

Conditional Use Permit Application
Grant County, SD
Crowned Ridge Wind, LLC
Crowned Ridge Wind II, LLC

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Crowned Ridge Wind, LLC
Crowned Ridge Wind II, LLC

GRANT COUNTY NOTICE OF APPEAL
CONDITIONAL USE PERMIT/VARIANCE APPLICATION

DATE: September 17th, 2018 PERMIT NUMBER _____

APPLICANT (PRINT): Crowned Ridge Wind, LLC and Crowned Ridge Wind II, LLC PHONE: 561-694-3913

ADDRESS (PRINT): 700 Universe Blvd., Juno Beach, Florida, 33408

OWNER (PRINT): _____ PHONE : _____

IF DIFFERENT THAN APPLICANT

ADDRESS (PRINT): _____

I/WE, THE UNDER SIGNED, ~~DO HEREBY PETITION~~ THE BOARD OF ADJUSTMENT OF GRANT COUNTY, SOUTH DAKOTA, TO ISSUE A CONDITIONAL USE PERMIT OR VARIANCE FOR

(CIRCLE APPROPRIATE REQUEST)

THE PROPERTY DESCRIBED AS: LEGAL DESCRIPTION (PRINT) _____

Crowned Ridge Wind, LLC and Crowned Ridge Wind II, LLC

PARCEL NUMBER: 194 Participating Parcels

SITE STREET ADDRESS: N/A

EXISTING LAND USE: Agriculture EXISTING ZONING: AG C/I PD NR
(CIRCLE ONE)

SIZE OF PARCEL: ACRES 11.090.049 LOT DIMENSIONS: WIDTH (FRONTAGE) _____ DEPTH _____

SURROUNDING LAND USE: NORTH: Shallow Aquifer
SOUTH: Stability
EAST: Stability
WEST: Stability

CONDITIONAL USE PERMIT:
PLEASE DESCRIBE WHAT YOU PROPOSE TO DO AND WHY YOU ARE SEEKING A CONDITIONAL USE PERMIT (ATTACH A SEPARATE SHEET OF PAPER IF NECESSARY). A Conditional Use Permit for a Wind Energy System is requested for construction and operation of the 72.8 MW Crowned Ridge Wind and Crowned Ridge II Wind Farms. Facilities will include approximately 32 turbines.

VARIANCE:
IF YOU ARE SEEKING A VARIANCE PLEASE PROVIDE A BRIEF STATEMENT OF THE VARIANCE DESIRED AND PLEASE STATE THE HARDSHIP REQUIRING RELIEF. (PROOF OF HARDSHIP IS ON THE APPLICANT – HARDSHIP EXAMPLES ARE ODD SIZE OR SHAPE OF THE LOT, UNUSUAL TOPOGRAPHY, ETC. ATTACH A SEPARATE SHEET OF PAPER IF NECESSARY).

SIGNATURE OF APPLICANT: *Tyler Wilhelms*
SIGNATURE OF OWNER (IF DIFFERENT THAN APPLICANT): _____

NOTE: A SKETCH OF PROPOSED PROPERTY SHALL ACCOMPANY THIS APPLICATION, SHOWING THE FOLLOWING:
1. NORTH DIRECTION
2. DIMENSIONS OF PROPOSED STRUCTURE
3. STREET NAMES
4. OTHER INFORMATION AS MAY BE REQUESTED
5. LOCATION OF PROPOSED STRUCTURE ON LOT
6. DIMENSIONS OF FRONT AND SIDE SETBACKS
7. LOCATION OF ADJACENT EXISTING BUILDINGS
THE BOARD OF ADJUSTMENT MAY REQUIRE THAT SUCH PLANS BE PREPARED BY A REGISTERED ENGINEER OR LAND SURVEYOR.

DATE FILED WITH ZONING OFFICER 9/17/2018 FEE PAID (NON-REFUNDABLE) (Y) \$200.00
HEARING DATE & TIME _____ ACTION BY BOARD _____

Conditions of permit:

WARNING: Original document has a reflective watermark on reverse side. Hold at an angle to view.

Crowned Ridge Wind II LLC
 700 Universe Blvd
 Juno Beach, FL 33408

Check Date: **08/13/2018**

Exhibit A20-5 ⁶⁴⁻¹²⁷⁸/₆₁₁
 Check No. **5000000100**

BANK OF AMERICA, NA

TWO HUNDRED DOLLARS

\$200.00

PAY TO THE ORDER OF

GRANT COUNTY
 210 E 5TH AVENUE
 MILBANK SD 57252-2433

Void after 180 days

Crowned Ridge Wind II LLC

SIGNATURE HAS A COLORED BACKGROUND • BORDER CONTAINS MICROPRINTING

⑈ 5000000100⑈ ⑆061112788⑆ 335 998 128 2⑈

Crowned Ridge Wind II LLC (6403 000013)
 Vendor Name: GRANT COUNTY

Check Date : 08/13/2018
 Check Number: 5000000100

Invoice Number	Invoice Date	Document Header Text	SAP Document	Gross Amount	Discount	Net Amount
08/09/2018	08/09/2018	CROWNED RIDGE WIND II APP	1900000032	200.00	0.00	200.00
		Check Total.....				\$200.00

September 17, 2018

Krista Atyeo-Gortmaker
Grant County Planning & Zoning
210 East 5th Avenue
Milbank, SD 57252-2499

Re: Grant County - Conditional Use Permit Application for Crowned Ridge Wind, LLC and Crowned Ridge Wind II, LLC

Dear Mrs. Atyeo-Gortmaker,

Crowned Ridge Wind, LLC & Crowned Ridge Wind II, LLC respectfully requests your review and consideration of the enclosed application for a Conditional Use Permit Section (§)504 to construct and operate an Energy System (WES) in Grant County §1211.

Enclosed with this letter for the application is a participating property owner list, corresponding map, and a project overview. Also included are all maps, plans, studies, reports, and analyses required for submittal per §1211 Energy System (WES) Requirements of the Grant County Ordinance [Ord. 2004-1].

Please do not hesitate to contact me if you have any questions or concerns.

Sincerely,

A handwritten signature in black ink that reads "Tyler Wilhelm". The signature is written in a cursive, flowing style.

Tyler Wilhelm
Project Manager, Renewable Development
Crowned Ridge Wind, LLC
Crowned Ridge Wind II, LLC
(561) 694-3193
Tyler.Wilhelm@NextEraEnergy.com

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- Appendix B:** Map of easements for WES
- Appendix C:** Copy of easement agreements with landowners
- Appendix D:** Map of occupied residential structures
- Appendix E:** Participating property owner list
- Appendix F:** Project Area Maps
- Appendix G:** Proof of utility right-of-way
- Appendix H:** Location of other WES in general area
- Appendix I:** Additional Project Detail Maps
- Appendix J:** Shadow Flicker & Sound Pressure Report
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I. PROJECT INTRODUCTION | Grant County Conditional Land Use Permit Application

Crowned Ridge Wind, LLC and Crowned Ridge Wind II, LLC, (together "*Crowned Ridge*"), Delaware limited liability companies, wholly owned, indirect subsidiary of NextEra Energy Resources, LLC ("*NextEra Energy Resources*"), propose to construct the Crowned Ridge Wind and Crowned Ridge Wind II wind energy facilities, (the "*Facility*") in Grant, Deuel, and Codington Counties, South Dakota. The portion of the Facility located in Grant County will include approximately 32 wind turbines, totaling approximately 72.8 megawatts ("*MW*"), associated transmission and operation facilities.

NextEra Energy Resources is North America's largest producer of wind energy with 130 wind facilities in operation throughout 32 states and Canada, totaling more than 21,000 MW of wind power. NextEra Energy Resources added over 1,000 MW of new wind generation to its portfolio in 2017. Currently, NextEra Energy Resources portfolio of facilities totals 21,000 net megawatts of generating capacity from power plants operating in 32 states and Canada.

As shown in this Application, Crowned Ridge has been diligent in designing the Facility which meets or exceeds the requirements of the Grant County Wind Energy System Requirements §1211 Energy System (WES) Requirements.

This Application is in response to the Grant County Zoning Ordinance and is outlined accordingly. A section for "Additional Information" has also been included within this application.

Project Developer Contact:

Tyler Wilhelm

Crowned Ridge Wind, LLC

Crowned Ridge Wind II, LLC

561-694-3193

Tyler.Wilhelm@NextEraEnergy.com

II. WIND ENERGY SYSTEM | Conditional Land Use Permit Requirements

Crowned Ridge adheres to the following *Wind Energy System* requirements, as outlined in §1211. Energy System (WES) Requirements of the Grant County Zoning Ordinance.

1) APPLICANT IDENTIFICATION

Permittee:

Crowned Ridge Wind, LLC, and
Crowned Ridge Wind II, LLC
700 Universe Boulevard Juno Beach, Florida 33408
(561) 694 - 3193; (561) 694 - 3604

Tyler.Wilhelm@NextEraEnergy.com ;

Jamie.Gentile@NextEraEnergy.com

2) PROJECT DESCRIPTION

The facility will be located between 158th street to the north and 166th street to the south. The westernmost extent of the Facility is 461st street and 472nd avenue to the east. The portion of the facility proposed in Grant County will include approximately 32 turbine locations (including alternate turbines) and associated transmission and operation facilities. The Facility is located within the townships of Mazeppa, Stockholm, and Troy, and contains approximately 11,090.049 acres of leased land.

Approximately 450 construction workers will proudly be supported during the construction phase of the Facility. Local businesses, including those who participate in providing construction materials, housing, food, recreation, and day to day necessities, will benefit from this temporary increase in personnel.

Table 1.0 - Wind Turbine Specifications

Manufacturer	Turbine Name	Hub Height	Rotor Diameter	Tip Height	MW Rating	Turbines Installed
General Electric	GE 2.3 - 116	90 M (~295 FT)	116 M (~380 FT)	148 M (~485 FT)	2.3	30
General Electric	GE 2.1 - 116	80 M (~262 FT)	116 M (~380 FT)	138 M (~452 FT)	2.1	1
General Electric	GE 1.7 - 116	80 M (~262 FT)	103 M (~338 FT)	131.5 M (~432 FT)	1.7	1

Legal Description of Property

See Parcel Exhibit Map & Parcel List in **Appendix A & Appendix E.**

Construction Schedule

Assuming all permits are issued, the below table depicts an anticipated schedule outlining major Crowned Ridge milestones.

CROWNED RIDGE Energy Center Milestones	
Break Ground	Post Approval, 2019
Road Work & Collection	Spring, 2019
Turbine Delivery Commencement	Summer, 2019
Substation Energization	Fall, 2019
Commercial Operation Date	Winter, 2019

Crowned Ridge will continue to update the anticipated construction table as needed and submit a finalized construction schedule prior to construction.

3) SITE PLAN

The Facility site plan (“site plan”) can be found in **Appendix F**.

The site plan, which includes maps showing the physical features and land uses of the project area, include the following:

- a) The project area boundaries.
- b) The locations and dimensions of all existing and proposed Wind Energy Systems.
- c) Existing topography.
- d) All new infrastructures above ground related to the Facility.
- e) Existing occupied residential structures, businesses, churches, and buildings owned/maintained by a governmental entity.

4) SOUND PRESSURE LEVEL

A copy of the Sound Pressure Level Report can be found in **Appendix J**.

5) CERTIFICATIONS

Crowned Ridge will comply with all applicable federal, state, and local laws and regulations and will obtain all required federal, state, and local approvals, licenses, permits or variances for the proposed wind project prior to the date of construction. Crowned Ridge performs a systematic evaluation of its wind projects to ensure they are sited in an environmentally responsible manner and are in compliance with all applicable local, state and federal laws and regulations.

The following list represents permits and approvals being pursued, as part of this Facility, pertaining to Grant County:

Federal/State Permits:

1. Federal Aviation Administration (FAA) Determinations of No Hazard for turbine and permanent MET tower locations.
2. United States Army Corps of Engineers, Nationwide Permit under §404 of the Clean Water Act (subject to §401 state certification), if necessary.
3. Coordination with the United States Fish and Wildlife Service for federal coordination under the voluntary Land Based Wind Siting Guidelines and state permitting requirements.
4. South Dakota Public Utilities Commission (PUC) Permit for the construction and operation of a Wind Energy Facility.
5. South Dakota Public Utilities Commission (PUC) Permit for the construction and operation of a Transmission Facility.
6. Concurrence from the State Historic Preservation Office (SHPO) for state PUC permitting.
7. South Dakota Department of Environment and Natural Resources potential permits:
 - a. Concrete Batch Plant Air Permit - if required.
 - b. General Permit for Storm Water Discharges.
 - c. §401 Water Quality Certification - if required separately.
8. South Dakota Department of Transportation, Highway Access/Approach Permit- if applicable.
9. South Dakota Department of Transportation, Utility Permit if applicable.
10. South Dakota Department of Transportation, Division of Highway Patrol - Oversized and/or Overweight Permit/Trip Permit/Fuel Permit.

Local Permits:

1. Land use or zoning regulations and permitting.
2. Conditional Use Permit.
3. Heavy Haul Road Agreement.
4. Road Crossing Agreement.
5. Right-of-Way Permit.
6. Road Use Agreement.
7. Pipeline Crossing Permit.
8. Utility Crossing Agreement.
9. Railroad Crossing Agreement.

10. Building Permit(s) (including, but not limited to, turbine foundation, substation and transmission line).
11. Turning and Radii Permits.
12. Operation and Maintenance (“O&M”) Building Permits.
13. Any/all temporary laydown trailer building permits, as required.
14. Transportation plan/permit for contractor provided material and equipment, as required.

6) **SHADOW FLICKER REPORT**

A copy of the Shadow Flicker Report can be found in **Appendix J**.

7) **DECOMMISSIONING SUMMARY**

The Decommissioning summary can be found in **Appendix K**.

8) **ECONOMIC BENEFITS**

Construction of the Facility is expected to directly employ approximately 450 individuals on-site including construction workers, engineers, electricians, truck and tractor drivers, environmental consultants, and a number of other contractors and service providers. This estimate represents the number of people expected to work on-site during the construction phase.

Crowned Ridge continues to invest in the people of South Dakota, as evidenced by the Aberdeen manufacturing plant, which builds wind turbines and was due to close, and was kept open. This saved local jobs, displaying a positive form of economic investment in South Dakota’s wind industry. Construction of the Facility is also expected to, in part, directly employ workers from Grant and neighboring Counties on-site during the construction period. On-site jobs will include those associated with site work, foundations, electrical, tower erection, and other associated labor needed to construct the Facility.

Construction of the Facility would also support economic activity elsewhere in Grant County and the State of South Dakota. Indirect supply-chain impacts would support several hundred jobs in South Dakota, with the majority of these jobs resulting from in-state expenditures on materials, specifically concrete, rebar, equipment, roads, and site preparation. Hotels, motels, restaurants, gas stations, pharmacies, grocery stores, hardware stores, machine shops, electrical supply companies, repair firms, equipment rental companies, and other local businesses would also potentially see an increase in demand for their goods and services.

Additionally, lease payments to landowners will generate annual benefits to the local economy over the life of the Facility. These payments represent a net increase in income for the landowner. Each turbine occupies a relatively small footprint when compared to the site as a whole, and landowners can continue farming and livestock operations on their property.

Direct employment, local O&M expenditures, lease payments would all support indirect and induced employment and income elsewhere in Grant County and the state as a whole. These benefits would be smaller than the construction-related benefits, but would occur each year and would likely gradually increase over time.

Overall, construction related benefits in Grant County would be smaller than the statewide impacts, reflecting the size of the local economy, but these jobs would make an important short-term contribution to the Grant County economy, generating a substantial positive impact to local businesses.

Operation

Once the construction phase is complete, operation and maintenance of the project will continue to contribute to the local economy. Crowned Ridge anticipates that operation of the Facility will provide direct employment for approximately seven to twelve (7-12) workers. In addition, project related O&M expenditures will generate economic benefits in the local economy. Typical local O&M related expenditures include vehicle related expenditures, such as fuel costs, site maintenance, replacement parts and equipment, and miscellaneous supplies.

9) LOCAL CONTRIBUTIONS

The goal of this proposed Community Outreach Plan is guided by Crowned Ridge to serve as the first and best source of information about this project, to give citizens and stakeholders an opportunity to both learn about and participate in its development. The Crowned Ridge Community Outreach Plan includes the following components:

- Conduct public open houses in the Project Area; and
- Create and distribute project fact sheets and updates that can be shared with citizens; and
- Conduct interviews and editorial board meeting(s) with local media; and
- Meet with stakeholders and community organizations in small-group settings, as needed, and
- Support local organizations through donations and sponsorships.

Public Open Houses

On November 16, 2017, Crowned Ridge hosted an open house at the Watertown Event Center in Watertown, South Dakota. Approximately 20 subject matter experts from Crowned Ridge were available to the local residents. The meeting featured poster displays on wind energy and the Facility. One-on-one and small group informational discussions took place throughout the duration of the open house, which provided opportunities for attendees to gain information about the Facility, have their questions addressed, and provide input to Crowned Ridge representatives.

Crowned Ridge notified landowners and stakeholders in the Facility area individually by mailing post cards announcing the open house and placed a notification of the open house in the Watertown Public Opinion.

Project fact sheet, brochures and mailings

Crowned Ridge has created a fact sheet detailing the location and specifications of the proposed Crowned Ridge Wind Energy Centers, including its positive economic impact on the local community. A brochure has been created that includes an explanation of how wind energy technology works to generate renewable energy. This information, as well as facility updates, were provided at the open house and other scheduled meetings with local stakeholders.

Conduct editorial board meeting(s) with local media

Crowned Ridge recognizes citizens look to a variety of sources, including local media, for information. As such, members of the Crowned Ridge development and communications team have made, and continue to make ourselves available for media interviews and, if available, an editorial board session with the local newspapers. This session would serve as a forum for reporters and editors to ask questions and for us to share information about the Crowned Ridge to help keep citizens informed throughout the development process.

Meet with stakeholders and organizations in small-group settings

Crowned Ridge has met with, and will continue to meet with community organizations and stakeholders in small-group settings, as needed. The purpose of these smaller meetings is to answer individual questions that may be of interest to civic groups and organizations. Our development team has shared Facility fact sheets and presentations about the proposed Crowned Ridge Wind Energy Centers.

Support local organizations through donations and sponsorships

Since 2016, Crowned Ridge has been a sponsor of the Crystal Springs Rodeo in Clear Lake, SD. In 2017 and 2018, we were the exclusive sponsor of the Xtreme Bulls competition and plan to continue this sponsorship for many years. Each year at the rodeo, members of our team were on hand to talk to guests, share information about our company, hand out bandanas to children and families who attended the event, and conduct interviews with a local radio station.

Crowned Ridge has partnered with a K-12 organization, Wind for Schools, that travels the state teaching students about wind energy. The donation given by Crowned Ridge, will be matched at the state level, further benefiting students in South Dakota. Renewable energy jobs are among the fastest growing jobs in America, according to the U.S. Bureau of Labor Statistics. By helping to integrate renewable energy into science curriculums, we are helping prepare students for potential careers in a growing industry.

10) CULTURAL RESOURCES

Multiple tribes were contacted and are engaged in identifying tribal resources in the Facility area. Coordinated by the Tribal Historic Preservation Office from Sisseton Wahpeton Oyate, tribal representatives from Sisseton Wahpeton Oyate, Yankton Sioux, Spirit Lake Nation and Crow Creek Sioux have been involved in supporting micro-siting and surveys.

Level III field surveys using pedestrian transect surveys have been conducted in multiple mobilizations and are currently on-going for archaeological, historical, and tribal resources within areas potentially affected by construction including turbine foundations, underground collection, access roads, substations, and turning radii. The Level III field survey is being performed jointly with tribal members from the Sisseton Wahpeton Oyate, Yankton Sioux, and Spirit Lake Nation selected to represent those tribes in identifying significant tribal resources are led by archaeologists meeting the U.S. Secretary of the Interior's Professional Qualification Standards.

All tribal sites, which are represented by rock cairns, alignments, and other traditionally recognized features on the landscape, are considered important to the tribes and will be considered for avoidance during the design process.

Avoidance of Potential Impacts

Planned construction activities for the Project may occur within the vicinity of sites important to tribal cultural traditions, archaeological sites, or historic standing structures. Sites evaluated as not eligible for the National Register of Historic Places (NRHP) listing are not significant and impacts to these sites would therefore not be considered. Those sites that are evaluated as eligible or of undetermined NRHP eligibility will be protected from direct impacts by establishing avoidance buffers around these resources.

III. ADDITIONAL INFORMATION

1) CONDITIONAL USE PERMIT STANDARDS

Crowned Ridge will be consistent with the requirements of §1211 Energy System (WES) Requirements, Ord. 2004-1. Crowned Ridge will insure that the placement, construction and modification of a wind Energy System (WES) facility is consistent with the County's and use policies, to minimize the impact of WES facilities, to establish a fair and efficient process for review and approval of applications, to assure a comprehensive review of environmental impacts of such facilities and to protect the health, safety, and welfare of the County's citizens.

LOCAL REQUIREMENTS

In accordance with the Zoning Ordinance for Grant County, a Conditional Land Use Permit must meet the following general standards pursuant to §1211: Energy System (WES) Requirements.

1211.01: Applicability

Crowned Ridge is submitting for consideration to construct approximately 32 turbines in Grant County. Crowned Ridge has entered into a long term agreement to distribute the electricity generated into the region. Crowned Ridge is in compliance with §1211 of Ord. 2004-1, Energy System (WES) Requirements for Grant County.

1211.01: Purpose

The purpose of this ordinance is to insure that the placement, construction and modification of a Wind Energy System (WES) Facility is consistent with the County's land use policies, to minimize the impact of WES facilities, to establish a fair and efficient process for review and approval of applications, to assure a comprehensive review of environmental impacts of such facilities, and to protect the health, safety, and welfare of the County's citizens. [Ord. 2004-1, Rev. 2004-1G]

1211.02: Federal and State Requirements

Crowned Ridge will meet or exceed all applicable federal and South Dakota standards and regulations and those of any agency of federal or state government with the authority to regulate WESs.

1211.04: General Provisions

1. Mitigation Measures:

(a) Site Clearance

Crowned Ridge will disturb or clear the site only to the extent necessary to assure suitable access for construction, safe operation and maintenance of the WES.

(b) Topsoil Protection

Crowned Ridge will implement measures to protect and segregate topsoil from subsoil in cultivated lands unless otherwise negotiated with the affected landowner.

- (c) **Compaction**
Crowned Ridge will implement measures to minimize compaction of all lands during all phases of the project's life and will confine compaction to as small an area as practicable.
- (d) **Live Stock Protection**
Crowned Ridge will take precautions to protect livestock during all phases of the Facilities life.
- (e) **Fences**
Crowned Ridge will promptly replace or repair all fences and gates removed or damaged during all phases of the Facilities life unless otherwise negotiated with the affected landowner.
- (f) **Roads**
- Public Roads
- i. Prior to commencement of construction, Crowned Ridge will identify all state, county or township "haul roads" that will be used for the Facility and will notify the state, county or township governing body having jurisdiction over the roads to determine if the haul roads identified are acceptable. The governmental body will be provided adequate time to inspect the haul roads prior to use of these haul roads. Where practical, existing roadways will be used for all activities associated with the WES. Where practical, all-weather roads will be used to deliver cement, turbines, towers, assemble nacelles and all other heavy components to and from the turbine sites.
- Haul Roads
- ii. Crowned Ridge will, prior to the use of approved haul roads, make satisfactory arrangements with the appropriate state, county or township governmental body having jurisdiction over approved haul roads for construction of the WES for the maintenance and repair of the haul roads that will be subject to extra wear and tear due to transportation of equipment and WES components. Crowned Ridge will notify the County of such arrangements upon request of the County.
- Turbine Access Roads
- iii. Construction of turbine access roads will be minimized. Access roads will be low profile roads so that farming equipment can cross them and will be covered with Class 5 gravel or similar material. When access roads are constructed across streams and drainage ways, the access roads will be designed in a manner so runoff from the upper portions of the watershed can readily flow to the lower portion of the watershed.

Private Roads

Crowned Ridge will promptly repair private roads or lanes damaged when moving equipment or when obtaining access to the site, unless otherwise negotiated with the affected landowner.

Control of Dust

- iv. Crowned Ridge will utilize all reasonable measures and practices of construction to control dust.

(g) Soil Erosion and Sediment Control Plan

Crowned Ridge will develop a detailed Stormwater Pollution Prevention plan (SWPPP) prior to construction and submit the plan to the County, and to the State. The SWPPP will address the erosion control measures for each project phase and, at a minimum will identify plans for grading, construction and drainage of roads and turbine pads; necessary soil information; detailed design features to maintain downstream water quality; a comprehensive revegetation plan to maintain and ensure adequate erosion control and slope stability and to restore the site after temporary project activities; and measures to minimize the area of surface disturbance. Other practices may include containing excavated material, protecting exposed soil, stabilizing restored material and removal of silt fences or barriers when the area is stabilized. The SWPPP will identify methods for disposal or storage of excavated material, per Appendix L.

2. Setbacks

Crowned Ridge will site the Facility consistent with the Requirements for Energy System (WES) as proposed in ordinance 2004-1, Rev. 2004-1G, §1211.

Crowned Ridge requests the setbacks between parcels that are obtained by either Crowned Ridge Wind, LLC or Crowned Ridge Wind II, LLC project are waived as the parcels are participants in the Crowned Ridge project as a whole.

- Pursuant to Grant County Ordinance 2004-1, Rev. 2004-1G, §1211, Crowned Ridge will maintain a distance of at least one thousand (1,000) feet from existing off-site residences, business, churches, and buildings owned and/or maintained by a governmental entity and public buildings. Distance from on-site or lessor's residence will be five hundred (500) feet. Distance to be measured from the wall line of the neighboring principal building to the base of the WES tower. These setbacks are further illustrated in **Appendix F**.
- The distance from centerline of public right-of-way will be at least five hundred (500) feet or one hundred ten percent (110%) the height of the wind turbines, whichever distance is greater, two (2) times the height of the wind turbines, measured from the ground surface to the tip of the blade when in a fully vertical position. These setbacks are further illustrated in **Appendix F**.
- The distance from any property line will be at least five hundred (500) feet or one hundred ten percent (110%) the height of the wind turbine, whichever distance is greater, two (2) times the height of the wind turbine, measured from the ground surface to the tip of the blade when in a fully vertical position unless wind easement has been obtained from adjoining property owner. These setbacks are further illustrated in **Appendix F**.
- *Exception: The board of adjustment may allow setback/separation distances to be less than the established distances identified above, if the adjoining landowners agree to*

a lesser setback/separation distance. If approved, such agreement is to be recorded and filed with the register of deeds.

3. Electromagnetic Interference

Crowned Ridge will not operate the WES so as to cause microwave, television, radio, or navigation interference contrary to Federal Communications Commission (FCC) regulations or other law. In the event such interference is caused by the WES or its operation, Crowned Ridge will take the measures necessary to correct / mitigate any problems. Prior to construction Crowned Ridge will conduct a beam path study to further mitigate any potential interference.

4. Lighting

Towers will be marked as required by the Federal Aviation Administration (FAA). There will be no lights on the towers other than what is required by the FAA. *This restriction shall not apply to infrared heating devices used to protect the monitoring equipment. Upon commencement of construction of a tower, in cases where there are residential uses located within a distance which is three hundred (300) percent of the height of the tower from the tower and when required by federal law, dual mode lighting shall be requested from the FAA. Beacon lighting, unless required by FAA, shall not be utilized.* Crowned Ridge will pursue approval for alternative lighting systems from the FAA within one (1) year of completion of construction. This restriction will not apply to infrared heating devices used to protect the monitoring equipment. In the event FAA does not approve an alternative lighting system, Crowned Ridge will comply with all lighting and markings otherwise required by FAA.

5. Turbine Spacing

The turbines will be spaced no closer together than three (3) rotor diameters (RD) within a string and 10 RDs between strings. If required during final micro siting of the turbines to account for topographic conditions, up to ten (10%) percent of the towers may be sited closer than the above spacing but Crowned Ridge will minimize the need to site the turbines closer.

6. Footprint Minimization

Crowned Ridge will design and construct the WES so as to minimize the amount of land that is impacted by the WES. Associated facilities in the vicinity of turbines such as electrical/electronic boxes, transformers and monitoring systems will, to the greatest extent feasible, be mounted on the foundations used for turbine towers or inside the towers unless otherwise negotiated with the affected landowner.

7. Collector Lines

Collector lines are the conductors of electric energy from the WES to the feeder lines. When located on private property, Crowned Ridge will place electrical lines, known as collectors, and communication cables underground between the WES and the feeder lines when located on private property. The exception to this requirement is when the total distance of collectors from the substation requires an overhead installation due to line loss of current from an underground installation. Collectors and cables will also be placed within or immediately adjacent to the land necessary for turbine access roads unless otherwise negotiated with the affected landowner. This paragraph does not apply to feeder lines.

8. Feeder Lines

Feeder lines are the conductors of electric energy from the collector lines to the main electric terminal, and may be located either above or below ground. Crowned Ridge will place overhead electric lines, known as feeders, on public rights of way or private property if no public right-of-way exists. Changes in routes may be made as long as feeders remain on public rights-of-way and approval has been obtained from the governmental unit responsible for the affected right-of-way. If no public right-of-way exists, Crowned Ridge will place feeders on private property. When placing feeders on private property, Crowned Ridge will place the feeder in accordance with the easement negotiated with the affected landowner. Crowned Ridge will submit the site plan and engineering drawings for the feeder lines before commencing construction. Feeder line support structures (power poles) will be placed on private property where concrete or other similar materials are used as an exposed or above-ground permanent foundation.

9. Decommissioning/Restoration/Abandonment

a. Cost Responsibility

The owner or operator of a WES is responsible for decommissioning that facility and for all costs associated with decommissioning that facility and associated facilities.

b. Decommissioning Plan

Within 120 days of completion of construction, Crowned Ridge will submit to the County a decommissioning plan describing the manner in which Crowned Ridge anticipates decommissioning the project in accordance with the requirements of paragraph (e) below. The plan will include a description of the manner in which Crowned Ridge will ensure that it has the financial capability to carry out these restoration requirements when they go into effect. Crowned Ridge will ensure that it carries out its obligation to provide for the resources necessary to fulfill these requirements. The County may at any time request Crowned Ridge to file a report with the county describing how Crowned Ridge are fulfilling this obligation.

c. Financial Assurance

After the tenth (10th) year of operation of a WES facility, the Board may require a performance bond, surety bond, letter of credit, corporate guarantee, or other form of financial assurance that is acceptable to the Board to cover the anticipated costs of decommissioning the WES facility.

d. Site Restoration

Decommissioning of the WES will begin within eight (8) months of the expiration of this permit, or earlier termination of operation of the WES and be completed within eighteen (18) months of the expiration of this permit or earlier termination of operation of the WES. Upon expiration of this permit, or upon earlier termination of operation of the WES, Crowned Ridge will have the obligation to dismantle and remove from the site all towers, turbine generators, transformers, overhead and underground cables, foundations, buildings and ancillary equipment to a depth of four

(4) feet. To the extent possible Crowned Ridge will restore and reclaim the site to its pre-project topography and topsoil quality. All access roads will be removed unless written approval is given by the affected landowner requesting that one or more roads, or portions thereof, be retained. Any agreement for removal to a lesser depth or for no removal will be recorded with the County and will show the locations of all such foundations. All such agreements between the permittees and the affected landowner will be submitted to the County prior to completion of restoration activities. The site will be restored in accordance with the requirements of this condition within eighteen (18) months after expiration. [Ord. 2004-1 Rev.2004-1G]

e. Failure to Decommission

If Crowned Ridge does not complete decommissioning, the Board may take such action as may be necessary to complete decommissioning, including requiring forfeiture of the bond. The entry into a participating landowner agreement will constitute agreement and consent of the parties to the agreement, their respective heirs, successors, and assigns, that the board may take such action as may be necessary to decommission a WES facility.

10. Abandoned Turbines

Crowned Ridge will advise the County of any turbines that are abandoned prior to the termination of operation of the WES. The County may require the permittees to decommission any abandoned turbine.

11. Height from Ground Surface

The minimum height of blade tips, measured from ground surface when a blade is in fully vertical position, will be greater than twenty-five (25) feet.

12. Towers

a. Color and Finish

The finish of the exterior surface of all turbines installed as part of this Facility will be white, non-reflective, and non-glass.

b. Design

All towers installed as part of this Facility will be singular tubular design.

13. Noise

- a. Noise level will not exceed 50 dBA, including constructive interference effects at the perimeter of the principal and accessory structures of existing off-site residences, businesses, and buildings owned and/or maintained by a governmental entity property line of existing off-site residences, businesses, and buildings, and public buildings. [Ord. 2004-1, Rev. 2004-1G] An acoustic analysis for the Project is included with this application and can be found in **Appendix J**.

14. Permit Expiration

Crowned Ridge acknowledges that the permit will be voided if no substantial construction as described in the application has been completed within two (2) years of issuance.

15. Required Information for Permit [Ord. 2004-1, Rev. 2004-1G]
 - a. **Appendix A** -- Boundaries of the site proposed for WES and associated facilities on United States Geological Survey Map or other map as appropriate.
 - b. **Appendix B** -- Map of easements for WES.
 - c. **Appendix C** -- Copy of easement agreements with landowners. Affidavit attesting that necessary easement agreements with landowners have been obtained.
 - d. **Appendix D** -- Map of occupied residential structures, businesses, churches, and buildings owned and/or maintained by a governmental entity and public buildings within one (1) mile of the project area.
 - e. **Appendix F** -- Map of sites for WES, access roads, and utility lines. Preliminary map of sites for WES, access roads, and collector and feeder lines. Final map of sites for WES, access roads, and utility lines to be submitted sixty (60) days prior to construction.
 - f. **Appendix G** -- Proof of utility right-of-way easement for access to transmission lines and/or utility interconnection.
 - g. **Appendix H** -- Location of other WES in general area.
 - h. **Appendix M** -- Project specific environmental concerns (e.g. native habitat, rare species, and migratory routes).
 - i. Final haul road agreements to be submitted sixty (60) days prior to construction.

2) §504. POWERS AND JURISDICTION RELATING TO CONDITIONAL USES

The County Board of Adjustment shall have the power to hear and decide, in accordance with the provisions of this regulation, requests for conditional uses or for decisions upon other special questions upon which the Board of Adjustments is authorized by this regulation to pass; to decide such questions as are involved in determining whether special conditions and safeguards as are appropriate under this regulation or to deny conditional uses when not in harmony with the purpose and intent of this regulation. A Conditional Use Permit shall not be granted by the Board of Adjustment unless and until:

Pursuant to §1211 Energy System (WES) Requirements of the Grant County Zoning Ordinance, these regulations shall apply to Crowned Ridge. Crowned Ridge has submitted for consideration a WES consisting of 32 wind turbines locations reaching a maximum height of approximately 486ft. Consequently, the WES Requirements shall apply to Crowned Ridge. Crowned Ridge will not adversely affect the public interest. Crowned Ridge will provide positive economic benefit to the community in the form of approximately 450 temporary construction jobs, payments directly to land owners, as well as tax payments to Grant County.

1. A written application for a conditional use is submitted, indicating the section of this regulation under which the special exception is sought and stating the grounds on which it is requested.

Crowned Ridge has submitted a written application for a Conditional Use Permit §504 for §1211 Energy System (WES) Requirements.

2. Notice of hearing shall be published once ten (10) days prior to the hearing in a paper of general circulation in the area affected.

3. The public hearing shall be held. Any party may appear in person, or by agent or attorney.

4. The Board of Adjustment shall make a finding that it is empowered under the section of this ordinance described in the application to grant the conditional use, grant with conditions, or deny the conditional use, and that the granting of the conditional use will not adversely affect the public interest.

Crowned Ridge will not adversely affect the public interest. Crowned Ridge will provide positive economic benefit to the community in the form of approximately 450 temporary construction jobs, payments directly to land owners, as well as tax payments to Grant County. Crowned Ridge has followed the siting guidelines as established by the County Zoning Code, which has considered the safety, health, and welfare of the public.

5. Before any conditional use is granted, the Board of Adjustment shall make written findings certifying compliance with the specific rules governing individual conditional uses and that satisfactory provision and arrangement has been made concerning the following, where applicable:

- a. Entrance to and exit from property and proposed structures thereon with particular reference to automotive and pedestrian safety and convenience, traffic flow, and control, and access in case of fire or catastrophe.

Crowned Ridge will work closely with Grant County and the South Dakota Department of Transportation to obtain all necessary Permits relevant to the highway access, utility crossings and ROW features.

- b. Off-street parking and loading areas where required, with particular attention to the items in (a) above and the economic, noise, glare, odor, or other effects of the conditional use on adjoining properties and properties generally in the district.

Crowned Ridge has included with this application for consideration an acoustic analysis for Grant County which can be found at Appendix J. The findings of the acoustic analysis will indicate that Crowned Ridge is in compliance with §1211 Energy System (WES) Requirements.

Additionally, included with this application is a shadow flicker analysis which can be found in Appendix J. The findings of the shadow flicker analysis indicate that Crowned Ridge has submitted turbine locations that do not exceed a maximum of thirty (30) hours of shadow flicker per year at any existing off-site residences, businesses, and buildings owned and/or maintained by a governmental entity, unless otherwise agreed to by the landowner.

Crowned Ridge has provided additional information regarding the economic benefits that the project will generate. This information can be found on Page 6.

Crowned Ridge will minimize any impact from parking and loading on the general community. Normal construction practices will be utilized to ensure as little disruption to adjoining parcels as possible.

- c. Refuse and service areas, with particular reference to the items in (a) and (b) above.

Crowned Ridge will adhere to all state and local requirements for any disposal of refuse from the construction and operation of the project.

- d. Utilities, with reference to locations, availability, and compatibility.

This information can be found in Appendix F.

- e. Screening and buffering with reference to type, dimensions, and character.

Crowned Ridge will meet and exceed the siting requirements set forth in §1211 Energy System (WES) Requirements. The Crowned Ridge Site Plan located in **Appendix F** depicts compliance with this requirement.

- e. Signs, if any, and proposed exterior lighting with reference to glare, traffic safety, economic effect, and compatibility and harmony with properties in the district.

Crowned Ridge will meet all lighting requirements listed in §1211 of the Energy System (WES) Requirements.

- f. Signs, if any, and proposed exterior lighting with reference to glare, traffic safety, economic effect, and compatibility, and harmony with properties in the district.

Crowned Ridge will meet or exceed the required yard (setback) requirements as outlined in the applicable sections of the WES policies of the Grant County Zoning Ordinance.

g. Required yards and other open spaces.

Crowned Ridge has complied with the siting criteria as outlined in §1211 of the County's code.

h. General compatibility with adjacent properties and other property.

Crowned Ridge is purposed to be located on Agricultural Land (A). Adjacent properties and other properties in the general area are primarily used for the same purpose i.e.: pasture land, and agriculture. Energy Systems (WES) is a use that is considered permissible as a conditional use in the Agricultural Zoning District. Crowned Ridge will comply with both State and County requirements for an Energy System (WES). Crowned Ridge has taken several steps to minimize any potential impact on surrounding properties.

6. A conditional use that is granted but not used within two (2) years will be considered invalid unless an extension has been requested and approved by the Board of Adjustment.

Crowned Ridge acknowledges that if a Conditional Use Permit is granted, and not used within two (2) years, it shall be considered invalid, unless an extension has been approved by the Board of Adjustments.

7. The affirmative vote of two-thirds (2/3) five (5) votes of the full membership of the Board of Adjustment is required to approve a conditional use.

Acknowledged.

8. In granting the Conditional Use Permit, the Board of Adjustment may prescribe appropriate conditions and safeguards, in conformity with this regulation. Violation of such conditions and safeguards, when made a part of the terms under which the Conditional Use Permit is granted, shall be deemed a violation of this ordinance and punishable under § 808 of this ordinance.

Crowned Ridge will conform with any conditions and safeguards prescribed by the Board of Adjustments.

9. Reapplication. No applicant requesting a Conditional Use Permit whose application includes the same or substantially the same requirements for the same or substantially the same property which has been denied by the Board of Adjustment shall be again considered by the Board of Adjustment before the expiration date of six (6) months from the date of the final action on the petition.

This is the initial submittal for Crowned Ridge, and it does not contain a duplicate request that was previously denied by the Board of Adjustment.

3) DESCRIPTION OF PROPOSED FACILITIES

An individual lease agreement, permitting the siting of a facility/turbine, has been signed by the respective landowner for each proposed wind turbine and related facilities location. In addition, Crowned Ridge Wind has written agreements with each consenting landowner, which ensures minimal impact to their land and that public health and safety guidelines will be followed. The proposed Facility will not emit any fumes. Below, please find a listing of all proposed Crowned Ridge Wind facilities. See site plan in **Appendix F** for locations of all proposed facilities.

- **Generation Equipment Description**

Crowned Ridge proposes to use GE 2.3 MW 116 meter (380ft) diameter rotor, 90 meter (295ft) tubular steel monopole, GE 2.1 MW 116 meter (380) diameter rotor, 80 meter (262ft) tubular steel monopole, and GE 1.7 MW 103 meter (337ft) diameter rotor, 80 meter (262ft) steel monopole throughout the Facility. These turbines employ active yaw control to steer the machine with respect to the wind. They have active blade pitching to maximize power output. The towers and turbines will be painted with a non-reflective/off-white color designed to minimize visual impacts. No advertising or graphics will be placed on any part of the tower or blades, however, the turbines will be clearly numbered above the entrance doors for identification and emergency response. The towers will not be illuminated except as required by the FAA.

- **Electrical Collection System**

The power generated by the Facility will be collected and conveyed to the Crowned Ridge substations by an electrical power collection system as shown on the site plans. Crowned Ridge energy collection system will include pad-mounted transformers, buried cables, and junction boxes.

- **Overhead Transmission Line Connection**

An overhead transmission line will be constructed to transfer wind energy system power from the substation into the switchyard. The proposed transmission line will be constructed and run within easements negotiated with private landowners.

- **Laydown Yard**

Multiple gravel base laydown areas including small temporary concrete batch plants, located on approximately 25-28 acres of land, will be required during the construction phase of Crowned Ridge. The Laydown yards will be used to temporarily store turbine parts, equipment, office trailers, and employee parking. Upon completion of all reclamation activities, these laydown yards will be reclaimed to the pre-construction state. Prior to construction the location of the laydown yards will be provided to the County.

- **Anemometer Tower (“Met Tower”)**

The proposed Facility will require approximately four (4) Met Towers. The towers will be approximately 263 ft. in height and properly lighted according to recommendations from the FAA. The tower will be mounted with equipment used to monitor wind speed, wind direction, temperature, barometric pressure, data logging and data transfer equipment. The tower will not generate electricity.

4) ACCESS ROADS

- **Existing Access Roads**

There is an existing highway system for sufficient transportation to the Facility location and to the necessary county roads providing access to each proposed wind turbine generator. It may be necessary to improve some existing roads (grade or widen) during construction to accommodate construction equipment and equipment transport trucks. A Transportation Plan outlining the proposed improvements will be presented for approval by Grant County before construction commences. In accordance to the Transportation Plan, Crowned Ridge will restore existing public roads after construction where improvements are necessary. It may also be necessary to repair, repave, or reconstruct existing county roads damaged by Facility construction. Crowned Ridge would promptly repair any Facility-related damage to existing county roads after construction to standards specified by road managers, and as agreed before construction begins.

- **New Turbine Access Roads**

Newly constructed turbine access roads will be rough graded, and will consist of approximately 4-6 inches of gravel over compacted material. The gravel will be obtained from local crushed rock gravel pits. The access roads will generally be constructed at-grade. Built material will be used only where needed to supplement the existing base or to blend the road into the surroundings. Culverts may be installed if ditches cannot be crossed at grade and as a preventive measure to avoid any damages to the existing or new access roads and the existing highway/county road system. When construction is complete, the access roads will be left in place to provide access for future operations and maintenance activities. After construction, these roads will be graded where low spots and ruts have occurred and culverts will be left in place. The roads will also be available for the use of the landowner.

IV. CONCLUSION






This Application and its attachments demonstrate Crowned Ridge's compliance with the Grant County Zoning Ordinance and with the general and specific standards and requirements for conditional land uses as described in the §1211 Energy System (WES) Requirements. Crowned Ridge respectfully requests a separate Conditional Use Permit approval for a Wind Energy System for the Crowned Ridge Wind, LLC and Crowned Ridge Wind II, LLC Facilities.

As explained thus far, upon approval of the Conditional Use Permit, Crowned Ridge Wind, LLC, and Crowned Ridge Wind II, LLC are anticipated to begin construction upon approval of all necessary permits. The Facility will be supported by approximately 450 construction workers, will supply clean renewable energy, and will operate safely and in compliance with all applicable local, state, and federal regulations. Crowned Ridge looks forward to the opportunity to continue investing in Grant County for the foreseeable future.

Appendix: A
Boundaries of the site proposed for WES



Crowned Ridge

-  Crowned Ridge I
-  Crowned Ridge II
-  Grant County
-  Township
-  County

120N
052W

120N
051W

120N
050W

120N
049W

120N
048W

120N
052.5W

119N
051.5W

119N
051W

119N
052W

119N
052.5W

119N
052W

119N
051W

119N
050W

119N
049W

119N
048W

Codington

Grant

118N
052W

118N
051W

118N
050W

118N
049W

118N
048W

Grant
Deuel

117N
051W

117N
050W

117N
049W

117N
048W

Codington

Deuel



Appendix: B
Map of easements for WES



Crowned Ridge

- Non-Participating
- Participating
- Crowned Ridge I
- Crowned Ridge II
- Grant County
- Township
- County

120N
052W

120N
051W

120N
050W

120N
049W

120N
048W

119N
051.5W

119N
051W

119N
052W

119N
051W

119N
050W

119N
049W

119N
048W

119N
052W

119N
052.5W

Codington

Grant

118N
052W

118N
051W

118N
050W

118N
049W

118N
048W



Codington

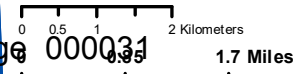
Deuel

117N
050W

117N
049W

117N
048W

Grant
Deuel



Appendix: C
Copy of easement agreements with landowners

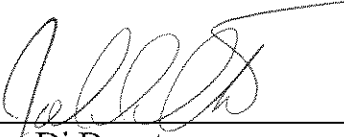
STATE OF FLORIDA)
 :SS
COUNTY OF PALM BEACH)

AFFIDAVIT OF
JOHN DI DONATO

Comes now, the undersigned, John Di Donato, having first been duly sworn on oath, and states and alleges as follows:

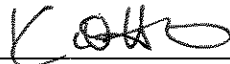
1. Your affiant is the Vice President of NextEra Energy Resources (NEER), LLC., and has knowledge of the matters asserted herein.
2. Crowned Ridge Wind I, LLC and Crowned Ridge II, LLC is an indirect wholly owned subsidiary of NEER and is the applicant for a permit for a Wind Energy System (WES) from Grant County, South Dakota.
3. The necessary easements from landowners have been obtained for development and construction of the WES, and attached hereto is the Map of Easements for the WES.

Dated this 10th day of September, 2018.



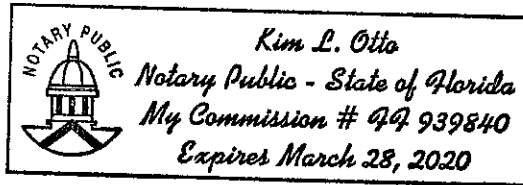
John Di Donato

Subscribed and sworn to before me this 10th day of September, 2018.



Notary Public, Florida

(SEAL)



Appendix: D

Map of occupied residential structures



Crowned Ridge

- Receptor
- Crowned Ridge I
- Crowned Ridge II
- Grant County
- Township
- County

119N
051W
119N
051.5W

120N
052W

120N
051W

120N
050W

120N
049W

119N
048W

119N
049W

119N
052W

119N
051W

119N
050W

Codington
Grant

118N
048W

118N
049W

118N
052W

118N
051W

118N
050W

Grant
Deuel

117N
048W

117N
049W

117N
051W

117N
050W

Page 000035

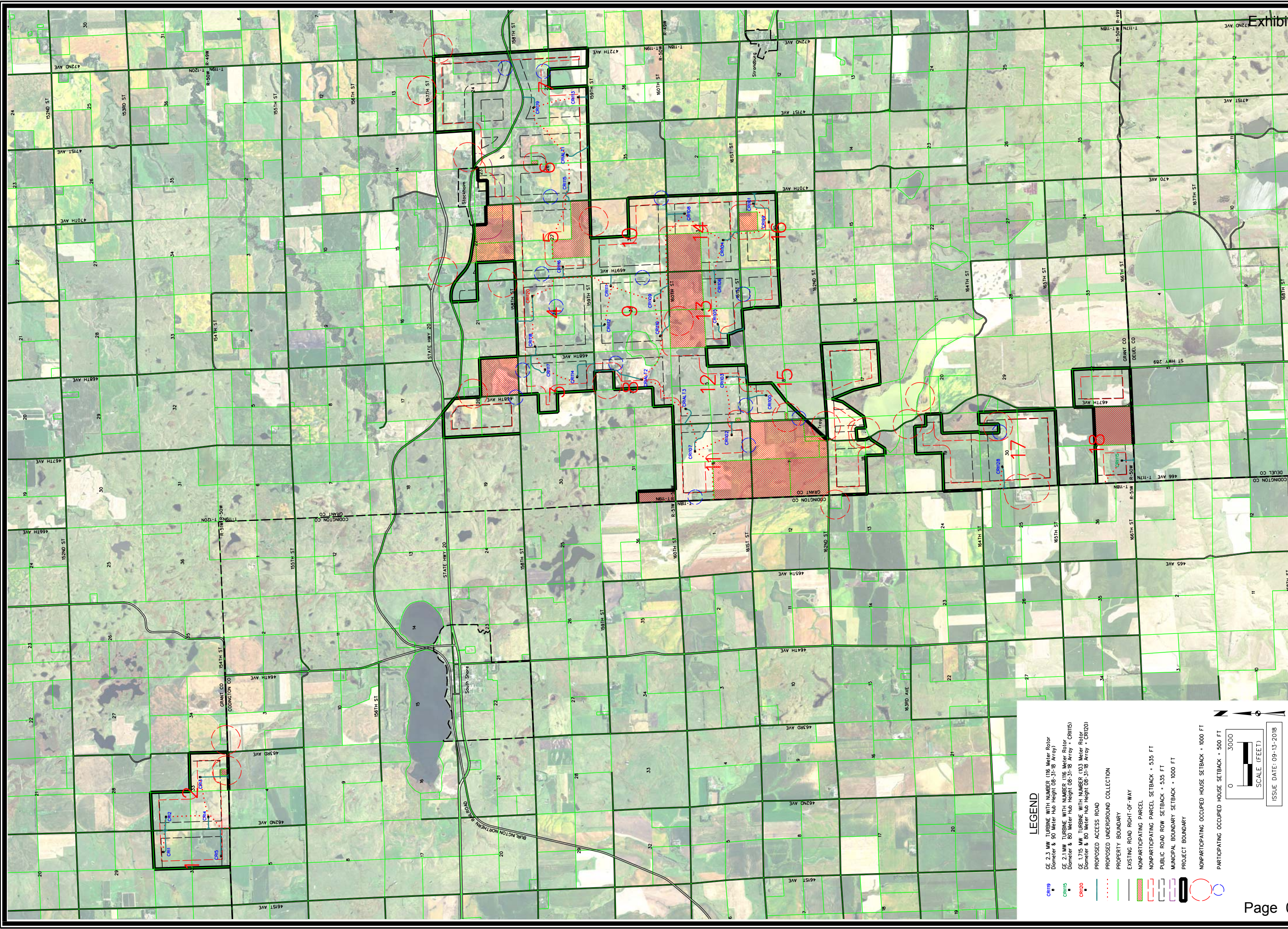


Appendix: E
Participating Property Owner List

Parcel ID	Acres	Landowner Name	PLSS Section	PLSS Township	PLSS Range	Parcel County
1020752077	159.7798	LARSON GILBERT	31	118N	050W	Grant
1020749082	149.6334	ZEMLIKA DEWEY L	32	118N	050W	Grant
1020749080	79.00769	ZEMLIKA DEWEY L	32	118N	050W	Grant
1020746790	162.3955	ZEMLIKA DARON A	30	118N	050W	Grant
1020746782	162.264	ZEMLIKA DARON A	30	118N	050W	Grant
1020746781	162.0814	EVJEN JOYCE A	30	118N	050W	Grant
1020749085	140.0065	EVJEN JOYCE A	30	118N	050W	Grant
1020753021	161.3144	LARSON ELMER G	19	118N	050W	Grant
1020746767	80.59571	LARSON ELMER G	19	118N	050W	Grant
1020749087	96.78363	LARSON ELMER G	19	118N	050W	Grant
1020746780	24.63964	RITTMANN JOHN E	18	118N	050W	Grant
1020746791	17.70622	RITTMANN JOHN E	18	118N	050W	Grant
1020746805	147.2169	ANDERSON HAROLD L	17	118N	050W	Grant
1020746776	64.14385	RITTMANN JOHN E	18	118N	050W	Grant
1020746792	138.5525	RITTMANN JOHN E	18	118N	050W	Grant
1020746774	156.7187	ANDERSON HAROLD L	17	118N	050W	Grant
1020750669	15.00008	WOLLSCHLAGER DOUGLAS	7	118N	050W	Grant
1020749012	2.099232	LINDBERG TERRY L	7	118N	050W	Grant
1020749013	7.116745	LINDBERG TERRY L	7	118N	050W	Grant
1020749026	9.368104	WOLLSCHLAGER DOUGLAS	7	118N	050W	Grant
1020749014	160.9136	WOLLSCHLAGER DOUGLAS E	7	118N	050W	Grant
1020750915	160.7344	BREYER DWAYNE J	11	118N	050W	Grant
1020749006	16.39542	MILLER KEVIN R	8	118N	050W	Grant
1020749030	140.6232	LINDBERG TERRY L	8	118N	050W	Grant
1020749047	132.4422	DAHLGREN KEVIN	9	118N	050W	Grant
1020749052	159.5552	GRANQUIST GARY	10	118N	050W	Grant
1020749051	159.6486	GRANQUIST GARY	10	118N	050W	Grant
1020746252	159.6953	BREYER DWAYNE J	11	118N	050W	Grant
1020749702	30.27497	DAHLGREN KEVIN	9	118N	050W	Grant
1020746242	160.2331	GRABOW TYLER	6	118N	050W	Grant
1020750982	156.3538	LINDBERG TERRY L	5	118N	050W	Grant
1020751004	79.7364	LINDBERG TERRY L	5	118N	050W	Grant
1020750893	159.1193	DAHLGREN KEVIN	4	118N	050W	Grant
1020750691	134.8045	DAHLGREN KEVIN K	4	118N	050W	Grant
1020746237	157.6296	FIELDS ROBERT A	3	118N	050W	Grant
1020746240	158.6681	FOX JOHN L	3	118N	050W	Grant
1020751037	160.912	RUHR MARY B	6	118N	050W	Grant
1020751026	160.8411	KRAKOW MARY M	6	118N	050W	Grant
1020750971	155.8953	AMBERG NANCY	5	118N	050W	Grant
1020750904	151.0978	PEKELDER RYAN R	5	118N	050W	Grant
1020750826	138.1246	PEKELDER RYAN R	3	118N	050W	Grant
1020748985	159.2069	KRAKOW KEVIN	31	119N	050W	Grant
1020746235	119.6866	PEKELDER ROBERT O	32	119N	050W	Grant
1020746227	120.9373	BOULAY CAROLYN LOY	33	119N	050W	Grant
1020746228	159.0887	FIELDS ROBERT A	33	119N	050W	Grant
1020750702	158.1188	PEKELDER RYAN R	34	119N	050W	Grant
1020750602	315.794	FOX JOHN L	34	119N	050W	Grant
1020748998	166.4626	PEKELDER ROBERT	32	119N	050W	Grant
1020748992	31.51747	PEKELDER ROBERT O	33	119N	050W	Grant
1020748990	159.3422	FIELDS ROBERT A	33	119N	050W	Grant
1020748991	119.9588	SONSTEGARD GARY	33	119N	050W	Grant
1020746210	39.71264	BERKNER	25	119N	050W	Grant
1020748967	118.9953	SONSTEGARD GARY	28	119N	050W	Grant
1020748977	159.7853	PEKELDER RYAN R	29	119N	050W	Grant

1020748937	199.5902	C D FARM INC	28	119N	050W	Grant
1020746208	79.35668	BAXTER PATRICIA J	25	119N	050W	Grant
1020746213	79.95232	DORSETT MARK D	25	119N	050W	Grant
1020746218	156.186	GRANQUIST MARK	26	119N	050W	Grant
1020746209	39.6569	BERKNER	25	119N	050W	Grant
1020746220	158.0585	DOLEN DUANE A	27	119N	050W	Grant
1020746217	312.5508	SCHULTZ LARRY	26	119N	050W	Grant
1020746686	6.100185	SCHULTZ LARRY A	26	119N	050W	Grant
1020748970	40.21449	C D FARM INC	29	119N	050W	Grant
1020748939	108.3927	C D FARM INC	29	119N	050W	Grant
1020746219	237.6032	SCHULTZ LARRY	27	119N	050W	Grant
1020748966	160.0421	C D FARM INC	28	119N	050W	Grant
1020746214	158.644	BAXTER PATRICIA J	26	119N	050W	Grant
1020748965	160.1962	C D FARM INC	28	119N	050W	Grant
1020748993	120.1203	BERKNER	25	119N	050W	Grant
1020748980	79.15733	DOLEN DUANE A	27	119N	050W	Grant
1020748979	137.6714	BERKNER	25	119N	050W	Grant
1020748938	51.40875	PEKELDER KRIS	29	119N	050W	Grant
1020748844	31.80666	GRANQUIST GARY	25	119N	050W	Grant
1020748968	15.19227	BERKNER	25	119N	050W	Grant
1020748948	0.362678	BERKNER	24	119N	050W	Grant
1020748924	161.2278	LARSEN DONALD A	20	119N	050W	Grant
1020748961	61.7948	GRANQUIST GARY	23	119N	050W	Grant
1020748854	117.7863	LUNDIN LV TR	23	119N	050W	Grant
1020748838	141.1063	GRANQUIST GARY	24	119N	050W	Grant
1020748962	87.96601	GRANQUIST GARY	23	119N	050W	Grant
1020748947	1.575029	STOCKHOLM TOWNSHIP EXEMPT	23	119N	050W	Grant
1020748949	157.6369	BERKNER	24	119N	050W	Grant
1020748875	17.43792	GRANQUIST GARY	24	119N	050W	Grant
1020748861	27.84427	BERG JAMES B	22	119N	050W	Grant
1020748958	51.73303	BERG JAMES B	21	119N	050W	Grant
1020748927	148.0182	LARSEN DONALD A	20	119N	050W	Grant
1020748849	155.6657	BERKNER	24	119N	050W	Grant
1020748850	154.3173	BERKNER	24	119N	050W	Grant
1020746457	161.105	SCHMELING RONALD	32	120N	051W	Grant
1020748178	161.8354	GTV LAND & CATTLE CO INC	33	120N	051W	Grant
1020748179	156.3683	ZIRBEL JAMES G	33	120N	051W	Grant
1020748161	161.1267	HENRICHS MICHAEL	32	120N	051W	Grant
1020748168	162.0413	GTV LAND & CATTLE CO INC	33	120N	051W	Grant

Appendix: F Project Area Maps



LEGEND

- CE 0.2 MW TURBINE WITH NUMBER (US Meter Rotor Diameter & 50 Meter Hub Height 08-31-18 Array)
- CE 2.1 MW TURBINE WITH NUMBER (US Meter Rotor Diameter & 60 Meter Hub Height 08-31-18 Array - CR115)
- CE 1.715 MW TURBINE WITH NUMBER (03 Meter Rotor Diameter & 60 Meter Hub Height 08-31-18 Array - CR120)
- PROPOSED ACCESS ROAD
- PROPOSED UNDERGROUND COLLECTION
- PROPERTY BOUNDARY
- EXISTING ROAD RIGHT-OF-WAY
- NONPARTICIPATING PARCEL
- NONPARTICIPATING PARCEL SETBACK + 535 FT
- PUBLIC ROAD ROW SETBACK + 535 FT
- MUNICIPAL BOUNDARY SETBACK + 1000 FT
- PROJECT BOUNDARY
- NONPARTICIPATING OCCUPIED HOUSE SETBACK + 1000 FT
- PARTICIPATING OCCUPIED HOUSE SETBACK + 500 FT

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SCALE (FEET)
ISSUE DATE: 09-13-2018

Exhibit A20-5

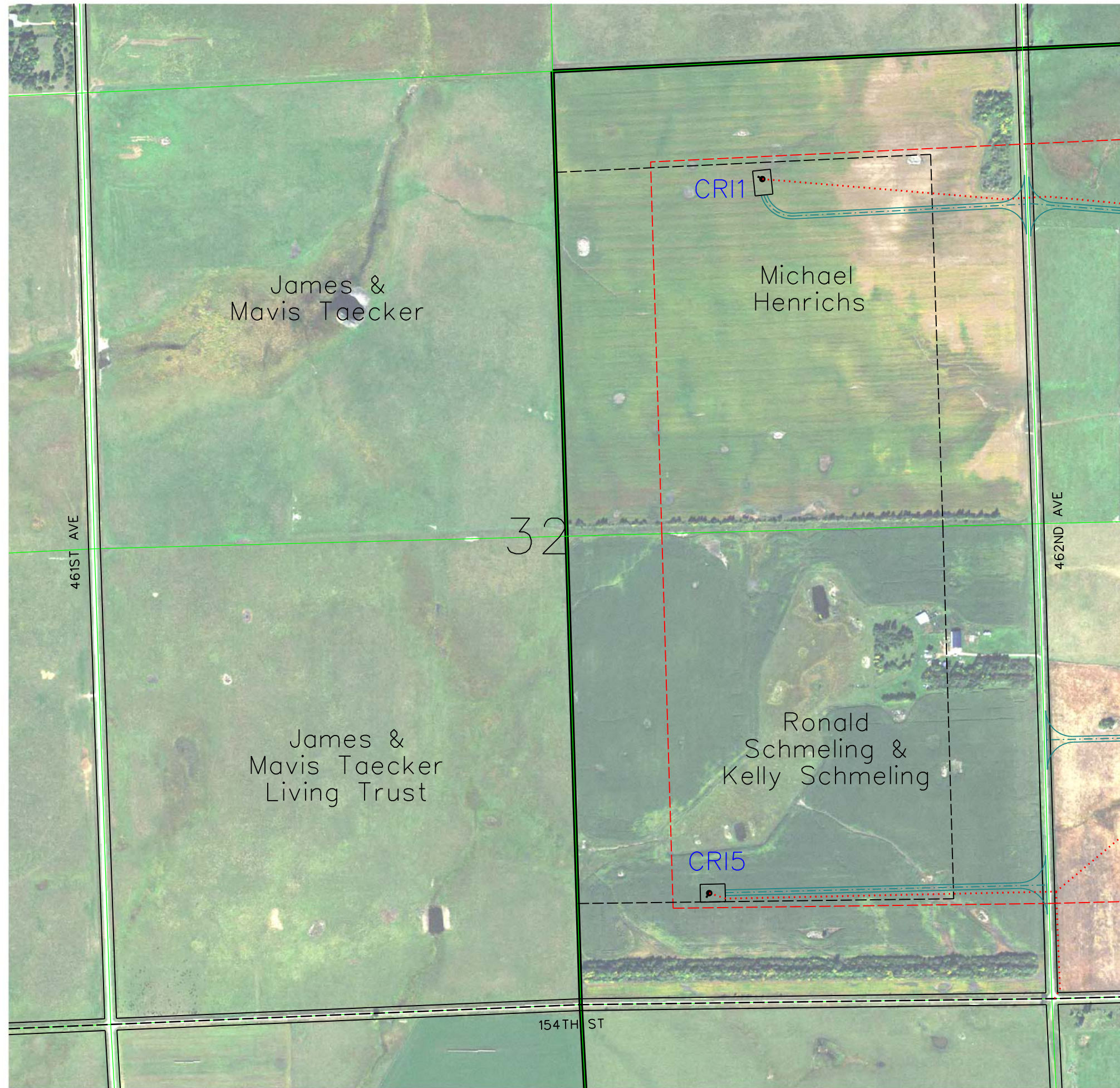
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Project No: 1140140			Sheet 1 of 1

NEXTERA ENERGY - CROWNED RIDGE I & II, LLC
CONDITIONAL USE PERMIT MAPBOOK
SNYDER & ASSOCIATES, INC.

GRANT COUNTY, SOUTH DAKOTA
 1751 MADISON AVENUE
 COUNCIL BLUFFS, IA 51503
 712-322-3202 | www.snyder-associates.com

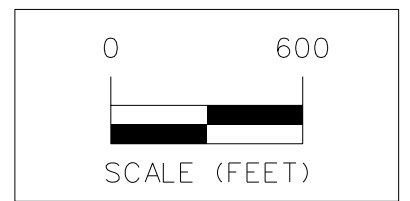
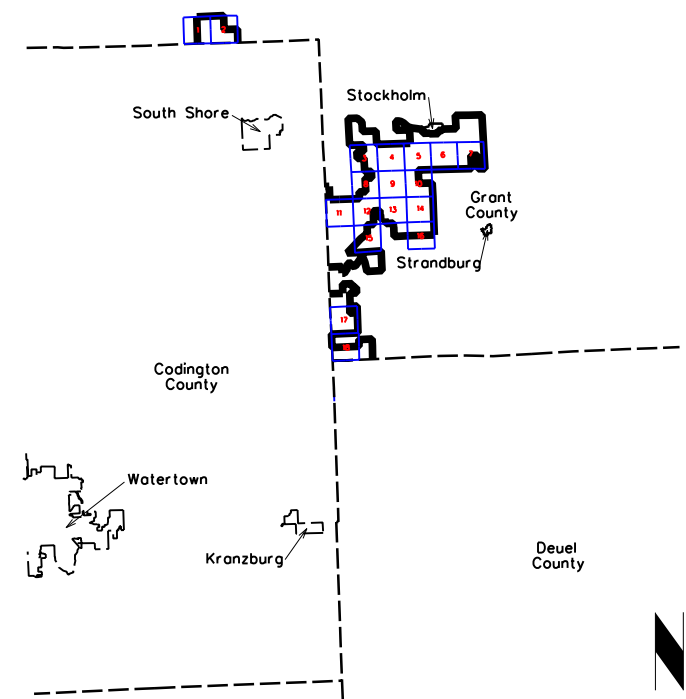
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LEGEND

- PAD MOUNT TRANSFORMER
 TURBINE
 CRANE PAD & GE 2.1MW 116RD 80HH AND GE 1.715MW 103RD 80HH TURBINE WITH NUMBER
- PAD MOUNT TRANSFORMER
 TURBINE
 CRANE PAD & GE 2.3MW 116RD 90HH TURBINE WITH NUMBER
- CRI119 GE 2.3 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 90 Meter Hub Height 08-31-18 Array)
- CRI115 GE 2.1 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI115)
- CRI120 GE 1.715 MW TURBINE WITH NUMBER (103 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI120)
- PROPOSED ACCESS ROAD
- PROPOSED UNDERGROUND COLLECTION
- PROPERTY BOUNDARY
- EXISTING ROAD RIGHT-OF-WAY
- NONPARTICIPATING PARCEL
- NONPARTICIPATING PARCEL SETBACK = 535 FT
- PUBLIC ROAD ROW SETBACK = 535 FT
- MUNICIPAL BOUNDARY SETBACK = 1000 FT
- PROJECT BOUNDARY
- NONPARTICIPATING OCCUPIED HOUSE SETBACK = 1000 FT
- PARTICIPATING OCCUPIED HOUSE SETBACK = 500 FT



ISSUE DATE: 09-13-2018

Exhibit A20-5

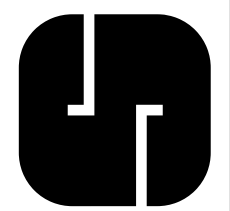
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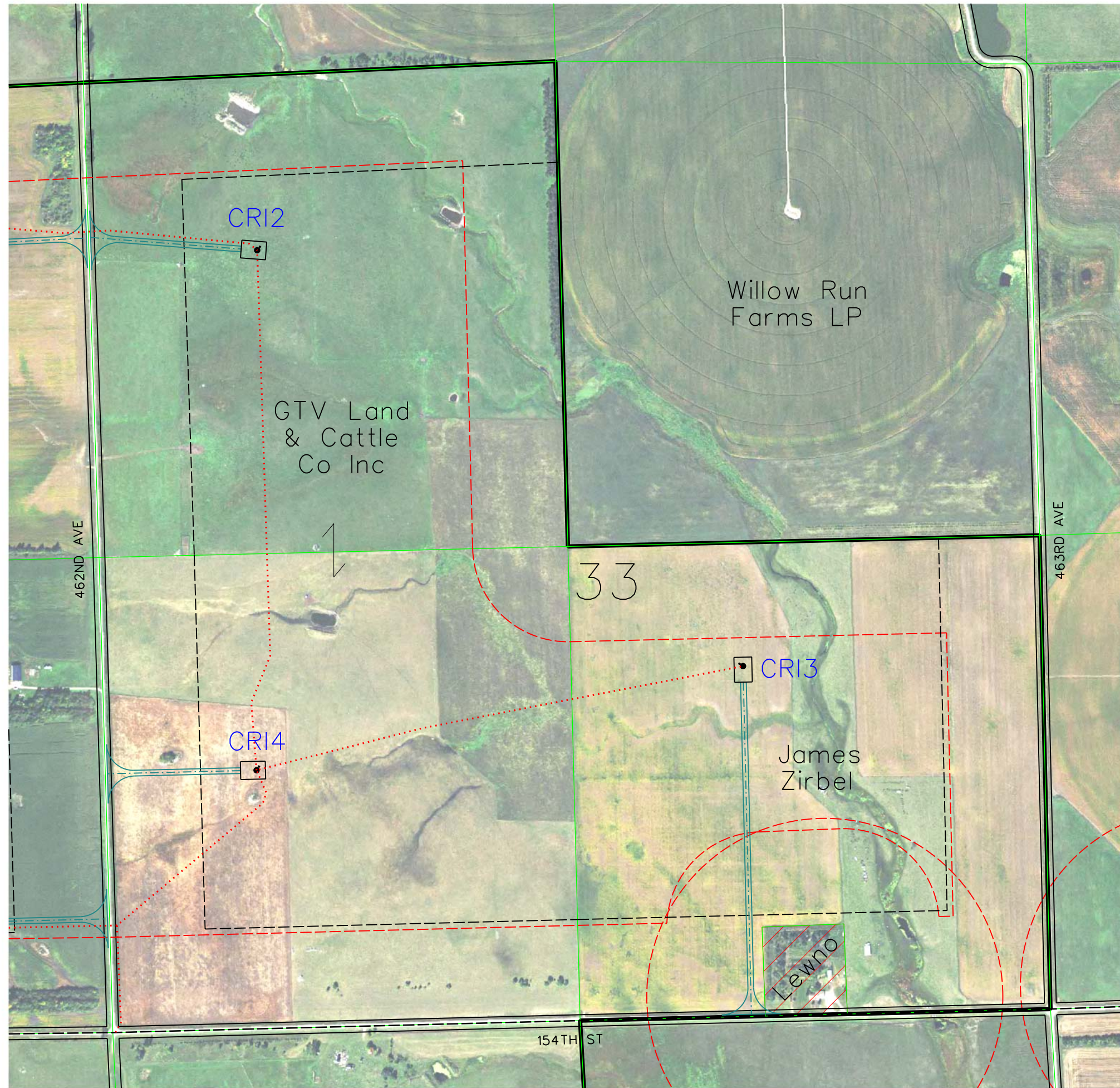
Project No: 1140140 Sheet 1 of 18

NEXTERA ENERGY - CROWNED RIDGE, LLC
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SNYDER & ASSOCIATES, INC.

GRANT COUNTY, SOUTH DAKOTA
 1751 MADISON AVENUE
 COUNCIL BLUFFS, IA 51503
 712-322-3202 | www.snyder-associates.com

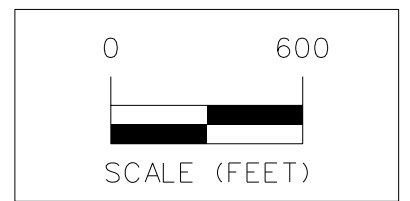
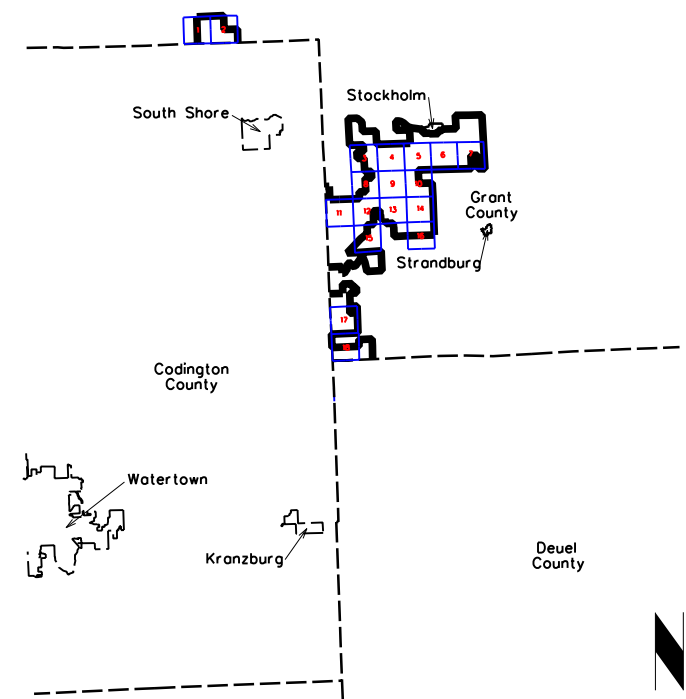


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 Snyder 1600



LEGEND

- PAD MOUNT TRANSFORMER
 TURBINE CRANE PAD & GE 2.1MW 116RD 80HH AND GE 1.715MW 103RD 80HH TURBINE WITH NUMBER
- PAD MOUNT TRANSFORMER
 TURBINE CRANE PAD & GE 2.3MW 116RD 90HH TURBINE WITH NUMBER
- CRI119 GE 2.3 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 90 Meter Hub Height 08-31-18 Array)
- CRI115 GE 2.1 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI115)
- CRI120 GE 1.715 MW TURBINE WITH NUMBER (103 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI120)
- PROPOSED ACCESS ROAD
- PROPOSED UNDERGROUND COLLECTION
- PROPERTY BOUNDARY
- EXISTING ROAD RIGHT-OF-WAY
- NONPARTICIPATING PARCEL
- NONPARTICIPATING PARCEL SETBACK = 535 FT
- PUBLIC ROAD ROW SETBACK = 535 FT
- MUNICIPAL BOUNDARY SETBACK = 1000 FT
- PROJECT BOUNDARY
- NONPARTICIPATING OCCUPIED HOUSE SETBACK = 1000 FT
- PARTICIPATING OCCUPIED HOUSE SETBACK = 500 FT



ISSUE DATE: 09-13-2018

Exhibit A20-5

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Technician:	DW	Date:	8/24/18	Field Bk:	

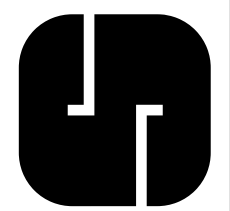
Project No: 1140140

Sheet 2 of 18

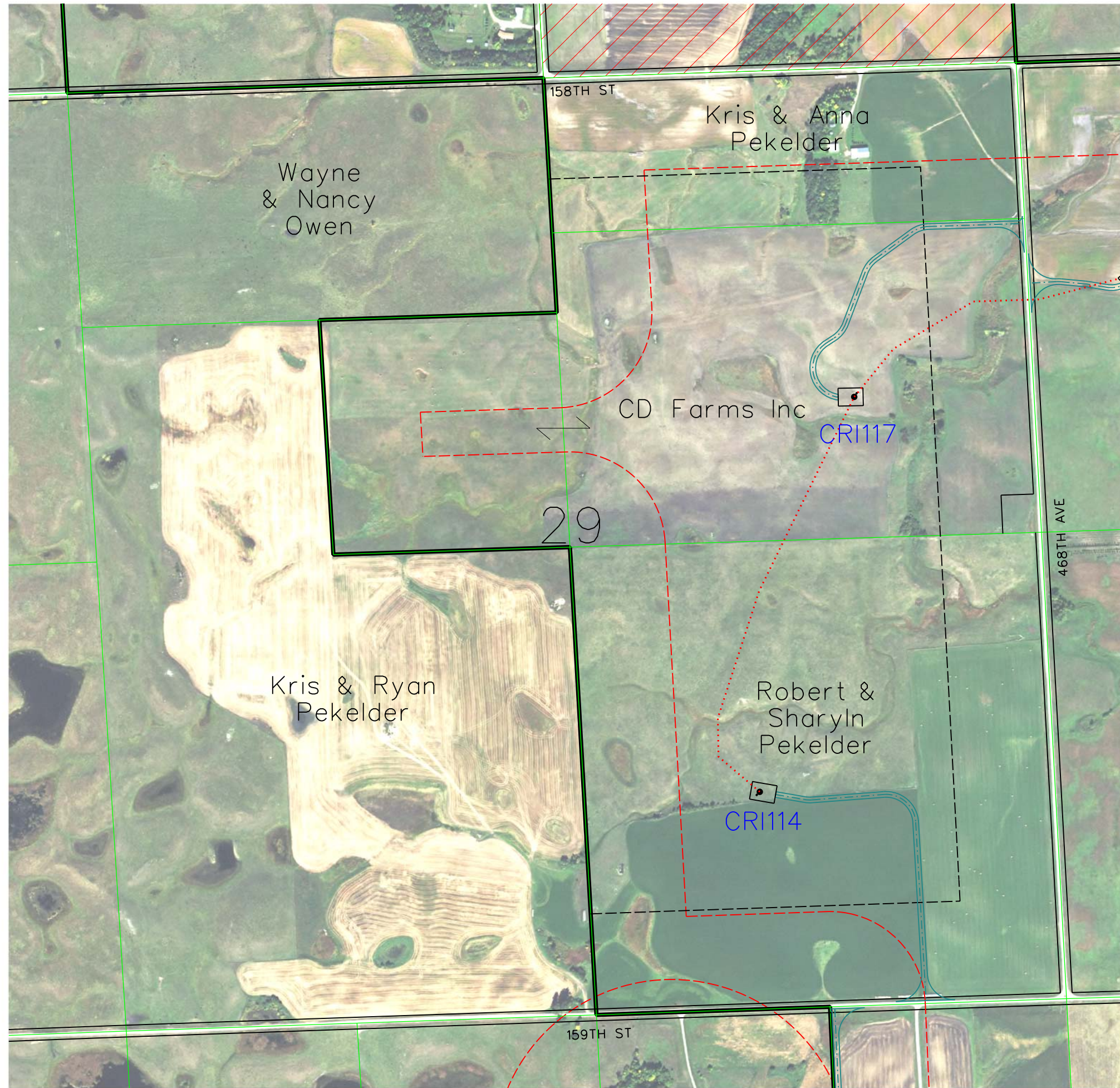
NEXTERA ENERGY - CROWNED RIDGE, LLC
 CUP MAPBOOK SEC 33, TWP 120N, RNG 51W
SNYDER & ASSOCIATES, INC.

GRANT COUNTY, SOUTH DAKOTA

1751 MADISON AVENUE
 COUNCIL BLUFFS, IA 51503
 712-322-3202 | www.snyder-associates.com

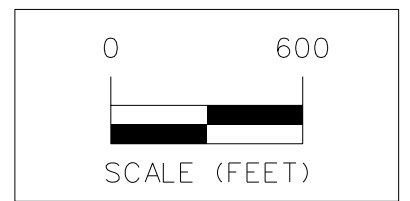
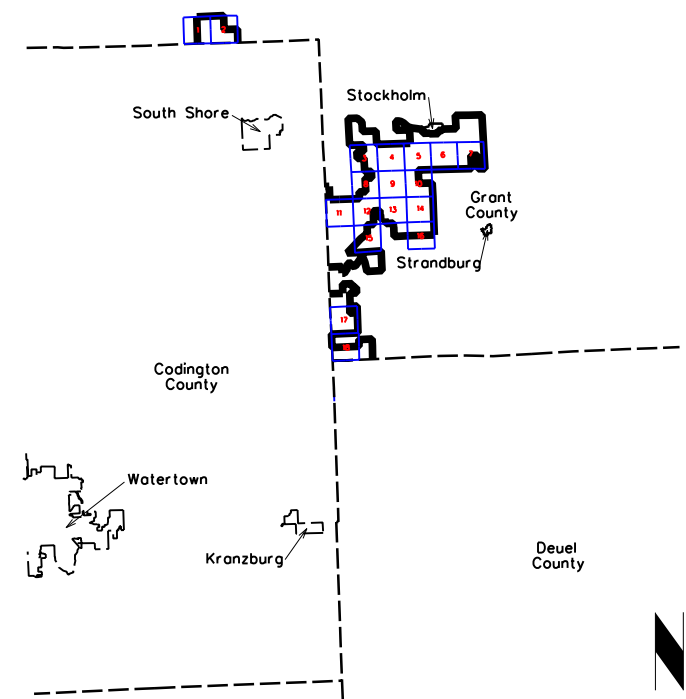


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 Snyder 1600



LEGEND

- PAD MOUNT TRANSFORMER
- TURBINE
- CRANE PAD & GE 2.1MW 116RD 80HH AND GE 1.715MW 103RD 80HH TURBINE WITH NUMBER
- CRANE PAD & GE 2.3MW 116RD 90HH TURBINE WITH NUMBER
- GE 2.3 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 90 Meter Hub Height 08-31-18 Array)
- GE 2.1 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI115)
- GE 1.715 MW TURBINE WITH NUMBER (103 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI120)
- PROPOSED ACCESS ROAD
- PROPOSED UNDERGROUND COLLECTION
- PROPERTY BOUNDARY
- EXISTING ROAD RIGHT-OF-WAY
- NONPARTICIPATING PARCEL
- NONPARTICIPATING PARCEL SETBACK = 535 FT
- PUBLIC ROAD ROW SETBACK = 535 FT
- MUNICIPAL BOUNDARY SETBACK = 1000 FT
- PROJECT BOUNDARY
- NONPARTICIPATING OCCUPIED HOUSE SETBACK = 1000 FT
- PARTICIPATING OCCUPIED HOUSE SETBACK = 500 FT

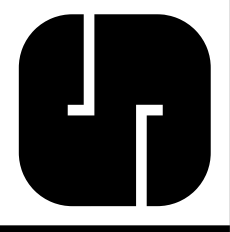


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Exhibit A20-5

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Technician: DW	Date: 8/24/18	Field Bk:	Page:

NEXTERA ENERGY - CROWNED RIDGE, LLC
 CUP MAPBOOK SEC 29, TWP 119N, RNG 50W
SNYDER & ASSOCIATES, INC.
 1751 MADISON AVENUE
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 712-322-3202 | www.snyder-associates.com

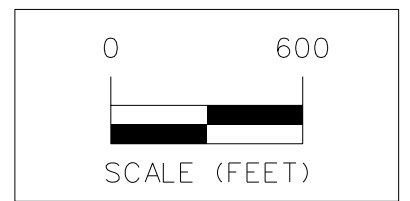
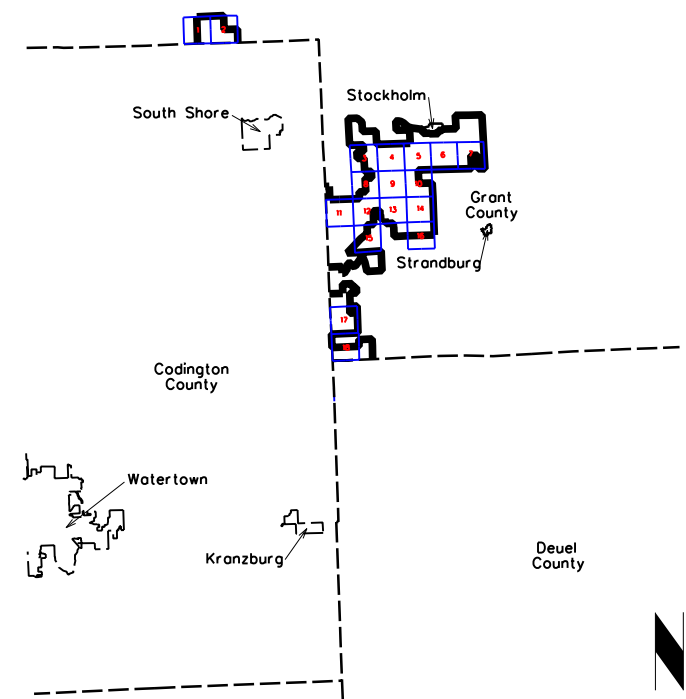


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LEGEND

- PAD MOUNT TRANSFORMER
 TURBINE
 CRANE PAD & GE 2.1MW 116RD 80HH AND GE 1.715MW 103RD 80HH TURBINE WITH NUMBER
- PAD MOUNT TRANSFORMER
 TURBINE
 CRANE PAD & GE 2.3MW 116RD 90HH TURBINE WITH NUMBER
- CRI119** GE 2.3 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 90 Meter Hub Height 08-31-18 Array)
- CRI115** GE 2.1 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI115)
- CRI120** GE 1.715 MW TURBINE WITH NUMBER (103 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI120)
- PROPOSED ACCESS ROAD
- PROPOSED UNDERGROUND COLLECTION
- PROPERTY BOUNDARY
- EXISTING ROAD RIGHT-OF-WAY
- NONPARTICIPATING PARCEL
- NONPARTICIPATING PARCEL SETBACK = 535 FT
- PUBLIC ROAD ROW SETBACK = 535 FT
- MUNICIPAL BOUNDARY SETBACK = 1000 FT
- PROJECT BOUNDARY
- NONPARTICIPATING OCCUPIED HOUSE SETBACK = 1000 FT
- PARTICIPATING OCCUPIED HOUSE SETBACK = 500 FT

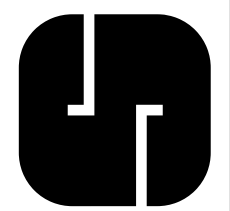


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NEXTERA ENERGY - CROWNED RIDGE, LLC
 CUP MAPBOOK SEC 28, TWP 19N, RNG 50W
SNYDER & ASSOCIATES, INC.
 1751 MADISON AVENUE
 COUNCIL BLUFFS, IA 51503
 712-322-3202 | www.snyder-associates.com

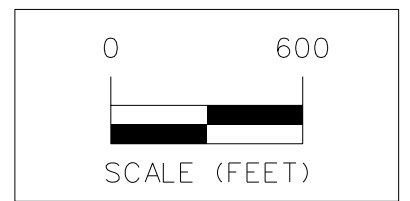
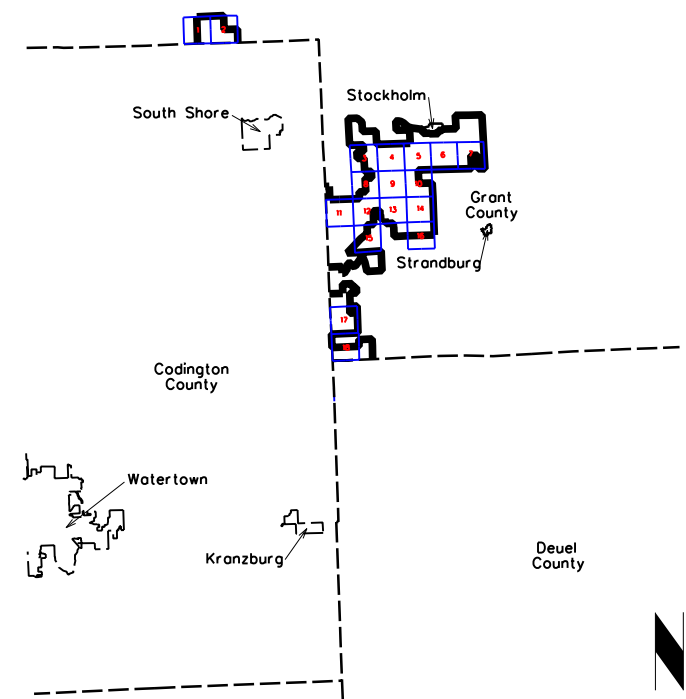


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LEGEND

- PAD MOUNT TRANSFORMER
 TURBINE CRANE PAD & GE 2.1MW 116RD 80HH AND GE 1.715MW 103RD 80HH TURBINE WITH NUMBER
- PAD MOUNT TRANSFORMER
 TURBINE CRANE PAD & GE 2.3MW 116RD 90HH TURBINE WITH NUMBER
- CRI119 GE 2.3 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 90 Meter Hub Height 08-31-18 Array)
- CRI115 GE 2.1 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI115)
- CRI120 GE 1.715 MW TURBINE WITH NUMBER (103 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI120)
- PROPOSED ACCESS ROAD
- PROPOSED UNDERGROUND COLLECTION
- PROPERTY BOUNDARY
- EXISTING ROAD RIGHT-OF-WAY
- NONPARTICIPATING PARCEL
- NONPARTICIPATING PARCEL SETBACK = 535 FT
- PUBLIC ROAD ROW SETBACK = 535 FT
- MUNICIPAL BOUNDARY SETBACK = 1000 FT
- PROJECT BOUNDARY
- NONPARTICIPATING OCCUPIED HOUSE SETBACK = 1000 FT
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ISSUE DATE: 09-13-2018

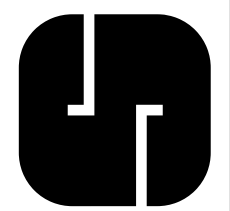
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Project No: 1140140 Sheet 5 of 18

NEXTERA ENERGY - CROWNED RIDGE, LLC
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SNYDER & ASSOCIATES, INC.

GRANT COUNTY, SOUTH DAKOTA
 1751 MADISON AVENUE
 COUNCIL BLUFFS, IA 51503
 712-322-3202 | www.snyder-associates.com

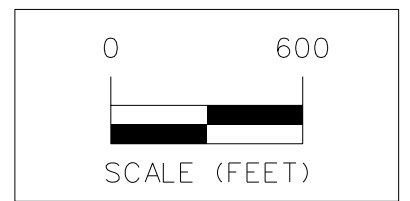
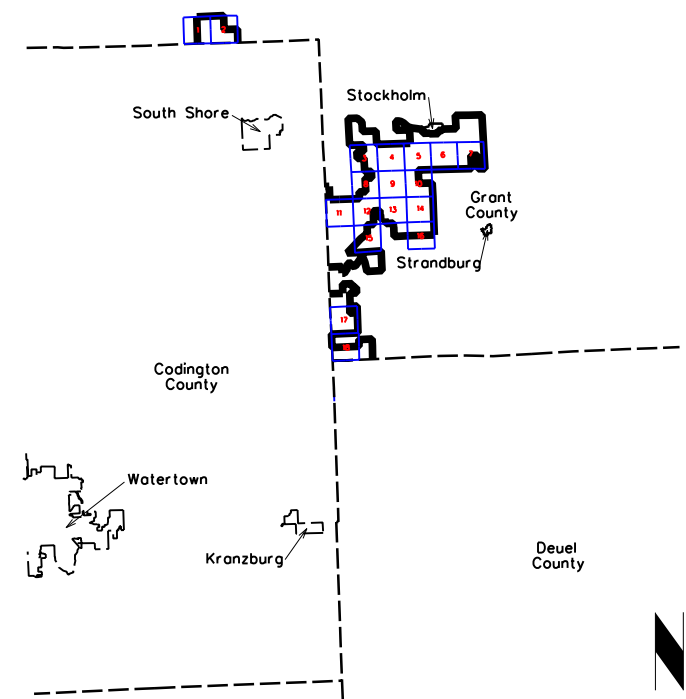


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LEGEND

- PAD MOUNT TRANSFORMER
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- PAD MOUNT TRANSFORMER
 TURBINE
 CRANE PAD & GE 2.3MW 116RD 90HH TURBINE WITH NUMBER
- CRI119 GE 2.3 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 90 Meter Hub Height 08-31-18 Array)
- CRI115 GE 2.1 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI115)
- CRI120 GE 1.715 MW TURBINE WITH NUMBER (103 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI120)
- PROPOSED ACCESS ROAD
- PROPOSED UNDERGROUND COLLECTION
- PROPERTY BOUNDARY
- EXISTING ROAD RIGHT-OF-WAY
- NONPARTICIPATING PARCEL
- NONPARTICIPATING PARCEL SETBACK = 535 FT
- PUBLIC ROAD ROW SETBACK = 535 FT
- MUNICIPAL BOUNDARY SETBACK = 1000 FT
- PROJECT BOUNDARY
- NONPARTICIPATING OCCUPIED HOUSE SETBACK = 1000 FT
- PARTICIPATING OCCUPIED HOUSE SETBACK = 500 FT



ISSUE DATE: 09-13-2018

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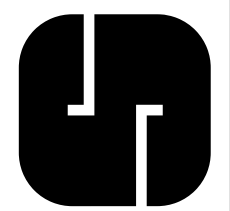
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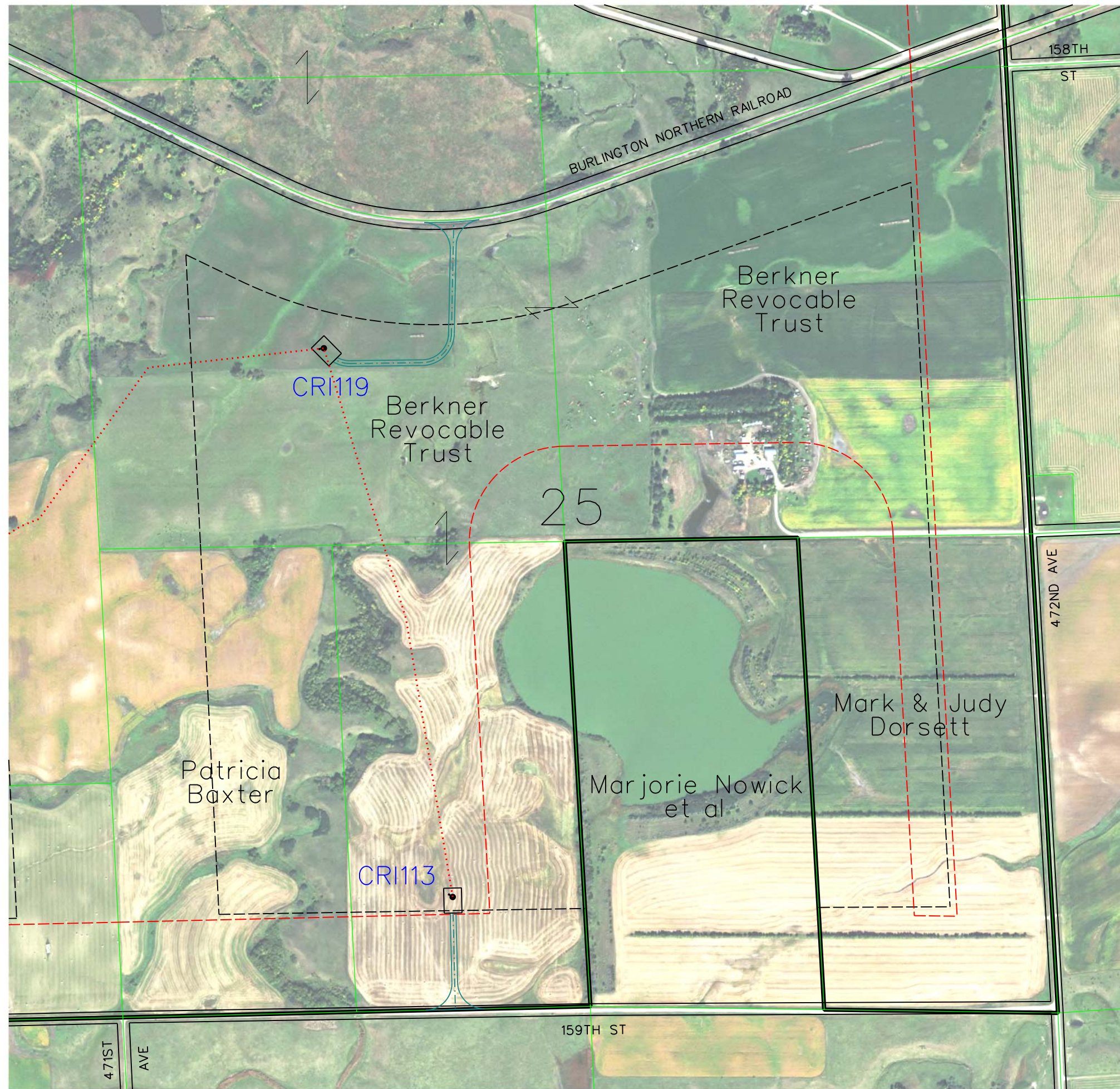
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Project No: 1140140
 Sheet 6 of 18

NEXTERA ENERGY - CROWNED RIDGE, LLC
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SNYDER & ASSOCIATES, INC.
 1751 MADISON AVENUE
 COUNCIL BLUFFS, IA 51503
 712-322-3202 | www.snyder-associates.com

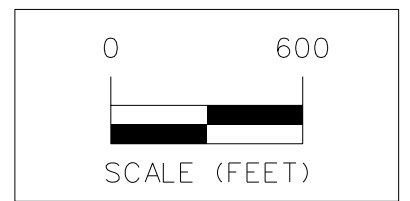
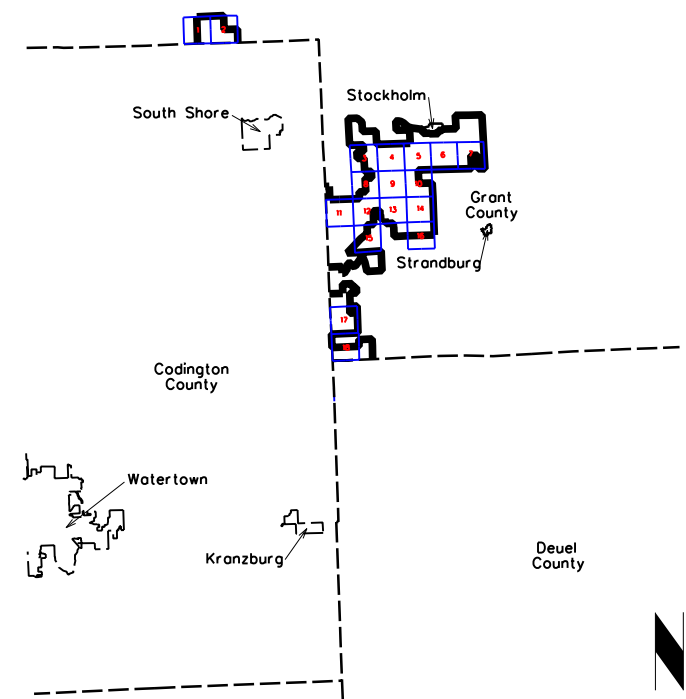


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LEGEND

- PAD MOUNT TRANSFORMER
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- PAD MOUNT TRANSFORMER
 TURBINE CRANE PAD & GE 2.3MW 116RD 90HH TURBINE WITH NUMBER
- CR119 GE 2.3 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 90 Meter Hub Height 08-31-18 Array)
- CR1115 GE 2.1 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CR1115)
- CR1120 GE 1.715 MW TURBINE WITH NUMBER (103 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CR1120)
- PROPOSED ACCESS ROAD
- PROPOSED UNDERGROUND COLLECTION
- PROPERTY BOUNDARY
- EXISTING ROAD RIGHT-OF-WAY
- NONPARTICIPATING PARCEL
- NONPARTICIPATING PARCEL SETBACK = 535 FT
- PUBLIC ROAD ROW SETBACK = 535 FT
- MUNICIPAL BOUNDARY SETBACK = 1000 FT
- PROJECT BOUNDARY
- NONPARTICIPATING OCCUPIED HOUSE SETBACK = 1000 FT
- PARTICIPATING OCCUPIED HOUSE SETBACK = 500 FT



ISSUE DATE: 09-13-2018

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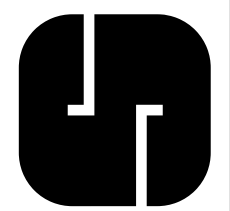
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Project No: 1140140
Sheet 7 of 18

NEXTERA ENERGY - CROWNED RIDGE, LLC

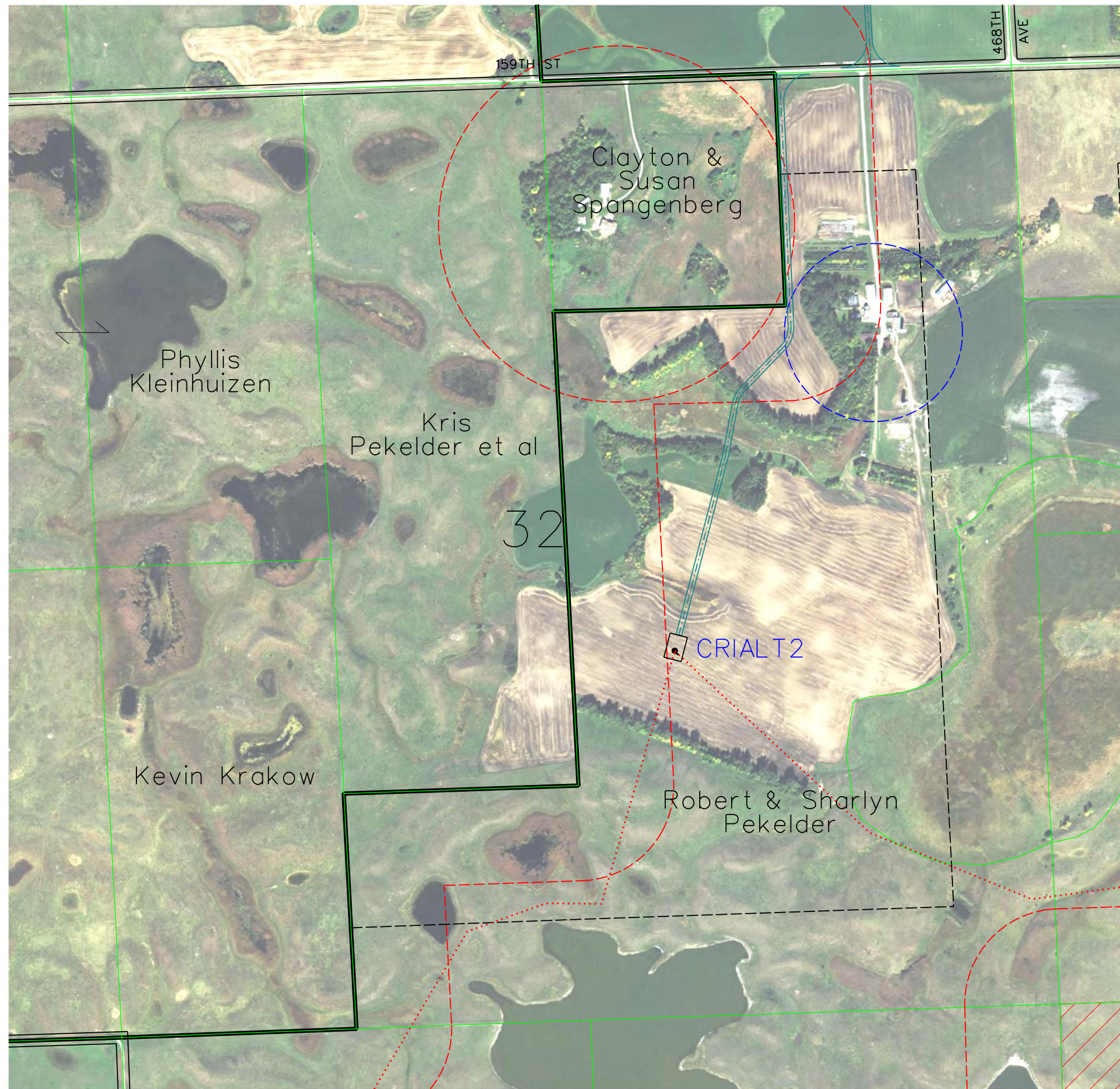
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SNYDER & ASSOCIATES, INC.



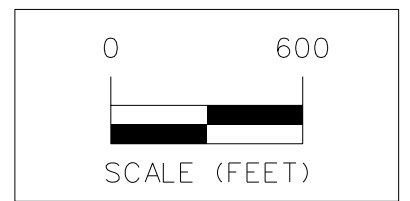
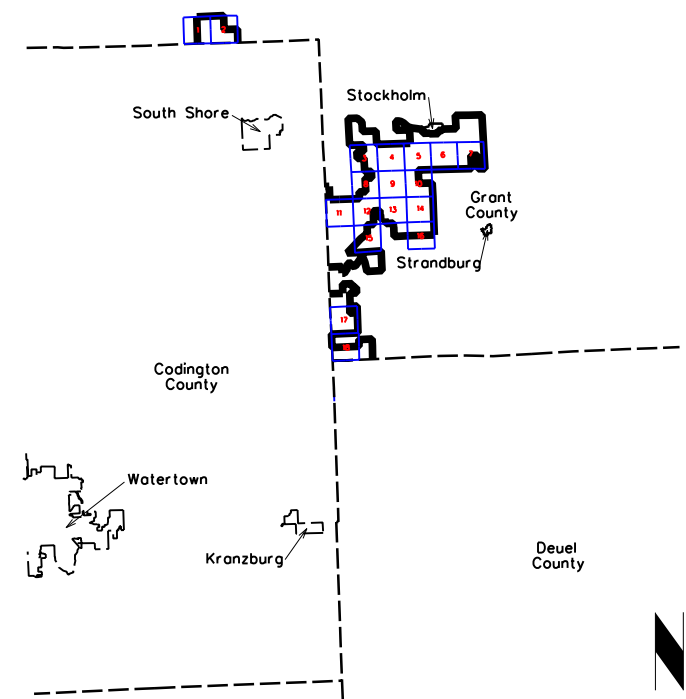
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LEGEND

- PAD MOUNT TRANSFORMER
 TURBINE
 CRANE PAD & GE 2.1MW 116RD 80HH AND GE 1.715MW 103RD 80HH TURBINE WITH NUMBER
- PAD MOUNT TRANSFORMER
 TURBINE
 CRANE PAD & GE 2.3MW 116RD 90HH TURBINE WITH NUMBER
- CRI119 GE 2.3 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 90 Meter Hub Height 08-31-18 Array)
- CRI115 GE 2.1 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI115)
- CRI120 GE 1.715 MW TURBINE WITH NUMBER (103 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI120)
- PROPOSED ACCESS ROAD
- PROPOSED UNDERGROUND COLLECTION
- PROPERTY BOUNDARY
- EXISTING ROAD RIGHT-OF-WAY
- NONPARTICIPATING PARCEL
- NONPARTICIPATING PARCEL SETBACK = 535 FT
- PUBLIC ROAD ROW SETBACK = 535 FT
- MUNICIPAL BOUNDARY SETBACK = 1000 FT
- PROJECT BOUNDARY
- NONPARTICIPATING OCCUPIED HOUSE SETBACK = 1000 FT
- PARTICIPATING OCCUPIED HOUSE SETBACK = 500 FT



ISSUE DATE: 09-13-2018

Exhibit A20-5

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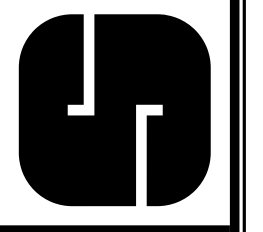
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Sheet 8 of 18

NEXTERA ENERGY - CROWNED RIDGE, LLC
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SNYDER & ASSOCIATES, INC.

GRANT COUNTY, SOUTH DAKOTA

1751 MADISON AVENUE
 COUNCIL BLUFFS, IA 51503
 712-322-3202 | www.snyder-associates.com

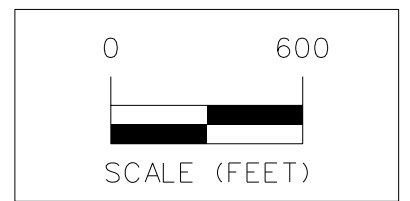
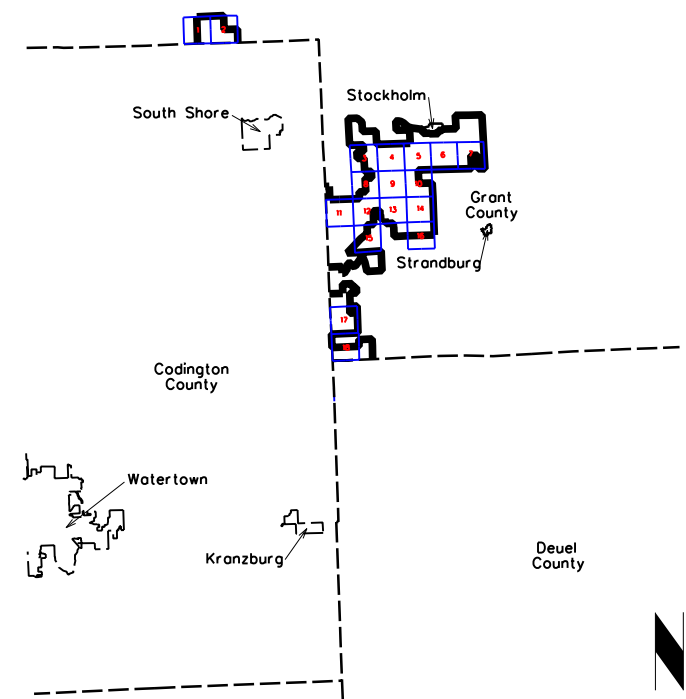


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LEGEND

- PAD MOUNT TRANSFORMER
 TURBINE
 CRANE PAD & GE 2.1MW 116RD 80HH AND GE 1.715MW 103RD 80HH TURBINE WITH NUMBER
- PAD MOUNT TRANSFORMER
 TURBINE
 CRANE PAD & GE 2.3MW 116RD 90HH TURBINE WITH NUMBER
- CRI119 GE 2.3 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 90 Meter Hub Height 08-31-18 Array)
- CRI115 GE 2.1 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI115)
- CRI120 GE 1.715 MW TURBINE WITH NUMBER (103 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI120)
- PROPOSED ACCESS ROAD
- PROPOSED UNDERGROUND COLLECTION
- PROPERTY BOUNDARY
- EXISTING ROAD RIGHT-OF-WAY
- NONPARTICIPATING PARCEL
- NONPARTICIPATING PARCEL SETBACK = 535 FT
- PUBLIC ROAD ROW SETBACK = 535 FT
- MUNICIPAL BOUNDARY SETBACK = 1000 FT
- PROJECT BOUNDARY
- NONPARTICIPATING OCCUPIED HOUSE SETBACK = 1000 FT
- PARTICIPATING OCCUPIED HOUSE SETBACK = 500 FT



ISSUE DATE: 09-13-2018

Exhibit A20-5

MARK	REVISION	DATE	BY

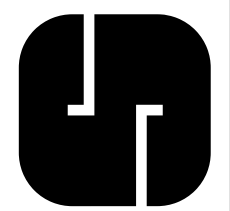
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Technician:	DW	Date:	8/24/18	Field Bk:	

Project No: 1140140 Sheet 9 of 18

NEXTERA ENERGY - CROWNED RIDGE, LLC

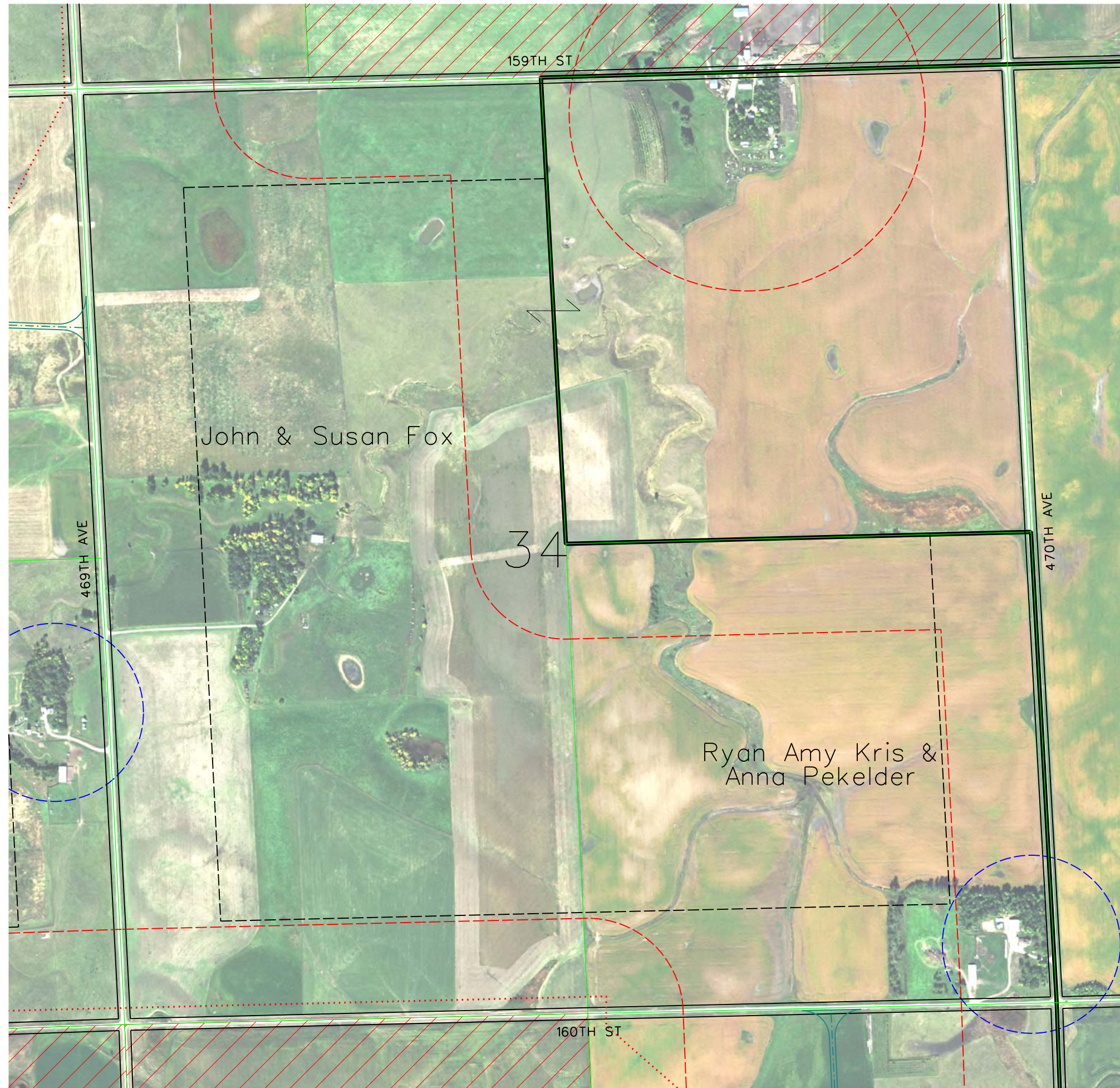
CUP MAPBOOK SEC 33, TWP 119N, R1G 50W

SNYDER & ASSOCIATES, INC.



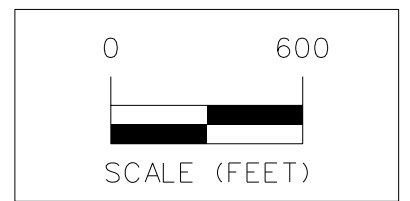
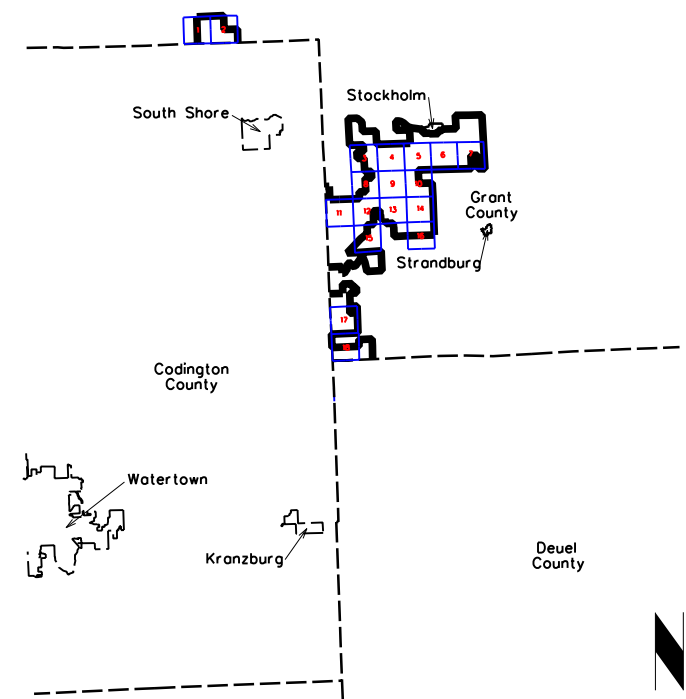
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LEGEND

- PAD MOUNT TRANSFORMER
- TURBINE
- CRANE PAD & GE 2.1MW 116RD 80HH AND GE 1.715MW 103RD 80HH TURBINE WITH NUMBER
- CRANE PAD & GE 2.3MW 116RD 90HH TURBINE WITH NUMBER
- CRI119 GE 2.3 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 90 Meter Hub Height 08-31-18 Array)
- CRI115 GE 2.1 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI115)
- CRI120 GE 1.715 MW TURBINE WITH NUMBER (103 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI120)
- PROPOSED ACCESS ROAD
- PROPOSED UNDERGROUND COLLECTION
- PROPERTY BOUNDARY
- EXISTING ROAD RIGHT-OF-WAY
- NONPARTICIPATING PARCEL
- NONPARTICIPATING PARCEL SETBACK = 535 FT
- PUBLIC ROAD ROW SETBACK = 535 FT
- MUNICIPAL BOUNDARY SETBACK = 1000 FT
- PROJECT BOUNDARY
- NONPARTICIPATING OCCUPIED HOUSE SETBACK = 1000 FT
- PARTICIPATING OCCUPIED HOUSE SETBACK = 500 FT

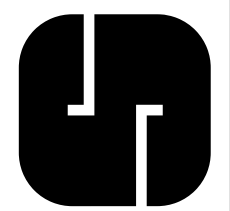


ISSUE DATE: 09-13-2018

Exhibit A20-5

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Technician: DW	Date: 8/24/18	Field Bk:	
Project No: 1140140			Sheet 10 of 18

NEXTERA ENERGY - CROWNED RIDGE, LLC
 CUP MAPBOOK SEC 34, TWP 119N, R19E, S05W
SNYDER & ASSOCIATES, INC.
 1751 MADISON AVENUE
 COUNCIL BLUFFS, IA 51503
 712-322-3202 | www.snyder-associates.com

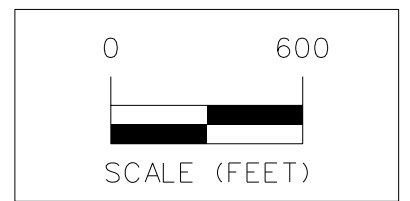
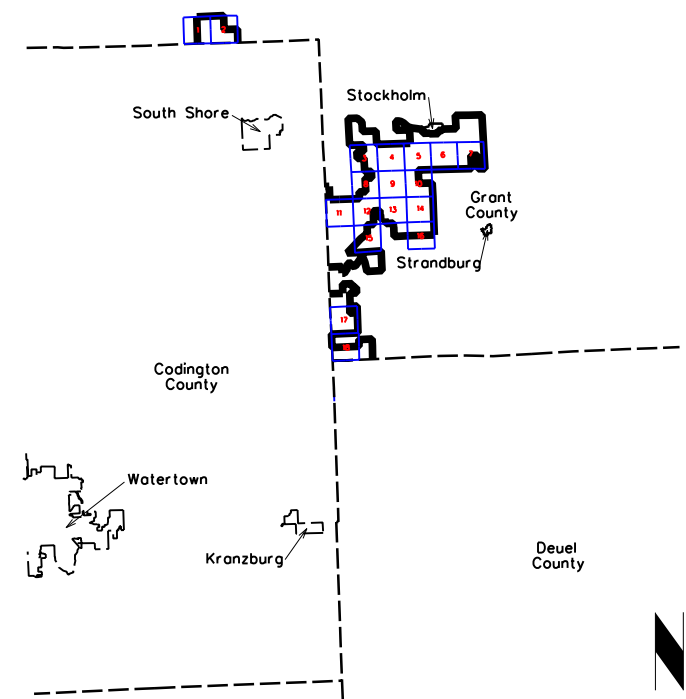


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LEGEND

- PAD MOUNT TRANSFORMER
 TURBINE
 CRANE PAD & GE 2.1MW 116RD 80HH AND GE 1.715MW 103RD 80HH TURBINE WITH NUMBER
- PAD MOUNT TRANSFORMER
 TURBINE
 CRANE PAD & GE 2.3MW 116RD 90HH TURBINE WITH NUMBER
- CRI119 GE 2.3 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 90 Meter Hub Height 08-31-18 Array)
- CRI115 GE 2.1 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI115)
- CRI120 GE 1.715 MW TURBINE WITH NUMBER (103 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI120)
- PROPOSED ACCESS ROAD
- PROPOSED UNDERGROUND COLLECTION
- PROPERTY BOUNDARY
- EXISTING ROAD RIGHT-OF-WAY
- NONPARTICIPATING PARCEL
- NONPARTICIPATING PARCEL SETBACK = 535 FT
- PUBLIC ROAD ROW SETBACK = 535 FT
- MUNICIPAL BOUNDARY SETBACK = 1000 FT
- PROJECT BOUNDARY
- NONPARTICIPATING OCCUPIED HOUSE SETBACK = 1000 FT
- PARTICIPATING OCCUPIED HOUSE SETBACK = 500 FT



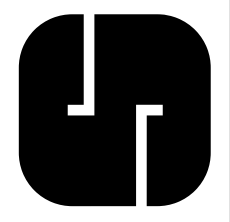
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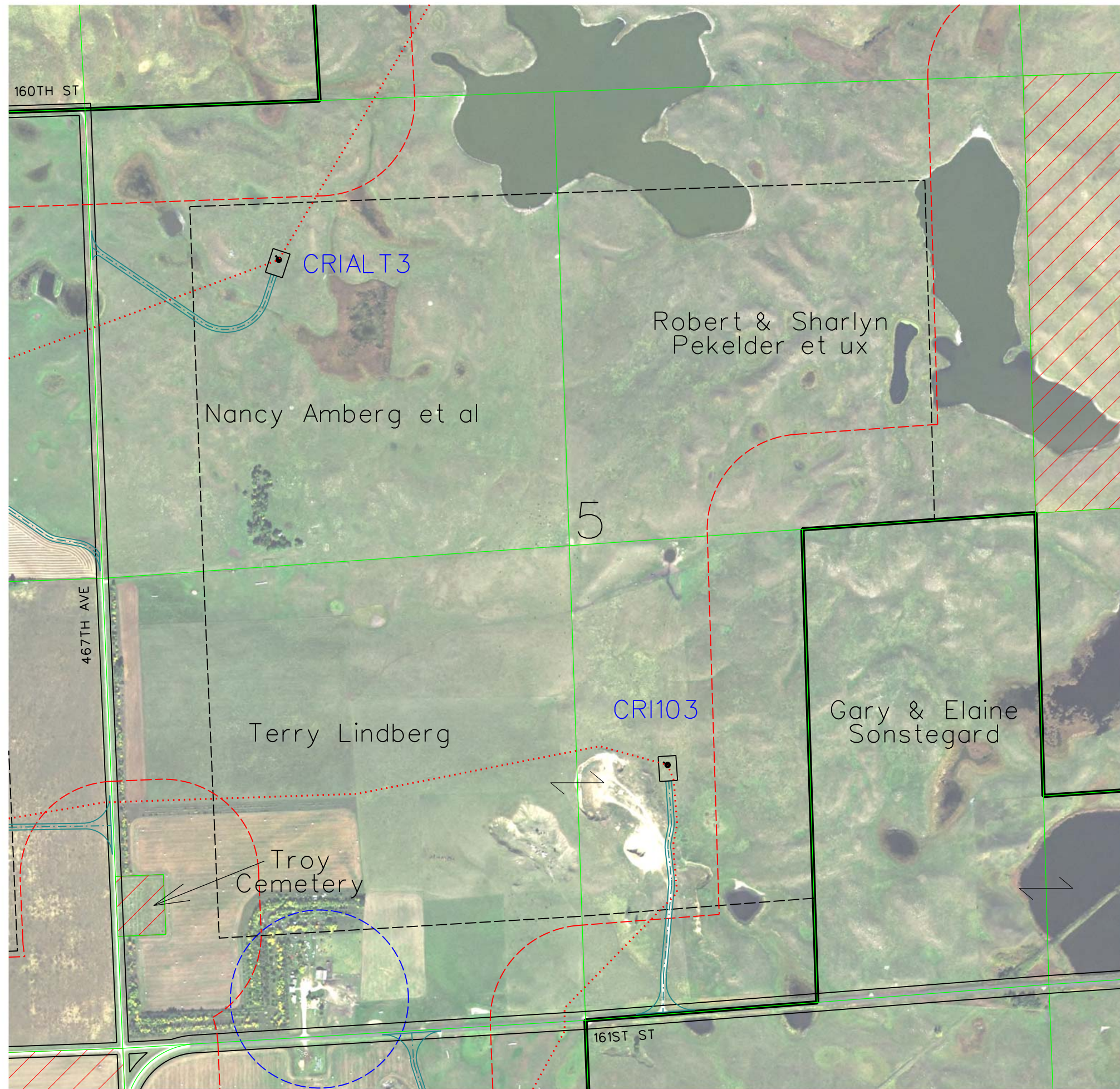
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Technician: DW	Date: 8/24/18	Field Bc:	

Project No: 1140140 Sheet 11 of 18

NEXTERA ENERGY - CROWNED RIDGE, LLC
 CUP MAPBOOK SEC 06, TWP 18N, R18W S01W
SNYDER & ASSOCIATES, INC.
 1751 MADISON AVENUE
 COUNCIL BLUFFS, IA 51503
 712-322-3202 | www.snyder-associates.com

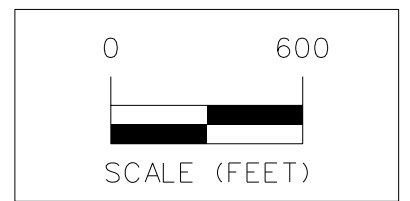
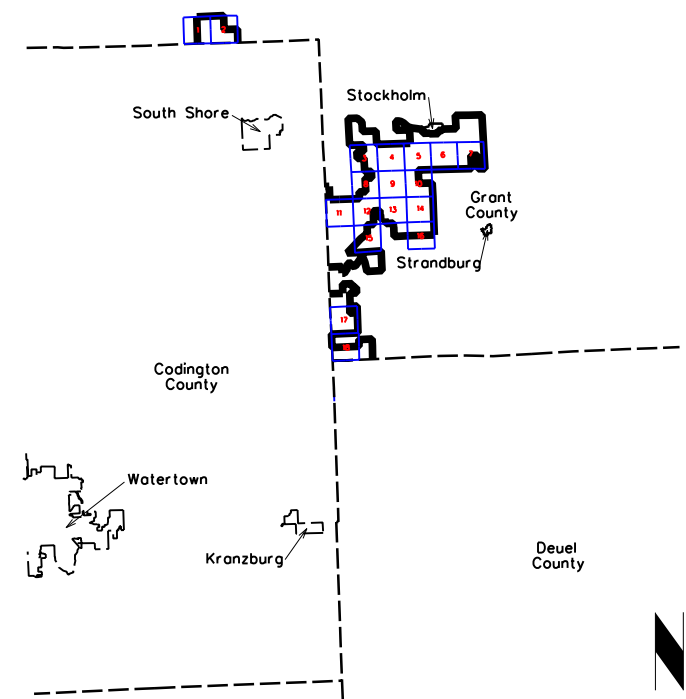


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 Snyder 1600



LEGEND

- PAD MOUNT TRANSFORMER
 TURBINE CRANE PAD & GE 2.1MW 116RD 80HH AND GE 1.715MW 103RD 80HH TURBINE WITH NUMBER
- PAD MOUNT TRANSFORMER
 TURBINE CRANE PAD & GE 2.3MW 116RD 90HH TURBINE WITH NUMBER
- CRI119 GE 2.3 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 90 Meter Hub Height 08-31-18 Array)
- CRI115 GE 2.1 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI115)
- CRI120 GE 1.715 MW TURBINE WITH NUMBER (103 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI120)
- PROPOSED ACCESS ROAD
- PROPOSED UNDERGROUND COLLECTION
- PROPERTY BOUNDARY
- EXISTING ROAD RIGHT-OF-WAY
- NONPARTICIPATING PARCEL
- NONPARTICIPATING PARCEL SETBACK = 535 FT
- PUBLIC ROAD ROW SETBACK = 535 FT
- MUNICIPAL BOUNDARY SETBACK = 1000 FT
- PROJECT BOUNDARY
- NONPARTICIPATING OCCUPIED HOUSE SETBACK = 1000 FT
- PARTICIPATING OCCUPIED HOUSE SETBACK = 500 FT



ISSUE DATE: 09-13-2018

Exhibit A20-5

MARK	REVISION	DATE	BY

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Technician:	DW	Date:	8/24/18	Field Bk:	

Project No: 1140140

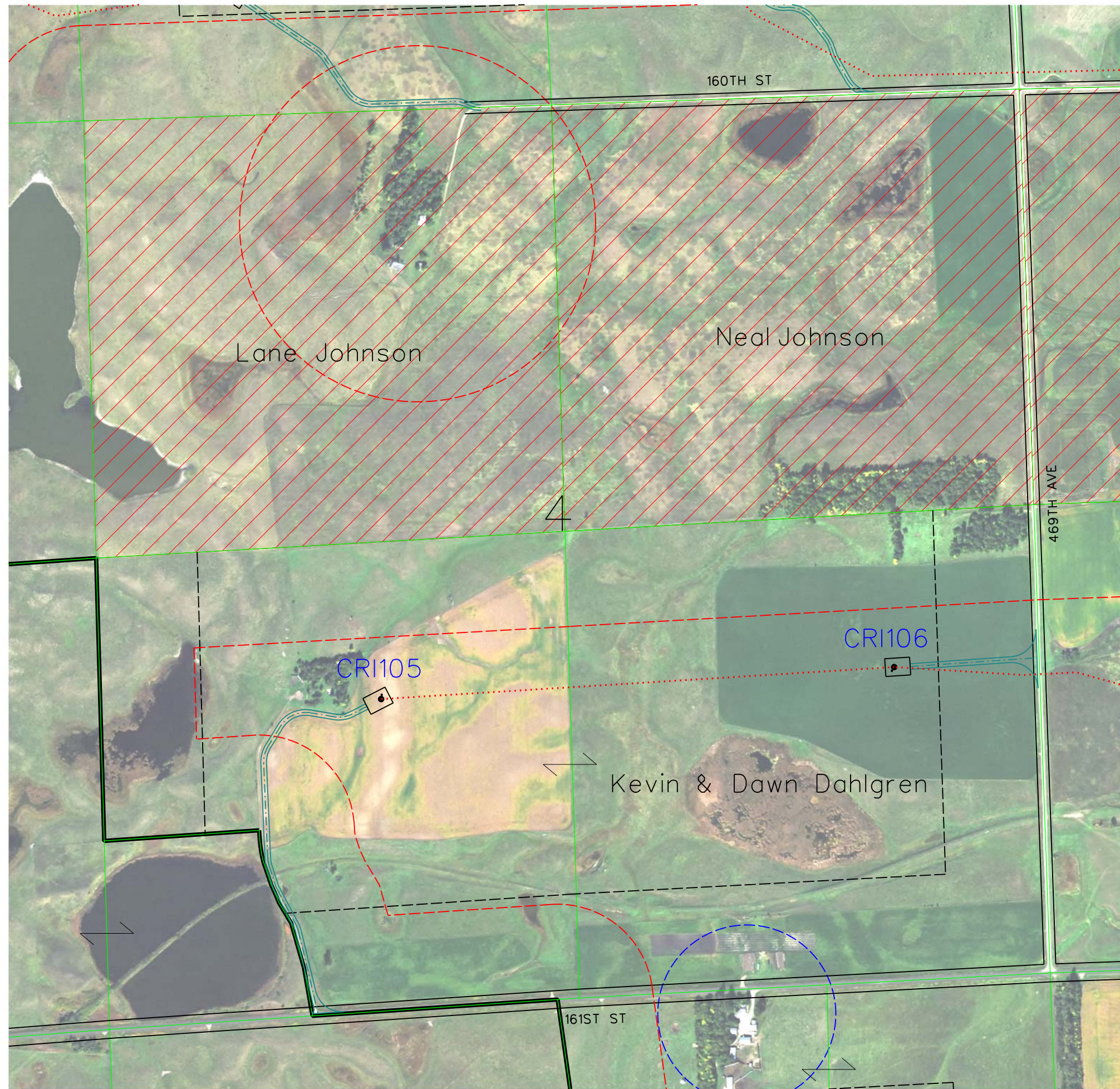
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NEXTERA ENERGY - CROWNED RIDGE, LLC
 CUP MAPBOOK SEC 05, TWP 118N, R1G 50W
SNYDER & ASSOCIATES, INC.
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 712-322-3202 | www.snyder-associates.com

Project No: 1140140

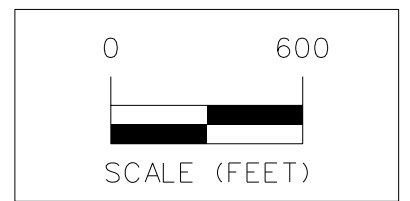
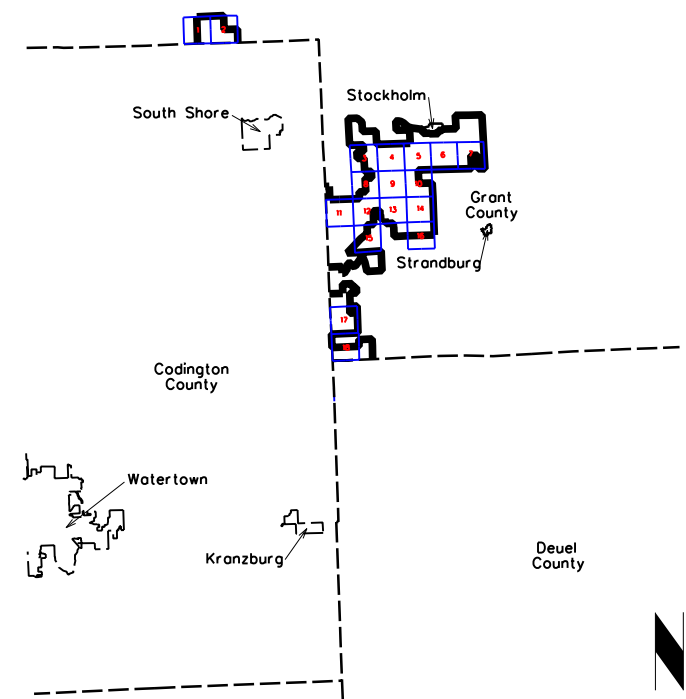
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 Snyder 1600



LEGEND

- PAD MOUNT TRANSFORMER
- TURBINE
- CRANE PAD & GE 2.1MW 116RD 80HH AND GE 1.715MW 103RD 80HH TURBINE WITH NUMBER
- CRANE PAD & GE 2.3MW 116RD 90HH TURBINE WITH NUMBER
- GE 2.3 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 90 Meter Hub Height 08-31-18 Array)
- GE 2.1 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI115)
- GE 1.715 MW TURBINE WITH NUMBER (103 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI120)
- PROPOSED ACCESS ROAD
- PROPOSED UNDERGROUND COLLECTION
- PROPERTY BOUNDARY
- EXISTING ROAD RIGHT-OF-WAY
- NONPARTICIPATING PARCEL
- NONPARTICIPATING PARCEL SETBACK = 535 FT
- PUBLIC ROAD ROW SETBACK = 535 FT
- MUNICIPAL BOUNDARY SETBACK = 1000 FT
- PROJECT BOUNDARY
- NONPARTICIPATING OCCUPIED HOUSE SETBACK = 1000 FT
- PARTICIPATING OCCUPIED HOUSE SETBACK = 500 FT



ISSUE DATE: 09-13-2018

Exhibit A20-5

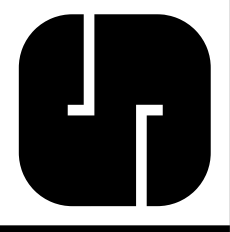
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Project No: 1140140

Page 13 of 18

NEXTERA ENERGY - CROWNED RIDGE, LLC
 CUP MAPBOOK SEC 04, TWP 118N, RNG 50W
SNYDER & ASSOCIATES, INC.
 1751 MADISON AVENUE
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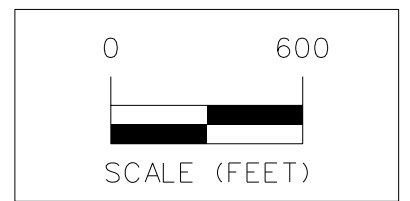
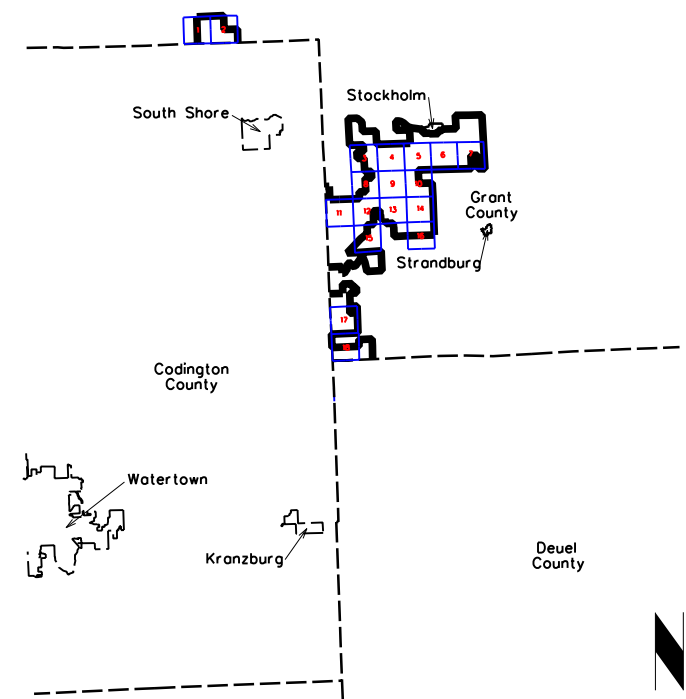


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 Snyder 1600



LEGEND

- PAD MOUNT TRANSFORMER
 TURBINE CRANE PAD & GE 2.1MW 116RD 80HH AND GE 1.715MW 103RD 80HH TURBINE WITH NUMBER
- PAD MOUNT TRANSFORMER
 TURBINE CRANE PAD & GE 2.3MW 116RD 90HH TURBINE WITH NUMBER
- CRI119 GE 2.3 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 90 Meter Hub Height 08-31-18 Array)
- CRI115 GE 2.1 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI115)
- CRI120 GE 1.715 MW TURBINE WITH NUMBER (103 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI120)
- PROPOSED ACCESS ROAD
- PROPOSED UNDERGROUND COLLECTION
- PROPERTY BOUNDARY
- EXISTING ROAD RIGHT-OF-WAY
- NONPARTICIPATING PARCEL
- NONPARTICIPATING PARCEL SETBACK = 535 FT
- PUBLIC ROAD ROW SETBACK = 535 FT
- MUNICIPAL BOUNDARY SETBACK = 1000 FT
- PROJECT BOUNDARY
- NONPARTICIPATING OCCUPIED HOUSE SETBACK = 1000 FT
- PARTICIPATING OCCUPIED HOUSE SETBACK = 500 FT



ISSUE DATE: 09-13-2018

Exhibit A20-5

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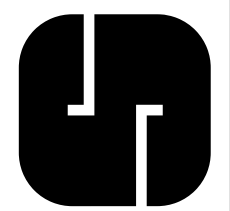
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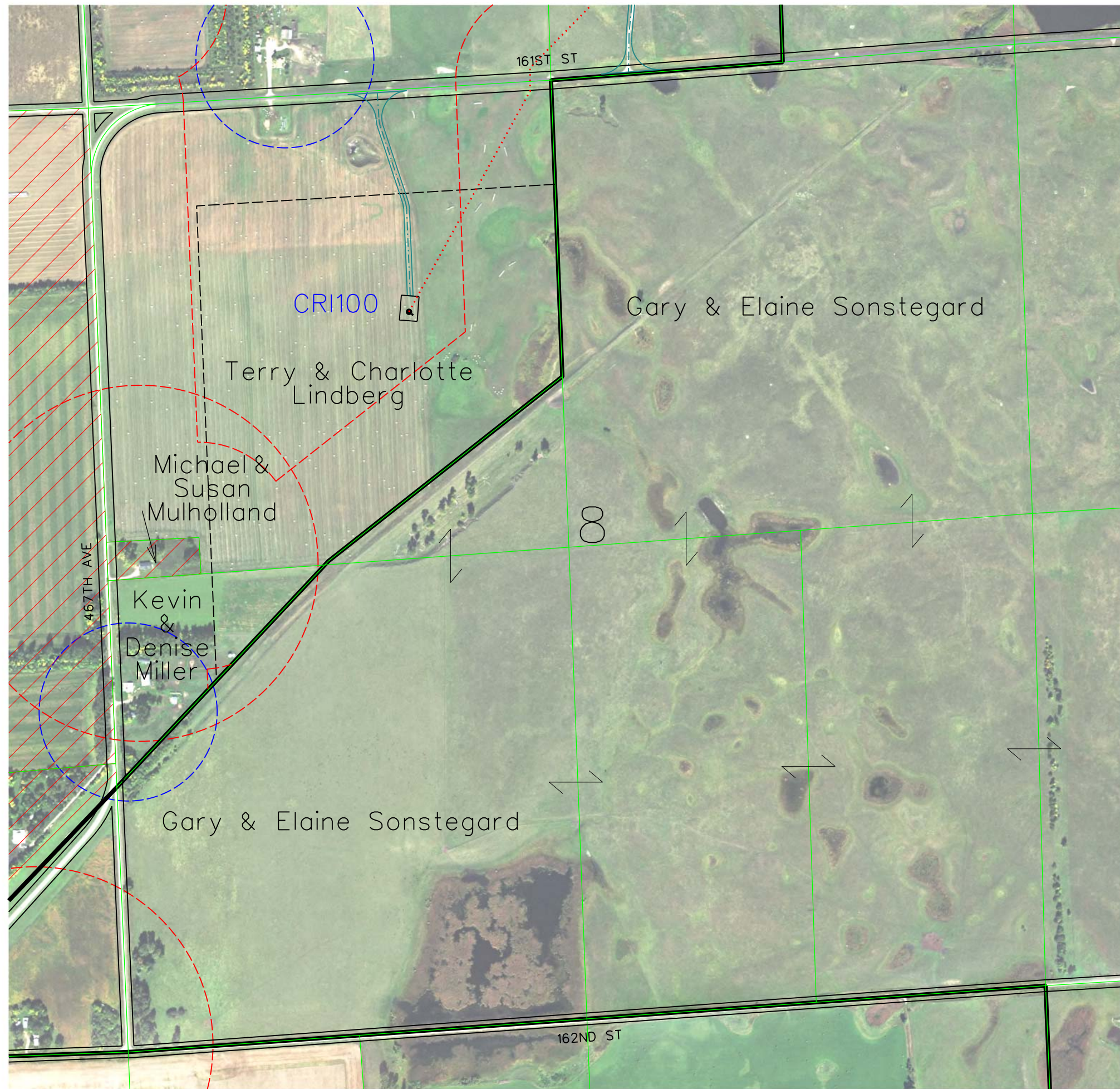
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SNYDER & ASSOCIATES, INC.

GRANT COUNTY, SOUTH DAKOTA

1751 MADISON AVENUE
 COUNCIL BLUFFS, IA 51503
 712-322-3202 | www.snyder-associates.com

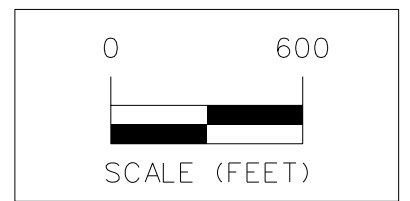
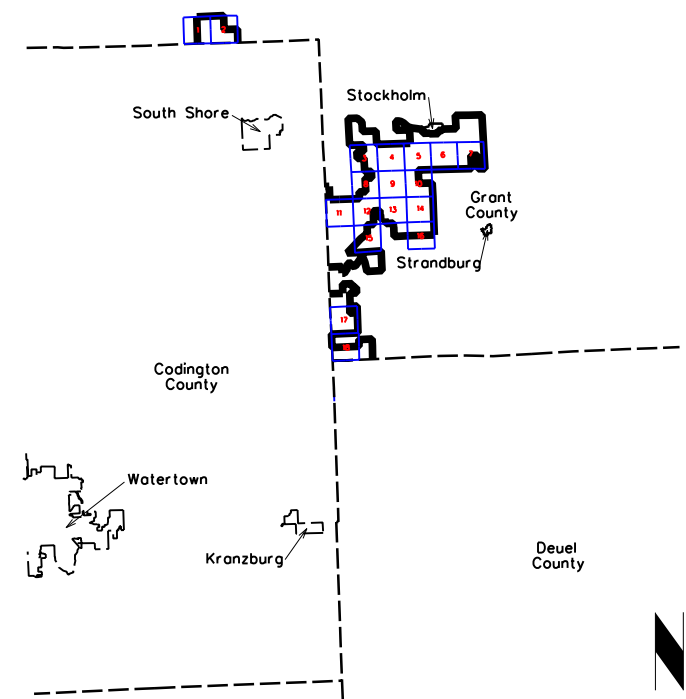


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 Snyder 1600



LEGEND

- PAD MOUNT TRANSFORMER
- TURBINE
- CRANE PAD & TURBINE WITH NUMBER
- GE 2.3 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 90 Meter Hub Height 08-31-18 Array)
- GE 2.1 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI115)
- GE 1.715 MW TURBINE WITH NUMBER (103 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI120)
- PROPOSED ACCESS ROAD
- PROPOSED UNDERGROUND COLLECTION
- PROPERTY BOUNDARY
- EXISTING ROAD RIGHT-OF-WAY
- NONPARTICIPATING PARCEL
- NONPARTICIPATING PARCEL SETBACK = 535 FT
- PUBLIC ROAD ROW SETBACK = 535 FT
- MUNICIPAL BOUNDARY SETBACK = 1000 FT
- PROJECT BOUNDARY
- NONPARTICIPATING OCCUPIED HOUSE SETBACK = 1000 FT
- PARTICIPATING OCCUPIED HOUSE SETBACK = 500 FT



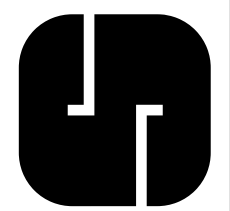
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Technician: DW	Date: 8/24/18	Field Bc:	

Project No: 1140140

NEXTERA ENERGY - CROWNED RIDGE, LLC
CUP MAPBOOK SEC 08, TWP 118N, RNG 50W
SNYDER & ASSOCIATES, INC.
 1751 MADISON AVENUE
 COUNCIL BLUFFS, IA 51503
 712-322-3202 | www.snyder-associates.com

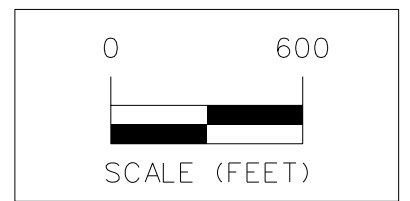
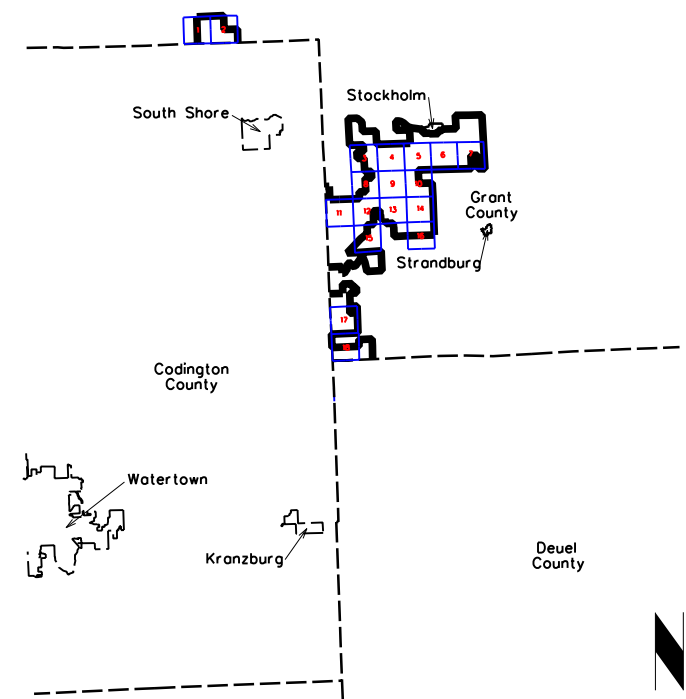


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 Snyder 1600



LEGEND

- PAD MOUNT TRANSFORMER
 TURBINE
 CRANE PAD & GE 2.1MW 116RD 80HH AND GE 1.715MW 103RD 80HH TURBINE WITH NUMBER
- PAD MOUNT TRANSFORMER
 TURBINE
 CRANE PAD & GE 2.3MW 116RD 90HH TURBINE WITH NUMBER
- CRI119 GE 2.3 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 90 Meter Hub Height 08-31-18 Array)
- CRI115 GE 2.1 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI115)
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- PROPOSED ACCESS ROAD
- PROPOSED UNDERGROUND COLLECTION
- PROPERTY BOUNDARY
- EXISTING ROAD RIGHT-OF-WAY
- NONPARTICIPATING PARCEL
- NONPARTICIPATING PARCEL SETBACK = 535 FT
- PUBLIC ROAD ROW SETBACK = 535 FT
- MUNICIPAL BOUNDARY SETBACK = 1000 FT
- PROJECT BOUNDARY
- NONPARTICIPATING OCCUPIED HOUSE SETBACK = 1000 FT
- PARTICIPATING OCCUPIED HOUSE SETBACK = 500 FT



ISSUE DATE: 09-13-2018

Exhibit A20-5

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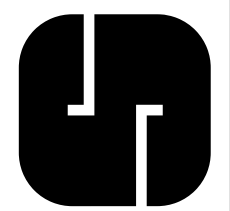
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NEXTERA ENERGY - CROWNED RIDGE, LLC
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GRANT COUNTY, SOUTH DAKOTA

SNYDER & ASSOCIATES, INC.
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 COUNCIL BLUFFS, IA 51503
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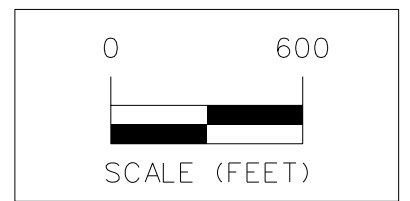
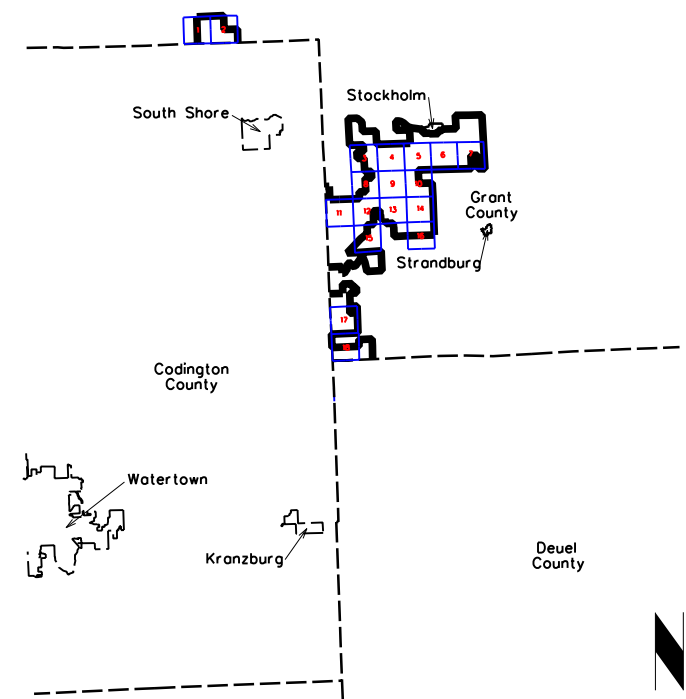


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LEGEND

- PAD MOUNT TRANSFORMER
 TURBINE CRANE PAD & GE 2.1MW 116RD 80HH AND GE 1.715MW 103RD 80HH TURBINE WITH NUMBER
 122' 72'
- PAD MOUNT TRANSFORMER
 TURBINE CRANE PAD & GE 2.3MW 116RD 90HH TURBINE WITH NUMBER
 140' 90' 100'
- CRI119 GE 2.3 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 90 Meter Hub Height 08-31-18 Array)
- CRI115 GE 2.1 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI115)
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- PROPOSED ACCESS ROAD
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- PROPERTY BOUNDARY
- EXISTING ROAD RIGHT-OF-WAY
- NONPARTICIPATING PARCEL
- NONPARTICIPATING PARCEL SETBACK = 535 FT
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- PARTICIPATING OCCUPIED HOUSE SETBACK = 500 FT



ISSUE DATE: 09-13-2018

Exhibit A20-5

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Engineer:	SCH	Checked By:	MGG	Scale:	1" =
Technician:	DW	Date:	8/24/18	Field Bk:	

Project No: 1140140

Sheet 17 of 18

NEXTERA ENERGY - CROWNED RIDGE, LLC
 CUP MAPBOOK SEC 30, TWP 118N, RNG 50W
SNYDER & ASSOCIATES, INC.

GRANT COUNTY, SOUTH DAKOTA

1751 MADISON AVENUE
 COUNCIL BLUFFS, IA 51503
 712-322-3202 | www.snyder-associates.com

Project No: 1140140

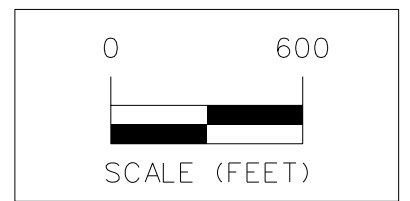
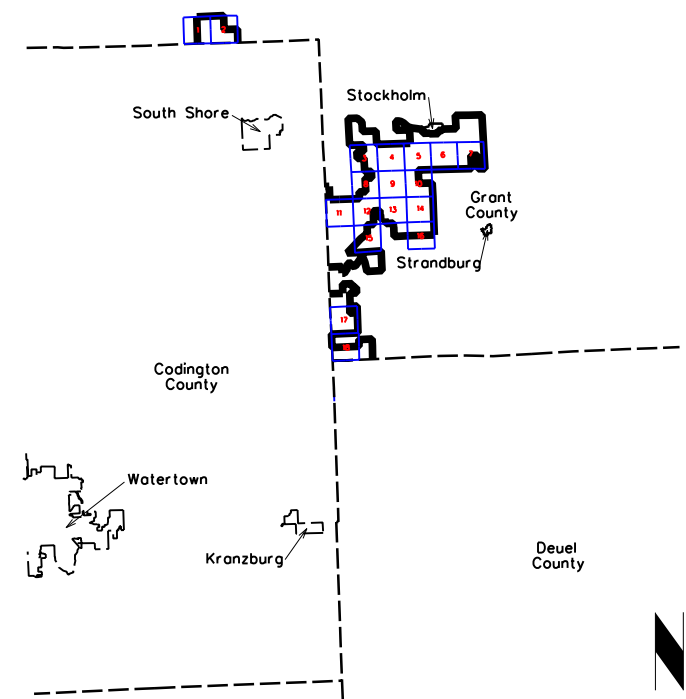
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LEGEND

- PAD MOUNT TRANSFORMER
 TURBINE CRANE PAD & GE 2.1MW 116RD 80HH AND GE 1.715MW 103RD 80HH TURBINE WITH NUMBER
- PAD MOUNT TRANSFORMER
 TURBINE CRANE PAD & GE 2.3MW 116RD 90HH TURBINE WITH NUMBER
- CRI119 GE 2.3 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 90 Meter Hub Height 08-31-18 Array)
- CRI115 GE 2.1 MW TURBINE WITH NUMBER (116 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI115)
- CRI120 GE 1.715 MW TURBINE WITH NUMBER (103 Meter Rotor Diameter & 80 Meter Hub Height 08-31-18 Array = CRI120)
- PROPOSED ACCESS ROAD
- PROPOSED UNDERGROUND COLLECTION
- PROPERTY BOUNDARY
- EXISTING ROAD RIGHT-OF-WAY
- NONPARTICIPATING PARCEL
- NONPARTICIPATING PARCEL SETBACK = 535 FT
- PUBLIC ROAD ROW SETBACK = 535 FT
- MUNICIPAL BOUNDARY SETBACK = 1000 FT
- PROJECT BOUNDARY
- NONPARTICIPATING OCCUPIED HOUSE SETBACK = 1000 FT
- PARTICIPATING OCCUPIED HOUSE SETBACK = 500 FT



ISSUE DATE: 09-13-2018

Exhibit A20-5

MARK	REVISION	DATE	BY

Engineer:	SCH	Checked By:	MGG	Scale:	1" =
Technician:	DW	Date:	8/24/18	Field Bk:	

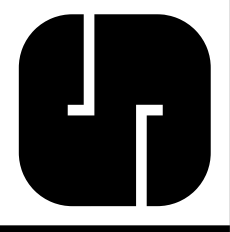
Project No: 1140140

Sheet 18 of 18

NEXTERA ENERGY - CROWNED RIDGE, LLC
 CUP MAPBOOK SEC 31, TWP 118N, RNG 50W
SNYDER & ASSOCIATES, INC.

GRANT COUNTY, SOUTH DAKOTA

1751 MADISON AVENUE
 COUNCIL BLUFFS, IA 51503
 712-322-3202 | www.snyder-associates.com



Appendix: G
Proof of utility right-of-way

Permit No. _____

GRANT COUNTY
 CONSENT FOR UTILITY COMPANY
 TO

CROSS A PUBLIC ROAD OR SECTION ROAD

The undersigned owners of Crowned Ridge and Crowned Ridge II Project, identified as,
 and whose addresses are

Crowned Ridge Wind, LLC of 700 Universe Blvd., Juno Beach, Florida 33408
 (Company) (Address)

Crowned Ridge Wind II, LLC of 700 Universe Blvd., Juno Beach, Florida 33408
 (Company) (Address)

Hereinafter called the "Applicant", is hereby granted permission to construct, operate, maintain and reconstruct the following identified transmission line facilities on, over, across, or adjacent to county right-of-way, as shown on the exhibits attached hereto and made a part hereof (attach map or exhibits):

Crossing ID	Township Name	Township	Range	Section	LAT	LONG
	Troy	118N	050W	31	44.98	-96.87
	Troy	118N	050W	30	45.00	-96.87
	Troy	118N	050W	11	45.04	-96.79
	Troy	118N	050W	7	45.04	-96.87
	Troy	118N	050W	8	45.04	-96.85
	Troy	118N	050W	10	45.04	-96.81
	Troy	118N	050W	3	45.06	-96.81
	Troy	118N	050W	5	45.06	-96.85
	Troy	118N	050W	4	45.06	-96.83
	Troy	118N	050W	6	45.06	-96.87
	Stockholm	119N	050W	34	45.07	-96.81
	Stockholm	119N	050W	33	45.07	-96.83
	Stockholm	119N	050W	32	45.07	-96.85
	Stockholm	119N	050W	25	45.08	-96.77
	Stockholm	119N	050W	26	45.08	-96.79
	Stockholm	119N	050W	27	45.09	-96.81
	Stockholm	119N	050W	28	45.09	-96.83
	Stockholm	119N	050W	29	45.09	-96.85
	Stockholm	119N	050W	24	45.10	-96.77
	Stockholm	119N	050W	23	45.10	-96.79
	Mazeppa	120N	051W	33	45.16	-96.96
	Mazeppa	120N	051W	32	45.16	-96.98

INSTALLATION AND MAINTENANCE: Installation and maintenance of said facilities on county right-of-way shall be subject to the following terms and conditions:

Permit No. _____

- 1. Construction, operation, maintenance, reconstruction, or removal of said facilities within the county right-of-way shall be completed in a manner satisfactory to, and subject to supervision by, the Highway Superintendent and/or County Commissioners.
- 2. Upon completion of construction, operation, maintenance, relocation, or removal of said facilities, Applicant and or their assignee, is responsible for restoration of any and all damages to County right-of-way as directed by the County Commissioners, or pay for restoration to be completed by the County or their designated representative.
- 3. Grant County shall not be liable for damage to said facilities resulting from the use of, reconstruction or maintenance of the impacted right-of-way.
- 4. The Applicant and or their assignee shall hold Grant County harmless for injury to persons or damage to property resulting from the activities conducted by the Applicant in crossing any existing road or section line.

I, the undersigned, being an authorized agent of the "Applicant", described in the above, do hereby agree on behalf of the said Utility Company that all terms and conditions above will be complied with, and any assignment of this overhead transmission facility described above shall include an assignment of this liability to comply with the terms and conditions as stated herein.

Dated this _____ day of _____ 20_____.

_____	_____
Signature of _____	Signature of _____
Title _____	Title _____
Authorized Agent of _____	Authorized Agent of _____

Approved by _____, the _____,
this _____ day of _____ 20_____.

Grant County Chairman

Please return a copy of the signed permit to:









Kerwin Schultz
Grant County Hwy Supt
47789 151st St.
Milbank, SD 57252

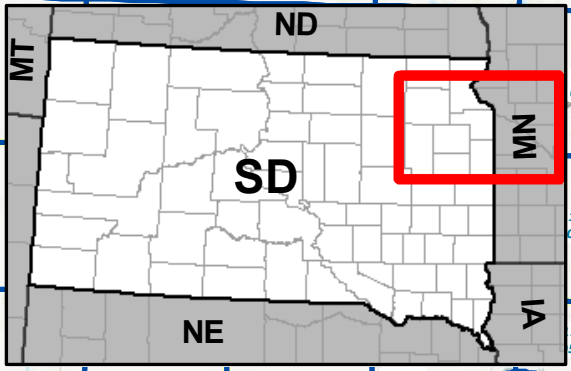
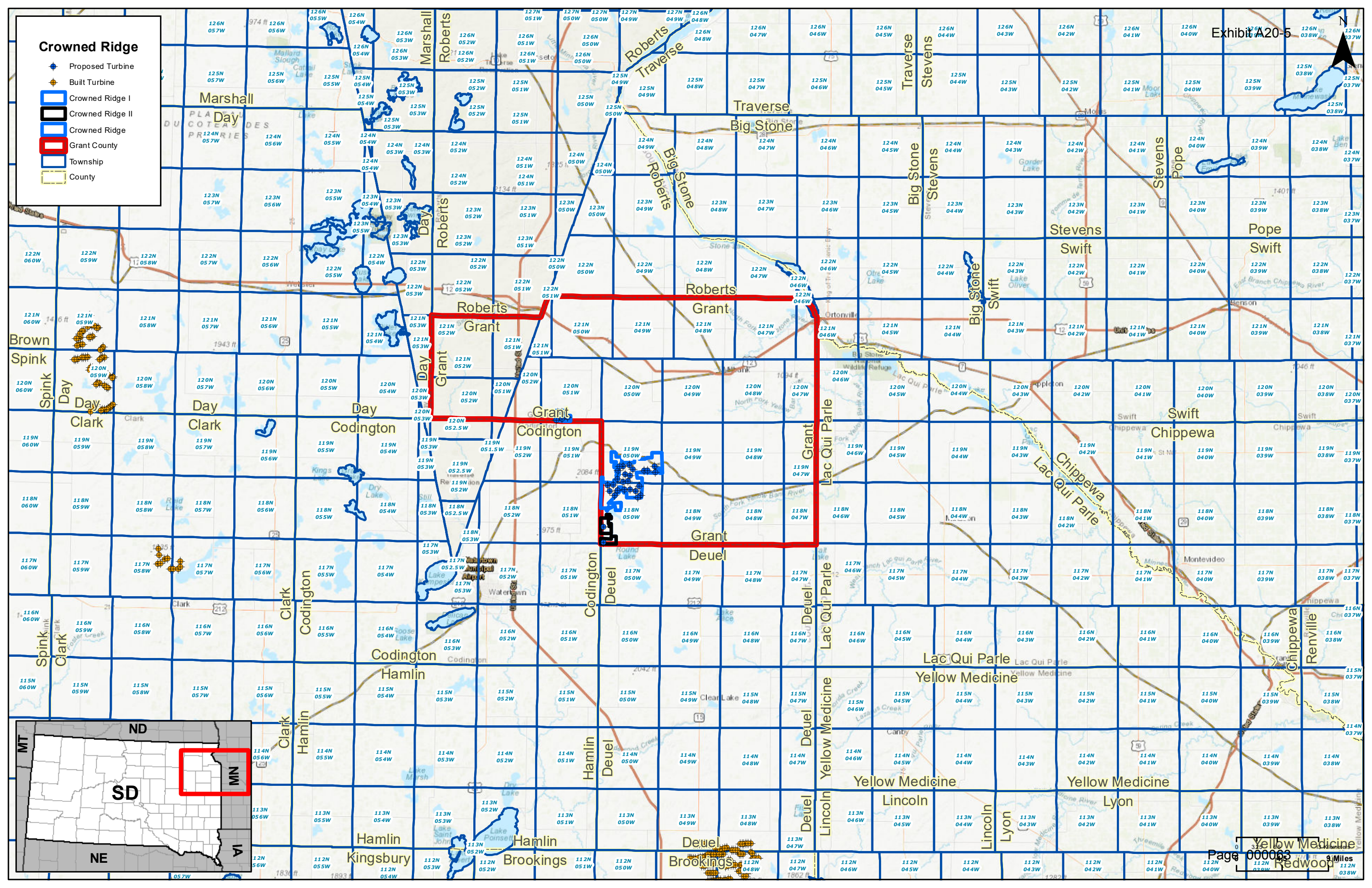
Appendix: H

Location of other WES in general area



Crowned Ridge







-  Proposed Turbine
-  Built Turbine
-  Crowned Ridge I
-  Crowned Ridge II
-  Crowned Ridge
-  Grant County
-  Township
-  County

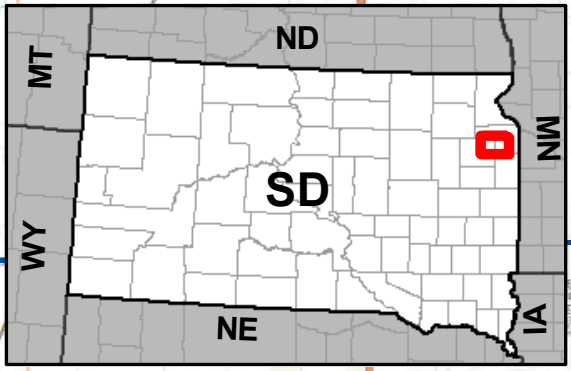
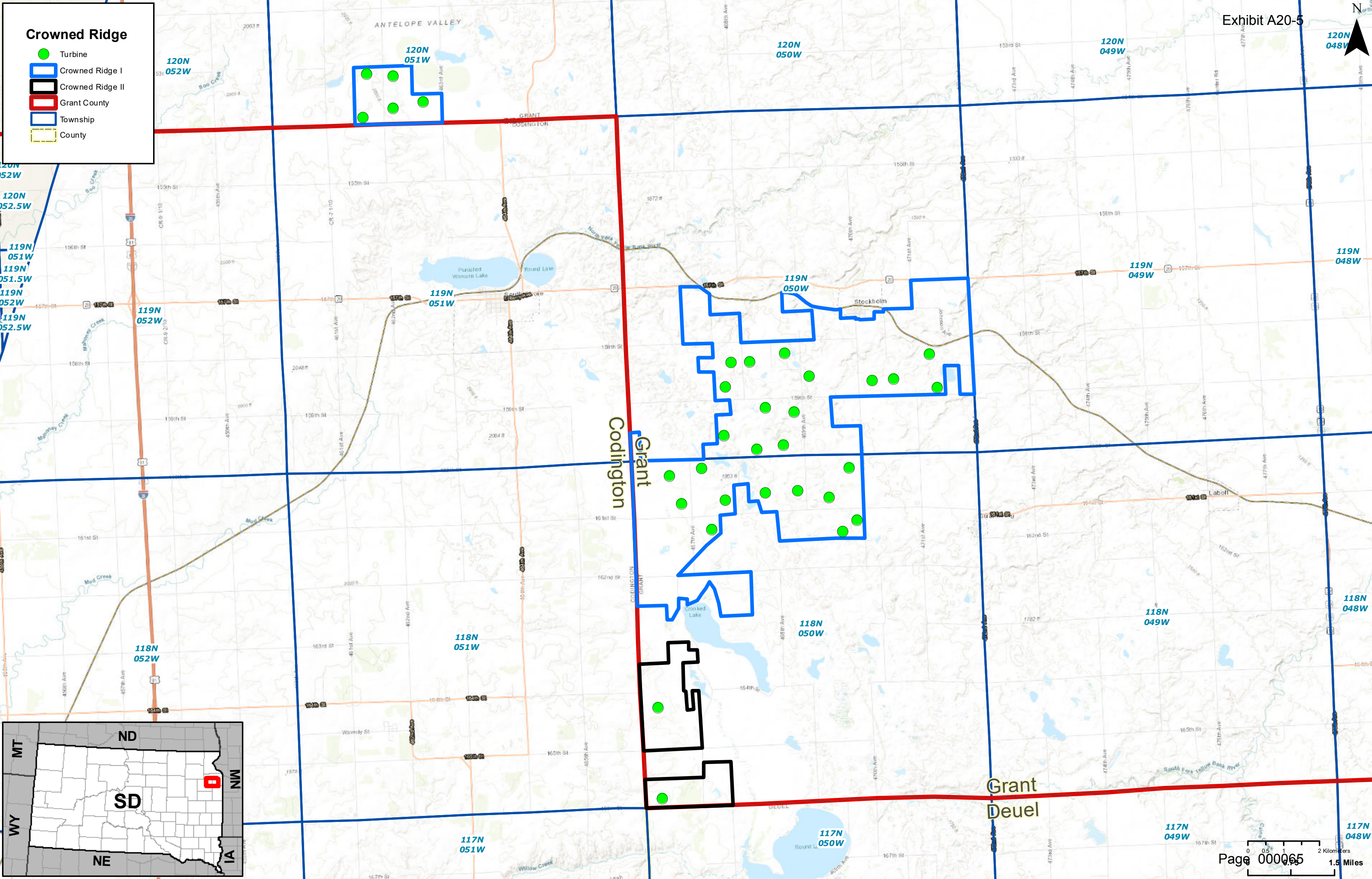


Appendix: I Additional Project Detail Maps



Crowned Ridge

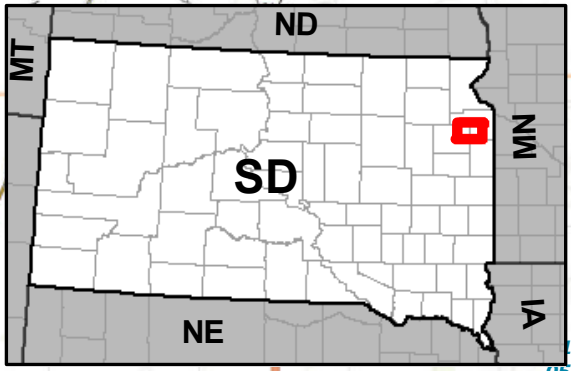
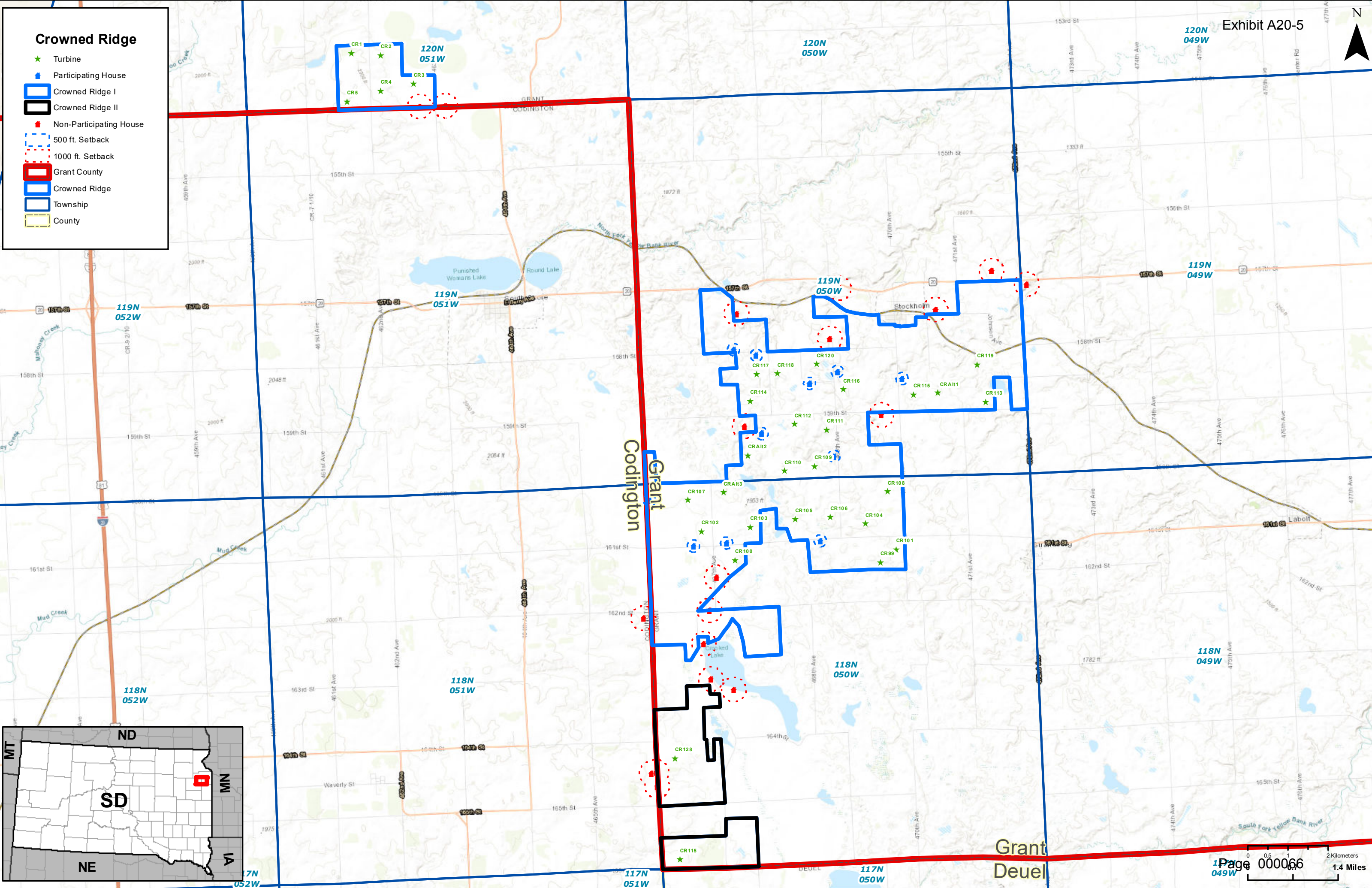
-  Turbine
-  Crowned Ridge I
-  Crowned Ridge II
-  Grant County
-  Township
-  County





Crowned Ridge

- ★ Turbine
- Participating House
- Crowned Ridge I
- Crowned Ridge II
- Non-Participating House
- 500 ft. Setback
- 1000 ft. Setback
- Grant County
- Crowned Ridge
- Township
- County



Appendix: J **Shadow Flicker & Sound Pressure Report**



Final Report
Crowned Ridge Wind Farms
Sound and Shadow Flicker Study
Grant County, SD

Submitted To:

SWCA Environmental Consultants
116 North 4th Street, Suite 200
Bismarck, North Dakota 58501
Tel: 701.258.6622
E-mail: SBaer@swca.com

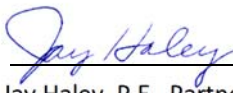
Submitted By:

Jay Haley, P.E., Partner
EAPC Wind Energy
3100 DeMers Ave.
Grand Forks, ND, 58201
Tel: 701-775-3000
E-mail: jhaley@eapc.net

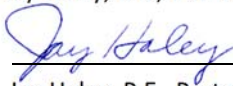
September 12,

2018

Author:


Jay Haley, P.E., Partner

Checked By:


Jay Haley, P.E., Partner

Approved By:

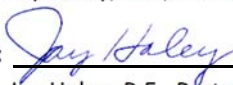

Jay Haley, P.E., Partner

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Legal Notice and Disclaimer

This report was prepared by EAPC expressly for the benefit of Crowned Ridge Wind, LLC and Crowned Ridge Wind II, LLC. Neither EAPC nor any person acting on their behalf: (a) makes any warranty, express or implied, with respect to the use of any information or methods disclosed in this report; or (b) assumes any liability with respect to the use of any information or methods disclosed in this report.

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The responsibilities for the applications and use of the material contained in this document remain solely with Crowned Ridge Wind, LLC and Crowned Ridge Wind II, LLC.

The information contained in this report is intended for the exclusive use of Crowned Ridge Wind, LLC and Crowned Ridge Wind II, LLC and may contain confidential or privileged information.

Report Update

EAPC bears no responsibility to update this report for any changes occurring subsequent to the final issuance of this report.

Revision History

Revision No.	Revision Purpose	Date	Revised By
0	Original	8/30/2018	J. Haley

Executive Summary

EAPC was hired to provide estimates of the potential sound and shadow flicker impacts for a proposed wind turbine layout for the Grant County portion of the Crowned Ridge and Crowned Ridge II wind farm projects in northeastern South Dakota. The scope of this report includes all proposed turbines from Grant County included in the Crowned Ridge and Crowned Ridge II projects that will be permitted separately through the South Dakota Public Utilities Commission. Locations of area existing residences and a wind turbine layout using a mixture of wind turbines manufactured by General Electric (GE) were provided to EAPC by Crowned Ridge Wind, LLC and Crowned Ridge Wind II, LLC. A computer model was built combining digital elevation data with the information supplied by Crowned Ridge Wind, LLC and Crowned Ridge Wind II, LLC to generate sound and shadow flicker models for the site. The resulting models were then used to perform sound and shadow flicker calculations for the area. Based on the calculations, site-wide realistic sound and shadow flicker maps were produced and an evaluation of the sound and shadow flicker impacts at 178 principle and accessory structures within Grant County was performed.

For the sound study, the 178 principle and accessory structures were modeled using a point-type sound sensor so that the highest sound pressure level at the perimeter of the structure could be calculated. Moderate ground attenuation was assumed.

For the shadow study, of the 178 principle and accessory structures, 36 principle structures were represented in the model by omni-directional shadow receptors that simulate a 1 m x 1 m window at 1 m above ground level. Reductions based on turbine operational time, turbine operational direction, and sunshine probabilities were used to calculate a realistic number of hours of shadow flicker to be expected at each shadow receptor. No obstacles were used so that shadow flicker reductions due to interference from trees and structures were not included, meaning that the “realistic” estimates are still somewhat conservative.

In summary, the maximum sound pressure level at the perimeter of principle and accessory structures is 47.7 dBA, therefore the project in Grant County as modeled, is in compliance with Grant County’s allowable sound pressure levels as described in Section 1211.04, paragraph 13 of the current Grant County Zoning Ordinance.

While there are currently no rules enforced by the state of South Dakota or Grant County to limit the number of shadow flicker hours allowed, Crowned Ridge Wind, LLC and Crowned Ridge Wind II, LLC has voluntarily limited the maximum shadow flicker hours to 30 hours per year at principle structures, which is consistent with the zoning ordinances in adjacent Counties. For the turbine array provided, no principle structure experienced more than 29 hours and 3 minutes of shadow flickering per year based on realistic assumptions regarding operational time and sunshine probability.

1. INTRODUCTION

EAPC was hired to conduct sound and shadow flicker studies for the regional development of two Crowned Ridge wind farm projects located in Codington, Grant and Grant Counties in northeastern South Dakota. The regional development's layout consists of 13 GE 1.7 MW wind turbines with a hub height of 80 meters, 15 GE 2.1 MW wind turbines with a hub height of 80 meters, and 264 GE 2.3 MW wind turbines with a hub height of 90 meters, for a total of 292 wind turbines. The locations of the proposed wind turbines were supplied by Crowned Ridge Wind, LLC and Crowned Ridge Wind II, LLC.

From the database of existing residences and coordinates supplied by Crowned Ridge Wind, LLC and Crowned Ridge Wind II, LLC, 178 principle and accessory structures in Grant County were found to be within 2 km of a wind turbine and were included in the sound and shadow models.

The area of interest for this report is located in Grant County near the town of Stockholm in northeastern South Dakota. The surrounding terrain has a change in elevation across the Grant County portion of the project site ranging from 426 to 621 meters (1,398 to 2,037 feet) at the wind turbine base. The region's vegetation is comprised primarily of agricultural land. Project overview maps can be found in Appendix B.

2. BACKGROUND - SOUND

To determine if the layout provided would be compliant with the Grant County regulations, detailed sound scenarios were analyzed using a computer model. The scenarios assumed that the wind turbines were operating at a wind speed that resulted in the loudest sound being emitted.

According to the GE sound documentation provided to EAPC by Crowned Ridge Wind, LLC and Crowned Ridge Wind II, LLC, the loudest normal operating sound pressure level emitted from the GE 1.7-103 is 107 dBA at 10 m/s and higher at 80 m above ground level (AGL).

For the GE 2.1-116, the sound emission specifications for the 2.3-116 were used, which is a conservative assumption since the sound emission levels for the 2.1-116 will likely be lower than for the larger 2.3-116.

For the 2.3-116, the loudest normal operating sound pressure level emitted is 107.5 at 10 m/s and higher at 90 m AGL.

The specifications for the three GE wind turbine models used in this study are included in Table 1 below. The table of wind turbine coordinates and sound profiles for the subset of turbines within 2 km of existing Grant County residences is included in Appendix A.

Table 1: Crowned Ridge wind energy projects wind turbine specifications.

Crowned Ridge wind energy projects wind turbine specifications						
Manufacturer	Model	Hub Height (m)	Rotor Dia. (m)	Cut-In Wind Speed (m/s)	Cut-Out Wind Speed (m/s)	Max. Sound Press. Level (dBA)
General Electric	GE 1.7	80	103	3	23	107
General Electric	GE 2.1	80	116	3	22	107.5
General Electric	GE 2.3	90	116	3	22	107.5

A safety margin of 2 dBA was added to both GE 1.7-103 and GE 2.3-116 sound profiles for the study.

The state of South Dakota does not have regulatory sound or shadow flicker limits for wind turbines. Grant County's current Ordinance Section 1211.04, paragraph 13 prescribes sound limits for wind turbine projects as follows:

"Noise level shall not exceed 50 dBA, average A-weighted Sound pressure including constructive interference effects at the perimeter of the principal and accessory structures of existing off-site residences, businesses, and buildings owned and/or maintained by a governmental entity."

Therefore, Grant County's only applicable sound limit is 50 dBA for all principle and accessory structures of existing off-site residences, businesses, and buildings owned and/or maintained by a governmental entity, which is what has been evaluated in this report.

3. STUDY METHODOLOGY - SOUND

This sound analysis was performed utilizing windPRO¹, which has the ability to calculate detailed sound maps across an entire area of interest or at site-specific locations using sound sensitive receptors.

The analysis used the ISO 9613-2 "Attenuation of sound during propagation outdoors, Part 2" sound calculation model with "General" ground attenuation and an attenuation factor of 0.5, which represents typical mixed vegetation and crop cover. Realistic sound

¹ windPRO is the world's leading software tool for designing wind farms, including sound and shadow flicker analysis.

pressure levels were calculated at 1.5 m AGL at the non-participating existing residences. The term “realistic” in this case, means that some amount of ground attenuation is accounted for.

The inputs for the windPRO sound calculation include the following:

- Turbine Coordinates
- Turbine Specifications
- Sound Receptor Coordinates
- Wind Turbine Sound Emission Data
- USGS Digital Elevation Model (DEM) (height contour data)

Turbine Coordinates: The location of a wind turbine in relation to a sound receptor is one of the most important factors in determining sound impacts. Sound pressure levels drop as they travel farther from the source of emission. The attenuation comes from atmospheric absorption as well as from absorption by the ground cover between the turbine and the receptor. The sound pressure waves can also be reflected by hard or smooth surfaces such as ice or water.

Turbine Specifications: Sound emission data including 1/3rd octave data supplied by the manufacture is used assuming the loudest sound pressure levels are being emitted at the hub height of the turbine. A safety margin of 2 dBA was added to the loudest sound pressure levels for all blade types for the analysis.

Sound Receptor Coordinates: As with the wind turbine coordinates, the elevation, and distance of a sound receptor in relation to the wind turbines are the main factors in determining the sound impacts. EAPC was provided with coordinates for 178 structures found to be located within 2 km of the 292 proposed wind turbine locations.

USGS Digital Elevation Model (DEM) (height contour data): For this study, 3 m USGS National Elevation Database (NED) DEM's were used to construct 10-foot interval height contour lines for the windPRO sound model. The height contour information is important to the sound calculation since it allows the model to place the wind turbines and the sound receptors at the correct elevations.

4. RESULTS OF ANALYSIS - SOUND

The sound study indicates that no principle or accessory structures will be above 50.0 dBA. Therefore the project would be in compliance with Grant County's allowable sound pressure levels as described in Section 1211.04, paragraph 13 of the current Grant County Zoning Ordinance. Table 2 shows the distribution of sound pressure levels for the project. The full table of results from the realistic case sound study can be found in Appendix C and the maps showing the sound iso-lines are in Appendix D.

Table 2: Existing residence realistic sound distribution

Realistic Sound (dBA)	Principle and Accessory Structures
0 to 25	0
25 to 30	0
30 to 35	7
35 to 40	49
40 to 45	70
45 to 50	52
+50	0

5. BACKGROUND - SHADOW FLICKER

Shadow flicker from wind turbines occurs when rotating wind turbine blades move between the sun and the observer. Shadow flicker is generally experienced in areas near wind turbines where the distance between the observer and wind turbine blade is short enough that sunlight has not been significantly diffused by the atmosphere. When the blades rotate, this shadow creates a pulsating effect, known as shadow flicker. If the blade's shadow is passing over the window of a building, it will have the effect of increasing and decreasing the light intensity in the room at a low frequency in the range of 0.4 to 0.875 Hz, hence the term "flicker." In this case, with a maximum rotational speed of 17.5 rpm for the GE 1.7-103, the frequency would be 0.875 Hz. This flickering effect can also be experienced outdoors, but the effect is typically less intense, and becomes less intense when farther from the wind turbine causing the flicker.

This flickering effect is most noticeable within approximately 1,000 meters of the turbine, and becomes more and more diffused as the distance increases. There are no uniform standards defining what distance from the turbine is regarded as an acceptable limit beyond which the shadow flicker is considered to be insignificant. The same applies to the number of hours of flickering that is deemed to be acceptable.

Shadow flicker is typically greatest in the winter months when the angle of the sun is lower and casts longer shadows. The effect is also more pronounced around sunrise and sunset when the sun is near the horizon and the shadows are longer. A number of factors influence the amount of shadow flicker on the shadow receptors.

One consideration is the environment around the shadow receptor. Obstacles such as terrain, trees or buildings between the wind turbine and the receptor can significantly reduce or eliminate shadow flicker effects. Deciduous trees may block the shadow flickering effect to some degree, depending on the tree density, species present and time

of year. Deciduous trees can lead to a reduction of shadow flicker during the summer when the trees are bearing leaves. However, during the winter months, these trees are without their leaves and their impact on shadow flicker is not as significant. Coniferous trees tend to provide mitigation from shadow flicker year round. For this study, no credit was taken for any potential shading effects from any type of trees or other obstacles that would reduce the number of shadow flickering hours at the structures.

Another consideration is the time of day when shadow flicker occurs. For example, it may be more acceptable for private homes to experience the shadow flickering during daytime hours when family members may be at work or school. Likewise, a commercial property would not be significantly affected if all the shadow flicker impact occurred before or after business hours.

The climate also needs be considered when assessing shadow flicker. In areas with a significant amount of overcast weather, there would be less shadow flicker, as there are no shadows if the sun is blocked by clouds. Also, if the wind is not blowing, the turbines would not be operational and therefore not creating shadow flickering.

While there are no State or Grant County requirements to limit the amount of shadow flicker, Crowned Ridge Wind, LLC and Crowned Ridge Wind II, LLC has elected to limit the maximum amount of shadow flicker to 30 hours per year for principle structures, which is consistent with the ordinances in both Codington and Deuel counties.

6. STUDY METHODOLOGY - SHADOW FLICKER

This shadow flicker analysis was performed utilizing windPRO, which has the ability to calculate detailed shadow flicker maps across an entire area of interest or at site-specific locations using shadow receptors.

Shadow maps which indicate where the shadows will be cast and for how long, are generated using windPRO, calculating the shadow flicker in varying user-defined resolutions. Standard resolution was used for this study and represents shadow flicker being calculated every three minutes of every day over the period of an entire year over a grid with a 20 m by 20 m resolution.

In addition to generating a shadow flicker map, the amount of shadow flicker that may occur at a specific point can be calculated more precisely by placing a shadow receptor at the location of interest and essentially “recording” the shadow flicker that occurs as the relative sunrise to sunset motion of the sun is simulated throughout an entire year.

The point-specific shadow flicker calculation is run at a higher resolution as compared to the shadow flicker map calculation to utilize the highest precision available within windPRO. Shadow flicker at each shadow receptor location is calculated every minute of every day for an entire year. Shadow receptors can be configured to represent an omni-directional window of a specific size at a specific point (greenhouse mode) or a window

facing a single direction of a specific size at a specific point (single direction mode). The shadow receptors used in this analysis were configured as greenhouse-mode receptors representing a 1 m x 1 m window located 1 m above ground level. This represents more of a “worst-case” scenario and thus will produce more conservative results since it assumes that all windows are always in direct line of sight with the turbines and the sun.

As a part of the calculation method, windPRO must determine whether or not a turbine will be visible at the receptor locations and not blocked by local topography or obstacles. It does this by performing a preliminary Zones of Visual Influence (ZVI) calculation, utilizing 10 m grid spacing. If a particular turbine is not visible within the 10 m x 10 m area that the shadow receptor is contained within, then that turbine is not included in the shadow flicker calculation for that receptor.

The inputs for the windPRO shadow flicker calculation include the following:

- Turbine Coordinates
- Turbine Specifications
- Shadow Receptor Coordinates
- Monthly Sunshine Probabilities
- Joint Wind Speed and Direction Frequency Distribution
- USGS Digital Elevation Model (DEM) (height contour data)

A description of each input variable and how they affect the shadow flicker calculation are included below.

Turbine Coordinates: The location of a wind turbine in relation to a shadow receptor is one of the most important factors in determining shadow flicker impacts. A line-of-sight is required for shadow flicker to occur. The intensity of the shadow flicker is dependent upon the distance from the wind turbine and weather conditions.

Turbine Specifications: A wind turbine’s total height and rotor diameter will be included in the windPRO shadow flicker model. The taller the wind turbine, the more likely shadow flicker could have an impact on local shadow receptors as the ability to clear obstacles (such as hills or trees) is greater, although in this analysis, no credit is taken for any such blockage from trees. The larger the rotor diameter is, the wider the area where shadows will be cast. Also included with the turbine specifications are the cut-in and cut-out wind speeds within which the wind turbine is operational. If the wind speed is below the cut-in threshold or above the cut-out threshold, the turbine rotor will not be spinning and thus shadow flicker will not occur.

Shadow Receptor Coordinates: As with the wind turbine coordinates, the elevation, distance and orientation of a shadow receptor in relation to the wind turbines and the sun are the main factors in determining the impact of shadow flicker. EAPC was provided with

coordinates for 178 principle and accessory structures found to be located within 2 km of the 292 proposed wind turbine locations.

Monthly Sunshine Probabilities: windPRO calculates sunrise and sunset times to determine the total annual hours of daylight for the modeled area. To further refine the shadow flicker calculations, the monthly probability of sunshine is included to account for cloud cover. The greater the probability of cloud cover, the less of an impact from shadow flicker. The monthly sunshine probabilities for many of the larger cities across the United States are available from the National Climatic Data Center (NCDC). For this study, 18 years' worth of monthly sunshine probability data were retrieved for Huron, SD, which was the closest, most representative station, to create the long-term representative monthly sunshine probabilities. The long-term representative monthly average sunshine probabilities are presented below in Table 3.

Table 3: Huron, SD monthly sunshine probabilities.

Huron, SD Monthly Sunshine Probabilities (1965-1983)												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sunshine %	0.62	0.62	0.62	0.59	0.66	0.69	0.76	0.74	0.69	0.59	0.51	0.51
retrieved from: http://www1.ncdc.noaa.gov/pub/data/ccd-data/pctpos15.dat												

Joint Wind Speed and Direction Frequency Distribution: A set of long-term corrected wind distributions was provided by Crowned Ridge Wind, LLC and Crowned Ridge Wind II, LLC to represent the annual wind speed and direction distribution for the project site. This data was used to estimate the probable number of operational hours for the wind turbines from each of the 12 wind direction sectors. During operation, the wind turbine rotors will always be assumed to face into the wind and automatically orient themselves as the wind direction changes. Shadow flicker can only occur when the blades are turning and the wind turbine rotor is between the sun and the receptor. Shadow flicker is most significant when the rotor is facing the sun.

USGS Digital Elevation Model (DEM) (height contour data): For this study, 3 m USGS National Elevation Database (NED) DEM's were used to construct 10-foot interval height contour lines for the windPRO shadow flicker model. The height contour information is important to the shadow flicker calculation since it allows the model to place the wind turbines and the shadow receptors at the correct elevations. The height contour lines also allow the model to include the topography of the site when calculating the zones of visual influence surrounding the wind turbine and shadow receptor locations.

The actual calculation of potential shadow flicker at a given shadow receptor is carried out by simulating the environment near the wind turbines and the shadow receptors. The position of the sun relative to the turbine rotor disk and the resulting shadow is calculated in time steps of one minute throughout an entire year. If the shadow of the rotor disk

(which in the calculation is assumed solid) at any time casts a shadow on a receptor window, then this step will be registered as one minute of shadow flicker. The calculation also requires that the sun must be at least 3.0° above the horizon in order to register shadow flicker. When the sun angle is less than 3.0°, the shadow quickly becomes too diffuse to be distinguishable since the amount of atmosphere that the light must pass through is 15 times greater than when the sun is directly overhead.

The sun's path with respect to each wind turbine location is calculated by the software to determine the paths of cast shadows for every minute of every day over a full year. The turbine runtime and direction are calculated from the site's long-term wind speed and direction distribution. Finally, the effects of cloud cover are calculated using long-term reference data (monthly sunshine probability) to arrive at the projected annual flicker time at each receptor.

7. RESULTS OF ANALYSIS - SHADOW FLICKER

The term "realistic" as used in this report means that turbine operational hours and direction as well as local sunshine probabilities have been factored in, but no blocking or shading effects due to trees or structures have been accounted for. This means that the realistic estimates are still inherently conservative values. Also, the realistic shadow flicker hours predicted by windPRO assumes an availability factor of 100% which is very unlikely to be the case. Actual availability factors will likely be in the range of 95-98%, however, with a conservative approach to estimating shadow flicker totals, the realistic estimates are not discounted accordingly.

Of the 178 principle and accessory structures, a total of 36 principle structures within 2 km of a wind turbine were found and analyzed. Standard resolution realistic shadow flicker maps were generated for the turbine array.

The 36 shadow receptors were then modeled as greenhouse-mode receptors and the estimated shadow flicker was calculated for the array. No principle structure shadow receptors are expected to experience more than 29 hours and 3 minutes of shadow flicker per year. Of the 36 principle structure receptors, the number that registered no shadow flicker hours was 12 (33.3%). Table 4 contains the realistic shadow flicker distribution of the 36 principle structures. The full table of results from the realistic shadow flicker study can be found in Appendix E and the maps showing the shadow flicker iso-lines are in Appendix F.

Table 4: Principle structures realistic shadow flicker distribution

Realistic Shadow Flicker (hrs/year)	Number of Principle Structures
0	12
0 to 5	6
5 to 10	7
10 to 15	2
15 to 20	5
20 to 25	2
25 to 30	2
30+	0

8. CONCLUSIONS

The conservative results of this study indicate that, of the 178 principle and accessory structures modeled, none measured more than 50 dBA, therefore the Crowned Ridge wind farms would be in compliance with the current Grant County Ordinance.

The sound study assumes that all GE 2.1-116 turbines have the same sound profile as the GE 2.3-116, which is a conservative assumption since the sound emission levels of the GE 2.1-116 would be lower than for the larger GE 2.3-116. In all cases, an additional 2 dBA was added to the sound pressure emission levels to provide for more conservative results.

The shadow flicker impact on the receptors was calculated with reductions due to turbine operational direction and sunshine probabilities included. No principle structures are expected to experience more than 29 hours and 3 minutes of shadow flicker per year.

This shadow flicker analysis is based on a number of conservative assumptions including:

- No credit was taken for the blocking effects of trees or buildings.
- The receptors were omni-directional rather than modeling specific facades of buildings.
- Study assumes 100% turbine availability
- Study assumes all turbine locations, including alternates, are built and operating

The overall effect of using these conservative assumptions indicate that realistically, the number of hours of shadow flicker that would be observed will be less than those predicted by this study.

APPENDIX A: WIND TURBINE COORDINATES

Crowned Ridge and Crowned Ridge II in Grant County
GE 1.7-103-80 m HH, GE 2.1-116-80 m HH, GE 2.3-116-90 m HH
UTM NAD83 Zone 14

WTG	Turbine Type	Easting (m)	Northing (m)	Base Elev. AMSL (m)	Sound Profile
CR- 1	GE2.3 116RD 90HH r2.madE	659,443	5,003,083	610.1	Normal Operation
CR- 2	GE2.3 116RD 90HH r2.madE	660,185	5,003,010	598.1	Normal Operation
CR- 3	GE2.3 116RD 90HH r2.madE	661,008	5,002,288	584.2	Normal Operation
CR- 4	GE2.3 116RD 90HH r2.madE	660,173	5,002,120	602.5	Normal Operation
CR- 5	GE2.3 116RD 90HH r2.madE	659,337	5,001,862	609.9	Normal Operation
CR- 6	GE2.3 116RD 90HH r2.madE	660,193	5,001,329	610.5	Normal Operation
CR- 7	GE2.3 116RD 90HH r2.madE	659,753	5,001,074	618	Normal Operation
CR- 8	GE2.3 116RD 90HH r2.madE	661,380	5,000,282	588.3	Normal Operation
CR- 43	GE2.3 116RD 90HH r2.madE	666,181	4,992,815	577.8	Normal Operation
CR- 44	GE2.3 116RD 90HH r2.madE	665,399	4,992,589	577.2	Normal Operation
CR- 51	GE2.3 116RD 90HH r2.madE	666,337	4,991,578	573.7	Normal Operation
CR- 52	GE2.3 116RD 90HH r2.madE	665,335	4,991,491	576	Normal Operation
CR- 54	GE2.3 116RD 90HH r2.madE	665,979	4,990,946	573.7	Normal Operation
CR- 58	GE2.3 116RD 90HH r2.madE	665,663	4,990,303	585	Normal Operation
CR- 59	GE2.3 116RD 90HH r2.madE	666,523	4,990,291	573	Normal Operation
CR- 67	GE2.3 116RD 90HH r2.madE	666,226	4,989,531	574.9	Normal Operation
CR- 99	GE2.3 116RD 90HH r2.madE	672,521	4,990,188	556.7	Normal Operation
CR- 100	GE2.3 116RD 90HH r2.madE	668,885	4,990,286	585	Normal Operation
CR- 101	GE2.3 116RD 90HH r2.madE	672,921	4,990,513	580.8	Normal Operation
CR- 102	GE2.3 116RD 90HH r2.madE	668,059	4,991,023	582	Normal Operation
CR- 103	GE2.3 116RD 90HH r2.madE	669,279	4,991,115	573	Normal Operation
CR- 104	GE2.3 116RD 90HH r2.madE	672,161	4,991,157	566.7	Normal Operation
CR- 105	GE2.3 116RD 90HH r2.madE	670,399	4,991,291	557.4	Normal Operation
CR- 106	GE2.3 116RD 90HH r2.madE	671,278	4,991,335	550.5	Normal Operation
CR- 107	GE2.3 116RD 90HH r2.madE	667,723	4,991,800	497.6	Normal Operation
CR- 108	GE2.3 116RD 90HH r2.madE	672,727	4,991,953	561	Normal Operation
CR- 109	GE2.3 116RD 90HH r2.madE	670,897	4,992,616	516	Normal Operation
CR- 110	GE2.3 116RD 90HH r2.madE	670,157	4,992,504	531.4	Normal Operation
CR- 111	GE2.3 116RD 90HH r2.madE	671,220	4,993,526	544.9	Normal Operation
CR- 112	GE2.3 116RD 90HH r2.madE	670,419	4,993,665	536.3	Normal Operation
CR- 113	GE2.3 116RD 90HH r2.madE	675,201	4,994,165	517.3	Normal Operation
CR- 114	GE2.3 116RD 90HH r2.madE	669,318	4,994,256	504.8	Normal Operation
CR- 115	GE2.3 116RD 90HH r2.madE	673,402	4,994,374	522	Normal Operation
CR- 116	GE2.3 116RD 90HH r2.madE	671,642	4,994,527	509.8	Normal Operation
CR- 117	GE2.3 116RD 90HH r2.madE	669,488	4,994,930	516	Normal Operation
CR- 118	GE2.3 116RD 90HH r2.madE	669,973	4,995,134	513	Normal Operation
CR- 119	GE2.3 116RD 90HH r2.madE	674,992	4,995,107	555	Normal Operation
CR- 120	GE1.7 103RD 80HH r4 1.715 Max	671,034	4,995,179	546	Normal Operation
CR-Alt1	GE2.3 116RD 90HH r2.madE	673,995	4,994,412	544.6	Normal Operation
CR-Alt2	GE2.3 116RD 90HH r2.madE	669,250	4,992,900	553.5	Normal Operation
CR-Alt3	GE2.3 116RD 90HH r2.madE	668,624	4,991,988	582	Normal Operation

APPENDIX B: CROWNED RIDGE WIND ENERGY PROJECTS SITE OVERVIEW MAP



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**Crowned Ridge Wind Farms
Overview Map**

Client
SWCA Environmental Consultants

Project Description
Wind turbine layout with existing principle and accessory structures in Grant County and wind turbines within 2 km.




Location: Watertown, SD
Project #: 20174430

Issue Dates


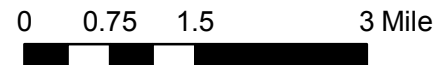
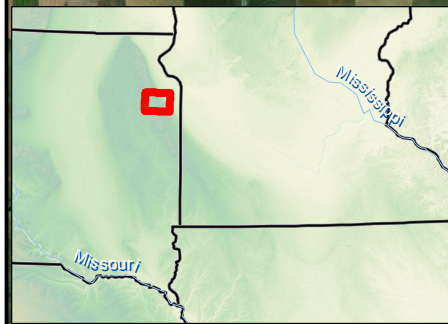
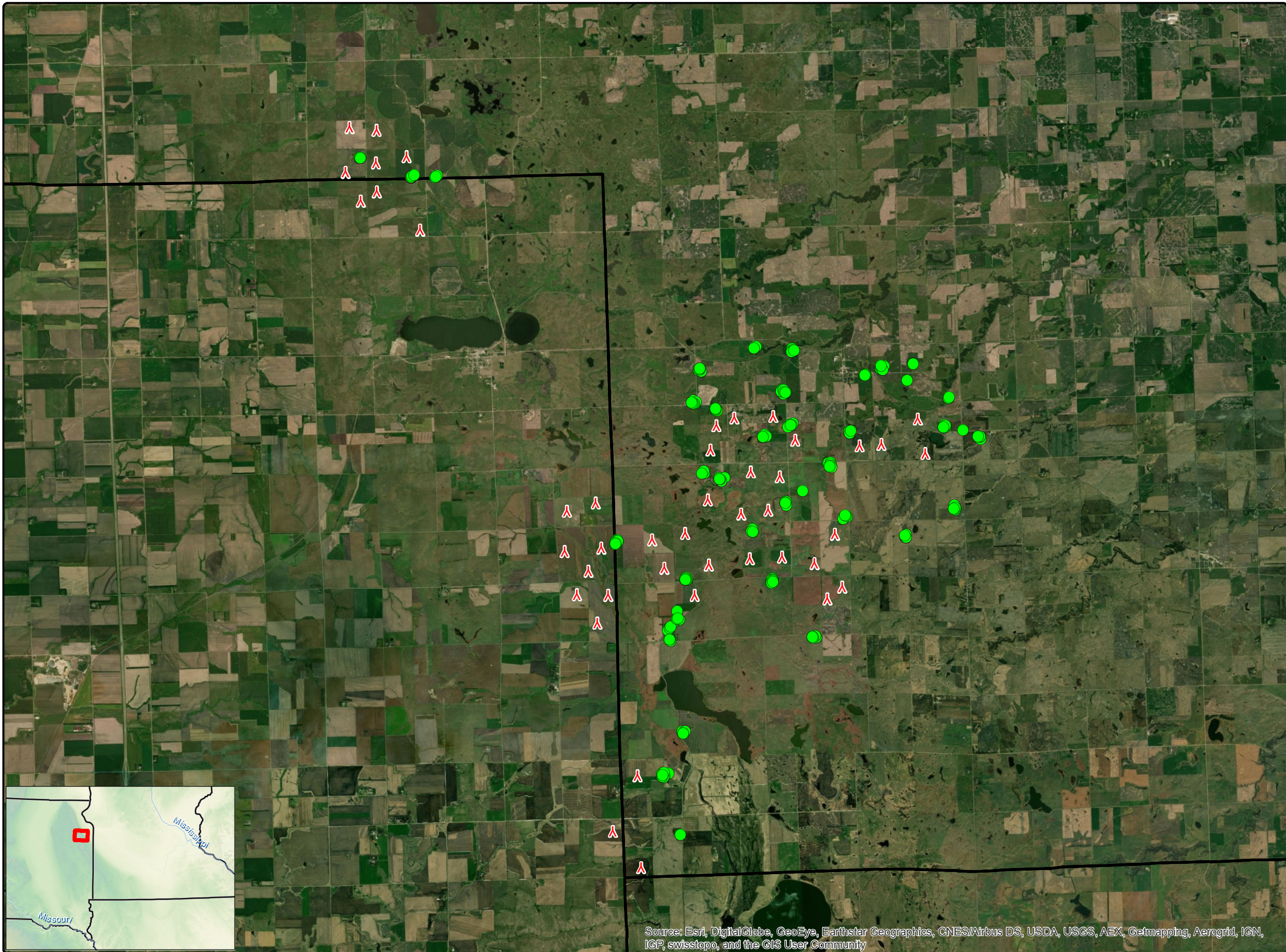
#	Description	Date
1	Original	2018.09.10

Drawn By: AS Checked By: JH

Legend

-  Turbines within 2 km
-  Principle and Acc. Structures
-  County Lines

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APPENDIX C: TABLE OF SOUND RESULTS

Crowned Ridge and Crowned Ridge II in Grant County
Realistic case sound results at principle and accessory structures
Results using GE 1.7-103-80 m HH, GE 2.1-116-80 m HH, GE 2.3-116-90 m HH WTG's
UTM NAD83 Zone 14

Noise Receptor #	Easting (m)	Northing (m)	Elevation AMSL (m)	Real Case Sound (dB(A))	Distance to Nearest Turbine (ft)
CR2-G8-P	668,054	4,985,395	576	41.3	2,382
CR2-G9-NP	668,173	4,985,425	571	40.3	2,782
CR1-G12-NP	668,229	4,989,039	575	39.1	4,623
CR1-G13-NP	672,216	4,989,142	558	38.6	3,576
CR1-G14-NP	668,156	4,989,332	574	40	3,940
CR1-G15-P	668,396	4,989,607	576	41.5	2,746
CR1-G16-NP	668,419	4,989,861	576	43.3	2,067
CR1-G18-P	668,678	4,990,722	585	46.8	1,581
CR1-G19-P	671,018	4,990,744	570	44.2	2,116
CR1-G21-P	666,766	4,991,807	577	46.2	1,594
CR1-G22-NP	674,670	4,991,955	528	35.9	6,375
CR1-G23-NP	670,471	4,992,104	560	46.8	1,670
CR1-G24-P	673,058	4,992,440	539	43.1	1,932
CR1-G25-P	671,391	4,992,858	549	45.7	1,801
CR1-G26-NP	672,589	4,993,869	531	41.6	3,140
CR1-G27-NP	676,630	4,994,642	481	35.3	4,941
CR1-G28-P	673,113	4,994,772	514	44.7	1,614
CR1-G32-P	669,477	4,995,401	546	46.5	1,545
CR1-G33-P	668,911	4,995,550	549	41.4	2,779
CR1-G34-NP	671,320	4,995,798	531	42.1	2,238
CR1-G35-P	674,702	4,996,176	489	37.7	3,632
CR1-G36-NP	673,559	4,996,344	498	36.7	6,211
CR1-G37-NP	668,998	4,996,452	549	37.8	5,246
CR1-G38-NP	673,972	4,996,493	495	36.2	5,646
CR1-G39-P	674,866	4,996,625	486	35.5	4,997
CR1-G41-P	671,563	4,997,050	498	39.4	3,983
CR1-G42-NP	670,566	4,997,097	519	39.5	3,819
CR1-G43-NP	661,141	5,001,721	583	44.3	1,909
CR1-G44-NP	661,781	5,001,732	584	40.2	3,123
CR1-G45-P	659,757	5,002,278	610	47.7	1,460
CR1-G59-P	675,755	4,994,888	488	41.2	2,605
CR1-G60-P	675,830	4,995,687	477	37.8	3,346
CR1-G65-P	671,496	4,994,973	537	46.7	1,542
CR1-G66-P	670,802	4,994,681	540	45.5	1,801
CR1-G67-P	669,597	4,993,440	556	45.3	2,106
CR1-G68-NP	669,159	4,993,632	565	44.8	2,113
CR1-G77-NP	676,031	4,992,629	503	34.2	5,728
CR1-G101-NP	676,224	4,994,810	487	37.6	3,966
CR1-G102-NP	671,443	4,994,898	532	47.4	1,381

Crowned Ridge and Crowned Ridge II in Grant County
Realistic case sound results at principle and accessory structures
Results using GE 1.7-103-80 m HH, GE 2.1-116-80 m HH, GE 2.3-116-90 m HH WTG's
UTM NAD83 Zone 14
continued

Noise Receptor #	Easting (m)	Northing (m)	Elevation AMSL (m)	Real Case Sound (dB(A))	Distance to Nearest Turbine (ft)
CR1-G182-NP	668,543	4,986,562	571	36.9	5,636
CR1-G183-NP	668,627	4,986,566	571	36.7	5,843
CR1-G184-NP	668,575	4,986,519	571	36.9	5,610
CR1-G185-NP	668,576	4,986,511	571	36.9	5,597
CR1-G195-NP	668,213	4,989,077	575	39.2	4,541
CR1-G196-NP	668,202	4,989,079	575	39.2	4,550
CR1-G197-NP	668,207	4,989,393	575	40.2	3,678
CR1-G198-NP	668,227	4,989,432	575	40.4	3,537
CR1-G199-NP	668,410	4,989,855	576	43.2	2,103
CR1-G212-NP	672,188	4,989,173	558	38.7	3,504
CR1-G213-NP	672,127	4,989,135	556	38.4	3,688
CR1-G214-NP	672,108	4,989,167	555	38.6	3,615
CR1-G215-NP	672,110	4,989,151	555	38.5	3,661
CR1-G244-NP	674,640	4,991,901	528	35.9	6,276
CR1-G245-NP	674,657	4,991,873	528	35.9	6,335
CR1-G246-NP	674,673	4,991,872	527	35.8	6,391
CR1-G247-NP	674,637	4,991,930	528	35.9	6,266
CR1-G248-NP	675,992	4,992,757	503	34.7	5,298
CR1-G249-NP	676,026	4,992,666	503	34.3	5,613
CR1-G250-NP	676,015	4,992,687	504	34.4	5,535
CR1-G251-NP	675,976	4,992,661	504	34.5	5,551
CR1-G252-NP	670,436	4,992,035	559	46.4	1,791
CR1-G253-NP	670,475	4,992,031	561	46.3	1,870
CR1-G254-NP	669,140	4,993,689	565	44.9	1,949
CR1-G255-NP	669,091	4,993,625	564	44.6	2,198
CR1-G256-NP	672,533	4,993,919	528	41.7	3,218
CR1-G257-NP	672,556	4,993,915	528	41.7	3,159
CR1-G258-NP	672,611	4,993,925	528	41.7	2,982
CR1-G259-NP	672,610	4,993,875	531	41.6	3,071
CR1-G260-NP	672,628	4,993,843	531	41.6	3,081
CR1-G261-NP	672,631	4,993,798	531	41.4	3,156
CR1-G262-NP	672,581	4,993,818	531	41.5	3,251
CR1-G263-NP	676,710	4,994,564	478	34.9	5,121
CR1-G264-NP	676,687	4,994,618	480	35	5,098
CR1-G265-NP	676,695	4,994,637	480	34.9	5,141
CR1-G266-NP	676,645	4,994,641	481	35.2	4,987
CR1-G267-NP	671,266	4,995,903	528	41.4	2,493
CR1-G268-NP	671,252	4,995,878	529	41.6	2,402

Crowned Ridge and Crowned Ridge II in Grant County
Realistic case sound results at principle and accessory structures
Results using GE 1.7-103-80 m HH, GE 2.1-116-80 m HH, GE 2.3-116-90 m HH WTG's
UTM NAD83 Zone 14
continued

Noise Receptor #	Easting (m)	Northing (m)	Elevation AMSL (m)	Real Case Sound (dB(A))	Distance to Nearest Turbine (ft)
CR1-G269-NP	671,319	4,995,907	527	41.2	2,566
CR1-G270-NP	671,334	4,995,846	529	41.6	2,398
CR1-G271-NP	671,369	4,995,834	529	41.6	2,415
CR1-G272-NP	669,073	4,996,413	546	38	5,052
CR1-G273-NP	669,029	4,996,482	549	37.8	5,312
CR1-G274-NP	669,013	4,996,482	549	37.7	5,325
CR1-G275-NP	669,021	4,996,494	549	37.7	5,354
CR1-G276-NP	670,513	4,997,056	517	39.3	3,963
CR1-G277-NP	673,566	4,996,315	499	36.7	6,132
CR1-G278-NP	673,541	4,996,324	498	36.7	6,214
CR1-G279-NP	673,549	4,996,317	499	36.7	6,178
CR1-G280-NP	673,989	4,996,548	493	36.1	5,761
CR1-G281-NP	674,068	4,996,563	493	36	5,659
CR1-G282-NP	674,035	4,996,457	495	36.3	5,426
CR1-G283-NP	673,987	4,996,582	493	36	5,856
CR1-G335-P	671,574	4,995,000	537	46.2	1,568
CR1-G336-P	671,544	4,994,955	536	46.7	1,440
CR1-G337-P	671,516	4,994,940	536	46.9	1,417
CR1-G338-P	670,845	4,994,643	540	45.4	1,863
CR1-G339-P	670,756	4,994,629	540	45.1	2,021
CR1-G340-P	669,500	4,995,344	547	47.5	1,362
CR1-G341-P	669,458	4,995,357	546	47	1,404
CR1-G342-P	669,454	4,995,383	546	46.6	1,489
CR1-G348-P	668,065	4,985,353	574	41.2	2,415
CR1-G349-P	668,038	4,985,314	574	41.5	2,329
CR1-G350-P	667,999	4,985,329	576	41.9	2,198
CR1-G351-P	668,000	4,985,367	576	41.9	2,201
CR1-G352-P	667,992	4,985,413	576	41.9	2,185
CR1-G353-P	668,047	4,985,437	576	41.3	2,372
CR1-G354-P	668,014	4,985,370	576	41.7	2,247
CR1-G355-P	668,474	4,989,626	576	41.8	2,552
CR1-G356-P	668,399	4,989,649	576	41.7	2,628
CR1-G357-P	668,425	4,989,662	576	41.9	2,543
CR1-G358-P	668,679	4,990,764	585	46.7	1,706
CR1-G359-P	668,655	4,990,773	585	46.6	1,765
CR1-G360-P	668,634	4,990,753	585	46.6	1,739
CR1-G361-P	668,631	4,990,741	585	46.6	1,709
CR1-G362-P	668,633	4,990,723	585	46.7	1,657

Crowned Ridge and Crowned Ridge II in Grant County
Realistic case sound results at principle and accessory structures
Results using GE 1.7-103-80 m HH, GE 2.1-116-80 m HH, GE 2.3-116-90 m HH WTG's
UTM NAD83 Zone 14
continued

Noise Receptor #	Easting (m)	Northing (m)	Elevation AMSL (m)	Real Case Sound (dB(A))	Distance to Nearest Turbine (ft)
CR1-G363-P	666,717	4,991,683	576	47.4	1,293
CR1-G364-P	666,744	4,991,787	577	46.6	1,499
CR1-G365-P	666,737	4,991,780	577	46.7	1,470
CR1-G366-P	666,725	4,991,762	576	46.9	1,411
CR1-G367-P	666,721	4,991,745	576	47	1,375
CR1-G368-P	666,750	4,991,737	576	46.7	1,453
CR1-G369-P	666,793	4,991,761	577	46.2	1,611
CR1-G370-P	666,789	4,991,772	577	46.2	1,614
CR1-G371-P	666,720	4,991,715	576	47.2	1,335
CR1-G372-P	666,720	4,991,700	576	47.3	1,319
CR1-G373-P	670,994	4,990,716	570	43.9	2,234
CR1-G374-P	671,031	4,990,721	570	44	2,172
CR1-G375-P	671,017	4,990,700	570	43.8	2,254
CR1-G376-P	670,994	4,990,676	571	43.6	2,352
CR1-G377-P	670,988	4,990,628	572	43.2	2,507
CR1-G378-P	671,025	4,990,658	569	43.5	2,372
CR1-G390-P	672,953	4,992,392	537	44.4	1,621
CR1-G391-P	673,027	4,992,469	539	43	1,959
CR1-G392-P	673,003	4,992,483	538	43	1,962
CR1-G393-P	671,839	4,993,146	534	43.3	2,382
CR1-G394-P	671,401	4,992,754	550	45.6	1,716
CR1-G395-P	671,359	4,992,841	549	46	1,686
CR1-G396-P	671,366	4,992,818	549	45.9	1,676
CR1-G397-P	669,619	4,993,504	556	45.2	2,323
CR1-G398-P	669,591	4,993,512	556	45.2	2,300
CR1-G399-P	669,557	4,993,498	557	45.2	2,205
CR1-G400-P	669,626	4,993,468	555	45.2	2,234
CR1-G401-P	669,712	4,993,507	555	45.3	2,379
CR1-G402-P	669,617	4,993,420	556	45.3	2,087
CR1-G403-P	669,571	4,993,463	556	45.3	2,126
CR1-G404-P	669,586	4,993,472	556	45.2	2,175
CR1-G405-P	669,561	4,993,470	557	45.2	2,129
CR1-G406-P	675,749	4,994,921	487	41.2	2,556
CR1-G407-P	675,708	4,994,937	487	41.6	2,415
CR1-G408-P	675,706	4,994,956	487	41.6	2,395
CR1-G409-P	675,701	4,994,915	487	41.7	2,411
CR1-G410-P	675,703	4,994,878	487	41.7	2,451
CR1-G411-P	675,749	4,994,933	487	41.2	2,546

APPENDIX D: STANDARD RESOLUTION SOUND MAP



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**Crowned Ridge Wind Farms
Sound Iso-Lines**

Client
SWCA Environmental Consultants

Project Description
Wind turbine layout with existing principle and accessory structures in Grant County and wind turbines within 2 km.

Predicted sound pressure levels at principle and accessory structures.

Location: Watertown, SD
Project #: 20174430

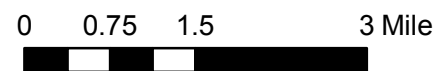
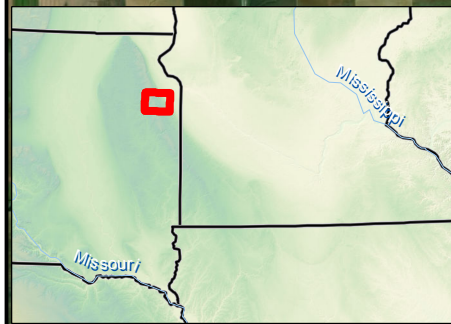
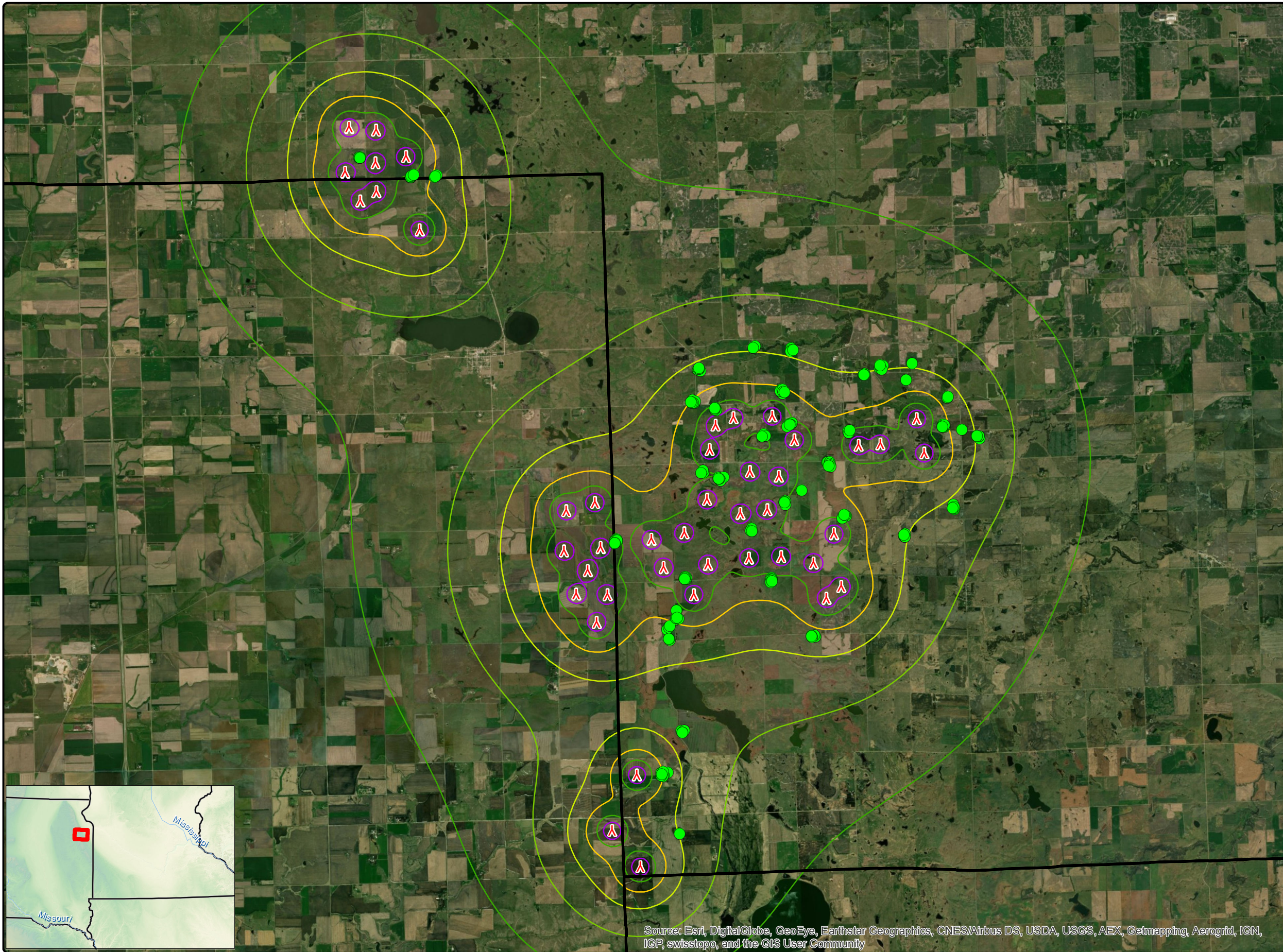
Issue Dates

#	Description	Date
1	Original	2018.09.10

Drawn By: AS Checked By: JH

- Legend*
- Turbines within 2 km
 - Principle and Acc. Structures
 - County Lines
- Sound Pressure (dBA)**
- 25
 - 30
 - 35
 - 40
 - 45
 - 50

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APPENDIX E: TABLE OF SHADOW FLICKER RESULTS

Crowned Ridge and Crowned Ridge II in Grant County**Realistic case shadow results at principle structures**

Results using GE 1.7-103-80 m HH, GE 2.1-116-80 m HH, GE 2.3-116-90 m HH WTG's

UTM NAD83 Zone 14

Shadow Receptor #	Easting (m)	Northing (m)	Elevation AMSL (m)	Real Case Shadow (hrs/year)	Distance to Nearest Turbine (ft)
CR1-G12-NP	668,229	4,989,039	575	0:00	4,623
CR1-G13-NP	672,216	4,989,142	558.0	0:00	3,576
CR1-G14-NP	668,156	4,989,332	574.0	0:00	3,940
CR1-G15-P	668,396	4,989,607	576.0	0:00	2,746
CR1-G16-NP	668,419	4,989,861	576.0	0:00	2,067
CR1-G18-P	668,678	4,990,722	585.0	22:24	1,581
CR1-G19-P	671,018	4,990,744	570.0	3:37	2,116
CR1-G21-P	666,766	4,991,807	577.1	29:03	1,594
CR1-G22-NP	674,670	4,991,955	527.6	0:00	6,375
CR1-G23-NP	670,471	4,992,104	559.8	5:16	1,670
CR1-G24-P	673,058	4,992,440	539.4	5:20	1,932
CR1-G25-P	671,391	4,992,858	549.0	18:40	1,801
CR1-G26-NP	672,589	4,993,869	531.0	8:14	3,140
CR1-G27-NP	676,630	4,994,642	480.8	2:54	4,941
CR1-G28-P	673,113	4,994,772	513.8	22:52	1,614
CR1-G32-P	669,477	4,995,401	546.0	18:39	1,545
CR1-G33-P	668,911	4,995,550	548.9	3:43	2,779
CR1-G34-NP	671,320	4,995,798	531.0	1:30	2,238
CR1-G36-NP	673,559	4,996,344	498.3	0:00	6,211
CR1-G37-NP	668,998	4,996,452	549.0	0:00	5,246
CR1-G38-NP	673,972	4,996,493	494.5	0:00	5,646
CR1-G41-P	671,563	4,997,050	497.8	0:00	3,983
CR1-G42-NP	670,566	4,997,097	518.9	0:00	3,819
CR1-G43-NP	661,141	5,001,721	583.3	19:10	1,909
CR1-G44-NP	661,781	5,001,732	583.8	2:50	3,123
CR1-G59-P	675,755	4,994,888	487.7	12:51	2,605
CR1-G60-P	675,830	4,995,687	477.0	5:43	3,346
CR1-G65-P	671,496	4,994,973	537.0	27:51	1,542
CR1-G66-P	670,802	4,994,681	539.7	15:55	1,801
CR1-G67-P	669,597	4,993,440	555.9	11:59	2,106
CR1-G68-NP	669,159	4,993,632	564.9	2:09	2,113
CR1-G77-NP	676,031	4,992,629	503.1	0:00	5,728
CR1-G101-NP	676,224	4,994,810	486.8	6:28	3,966
CR1-G102-NP	671,443	4,994,898	531.8	15:44	1,381
CR2-G8-P	668,054	4,985,395	576.0	9:00	2,382
CR2-G9-NP	668,173	4,985,425	570.9	6:31	2,782

APPENDIX F: STANDARD RESOLUTION SHADOW FLICKER MAP



EAPC
WIND ENERGY

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**Crowned Ridge Wind Farms
Shadow Flicker Iso-Lines**

Client

SWCA Environmental Consultants

Project Description

Wind turbine layout with existing principle structures in Grant County and wind turbines within 2 km.

Predicted shadow flicker at principle structures.

Location: Watertown, SD

Project #: 20174430

Issue Dates

#	Description	Date
1	Original	2018.09.10

Drawn By: AS Checked By: JH

Legend

- Principle Structures
- ▲ Turbines within 2 km
- County Lines

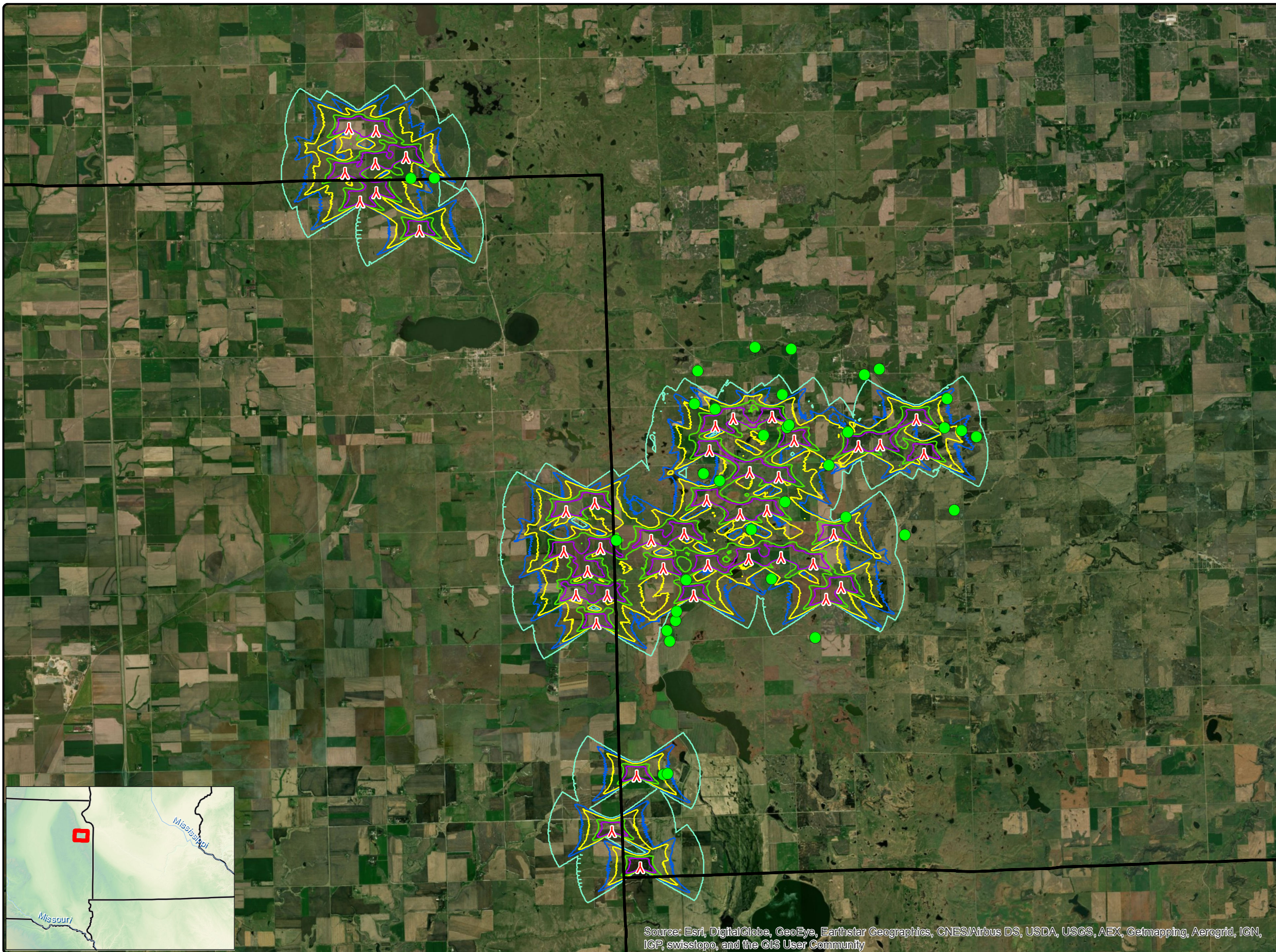
Shadow Flicker (hr/yr)

- 0
- 5
- 10
- 30
- 50

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0 0.75 1.5 3 Mile



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Appendix: K Decommissioning Report

DECOMMISSIONING SUMMARY | Grant County

Crowned Ridge Wind, LLC and Crowned Ridge Wind II, LLC (collectively, Crowned Ridge Wind) currently estimates that the Project will have a useful life of at least 30 years based on our experience operating projects, on models, and technology. One (1) year in advance of the anticipated Project decommissioning, Crowned Ridge Wind will provide notice to Grant County that decommissioning will occur. After that time, the Project would be decommissioned, and the existing equipment would be removed. In the event a turbine is found to be inactive for a period of twelve (12) consecutive months, Grant County has the ability to initiate the decommissioning process as described below for the inactive turbine.

INTENDED DISPOSITION OF TURBINES & SITE:

The goal of Project decommissioning is to remove the installed power generation equipment and to return the site to a condition as close to a pre-construction state as feasible. The major activities required for the decommissioning may be as follows:

- Creation of temporary work areas to enable decommissioning of equipment;
- Wind turbine and meteorological tower removal;
- Electrical system removal;
- Structural foundation removal per ROW grant requirements;
- Road removal;
- Re-grading;
- Re-vegetation; and
- Restoration of temporary work areas.

The decommissioning activity most notable to the general public will be the removal of the wind turbines and meteorological towers. Removal of the facilities shall include removing the caisson and all other components to a depth of no less than four (4) feet below grade unless a lesser depth is otherwise agreed to by the landowner. The disassembly and removal of this equipment will essentially be the same as its installation, but in reverse order. The large components that make up a wind turbine will be disassembled in the reverse order they were assembled. The rotor (hub and blades) are removed from the nacelle and, with the help of a smaller crane, turned horizontally and set on the ground. Next, the nacelle will be removed from the top of the tower, followed by each portion of the tower. The meteorological tower will similarly be disassembled by a crane, starting with the upper tower section and moving downward. Once the turbine rotor has been removed, a crew and small crane will disassemble it into the hub and three loose turbine blades. The most efficient manner for component removal will be for each large component (other than the rotor) to be placed directly onto a truck bed when it is removed from the turbine. These trucks could then immediately take the component off the site. This approach will limit the need for clearing an area around the turbine base to just enough area to set down the rotor. When the rotor is disassembled, the blades will be placed into a carrying frame, which can then be loaded onto a truck for removal from the site. The hub can also be removed once it is disassembled from the blades.

Between each of the turbine locations will be a buried electrical cable and fiber optic cable. The respective Project owners will consult with the landowners at the time of decommissioning to determine if the landowners desire the Project owners to remove the cables or to leave to them in place. Removing the cables will cause some environmental impact that would need to be mitigated, but leaving them in place could impact future uses for the site. If the cables are to be removed, a trench will be opened and the cables pulled out. The cables will be cut into manageable sections and removed from the site. The trenches will then be filled with native soil, compacted, tilled and returned to a condition suitable for

growing crops. Once the Project and transmission line is de-energized, the substation will be disassembled. Major components will be removed from their foundations and placed onto trucks using a small crane. Fences and fence posts will be taken down and removed. The aggregate base and concrete foundations at the collection substation will be removed, and native soils will be spread on-site to return it to its prior condition and to assist in preventing erosion.

The Project owners will review if the substation grounding grid is to be removed or left in place. Assuming the transmission line no longer serves a purpose for the site; it will be disassembled and removed. Initially, the wires will be removed from the tower hangers and collected for recycling. The tower structures will then be disassembled and removed, including grounding rods to 5 feet below grade unless a lesser depth is otherwise agreed to by the landowner. The areas around the poles, along with any access roads that were necessary, will be reclaimed.

When the wind turbines and substation components are removed from their foundations, the concrete and steel within the deeper wind turbine foundations will be broken-up and removed to a depth of four (4) feet below grade unless a lesser depth is otherwise agreed to by the landowner. Fully removing the wind turbine foundations would require major excavation/disturbance at each tower site, as well as additional truck haul-away traffic. The foundation sections below 4 feet, that are proposed to remain, are composed of non-leaching elements, concrete and steel, that should not present a hazard to the environment.

The landowners will have the choice, when the Project is decommissioned, as to whether the Project access roads are to be removed. To facilitate the various uses for the property, the owner may choose to leave the roads in place. If the roads are left, maintenance of the roads will become the responsibility of the respective landowner. Once all the necessary equipment and materials have been removed from an area and the road to that area is no longer needed, it can be removed. The road surface and bed materials will be removed down to grade. Any materials native to the site will be scattered across the site, and foreign materials will be removed. For areas where equipment or materials are removed, those areas will be re-graded back to near pre-construction contours (if possible). Removed roads will be re-graded to original contours if cuts and fills make such re-grading practical. Crane pads will also be re-graded. All disturbed areas will be seeded and mulched.

Restoration areas shall be filled and covered with top soil and restored to a state compatible with the surrounding land and will be completed within ninety (90) days of abandonment.

Appendix: L Soil Erosion

SOIL EROSION SUMMARY | Grant County

Crowned Ridge respectfully requests the ability to submit a Stormwater Pollution Prevention plan (SWPPP), prior to construction. Crowned Ridge is currently developing a SWPPP. The SWPPP will incorporate planned infrastructure in coordination with Codington, Deuel, and Grant Counties. Crowned Ridge will submit the SWPPP to Grant County at the same time the project is filled the with South Dakota Department of Environment & Natural Resources.

The SWPPP will incorporate measures for erosion control for each Facility phase. The SWPPP will incorporate plans for grading, construction and drainage of roads and turbine pads, necessary soil information, and detailed design features to maintain downstream water quality. A revegetation plan to maintain and ensure adequate erosion control and slope stability will also be included.

Crowned Ridge will meet or exceed all County and State requirements for Soil Erosion and Stormwater Pollution and Protection.

Appendix: M Environmental Consultation

ENVIRONMENTAL CONSULTATION I Grant County

Crowned Ridge has been in routine coordination with the US Fish and Wildlife Service (USFWS), South Dakota Department of Game, Fish, and Parks (SDGFP), and South Dakota Historic Preservation Office (SHPO) since April 2017. This coordination was initiated in spring 2017:

April 19, 2017 - two technical memoranda were provided to USFWS and SDGFP describing the project and summarizing natural resources-related surveys completed to-date and in-progress.

April 20, 2017 - Crowned Ridge held a conference call with the USFWS and SDGFP to review the technical memoranda, reintroduce the project to the agencies, and invite agency input.

June 14, 2017 - two technical memoranda were provided to SHPO and Sisseton Wahpeton Oyate (SWO) Tribal Historic Preservation Office (THPO) describing the project, known cultural resources, and establishing methods for field surveys and subsequent reporting.

June 19, 2017 - Crowned Ridge and SHPO reviewed the information and approach set forth in the two memoranda via conference call.

Since that time and through the present, Crowned Ridge have continued substantial coordination efforts with the USFWS and SDGFP related to potential natural resources in the project vicinity. Coordination has included routine information gathering and sharing. Crowned Ridge's data requests and agency responses have included those related, and not limited, to USFWS wetland and grassland easement information, raptor nest location data, and threatened and endangered species occurrence data.

Crowned Ridge also is in active, continuous contact, and working directly with the SWO THPO on address of traditional cultural properties. The SWO THPO is serving as project liaison for coordinating with other concerned tribes in the region. Additionally, Crowned Ridge is in periodic contact with the SHPO, and has conducted various files searches and refreshes of files on known resources in the project area between June 2017 and May 2018. Further, following the 2017 fieldwork, on March 12, 2018, a follow-up call was held with SHPO, reviewing project status, results to date, and potential reporting schedule.