Public Necessity for the 200 MW Courtenay Wind Farm, and for Transfer of Certificate of Site Compatibility Number 36 from Courtenay Wind Farm, LLC to Xcel Energy. NSP acquired Courtenay Wind Farm (CWF) from Geronimo Energy. NSP proposed to develop, construct, own, operate and maintain the Courtenay Wind Farm Project.

The Courtenay Wind Farm Project is a 200 MW wind energy generation facility covering 24,900 acres of land. The Project consists of 100 Vestas wind turbine generators and associated infrastructure. The Project is under the jurisdiction of the North Dakota PSC, which issued its Findings of Fact, Conclusions of Law, and Order in Case No. PU-15-174 (previously PU-13-064 dated 13 November 2013) on 24 August 2014, granting a First Reissued Certificate of Corridor Compatibility No. 36 and Certificate of Public Convenience and Necessity No. 5876 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 Courtenay is 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 for a Certificate of Corridor Compatibility and Route Permit (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 under seven (7) categories: Siting & Location; Project Design & Engineering; Pre-Construction; Cultural Resources; Natural Resources; 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 2017) 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). Green 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

Samantha Swanberg, Wenck Environmental Scientist, visited the Project site on 30 August 2017. Representatives from Xcel Energy, Jayme Orrock and John Bartunek, accompanied Wenck staff during the site visit.

The site was inspected visually by driving to access points and walking within the Project Area at those points. Digital photographs (Canon Power Shot SD1300 IS, 12 megapixels) 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) (**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). Green 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, 8	Courtenay Wind Farm is located in Stutsman County, ND. The Project will consist of 100 Vestas wind turbine generators and associated infrastructure. Associated infrastructure includes access roads, electrical collection system, meteorological monitoring stations, a project collector substation, a transmission line, and an operations and maintenance facility.	Docket #5, Application, PU-13-064; Docket #1, Application, PU-15-174	Section 3.1.1
ND Admin. Code Article 69-06-08; Findings of Fact 17-21	Siting Criteria analysis – exclusion, avoidance, selection, and policy areas. Exclusion areas include prime farmland and farmland of statewide importance present within the Project Area. There were avoidance areas within the Project Area, including the following: cultural resources present within the Project Area, but there will be no direct impacts to such resources; a small portion of the undeveloped land of the city of Courtenay is within the Project Area, but no Project facilities will be located within the city limits; trees and shrubs are present, and Xcel will comply with the Commission's tree and shrub mitigation specifications; wetlands are present within the Project Area, but impacts have been minimized to the extent practicable.	Docket #5, Application, PU-13-064	Section 3.1.2
Findings of Fact 22	The Project and its associated facilities will occupy and disturb up to approximately 50 acres of land, or approximately 0.2 percent of the total Project Area, during the life of the Project.	Docket #5 Application, PU-13-064	Section 3.1.3
Findings of Fact 36, 37; App. p. 7-13	Turbine setbacks: 1400ft from inhabited residences must be designated avoidance areas per the PSC. Stutsman County Wind Turbine Zoning regulations require each wind turbine must be set back at least five rotor diameters from any occupied structure. For a 100-meter rotor diameter this setback equates to 1,641 feet. The Project will comply with Stutsman County zoning regulations.	Docket #5, Application, PU-13-064	Section 3.1.4
Findings of Fact 23, 24	No adverse impacts foreseen to surrounding community, public services, safety. Expected economic benefit.	Docket #5, Application, PU-13-064; Docket #1, Application, PU-15-174	Section 3.1.5

Source of Project Specification	Description of Project Specification	Written Verification*	*Site Verification**
	PROJECT DESIGN & ENGINEERING		
App. p. 1-8; Findings of Fact 3, 8, 10, 12	The Project will have a nameplate (gross) capacity of approximately 200.5 MW, with a projected average annual output of up to 825,546 megawatt hours (MWh) per year, assuming net capacity factors of between 43 and 47 percent.	Docket #5, Application, PU-13-064; Docket #1, Application, PU-15-174	Section 3.2.1
Certification Order Provisions 14, 16	Vesta Turbines, 1.815 MW, 80 m hub height, 100 m rotor diameter. All electrical equipment associated with the turbines, with the exception of pad mounted transformers, will be contained within the solid steel enclosed tubular towers on which the turbines are mounted.	Docket #18, Turbine locations and other supplemental information PU-13-064; Docket #4, Application, PU-13-064	Section 3.2.2
Findings of Fact 39;	The Project substation will be fenced and locked, and will have applicable warning signs. The electricity is collected by a system of underground or overhead power collection lines.	Docket #5, Application, PU-13-064;	Section 3.2.3
ND Century Code Ch. 49-22-24; Findings of Fact 13	Compliance with National Electric Safety Code.	None	Section 3.2.4
Certification Order Provisions 33	Provide engineering design drawings showing surveyed structure and collection substation locations prior to construction upon request.	None	N/A
Certification Order Provisions 35	Provide electronic and paper as-built design specifications and associated GIS files within 3 months after construction is complete.	None	Section 3.2.5
	PRE-CONSTRUCTION		
ND Century Code Ch. 49-22-07.1; ND Admin. Code Article 69-06-03	Letter of Intent.	Docket #1, Letter of Intent, PU-13-064	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 and Route Permit.	Docket #5, Application, PU-13-064; Docket #1, Application, PU-15-174	N/A
ND Century Code Ch. 49-22-07	Certificate of Site Compatibility or Route Permit.	Docket #355, Findings of Fact, Conclusions of Law and Order,	N/A

Source of Project Specification	Description of Project Specification	Written Verification*	*Site Verification**
		PU-13-064; Docket #28, Findings of Fact, Conclusions of Law and Order, PU-15-174	
ND Century Code Ch. 49-22-04; ND Admin. Code Article 69-06-02	Ten-year Plan.	PU-16-489	N/A
Certification Order Provisions 2, 5	Conduct Pre-Construction Conference. Provide notice of intent to start construction.	Docket #63, Letter notice of intent to begin construction activities; Docket #66, Letter of intent to begin construction, permits, request to approve tower location change.	N/A
Certification Order Provisions 34	Inform Commission of plans to modify energy conversion facility, or of any plans to modify the site plan for the energy conversation facility and obtain approval.	Docket #66, Letter of intent to begin construction, request to approve tower location change; Docket #68, Email- staff approval of structure relocations request; Docket #71, Letter enclosing Commission Motion acknowledging staff approval of relocations; Docket #73, Email- staff approval of site plan adjustment request, PU-13-064; Docket #32, Email- staff approval of site plan adjustment request; Docket #34, Letter enclosing Commission motion; Docket #47, Proposed windfarm site revisions; Docket #54, Commission Motion to acknowledge staff approval of site plan revisions, PU-15-174	N/A

Source of Project Specification	Description of Project Specification	Written Verification*	*Site Verification**
Certification Order Provisions 2, 3	Compliance with rules and regulations of other jurisdictional agencies. Obtain permits and approvals from other agencies and provide copies prior to applicable permitted activity.	Docket #4, State Historical Society comments and recommendations; Docket #5, Application; Docket #18, Agency Correspondence; Docket #20, Exhibit 11; Docket #27, Letter comments; Docket #50, Supplement to late-filed; Docket #62, Permits, Pre-construction tree and shrub inventory; Docket #66, Letter of intent to begin construction, permits, request to approve tower location change, PU-13-064	*N/A*
Certification Order Provisions 40	Participate in ND One-Call Excavation Notice System.	None recorded	Section 3.3.5
	CULTURAL RESOURCES		
Findings of Fact 26, 27; Certification Order Provisions 11	Complete Class III cultural resources survey of corridor. Cultural resource sites determined ineligible for National Register of Historic Places. SHPO concurrence provided with Application. No avoidance or mitigation necessary.	Docket #50, Supplement to late-filed, PU-13-064	Section 3.4.1
Findings of Fact 26, 27; Certification Order Provisions 11	Submit cultural resource mitigation plans to SHPO prior to construction for approval. Report discovery of cultural, archeological, historic, etc. sites and stop construction, consult SHPO for clearance, and file report to PSC.	Docket #4, Application; Docket #44, Late-filed Exhibit 16; Docket #50, Supplement to late-filed, PU-13-064	N/A
	NATURAL RESOURCES		
Findings of Fact 32; App. pp. 7-16, 7-18,	CWF conducted environmental studies of the Project Area, including a Whooping Crane Likelihood of Occurrence Survey, a 2012 Fall Avian and Crane Survey, and a 2013 Spring Avian Survey. Expect temporary displacement of wildlife due to clearing and construction, but no significant impacts. No adverse impacts to federally-listed threatened or endangered species are anticipated. An eagle nest was identified within the Project Area,	Docket #5, Application, Appendix C; Docket #20, Exhibit 14 PU-13-064; Docket #25, Late-filed Exhibit NSP-LF2, PU-15-174;	Section 3.5.1

Source of Project Specification	Description of Project Specification	Written Verification*	*Site Verification**
	and CWF is coordinating with USFWS on next steps concerning the nest. CWF will prepare a Bird and Bat Conservation Strategies (BBCS) plan, which will address avian and bat-related mitigation measures.	None - Post-construction bird and bat mortality monitoring and BBCS	
Findings of Fact 20, 31, 38; App. pp. 7-6, 7-12, 7-13;	No permanent impacts or minimal impacts to wetlands or waterbodies are anticipated. CWF coordinated with the USWFS with respect to the location of Project facilities on USFWS wetland easements. Erosion and sediment controls, and other specific construction measures will be used through wetlands, according to permit and application.	Docket #5, Application; Docket #45, Late-filed Exhibit 17, PU-13-064; None - USACE correspondence	Section 3.5.2
Certification Order Provisions 10, 30	Report presence of T+E species, bald or golden eagles during construction and operation.	Docket #64, Courtenay Wind Farm project, PU-13-064	Section 3.5.3
Certification Order Provisions 18	Reclamation, fertilization, and reseeding according to NRCS (or landowner if approved).	None	Section 3.5.4
App. p. 98; Findings of Fact 29, 35; Certification Order Provisions 21	Shrubland avoided to extent practicable. Tree and shrub removal and replacement will comply with “Tree and Shrub Mitigation Specifications”.	Docket # 62, Permits, Pre-construction tree and shrub inventory, final construction layout maps PU-13-064; Docket #65 Landowner waiver of tree replacement, PU-15-174; No documentation of replacement reports or survival monitoring.	Section 3.5.5
Route App. pp. 7-16, 7-19	Control noxious weeds to minimize spread of noxious weeds during construction and life of project.	None	Section 3.5.6
	SOUND AND FLICKER MITIGATION		
Findings of Fact 33; App. p. 3-7, 7-14, 7-15;	An acoustic modeling analysis was performed for the Project. The analysis indicates that sound levels for the Project will comply with the Commission's Avoidance Area requirement that sound levels	Docket #5 Application; Docket #18, Acoustic Screening report; Docket #20, Exhibit 8; Docket #38, Affidavit of service cert. &	Section 3.6.1

Source of Project Specification	Description of Project Specification	Written Verification*	*Site Verification**
	within 100 feet of an inhabited residence or community building not exceed 50 dBA.	reg. mail; Docket #48, Response to Notice Information, PU-13-064	
Findings of Fact 34; App p. 7-14 – 7-15	A shadow flicker analysis was conducted for the Project. The analysis shows no occupied residences are anticipated to have shadow flicker levels of over 30 hours a year. In the event that flicker mitigation is necessary, CWF will work with individual landowners to address issues, and the mitigation measures employed may include adding vegetative screening or installing curtains or blinds on the windows facing the turbine casting shadows.	Docket #5, Application; Docket #18, Shadow Flicker Assessment; Docket #20, Exhibit 8; Docket #38, Affidavit of service cert. & reg. mail; Docket #48, Response to Notice Information, PU-13-064	Section 3.6.2
	CONSTRUCTION, RECLAMATION & SOILS		
Certification Order Provisions 5, 8, 15	Construct and operate in accordance with Application and safety requirements. Construction suspended during adverse weather conditions. Provide weekly construction reports.	Docket #64, 65, 67, 69, Courtenay Wind Farm project weekly construction update PU-13-064; Docket #38-45, 58, 60-64, 66-92 Courtenay Wind Farm Progress report, PU-15-174	N/A
Certification Order Provisions 17	Underground collection and feeder lines buried to a minimum depth of at least 48 inches to the top of the lines.	None	Section 3.7.2
Findings of Fact 38	Soil erosion minimized by use of BMPs during and after construction to protect surface water and soils/topsoil.	None	Section 3.7.3
Certification Order Provisions 16	Topsoil and subsoil must be segregated and replaced separately. Topsoil will be removed and replaced to maximum depth of 12 inches.	Docket #46, Construction Inspection Report, PU-15-174	Section 3.7.4
Certification Order Provisions 13, 14, 19	All crossings of graded roads will be bored. Temporarily disturbed areas and roads will be restored. Pre-existing roads restored to satisfactory condition. Restoration of area to pre-construction contours as soon as practicable upon completion of construction. Reclamation and maintenance throughout life of facility.	None	*Section 3.7.5*

Source of Project Specification	Description of Project Specification	Written Verification*	*Site Verification**
Certification Order Provisions 22, 26	Temporary fences and gates were to be installed as necessary. Repair/replace all damaged fences and gates. Repair/replace damaged drainage tile. Waste removed and disposed regularly.	None	*Section 3.7.6*
	OPERATION		
Certification Order Provisions 7, 8, 30	Construct and operate in accordance with Application and safety requirements. Maintain records of compliance with Order and Certificate of Site Compatibility. Extraordinary events (e.g. injuries, T+E wildlife fatalities) reported as soon as reasonably possible.	None reported to date.	Section 3.8.1
Certification Order Provisions 19, 26;	Reclamation and maintenance throughout life of facility. Waste removed & disposed regularly.	Docket #5, Application, PU-13-064	Section 3.8.2
Findings of Fact 34; Certification Order Provisions 24, 28, 29, 32	Educational materials, as requested, and notification of possible dangers to landowners. Safety measures for traffic control or to restrict public access to the transmission facility. Procedure for handling complaints. Cooperation with landowners/residents to mitigate television and radio interference.	Docket #5, Application, PU-13-064	Section 3.8.3

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

3.0 Findings

3.1 SITING & LOCATION OF FACILITY

3.1.1 Designated Location & Maps of Corridor

The Project was built as proposed in the designated location described in the Application and Order in Stutsman County, North Dakota. The Project was within the corridor approved for Courtenay Wind Farm in Case Number PU-15-174 (previously PU-13-064). The Project Area is composed of private land parcels subject to easement agreements between CWF and Stutsman County landowners. The Project Area covers approximately 24,200 acres, the Project's above ground facilities will occupy less than one percent of that area.

3.1.2 Siting Criteria

Siting criteria were analyzed in detail in the Application for the Project (Docket #5, Application PU-13-064). The route had the following exclusion areas: prime farmland and farmland of statewide importance. The Commission found that the prime farmland and unique farmland that would be removed from use for the life of the facility is of such small acreage as to be of negligible impact on agricultural production. Also, the following exclusion areas are present within the Project Area: areas less than one and one-tenth times the height of the turbine plus seventy-five feet from the centerline of county or maintained township roadways; areas less than one and one-tenth times the height of the turbine from any railroad right-of-way (ROW); and areas less than one and one-tenth times the height of the turbine from the property line of a nonparticipating landowner. However, all Project turbines have been sited outside of these areas. The Project Area had the following avoidance areas: cultural resources, land within city limits, trees and shrubs, and wetlands. Cultural resources are present within the Project Area, but there will be no direct impacts to such resources from Project facilities. A small portion of the undeveloped land of the city of Courtenay is located within the Project Area, but no Project facilities will be located within the city limits. Trees and shrubs are present, but Xcel will comply with the Commission's tree and shrub mitigation specifications with respect to any tree or shrub removal. Wetlands are present within the Project Area, but impacts have been minimized to the extent practicable (Docket #55, Findings of Fact, Conclusion of Law and Order). Wenck also confirmed that impacts to selection and policy criteria were considered and kept at a minimum.

3.1.3 Land & Agricultural Impacts

The Project was built as proposed within the estimated construction ROW. The current land use within and surrounding the Project is rural in nature, with cultivated row cropping being the primary use. Farmsteads are scattered within the Project Area near accessible roads. No known center pivot irrigation systems are present (Docket #5, Application PU-13-064). The Project Area contains approximately 24,200 acres and approximately 20,800 privately-owned acres are currently leased for the Project. The Project and its associated facilities will occupy and disturb up to approximately 50 acres of land, less than one percent of the total Project Area, during the life of the Project (Docket #5, Application PU-13-064). Landowners can continue to plant crops near and graze livestock up to the turbine pads. Agricultural

practices will be impacted by requiring maneuvering of agricultural equipment around turbine structures. CWF negotiated easements with landowners.

At the time of the inspection, the land had been restored to its pre-construction contours and had been seeded in fall 2016 and summer 2017. Generally, areas impacted by construction (except above ground facilities) were returned to previous land use, including cropland and rangeland. However, there were annual weeds present in reclaimed grasslands, which is typical during the first year after reclamation.

3.1.4 Setbacks

Turbines will be setback at least 1,400 feet from occupied residences (Docket #5, Application PU-13-064). Stutsman County Wind Turbine Zoning regulations require each wind turbine must be set back at least five rotor diameters from any occupied structure. For a 100-meter rotor diameter this setback equates to 1,641 feet. The Project will comply with Stutsman County zoning regulations.

The nearest residence appears to be 1,682 feet (residence U) from the nearest turbine. It was previously 1,560 feet (residence Y), but there is no longer a resident dwelling at that location (Docket #18, Exhibit 4; Docket #53, Correction to Application Exhibit 4, PU-13-064). Setbacks appeared to be appropriate according to the site visit.

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

3.2 PROJECT DESIGN & ENGINEERING

3.2.1 Capacity

The Project will have a nameplate (gross) capacity of approximately 200.5 MW, with a projected average annual output of up to 825,546 megawatt hours (MWh) per year, assuming net capacity factors of between 43 and 47 percent. Associated infrastructure includes access roads, electrical collection system, meteorological monitoring stations, a project collector substation, a transmission line, and an operations and maintenance facility. (Docket #1, Application PU-15-174). The site inspection observations coincide with these parameters.

3.2.2 Turbine Specifications

All turbines were constructed as specified, 1.815 MW, 80 m hub height, 100 m rotor diameter (Docket #18, Turbine locations and other supplemental information PU-13-064). Each turbine had a concrete foundation, a control panel in the tower base, wind speed and direction sensor that communicates to the turbine control system. Lightning protection will be consistent with the wind turbine supplier's design and specifications and local utility or code requirements (Docket #4, Application PU-13-064). The Project uses a Supervisory Control and Data Acquisition (SCADA) system, which allows remote control and monitoring of the status of all turbines in the Project (Docket #4, Application PU-13-064). Lighting was

not confirmed since the inspection took place during daylight hours but is assumed to be in compliance with the Federal Aviation Administration (FAA).

3.2.3 Collection Line & Substation

The Project substation was fenced off and there were warning signs. Several points along the collection line system were observed and it appeared to be constructed where proposed. Points where the collection line was bored under major roads were observed and no concerns were noted. Markers were in place.

3.2.4 National Electric Safety Code

There was no written verification or certification of compliance with the National Electric Safety Code, but it is assumed that the Project is under compliance in order to operate.

3.2.5 As-built Drawings and GIS Files

No as-built alignment drawings were submitted to the PSC to date. No associated GIS or CAD files (acceptable alternative to GIS) have been received. The PSC should pursue receipt of the drawings and their accuracy should be confirmed.

3.3 PRE-CONSTRUCTION

3.3.1 PSC-Required Documents

A letter of intent was received 1 February 2013 (Docket #1, Letter of Intent PU-13-064). An Application for the Project was filed on 12 April 2013 (Docket #1, Application PU-13-064) by Courtenay Wind Farm, LLC (Geronimo) and on 30 April 2015 (Docket #1, Application PU-15-174) by NSP. A First Reissued Certificate of Corridor Compatibility No. 36 and Certificate of Public Convenience and Necessity No. 5876 for the Project were issued on 24 August 2015. The certificate is issued in accordance with the Finding of Fact, Conclusion of Law and Order of the Commission in Case No. PU-13-64 dated November 13, 2013 and Case No. PU-15-174 dated August 24, 2015 and is subject to the conditions and limitations noted in those orders (Docket #28, Findings of Fact, Conclusions of Law and Order).

A Ten-Year Plan for NSP was filed in docket PU-16-489.

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

A pre-construction conference was held on 27 March 2014 prior to tree clearing with the tree clearing contractor and a second pre-construction meeting was held on 13 October 2014 with the construction contractor. Meeting minutes were taken, as well as a list of attendees (Docket #63, Letter notice of intent to begin construction activities; Docket #66, Letter of intent to begin construction, permits, request to approve tower location change). No Land Agent Contact was listed in the meeting minutes. The minutes stated that the initial construction phase was due to begin on the last week in October or the first week in November 2014.

3.3.3 PSC Approval of Modifications

On 7 November 2014, 10 September 2015, and 11 May 2016 CWF filed notifications of project route adjustments (Docket #66, Letter of intent to begin construction, request to approve tower location change; Docket #73, Email- staff approval of site plan adjustment request PU-13-064; Docket #32, Email- staff approval of site plan adjustment request; Docket #34, Letter enclosing Commission motion; Docket #47, Proposed windfarm site revisions; Docket #54, Commission Motion to acknowledge staff approval of site plan revisions PU-15-174). The route adjustments were necessary under N.D.C.C. 49-22-16.3(1). The Commission acknowledged that they received CWF's filing. Route adjustments for the Project were all located inside the designated corridor in Stutsman County.

3.3.4 Permits and Approvals from Other Agencies

It was indicated in the Application that consultation with federal, state, and local agencies would be required to obtain permits for the Project. Agencies consulted with and permits identified as required for the Project included:

- U.S. Fish and Wildlife Service (USFWS)
- U.S. Army Corps of Engineers
- North Dakota Game and Fish Department (NDGFD)
- North Dakota Parks and Recreation Department (NDPRD)
- North Dakota State Historical Preservation Office (SHPO)
- North Dakota Department of Health (NDDH)
- North Dakota Department of Transportation
- North Dakota State Water Commission
- North Dakota Industrial Commission
- Federal Aviation Administration – Southwest Regional Office
- Stark Preservation Planning LLC
- North Dakota Geological Survey
- Division of Community Services
- North Dakota Land Department
- North Dakota Aeronautics Commission
- North Dakota Soil Conservation Committee – NDSU Extension Service
- North Dakota Pipeline Authority
- North Dakota Transmission Authority
- North Dakota Department of Career and Technical Education
- North Dakota Department of Human Services
- North Dakota Industrial Commission
- North Dakota Department of Labor
- North Dakota Attorney General
- North Dakota Department of Agriculture
- North Dakota Indian Affairs Commission
- North Dakota Highway Department
- Job Service of North Dakota
- Minot Airforce Base – 5OSS/Airspace
- North Dakota Economic Development and Finance Division
- North Dakota Energy Development Impact Office
- North Dakota Governor's Office
- North Dakota Department of Commerce
- Stutsman County Board of Commissioners

Associated permits were filed with the PSC as required (Docket #5, Application; Docket #4, State Historical Society comments and recommendations; Docket #18, Agency Correspondence; Docket #20, Exhibit 10; Docket #27, Letter comments; Docket #62, Permits, Pre-construction tree and shrub inventory; Docket #66, Letter of intent to begin construction, permits, request to approve tower location change). Consultations with the above-mentioned agencies and their approval have been documented with the PSC. Not all agencies responded or commented back (Docket #5, Application).

3.3.5 North Dakota One-Call Participation

There was no written documentation that CWF participated in North Dakota One-Call. In the application, CWF does state they will comply with North Dakota One Call requirements (Docket #5, Application PU-13-064). No reports of damage to underground facilities were reported to the PSC. It appeared no damage to facilities occurred during construction. Based on these indications, it can be assumed that Courtenay participated in ND One-Call as required.

3.4 CULTURAL RESOURCES

3.4.1 Cultural Site Avoidance

CWF provided the State Historical Society of North Dakota's State Historic Preservation Office (SHPO) with the February 11, 2013 Literature Search Report (Docket #5, Application Appendix E). SHPO responded in a letter dated February 26, 2013 (Docket #5, Application Appendix H). The February 2013 letter from SHPO recommended a Class II (reconnaissance) survey by a permitted architectural historian for standing structures in the visual Area of Potential Effect (APE), and a Class III (pedestrian) survey for all areas directly impacted by the Project, including crane paths, access roads, transmission lines and turbine pads. Before construction of the Project, CWF will conduct a Class III field inventory of the Project Area in an effort to identify all potential cultural, archaeological, and architectural resources (Docket #4, Application PU-13-064).

The North Dakota SHPO reviewed the Class III Cultural Resources Survey and concurred with a "No significant sites affected" determination for the Project (Docket #44, Late-filed exhibit 16; Docket #50, Supplement to late-filed Exhibit 15 PU-13-064).

Therefore, no historic properties were affected by construction and no mitigation plans were deemed necessary. No discoveries of cultural or historic materials were reported in the weekly progress reports during construction.

3.5 NATURAL RESOURCES

3.5.1 Wildlife

CWF had conducted a Tier 2 Site Characterization to assess the Project Area for potential impacts to wildlife according to Tier 2 of the recommendations of the United States Fish and Wildlife Service's (USFWS) Land Based Wind Energy Guidelines (LBWEG), along with a Whooping Crane Likelihood of Occurrence Survey, a 2012 Fall Avian and Crane Survey, and a 2013 Spring Avian Survey (Docket #5, Application Appendix C; Docket #20, Exhibit 14 PU-13-064). Temporary displacement of wildlife is expected due to clearing and construction, but no significant impacts. No adverse impacts to federally-listed threatened

or endangered species are anticipated. An eagle nest was identified within the Project Area, and CWF stated it was coordinating with USFWS on next steps concerning the nest, but no further documentation is provided in the case file indicating how impacts to the eagle or nest were resolved.

The application also stated that Courtenay will prepare a Bird and Bat Conservation Plan (BBCS) with the input of the USFWS and NDGFD and implement the plan once complete. A Conservation Plan Summary was filed on 30 July 2015 (Docket #25, Late-filed Exhibit NSP-LF2 PU-15-174). In the application CWF stated mitigation measures would include an BBCS document, post-construction bird and bat mortality monitoring, revegetation, tree replacement, avoiding or minimizing disturbance to individual wetlands or drainage systems, avoiding and minimizing impacts to native prairie, and maintaining appropriate water and soil conservation practices. The BBSC and post-construction bird and bat mortality monitoring documents were not found on file.

Measures were proposed to minimize impacts to wildlife in the Project Area and Wenck verified several of these measures. The electrical collection system connecting the turbines to the Project substation were buried underground, where possible, to avoid bird collisions.

3.5.2 Wetlands

In a letter dated 6 February 2013, the U.S. Army Corps of Engineers (USACE) indicated that a Department of the Army permit may be required for all or part of the Project for potential impacts to wetlands. The Corps of Engineers requested further information to fully evaluate the Project via a permit application (Docket#5, Application PU-13-064). A wetlands and waters survey report (Docket #45, Late-filed Exhibit 17 PU-13-064) was filed on 25 October 2013. CWF stated in the application that they worked with the USFWS to avoid any permanent impacts to all wetland basins subject to USFWS wetland easements. No additional correspondence between CWF and the USACE and no USACE permit was in the case file to verify USACE final approval. During the construction inspection, it appeared that wetlands were avoided in the overall Project design (**Appendix A**, Photo 16). It appeared that access roads and turbine pads were routed around wetland basins to avoid them.

3.5.3 Reporting

Weekly construction reports were submitted for the Project (Docket #64, 65, 67, 69, Courtenay Wind Farm Project weekly construction update PU-13-064; Docket #38-45, 58, 60-64, 66-92 Courtenay Wind Farm Progress report). No other types of reports were submitted indicating disturbance or presence of threatened or endangered species during construction or operation. In an April 2014 construction progress report, CWF provides notice that it has observed a new active bald eagle nest in the Project Area; and stated that the United States Fish and Wildlife Service (USFWS) is aware of the new nest, and coordination with USFWS regarding eagle-related matters is on-going (Docket #64, Courtenay Wind Farm Project – week ending 4-18-2014). No further documentation is provided in the case file indicating how impacts to the eagle or nest were resolved. Wenck recommends the PSC request information on how this issue was resolved during operation of the Project.

3.5.4 Reclamation & Reseeding

At the time of the site inspection reseeding had been completed in non-cropland areas. Reclaimed areas in croplands had been planted with the crops in spring 2017. Reseeding non-cropland areas had started in fall 2016 and finished in May 2017. Cropland areas were on the right trajectory but still somewhat stunted or thinner in the reclaimed area (**Appendix A**, Photos 1, 6, 16). Through communication with the Xcel representative, he stated the seed list was recommended by NRCS and landowners. The typical seed mix included western wheatgrass, green needlegrass, slender wheatgrass, Canada wildrye, and Dacotah switchgrass as cover crops. Seeded grasses were growing in most areas along with annual weeds and some native plants (**Appendix A**, Photos 4, 9, 14, 15, 18, 19, 20). Annual weeds are typical the first year after re-seeding. Native grassland areas had annual weeds though out, Wenck recommends the PSC request photo documentation from Xcel grasses have fully established in all grassland re-seeded areas of the project.

3.5.5 Tree & Shrub Mitigation

A tree and shrub count was done within the area expected to be impacted by construction which stated that 66 trees (28 were dead) and 78 shrubs were inventoried with the construction corridor (Docket # 62, Permits, Pre-construction tree and shrub inventory, final construction layout maps PU-13-064). The Pre-Construction meeting noted that tree and shrub clearing would be completed before 15 April 2014 to minimize environmental impacts on the nesting of migratory birds (Docket # 62, Permits, Pre-construction tree and shrub inventory, final construction layout maps PU-13-064). During the 2015 wind farm construction season it was necessary to remove a tree on a parcel of land in Section 24. The landowner waived his right to the replanting on his property and the replacement trees will be donated to the City of Wimbledon's memorial (Docket #65 Landowner waiver of tree replacement PU-15-174).

It appeared that in general, major woody areas were avoided through Project siting. The Xcel representative thought that no trees were removed from the Project site. However, other than documentation of the tree removed in Section 24, there were no post-construction Tree and Shrub replacement plans or mitigation/survival monitoring reports found in the documentation that would indicate the inventoried trees and shrubs to be removed were replaced as required by the PSC's Tree and Shrub Mitigation Specifications. Wenck recommends the PSC request the required documentation.

3.5.6 Noxious Weeds

It was stated in the Application that noxious weeds would be controlled in the immediate vicinity of the turbines, access roads, and associated facilities, immediately after construction and periodically for the life of the Project. The Application also stated that CWF would develop a management plan to prevent the spread of noxious weeds throughout the Project Area during construction and ongoing operations in accordance with state and county regulations (Docket #5, Application PU-13-064). The case file did not have any noxious weed management plans on record. Annual weeds were observed near the turbine pads and access roads, which is typical in the first year after reclamation and planting. Canada thistle, a noxious weed, was found in road ditches near a reclaimed area along the Project. At the time of the site visit weeds had recently been sprayed around the pads. Annual weeds should be sprayed or mowed to keep junction box clearly visible (**Appendix**

A, Photo 12). The Xcel rep stated that weeds had recently been sprayed around the pads at the time of the inspection, and that they would spray for weeds in the spring and fall.

3.6 SOUND & FLICKER MITIGATION

3.6.1 Sound Mitigation

The acoustic modeling analysis completed for the Project indicates that sound levels for the Project will comply with the Commission's Avoidance Area requirement that sound levels within 100 feet of an inhabited residence or community building not exceed 50 dBA (Docket #18, Acoustic Screening Report PU-13-064). Prior to construction, there were landowner concerns about noise near their residences/properties (Docket # 38, Affidavit of service cert. & reg. mail; Docket# 48, Response to Notice Information). There was no explicit requirement for CWF/Xcel to submit post-construction sound level information, and none has been filed. No formal complaints have been filed with the PSC since construction has been complete and the Project has been in operation. Wenck received verbal confirmation from Xcel staff that landowner and resident concerns are addressed promptly and that Xcel makes every reasonable attempt to alleviate problems caused by the facility.

3.6.2 Flicker Mitigation

Preliminary studies by CWF found that no occupied residences within the Project Area had the potential to receive more than 30 hours per year of shadow flicker impacts (Docket #18, Shadow Flicker Assessment Report PU-13-064, Docket #20, Exhibit 8 PU-13-064). Prior to approval and construction of the Project, there were landowner concerns about flashing lights near their residences/properties (Docket #38, Affidavit of service cert. & reg. mail; Docket #48, Response to Notice Information). No formal complaints have been filed with the PSC since construction has been complete and the Project has been in operation.

3.7 CONSTRUCTION, RECLAMATION & SOILS

3.7.1 Construction Management & Safety

Weekly construction reports were submitted for the duration of construction (Docket #64, 65, 67, 69, Courtenay Wind Farm Project weekly construction update PU-13-064; Docket #38-45, 58, 60-64, 66-92 Courtenay Wind Farm Progress report PU-15-174). Reports indicated that construction of the Project proceeded in accordance to the Application and safety requirements. Progress reports did indicate delays in construction due to weather (Docket #65, Courtenay Wind Farm Project).

3.7.2 Utility Lines

For installation of collection lines, it appeared that county road and highway crossings had been bored. CWF reported that the bores for road crossings began and ended further out in adjacent agricultural fields, not in the road ditches. The Xcel representative stated that utility lines were buried to at least 48 inches.

3.7.3 Erosion & Sedimentation

The Project Application states BMPs would be used during and after construction to minimize soil erosion and protect topsoil and surface water (Docket #5, Application). At the time of inspection straw wattles were observed at an access road along a hillside and between a road and wetland (**Appendix A**, Photos 3, 4, 20). Culverts and drainage structures were installed where necessary to allow for the natural flow of water (**Appendix A**, Photo 9). In general, erosion problems were minor and infrastructure of the Project Area was well maintained.

3.7.4 Soil Segregation and Staging

In general, it appeared that measures were taken to minimize the overall impact of the Project and the extent of land and soil disturbance. In a previous inspection the contractor stated that for the pad areas, topsoil was stripped to the color change in the soil, which averaged 6 to 8-inch depth (Docket #46, Construction Inspection Report PU-15-174).

3.7.5 Reclamation & Roads

There were weekly construction reports to indicate that cleanup and reclamation had occurred concurrently with construction activities. At the time of the inspection, construction and re-seeding was completed. All roads within the Project Area that were bored under appeared to be in good condition and properly maintained. There were low water crossings installed along certain access road locations as needed which appeared to be in good condition (**Appendix A**, Photo 9). The Xcel representative stated they will re-grade and dress the roads every year.

3.7.6 Fencing, Repairs & Waste

Existing fences or gates that were impacted by construction appeared to be replaced or repaired as needed. No waste debris was 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. Examples of operational safety measures observed at the site include: use of personal protective equipment, warning signs, and vehicle safety measures (**Appendix A**, Photos 3, 7, 8). No reports of extraordinary events were filed to date with the PSC.

3.8.2 Maintenance

The Application states that as part of its operational and maintenance activities, each turbine will receive annual inspections that will include inspections of the various components (wind braking system, lubricants, balance, terminal checks) and the Project will be continuously monitored via the SCADA system (Docket #5 Application). 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 3, 7, 11, 12, 13). There was a security fence in place surrounding the substation (**Appendix A,** Photos 8, 10). There were signs at entrances to tower access roads at each intersection with a county road or highway, the signs denoted the tower identification numbers for the towers in each string. At a location along a county road, CWF put up signs “Hill Blocks View”. Wenck received verbal confirmation from Xcel staff that landowner and resident concerns are addressed promptly and that CWF makes every reasonable attempt to alleviate problems caused by the facility. However, there were no formal procedures on file for how Xcel handles complaints or explanation 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 plans 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 suggests these items be on file with the PSC to confirm compliance and recommends the PSC request from Courtenay Wind Farm the following list of "Necessary" items, and if the PSC deems appropriate, the list of "Potential" items could also be requested.

Necessary Items

- Provide as-built maps and associated GIS/CAD files.
- Documentation of Tree and Shrub Replacement, Planting Report, and annual Survival Reports for three years following planting.
- Documentation on coordination with USFWS about active eagle nest in Project Area.

Potential Items

- USACE wetland permit/easement coordination.
- Post-construction aviation monitoring studies and Bird and Bat Conservation Plan (BBSC).
- Photo documentation of reseeded grassland areas until grasses are fully established.

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. The issues that need to be resolved before the Project is considered complete and in full compliance involve receiving written documentation including the following: as-built maps/specifications and GIS files; documentation of coordination with USFWS regarding eagle activity; documentation of USACE wetland coordination and documentation of Tree and Shrub Mitigation, Planting, and Survival reports.

6.0 References

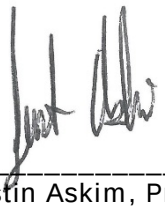
North Dakota Public Service Commission (ND PSC). 2017. Online Case Search. Available from: http://www.psc.nd.gov/database/company_case_list.php. Accessed August-October 2017.

Orrock, Jayme and Bartunek, John 2017. Xcel Energy. Personal Communication: discussion during site visit on 30 August 2017.

7.0 Signatures

The services performed by Wenck staff 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.

Project Manager, Justin Askim, and Lead Inspector/Environmental Scientist, Sam Swanberg, prepared the report.



_____ 10/11/2017

Justin Askim, Principal/Project Manager Date

_____ 10/11/2017

Sam Swanberg, Lead Inspector/Environmental Scientist Date

Appendix A

Photographs

Photo 1. (GPS Point #548) – View of base of Turbine 100. Gravel pad/access road surrounds turbine, there is a 16-ft radius around the turbine for the road/gravel pad. Weeds (brown in color) next to the turbine base by stairs have been sprayed, they will be sprayed in the spring and fall for this project. The corn next to the access road, where it has been reclaimed, is somewhat stunted. Direction: North.

Photo 2. (GPS Point #548) – Access road near Turbine 100. The access road is within a cropped corn field. Direction: South.

Photo 3. (GPS Point #549) – Access road to Turbines 95-98. Warning sign shown. Straw wattles shown to the left of the access road. This access road was cut into the side of the hill. Direction: West.

Photo 4. (GPS Point #549) – Access road to Turbines 95-98 (same area as photo above). The access road was cut into side of the hill and this area was reclaimed, it has annual weeds growing which is typical for the 1st growing season after re-seeding. Note straw wattle by edge of road (weed growth is covering most of the wattle), wetland to the right of photo. Canada thistle (not shown) was observed near the reclaimed area in the county road ditch. Direction: West-northwest.

Photo 5. (GPS Point #550) – View of low water crossing that was installed on an access road. The concrete is approximately 6-inch depth to help stabilize the road. Direction: North.

Photo 6. (GPS Point #551) – View of Turbine 59, in soybean field. Crops were coming along well but still somewhat thinner in reclaimed areas. Direction: North.

Photo 7. (GPS Point #551) – View of base of Turbine 59. Safety warning signs were in place. Box has two cement bollards and gravel around it. Weeds have been recently sprayed. Direction: Southeast.

Photo 8. (GPS Point #552) – View of substation for Courtenay Wind Farm. The area is fenced. Direction: East.

Photo 9. (GPS Point #552) – Courtenay Wind Farm Substation to the left of photo. Culvert with rocks were installed, no sedimentation or erosion were observed. This area had previously been washed out but has been reclaimed. Direction: Southeast.

Photo 10. (GPS Point #552) – Courtenay Wind Farm Substation to the left of photo. Trees were planted near fenced area. Trees were to be planted in front of the substation to help screen the view of the substation as per an agreement with a landowner. A few of the trees appear to be dying. Direction: Southeast.

Photo 11. (GPS Point #553) – Underground line marker by road. Direction: West.

Photo 12. (GPS Point #553) – Underground line marker by road. Lines connect to substation. Junction box has cement bollards surrounding it. Annual weeds should be sprayed or mowed to keep junction box clearly visible. Direction: East.

Photo 13. (near GPS Point #553) – View of line markers. Underground line connects to substation. There looks to be a slight unevenness in field, unsure if it is from underground lines, natural topography, or something else. Direction: South.

Photo 14. (near GPS Point #554) – Area has been reseeded with recommended NRCS seed mix. Some non-planted native species are coming in such as wild sunflowers and foxtail barley. Area has some annual weeds which is typical in first year after re-seeding. Direction: East.

Photo 15. (GPS Point #554) – Area has been reseeded with recommended NRCS seed mix. Most of the yellow flower heads here are sow thistle (a weed), not wild sunflowers. Direction: East.

Photo 16. (GPS Point #555) – Near Turbine 49. This area has been reclaimed back to cropland (soybeans). Crops were somewhat thinner or stunted in the reclaimed area. There was previously a silt fence near the wetland. Direction: West.

Photo 17. (GPS Point #556) – Access road Near Turbine 31 in CRP land. Direction: South.

Photo 18. (GPS Point #556) – Access road and pad by Turbine 31 in CRP land, that has annual weeds growing throughout, primarily kochia. Direction: Northwest.

Photo 19. (GPS Point #557) – The road (Hwy 9 and 89th Ave) had been widened so equipment and vehicles could make the turn during construction. Area has been restored. Direction: South.

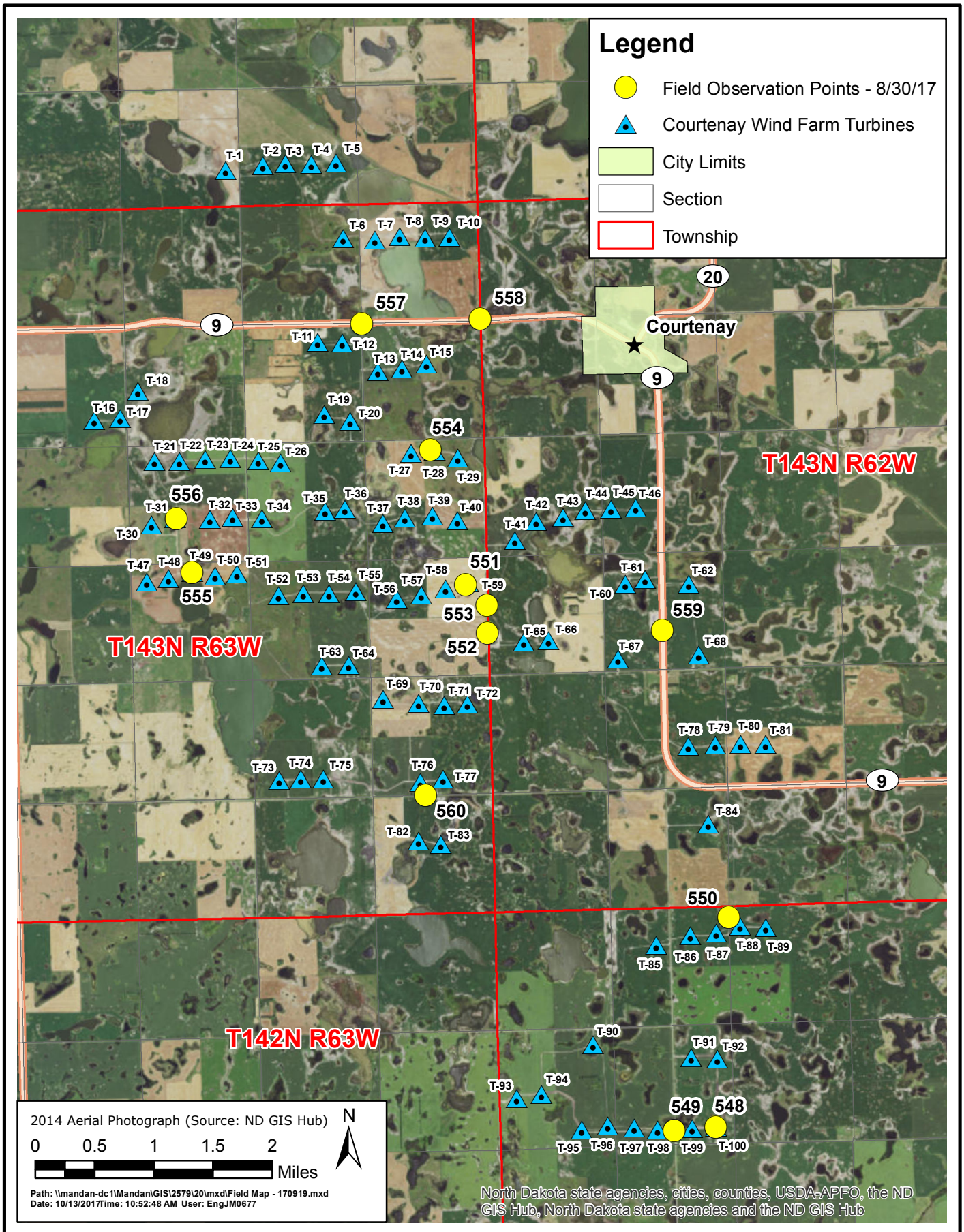
Photo 20. (GPS Point #558) – The road (Hwy 9 and 90th Ave) had been widened so equipment and vehicles could make the turn during construction. Area is being restored; some vegetation is starting to grow, but bare soils are present. There are straw wattles in place near the wetland to prevent sedimentation. The Xcel representative stated they are monitoring this area. Direction: West.

Photo 21. (GPS Point #559) – This area was previously part of the laydown yard. Most of the area has been reseeded and reclaimed, except for the dirt and gravel piles, which the landowner asked to be left there. Direction: West-northwest.

Photo 22. (GPS Point #559) – This area was previously part of the laydown yard. Most of the area has been reseeded and reclaimed. The landowner asked for the dirt/gravel piles to be left. Direction: West-southwest.

Appendix B

Field Observation Points



NORTH DAKOTA PUBLIC SERVICE COMMISSION

Field Observation Map

WENCK ASSOCIATES

Responsive partner. Exceptional outcomes.

OCT 2017

Figure 1

Responsive partner.
Exceptional outcomes.

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