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From the office of Miles F. Schumacher
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August 22, 2019

Via Electronic Filing

Ms. Patricia Van Gerpen
Executive Director
South Dakota Public Utilities Commission
500 East Capitol Avenue
Pierre, SD 57501

Re: Docket #EL19-003; Application to the SD PUC for a Facility Permit to Construct A 300 megawatt Wind Facility

Dear Ms. Van Gerpen:

Please find attached a Wildlife Conservation Strategy for the Crowned Ridge Wind I Facility. This is being filed to meet a commitment made during testimony at the hearing. Also attached is a corresponding Certificate of Service.

If you have any questions, please contact me.

Yours very truly,

LYNN, JACKSON, SHULTZ & LEBRUN, P.C.

Miles F. Schumacher
MFS:kab
Enclosures

Wildlife Conservation Strategy for the Crowned Ridge I Wind Facility, Grant and Codington Counties, South Dakota

AUGUST 2019

PREPARED FOR

Crowned Ridge Wind, LLC

PREPARED BY

SWCA Environmental Consultants

WILDLIFE CONSERVATION STRATEGY FOR THE CROWNED RIDGE I WIND FACILITY, GRANT AND CODINGTON COUNTIES, SOUTH DAKOTA

Prepared for

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SWCA Project No. 53378

August 2019

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1 INTRODUCTION

Crowned Ridge Wind, LLC (Crowned Ridge), a wholly-owned, indirect subsidiary of NextEra Energy Resources, LLC (NextEra), is developing the Crowned Ridge I Wind Facility (Project) in Grant and Codington counties, South Dakota (Figure 1). Crowned Ridge is committed to environmental due diligence and contracted SWCA Environmental Consultants (SWCA) to assess potential wildlife impacts resulting from Project construction and operation. Crowned Ridge has voluntarily developed and implemented this Wildlife Conservation Strategy (WCS) in its continued efforts to demonstrate due diligence in avoiding and minimizing impacts to wildlife in association with the development, construction, and operation of the Project. This WCS describes Crowned Ridge's strategy to address wildlife conservation in all phases of Project development.

1.1 Statement of Purpose

There are potential wildlife impacts resulting from construction and operation of a wind energy facility. This WCS outlines various processes that Crowned Ridge has employed or will employ to:

1. Comply with all state and federal wildlife conservation and protection laws and regulations at the Project;
2. Ensure that impacts to wildlife resources, particularly birds and bats, are identified, quantified, and analyzed; and
3. Implement various avoidance and minimization measures to address unanticipated impacts that result from the operation of the Project.

Reducing impacts on birds, bats, and other wildlife that occur as a result of the Project is important to Crowned Ridge as both a regulatory and natural resource conservation priority.

1.2 Corporate Policy

Crowned Ridge is committed to siting, constructing, operating, and decommissioning the Project in an environmentally responsible and sustainable manner. This includes minimizing impacts to natural resources, including local wildlife and the habitats they use. As part of this commitment, Crowned Ridge has developed this WCS for the Project. The objective of this WCS is to ensure that:

- All Project-related actions comply with federal and state regulations pertaining to wildlife;
- All Project-related actions comply with conditions of existing permits with respect to wildlife;
- Avoidance and minimization measures designed for Project-specific wildlife species concerns are implemented;
- Effective documentation of bird and bat injuries and fatalities will occur to provide the basis of ongoing adaptive management and development of wildlife protection procedures; and
- Crowned Ridge staff and all relevant subcontractors will receive the appropriate training pursuant to avian, bat, and other wildlife monitoring and reporting.

1.3 Agency Coordination History

Crowned Ridge has coordinated with the South Dakota Game, Fish, and Parks (SDGFP) and South Dakota field office of the U.S. Fish and Wildlife Service (USFWS) as part of the development of the

Project and the permitting process required by the South Dakota Public Utilities Commission (SDPUC) (Table 1). Copies and records of correspondence are in Appendix A.

2 REGULATORY FRAMEWORK

Native birds are protected under a variety of federal and state laws and regulations. With regard to the Project, these laws and regulations include the Endangered Species Act (ESA), Migratory Bird Treaty Act (MBTA), and the Bald and Golden Eagle Protection Act (BGEPA).

2.1 Migratory Bird Treaty Act

The MBTA implements the Unites States' obligations under four treaties for the protection of migratory birds. The MBTA is administered by the USFWS, which maintains a list of all species protected by the MBTA (50 Code of Federal Regulations [CFR] 10.13). This list includes over 1,000 species of migratory birds, including eagles and other raptors, waterfowl, shorebirds, seabirds, wading birds, and passerines.

The MBTA makes it unlawful "by any means or in any manner, to pursue, hunt, take, capture, kill … possess, offer for sale, sell … purchase … ship, export, import …transport or cause to be transported… any migratory bird, any part, nest, or eggs of any such bird …" except as otherwise permitted under the regulations. (16 United States Code [USC] 703). The USFWS has interpreted the MBTA to be a strict liability statute, meaning that proof of intent, knowledge, or negligence is not an element of an MBTA violation. Actions resulting in the "take" of a protected species, in the absence of a USFWS permit or regulatory authorization, are a violation.

The word "take" is defined by regulation as "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect" (50 CFR 10.12). The MBTA does not have a provision directly prohibiting incidental takes and the definition of "take" does not include the broader terms of "harass" or "harm" that have been found to prohibit incidental take.

2.2 Bald and Golden Eagle Protection Act

Under authority of the BGEPA (16 USC 668–668d), bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) are afforded additional legal protection. The BGEPA states that "no person shall knowingly, or with wanton disregard for the consequences of his act take, possess, sell, purchase, barter, offer for sale, purchase or barter, transport, export, or import, at any time or in any manner any bald eagle commonly known as the American eagle or any golden eagle, alive or dead, or any part, nest or egg thereof of the foregoing eagles…". The BGEPA defines take to include "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb" (16 USC 668c), and includes criminal and civil penalties for violating the statute (16 USC 668). The term "disturb" is defined as agitating or bothering an eagle to a degree that causes, or is likely to cause, injury to an eagle, or a decrease in productivity or nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior (50 CFR 22.3).

BGEPA authorizes the Secretary of the Interior to permit the take of bald or golden eagles for several defined purposes, including when "necessary to permit the taking of such eagles for the protection of wildlife or of agricultural or other interests in any particular locality." Based on this authority, the USFWS published a final rule (Eagle Permit Rule) on September 11, 2009 (see 50 CFR Parts 13 and 22) establishing two new permit types: 1) individual permits that can be authorized in limited instances of disturbance and in certain situations where other forms of take may occur, such as human or eagle health

and safety; and 2) programmatic permits that may authorize incidental take that occurs over a longer period of time or across a larger area (USFWS 2009). On December 16, 2016, the USFWS issued a revised Eagle Permit Rule that includes changes to the regulations for eagle incidental take permits and eagle nest take permits. The revisions to the Eagle Permit Rule went into effect on January 17, 2017, and include changes to permit issuance criteria, duration (including a maximum permit term of 30 years), compensatory mitigation standards, and permit application requirements.

2.3 Endangered Species Act

Certain species at risk of extinction are protected under the federal Endangered Species Act of 1973 (ESA; 16 USC §1531 *et seq.*, as amended). The ESA defines and lists species as "endangered" or "threatened" and provides regulatory protection for the listed species. The federal ESA also provides a program for the conservation and recovery of threatened and endangered species and for the conservation of designated critical habitat. Section 9 of the federal ESA prohibits the "take" of species listed by USFWS as threatened or endangered.

. "Take" is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (16 USC 1532). Significant modification or degradation of listed species' habitats where the modification actually kills or injures wildlife by significantly impairing essential behavioral patterns is considered "harm" under ESA regulations. Section 10(a) of the federal ESA includes provisions for the authorization of take that is incidental to, but not the purpose of, otherwise lawful activities. Under Section 10(a)(1)(B), an Incidental Take Permit may be issued if take is incidental and does not jeopardize the survival and recovery of the species.

2.4 State Protection

South Dakota's Endangered and Threatened Species law (SDCL Chapter 34A-8) prohibits the take, possession, and transportation of "wildlife and plants indigenous to the state determined to be endangered or threatened within the state" as determined by the SDGFP.

2.5 Non-regulatory Framework

In addition to regulatory drivers, the WCS also briefly discusses bird species included on the USFWS list of Birds of Conservation Concern (BCC). Although these species are not formally protected under any regulatory laws, BCC species are closely monitored by USFWS due to population declines and/or rare occurrences in a specific region. As a result, BCC species that might be encountered at the Project are included in this WCS. Development of the BCC category for birds was the result of a 1988 amendment to the Fish and Wildlife Conservation Act that mandates the USFWS identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the ESA. The overall goal is to prevent or remove the need for additional ESA bird listings by implementing proactive management and conservation actions. The BCC categorization is intended to stimulate coordinated and collaborative proactive conservation actions among federal, state, tribal, and private partners (USFWS 2008a). The proposed Project Area is located in the Prairie Potholes Bird Conservation Region (BCR 11) and only BCC species for this region are discussed in the WCS.

3 PROJECT DESCRIPTION

3.1 Project Components

The Project will be situated within an approximately 53,186-acre Project Area (Figure 2), and the total installed capacity of the Project will not exceed 300 MWs. Project components will include:

- Up to 130 wind turbine generators;
- Access roads to turbines and associated facilities;
- Underground 34.5-kilovolt (kV) electrical collector lines connecting the turbines to the collection substation;
- Underground fiber-optic cable for turbine communications co-located with the collector lines;
- The low-side of a 34.5 to 345-kV collection substation;
- One permanent meteorological (met) tower;
- An operations and maintenance (O&M) facility; and
- Additional temporary construction areas, including laydown and batch plant areas.

The Project will utilize the Crowned Ridge 34-mile 230 kV generation tie line and a new reactive power compensation substation to transmit the generation from the Project's collector substation to the Project's point of interconnection located at the Big Stone South 230 kV Substation.

3.2 Site Description

3.2.1 Tier 1 Evaluation Area

Crowned Ridge conducted a desktop analysis consistent with Tier 1-Preliminary Site Evaluation recommendations of the USFWS Wind Energy Guidelines (WEG) (USFWS 2012) to assess the potential for adverse effects on species of concern and their habitat. The results were evaluated to further inform the location determination process for the proposed Project. As part of the initial site screening, Crowned Ridge evaluated existing, publicly available Geographic Information System (GIS) data on the proposed Project Area, including land ownership, National Land Cover Data (NLCD), US Department of Agriculture (USDA) National Agriculture Statistics Service data, U.S. Geological Survey (USGS) Ecoregions, the National Wetlands Inventory, the National Hydrography Database, Federal Emergency Management Agency floodplains, high resolution aerial imagery, data available from South Dakota State University's Public Research Access Institutional Repository and Information Exchange, and known species occurrence and habitat data provided by USFWS and SDGFP, as well as results from field evaluations performed for previous iterations of the Project Area. The location of the proposed Project Area was selected over other evaluated areas based on the evaluation of these factors. Other factors that influenced the selection of the proposed Project Area were wind resource, interested landowners, and proximity to a transmission line for interconnection.

The Project lies within three ecoregions, namely the Prairie Coteau Escarpment, the central Prairie Coteau, and the Big Sioux Basin (Bryce et al. 1996). Land within the Project Area is characterized by tilled agriculture and a well-developed drainage network across the Big Sioux Basin, hummocky topography with no distinct drainage pattern in the Prairie Coteau, and relatively gradual slopes with eastern flowing perennial streams along the Prairie Coteau Escarpment. Vegetation is primarily cropland

and grassland with small patches of planted trees in shelterbelts around farmsteads/homesteads, and near natural streams. Two active sand and gravel pits are located in T118N R51W Sections 15 and 16. Project elevations range from approximately 1,040 to 2,050 feet above mean sea level. The Project is located entirely on private land, which includes undeveloped rural areas, agricultural lands, and residential farmsteads.

The Tier 1 Preliminary Site Evaluation and coordination with USFWS and SDGFP identified species of concern with the potential to occur within the Project Area.

The following species are evaluated in detail to determine the likelihood of occurrence within the Project Area in Section 4.1:

- Bald eagle and golden eagle (federally protected; BGEPA),
- Osprey (*Pandion haliaetus*) (state threatened),
- Piping plover (*Charadrius melodus*) (federally threatened),
- Prairie grouse – greater prairie-chicken (*Tympanuchus cupido*) and sharp-tailed grouse (*Tympanuchus phasianellus*) (neither species is federally or state-listed but leks are of concern to USFWS and SDGFP),
- Red knot (*Calidris canutus*) (federally threatened),
- Whooping crane (*Grus americana*) (federally endangered),
- Northern long-eared bat (*Myotis septentrionalis*; NLEB) (federally threatened),
- Northern river otter (*Lontra canadensis*) (state threatened),
- Prairie butterflies – Dakota skipper (*Hesperia dacotae*) (federally threatened) and Poweshiek skipperling (*Oarisma poweshiek*) (federally endangered),
- Blacknose shiner (*Notropis heterolepis*) (state endangered),
- Northern redbelly dace (*Chrosomus eos*) (state threatened), and
- Topeka shiner (*Notropis topeka*) (federally endangered).

3.2.2 Tier 2 Project Area

Consistent with Tier 2-Project Area Evaluation recommendations of the WEG, field evaluations were conducted at the proposed Project Area. During ground-based surveys completed for previous iterations of the Project, biologists observed habitats and site conditions, which were then used to evaluate the initial results of the desktop study and to inform the assessment of the potential occurrence of sensitive wildlife resources. Subsequent Project re-designs modified the Project Area to avoid non-wildlife constraints, wetlands, and high-quality native prairie to the extent possible. The site visits confirmed that the existing land use in the Project Area is primarily grassland, cropland, and hay/pasture. There are rural residences and farmsteads located within the Project Area.

There are no major rivers or lakes within the Project Area; however, the Project Area contains numerous streams and wetlands that vary from shallow vegetated depressions to man-made cattle ponds and intermittent creeks. Three named streams and multiple unnamed tributaries to these streams are located within the Project Area (Crowned Ridge 2019). There are few wetlands evident that are not associated with a stream system. Trees and forested areas are sparsely scattered throughout the Project Area and are restricted mainly to riparian areas and to windbreaks around fields and residences. The topography within the Project Area primarily consists of rolling plains, and lacks prominent landscape features (e.g., hills,

valleys); the elevation within the Project Area ranges from approximately 1,040 to 2,050 feet above mean sea level.

3.2.3 Baseline Habitat Management

The habitat within the Project Area is primarily agriculture and pasture vegetation typical of South Dakota. According to the NLCD, the majority of the Project Area is herbaceous (47 percent) and cultivated crops (36 percent) (Table 2, Figure 3), all of which is managed by private landowners. Crop sales in Grant and Codington counties are primarily grains, oil seeds, dry beans, and dry peas, while cattle, hogs, and sheep comprise the majority of livestock sales (USDA 2012). The NLCD shows 5,885 acres (11 percent) of pasture/hay (Table 2, Figure 3). There are no federally managed habitats within the Project Area.

4 PROJECT HISTORY OF BIRD, BAT, AND SPECIES OF CONCERN PRESENCE AND RISK ASSESSMENTS

4.1 Tier 1: Preliminary Site Evaluation

4.1.1 Decision to Abandon or Move Forward

4.1.1.1 ARE SPECIES OR HABITATS OF CONCERN PRESENT?

Native prairie and the following special-status wildlife species were identified as potentially present within the Project Area and were therefore evaluated in detail to determine the likelihood of occurrence within the proposed Project Area and potential risks to these species and their habitats.

4.1.1.1.1 Habitat

Native Prairie

The NLCD class "herbaceous" includes land currently not used for hay/pasture or cropland, but that may or may not have been disturbed in the past. These areas likely provide suitable habitat for grassland and some prairie species. However, Bauman et al. (2016) conducted a GIS exercise to quantify undisturbed lands in eastern South Dakota that are most likely to support native, undisturbed prairie that, in turn, are more likely to support prairie obligate and sensitive species. This exercise is described below.

Bauman et al. (2016) utilized South Dakota Farm Service Agency's 2013 Common Land Unit data layers, and the 2012 USDA National Agriculture Imagery Program county mosaic aerial imagery, to evaluate approximately 22.6 million acres of land in the 44 counties that comprise eastern South Dakota. Land currently under crop production, or that has in the past been used for crop production, was removed from consideration for the exercise. This was followed by manual removal of other disturbed areas. The remaining land tracts were then categorized as potentially "undisturbed grassland" or "undisturbed woodland." Water bodies larger than 40 acres as defined by the SDGFP's Statewide Water Bodies layer were then removed to allow a more accurate interpretation of the remaining undisturbed grassland/wetland complex. The resulting dataset provides an indication of the location of likely undisturbed grasslands that may support native prairies and provide habitat for prairie species (Bauman et al. 2016). These areas may overlap with the cover types "herbaceous" and/or "hay/pasture" (Table 2).

According to Bauman et al. (2016), there are 505 discrete tracts of land that may support native prairie within the Project Area. These tracts range in size from less than 0.1 to 631.0 acres, with an average size of 35.4 acres. The total acreage of land that may contain native prairie habitat within the Project Area, according to Bauman et al., is approximately 17,889.4 acres.

USFWS and SDGFP identified native prairie as a habitat of concern because it may support the Dakota skipper, Poweshiek skipperling, or grassland bird species of concern. See Section 5.1 for additional assessment results.

4.1.1.1.2 Insects

Prairie Butterflies – Dakota Skipper and Poweshiek Skipperling

The Dakota skipper is an obligate of undisturbed, native prairies, and generally inhabits wet lowlands dominated by bluestem grasses, or dry uplands that are a mix of bluestem and needle stem grasses (Vaughn 2005). Larvae have been observed feeding on several grasses, although little bluestem (*Schizachyrium scoparium*) is the preferred food source; the preferred nectar source for adults is purple coneflower (*Echinacea angustifolia*) (Vaughn 2005), in addition to other prairie flowering species. As of 2002, Dakota skippers had been recorded at 53 sites in 10 counties in South Dakota, including two sites in Codington County (USFWS 2002). Of the Dakota Skipper sites recorded in Codington County, none are within the Project Area. The closest occurrence is approximately 15 miles west of the Project Area. There is no designated critical habitat for the Dakota skipper within the Project Area. The nearest critical habitat is in Grant County, adjacent to the western boundary of the northeastern portion of the Project Area. Dakota skippers have not been recorded in the Project Area (USFWS 2017a).

The Poweshiek skipperling lives in high quality tallgrass prairie in both upland, dry areas and low moist areas (USFWS 2014). Nectar species for the Poweshiek skipperling include purple coneflower, black-eyed Susan (*Rudbeckia hirta*), palespike lobelia (*Lobelia spicata*), and other flowering prairie species. There is no definitive research available regarding which plant species are necessary for larvae to develop, but they appear to select fine-stemmed grasses and sedges, such as slender spike rush (*Eleocharis elliptica*), prairie dropseed (*Sporobolis heterlepis*), and little bluestem (Shepherd 2005; USFWS 2014). Skadsen (2015) suggests the Poweshiek skipperling may be extirpated from South Dakota.

See Section 5.1 for additional assessment results.

4.1.1.1.3 Birds

Bald Eagle and Golden Eagle

Bald eagles typically occupy habitat near large rivers, lakes, and marshes with available food sources (USFWS 2007). They build stick nests as large as 10 ft. in diameter in trees and occasionally on human-made structures (USFWS 2007). Skadsen (2017) identifies the bald eagle as an “uncommon migrant” in northeast South Dakota. The golden eagle nests primarily west of the Missouri River in South Dakota, usually on cliffs, rocky outcrops, and in large trees (Kochert et al. 2002; Pulkrabek and O’Brien 1974). Skadsen (2017) lists the golden eagle as a “rare migrant” in northeast South Dakota. See Section 5.2 for additional assessment results.

Osprey

Ospreys inhabit areas near large water bodies that support their prey, which consists almost exclusively of fish (SDGFP 2017a). Their nest sites include large trees on or near water bodies, with preference

to locations that offer separation from surrounding vegetation to avoid predators (SDGFP 2017a). The Project Area contains lakes and streams which have the potential to support osprey prey resources, though forested areas with available nesting sites are limited throughout the Project Area. See Section 5.2 for additional assessment results.

Piping Plover

Within South Dakota, piping plovers breed and nest on open beaches, alkaline wetlands, and sandflats (Aron 2005). In the Northern Great Plains, the nesting season extends from late April through August, with peak activity in May and June (Aron 2005). Nests consist of shallow scrapes in the sand lined with rocks or small shells (Aron 2005). The SDGFP (2016) lists the piping plover as known to have occurred in Codington County but not Grant County; however, the USFWS (2017a) does not list the species as a known or potential occurrence in Codington County. The Platte River Recovery Implementation Program (PRRIP) (2017) indicates that the species nests primarily on the Missouri River, downstream of the Gavins Point (approximately 150 miles south of Project Area) and Fort Randall Dams (approximately 154 miles southwest of Project Area), with some nesting on tributaries of the Missouri. The PRRIP (2017) also states that piping plovers have been observed at Horseshoe Lake in western Codington County, approximately 14 miles west of the Project Area. See Section 5.2 for additional assessment results.

Prairie Grouse

The greater prairie-chicken and sharp-tailed grouse may be present in the Project Area. These species are not federally or state-listed as threatened or endangered. Current research suggests that certain grouse species may avoid anthropogenic structures (Hagen et al. 2011; USFWS 2012); however, long-term data sets are still needed to assess wind energy impacts (Johnson et al. 2012). Regardless, state and federal wildlife agencies have regularly expressed concern about the locations of wind turbines with respect to grouse leks. Leks are breeding grounds where grouse congregate, and males engage in communal breeding displays during the spring (Connelly et al. 1998). See Section 5.2 for additional assessment results.

Red Knot

The red knot is a shoreline species that breeds in drier Arctic tundra areas that generally are sparsely vegetated. Nests are cup-shaped depressions lined with vegetation and located on the ground. Outside of the breeding season, the species primarily is found in marine habitats, especially near coastal inlets, estuaries, and bays (Harrington 2001). The species may be present in South Dakota as a migrant or accidental occurrence but breeding or wintering populations have not been observed (Harrington 2001). See Section 5.2 for additional assessment results.

Whooping Crane

The USFWS indicates that South Dakota is within the whooping crane migration corridor and that the species may stopover in suitable habitat including cropland and pastures, wet meadows, shallow marshes, shallow portions of large water bodies, and both freshwater and alkaline basins (Appendix A). The Project Area is approximately 30 miles east of the 95% core migration corridor (as delineated by Pearse et al. 2018a and 2018b; Figure 4) at its closest, indicating that it is relatively less likely for the species to be present within the Project Area than in areas closer to the migration corridor. According to the USFWS Whooping Crane Tracking Project Database, the closest whooping crane observation is from spring 2015, approximately 16 miles northwest of the Project Area. See Section 5.2 for additional assessment results.

4.1.1.1.4 Mammals

Northern Long-eared Bat

Summer habitat for NLEB consists of forested areas with trees greater than 3 inches in diameter at breast height (USFWS 2017b). NLEB roost in live trees and/or snags that have exfoliating bark, cracks, crevices, and/or cavities (USFWS 2017b). The species typically forages in forest interiors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure (USFWS 2017b). NLEB also may roost in human-made structures such as buildings, barns, bridges, and bat houses (USFWS 2017b). The species hibernates in caves, mines, or other cave-like structures during the winter. The USFWS lists NLEB as possibly present in Codington and Grant Counties, indicating that the Counties are within the range of the species and may contain suitable habitat. However, there are no records of the species being present in these counties (USFWS 2017a). The nearest county records published by USFWS indicating known presence of NLEB are in Brookings County to the south of the Project and in Roberts County to the north (USFWS 2017a).

The USFWS cites White Nose Syndrome, a fungal pathogen specific to bats, as the primary cause for the decline of the species, rather than habitat removal (USFWS 2016a). NLEB was listed as a threatened species with a final 4(d) rule on April 2, 2016 (USFWS 2016a). The 4(d) rule prohibits purposeful take of the species range-wide. Within the "WNS Zone" (counties within 150 miles of known occurrences of the pathogen that causes white-nose syndrome) incidental take resulting from specified activities is prohibited during certain times of year. The Project Area is within the WNS Zone, therefore incidental take that results from operation of utility-scale wind-energy turbines currently is not prohibited. Additionally, incidental take that results from tree-clearing activities is not prohibited, unless it occurs within 0.25 mile of a known NLEB hibernacula or within 150 feet of a known maternity roost tree between June 1 and July 31. See Section 5.3 for additional assessment results.

Northern River Otter

Northern river otters can occupy many types of habitat; however, riparian vegetation along a wetland margin is a key habitat feature (SDGFP 2012). This species is more prevalent in areas with abundant food and limited disturbance (SDGFP 2012). Northern river otters and beavers are closely associated; the northern river otter exploits dens, downed trees, ponds, and prey that thrive in beaver ponds (SDGFP 2012). The northern river otter was reintroduced into the Minnesota River valley in 1980 and 1981 (Skadsen 2016a). Since then, Skadsen (2016a) reports that the population has expanded its range and the species now is frequently observed in Grant County along the Yellowbank River drainages, which cross through the Project Area, and along other tributaries and lakes within the Minnesota River valley, which lies approximately 16 miles northeast of the Project Area. The Project Area contains lakes and streams which have the potential to support northern river otters. However, it is unknown whether northern river otters frequently utilize these tributaries in Codington County (SDGFP 2012). The closest documented observation of the northern river otter was along an unnamed tributary approximately 13.8 miles east of the Project Study Area (South Dakota Natural Heritage Database spatial data accompanying correspondence shown in Appendix A). Due to the limited habitat, it is unlikely that northern river otters would occur within the Project Area and no significant impacts to suitable habitat are anticipated from the Project; therefore, this species was eliminated from further consideration in this WCS.

4.1.1.1.5 Fish

Blacknose Shiner

The blacknose shiner is a small minnow native to eastern South Dakota, and is found in tributaries to the Minnesota, Big Sioux, James and Keya Paha River drainages. The species prefers cool, clear streams with

deep pools, abundant vegetation and sandy to gravel substrates (SDGFP 2017b). Historical records exist for the Little Minnesota River and Lake Traverse, neither of which are in Grant County (Bailey and Allum 1962). Skadsen (2016b) lists the blacknose shiner as likely extirpated from northeast South Dakota. Additional tributaries to the Minnesota River do occur in the Project Area, and the SDGFP (2016) indicates that the species is known from Grant County. However, there is no information available to determine whether the blacknose shiner currently inhabits streams in the Project Area. Due to the limited habitat, it is unlikely that blacknose shiners would occur within the Project Area and no significant impacts to suitable habitat are anticipated from the Project; therefore, this species was eliminated from further consideration in this WCS.

Northern Redbelly Dace

The northern redbelly dace is a small olive to dark brown-colored fish native to eastern South Dakota that prefers quiet spring-fed areas of streams, bogs, and beaver ponds with aquatic vegetation (SDGFP 2017c). It is found within tributaries to the Missouri, Minnesota, Big Sioux, White, Niobrara, and Keya Paha River drainages. McCoy and Hales (1974) observed the northern redbelly dace in both the North and South Forks of the Yellowbank River in Grant County in 1973 (SDNHD spatial data accompanying correspondence shown in Appendix A), but the species was not observed during subsequent surveys (Burgess and Shearer 2008; Dieterman and Berry 1996). It is hypothesized that the species may be extirpated from northeast South Dakota (Skadsen 2016b). Tributaries to the North Fork of the Yellow Bank River are present within the Project Area. However, there is no information available to determine whether the northern redbelly dace currently inhabits streams within the Project Area. Due to the limited habitat, it is unlikely that northern redbelly dace would occur within the Project Area and no significant impacts to suitable habitat are anticipated from the Project; therefore, this species was eliminated from further consideration in this WCS.

Topeka Shiner

The Topeka shiner is a small minnow native to eastern South Dakota, and is found within tributaries to the James, Vermillion, and Big Sioux drainages. The species prefers a variety of habitats including runs, pools, and backwater areas in cool, perennial streams. Occupied streams typically are groundwater-fed; and have high water quality, clean gravel substrates, and vegetated banks (Shearer 2003). Shearer (2003) synthesized available occurrence data and identified 16 streams where the Topeka shiner was observed before 1997, and 38 streams where the species was observed between 1997 and 2002. None of those streams are in Grant or Codington Counties. However, additional tributaries to the Big Sioux River do occur in the Project Area, and the USFWS (2017a) lists the species as known from Codington County. There is no information available to determine whether the Topeka shiner currently inhabits streams in the Project Area. Due to the limited habitat, it is unlikely that northern redbelly dace would occur within the Project Area and no significant impacts to suitable habitat are anticipated from the Project; therefore, this species was eliminated from further consideration in this WCS.

4.1.1.2 DOES THE LANDSCAPE CONTAIN AREAS PRECLUDED BY LAW OR AREAS THAT ARE DESIGNATED AS SENSITIVE?

USFWS, the U.S. Forest Service, and SDGFP maintain conservation areas to help preserve habitats critical to migratory birds and other sensitive species (e.g., recreation areas, National Wildlife Refuges [NWRs], National Grasslands, state parks, and state wildlife areas). Public lands within the Project Area consist of privately-owned lands that are leased by the SDGFP as Waterfowl Production Areas, Game Production Areas, and Walk-in Areas (WIAs) (Crowned Ridge 2019). Waterfowl Production Areas are managed to protect habitat for waterfowl and migratory birds. Game Production Areas are managed to provide wildlife habitat, improve production of wildlife, and provide opportunities for wildlife viewing

and hunting. WIAs allow public hunting on private lands with agreements lasting one to three years. Conservation easements within the Project Area include USFWS wetland easements, grassland easements, wetland/grassland combination easements, and Farmers Home Administration (FHA) easements. There are approximately 8,901.6 acres of wetland, grassland, or wetland/grassland combination easements in the Project Area (Crowned Ridge 2019). Within wetland easements, the USFWS and private landowners agree to avoid impacts to specific wetlands. These wetlands are referred to as protected basins.

4.1.1.3 ARE THERE CRITICAL AREAS OF WILDLIFE CONGREGATION?

There are no critical areas of wildlife congregation within the Project Area.

4.1.1.4 IS THERE POTENTIAL TO FRAGMENT LARGE, INTACT HABITATS FOR SPECIES THAT ARE SENSITIVE TO HABITAT FRAGMENTATION?

To date USFWS has not identified any specific species of habitat fragmentation concern for the Project (Appendix A). Much of the Project Area is already fragmented and in use as pasture or crop production. A network of county roads exists throughout the Project Area; although these roads are not barriers to most wildlife movement, their presence disrupts the continuity of the landscape, contributing to habitat fragmentation. There are patches of native prairie that could be sensitive to further habitat fragmentation; however, due to the existing fragmented nature of the Project Area, impacts are unlikely. In addition, Crowned Ridge has avoided siting turbines and other associated Project facilities in areas of high-quality native prairie to the extent possible and will restore impacts to native prairie using native vegetation (weed-free) seed mixes (see Sections 5.1 and 6.1 regarding Dakota skipper).

4.2 Tier 2: Site Characterization

4.2.1 Abandon Site or Advance to Field Surveys?

4.2.1.1 ARE PLANT COMMUNITIES OR VEGETATION HABITATS OF CONSERVATION PRESENT?

Native prairie was the only plant community of conservation concern detected within the Project Area during the Tier 1 Site Evaluation or Tier 2 Site Characterization. Crowned Ridge determined that high quality native prairie could be avoided by the Project to the extent possible and any impacts to native prairie habitat will be restored using native vegetation (weed-free) seed mixes.

4.2.1.2 WHAT SPECIES OF BIRDS AND BATS ARE LIKELY TO USE THE PROPOSED SITE?

4.2.1.2.1 Birds

South Dakota has 438 documented bird species (South Dakota Ornithologists' Union [SDOU] 2018), and is situated within the Central Flyway, one of several broad bird migratory routes in North America (USFWS 2011). During fall migration, most birds that move along the Central Flyway travel from breeding grounds as far away as Alaska and northern Canada through the central states, eventually reaching wintering grounds near the Gulf of Mexico, and as far away as South America (USFWS 2011). Resident and migratory birds use the Project Area for foraging, hunting, shelter, breeding and nesting, and possibly as a stopover site during migration.

Species present within the Project Area are likely to be common grassland/agriculture species of South Dakota. Waterfowl and waterbird species are likely to use the wetlands as breeding and migratory stopover areas. Raptor species breeding in the Project Area are likely to be in low numbers, and mostly restricted to species adapted to open grassland and agriculture habitats such as great-horned owl, red-tailed hawk, and northern harrier. Grassland species have the potential to occur within the native prairie that occurs within the Project Area. To determine the species that are likely to use the Project Area, Crowned Ridge reviewed the results from the closest National Audubon Society Christmas Bird Count (CBC) count circle and USGS Breeding Bird Survey (BBS) route, summarized below.

Christmas Bird Count

The closest CBC is the Waubay NWR (abbreviated SDWA) centered approximately 26 miles northwest of the Project Area (National Audubon Society 2018). There are 70 species that have been observed during the SDWA CBC over the last 10 years, including two BCC species (2008–2017) (Table 3). There have been no federally listed threatened or endangered species observed during the SDWA CBC over the last 10 years.

Breeding Bird Survey

The nearest USGS BBS is the Wilmot Survey Route (#81017), approximately 15 miles to the north-northeast of the Project Area (near the town of Wilmot) and situated along similar agriculture and grassland habitats. The Wilmot Survey Route has documented 84 species of birds that potentially breed in the area over the last five years (Table 4). Most of these species prefer grassland habitat, agricultural areas, or wetland habitat. The Project Area is 47 percent cultivated crops/pasture/hay (36 percent cultivated crops and 11 percent pasture/hay), 47 percent grassland/herbaceous habitat, and less than 2.15 percent wetland habitat (woody wetlands, emergent herbaceous wetlands, open water), indicating that similar species could breed in the Project Area. The exception to this involves species that prefer wetlands, which may occur in fewer numbers due to the paucity of wetlands within the Project Area. Six BCC species were observed along the survey route (Table 4).

Birds of Conservation Concern

The Project Area is in BCR 11 (USFWS 2008a). There are 27 BCC species listed within BCR 11 meaning they may also occur within the Project Area (Table 5). None of the BCC species are listed as federally endangered or threatened; however, two species are ESA delisted (bald eagle and peregrine falcon). Five species (solitary sandpiper, Hudsonian godwit, buff-breasted sandpiper, shot-billed dowitcher, and Smith's longspur) are non-breeding migrants that may pass through the region, and possibly the Project Area, during spring and fall migration. Five BCC species for BCR 11 were observed during 2017 avian surveys (peregrine falcon, marbled godwit, chestnut-collard longspur, grasshopper sparrow, and red-headed woodpecker; see Section 5.2.2). Three additional species were observed during 2017 avian surveys that are considered BCC within USFWS Region 6 (ferruginous hawk, prairie falcon, and willow flycatcher) but not specifically for BCR 11.

BCC species were detected on nearby CBC and BBS surveys. Two BCC species (bald eagle, short-eared owl) have been observed within the last 10 years during the SDWA CBC. Six BCC species (American bittern, bald eagle, upland sandpiper, marbled godwit, red-headed woodpecker, and grasshopper sparrow) have been detected along the nearby BBS route over the last five years, only one of which (grasshopper sparrow) prefers grassland habitat and therefore also could be found within the Project Area. The remaining five BCC species mostly prefer wetlands and/or woodland habitat, which each comprise less than 2.15 percent of the Project Area, so therefore it is not expected that these species would occur within the Project Area.

4.2.1.2.2 Bats

Six bat species have potential to occur within the Project Area: eastern red bats, silver-haired bats, hoary bats, NLEB, little brown bats, and big-brown bats. SWCA cross-referenced these species' requirements with availability of suitable habitat in the Project Area, reviewed occurrence records, and coordinated with USFWS to determine seasonal likelihood of occurrence for each species.

The only federally listed species with potential to occur within the Project Area is NLEB. There is limited suitable habitat for NLEB within the Project Area, typically in the form of wooded riparian corridors, small woodlots, and isolated forest patches. As a forest interior species, NLEB requires contiguous forest blocks of 15 or greater acres and prefers forested blocks of greater than 114 acres (Crowned Ridge 2019: Appendix F). The Project Area contains 246 total acres of forested blocks that individually are between 15 and 114 acres, and 341 total acres of forested blocks that individually are 114 acres or greater (Crowned Ridge 2019: Appendix F). These acreages represent a combined 1.1 percent of the Project Area qualifying as suitable roosting and/or foraging habitat. The habitat available within the Project Area is similar in availability and density to the surrounding landscape, indicating that there is no regionally unique habitat that could serve as an attractant for NLEB to the Project Area. Furthermore, the USFWS has stated that there is low likelihood of NLEB occurring within the Project Area as a summer resident (USFWS personal communication, 2018) (Crowned Ridge 2019: Appendix F). There is potential for NLEB to occur within the Project Area as a migrant during the spring and fall, though migration behavior of the species is poorly understood.

Based on habitat suitability and availability, the remaining species with potential to occur have varying likelihoods of occurrence throughout the year (Crowned Ridge 2019: Appendix F).

4.2.1.3 IS THERE POTENTIAL FOR SIGNIFICANT ADVERSE IMPACTS TO THOSE SPECIES?

The Tier 1 and Tier 2 evaluation results show low potential for significant adverse impacts regarding birds, bats, or other wildlife species or their habitats within the Project Area. Based on the habitat present, abundance of cultivated crops, and the distance from major waterbodies and other wildlife attractants, no significant, unavoidable adverse impacts to species or habitats of concern were identified.

4.2.1.4 IS THERE A HIGH PROBABILITY OF SIGNIFICANT ADVERSE IMPACTS THAT CANNOT BE AVOIDED OR MINIMIZED?

The site-specific characterization was consistent with the Tier 1 Site Evaluation in that there was a low probability of significant adverse impacts on wildlife or their habitats. Therefore, Crowned Ridge decided to move forward with focused field studies of the Project Area to further evaluate the presence of bird and bat species. The data from those studies are used to inform this WCS.

5 TIER 3: FIELD STUDIES

Based on the results of the Tier 1 and Tier 2 analysis, Crowned Ridge conducted Tier 3 field studies in accordance with the USFWS Land-based WEG (USFWS 2012) to better understand risks to wildlife from development of the Project. Surveys conducted at the Project are summarized in Table 6 and described in detail in this section.

5.1 Prairie Butterflies Assessment

Crowned Ridge completed a thorough desktop and field-verified habitat assessment for potentially suitable Dakota skipper and Poweshiek skipperling habitat in the Project Area (Crowned Ridge 2019: Appendix C). Based on habitat assessment results, "adult presence/absence survey areas" were identified (Appendix B). In these areas, the Applicant completed three rounds of Dakota skipper and Poweshiek skipperling adult presence/absence surveys between June 28 and July 12, 2018, with 48 hours' spacing between each survey round and in accordance with the USFWS's 2018 Dakota Skipper Protocol. The surveys fell within the adult flight period of both species.

Prior to the survey, Crowned Ridge obtained USFWS concurrence with proposed survey methods. All observed butterfly species were documented, and a general count of flowering plants was conducted. No Dakota skippers or Poweshiek skipperlings were observed.

5.2 Bird Status Assessments

The following surveys were conducted to assess bird presence and use of the Project Area.

5.2.1 Survey Methods

5.2.1.1 AVIAN USE SURVEYS

Avian use surveys for the Project Area were completed April 1, 2017 through November 30, 2017 with the objective of characterizing activity, spatial distribution, and relative abundance of avian species (Crowned Ridge 2019: Appendix E). Study methods included large bird use surveys and small bird use surveys in accordance with recommendations set forth in the WEGs. Point count surveys were conducted at 29 locations throughout the Project Area with 800-meter and 100-meter buffers for large and small bird surveys, respectively (Figure 5). A total of 232 surveys across the 29 points were completed during the survey.

5.2.1.2 RAPTOR NEST SURVEYS

Two raptor nest aerial surveys were completed in 2017 and one was completed in 2018 to identify nesting raptors and to provide spatial and species information (Crowned Ridge 2019: Appendix D). Biologists surveyed for all raptor nests within the Project Area and a 2-mile (3.2-kilometer) buffer. Biologists surveyed specifically for eagle nests with the Project Area and a 10-mile (16-kilometer) buffer.

5.2.1.3 WHOOPING CRANE HABITAT ASSESSMENT

A desktop assessment was conducted to identify potentially suitable whooping crane habitat in the Project Area plus a 1-mile buffer (Crowned Ridge 2019: Appendix E). The assessment followed methods outlined in The Watershed Institute's (TWI's) Potentially Suitable Habitat Assessment for the Whooping Crane (TWI 2013).

5.2.2 Survey Results

5.2.2.1 SPECIES PRESENCE BY SEASON/BIRD USE PATTERNS

5.2.2.1.1 Large and Small Birds

SWCA recorded 356 large bird observations. Flight altitudes for 209 of the 356 observations occurred at 0–200-meters (m) above ground level (agl); however, 172 of the 209 observations (48.3%) occurred at a height below 30 m, which is outside of the typical turbine rotor-swept area. Surveyors recorded four large bird species recognized by the USFWS as BCC within the Project Area: ferruginous hawk, peregrine falcon, prairie falcon, and marbled godwit; however, ferruginous hawk and prairie falcon are BCC within USFWS Region 6 but not specifically within BCR 11 (USFWS 2008a). Twelve raptor species were observed: American kestrel, Cooper's hawk, ferruginous hawk, merlin, northern harrier, peregrine falcon, prairie falcon, rough-legged hawk, red-shouldered hawk, red-tailed hawk, sharp-shinned hawk, and Swainson's hawk. No bald or golden eagles were observed within the Project Area. Twenty-three non-raptor species were recorded: American crow, American white pelican, blue-winged teal, California gull, Canada goose, double-crested cormorant, Franklin's gull, gadwall, great blue heron, great egret, greater prairie-chicken, greater yellowlegs, marbled godwit, mallard, northern pintail, ring-billed gull, ring-necked pheasant, snow goose, sharp-tailed grouse, turkey vulture, Wilson's snipe, wild turkey, and wood duck. All species observed during the 8-month survey period are considered typical for the region and seasons of observation.

A total of 644 small bird observations of 54 species were made during surveys. Flight altitudes for 643 of the 644 observations occurred at 0–200 m agl; however, 625 of the 643 observations (97.2%) occurred at a height below 30 m, which is outside the turbine rotor-swept area. Biologists recorded four small bird species recognized by the USFWS as BCC within the Project Area: the chestnut-collard longspur, grasshopper sparrow, willow flycatcher, and red-headed woodpecker; however, willow flycatcher is a BCC within USFWS Region 6 and National but not specifically within BCR 11 (USFWS 2008a). Western meadowlark, red-winged blackbird, and American robin accounted for 238 (36.9%) of all observations. A complete list of observed species is provided in the Avian Use Survey Report (Crowned Ridge 2019: Appendix E). All species observed during the 8-month survey period are considered typical for the region and seasons of observation.

5.2.2.1.2 Non-Eagle Raptor Nests

The 2017 surveys identified 22 non-eagle raptor nest structures within the 2-mile buffer survey area (Figure 6). Eight of these nests were considered occupied and fourteen nests were considered unoccupied. Five occupied non-eagle raptor nests (four red-tailed hawk nests, one great-horned owl nest) were observed within the Project Area. Three occupied non-eagle raptor nests (two red-tailed hawk nests, one Swainson's hawk nest) were observed outside the Project Area within the 2-mile buffer.

The 2018 survey identified 47 non-eagle raptor nest structures within the 2-mile buffer survey area (Figure 6). Sixteen nests were considered occupied, and thirty-one nests were considered unoccupied. Eight occupied non-eagle raptor nests (six red-tailed hawk nests, two great-horned owl nests) were observed within the Project Area. Likewise, eight occupied non-eagle raptor nests (six red-tailed hawk nests, two great-horned owl nests) were observed outside the Project Area within the 2-mile buffer (Crowned Ridge 2019: Appendix D).

5.2.2.1.3 Eagle Nests

During the 2017 surveys, two occupied bald eagle nests were observed within the 2-mile buffer (Figure 6). No bald eagle nests were observed within the Project Area.

During the 2018 surveys, two occupied bald eagle nests and one (likely) unoccupied eagle nest were observed within the 2-mile buffer and outside the Project Area. Three occupied bald eagle nests were identified within the 10-mile buffer and beyond the 2-mile buffer. No bald eagle nests were observed within the Project Area (Crowned Ridge 2019: Appendix D; Figure 6).

5.2.2.2 SPECIES OF CONCERN

No federally listed threatened or endangered species were observed during avian use surveys, raptor nest surveys, or as incidental observations. Observations of BCC species are summarized Section 5.2.2.1.1. Species of concern with the potential to occur within the Project Area are discussed below.

5.2.2.2.1 Bald Eagle and Golden Eagle (Federally Protected Under BGEPA)

Several avian use and raptor nest surveys have been completed for nearby study areas, or for earlier iterations of the Project Area. Surveys indicate the presence of bald eagles near the Project; however, no golden eagles were observed during these recent surveys. In 2015, studies in a nearby study area indicated bald eagles were present; however, no golden eagles were observed (Tetra Tech 2015). A total of 453 hours of survey were conducted over all four seasons during the 2015 survey, during which four bald eagles and zero golden eagles were observed (Tetra Tech 2015). The timing of the sightings suggests that observed individuals likely were migrants and not resident breeding adults (Tetra Tech 2015). In the spring and fall of 2008, avian surveys were conducted for an earlier iteration of the Project in Grant, Codington, Deuel, and Brookings Counties (Tetra Tech 2008a, 2008b). Three golden eagles and zero bald eagles were observed (Tetra Tech 2008a, 2008b).

Most recently, large bird use surveys were completed for the current Project Area from April through November 2017. A total of 232 surveys across 29 points were completed. No bald or golden eagles were observed within the Project Area. Raptor nest aerial surveys conducted in 2017 and 2018 identified three bald eagle nests within 10 miles of the Project Area. No nests were observed within the Project Area (Crowned Ridge 2019: Appendix D). The closest occupied bald eagle nest observed was in 2017 approximately 530 ft from the Project Area boundary. In 2018, the closest occupied bald eagle nest observed was approximately 4,360 ft from the Project Area boundary. No golden eagles were observed during 2017–2018 Project Area surveys.

Although the landscape within the Project Area does not support any large waterbodies or an abundance of smaller waterbodies that would attract bald eagles for nesting or foraging, the presence of occupied bald eagle nests in the vicinity of the Project Area suggests that the species may occasionally hunt or pass through the Project Area during the breeding season. Based on the distance of the bald eagle nests from the Project Area, there is a low likelihood of bald eagle occurrence.

Golden eagles have a low likelihood of breeding within the Project Area due to a lack of suitable nesting habitat; however, the species may hunt or pass through the Project Area during any time of the year. The combination of no golden eagle sightings during the avian use surveys with no habitat features that would concentrate golden eagles within the Project Area compared to the surrounding area suggests a low likelihood of golden eagle occurrence in the Project Area.

5.2.2.2.2 Osprey (State Threatened)

Several avian use surveys have been completed for nearby study areas, or for earlier iterations of the Project Area. No ospreys were observed during those surveys. Avian use surveys were completed in the Project Area from April through November 2017. A total of 232 surveys across 29 points were completed. No ospreys were observed within the Project Area. Raptor nest aerial surveys were conducted in 2017 and 2018; no osprey nests were identified within the Project Area or within 2 miles of the Project Area.

Osprey have a low likelihood of breeding within the Project Area due to a lack of suitable nesting habitat; this combined with no osprey sightings during the avian use surveys suggest a low likelihood of osprey within the Project Area.

5.2.2.2.3 Piping Plover (Federally Threatened)

Several avian use surveys have been completed for nearby study areas, or for earlier iterations of the Project Area. No piping plovers were observed during these surveys. Avian use surveys were completed for the current Project Area from April through November 2017. Point count surveys were conducted at 29 locations throughout the Project Area. A total of 232 surveys were completed. No piping plovers were observed.

Piping plover have a low likelihood of breeding within the Project Area due to a lack of suitable nesting habitat; this combined with no piping plover sightings during the avian use surveys suggest a low likelihood of piping plover within the Project Area.

5.2.2.2.4 Prairie Grouse (Not Federally or State-Listed)

During spring 2007-2008 avian surveys, several active greater prairie-chicken leks were observed within a nearby study area. Four active leks were recorded during spring 2016 surveys in or near an earlier iteration of the Project Area, including two greater prairie-chicken leks and two unknown leks. Throughout agency coordination on the current Project Area, the Applicant has requested and received lek occurrence data from the SDGFP (Appendix A). These locations have been documented spatially in the Applicant's Project planning databases to ensure consideration during Project siting (Figure 7). During most recent avian use studies in the Project Area, one greater-prairie chicken and one sharp-tailed grouse, and no leks, were observed.

5.2.2.2.5 Red Knot (Federally Threatened)

Several avian use surveys have been completed for nearby study areas, or for earlier iterations of the Project Area. No red knots were observed during these surveys. Avian use surveys were completed for the current Project Area from April through November 2017. Point count surveys were conducted at 29 locations throughout the Project Area. A total of 232 surveys were completed. No red knots were observed.

Red knots have a low likelihood of breeding within the Project Area due to a lack of suitable nesting habitat; this combined with no red knot sightings during the avian use surveys suggest a low likelihood of red knots within the Project Area.

5.2.2.2.6 Whooping Crane (Federally Endangered)

Several avian use surveys have been completed for nearby study areas, or for earlier iterations of the Project Area. No whooping cranes were observed during these surveys. Avian use surveys were

completed for the current Project Area from April through November 2017. Point count surveys were conducted at 29 locations throughout the Project Area. A total of 232 surveys were completed. No whooping cranes were observed. Additionally, the desktop whooping crane habitat assessment found that wetlands considered potentially suitable habitat comprised only 0.75% of the total Project Area.

The combination of no whooping crane sightings during the avian use surveys with no habitat features that would concentrate whooping cranes within the Project Area compared to the surrounding area suggests a low likelihood of whooping crane occurrence in the Project Area.

5.2.2.3 SPECIES OF HABITAT FRAGMENTATION CONCERN

To date, USFWS has not identified any specific species of habitat fragmentation concern for the Project (Appendix A).

5.3 Bat Status Assessment

5.3.1 Survey Methods

A desktop bat habitat assessment was conducted with the purpose of assessing the availability and suitability of bat habitat within the Project Area, and to determine the potential for presence of state-listed and federally listed bat species (Crowned Ridge 2019: Appendix F).

A long-term, passive, acoustic bat monitoring survey was conducted within the Project Area between April 6 and December 1, 2017 in accordance with the recommendations set forth in the WEGs (Crowned Ridge 2019: Appendix G). Two acoustic detectors were deployed on a meteorological tower within the Project Area. Data were analyzed to determine bat passes per detector night of recording, where a "detector night" is equal to one detector deployed for one calendar night.

5.3.2 Survey Results

5.3.2.1 SPECIES PRESENCE BY SEASON/BAT USE PATTERNS

Nearly 80% of the calls recorded occurred in the fall. Although the dynamics of bat migration are not fully understood, one factor that could contribute to this difference is recruitment of juveniles into the fall migration population. Seasonal differences in the data collected suggest that the Project Area experiences limited bat migration in spring. However, if 2017 data are indicative of an overall pattern, spring bat populations are sparse when compared with other regions of the United States. The highest levels of activity observed correlated with fall migration, though even these spikes of activity were low when compared with other fall migration events.

Overall, the level of bat activity may suggest that bat use of the Project Area is relatively low. The annual mean passes the per detector night recorded during the study at 1.6. For comparison, Jain (2005) documented a mean activity level in 2003 and 2004 of 34.9 and 36.6 passes per detector-night, respectively, in Iowa. Because of the lack of suitable roosting and foraging habitat in the project area, the number of bats is likely much lower than what might be observed in other, more ecologically diverse, parts of the country.

5.3.2.2 SPECIES OF CONCERN

A desktop bat habitat assessment was conducted with the purpose of assessing the availability and suitability of bat habitat, including that of NLEB, within an earlier iteration of the Project Area in summer 2015. This assessment identified only marginal potential NLEB habitat. A desktop bat habitat assessment was completed for the current Project Area in September 2018 (Crowned Ridge 2019: Appendix F). The assessment concluded that there is limited suitable NLEB habitat within the Project Area and that USFWS considers the species unlikely to occur except as an occasional migrant (USFWS personal communication 2018) (Crowned Ridge 2019: Appendix F).

Several passive bat acoustic surveys have been completed on previous iterations of the Project Area. These surveys indicated a low likelihood of NLEB presence in the study areas. A passive bat acoustic survey was completed on the current Project Area in April through November 2017 (Crowned Ridge 2019: Appendix G).

There is little suitable roosting or foraging habitat in the Project Area for NLEB. The small size and small number of wooded parcels in the Project Area likely limits the density and diversity of bats in the Project Area. Because of this lack of forested habitat within the Project Area, combined with no detections during our surveys, NLEB have a low likelihood of occurring in the Project Area.

5.3.2.3 SPECIES OF HABITAT FRAGMENTATION CONCERN

To date, USFWS has not identified any specific species of habitat fragmentation concern for the Project (Appendix A).

6 POTENTIAL PROJECT IMPACTS

This section outlines potential risks to wildlife related to the construction and operation of the Project.

6.1 Project Risk Assessment

In the following sections, the field data collected to date were analyzed to assess potential Project impacts. Impacts to the species under discussion can be short-term (one or two reproductive seasons), or long-term (affecting several generations). They can be direct (an immediate effect to an individual, population or its habitat), or indirect (an effect that may occur over time or result from other actions). Direct impacts may include collisions with Project infrastructure such as turbine blades or transmission lines; electrocution; disturbance from construction or operations activities; displacement due to loss of suitable habitat; and habitat loss and fragmentation that creates a barrier to dispersal, regular movements, or migration. Indirect impacts may include loss or change of population vigor; attraction to modified habitats, and increased exposure to predation as a result of altered habitat use. Additionally, the Project may contribute to cumulative impacts that may affect certain species, in conjunction with impacts from other future development.

6.1.1 Avian Impacts

Birds have been identified as a group at risk because of collisions with wind turbines and power lines (Arnett et al. 2007; Drewitt and Langston 2006; Erickson et al. 2005). Specifically, migrant passerines (e.g., songbirds) are found more often in post-construction mortality monitoring compared to other groups of birds (Arnett et al. 2007). In fact, at newer generation wind energy facilities outside of California, approximately 80 percent of documented mortalities have been songbirds, of which 50 percent are often

nocturnal migrants (Drewitt and Langston 2006; Erickson et al. 2001; Johnson et al. 2002; Strickland and Morrison 2008).

Songbirds, raptors, waterfowl, and gulls were the most commonly observed species groups during 2017 avian use surveys and are likely to use the Project Area (Crowned Ridge 2019: Appendix E). The most commonly observed species were western meadowlark, red-winged blackbird, northern harrier, red-tailed hawk, Franklin's gull, Canada goose, and American robin (Crowned Ridge 2019: Appendix E).

6.1.1.1 DIRECT IMPACTS ON BIRDS

6.1.1.1.1 General Avian Species

The avian community detected within the Project Area during avian surveys was characterized by species typical of agricultural lands and grassland/pastures in South Dakota. Within disturbed habitats such as these, the greatest potential impact of wind facilities to avian species is risk of collisions with turbines. Nationally, reported avian fatality rates at wind energy facilities average 2.43 birds/MW/year and range from 0.15 to 11.02 birds/MW/year. Publicly available avian fatality rates at wind facilities in the mid-west of North America with similar habitat to that of the Project average 2.00 birds/MW/year (2.43 birds/turbine/year; Table 7). Recent meta-analyses relevant to the Project have estimated an average all-bird (mostly small birds) fatality rate of 1.81 birds/MW/year in the Great Plains (Loss et al. 2013) and 2.29 small birds/MW/year in the Prairie biome (Erickson et al. 2014). The meta-analysis provided by other studies and the publicly available fatality rates indicate that any Project-related bird fatalities, should the occur, may be reasonably expected to be within the range defined by these studies and the publicly available fatality rates in Table 7.

Collision

Locally breeding songbirds may experience lower mortality rates than migrants because many of these species tend not to fly at turbine heights during the breeding season. However, some breeding songbird species have behaviors that increase the risk of collisions with turbines. For example, horned larks have been commonly found as fatalities at wind farms, and mortality may be partially attributed to the breeding flight displays within the rotor-swept area (RSA) (Johnson and Erickson 2011; Pickwell 1931).

The western meadowlark (Johnson and Erickson 2011; Thelander et al. 2003) and red-winged blackbird (Kerlinger et al. 2006; Thelander et al. 2003) have been documented as fatalities at other wind energy projects according to publicly available data. The western meadowlark and red-winged blackbird were among the 25 most commonly detected collision fatalities at wind energy facilities (Erickson et al. 2014). American robin was another species observed in Project Area point counts that was among the 25 most commonly detected collision fatalities. Although risk of turbine-related fatalities at the Project exists for each of these species, should they occur, they are unlikely to have population-level impacts because South Dakota populations for each species are large and relatively stable (7.5 million—western meadowlark, 6.7 million—red-winged blackbird, 4.1 million—American robin) (PIFSC 2019).

Although non-raptor mortality due to collision is expected to be low, collision fatalities are a cause of concern to Crowned Ridge. To monitor and minimize collision fatalities as a result of operation of wind turbines to the extent possible, Crowned Ridge will implement fatality monitoring for one year (Section 8) and adaptive management for the life of the Project (Section 9). Section 6.1.1.1.5 describes how Crowned Ridge will mark the associated generation tie-line to reduce the likelihood of avian collision with the powerline.

Electrocution

Utility lines, particularly distribution lines, can potentially result in electrocution of large raptors because their wingspan is large enough that the bird can simultaneously contact two conductors or a conductor and grounded hardware (APLIC 2006). Utility lines generally pose less of a threat to non-raptors because of their smaller wing spans. However, any structures that allow for circuit completion (i.e., flesh-to-flesh contact between energized parts or an energized and grounded part) pose an electrocution risk. Avian electrocutions typically occur on distribution lines with voltages less than 60 kilovolts. The risk of electrocution at the Project is likely to be low due to measures Crowned Ridge will undertake to prevent electrocution. See Section 7.0 for details of avoidance and minimization measures.

Disturbance/Displacement

In addition to mortality associated with wind farms, concerns have been raised that some bird species may avoid areas near turbines after the wind farm is in operation (Drewitt and Langston 2006). For example, at the Buffalo Ridge wind energy facility in Minnesota, densities of male songbirds were significantly lower in CRP grasslands containing turbines than in CRP grasslands without turbines though the causal mechanism was not studied (Leddy et al. 1999). Reduced abundance of grassland songbirds was found within 50 m of turbine pads for a wind farm in Washington and Oregon, and the investigators attributed displacement to the direct loss of habitat or reduced habitat quality and not the presence of the turbines (Erickson et al. 2004). Research at three sites in North and South Dakota (Shaffer and Buhl 2016) suggests that certain grassland songbird species (seven of nine studied; one species was unaffected, one species was attracted) may avoid turbines by as much as 300 m. Displacement and attraction were observed to continue through the five-year study period. None of these studies have addressed whether these avoidance effects are temporary (i.e., the birds may habituate to the presence of turbines over time) or permanent. Pearce-Higgins et al. (2012) found little evidence for a post-construction decline for ten species of birds at wind projects in upland habitats in the United Kingdom.

Project construction activities and the presence of turbines and other Project features may disturb or displace birds, particularly species of habitat fragmentation concern. Many of the species detected during bird surveys likely breed in the Project Area, suggesting potential for impact to breeding birds. However, the impacts to birds from disturbance or displacement from the Project are likely to be low based on the relatively low bird use in the Project. The heavy agricultural use within the Project Area suggests that the additional disturbance and habitat loss caused by construction and operation of the Project will not cause birds to avoid the Project Area, nor should it alter the current use of habitat by bird species within the Project Area. The risk of disturbance/displacement will be further reduced through avoidance and minimization measures taken during the design, construction, and operational phases of the Project (Section 7.0).

6.1.1.1.2 Birds of Conservation Concern

The five BCR 11 BCC species (peregrine falcon, marbled godwit, chestnut-collard longspur, grasshopper sparrow, and red-headed woodpecker) observed within the Project Area are expected to occur in low numbers and therefore any risk of fatalities are also expected to be low. Direct impacts to BCC species observed within the Project Area, are expected to be similar to impacts identified under general avian species and/or raptors. The risk of direct impacts will be reduced through avoidance and minimization measures implemented during the design, construction, and operational phases of the Project (Section 7.0).

6.1.1.1.3 Raptors (non-eagle)

Despite the observation that most bird fatalities at wind farms are songbirds, raptor mortality historically has received the most attention. Raptor mortality at newer wind projects has been low relative to older-generation wind farms, although there is substantial regional variation in raptor mortality rates (Erickson et al. 2002; Erickson et al. 2004; Jain et al. 2007; Johnson et al. 2002; Kerns and Kerlinger 2004).

Collision

While a recent meta-analysis suggests that pre-construction studies may be poor indicators of post-construction mortality (Ferrer et al. 2012), high raptor use has been associated with high raptor mortality at wind farms (Strickland et al. 2011). Conversely, raptor mortality has been low where raptor use was low.

Northern harriers and red-tailed hawks were the most frequently detected raptor specie during the 2017 avian use surveys (Crowned Ridge 2019: Appendix E). These species are commonly associated with agricultural and grassland prairie habitats, which are present within the Project Area and provide opportunities for foraging, an activity associated with susceptibility to turbine collisions (Thelander et al. 2003).

Northern harrier and red-tailed hawk fatalities have been recorded at operating wind facilities (Erickson et al. 2002; Erickson et al. 2004; Gritski et al. 2010, Johnson and Erickson 2011; Young et al. 2003). Red-tailed hawk nests were found within the Project Area and 2-mile buffer during 2017 and 2018 raptor nest surveys; this may increase the risk for collisions during nesting activities. Project-related fatalities of northern harrier, should they occur, are unlikely to have population-level impacts because populations in South Dakota are relatively large and stable (29,000) (PIFSC 2019).

In a study of raptor response to wind farms, red-tailed hawks were observed engaging in high-risk flight behaviors at operational wind facilities whereas northern harriers were identified as having a low risk flight behavior for collisions (Garvin et al. 2011). Results from post-construction mortality monitoring studies indicate that red-tailed hawks are frequently found as turbine-related fatalities (Grodsky and Drake 2011; Garvin et al. 2011; Johnson and Erickson 2011). Drewitt and Langston (2006) summarized that bird activity is typically higher near active nests than areas without active nests, as a result, red-tailed hawks may have increased potential for collision if they repeatedly fly within the Project Area during nesting activities and during the time when young begin to fledge from the nests. Red-tailed hawk nests were found within the Project Area and 2-mile buffer; the presence of occupied raptor nests within and near the Project Area may increase the risk for collisions during nesting activities. However, Project-related fatalities are unlikely to have population-level impacts because red-tailed hawk populations in South Dakota are relatively large and stable (61,000) (PIFSC 2019).

Although raptor mortality due to collision is expected to be low, collision fatalities have potential to occur at Crowned Ridge. To monitor and minimize collision fatalities to the extent possible, Crowned Ridge will implement fatality monitoring for one year (Section 8) and adaptive management for the life of the Project (Section 9). Section 6.1.1.1.5 describes how Crowned Ridge will mark the associated generation tie-line to reduce the likelihood of avian collision with the powerline.

Electrocution

Fatalities of large raptors have occurred as a result of electrocution and collisions with utility lines and structures, particularly distribution lines (APLIC 2006). Due to their large size, raptors are able to bridge conductive elements to complete a circuit (APLIC 2006). Therefore, any structures that allow for circuit completion (i.e., flesh-to-flesh contact between energized parts or an energized and grounded part) pose

an electrocution risk. To protect birds from possible electrocution, the Avian Power Line Interaction Committee (APLIC) recommends that lines have a horizontal separation of 60 inches and a vertical separation of 40 inches between phase conductors or between a phase conductor and grounded hardware (APLIC 2006). Therefore, the risk of electrocution for raptors from the Project is likely to be low because all collection lines will be buried and all overhead lines and the generation interconnection tie line will be constructed following a manner consistent with APLIC guidelines for the design of overhead lines (see Section 7.0).

Disturbance and Displacement

Raptors may be vulnerable to disturbance from many types of human activity. Human disturbance may result in direct and indirect impacts to raptor habitat, occupancy, and nesting success (USFWS 2008b). Direct impacts may include the loss of foraging or nesting habitat within the Project Area, direct mortality (e.g., due to collisions with wind turbines, electrocution by power lines), sound disturbance (e.g., construction sound), and loss of nest sites or winter roost sites (USFWS 2008b).

Disturbance or displacement nesting raptors is possible if birds are nesting or have preferred foraging areas within line-of-sight of the Project facilities. A number of studies conducted at western wind energy facilities suggest that wind energy facilities do not have long term impacts on raptor nest densities (Erickson et al. 2004; Gritski et al. 2008; Howell and Noone 1992; Johnson et al. 2003; Young et al. 2006). For example, post-construction studies at an Oregon project found that raptor nests more than 0.5 miles from turbines were not impacted by project disturbance (Gritski et al. 2008). Studies have also found no clear relationship between nest occupancy and distance from turbines (Johnson et al. 2003; Young et al. 2006). Suitable raptor nesting habitat within the Project Area is limited. There are few trees sufficient to support raptor nests, there are no cliff nesting habitat, and there are no large waterbodies within the Project Area that would attract nesting bald or golden eagles. Given the number of known raptor nests within the Project Area and two-mile buffer, some nesting raptors may be disturbed or displaced by construction activities. However, disturbance and displacement of raptors will be minimized through the implementation of avoidance and minimization measures described in Section 7.0.

6.1.1.1.4 Eagles

Collision

No bald eagles or their nests were found within the Project Area during the 2017 and 2018 nest surveys; however, there were two occupied bald eagle nests observed within the 2-mile buffer in 2017 and there were two occupied bald eagle nests and one (likely) unoccupied bald eagle nests observed within the 2- mile buffer and outside the Project Area and three bald eagle nests within the 10-mile buffer and beyond the 2-mile buffer in 2018 (Crowned Ridge 2019: Appendix D). The nearest bald eagle nest to the Project Area is over 1.5 miles from the nearest turbine. Although bald eagles have a low likelihood of breeding within the Project Area due to a lack of suitable nesting habitat, bald eagles nesting in the vicinity of the Project could occur in the Project Area when foraging or migrating.

Six bald eagle mortalities associated with wind energy facilities within the United States were reported from 1997 through June 2012 (Pagel et al. 2013). Bald eagles are believed to be at less risk of turbine collision than golden eagles because they tend to focus their hunting efforts for fish and waterfowl in lakes and rivers (Buehler 2000). Although bald eagle collisions with turbines may be possible, the likelihood of collisions are already substantially reduced due to the lack of nests and suitable nesting habitat within the Project Area and will be further minimized through the implementation of avoidance and minimization measures described in Section 7.0. Section 6.1.1.1.5 describes how Crowned Ridge will mark the associated generation tie-line to reduce the likelihood of avian collision with the powerline.

No golden eagles or their nests were found within the Project Area or 10-mile buffer surrounding the Project Area during the 2017 and 2018 nest surveys (Crowned Ridge 2019: Appendix D). Although golden eagles have a low likelihood of breeding within the Project Area due to a lack of suitable nesting habitat, golden eagles could occur in the Project Area when foraging or migrating.

Seventy-nine golden eagle mortalities associated with wind energy facilities within the United States were reported from 1997 through June 2012, excluding the Altamont Pass Wind Resource Area in California (Pagel et al. 2013); however, to date no golden eagle mortalities have been reported at wind energy facilities in South Dakota. Golden eagles are believed to be more at risk of turbine collision than bald eagles because they hunt for land-based prey along topographic contours where turbines are often located (Kochert et al. 2002). Potential collision impacts on golden eagles will be minimized through the implementation of avoidance and minimization measures described in Section 7.0. Section 6.1.1.1.5 describes how Crowned Ridge will mark the associated generation tie-line to reduce the likelihood of avian collision with the powerline.

Electrocution

Potential impacts to eagles are the same as described for raptors above.

Disturbance and Displacement

Due to the lack of foraging habitat (large bodies of water) and nests less than 1.5 miles from any turbines, it is unlikely that foraging or nesting bald eagles will be displaced or disturbed by the Project. There is some evidence that bald eagles avoid operating wind turbines (Sharp et al. 2012), but this avoidance appears to be over short distances rather than displacement from the entire wind farm.

It is unlikely that nesting golden eagles will be disturbed or displaced due to the lack of nesting habitat and absence of golden eagle nests within the Project Area. However, golden eagles may be disturbed or displaced from the Project Area if infrastructure interferes with hunting or availability of prey.

6.1.1.1.5 Whooping Cranes

Collision

Whooping cranes may be directly affected by the Project through collision with wind turbines or associated power lines. No whooping crane observations were documented in the Project Area and the Project is located approximately 30 miles east of the 95 percent isopleth of the whooping crane migration corridor (Figure 4).

To date, no whooping crane mortality has been attributed to collision with wind turbines at any facility. Whooping cranes typically fly at altitudes higher than the tallest proposed turbine height (431 feet at the tip of an upright turbine blade) during migration; however, individuals fly at lower altitudes in response to climate conditions (e.g., low cloud cover), while searching for a stopover location and while landing, taking off, and moving between roosting and foraging locations. It is during these low flight times that the cranes are at the highest risk for collision with turbines and power lines. Although collision with turbines or transmission lines is a risk, cranes have been documented altering flight direction in response to turbines at a wind facility in South Dakota (Nagy et al. 2012), and multiple studies have documented sandhill cranes gradually climbing as they approach marked power lines (Morkill and Anderson 1991; Murphy et al. 2009).

Crowned Ridge will mark a total of 14.4 miles along the associated generation tie line. Of the total 14.4 miles to be marked, 8.8 miles were identified using the approach recommended in The Watershed

Institute's (TWI) *Potentially Suitable Habitat Assessment for the Whooping Crane*. An additional 5.6 miles were identified for marking based on locations where the overhead line spanned a mapped aquatic resource or where proximate mapped aquatic resources may expand to combine in high rain events per USFWS recommendations (USFWS personal communication, 2019) (Figure 8). In segments identified for line marking, bird diverters will be installed every 50 feet.

Electrocution

Electrocution is unlikely for whooping cranes because they are a ground-nesting bird, adapted to foraging on the ground, and are not known to perch or nest on or near the conductive elements of power lines.

Disturbance and Displacement

Land use within the Project Area consists mainly of grassland/pasture or agricultural production with a limited extent of wetlands within the Project Area. The wetland-agricultural habitat matrix preferred by whooping cranes as stopover habitat exists within the Project Area; however, it also exists in the surrounding landscape. Therefore, it is unlikely that whooping cranes will be displaced from the Project Area or that Project operations will disturb them.

6.1.1.2 INDIRECT IMPACTS ON BIRDS

6.1.1.2.1 General Avian Species

Habitat Loss and Fragmentation

Birds may be indirectly affected by habitat loss and fragmentation due to Project development. Habitat fragmentation can exacerbate the problem of habitat loss for birds by decreasing patch area and increasing edge habitat. Habitat fragmentation can reduce bird productivity through increased nest predation and parasitism and reduced pairing success of males (Robinson et al. 1995). However, the increase in the amount of habitat loss and fragmentation as a result of Project construction will be minimized by the use of existing roads to the extent possible and lands already altered by agriculture, as well as restoring any native prairie impacts using native vegetation (weed-free) seed mixes. Additionally, Crowned Ridge will follow all requirements of the Project's construction stormwater authorization including the Storm Water Pollution Prevention Plan to control erosion and potential pollutants.

Decreases to Population

The avian community detected within the Project Area during avian surveys was characterized by species typical of agricultural lands and pastures in South Dakota. The primary species observed during Project surveys were Western meadowlark, red-winged blackbird, and American robin. Project-related fatalities of these species, should they occur, are unlikely to have population-level impacts because South Dakota populations for each species are large (7.5, 6.7, and 4.1 million each, respectively) (PIFSC 2019).
In addition, locally breeding birds may experience lower mortality rates than migrants because many of these species tend not to fly at turbine heights during the breeding season. However, some breeding bird species have behaviors that increase the risk of collisions with turbines. For example, horned larks have been commonly found as fatalities at wind farms, and mortality may be partially attributed to the breeding flight displays within the RSA (Johnson and Erickson 2011; Pickwell 1931). Most songbirds, doves, and gamebirds are short-lived and have high reproductive output, and their population growth rates are more sensitive to reproductive failure than to adult survival (Arnold and Zink 2011; Stahl and Oli 2006).
A recent meta-analysis of wind-energy impacts concluded that collisions with wind turbines have negligible cumulative impacts on small bird populations such as passerine, with mortality rates due to these collisions ranging from 0.008 to 0.0043 percent of the continental population per year (Erickson et

al. 2014). Therefore, collision mortality for most bird species is expected to have negligible effects on population dynamics.

Avoidance and minimization measures will be implemented during all phases of the Project to reduce the possibility of population-level impacts on all bird species (see Section 7.0).

6.1.1.2.2 Birds of Conservation Concern

The five BCR 11 BCC species (peregrine falcon, marbled godwit, chestnut-collard longspur, grasshopper sparrow, and red-headed woodpecker) observed within the Project Area are expected to occur in low numbers and therefore any risk of fatalities are also expected to be low. Indirect impacts to BCC species observed within the Project Area, are expected to be similar to impacts identified under general avian species and/or raptors.

Habitat Loss and Fragmentation

Indirect impacts to the five BCR 11 BCC species observed within the Project Area are similar to the impacts identified under general avian species and/or raptors. Crowned Ridge will avoid areas of high-quality grassland to the extent possible in order to minimize habitat loss for grassland dependent species and impacts to native grassland habitat will be restored with native vegetation (weed-free) seed mixes. Less than 1 percent of both temporary and permanent impacts will occur to grassland habitat due to Project Development. Grassland fragmentation will be avoided and minimized through implementation of mitigation measures during the design, construction, and operation phases of the Project (Section 7.0).

Decreases to Population

Indirect impacts to the five BCR 11 BCC species observed within the Project Area are similar to the impacts identified under general avian species and/or raptors. Crowned Ridge will avoid impacting these species and their habitat to the extent possible, as outlined in Section 7.0.

6.1.1.2.3 Raptors (non-eagle)

Habitat Loss and Fragmentation

Raptors that use the Project Area may be indirectly impacted by the Project. Indirect impacts may include habitat degradation and fragmentation and reduction or changes in available prey species (USFWS 2008b). The Project Area is primarily cropland and pastureland, which offers habitat for small mammals that are prey sources for raptors. The permanent habitat impacts within the Project footprint will be small, and as a result, impacts on availability of prey species are expected to be minimal. Overall, habitat degradation and fragmentation due to Project construction will be minimal due to the existing disturbed nature of the Project Area and the small permanent footprint of the Project. Impacts to native grassland will be avoided and minimized according to the mitigation measures in Section 7.0.

Decrease to Population

Indirect impacts to raptor species observed within and in the vicinity of the Project Area are similar to the impacts identified under direct impacts to raptor species. Avoidance and minimization measures will be implemented during all phases of the Project to reduce the possibility of population-level impacts on all bird species (see Section 7.0).

6.1.1.2.4 Eagles

Habitat Loss and Fragmentation

Indirect impacts on bald and golden eagles relating to habitat loss and fragmentation are similar to those discussed for other raptors (see Section 6.1.1.2.3). Indirect impacts on bald eagles' prey species may differ slightly as turbine operation may cause bald eagles to avoid some areas where they may have foraged for carrion in the past.

Decrease to Population

Bald and golden eagle populations appear to be generally increasing or stable. However, their population sizes are relatively small when compared to other raptors and they are fairly uncommon; the USFWS estimated that there were 128 nesting pairs of bald eagles in South Dakota in 2012 (USFWS 2016b). An estimate of the golden eagle breeding population in South Dakota was not found to be available. Due to their protected status, Crowned Ridge will avoid impacting these species and their habitat to the extent possible, as outlined in Section 7.0.

6.1.1.2.5 Whooping Cranes

Habitat Loss and Fragmentation

Because cranes may avoid turbines by altering flight paths, the USFWS (2009) holds the opinion that such avoidance will lead to avoidance of stopover in areas with operational wind turbines. It has been assumed that whooping cranes prefer areas isolated from human disturbances when available. Studies on whooping crane migration habitat and use, and the diminution of this habitat with increasing development, point to an inverse relationship between disturbance level and habitat value (Austin and Richert 2001; USFWS 2009). As a result, potential indirect effects to the whooping crane posed by the Project include avoidance of structures (e.g., turbines, meteorological towers, and transmission lines), habitat loss and fragmentation, and disturbance caused by anthropogenic activities. Behavioral avoidance of wind farms by whooping cranes, while reducing the probability of direct impacts through collision, may amount to loss of stopover habitat. The loss of stopover habitat use through avoidance, however, may be relatively small given the large amount of suitable habitat present within the migration corridor (Western Area Power Administration [WAPA] and USFWS 2015) and the paucity of suitable habitat within the Project Area. Placing wind turbine structures in already developed areas, would likely have less impact than placement in areas where there are no existing disturbances. The Project turbines are sited close to existing section line roads and many of the turbines are sited within lands already altered by agriculture. Although none of these factors excludes the possibility of crane use of the Project Area, in combination it is likely that they make the attractiveness of the location less appealing than habitats surrounding the Project Area.

Decrease to Population

The population of whooping cranes is estimated at 505 birds (95 percent Confidence Interval = 439.2–576.6) as of the 2017/2018 winter whooping crane survey conducted by USFWS at Aransas National Wildlife Refuge [USFWS 2018]). Due to the small population, any Project-related fatalities would have population-level impacts. Crowned Ridge will avoid impacting whooping cranes and their habitat to the extent possible, as outlined in Section 7.0.

6.1.2 Bat Impacts

6.1.2.1 DIRECT IMPACTS ON BATS

6.1.2.1.1 General Bat Species

Collision

Bats have been identified as a wildlife group at risk due to collisions or other interactions with wind turbines (Arnett et al. 2007; Arnett et al. 2008; Drewitt and Langston 2006; Erickson et al. 2001). Bat collision mortality at wind farms is a widespread phenomenon, commonly exceeding avian collision mortality (Kunz et al. 2007). Of 46 species of bats in North America, 11 species have been identified among fatalities at wind farms. Migratory foliage or tree-roosting bat species (hoary bat, eastern red, and silver haired bat) appear to be most susceptible to collision with wind turbines. These species have experienced the highest fatality rates at wind energy facilities in North America, particularly during the spring (March – May) and fall (August – October) season when activity levels increase as these species migrate (Arnett et al. 2008; Cryan 2003; Kunz et al. 2007). Studies of wind energy facilities in the Midwest with similar agriculture/grassland habitat have documented Brazilian free-tailed (not found in South Dakota), hoary, eastern red, silver-haired, little brown, big brown, and tricolored bats as fatalities during mortality surveys (Table 8).

The relationship between activity and mortality has yet to be clearly identified, but we assume that regional fatality patterns are indicative of potential risk at the Project Area. Recent research has shown that mean wind speed and mean ambient temperature have the greatest effects on bat activity patterns but may differ seasonally with bat activity generally lower at low mean nightly temperatures of approximately less than 10 degrees Celsius (°C; 50°F) in the spring and less than 16°C (61°F) in fall at wind speeds greater than 5 meters/second (Weller and Baldwin 2012). However, results of the study have not been replicated for verification. Bat fatality rates at wind energy facilities in the Midwest region average 17.25 ± 12.05 (90-percent confidence interval) bats/turbine/year or 13.4 ± 9.00 bats/MW/year (Table 8). Of the six bat species that may occur in the Project Area discussed in Section 4.2.1.2.2, hoary, eastern red, silver-haired, little brown, and big brown bats have been found during mortality searches at operating wind farms in agricultural/grassland habitat (Table 8). Of these species, the migratory tree bats are considered to be at the greatest risk from wind energy projects (Tierney 2009).

The limited roosting habitat within the Project Area is a major limiting factor for use of the Project Area by migrating bats. Therefore, bat migration through the Project Area is likely low in magnitude. To better understand Project impacts on bats, Crowned Ridge will conduct 1 year of post-construction fatality monitoring.

Disturbance/Displacement

Disturbance and displacement have not been identified as risks associated with bats and operational wind farms in reviews of bat-wind turbine impacts (Kunz et al. 2007), and bats are known to habituate to anthropogenic structures (Keeley and Tuttle 1999). Given the history of agricultural activity in the Project Area, we expect that the local bat community would remain in the area at similar population levels after construction of the Project. Although activity may change the sound environment in the Project Area during daylight hours; Project-related sound levels are not anticipated to have deleterious effects on resident or migrant bats due to bats' nocturnal nature.

6.1.2.1.2 Northern Long-eared Bat

NLEB is the only listed bat species with the potential to occur within the Project Area. The 4(d) rule prohibits purposeful take of the species range-wide. Within the "WNS Zone" (counties within 150 miles of known occurrences of the pathogen that causes white-nose syndrome) incidental take resulting from specified activities is prohibited during certain times of year. The Project Area is within the WNS Zone; therefore, incidental take that results from operation of utility-scale wind-energy turbines currently is not prohibited. Additionally, incidental take that results from tree-clearing activities is not prohibited, unless it occurs within 0.25 mile of a known NLEB hibernacula or within 150 feet of a known maternity roost tree between June 1 and July 31.

No NLEBs were detected during the acoustic monitoring. If present, direct impacts could include collision with turbine blades, habitat disturbance by removal of roost trees, or disturbance to hibernacula. The Project Area only contains approximately 0.7 percent of forested habitat (based on NLCD data) that would be desirable for roosting and breeding by NLEB. Based on the limited quantity of suitable habitat and the lack of documented detections within the Project Area, the potential for direct impacts on NLEB or their habitat are expected to be low.

6.1.2.2 INDIRECT IMPACTS ON BATS

6.1.2.2.1 General Bat Species

Habitat Loss and Fragmentation

Indirect impact on bats are generally the same as the direct impacts outlined above. The impacts of habitat fragmentation from wind development on bats are not well-known (Kuvlesky et al. 2007). Both roosting and foraging habitat within the Project Area are limited in availability due to large amounts of open-land agriculture and few large permanent sources of surface water. In addition, the Project has a relatively small footprint of temporary and permanent disturbance. For these reasons, the risk of habitat loss and fragmentation is low.

6.1.2.2.2 Northern long-eared Bat

Indirect impacts on NLEB are generally the same as the direct impacts outlined above. The lack of known occurrences or hibernacula of NLEB within the Project Area, the existing fragmented nature of the Project Area, and lack of large tracts of forested habitat, indirect impacts are not expected.

6.1.3 Dakota Skipper Impacts

6.1.3.1 DIRECT IMPACTS ON DAKOTA SKIPPER

The Dakota skipper is known to occur in Codington County and there is designated critical habitat for the species in Grant County. Potentially suitable habitat for the Dakota skipper was identified within the Project Area. Therefore, it is possible the Dakota skipper could be present with the Project Area within areas of suitable habitat. However, adult presence/absence surveys within the Project Area did not observe Dakota skippers. If present, direct impacts on the Dakota skipper could include collision with Project vehicles or disturbance and/or displacement from preferred habitat. Crowned Ridge has avoided locating Project facilities on lands classified as potentially suitable Dakota skipper habitat to the extent possible (Appendix B).

6.1.3.2 INDIRECT IMPACTS ON DAKOTA SKIPPER

Indirect impacts on the Dakota skipper are generally the same as the direct impacts outlined above.

6.1.4 Cumulative Impacts

Activities that currently exist within the proposed Project Area and vicinity are primarily limited to agriculture. Wind energy development removes less total land from agricultural use than other forms of development. Except for the physical locations of the turbines, access roads, and other permanent facilities, all the land surrounding the Project facilities will be available for agriculture. In addition to the proposed Project, there are nine other proposed wind farms in the vicinity of the proposed Project and wind energy development is expected to continue in South Dakota.

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

6.2 Risk Assessment Decisions

6.2.1 Decision Criteria to Either Abandon or Advance

6.2.1.1 TIER 1/TIER 2 QUESTIONS

Results of the Initial Site Evaluation indicate the majority of the Project Area is disturbed, fragmented, and managed lands for agriculture and pasture (Section 3.2.3). Grasslands have been tilled, mowed, and/or used for livestock grazing making them low quality prairie habitats for most breeding birds. The anticipated avian community using the Project Area is composed of common species typically associated with agricultural and pasture lands of South Dakota. There are no plant communities or vegetation habitats of conservation concern designated within the Project Area other than the concerns expressed by USFWS and SDGFP regarding native prairie. Further, there are no critical areas of wildlife congregation within the Project Area. There are 15 species of concern potentially occurring within the Project Area; these species' potential use of the Project Area and Project risks were evaluated in Sections 4.0 and 6.0. For many of these species, risk is likely low and can be managed through best management practices and avoidance and minimization measures (Section 7.0).

Based on the results of the Tier 1 Preliminary Site Evaluation (Section 4.1) and Tier 2 Site Characterization (Section 4.2), Crowned Ridge concluded the Project is viable for development within the Project Area.

6.2.1.2 WHAT ARE THE DISTRIBUTIONS, ABUNDANCE, BEHAVIORS, AND SITE USE OF BIRDS AND BATS, AND WHAT PROJECT ELEMENTS EXPOSE THESE SPECIES TO RISK?

Field studies (Section 5.0) were designed to document avian and bat use of the Project Area. The results of these studies will be used to predict the overall Project impacts to the avian and bat community, particularly during the migratory seasons when impacts would be the highest risk. The results of the studies indicate a low potential risks from Project development to the species documented or identified as potentially occurring as discussed in Sections 5.0 and 6.0, respectively.

Based on the results of the Tier 1 Preliminary Site Evaluation, Tier 2 Site Characterization, and Tier 3 Field Studies, Crowned Ridge concluded the Project is viable for development within the Project Area.

6.2.1.3 WHAT ARE THE POTENTIAL RISKS TO INDIVIDUALS AND LOCAL POPULATIONS OF BIRDS AND BATS AND THEIR HABITATS?

Based on the wildlife species that occur and are likely to occur, potential Project risks include direct and indirect impacts. Direct impacts include mortality due to collision with Project structures and electrocution, disturbance, and displacement. Indirect impacts could be adverse effects due to habitat fragmentation or habitat loss. A detailed risk assessment is presented above, in Section 6.1. No significant impacts to local populations of wildlife are anticipated from development of the Project.

Based on the results of the risk assessment, Crowned Ridge concludes that there will be no significant, unavoidable impacts on birds, bats, or other wildlife species and the Project is viable for development within the Project Area.

6.2.1.4 HOW CAN IMPACTS TO BIRDS AND BATS BE AVOIDED AND MINIMIZED?

Crowned Ridge understands that the construction and operation of a wind energy facility may pose risks to birds, bats, and other wildlife. Crowned Ridge is committed to minimizing potential impacts on these resources and will implement conservations measures throughout the construction and operations phases of the Project. Conservation measures that will be implemented by the Project are detailed in Section 7.0.

6.2.1.5 WHAT STUDIES SHOULD BE INITIATED AND CONTINUED POST-CONSTRUCTION TO EVALUATE PREDICTIONS OF IMPACTS TO BIRDS AND BATS?

Post-construction studies are essential to understanding whether pre-construction predictions of impacts and risks to birds, bats, and other wildlife are accurate. Therefore, Crowned Ridge will conduct formal post-construction fatality monitoring and implement an employee-based routine monitoring program. Details of this monitoring are presented in Section 8.0.

6.2.2 Decision of Need for Other Bird and Bat Conservation Plans

Crowned Ridge does not anticipate the need for additional bird or bat conservation plans based on the data collected to date. Crowned Ridge will coordinate with USFWS regarding ongoing surveys and assessments and further evaluate the need for additional plans as needed.

7 CONSERVATION MEASURES TO AVOID AND MINIMIZE ADVERSE IMPACTS

7.1 Siting and Design Measures to Avoid/Minimize Impacts

This section identifies impact avoidance and minimization measures that will be incorporated into the final design for the Project. These measures were derived from the voluntary WEG (USFWS 2012) and industry Best Management Practices (BMPs). All avoidance and minimization measures implemented during the planning and design phase demonstrate practical means to reduce impacts to bird and bat species and their habitats.

- Utility lines will be designed following APLIC (2006, 2012) guidelines to prevent bird collisions and electrocution. Crowned Ridge will maintain a horizontal separation of 60 inches and a vertical separation of 40 inches between phases and between phases to ground to protect birds from possible electrocution from the overhead transmission line as recommended by APLIC (2006). Additionally, the principles of isolation and insulation will be considered when retrofitting any overhead electrical equipment and Crowned Ridge will use pad-mounted transformers. In addition, utility poles will be of monopole design instead of lattice design to minimize opportunities for perching and nesting wherever feasible.
- Birds and bats could collide with electrical collection lines and redundant overhead telecommunication lines. Crowned Ridge will bury these lines.
- All turbines will sit on a tubular tower, and not a lattice structure, to minimize perching opportunities for raptors such as eagles and other birds.
- Met towers will not be located in sensitive habitats or in areas where ecological resources known to be sensitive to human activities are present.
- Access roads and turbines will be located away from wetlands and waterbodies to the greatest extent possible to minimize impacts on aquatic species, semiaquatic species, birds, bats, and their habitat.
- Impacts to potentially jurisdictional wetland areas will be below NWP thresholds. Avoiding wetland impacts will generally reduce potential impacts to migratory birds and bats and sensitive habitat.

7.2 Construction Measures to Avoid/Minimize Impacts

- To reduce habitat disturbance and minimize the potential for wildlife mortality, equipment and vehicle travel will be limited to roads or specific construction pathways during construction. Construction traffic, parking, and laydown areas will be located within previously disturbed lands to the extent feasible. The construction footprint will be minimized in areas of native vegetation. Restoration of disturbed areas will include the replacement of the original pre-construction topsoil, or equivalent quality topsoil, to its original elevation, contour, and compaction. Disturbed soil, if not replanted with crops, will be reclaimed with native vegetation (weed-free) seed mixes, if approved by the landowner.
- All trash and food-related waste will be placed in self-closing containers and removed daily from the site. This prevents trash from being exposed or blown around the Project Area and reduces attraction of wildlife to the Project Area.

- To minimize vehicle collisions with wildlife, vehicular speed will be limited to 15 miles per hour on turbine or transmission line access roads; vehicular speed will be limited to 35 miles per hour on county roads within the Project Area boundary. Crowned Ridge will follow posted speed limits on county roads outside of the Project Area boundary.
- A site-specific worker environmental training program will be developed and implemented throughout the construction of the Project to inform workers of the biological resources present on-site to minimize wildlife impacts. All employees and contractors working in the field will be required to attend the environmental training session prior to working on-site. This training includes information regarding the sensitive biological resources, restrictions, protection measures, individual responsibilities associated with the Project, and the consequences of non-compliance. Written material will be provided to employees at orientation and participants sign an attendance sheet documenting their participation.
- To avoid habitat destruction, BMPs for fire prevention during construction will be implemented to minimize wildfire potential.
- Crowned Ridge will work closely with landowners or land management agencies to devise and implement a plan to control noxious weeds. Any use of pesticides, herbicides, fertilizers, and other chemicals will be in accordance with federal and state laws to minimize drift and other impacts on native habitat.
- Actual construction footprints and surface disturbance areas will be minimized during construction to minimize wildlife habitat disturbance. In addition, all native prairie will be avoided to the extent possible to minimize impacts on native prairie and the bird and wildlife species that rely on it. Native prairie will be reclaimed with native vegetation (weed-free) seed mixes, if approved by the landowner.
- Removal of vegetation will be avoided within the peak bird nesting season to the extent feasible to avoid removing or disturbing any nests. If not possible, pre-construction nest surveys will be implemented and any nests of ground-nesting birds (e.g., killdeer) will be flagged and a 50-foot non-disturbance buffer placed around nests while it is occupied.
- Crowned Ridge will minimize impacts to existing trees and shrubs. If impacts to trees or shrubs cannot be avoided, the individual trees or shrubs will be replaced.
- Disturbance to raptor nests within the Project Area will be avoided by establishing a 300-foot radius non-disturbance buffer on the center of each active nest during the nesting season.
- To avoid injury or mortality of wildlife due to poisoning, an appropriately-sized emergency spill containment kit will be available to contain and remove spilled fuels, hydraulic fluids, and other potential pollutants when working within or near streams, lakes, or ponds.
- A Storm Water Pollution Prevention Plan will be developed for the construction site to prevent contamination of natural water resources, minimize erosion, storm water runoff, and transport of sediment and other contaminants.

7.3 Operational Measures to Avoid/Minimize Impacts

- Crowned Ridge will design the transmission line to conform to APLIC suggested practices to the extent possible (APLIC 2006, 2012). These standards are intended to protect raptors and other birds from collision and electrocution. These measures are sufficient to protect even the largest birds that may perch or roost on transmission lines or towers.

- Crowned Ridge will mark the associated, overhead generation tie line to reduce the potential for whooping crane, waterfowl, or other avian collision.
- Avian and bat fatalities will be evaluated during standardized post-construction fatality monitoring for two years following construction.
- Crowned Ridge will implement an Adaptive Management Program (Section 9) for avoidance, minimization, and mitigation of impacts to birds, bats, and other sensitive wildlife.
- A site-specific worker environmental training plan will be developed and implemented throughout the Project operating life to inform workers of the biological resources present on-site to minimize wildlife impacts. All employees and contractors working in the field will be required to attend the environmental training session prior to working on site. This training will include information regarding the sensitive biological resources (with an emphasis on eagles and whooping cranes), restrictions, protection measures, individual responsibilities associated with the Project, and the consequences of non-compliance. Written material will be provided to employees at orientation and participants will sign an attendance sheet to document their participation.
- "Good housekeeping" procedures will be developed to keep the site clean of debris, garbage, carrion, fugitive trash or waste, and graffiti; to prohibit scrap heaps and dumps; and to minimize storage yards. This will prevent trash from being exposed or blown around the Project Area and will avoid attracting predators and potential food sources for eagles and other predators (i.e. rodents and other small mammals) to the Project.
- To minimize vehicle collisions with wildlife, vehicular speed will be limited to 15 miles per hour on turbine or transmission line access roads; vehicular speed will be limited to 35 miles per hour on county roads within the Project Area boundary. Crowned Ridge will follow posted speed limits on county roads outside of the Project Area boundary.
- Crowned Ridge will contact local game managers to remove road-killed animals on state and county roadways within the Project Area. Road-killed animals or other carcasses (excluding eagles and other migratory birds) detected by personnel on actual Project service roadways will be removed promptly by Crowned Ridge personnel under guidance and/or assistance from local game managers to avoid attracting eagles or other raptors to the Project Area.
- To avoid habitat destruction, BMPs for fire prevention during operation will be implemented to minimize wildfire potential.
- Crowned Ridge workers and subcontractors will not be allowed to have firearms or pets at the Project and will be instructed to not disturb or harass wildlife.
- Lighting of the turbines will be pursuant to Federal Aviation Administration aviation hazard lighting standards. Crowned Ridge is proposing in its lighting plan to use radar activated hazard lights acceptable to the Federal Aviation Administration. Crowned Ridge may also install motion activated timed lighting on tower entrances and other facilities that require lighting at night to avoid the potential to attract insects that may draw birds and bats toward the facility.
- Crowned Ridge has voluntarily agreed to develop and implement this WCS in its continued efforts to demonstrate due diligence in avoiding and minimizing impacts to avian and bat species in association with development and operation of the Project.

7.4 Measures to Offset and/or Compensate for Habitat Related Impacts

Approximately 86.0 acres of the total Project Area will be permanently affected due to conversion to turbine sites, access roads, junction boxes, and the permanent meteorological towers, and approximately 2,134.4 acres of land will be temporarily disturbed during construction for turbine installation, road construction, collection line trenching, temporary meteorological tower installation, and temporary crane paths. Approximately 95 percent of the area that is temporarily disturbed will be reclaimed. These impacts represent a minor portion of the land area available for agricultural production. As a result, the Project would not result in significant permanent impacts to agricultural production or the habitat that it offers to birds, bats, and other wildlife.

Land where the turbines will be sited is primarily undeveloped pasture/hay, cropland, and grassland. Areas of highest quality native prairie were avoided to the extent possible. Access road construction would result in the greatest effects to native vegetation, resulting in permanent loss of these habitats where they occur along selected routes. Installation of the buried collection lines would result in some temporary effects to native and non-native grasslands. Any temporary impacts to native prairie will be offset by reseeding using a native vegetation (weed-free) seed mix in accordance with landowner preferences. Other temporarily disturbed areas will be reseeded or restored to crop, depending on original conditions and landowner preference.

Additionally, Crowned Ridge has voluntarily elected to develop an offset package intended to mitigate for the Project's potential impacts to native habitats. The offset package will address direct and indirect impacts to native habitats by assessing wetlands within 0.5 miles of turbines and native grasslands within 300 m from turbines or roads. Crowned Ridge will factor in all other avoidance and minimization measures previously committed, including permit conditions related to post-construction grouse lek monitoring and mitigation if impacts are detected.

8 TIER 4: POST-CONSTRUCTION STUDIES TO ESTIMATE IMPACTS

8.1 Carcass Surveys

Crowned Ridge will conduct standardized post-construction fatality monitoring for two years following construction (Appendix C). The objective of the fatality monitoring is to identify the bird and bat species found as fatalities at the Project and to statistically estimate fatality rates. The monitoring framework consists of standardized carcass searches conducted at a sample of the Project turbines. The number of fatalities found during searches represents a minimum number of fatalities at a project because not all fatalities that occur are found by observers. Therefore, carcass persistence trials and searcher efficiency trials will be conducted concurrently with standardized fatality monitoring to account for the bias attributable to carcass removal by scavengers and searcher efficiency. Fatality rates (e.g., birds/turbine/year and birds/operational MW/year) will then be estimated using statistical methods that adjust the number of carcasses found for detection biases. Per-turbine and per-megawatt estimates provide different ways of scaling fatality information to be comparable to other projects. Annual fatality rates will be calculated for all bird species combined, small (less than or equal to 10 inches) and large (greater

than10 inches) birds, raptors, and sensitive species (collectively). For further information on this protocol, see Appendix C: Post-construction Fatality Monitoring.

Crowned Ridge will follow the reporting protocol described in Appendix D, pages 16-17, regarding discovery of any eagle or federally listed species fatality or injury.

8.1.1 Project Permits Addressing Birds and Bats

To collect, transport, and temporarily possess migratory birds found as fatalities on properties that generate electricity, a USFWS Special Purpose Utility permit must be obtained. Additionally, a state scientific collector permit from SDGFP is required to kill, take, or possess wildlife and their parts when conducting research or for other scientific purposes, including education and information.

Crowned Ridge will not collect fatalities detected during post-construction monitoring. As a result, Crowned Ridge will not obtain permits for scientific collecting purposes. Crowned Ridge will follow the reporting protocol described in Appendix D, pages 16-17, regarding discovery of any eagle or federally listed species fatality or injury.

8.2 Grouse Lek Monitoring

Crowned Ridge will conduct ground-based grouse lek monitoring of known leks that are located less than one mile from a wind turbine for two years following construction. Known leks include SDGFP-confirmed lek locations and leks documented during pre-construction wildlife studies. The objective of the grouse lek monitoring is to gain additional information on the effect that operating wind turbines may have on grouse leks, if any. Crowned Ridge will consult with SDGFP and USFWS to develop an appropriate lek monitoring protocol.

Additionally, Crowned Ridge will develop a mitigation plan within 90 days of the SDPUC's final order for the Project. The plan will describe measures to mitigate potential impacts to grouse leks as a result of operation of the Project during post-construction grouse lek monitoring, if such impacts are observed. For example, if impacts to known leks differ significantly as compared to the control sites SDGFP plans to monitor in conjunction with the Sweetwater Wind project, Crowned Ridge may commit to contributing to ongoing SDGFP studies intended to understand the potential impacts of wind development on prairie grouse species. During development of the mitigation plan, Crowned Ridge will collaborate with the SDGFP to document existing landscape conditions, document man-made and natural disturbance and factors, and establish a process by which any observed effects will be attributed to causes.

8.3 Other

Crowned Ridge does not have any additional surveys planned for post-construction monitoring. However, an adaptive management plan will be used in coordination with USFWS and SDGFP to maintain the effectiveness of this WCS to minimize any future impacts not already foreseen.

8.3.1 Wildlife Response and Reporting System

In addition to the carcass surveys, a standard protocol called the WRRS is used at all NextEra energy facilities. The purpose of the WRRS is to standardize the actions taken in response to any wildlife fatalities and/or injuries found within the Project's boundaries. Personnel will be trained to follow the search procedure and fill out the reporting form. Wildlife surveys/inspections will be completed each time

a turbine is visited. For further information on this protocol, see Appendix D: Wildlife Response and Reporting System.

9 TIER 5: OTHER POST-CONSTRUCTION STUDIES AND ADAPTIVE MANAGEMENT

The United States Department of Interior defines adaptive management as a decision-making process that promotes flexible decision making and adjustment of management decisions as information is collected (Williams et al. 2007). Crowned Ridge has adopted an adaptive management approach to assessing and responding to the impacts of its wind energy facility on birds and bats. Crowned Ridge is committed to adaptively managing impacts to birds and bats for the life of the Project. Based on experience from the operating wind farms in the region, significant unanticipated impacts to species of concern are not expected. In the event that the Crowned Ridge detects a significant unanticipated impact, such as mortality or injury to a federally listed species or higher than expected migratory bird or bat mortality for the region, Crowned Ridge will contact the USFWS South Dakota Field Office to discuss additional potential avoidance, minimization, or mitigation measures to be considered. Crowned Ridge is committed to developing an approach that facilitates understanding any unanticipated significant issues and collaboratively working with the USFWS to develop additional avoidance, minimization, or mitigation measures that may be appropriate.

10 REPORTING FORMATS AND SCHEDULE

10.1 Pre-construction Survey Data

Pre-construction survey data have been, and will continue to be, compiled and analyzed in a report for each survey and/or survey season. Reports are in standard scientific format or in memorandum format, as appropriate based on the amount of data collected. Reports have been and will be submitted to USFWS and SDGFP.

10.2 Post-construction Mortality Reporting

Crowned Ridge will prepare annual post-construction mortality reports. The reports will include a detailed description of the survey methods; results from carcass searches, carcass persistence trials, and searcher efficiency trials; an estimate of fatalities on a per-turbine and per-megawatt basis; and discussions of the results in the context of adaptive management. Annual reports will be provided to USFWS and SDGFP.

10.3 Post-construction Grouse Lek Reporting

Annual reports will be prepared for the post-construction grouse lek monitoring. Reports will include a detailed description of survey methods and results. Annual reports will be provided to USFWS and SDGFP.

10.4 Other

Crowned Ridge will inform the appropriate agencies of any new critical habitat of threatened or endangered species in the Project Area, should Crowned Ridge become aware of critical habitat that was not previously reported to the SDPUC. Crowned Ridge will relay this information via telephone and email communications if needed.

11 PERSONNEL TRAINING

Crowned Ridge will develop a site-specific worker environmental training program that will be administered to all employees and contractors working in the field during construction. The training will be implemented to inform workers of the biological resources present on-site to minimize wildlife impacts. All employees and contractors working in the field will be required to attend the environmental training session prior to working on-site. This training includes information regarding identification of the sensitive biological resources, restrictions, protection measures, individual responsibilities associated with the Project, and the consequences of non-compliance. Written material will be provided to employees at orientation and participants will sign an attendance sheet documenting their participation. The training will be performed by qualified consultants or in-house environmental staff qualified to conduct the training.

12 DECOMMISSIONING

Crowned Ridge has entered into lease and easement agreements with private landowners within the Project Area for the placement of Project infrastructure. Crowned Ridge anticipates that the life of the Project will be approximately 25 years, which is consistent with the Project's contracted term. At the end of the Project's contracted life there may be opportunities to extend the life of the Project by repowering the Project by retrofitting the turbines and power system with upgrades based on new technology, which may allow the wind farm to produce efficiently and successfully for many more years.

In the event the Project's contracted life is not extended, the Project will be decommissioned in accordance with applicable state and county regulations. Current decommissioning requirements in Grant and Codington Counties require that all towers, turbine generators, transformers, overhead collector and feeder lines, foundations, buildings, and ancillary equipment be dismantled and removed to a depth of 4 feet. To the extent possible, the site shall be restored and reclaimed to its pre-project topography and topsoil quality. All access roads shall be removed, unless written approval is given by the landowner requesting roads be retained. Crowned Ridge will comply with all decommissioning and restoration requirements in both Codington and Grant County as listed within section 9 of the Codington County ordinance and section 10 of the Grant County ordinance, which also includes requirements on financial assurances that are specific to each county. The Decommissioning Plan for the Project is included in Appendix L of the South Dakota Public Utilities Commission (SDPUC) Application submitted for the Project (Crowned Ridge 2019).

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Table 1. Chronology of Resource Agency Contacts for the Project

Date	Agency	Event and Participant
November 26, 2007	Department of the Interior, United States Fish and Wildlife Service (USFWS) - Ecological Services	Letter - Wind Energy Project Coordination, Eastern and North Central South Dakota; from Pete Grober, Field Supervisor, South Dakota Field Office, USFWS to Erik W. Jansen, Biologist, Tetra Tech EC, Inc.
December 3, 2007	South Dakota Game, Fish, and Parks (SDGFP)	Letter - Environmental review of Eastern and North-central Wind Resource Area as potential wind power project areas; from Silka L. F. Kempema, Wildlife Biologist, SDGFP to Erik W. Jansen, Biologist, Tetra Tech EC, Inc.
February 5, 2010	USFWS	Letter - Proposed Crowned Ridge Wind Energy Center, Codington and Grant Counties, South Dakota; from Pete Grober, Field Supervisor, South Dakota Field Office, USFWS to Anne-Marie Griger, Tetra Tech EC, Inc.
February 11, 2015	SDGFP	Letter - Crowned Ridge Wind Energy Center in Codington and Grant Counties, South Dakota; from Anne-Marie Griger, Tetra Tech, Inc., to Jeff Vonk, Secretary of SDGFP.
February 11, 2015	USFWS	Letter - Crowned Ridge Wind Energy Center in Codington and Grant Counties, South Dakota; from Anne-Marie Griger, Tetra Tech, Inc., to Scott Larson, Field Supervisor, South Dakota Field Office, USFWS.
March 23, 2014 (date is incorrect and is actually March 23, 2015)	USFWS	Letter - Crowned Ridge Wind Energy Center, Codington and Grant Counties, South Dakota; From Scott Larson, Field Supervisor, South Dakota Field Office, USFWS to Anne-Marie Griger, Tetra Tech, Inc.
April 19, 2017	USFWS and SDGFP	Technical memorandum re: Project Background. Delivered via email.
April 20, 2017	USFWS and SDGFP	Conference call. Participants were Natalie Gates, USFWS Biologist, South Dakota Field Office; Natoma Hansen, USFWS Refuge Manager, Madison Wetland Management District; Connie Mueller, USFWS Project Leader, Waubay National Wildlife Refuge Complex; Silka Kempema, Wildlife Biologist, SDGFP; Kim Wells, Senior Manager, Environmental Services, NextEra; Tyler Wilhelm, Project Manager – Wind Development, NextEra; Kely Mertz, Senior Project Manager, SWCA Environmental Consultants (SWCA).
June 15, 2017	SDGFP	Project email - data request from Kely Mertz, Senior Project Manager, SWCA to Travis Runia, Upland Game Biologist, SDGFP.
July 11, 2017	SDGFP	Email data response to June 15, 2017 project email; from Travis Runia, Upland Game Biologist, SDGFP to Kely Mertz, Senior Project Manager, SWCA.
July 12, 2017	SDGFP	Project letter - Crowned Ridge I and II Wind Energy Projects in Codington, Deuel, and Grant Counties, South Dakota; from Kely Mertz, Senior Project Manager, SWCA to Silka Kempema, Wildlife Biologist, SDGFP.
July 12, 2017	USFWS	Project letter - Crowned Ridge I and II Wind Energy Projects in Codington, Deuel, and Grant Counties, South Dakota; from Kely Mertz, Senior Project Manager, SWCA to Natalie Gates, Biologist, South Dakota Field Office, USFWS.
August 1, 2017	SDGFP	Email data response to July 12, 2017 project letter; from Casey Heimerl, SDGFP to Kely Mertz, Senior Project Manager, SWCA. Spatial data were provided as an attachment to the email.
April 20, 2018	SDGFP	Project email - data request from Kely Mertz, Senior Project Manager, SWCA to Casey Heimerl, SDGFP.
April 24, 2018	SDGFP	Email data response to April 20, 2018 project email; from Casey Heimerl, SDGFP to Kely Mertz, Senior Project Manager, SWCA. Spatial data were provided as an attachment to the email.
April 3, 2019	USFWS	Online USFWS IPaC Official Species List generated for the Project Area by Becky Braeutigam, Natural Resources Project Manager, SWCA.

Date	Agency	Event and Participant
April 3, 2019	SDGFP	Project letter - Crowned Ridge I Wind Energy Project in Codington and Grant Counties, South Dakota; from Kely Mertz, Senior Project Manager, SWCA to Silka Kempema, Wildlife Biologist, SDGFP.
April 26, 2019	SDGFP	Email data response to April 3, 2019 project letter; from Casey Heimerl, SDGFP to Becky Braeutigam, Natural Resources Project Manager, SWCA. Spatial data were provided as an attachment to the email.
July 2, 2019	USFWS	Letter from Scott Larson, Field Supervisor, North and South Dakota Field Offices, USFWS to Kimberly Wells, Senior Manager, Environmental Services, NextEra Energy Resources, LLC (NextEra) and Darren Kearney, South Dakota Public Utilities Commission (SDPUC).
July 8, 2019	USFWS	Letter responding to July 2, 2019 USFWS letter; from Kimberly Wells, Senior Manager, Environmental Services, NextEra to Kristen N. Edwards, Staff Attorney, SDPUC.
July 9, 2019	USFWS	Project email delivering copy of July 8, 2019 letter; from Kimberly Wells, Senior Manager, Environmental Services, NextEra to Natalie Gates, Biologist, South Dakota Field Office, USFWS.
July 9, 2019	USFWS	Project email delivering copy of July 8, 2019 letter; from Kimberly Wells, Senior Manager, Environmental Services, NextEra to Scott Larson, Field Supervisor, North and South Dakota Field Offices, USFWS.
July 16, 2019	USFWS and SDGFP	Conference call to discuss topics in July 2 and 8, 2019 letters. Participants were Scott Larson, Field Supervisor, North and South Dakota Field Offices, USFWS; Natalie Gates, Biologist, South Dakota Field Office, USFWS; Hilary Meyer, Environmental Review Senior Biologist, SDGFP; Kimberly Wells, Senior Manager, Environmental Services, NextEra; Tyler Wilhelm, Project Manager – Wind Development, NextEra; Michelle Philips, Environmental Specialist, NextEra; Kely Mertz, Senior Project Manager, SWCA; Sarah Sappington, Director, SWCA,
July 17, 2019	USFWS and SDGFP	Project email with attachment containing Natalie Gates' comments on July 16, 2019 conference call topics; from Natalie Gates, Biologist, South Dakota Field Office, USFWS to Kristen N. Edwards, Staff Attorney, SDPUC.
July 31, 2019	SDGFP	Conference call to collaborate on post-construction grouse lek monitoring protocol. Participants were Hilary Meyer, Environmental Review Senior Biologist, SDGFP; Tyler Wilhelm, Project Manager – Wind Development, NextEra; Kim Wells, Senior Manager, Environmental Services, NextEra; and Kely Mertz, Senior Project Manager, SWCA.
August 6, 2019	USFWS and SDGFP	Project email with attachment from Kim Wells, Senior Manager, Environmental Services, NextEra to Natalie Gates, Biologist, South Dakota Field Office, USFWS; Hilary Meyer, Environmental Review Senior Biologist, SDGFP; and Scott Larson, Field Supervisor, North and South Dakota Field Offices, USFWS. Email attachments included draft minutes for review and SDPUC final order for Crowned Ridge I Wind Farm.
August 15, 2019	USFWS and SDGFP	Project email with attachment from Kimberly Wells, Senior Manager, Environmental Services, NextEra to Hilary Meyer, Environmental Review Senior Biologist, SDGFP. Attachment included figure with additional information regarding pre-construction Dakota skipper survey effort.
August 16, 2019	SDGFP	Project email with attachment from Kimberly Wells, Senior Manager, Environmental Services, NextEra to Hilary Meyer, Environmental Review Senior Biologist, SDGFP. Email attachment included resume for NextEra's proposed post-construction lek monitoring lead biologist.

Table 2. NLCD Land Cover Types at the Project

Land Cover	Acreage in Project Area	Percent of Project Area
Herbaceous	24,816.30	46.66
Cultivated Crops	19,049.25	35.82
Hay/Pasture	5,885.28	11.07
Developed, Open Space	1,681.38	3.16
Emergent Herbaceous Wetlands	853.4	1.60
Deciduous Forest	370.24	0.70
Open Water	273.95	0.52
Developed, Medium Intensity	149.49	0.28
Developed, Low Intensity	40.55	0.08
Shrub/Scrub	25.58	0.05
Developed, High Intensity	21.97	0.04
Woody Wetlands	15.53	0.03
Barren Land	1.91	<0.01
Evergreen Forest	1.33	<0.01
Total	53,186.16	100.00

Source: Homer et al. (2015)

Table 3. Species and Average Counts for the SDWA CBC from 2008 to 2017

Species Group	Average Count/Year*
Waterfowl	
Canada Goose	416.2
Mallard	131.3
Snow Goose	3.0
Lesser Scaup	1.6
Common Merganser	0.7
Hooded Merganser	0.3
Ruddy Duck	0.3
Gadwall	0.2
Northern Pintail	0.2
Redhead	0.2
Wood Duck	0.1
Green-winged Teal (American)	0.1
Common Goldeneye	0.1
Gamebirds	
Ring-necked Pheasant	113.8
Wild Turkey	94.2
Sharp-tailed Grouse	46.4
Gray Partridge	3.2
Raptors	
Great Horned Owl	3.0
Bald Eagle†	2.6
Prairie Falcon	2.6
Northern Harrier	1.4
Rough-legged Hawk	1.4

Species Group	Average Count/Year*
Snowy Owl	1.4
Short-eared Owl†	0.5
American Kestrel	0.4
Cooper's Hawk	0.3
Red-tailed Hawk	0.2
Prairie Falcon	0.2
Merlin	0.2
Sharp-shinned Hawk	0.1
Barred Owl	0.1
Others	
American Coot	0.2
Belted Kingfisher	0.2
Pigeons/Doves	
Rock Pigeon (Feral Pigeon)	102.7
Eurasian Collared-Dove	11.6
Mourning Dove	0.4
Woodpeckers	
Downy Woodpecker	7.7
Hairy Woodpecker	3.1
Red-bellied Woodpecker	0.9
Northern Flicker	0.3
Northern Flicker (Yellow-shafted)	0.1
Pileated Woodpecker	0.1
Songbirds	
Lapland Longspur	1026.8
American Robin	407.0
American Crow	289.3
Common Redpoll	134.0
Cedar Waxwing	88.2
Bohemian Waxwing	40.5
Horned Lark	32.0
Snow Bunting	21.5
Blue Jay	20.8
Song Sparrow	17.3
American Tree Sparrow	11.4
Red-breasted Nuthatch	10.1
Purple Finch	8.0
Northern Shrike	6.0
Western Meadowlark	5.3
American Goldfinch	5.1

Species Group	Average Count/Year*
House Finch	3.9
White-throated Sparrow	2.0
Red Crossbill	1.5
European Starling	1.4
Black-capped Chickadee	1.0
Brown Creeper	1.0
White-breasted Nuthatch	0.9
Common Grackle	0.7
Brown-headed Cowbird	0.6
Brewer's Blackbird	0.5
Dark-eyed Junco	0.2
Red-winged Blackbird	0.1

Source: National Audubon Society (2018)

*Average number of individuals counted per year

†USFWS BCC, Region 11 (USFWS 2008a)

Table 4. Species Encountered and Their Abundance on the Wilmot BBS Route

Species Group	Birds/Route*	Preferred Habitat
Waterfowl		
Mallard	40.8	Wetlands
Canada Goose	11.6	Wetlands
Blue-winged Teal	5.0	Wetlands
Gadwall	1.4	Wetlands
Redhead	1.2	Wetlands
Wood Duck	0.6	Wetlands
Northern Pintail	0.6	Wetlands
Northern Shoveler	0.4	Wetlands
Gamebirds		
Ring-necked Pheasant	47.2	Grasslands/Agriculture
Wild Turkey	6.6	Grasslands/Agriculture
Waterbirds/Shorebirds		
Killdeer	14.2	Wetlands/Grasslands/Agriculture
Upland Sandpiper†	2.8	Wetlands/Grasslands
Wilson's Snipe	2.8	Wetlands
American White Pelican	2.6	Wetlands
American Bittern†	2.6	Wetlands
Ring-billed Gull	2.0	Wetlands
Pied-billed Grebe	1.2	Wetlands
Marbled Godwit†	0.8	Wetlands/Grasslands
Sora	0.8	Wetlands

Species Group	Birds/Route*	Preferred Habitat
American Coot	0.6	Wetlands
Willet	0.2	Wetlands/Grasslands
Belted Kingfisher	0.2	Wetlands
Raptors		
Red-tailed Hawk	3.4	Grasslands/Agriculture/Woodlands
Northern Harrier	0.4	Grasslands
Bald Eagle†	0.2	Wetlands/Woodlands
Great Horned Owl	0.2	Grasslands/Shrub/Woodlands
American Kestrel	0.2	Grasslands
Pigeons/Doves		
Mourning Dove	56.6	Shrub/Open Areas
Rock Pigeon	5.4	Urban Areas
Eurasian Collared-Dove	0.2	Urban Areas
Nightjars/Swifts		
Chimney Swift	1.2	Urban Areas
Common Nighthawk	1.0	Grasslands
Woodpeckers		
(Yellow-shafted Flicker) Northern Flicker	2.0	Woodlands
Downy Woodpecker	0.8	Woodlands
Red-headed Woodpecker†	0.6	Woodlands
Pileated Woodpecker	0.2	Woodlands
Songbirds		
Red-winged Blackbird	91.8	Grasslands/Agriculture/Wetlands
Common Grackle	66.8	Grasslands/Agriculture
Cliff Swallow	49.6	Grasslands/Agriculture
Brown-headed Cowbird	40.0	Grasslands/Agriculture/Urban
American Robin	31.2	Grasslands/Agriculture/Woodlands
Western Meadowlark	27.8	Grasslands/Agriculture
Common Yellowthroat	23.4	Grasslands/Agriculture/Wetlands
American Goldfinch	22.0	Grasslands/Agriculture/Shrub
Yellow Warbler	20.4	Grassland/Agriculture/Shrub
Song Sparrow	20.0	Grasslands/Agriculture/Shrub
Vesper Sparrow	17.2	Grasslands/Agriculture
Yellow-headed Blackbird	16.6	Grasslands/Agriculture/Wetlands
Clay-colored Sparrow	16.2	Grasslands
Barn Swallow	15.6	Grasslands/Agriculture/Urban
Horned Lark	15.4	Grasslands/Agriculture
House Wren	15.2	Grasslands/Agriculture
European Starling	13.0	Urban Areas
Bobolink	11.8	Grasslands
Marsh Wren	10.6	Wetlands

Species Group	Birds/Route*	Preferred Habitat
House Sparrow	9.8	Urban Areas
Warbling Vireo	9.6	Grasslands/Agriculture/Shrub
Chipping Sparrow	8.0	Grasslands/Agriculture/Shrub
Orchard Oriole	7.4	Grasslands/Shrub/Woodlands
Eastern Kingbird	7.0	Grasslands/Agriculture/Shrub
Brown Thrasher	6.0	Grasslands/Agriculture/Shrub
Tree Swallow	5.4	Grasslands/Agriculture
Savannah Sparrow	5.4	Grasslands/Agriculture
American Crow	5.0	Grasslands/Agriculture/Woodlands
Cedar Waxwing	4.2	Shrub/Woodlands
Grasshopper Sparrow†	2.8	Grasslands
Sedge Wren	2.6	Wetlands
Blue Jay	2.4	Woodlands
Baltimore Oriole	2.4	Grassland/Agriculture/Woodlands
Least Flycatcher	2.2	Woodlands
Willow Flycatcher	2.0	Grasslands/Agriculture/Shrub
Bank Swallow	2.0	Grasslands/Agriculture/Wetlands
Gray Catbird	1.2	Grasslands/Agriculture/Shrub
Rose-breasted Grosbeak	1.2	Woodlands/Shrub
Western Kingbird	1.0	Grasslands/Agriculture
Great Crested Flycatcher	0.8	Woodlands
Red-eyed Vireo	0.8	Grasslands/Agriculture
Brewer's Blackbird	0.8	Grasslands/Agriculture/Wetlands
Eastern Wood-Pewee	0.6	Woodlands
Eastern Bluebird	0.6	Grasslands/Agriculture/Shrub
Field Sparrow	0.4	Grasslands/Agriculture
White-breasted Nuthatch	0.2	Woodlands
Swamp Sparrow	0.2	Wetlands
Indigo Bunting	0.2	Grasslands/Agriculture/Shrub

Source: Pardiek et al. (2018)

*These numbers reflect the abundance of the species near the survey route. They are averages of the total counts along the route for the period 2010-2014. Because each survey route is 24.5 mi long and consists of fifty 3-minute counts along the length of the route, the abundance estimate represents the number of birds that a biologist would encounter in about 2.5 hours of roadside birding in the area near the BBS route.

†USFWS BCC, Region 11 (USFWS 2008a)

Table 5. USFWS BCC Species for BCR 11

Species	Residency Status Near Project Area/Notes	Detected in Vicinity of Project Area
Horned Grebe	Non-breeder – migrant	No
American Bittern	Breeder – summer resident	BBS
Least Bittern	Summer resident (rare)	No
Bald Eagle	Breeder and migrant; BGEPA	BBS/CBC

Species	Residency Status Near Project Area/Notes	Detected in Vicinity of Project Area
Swainson's Hawk	Breeder – summer resident	No
Peregrine Falcon	Non-breeder – migrant	Project Avian Use Surveys
Yellow Rail	Non-breeder – migrant	No
Mountain Plover	Project outside of its range	No
Solitary Sandpiper	Non-breeder – migrant	No
Upland Sandpiper	Breeder – summer resident	BBS
Long-billed Curlew	Project outside of its range	No
Hudsonian Godwit	Non-breeder – migrant	No
Marbled Godwit	Breeder – summer resident (rare)	BBS/Project Avian Use Surveys
Buff-breasted Sandpiper	Non-breeder – migrant	No
Short-billed Dowitcher	Non-breeder – migrant	No
Black Tern	Breeder – summer resident	No
Black-billed Cuckoo	Breeder – summer resident	No
Short-eared Owl	Breeder – year-round resident	CBC
Red-headed Woodpecker	Breeder – summer resident	BBS/Project Avian Use Surveys
Sprague's Pipit	Non-breeder – migrant	No
Grasshopper Sparrow	Breeder – summer resident	BBS/Project Avian Use Surveys
Baird's Sparrow	Project outside of its range	No
Nelson's Sharp-tailed Sparrow	Non-breeder – migrant	No
McCown's Longspur	Project outside of its range	No
Smith's Longspur	Non-breeder – migrant	No
Chestnut-collared Longspur	Breeder – summer resident (rare)	Project Avian Use Surveys
Dickcissel	Breeder – summer resident (rare)	No

Sources: USFWS (2008a), Cornell Lab of Ornithology (2019) (residency status)

Table 6. Summary of Survey Efforts to Date Within the Project Area and Vicinity

Date	Survey	Survey Area
Mar. 2007 – June 2008	avian use surveys (spring)	Earlier iteration of Project Area
June 2008	Dakota skipper habitat delineation	Earlier iteration of Project Area
Aug. – Nov. 2008	avian use survey (fall)	Earlier iteration of Project Area
June – July 2009	Dakota skipper habitat delineation	Earlier iteration of Project Area
Aug. – Nov. 2014	avian use surveys (fall)	Earlier iteration of Project Area
Mar. – Nov. 2014; Nov – Mar. 2015	eagle survey	Earlier iteration of Project Area
2015	Dakota Skipper habitat evaluation	Earlier iteration of Project Area
Summer 2015	bat habitat assessment	Nearby study area
Aug. – Oct. 2015; Apr. – Oct. 2016	bat acoustic survey	Earlier iteration of Project Area
Mar. – Apr. 2016	raptor nest survey	Earlier iteration of Project Area
Apr. – May 2016	lek surveys	Earlier iteration of Project Area
Apr. – Oct. 2016	bat acoustic survey	Earlier iteration of Project Area

Date	Survey	Survey Area
July 2016	bat acoustic survey	Earlier iteration of Project Area
Sept. 2016	Dakota skipper and Poweshiek skipperling habitat assessment	Earlier iteration of Project Area
Apr. 2016 – Feb. 2017	avian use survey	Earlier iteration of Project Area
Apr. and May 2017	raptor nest aerial survey	Project Area
Apr. – Nov. 2017	avian point count surveys	Project Area
Apr. – Nov. 2017	bat acoustic monitoring	Project Area
Spring 2018	raptor nest aerial survey	Project Area
June – July 2018	Dakota skipper and Poweshiek skipperling adult survey	Project Area
Summer 2018	desktop whooping crane habitat assessment	Project Area
Sep. 2018	desktop bat habitat assessment	Project Area

Table 7. Estimated Mean Bird Fatalities for All Birds per Turbine and per Megawatt at Wind Facilities in the Midwest with Similar Habitat to the Project

Wind Facility	State	Habitat	Estimated Mean Bird Fatality/ turbine/year	Estimated Mean Bird Fatality/ MW/year	Source
Blue Sky Green Field	WI	Agricultural cropland	11.83	7.17	Gruver et al. 2009
Buffalo Ridge Phase I (1996-1999)	MN	Agricultural cropland	0.98	2.86	Johnson et al. 2000
Forward Energy	WI	Agricultural cropland	3.27	2.18	Grodsky and Drake 2011
Kewaunee County	WI	Agricultural cropland	1.29	1.95	Howe et al. 2002
Ainsworth	NE	Mixed grass prairie	2.68	1.63	Derby et al. 2007
Summerview	AB, Canada	Mixed grass prairie	1.9	-	Brown and Hamilton 2006
Red Canyon	TX	Short-grass prairie	0.77	0.50	Miller 2008
Top of Iowa	IA	Agricultural cropland	0.44 (2003) 0.96 (2004)	0.49 (2003) 1.07 (2004)	Jain 2005 Jain et al. 2011
Buffalo Gap II	TX	Mixed-grass prairie	0.22	0.15	Tierney 2009
Regional Mean (90-percent Confidence Interval)			2.43 (±1.80)	2.00 (±1.17)	

Table 8. Estimated Mean Bat Fatalities per Turbine and per Megawatt at Wind Facilities in the Midwest

Wind Facility	State	Habitat	Estimated Mean Bat Fatality/ turbine/year	Estimated Mean Bat Fatality/ MW/year	Documented Bat Species Fatalities*	Source
Blue Sky Green Field	WI	Agricultural cropland	40.54	24.57	Little brown, silver-haired, big brown, hoary, eastern red, and unidentified bat	Gruver et al. 2009
Forward Energy	WI	Agricultural cropland	23.44	15.63	Hoary, silver-haired, eastern red, unknown, little brown, big brown bat	Grodsky and Drake 2011
Kewaunee County	WI	Agricultural cropland	4.26	6.45	Eastern red and hoary bat	Howe et al. 2002

Wind Facility	State	Habitat	Estimated Mean Bat Fatality/ turbine/year	Estimated Mean Bat Fatality/ MW/year	Documented Bat Species Fatalities*	Source
Top of Iowa	IA	Agricultural cropland	4.45 (2003) 7.14 (2004)	4.94 (2003) 7.94 (2004))	Hoary, little brown, eastern red, big brown, silver-haired bat	Jain 2005 Jain et al. 2011
Ainsworth	NE	Mixed grass prairie	1.91	1.16	Hoary, unidentified species, big brown and eastern red bat	Derby et al. 2007
Summerview	AB, Canada	Mixed grass prairie	18.48	-	Hoary, silver-haired, little brown, big brown, eastern red bat	Brown and Hamilton 2006
Buffalo Ridge Phase I (1996-1999)	MN	Agricultural cropland	0.26	-	Hoary, eastern red, silver-haired, tricolored bat	Johnson et al. 2000
Regional Mean (90-percent Confidence Interval)			17.25 (±12.05)	13.4 (±9.00)		

* In order of decreasing frequency

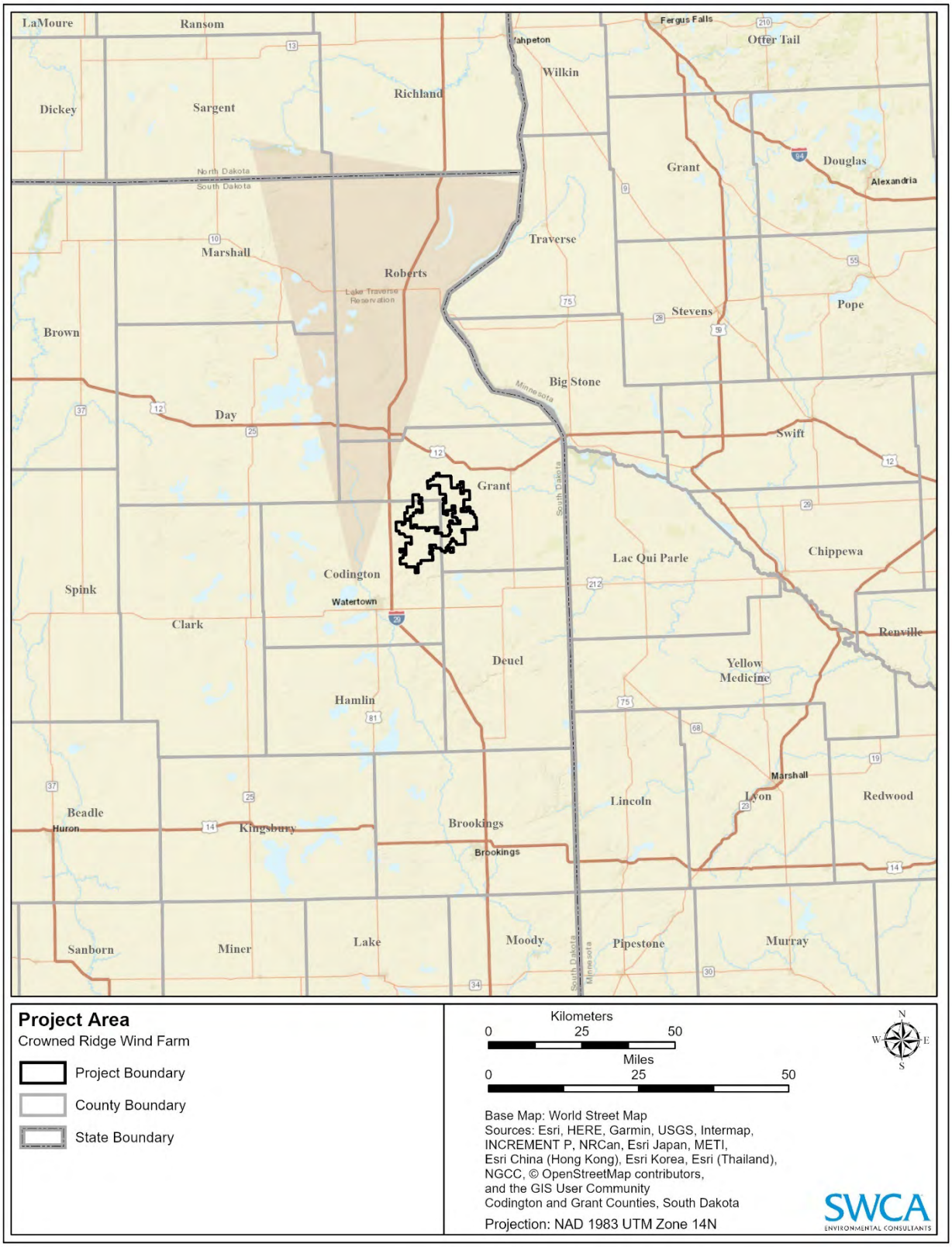

Figure 1. Project area and location.

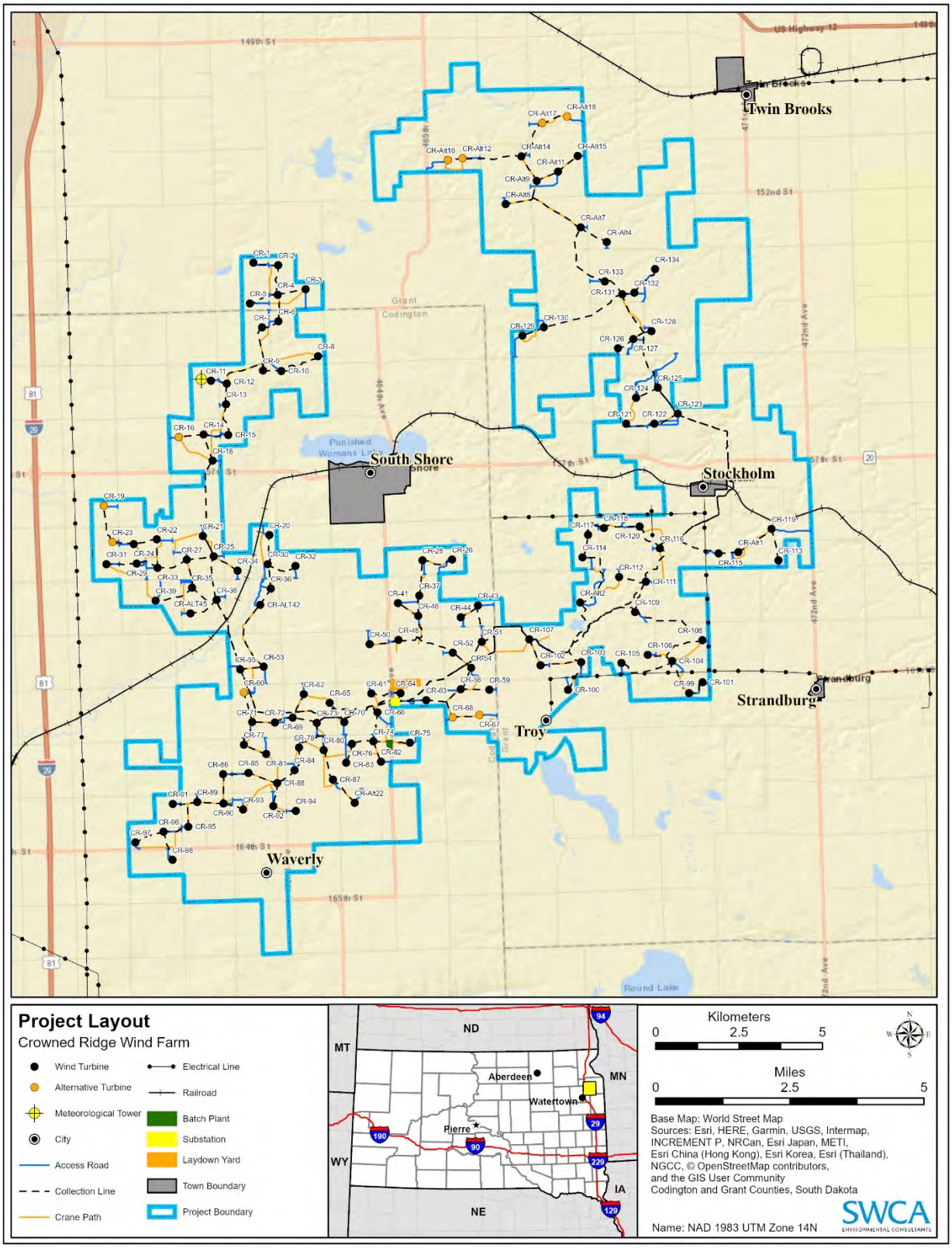

Figure 2. Project layout.

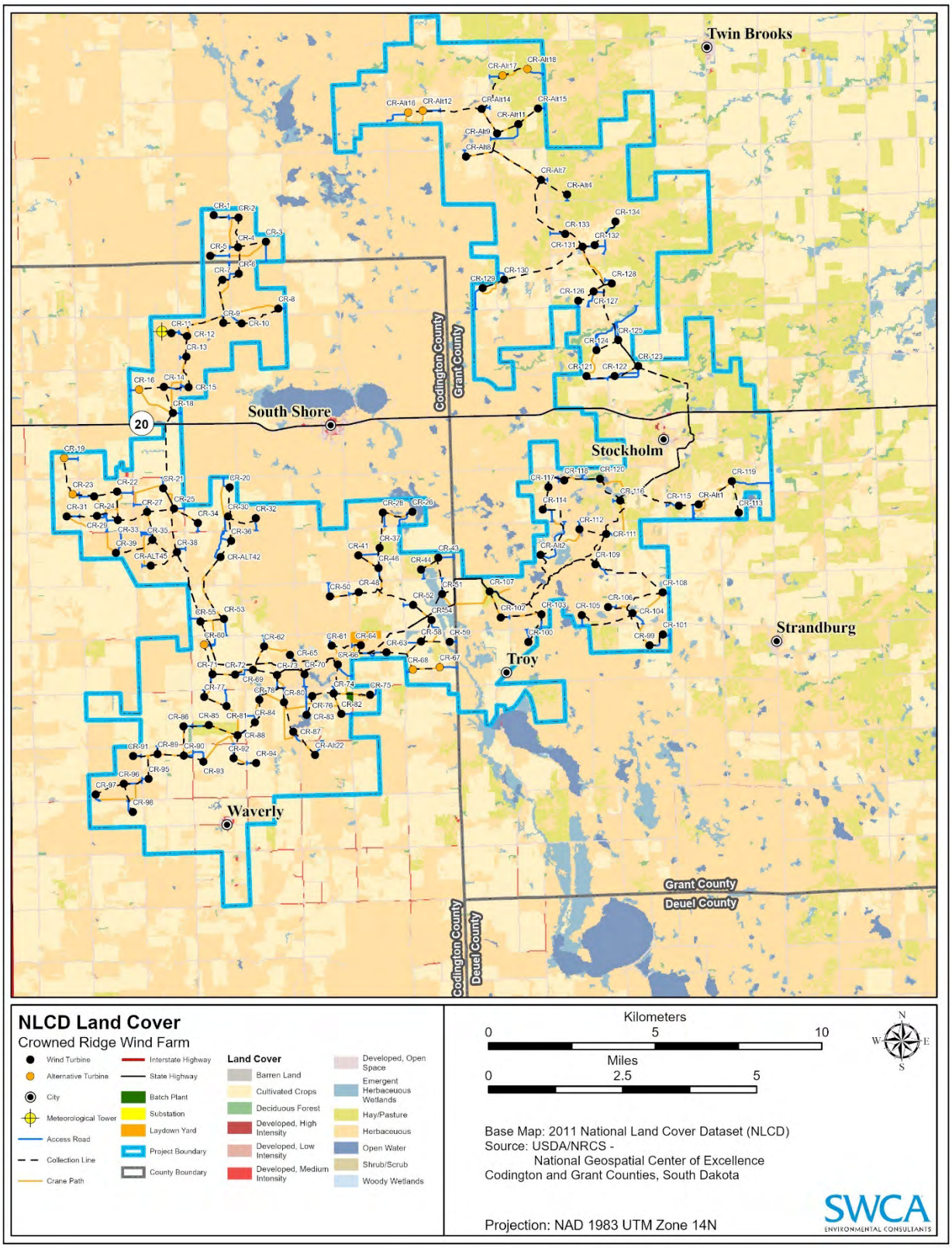

Figure 3. NLCD land cover within the project area.

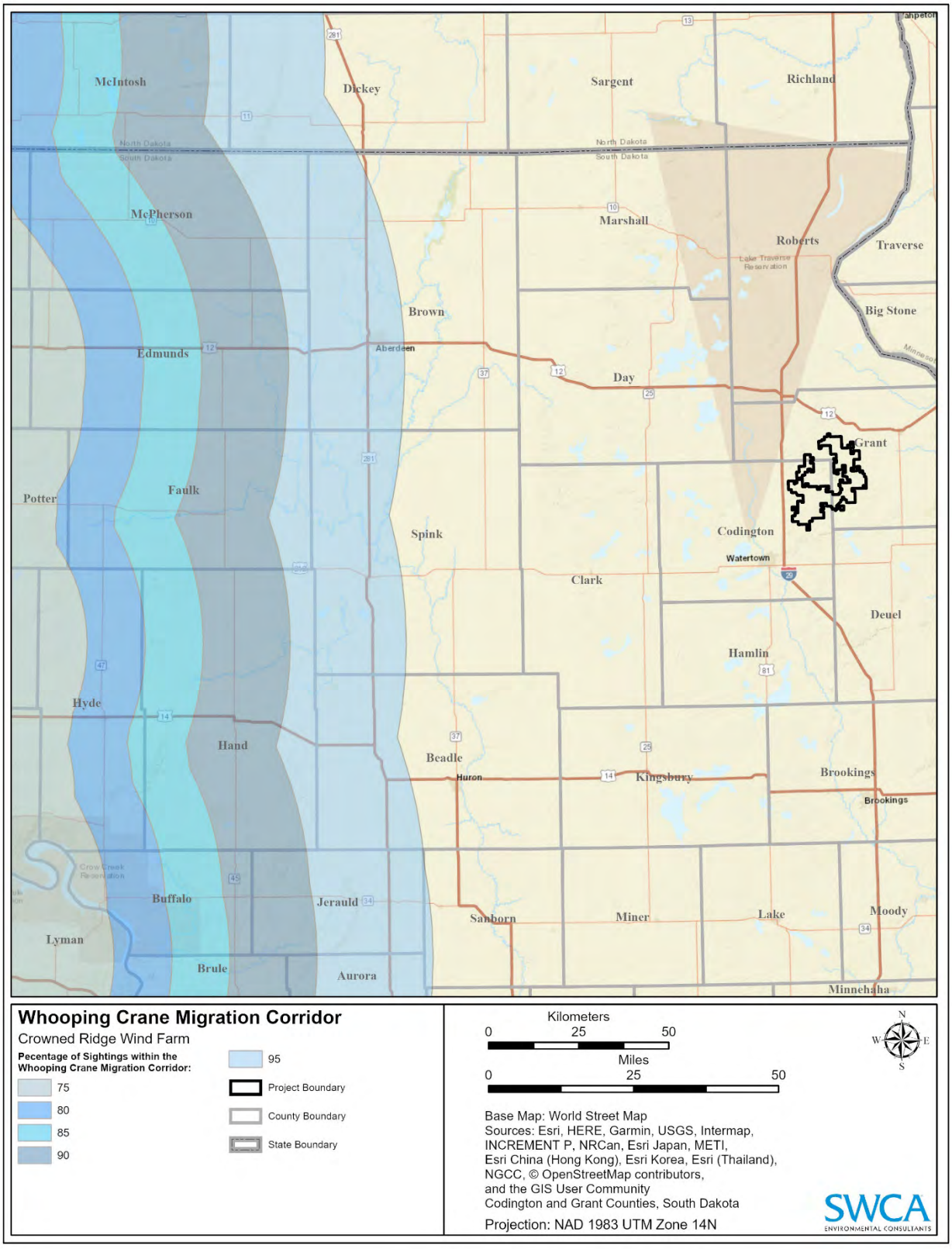

Figure 4. Project area location proximity to whooping crane migration corridor.

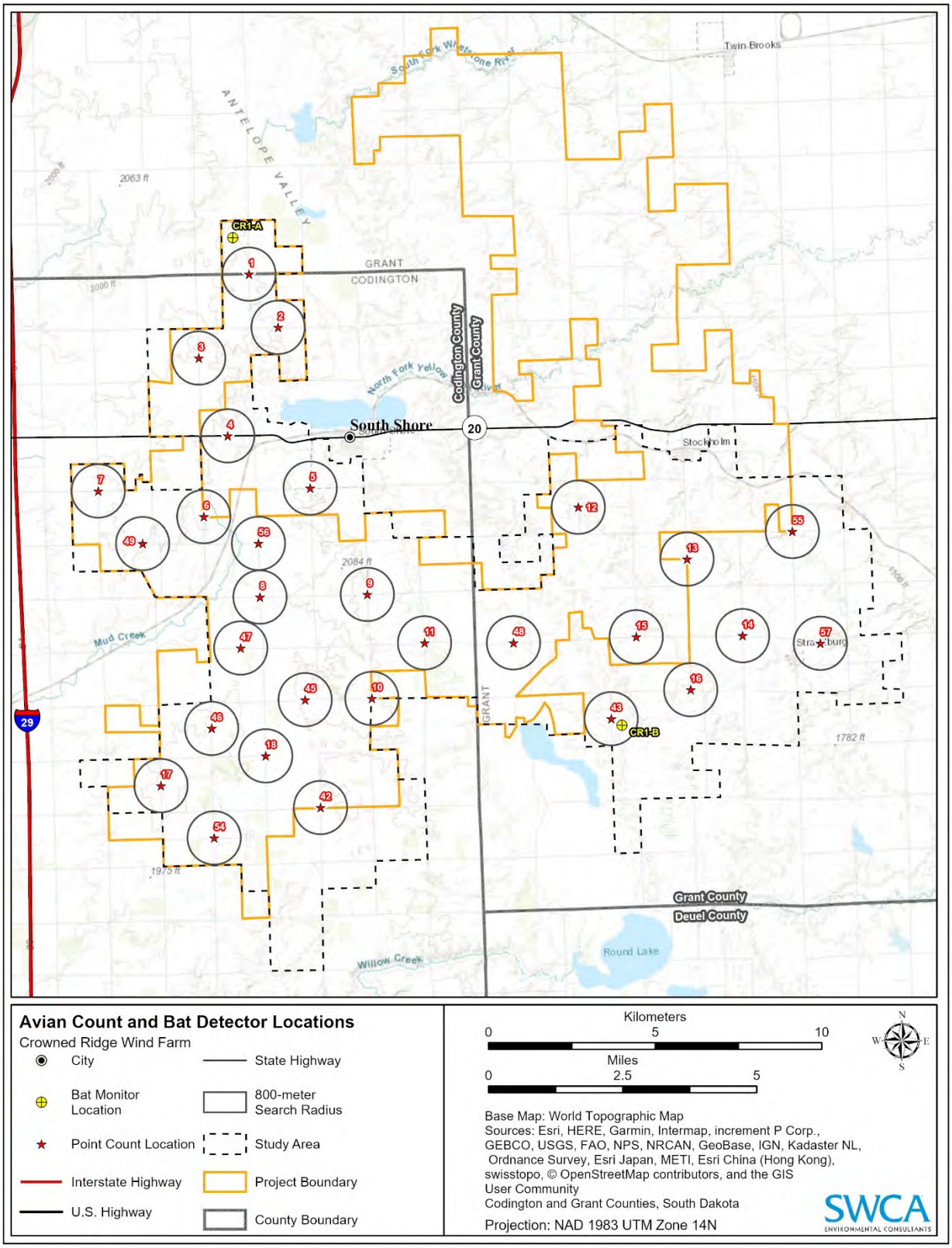

Figure 5. Avian count and bat detector locations.

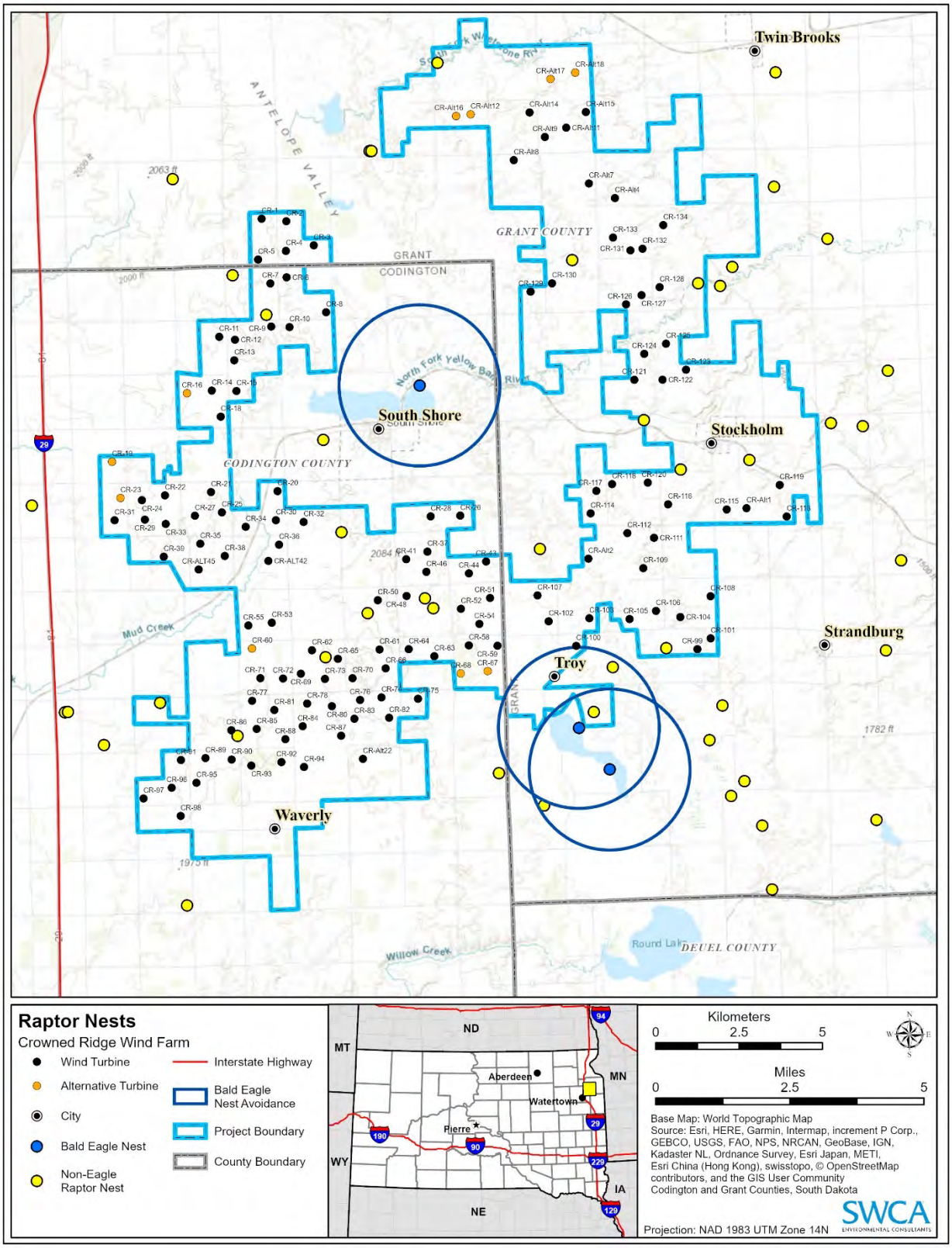

Figure 6. Raptor nest locations.

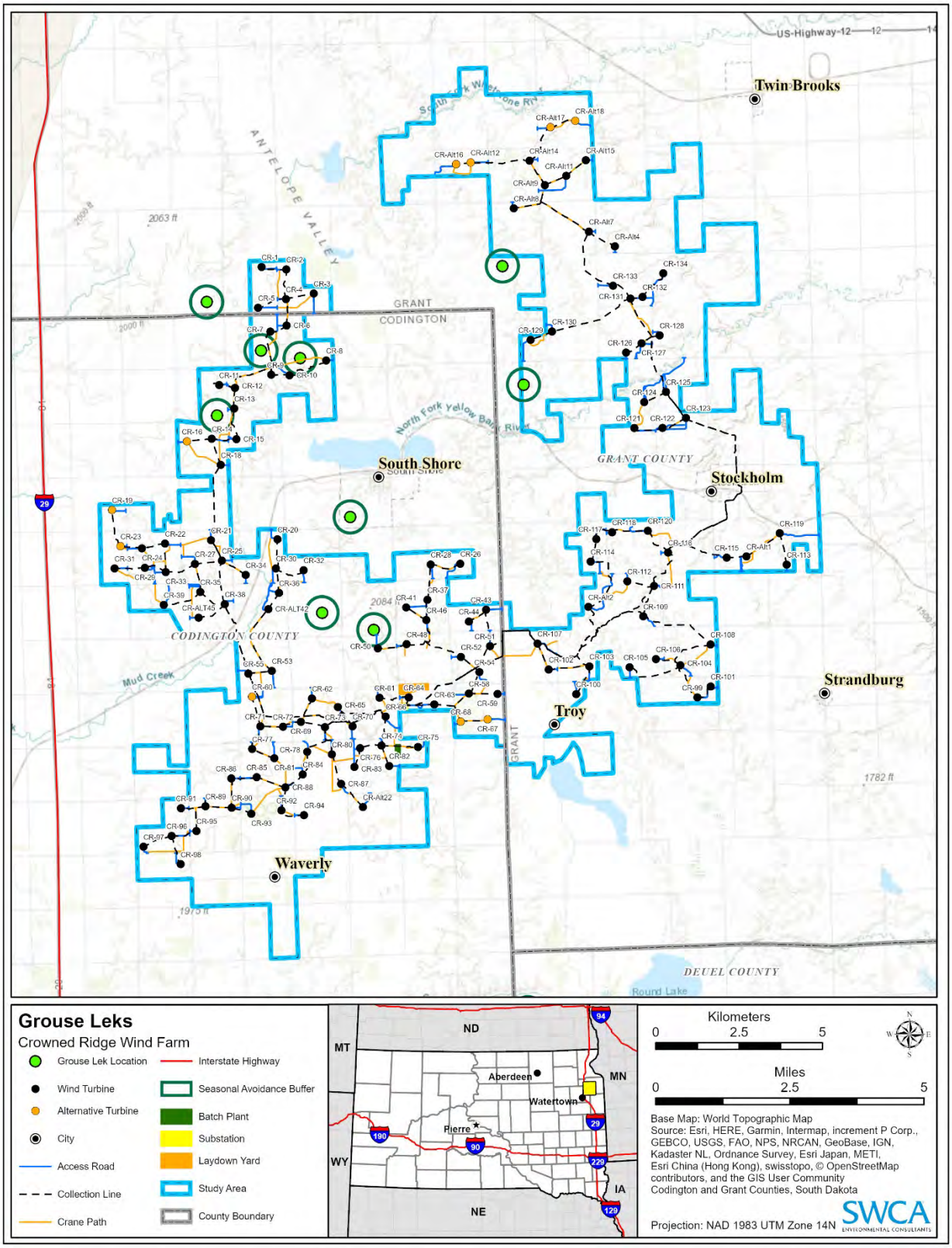

Figure 7. Grouse lek locations.

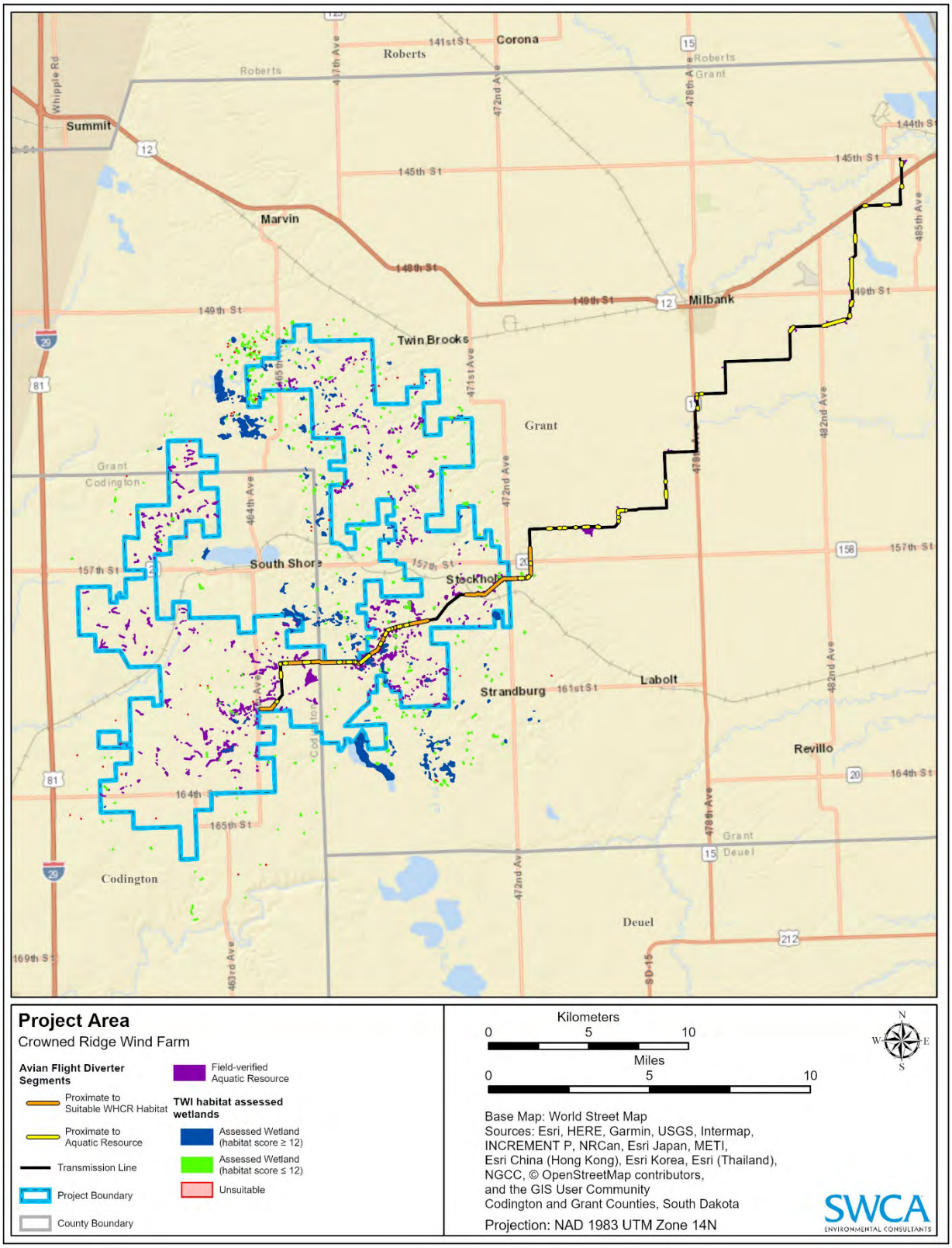

Figure 8. Overhead transmission line segments marked for avian flight diverter installation.

APPENDIX A

Agency Coordination

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
420 South Garfield Avenue, Suite 400
Pierre, South Dakota 57501-5408

November 26, 2007

Mr. Erik W. Jansen, Biologist
Tetra Tech EC, Inc.
1750 SW Harbor Way, Suite 400
Portland, Oregon 97201

Re: Wind Energy Project Consultation, Eastern and North Central South Dakota

Dear Mr. Jansen:

This letter is in response to your request dated October 19, 2007, for listed threatened or endangered species and environmental comments regarding the above referenced project. Your letter indicates a general interest in wind energy development in all or portions of five counties in eastern and north-central South Dakota: the West half (W ½) of Grant County, the Northeast quarter (NE 1/4) of Codington County, the West half (W ½) and South half (S ½) of Deuel County, the Northeast quarter (NE 1/4) of Brookings County, and all of McPherson County.

In accordance with section 7(c) of the Endangered Species Act, as amended, 16 U.S.C. 1531 et seq., we have determined that the following federally listed species may occur in the project area (this list is considered valid for 90 days):

Species	Status	Expected Occurrence
American burying beetle (Nicrophorus americanus)	Endangered	Historic Records, No Recent Specimens, Brookings County.
Western prairie fringed orchid (Platanthera praeclara)	Threatened	Possible Habitat, No Recent Specimens, Brookings County.
Topeka shiner (Notropis topeka)	Endangered	Known Resident in Codington, Deuel, and Brookings Counties.
Whooping crane (Grus americana)	Endangered	Migration Records in Codington and McPherson Counties.
Dakota skipper (Hesperia dacotae)	Candidate	Resident in Brookings, Codington, Deuel, Grant, and McPherson Counties.

While historic records of the American burying beetle exist for Brookings County, recent documentation of the species in South Dakota has occurred only in Todd, Gregory, and Bennett Counties. The American burying beetle was formerly known to occupy a broad geographic range, and habitat was not thought to be limiting. However, recent studies have shown some preference by this species for sandy or sandy-loam grasslands with interspersed stands of low-meadow cottonwoods. If this type of habitat exists at the proposed project areas, surveys for the American burying beetle should be considered and any results reported to this office.

The Western prairie fringed orchid has not recently been documented in South Dakota. However, the life cycle of the plant often makes it difficult to detect. Additionally, populations currently exist in the neighboring states of Nebraska, Iowa, Minnesota, and North Dakota, and potential habitat may still be found in South Dakota. Although the plant is typically associated with intact native prairie, the Western prairie fringed orchid has also been found on disturbed sites. Potential habitats generally include mesic upland prairies, wet prairies, sedge meadows, subirrigated prairies, and swales in sand dune complexes. If these habitats exist within the proposed project areas, surveys for the Western prairie fringed orchid should be considered prior to construction.

Topeka shiners are known to occupy numerous small streams within eastern South Dakota within the Big Sioux, Vermillion, and James River watersheds. Activities affecting instream habitat of waterways within any of these three watersheds (e.g., road crossings, loss of riparian buffer) have the potential to adversely impact this minnow.

The single self-sustaining migratory population of whooping cranes remaining in the wild migrates through South Dakota as it travels between northern breeding grounds and southern wintering areas. The species occupies numerous habitats such as cropland and pastures; wet meadows; shallow marshes; shallow portions of rivers, lakes, reservoirs, and stock ponds; and both freshwater and alkaline basins for feeding and loafing. Overnight roosting sites frequently require shallow water in which they stand and rest. Line strike mortality is one of the greatest threats to this species; collisions with distribution and transmission lines are the highest known source of mortality to fledged whooping cranes. Interactions of the species with wind turbines is currently not known but, as large birds with low maneuverability, they are deemed likely to be susceptible to collision mortality with turbines as well. It is also possible that these birds may avoid wind farm areas entirely, thereby suffering a loss of potential stopover habitat in South Dakota. Additionally, should construction occur during spring or fall migration, the potential for disturbances to whooping cranes exists. Any whooping crane sightings should be reported to this office. While the species has been noted further east in South Dakota, McPherson County is included as part of the species' primary migration corridor.

The Dakota skipper may also occur on some of the proposed project areas. The Dakota skipper is a candidate species and accordingly is not, at present, provided Federal protection under the Endangered Species Act. Their candidate status defines these butterflies as a species in decline that the U.S. Fish and Wildlife Service (Service) believes needs to be listed as threatened or endangered, but listing is currently precluded by other priorities. Dakota skippers are obligate residents of high quality prairie ranging from wet-mesic tallgrass prairie to dry-mesic mixed grass prairie. In northeastern South Dakota, Dakota skippers inhabit dry-mesic hill prairies with abundant purple coneflower but also use mesic to wet-mesic tallgrass prairie habitats characterized by wood lily and smooth camas. If this type of habitat exists in the proposed project areas, surveys for the species should be considered and results reported to this office.

Please note that the bald eagle (Haliaeetus leucocephalus) also occurs throughout South Dakota throughout the year, and new nests are appearing annually. While Endangered Species Act protections for the bald eagle have been removed, effective August 8, 2007, the species will continue to be protected under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA). These laws protect bald eagles from a variety of harmful actions and impacts. Our agency has developed guidance for the public regarding means to avoid take of the bald eagle under these laws. The National Bald Eagle Management Guidelines are available online at http://www.fws.gov/migratorybirds/baldeagle.htm. We recommend that you review these guidelines as they serve to advise you of circumstances where the laws may apply to your activities so that you may avoid potential violations of this law on future projects.

In addition to concerns related specifically to threatened and endangered species, primary concerns of the Service regarding wind farms are collision mortality, the loss of habitat, and habitat avoidance behaviors by wildlife. While there is still much to be learned regarding wind turbine-wildlife interactions, we do know that wind turbines can have adverse impacts on some species. Recent studies of grassland nesting birds have shown a tendency for avoidance of areas immediately surrounding turbines; thus, when considering the issues of habitat fragmentation and grassland bird avoidance, the area impacted may be larger than the final footprint of the project.

The Service has developed voluntary interim guidelines to assist energy companies in accomplishing the goal of reducing the risk posed by turbines to wildlife. You may access these guidelines on the internet at: http://www.fws.gov/habitatconservation/wind.htm. The guidelines stress the importance of proper evaluation of potential wind turbine development sites, proper location and design of turbines and related facilities, and pre- and post-construction research and monitoring.

Areas of interest identified in your letter contain grassland with relatively high density of a variety of wetland types interspersed, McPherson County in particular. Areas in northeastern South Dakota contain ridge lines and rolling topography with quality forest/shrub/grass habitats. Thus, some areas identified in your letter may exhibit relatively high value for wildlife, particularly avian species. Currently the best means of avoiding impacts to wildlife by wind farms is to avoid such high wildlife use areas. Placement of turbines within existing cropland or in/near developed areas is recommended for this reason.

If placement of wind farms and associated facilities must occur within intact native habitats, offsetting and/or mitigative measures should be considered to compensate for loss and fragmentation of wildlife habitat. Additionally, a mixture of native grasses and forbs typical of those found in this region should be planted to reclaim temporarily disturbed areas. Monitoring and contingency measures should be worked into reclamation plans to ensure that the native prairie is reestablished and that invasive weeds do not overtake disturbed sites.

Please note that the South Dakota Department of Game, Fish and Parks (SDDGFP) has coordinated with the South Dakota Public Utilities Commission (SDPUC) regarding distribution of the SDDGFP's "Siting Guidelines for Wind Power Projects in South Dakota" to wind developers intending to construct projects within the state of South Dakota. You may wish to contact the SDPUC and/or the Wildlife Diversity Division of the SDDGFP in Pierre, South Dakota, for more information. Contact information may be found on their respective web sites: http://www.state.sd.us/puc/ index.htm and http://www.sdgfp.info/Wildlife/Diversity/index.htm. The guidelines themselves may be found on the internet at: http://www.sdgfp.info/wildlife/diversity/windpower.htm.

Additionally, bats are known to suffer mortality due to collisions with wind turbines. The SDDGFP has completed a State Management Plan for bats and may be able to provide additional information and/or recommendations regarding this project. If you have not already done so, please contact Ms. Silka Kempema at the SDDGFP-Wildlife Division, Joe Foss Building, 523 East Capitol Avenue, Pierre, South Dakota 57501, Telephone No. (605) 773-2742, for more information.

The Northern Prairie Wildlife Research Center of Jamestown, North Dakota, has initiated studies of avian responses to wind turbines in both North Dakota and South Dakota. This research may be relevant to your project. We recommend that you contact Ms. Jill Shaffer of the Northern Prairie Wildlife Research Center at (701) 253-5547 for more information.

Please note that the Service owns easement rights on numerous private properties in the state in addition to fee title ownership of Waterfowl Production Areas (WPA). Concentrations of WPA's and easements are further indication of high wildlife values of certain areas in South Dakota. The Service currently has a policy regarding placement of turbines on easements. We refer you to our Wetland Management Districts for actions that may impact easements or WPA's (see table below) and anticipate being kept informed of any actions that may impact these properties.

Office	Jurisdiction	Address	Phone
Madison Wetland Management District	Deuel, Brookings	P.O. Box 48, Madison, SD 57042	(605) 256-2974
Waubay Wetland Management District	Grant, Codington	44401 134A Street Waubay, SD 57273	(605) 947-4521
Sand Lake Wetland Management District	McPherson	39650 Sand Lake Drive Columbia, SD 57433	(605) 885-6320

Although your letter did not mention meteorological towers, it is our understanding that meteorological towers are often constructed in association with wind turbines and that these structures are often similar in design to typical communications towers: tall, lighted, lattice structured, and guyed. These types of towers can be problematic for birds that may fly into the light of the towers and may become reluctant to leave the lighted area, particularly during inclement weather. Mortality results as the birds circle the structure and collide with the guy wires or the lattice of the tower itself. We presume that if meteorological tower(s) have not already been established as part of the proposed projects, they may be in the future. We recommend review of the guidance set forth in U.S. Fish and Wildlife Service Interim Guidelines for Recommendations on Communications Tower Siting, Constructions, Operation and Decommissioning available on the internet at http://migratorybirds.fws.gov/issues/towers/comtow.html, and application of any retrofit measures possible to minimize the threat of avian mortality.

As with towers, the above ground utilities proposed in association with turbine projects (overhead transmission or distribution lines and substations) pose the risk of collision mortality and/or electrocution of birds. In addition to whooping cranes (previously mentioned), thousands of other birds are killed annually as they attempt to utilize overhead power lines or areas near power lines as nesting, hunting, resting, feeding, and sunning sites. Transmission lines are typically less problematic than distribution lines in terms of electrocutions due to their relatively

larger size and spacing between conductive components but still pose a collision mortality risk. Proposed substations may also pose a risk of electrocutions.

We recommend the installation of underground, rather than overhead, power lines whenever possible and appropriate to minimize avian mortality and environmental disturbances. For all new above ground facilities, overhead lines or modernization of old overhead lines, we recommend incorporating measures to prevent avian electrocutions and collisions. The publication entitled "Suggested Practices for Avian Protection on Power Lines - The State of the Art in 2006" has many good suggestions including pole extensions, modified positioning of live phase conductors and ground wires, placement of perch guards and elevated perches, elimination of cross arms, use of wood (not metal) braces, and installation of various insulating covers. You may obtain this publication by contacting the Edison Electric Institute on the internet via their website at www.eei.org or by calling 1-800-334-5453.

Additional information regarding simple, effective ways to prevent raptor electrocutions on power lines is available in video form. "Raptors at Risk" may be obtained by contacting EDM International, Inc. at 4001 Automation Way, Fort Collins, Colorado 80525-3479, Telephone No. (970) 204-4001, or by visiting their web site at http://www.edmlink.com/raptorvideo.htm.

We also recommend marking overhead lines in order to make them more visible to birds. Orange or yellow aviation balls are frequently used for this purpose, but other types of marking devices are also available. For more information on bird strikes, please see "Mitigating Bird Collisions With Power Lines: The State of the Art in 1994" which may be obtained by contacting the Edison Electric Institute at the same web site and telephone number listed above.

The Service has coordinated with the Avian Power Line Interaction Committee (APLIC) to develop guidelines to assist utility companies in formulating Avian Protection Plans. These plans are utility-specific and designed to reduce avian and operational risks that result from avian interactions with electric utility facilities. We submit that these guidelines may also be adapted to wind farms, and we encourage wind energy facilities to investigate the formulation of Avian Protection Plans for their projects. These guidelines may be accessed at the APLIC's web site, http://www.aplic.org/.

The Service's guidance on bald eagles, communications towers, and wind turbines, as well as the APP guidelines and "Suggested Practices . . ." publications will provide some protection for migratory birds; however, implementation of these measures will not remove any liability should violations of the law occur. Please be apprised of the potential application of the Migratory Bird Treaty Act of 1918 (MBTA), as amended, 16 U.S.C. 703 et seq., and the Bald Eagle Protection Act of 1940 (BEPA), as amended, 16 U.S.C. 668 et seq., to the project(s). The MBTA does not require intent to be proven and does not allow for "take," except as permitted by regulations. Section 703 of the MBTA provides: "Unless and except as permitted by regulations . . . it shall be unlawful at any time, by any means, or in any manner, to . . . take, capture, kill, attempt to take, capture, or kill, possess . . . any migratory bird, any part, nest, or eggs of any such bird . . . ." The BEPA prohibits knowingly taking, or taking with wanton disregard for the consequences of an activity, any bald or golden eagles or their body parts, nests, or eggs, which includes collection, molestation, disturbance, or killing activities.

Our foremost recommendation to preclude impacts to migratory birds, federally listed species, and other wildlife by wind energy development is to avoid placing wind farms in high wildlife use areas.

If the a Federal agency is involved in the proposed projects, that agency or their designated representative must determine whether adverse affects may be incurred on listed species in South Dakota and, if so, should request formal consultation from this office. If a "may affect - not likely to adversely affect" determination is made for this project, it should be submitted to this office for concurrence. If a "no effect" determination is made, further consultation may not be necessary. However, a copy of the determination should be sent to this office. Private companies with no Federal nexus should be advised of the potential to impact listed species and note that avenues exist to obtain take permits for their actions via further consultation with this office.

If changes are made in the project plans or operating criteria, or if additional information becomes available, the Service should be informed so that the above determinations can be reconsidered.

The Service appreciates the opportunity to provide comments. If you have any questions regarding these comments, please contact Natalie Gates of this office at (605) 224-8693, Extension 234.

Sincerely,

Pete Gober
Field Supervisor
South Dakota Field Office

cc: USGS; Jamestown, ND
(Attention: Jill Shaffer)
Secretary, SDDGFP; Pierre, SD
(Attention: Silka Kempema)
USFWS; Madison, SD
(Attention: Tom Tornow)
USFWS; Waubay, SD
(Attention: Larry Martin)
USFWS; Columbia, SD
(Attention: Gene Williams)

NAGate

U.S. FISH AND WILDLIFE SERVICE

South Dakota Field Office
420 South Garfield Avenue, Suite 400
Pierre, South Dakota 57501-5408

Commercial Telephone (605) 224-8693
Facsimile Telephone (605) 224-9974

E-Mail Address: R6FWE_PIE@fws.gov (Ecological Services)
R6FFA_GRP@fws.gov (Great Plains FWMAO)

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Shelley Erickson 221	Joy Gober 227		Wayne Stancill 226
Natalie Gates 234	Scott Larson 232	Robert Klumb 228	Greg Wanner 225

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FACSIMILE TRANSMITTAL COVER

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Number Of Pages (Including Cover): 7 **Date:** 11/27/07

TO Erik Jansen

AGENCY Tetra Tech **CITY** Portland **STATE** OR

FACSIMILE NO. 503 227 1287 **COMMERCIAL NO.** _____

FROM Natalie Gates

SUBJECT Wind Proposal USFWS Response

MESSAGE

Fax As requested, enc

Natalie

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DEPARTMENT OF GAME, FISH AND PARKS
Foss Building
523 East Capitol
Pierre, South Dakota 57501-3182

December 3, 2007

Erik W. Jansen, Biologist
Tetra Tech EC, Inc.
1750 SW Harbor Way, Suite 400
Portland, OR 97201

RE: Environmental review of Eastern and North-central Wind Resource Area as potential wind power project areas

Dear Mr. Jansen:

The following comments are in response to your letter dated 19 October 2007 requesting environmental considerations and concerns of the Eastern (W1/2 Grant Co., NE 1/4 Codington Co., W1/2, S1/2 Duel Co., and NE1/4 Brookings Co.) and North-central (McPherson County) Wind Resource Areas.

The proposed siting and operation of these wind power projects have potential to directly and indirectly impact area wildlife by killing bats and birds through wind turbine and power line strikes and altering important and declining habitats and breeding and movement behavior of wildlife. While we applaud efforts to provide alternative energy sources, we offer the following considerations for your planning efforts, encouraging responsible siting and mitigation where appropriate to avoid or lessen direct and indirect impacts. As requested, I have provided separate comments for each wind resource area in addition to final comments that apply to any other potential wind power project in South Dakota.

Eastern Wind Resource Area (EWRA)

Grasslands - The EWRA is located within the tall-grass prairie zone. Native grasslands within this zone are decreasing at an alarming rate. Less than one percent of native tall-grass prairie habitat in South Dakota remains (Samson et al. 1998). Other grassland types such as rangeland (grazed grasslands with native plant spp.), pasture (grazed grasslands with non-native plant spp.) and Conservation Reserve Program lands (tilled land planted to vegetative cover) serve as grassland wildlife habitat (Haufler 2005). Fragmentation resulting from woody encroachment, road construction, and conversion of surrounding habitat has resulted in the remaining grassland habitats existing as smaller disjunct patches. Patches often provide less suitable habitat for many native species of grassland wildlife. Some of the last remaining contiguous grasslands tracts occur along the Coteau escarpment that angles through the EWRA.

Grassland birds - Placement of turbines in this area may fragment grassland wildlife habitat reducing its suitability to serve as habitat and modify behavior of grassland bird species, a group of species which has shown the most consistent and long term declines of any other group of bird species in North America (Peterjohn and Sauer 1999). This area is known to have abundant sharp-tailed grouse populations. Greater prairie chickens also are present. The greater prairie chicken is a species known to be area-sensitive, requiring comparatively large tracts of open, contiguous grassland. The lesser prairie chicken, a similar species found more commonly in the southern Great Plains, avoids nesting within 400 m of transmission lines or improved roads (Pitman et al 2004). This highly suggests that placement of turbines and associated infrastructure (roads and transmission lines) may also negatively affect greater prairie chickens.

Birds are susceptible to direct strikes with wind turbines. Based on a study conducted in the Buffalo Ridge area of Minnesota, species with known wind turbine strike mortality and are known to occur in the EWRA include grasshopper sparrow and western meadowlark (Higgins et al 2007).

Properly timed, species-appropriate surveys for prairie grouse (greater prairie chickens and sharp-tailed grouse) and other grassland bird species should be conducted pre-construction. Prairie grouse surveys should be conducted in spring when breeding individuals are on communal display grounds (leks). Surveys for other breeding grassland birds are best conducted in June, although mid-May through early July is acceptable.

Butterflies - Four rare butterfly species are located within the EWRA. These species are classified as Species of Greatest Conservation Need, as listed in our State Wildlife Action Plan (http://www.sdgfp.info/Wildlife/Diversity/Comp_Plan.htm) and are rare species monitored by our Natural Heritage Program (NHP). They include: 1) Dakota skipper, 2) Powesheik skipperling, 3) regal fritillary, and 4) Ottoe skipper.

The range of the Dakota skipper in South Dakota is limited to eleven counties in the north eastern portion of the state. The Dakota skipper requires native mid- to tall-grass prairie and is found on rolling rangeland with abundant wetlands. Larval host plants are grasses, especially little bluestem. Flight of emerging adults occurs from June to mid-July. This species is a candidate for listing under the Federal Endangered Species Act (ESA). As such, I recommend contacting the U.S. Fish and Wildlife Ecological Services Field office in Pierre, South Dakota (605-224-8693) for further information regarding the protection of this species required under ESA. Current threats to this species include, but are not limited to, improper land management uses, agricultural cultivation, road construction, and invasive plant species. South Dakota populations are important to the existence of this species and approximately half of known populations are located on private lands.

The Powesheik skipperling distribution in South Dakota also is limited to eleven counties in the north eastern portion of the state. The Powesheik skipperling prefers native tall-grass prairie and wetlands. Larval host plants are sedges. Flight of emerging adults occurs primarily in July. Threats include excessive prescribed burning, loss of habitat due to conversion to other uses, invasive plants, population isolation, and extreme population crashes.

The regal fritillary is rapidly declining across its range in the United States. In South Dakota, its range is restricted to native prairie sites. Some of the last strongholds of this species are located in prairie states, such as South Dakota, with areas of large expanses of suitable habitat (such as the EWRA) that support larval host plants (violets). Flight periods are from June to September. Threats include loss and fragmentation of habitat to agriculture (excluding grazing or haying), conversion to cropland, woody encroachment, chemicals (e.g., pesticides and herbicides), and improper fire management.

The Ottoe skipper also requires relatively undisturbed native prairie with nectar sources (coneflowers, grayfeathers, asters, etc). It is uncommon to rare throughout the state. Peak flight for the Ottoe skipper is in mid-July. The reduction and degradation of prairie habitat is the main threat to this species.

The conservation of the four rare butterfly species documented in the EWRA requires protection of remaining undisturbed tracts of native prairie with associated nectar sources and larval host plants. There are potential disturbances to these rare butterfly species associated with the construction and maintenance of a wind power project. Road construction and turbine pad maintenance increases the chances of non-native, invasive plant species invasion. Chemical control of these species is a known threat. Pre-construction surveys for these species should be conducted during the appropriate times (flight periods). Construction in areas that are or potential butterfly habitat should be avoided.

Wetlands - The proposed project area is located within the Prairie Pothole region. This glaciated region, characterized by high densities of wetland basins of various depths and sizes, extends from Iowa into Minnesota, the Dakotas, Montana and parts of Canada. It is the major waterfowl production area in North America. Wetland losses in the Prairie Pothole Region are staggering and range from 99% in Iowa to 35% in South Dakota. Wetland basin densities (# of basins/10 mi^2) in the EWRA range from 90 to over 420 basins/10 $miles^2$. More specifically, this area is known to have some of the highest seasonal and semipermanent wetland basin densities in the state (Johnson and Higgins 1997). These remaining, high density wetlands provide critical wildlife habitat.

Wetland birds - Waterbird species such as loons, black terns, great egrets, and green backed herons are known to occur in the EWRA. Abundant waterfowl such as mallard, blue-winged teal, redhead, ruddy duck, American coot, and bufflehead also can be found in the area. Birds are susceptible to direct strikes with wind turbines. Based on a study conducted in the Buffalo Ridge area of Minnesota, species with known wind turbine strike mortality and are known to occur in the EWRA include ruddy duck, American coot, and Franklin's gull (Higgins et al 2007). Proper siting of turbines outside of daily and seasonal migration routes of waterbirds and waterfowl and the protection of remaining wetlands within the proposed project area is crucial to reduce the impact to wetland dependent species.

Bats - Bats forage and migrate along rivers, streams, and lakes. Construction of a wind power plant may affect daily and seasonal bat movements between breeding and foraging areas. Thirteen species of bats are found in South Dakota, some of which are summer residents, year-round residents, or migratory (Table 1).

Table 1. South Dakota Bats

Common Name	Scientific Name	State Residency
Big Brown Bat	*Eptesicus fuscus*	Year-round resident
Fringed Myotis	*Myotis thysanodes*	Year-round resident
Little Brown Myotis	*Myotis lucifugus*	Year-round resident
Long-eared Myotis	*Myotis evotis*	Year-round resident
Long-legged Myotis	*Myotis volans*	Year-round resident
Northern Myotis	*Myotis septentrionalis*	Year-round resident
Townsend's Big-eared Bat	*Corynorhinus townsendii*	Year-round resident
Western Small-footed Myotis	*Myotis ciliolabrum*	Year-round resident
Hoary Bat	*Lasiurus cinereus*	Summer resident
Silver-haired Bat	*Lasionycteris noctivagans*	Summer resident
Evening Bat	*Nycticeius humeralis*	Migratory
Eastern pipistrell	*Pipistrellus subflavus*	unclassified

There has been limited research conducted on bats in South Dakota. However, Swier (2006) reported four species of bats occurring near the EWRA: 1) big brown bat, 2) Eastern red bat, 3) hoary bat, and 4) little brown myotis.

Six bat species are considered rare and monitored by the NHP: 1) long-eared myotis, 2) fringed myotis, 3) Northern myotis, 4) silver-haired bat, 5) Townsend's big-eared bat, and 6) evening bat. Although the NHP data base has no records of theses species in the proposed project area, this does not preclude the presence of any of these species in the area. Because of limited, EWRA-specific data, we would suggest pre-construction surveys of the area for potential bat habitat and species. Surveys for species should be conducted for at least one full year before construction.

Recently, South Dakota Department of Game, Fish and Parks (SDGFP) in cooperation with the South Dakota Bat Working Group (SDGWG), developed a South Dakota Bat Management Plan specific to bats and their habitats in South Dakota (http://www.sdgfp.info/Wildlife/Diversity/batmanagmentplan71304.pdf). Please review this document for pertinent information. Again, because bats reside and migrate through South Dakota, it is important to evaluate the propose project area for roosting, feeding, migration and/or stopover habitat and to survey these areas for bats.

Landscape considerations - Placement of a wind power project should take into account larger landscape-level (e.g. surrounding land uses) and cumulative impacts (e.g. existing and potential wind power projects) as well as project associated infrastructure (i.e. transmission lines and roads).

Public lands - Several Game Production Areas within the EWRA are managed by SDGFP. Placement of public lands is often done so in areas with existing and potential wildlife habitat. Management of these lands, for wildlife, is conducted in the public interest. In addition, several USFWS Waterfowl Protection Areas are also located within the EWRA. Public lands managed

for wildlife may be affected by the placement of a wind power project in the vicinity.

Migrating wildlife - The resulting mosaic of grassland and wetland basins and corridors makes it an important migration route for birds (e.g., neotropical migrants, shorebirds, and waterfowl). The Central Flyway, an important pathway for migratory ducks, geese, swans, and cranes runs through the midsection of the country, including South Dakota. Species using this flyway during migration, and particularly during inclement weather when birds alter their flight altitude, may suffer increased mortality due to direct strikes with wind turbines and associated power lines. Appropriately timed, pre-construction surveys for migratory bird species should be conducted. Spring migration can begin as early as late-March, early-April, tapering off in mid-May, depending on the species. Fall migration can begin as early as mid-July and extend through October/November depending on weather conditions and species.

Powerlines - Construction of powerlines is often associated with a proposed wind power project. Power line strikes are a known cause of mortality to birds (Erickson et al. 2005). Waterfowl (ducks, geese, swans, and cranes), raptors, and passerines are species most susceptible to powerline collisions. The Avian Protection Power line Interaction Committee (APLIC) has developed two documents that may be of use to reduce powerline strikes and mortality: 1) 'Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006' and 2) 'Mitigating Bird Collisions with Power lines'. Both of these documents are available from the Edison Institute (http://www.aplic.org/, under 'products and services'). The new and existing power lines associated with the proposed project should be buried, marked, or retrofitted to reduce strikes and electrocutions of bird species.

Non-native species - During the construction and maintenance phase of a wind power project existing roads often experience increased traffic and new roads are constructed. This increases the amount of area disturbed and allows for the introduction and establishment of non-native species. Resulting control of those species through pesticides and herbicides may also impact habitats of rare wildlife species. Non-native species are one of the major threats to rare and declining wildlife species. Improved access can also increase human activity in the area.

The matrix of grassland and wetland habitats in the proposed project area plays a crucial role in the life history of several wildlife species whether migratory or resident. Because of the potential impacts placement of the proposed wind power project would have on unique and declining habitats in the region and their associated species, we recommend the placement of turbines in areas currently disturbed (e.g. cultivated areas) and the use of existing infrastructure (roads and transmission lines) as much as possible.

North-central Wind Resource Area (McPherson County)

Grassland habitat - McPherson County is located within the mixed-grass prairie zone. In the United States, native mixed-grass prairie is disappearing at an alarming rate. In South Dakota, the area of mixed-grass prairie has decreased 70% (Samson et al. 1998). The native prairie that still remains is most often grazed (i.e. rangeland). These and other grassland types such as pasture (grazed grasslands of non-native plant spp.) and Conservation Reserve Program lands (tilled land idled and planted to vegetative cover) also serve as grassland wildlife habitat (Haufler 2005). Fragmentation resulting from woody encroachment, road construction, and conversion of surrounding habitat has resulted in the remaining grassland habitats existing as smaller disjunct patches. Patches often provide less suitable habitat for many native species of grassland wildlife. McPherson County has large tracts of contiguous grassland habitat (including rangeland) located along the ridge extending through Wacker, Weber, Hoffman, and Central McPherson townships.

Grassland birds - Placement of turbines in this area may fragment grassland wildlife habitat reducing its suitability to serve as habitat and modify behavior of grassland bird species, a group of species which has shown the most consistent and long term declines of any other group of species in North America (Peterjohn and Sauer 1999). Two grassland bird species, Baird's sparrow and Sprague's pipit, are known to occur in McPherson County. Range-wide, both of these species have exhibited significant long term negative population trends. In South Dakota, these species hold special conservation status and are classified as Species of Greatest Conservation Need, as listed in our State Wildlife Action Plan (http://www.sdgfp.info/Wildlife/Diversity/Comp_Plan.htm) and are rare species monitored by our NHP. In addition, these species are considered Grassland Species of Concern in South Dakota (Bakker 2005). Regionally they are Species of Special Concern as defined by Partner's in Flight and are considered a Species of Conservation Concern by the USFWS. The amount of emphasis placed on the conservation of these species indicates populations are declining.

Baird's sparrows breed in the north-western and north-central part of the state. Throughout most of its breeding range, it is known to prefer native mixed grass prairie interspersed with forbs (broad-leaved, herbaceous plant), moderate amounts of litter (dead layers of vegetation), and little to no shrub cover. Although the Baird's Sparrow has a strong tendency to prefer native prairie, it can be observed in non-native grasslands (e.g. crested wheatgrass) that provide appropriate habitat structure. Baird's sparrows are known to prefer large patches of grassland habitat and show avoidance of areas with extensive woody vegetation and areas near roads.

Sprague's pipits are found in the northwestern portion of the state, preferring plains and short-grass prairie with intermediate vegetation height. This species prefers native prairie, although they are known to occupy habitat consisting of non-native plant species. Sprague's pipits are most common in large contiguous grassland areas and are known to be area sensitive.

Properly timed, species-appropriate pre-construction surveys should be conducted for grassland bird species. Surveys for most breeding grassland birds are best conducted in June, although mid-May through early July is suitable. Prairie grouse surveys should be conducted in spring when breeding individuals are on communal display grounds (leks).

Wetland habitats - McPherson County is located within the Prairie Pothole Region. This glaciated region, characterized by a diversity and quantity of basin wetlands, extends from Iowa into Minnesota, the Dakotas, Montana and parts of Canada. It is the major waterfowl production area in North America. Wetland losses in the Prairie Pothole Region are staggering and ranging from 99% in Iowa to 35% in South Dakota. Throughout McPherson County, wetland basin density is high (270 - over 420 basins/10 mi^2). More specifically, the eastern quarter of the County has some of the highest concentrations of temporary and seasonal wetlands (Johnson and Higgins 1997) in the state. Remaining wetlands provide important wildlife habitat.

Wetland birds - In terms of waterfowl breeding activity, the western two-thirds of McPherson County has over 100 breeding duck pairs/mi^2. This is some of the highest breeding waterfowl densities in the Prairie Pothole region. Conservation of this habitat also is critical to waterbirds and shorebirds for breeding, feeding, and migration habitat.

Bird diversity - Reflective of the diversity and quality of native wetland and grassland habitats in the region, the northeastern portion of McPherson County has some of the highest bird species richness in the state (Peterson 1995). This is based upon data gathered from a five-year, state-wide breeding bird survey efforts.

Bats - Bats forage and migrate along rivers, streams and lakes. Construction of a wind power project may affect daily and seasonal bat movements between breeding and foraging areas. Thirteen species of bats are found in South Dakota, some of which are summer residents, year-round residents, or migratory (Table 1). There has been limited research conducted on bats in South Dakota, especially in McPherson County. The NHP database has no records of bat species considered rare in the proposed project. However, this does not preclude the presence of any of these or other bat species in the area. Because of limited information on bats in McPherson County, we would suggest pre-construction surveys of the area for potential bat habitat and species. Surveys for species should be conducted for at least one full year before construction.

Recently, SDGFP in cooperation with the SDBWG, developed a South Dakota Bat Management Plan specific to bats and their habitats in South Dakota (http://www.sdgfp.info/Wildlife/Diversity/batmanagmentplan71304.pdf). Please review this document for pertinent information. Again, because bats reside and migrate through South Dakota, it is important to evaluate the propose project area for roosting, feeding, migration and/or stopover habitat and to survey these areas for bats.

Landscape considerations - Placement of a wind power project should take into account larger landscape-level (e.g. surrounding land uses) and cumulative impacts (e.g. existing and potential wind power projects) as well as project associated infrastructure (i.e. transmission lines, roads).

Public lands - Several Game Production Areas within McPherson County are managed by SDGFP. Placement of public lands is often done so in areas with existing and potential wildlife habitat. Management of these lands, for wildlife, is conducted in the public interest. In addition, several U. S. Fish and Wildlife Service Waterfowl Protection Areas are also located within McPherson County. Public lands managed for wildlife may be affected by the placement of a

wind power project in the vicinity.

Migrating wildlife - The resulting mosaic of grassland and wetland basins and corridors in the County make it an important migration route for birds (e.g., neotropical migrants, shorebirds, waterfowl). The Central Flyway, an important pathway for migratory ducks, geese, swans, and cranes runs through the midsection of the country, including South Dakota. Species using this flyway during migration, and particularly during inclement weather when birds alter their flight altitude, may suffer increased mortality due to direct strikes with wind turbines and associated power lines. Appropriately timed, pre-construction surveys for migratory bird species should be conducted. Spring migration can begin as early as late-March, early-April, tapering off in mid-May, depending on the species. Fall migration can begin as early as mid-July and extend through October/November depending on weather conditions and species.

Powerlines - Construction of powerlines is often associated with a proposed wind power project. Power line strikes are a known cause of mortality to birds (Erickson et al. 2005). Waterfowl (ducks, geese, swans, and cranes), raptors, and passerines are species most susceptible to powerline collisions. The Avian Protection Power line Interaction Committee (APLIC) has developed two documents that may be of use to reduce powerline strikes and mortality: 1) 'Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006' and 2) 'Mitigating Bird Collisions with Power lines'. Both of these documents are available from the Edison Institute (http://www.aplic.org/, under 'products and services'). The new and existing power lines associated with the proposed project should be buried, marked, or retrofitted to reduce strikes and electrocutions of bird species.

Non-native species - During the construction and maintenance phase of a wind power projects existing roads often experience increased traffic and new roads are constructed. This increases the amount of area disturbed and allows for the introduction and establishment of non-native species. Resulting control of those species through pesticides and herbicides may also impact habitats of rare wildlife species. Non-native species are one of the major threats to rare and declining wildlife species. Improved access can also increase human activity in the area.

The matrix of grassland and wetland habitats in the proposed project area plays a crucial role in the life history of several wildlife species whether migratory or resident. Because of the potential impacts placement of the proposed wind power project would have on unique and declining habitats in the region and their associated species, we recommend the placement of turbines in areas currently disturbed (e.g. cultivated areas) and the use of existing infrastructure (roads and transmission lines) as much as possible.

Research and Monitoring

As outlined above, our agency has concerns regarding direct and indirect impacts to wildlife and habitats in association with the siting of the proposed project. Before project construction, appropriate monitoring should be conducted to determine bird and bat use of the project areas. Based upon results of these studies, project construction should be modified, continued, or cancelled. If the project is continued, monitoring should be conducted for a minimum of two years post-construction to determine if and how many bird and bat strikes are caused by this project, if habitats have been significantly altered, and if the surrounding public lands and their uses have been impacted. Any mitigation should be carefully planned, funded, and followed.

If monitoring involves live trapping or collection of wildlife species, you must first obtain a collection permit from our agency. Also, we kindly request that if you or your associates observe any of the animal (http://www.sdgfp.info/Wildlife/Diversity/RareAnimal.htm) or plant species (http://www.sdgfp.info/Wildlife/Diversity/rareplant2002.htm) monitored by the NHP, please contact myself or any of our NHP staff (http://www.sdgfp.info/Wildlife/Diversity/staff_contact.htm).

In coordination with the SDBWG, the SDGFP has developed 'Siting Guidelines for Wind Power Projects in South Dakota' This document addresses many of the concerns involved with siting wind power projects in South Dakota and may be found at on the world wide web (http://www.sdgfp.info/Wildlife/Diversity/windpower.htm). I have enclosed a copy for your convenience.

The SDGFP appreciates the opportunity to provide comments on the proposed project wind resource areas. As plans are further refined, I would be willing to conduct a site visit with you or your associates to continue to provide siting recommendations to reduce conflicts with wildlife. If you have any questions on the above comments, please feel free to contact me at 605-773-2742 or Silka.Kempema@state.sd.us.

Regards,

Silka Kempema

Silka L. F. Kempema
Terrestrial Wildlife Biologist

CC: Natalie Gates, US Fish and Wildlife Service, Pierre, SD
Will Morlock, SD Game, Fish and Parks, Watertown, SD
Mary Clawson, SD Game, Fish and Parks, Aberdeen, SD

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CRS-0113

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
420 South Garfield Avenue, Suite 400
Pierre, South Dakota 57501-5408

February 5, 2010

Ms. Anne-Marie Griger
Tetra Tech, EC Inc.
7800 Shoal Creek Boulevard, Suite 253 East
Austin, Texas 78757

Re: Proposed Crowned Ridge Wind Energy Center, Codington and Grant Counties, South Dakota

Dear Ms. Griger:

This letter is in response to your request dated December 7, 2009, for environmental comments regarding the above referenced project involving construction of a wind farm up to 150 megawatts in size and an associated 34-mile transmission line. The proposed location of the project is north and east of the city of Watertown and includes various sections within Townships 118- 121 North, Ranges 48-52 West, Codington and Grant Counties, South Dakota. Herein we provide information regarding U.S. Fish and Wildlife Service (Service) trust resources, including easement properties, federally endangered species, eagles, birds of conservation concern, and other migratory birds that may occur in the project area. We have included recommended measures to be applied to various components of a wind farm, including meteorological towers, power lines, and the turbines themselves in order to minimize impacts to Service trust resources and to assist the development company in achieving compliance with Federal laws.

Threatened/Endangered Species

In accordance with section 7(c) of the Endangered Species Act (ESA), as amended, 16 U.S.C. 1531 et seq., we have determined that the following federally listed species may occur in the project area (this list is considered valid for 90 days):

Species	Status	Expected Occurrence
Topeka shiner (Notropis topeka)	Endangered	Known Resident.

Topeka shiners are known to occupy numerous small streams within eastern South Dakota and are concentrated within the Big Sioux, Vermillion, and James River watersheds. Willow Creek in the Big Sioux watershed of Codington County is a known occupied stream with a tributary that appears to fall within the project area. Project activities that may impact this waterway directly or indirectly have the potential to negatively affect the Topeka shiner. The Service recommends avoidance of these impacts, particularly related to instream work. Further consultation may be required to determine the possibility of adverse affects to this species.

As indicated by Appendix 1 included with your letter (Summary of Surveys Conducted to Date), you are aware that the Dakota skipper (Hesperia dacotae) is known to occur in northeastern South Dakota. The Dakota skipper is a candidate species and accordingly is not, at present, provided Federal protection under the ESA. Their candidate status defines these butterflies as a species in decline that the Service believes needs to be listed as threatened or endangered, but listing is currently precluded by other priorities. Dakota skippers are obligate residents of high quality prairie ranging from wet-mesic tallgrass prairie to dry-mesic mixed grass prairie. In northeastern South Dakota, Dakota skippers inhabit dry-mesic hill prairies with abundant purple coneflower but also use mesic to wet-mesic tallgrass prairie habitats characterized by wood lily and smooth camas. Per your surveys, it appears that significant percentages of good to excellent Dakota skipper grasslands exist in the project area. Surveys for this species by a qualified biologist may be useful to confirm the ranking of habitat (excellent, good, poor) described in the summary of surveys. The Service requests the results of any such surveys and recommends avoidance and minimization of impacts to Dakota skipper habitats.

If a Federal nexus exists for this project and the Federal action agency or their designated representative determines that the project "may adversely affect" listed species in South Dakota, it should request formal consultation from this office. If a "may affect - not likely to adversely affect" determination is made for this project, it should be submitted to this office for concurrence. If a "no effect" determination is made, further consultation may not be necessary; however, a copy of the determination should be forwarded to our office.

Please note that, if impacts to federally listed species may occur as a result of projects with no Federal nexus, avenues to avoid violations of section 9 of the ESA should be investigated via contact with this office.

Bald and Golden Eagles

A golden eagle was reported in Appendix 1 included with your letter (Summary of Surveys Conducted to Date). Please note also that the bald eagle (Haliaeetus leucocephalus) occurs throughout South Dakota in all seasons, and new nests are appearing each year. While ESA protections for the bald eagle have been removed, effective August 8, 2007, both bald and golden eagles will continue to be protected under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) (more on these laws below). These laws protect eagles from a variety of harmful actions and impacts. The Service has developed guidance for the public regarding means to avoid take of the bald eagle under these laws. The *"National Bald Eagle Management Guidelines"* are available online at: http://www.fws.gov/migratorybirds/baldeagle.htm. We recommend reviewing these guidelines as they serve to advise of circumstances where these laws may apply and to assist in avoiding potential violations on this and future projects. Additionally, permit regulations have been published for bald eagles and golden eagles. These regulations may be found in the Federal Register (Volume 74, No. 175, Friday, September 11, 2009) online at: http://www.gpoaccess.gov/fr/index.html.

Birds of Conservation Concern

Your survey efforts revealed South Dakota state-sensitive species in the project area. Please note that the Migratory Birds Division of the Service has identified bird species of conservation concern: *"Birds of Conservation Concern 2008"* may be found online at: http://www.fws.gov/migratorybirds/NewReportsPublications/SpecialTopics/BCC2008/BCC2008.pdf. This document is intended to identify species in need of coordinated and proactive

conservation efforts among State, Federal, and private entities, with the goals of precluding future evaluation of these species for ESA protections and promoting/conserving long-term avian diversity. A primary threat to many of these species is habitat loss and fragmentation.

In accordance with Executive Order 13186 regarding migratory bird protection, we recommend avoidance, minimization, and finally compensation to reduce the impacts to species protected by the MBTA. Compliance with this law may be partially addressed in an Avian and Bat Protection Plan (see below); however, a separate mitigation plan that specifically addresses direct and indirect take of birds during and after construction is also recommended. Particularly if placement must occur within intact native habitats, we strongly recommend development of mitigative/offsetting measures for this habitat and its associated wildlife.

U.S. Geological Survey (USGS) Research

The USGS's Northern Prairie Wildlife Research Center in Jamestown, North Dakota, has initiated studies of avian responses to wind turbines in both North Dakota and South Dakota. Their research may be relevant to your project, depending on habitat within the project area. We recommend that you contact Ms. Jill Shaffer of the Northern Prairie Wildlife Research Center at Telephone No. (701) 253-5547 for more information and for the possibility of participation in that research.

Service Wetland Management District

Our records indicate that the Service holds easements on some of the properties proposed for construction, and your letter indicates that you have been in contact with the Habitat and Population Evaluation Team's office to obtain the locations of these easements. If you have not already done so, please also contact Mr. Larry Martin of the Service's Waubay Wetland Management District at 44401 134A Street, Waubay, South Dakota 57273, Telephone No. (605) 947-4521, for additional information.

Bats

Bats are known to suffer mortality due to direct collisions with wind turbines, and it has been recently determined that many also die as a result of air pressure changes at the turbine blades that cause internal injuries. The South Dakota Department of Game, Fish and Parks (SDDGFP) has completed a State management plan for bats and may be able to provide additional information and/or recommendations on bats relative to this project. Your letter states that you have contacted the SDDGFP; thus, you may have already received a response from Silka Kempema of that agency. Nonetheless, her contact information is SDDGFP-Wildlife Division, Joe Foss Building, 523 East Capitol Avenue, Pierre, South Dakota 57501, Telephone No. (605) 773-2742.

Fisheries

As per the map sent with your letter, the project area contains the Whetstone River and the North Fork Yellow Bank River which have been classified by the Service as Type II, High Priority Fishery Resources. Riverine and riparian areas are among the highest resource priorities in this region of the Service. We recommend minimization of impacts to these resources and mitigation of all unavoidable habitat losses. The following methods should be implemented to minimize environmental impacts:

1. Instream work should not be undertaken during fish spawning periods. Most spawning occurs in April, May, and June.

2. Stream bottoms and wetlands impacted by construction activities should be restored to pre-project elevations.

3. Removal of vegetation and soil should be accomplished in a manner to reduce soil erosion and to disturb as little vegetation as possible.

4. Grading operations and reseeding of native species should begin immediately following construction.

5. If trees or brush will be impacted by the project, a ratio of at least 2:1 acres planted versus acres impacted should be incorporated into mitigation plans for the project.

Wetlands

According to National Wetlands Inventory maps (available online at http://wetlands.fws.gov/), numerous wetlands exist within the proposed project area. If a project may impact wetlands or other important fish and wildlife habitats, the Service, in accordance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321-4347) and other environmental laws and rules, recommends complete avoidance of these areas, if possible; then minimization of any adverse impacts; and finally, replacement of any lost acres; in that order. Alternatives should be examined and the least damaging practical alternative selected. If wetland impacts are unavoidable, a mitigation plan addressing the number and types of wetland acres to be impacted and the methods of replacement should be prepared and submitted to the resource agencies for review.

Wind Turbine Guidelines

Among the Service's primary concerns regarding wind turbines are avian collision mortality and the loss of habitat/habitat avoidance behaviors by wildlife, including federally listed species as indicated above. While there is still much to be learned regarding wind turbine-wildlife interactions, we do know that wind turbines can have adverse impacts on some species. Turbine location, spacing, aspect, lighting, size, and design are all potential factors related to the risk posed to resident and migratory wildlife as are the types of surrounding habitats, their use by various species of wildlife, landscape features, prey base, migration corridors, and behavioral patterns. Direct collision mortality is a concern as is loss of habitat caused by the footprint of the turbines and associated roads and structures, along with impacts that can occur with encroachment of invasive weeds as a result of these disturbances. Recent studies of grassland nesting birds have shown a tendency for avoidance of areas immediately surrounding turbines, causing indirect habitat loss as well. Currently, perhaps the best means of avoiding impacts to wildlife is to avoid placing wind farms within high wildlife use areas. Placement of turbines within existing cropland or other disturbed areas is recommended for this reason.

The Service has developed voluntary *"Interim Guidelines to Avoid and Minimize Wildlife Impacts from Wind Turbines"* to assist energy companies in accomplishing the goal of reducing the risk posed by turbines to wildlife. These guidelines may be accessed on the internet at: http://www.fws.gov/habitatconservation/Service%20Interim%20Guidelines.pdf. The guidelines stress the importance of proper evaluation of potential wind turbine development sites (via development of a Potential Impact Index score for the proposed site and a reference area), appropriate location and design of turbines and related facilities, and pre- and post-construction

research and monitoring. If the proposed project is to be constructed, we request the results of any pre-/post-construction wildlife monitoring, including any incidental mortality detected.

Please note that the SDDGFP has coordinated with the South Dakota Public Utilities Commission (SDPUC) regarding distribution of SDDGFP's *"Siting Guidelines for Wind Power Projects in South Dakota"* to wind developers intending to construct projects within the state of South Dakota. You may wish to contact the SDPUC and/or the Wildlife Diversity Division of the SDDGFP in Pierre for more information. Contact information may be found on their respective websites: http://puc.sd.gov/ and http://www.sdgfp.info/Wildlife/Diversity/index.htm. The guidelines themselves may be found online at: http://www.sdgfp.info/wildlife/diversity/windpower.htm.

Meteorological Towers

Meteorological towers constructed in association with wind turbines are often similar in design to typical communication towers: tall, lighted, lattice structured, and guyed. These types of towers can be problematic for birds, particularly during inclement weather, as they enter the lighted area, become reluctant to leave it, and suffer mortality as they circle the structure and collide with the guy wires or the lattice tower itself. We recommend following the guidance set forth in *"U.S. Fish and Wildlife Service Interim Guidelines for Recommendations on Communications Tower Siting, Constructions, Operation and Decommissioning,"* found online at: http://www.fws.gov/habitatconservation/communicationtowers.html, to minimize the threat of avian mortality at these towers. Monitoring at these towers would provide insight to the effectiveness of the minimization measures. We request the results of any wildlife monitoring and any data obtained regarding wildlife mortality at towers associated with this project.

In order to obtain information on the usefulness of the communications tower guidelines in preventing birds strikes and to identify any recurring problems with their implementation which may necessitate modifications, please advise us of the final location and specifications of any towers associated with the wind turbine project and which of the measures recommended for the protection of migratory birds were implemented. If any of the recommended measures cannot be implemented, please explain why they were not feasible. A Tower Site Evaluation Form is also available via the above communication tower website (http://www.fws.gov/habitatconservation/communicationtowers.html). If meteorological towers are to be constructed, please complete this form and forward it to our office.

Power Lines

The construction of additional overhead power lines associated with wind farms creates the threat of avian electrocution, particularly for raptors, and collisions. Thousands of these birds, including endangered species, are killed annually as they attempt to utilize overhead power lines as nesting, hunting, resting, feeding, and sunning sites. The Service recommends the installation of underground, rather than overhead, power lines whenever possible/appropriate to minimize environmental disturbances. For all new overhead lines or modernization of old overhead lines, we recommend incorporating measures to prevent avian electrocutions. The publication entitled *"Suggested Practices for Avian Protection on Power Lines - The State of the Art in 2006"* has many good suggestions, including pole extensions, modified positioning of live phase conductors and ground wires, placement of perch guards and elevated perches, elimination of cross arms, use of wood (not metal) braces, and installation of various insulating covers. You may obtain this publication by contacting the Edison Electric Institute via their website at www.eei.org or by calling 1-800-334-5453.

Please note that utilizing just one of the *"Suggested Practices . . ."* methods may not entirely remove the threat of electrocution to raptors. In fact, improper use of some methods may increase electrocution mortality. Perch guards, for example, may be only partially effective as some birds may still attempt to perch on structures with misplaced or small-sized guards and suffer electrocution as they approach too close to conducting materials. Among the most dangerous structures to raptors are poles that are located at a crossing of two or more lines, exposed above-ground transformers, or dead end poles. Numerous hot and neutral lines at these sites, combined with inadequate spacing between conductors, increases the threat of raptor electrocutions. Perch guards placed on other poles has in some cases served to actually shift birds to these more dangerous sites, increasing the number of mortalities. Thus, it may be necessary to utilize other methods or combine methods to achieve the best results. The same principles may be applied to substation structures.

Please also note that the spacing recommendation within the *"Suggested Practices . . ."* publication of at least 60 inches between conductors or features that cause grounding may not be protective of larger raptors such as eagles. This measure was based on the fact that the skin-to-skin contact distance on these birds (i.e., talon to beak, wrist to wrist, etc.) is less than 60 inches. However, an adult eagle's wingspan (distance between feathertips) may vary from 66 to 96 inches depending on the species (golden or bald) and gender of the bird. Unfortunately, wet feathers in contact with conductors and/or grounding connections can result in a lethal electrical surge. Thus, the focus of the above precautionary measures should be to a) provide more than 96 inches of spacing between conductors or grounding features, b) insulate exposed conducting features so that contact will not cause raptor electrocution, and/or c) prevent raptors from perching on the poles in the first place.

Additional information regarding simple, effective ways to prevent raptor electrocutions on power lines is available in video form. *"Raptors at Risk"* may be obtained by contacting EDM International, Inc. at 4001 Automation Way, Fort Collins, Colorado 80525-3479, Telephone No. (970) 204-4001, or by visiting their website at: http://www.edmlink.com/raptorvideo.htm.

In addition to electrocution, overhead power lines also present the threat of avian line strike mortality. Particularly in situations where these lines are adjacent to wetlands or where waters exist on opposite sides of the lines, we recommend marking them in order to make them more visible to birds. For more information on bird strikes, please see *"Mitigating Bird Collisions With Power Lines: The State of the Art in 1994"* which may be obtained by contacting the Edison Electric Institute at the same website and telephone number listed above. Please note that, while marking of power lines reduces line strike mortality, it does not preclude it entirely. Thus, marking of additional, existing, overhead lines is recommended to further offset the potential for avian line strike mortality.

Avian Protection Plans

As a means to address some of the above issues, the Service has coordinated with the Avian Power Line Interaction Committee (APLIC) to develop guidelines to assist companies in formulating Avian (and Bat) Protection Plans (APP). APPs are utility-specific and designed to reduce avian and operational risks that result from avian interactions with electric utility facilities, but they may be adapted to wind energy facilities as well and include consideration of bat species which are known to suffer mortality at wind farms. We encourage project developers to investigate the formulation of an Avian (and Bat) Protection Plan for specific projects and perhaps generate APPs at the company level. The APP guidelines may be accessed at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/BirdHazards.html.

The Service has developed an online reporting system for mortalities. Instructions for our "Bird Fatality/Injury Reporting Program" may be found online at: http://www.aplic.org/USFWS_BirdFatality_FilerInstructions.pdf, and the reporting site itself is located online at: https://birdreport.fws.gov/. Migratory bird mortalities or injuries located by your company, contractors, or other individuals should be recorded to this online site within 30 days of discovery. Use of this reporting program will benefit migratory birds by increasing our tracking capability of activities impacting migratory birds. This program may be used to compliment an Avian (and Bat) Protection Plan.

MBTA and BGEPA

Although adherence to the Service's recommendations will provide some protection for migratory birds, implementation of these measures alone will not remove any liability should violations of the law occur. The MBTA prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. The BGEPA prohibits knowingly taking, or taking with wanton disregard for the consequences of an activity, any bald or golden eagles or their body parts, nests, or eggs, which includes collection, molestation, disturbance, or killing activities (again, refer to the new regulations regarding take of eagles in the September 11, 2009, publication of the Federal Register for additional information).

While the MBTA has no provision for allowing unauthorized take, the Service realizes that some birds may be killed as a result of this project even if all reasonable measures to protect them are used. The Service's Office of Law Enforcement carries out its mission to protect migratory birds through investigations and enforcement as well as by fostering relationships with individuals, companies, and industries that have taken effective steps to minimize their impacts on migratory birds and by encouraging others to enact such programs. It is not possible to absolve individuals, companies, or agencies from liability even if they implement avian mortality avoidance or similar conservation measures. However, the Office of Law Enforcement focuses its resources on investigating and prosecuting individuals and companies that take migratory birds without regard for their actions or without following specific agreements to avoid take.

In summary, the following items are pertinent to the proposed project, and we recommend addressing these issues if/when the project progresses:

- ✓ ESA listed species impacts: Topeka shiner
- ✓ Bald and golden eagle impacts (BGEPA and MBTA)
- ✓ Migratory bird impacts (MBTA), including Birds of Conservation Concern, with application of pre-/post-construction monitoring and mortality data and mitigative/offsetting measures to be coordinated with and reported to the Service
- ✓ USGS avian/wind studies and potential participation in their ongoing research
- ✓ Service easement impacts
- ✓ Fisheries and wetlands impacts
- ✓ SDDGFP wind siting guidelines and bat issues

✓ Existing guidelines for various project components:

a) Wind farm siting: Service's *"Interim Guidelines to Avoid and Minimize Wildlife Impacts from Wind Turbines"*

b) Meteorological Towers: Service's *"Interim Guidelines for Recommendations on Communications Tower Siting, Constructions, Operation and Decommissioning"* and the associated Tower Site Evaluation Form

c) Overhead power lines: APLIC's *"Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006"* and *"Mitigating Bird Collisions With Power Lines: The State of the Art in 1994"*

d) Overall project construction/operation: Service's *"National Bald Eagle Management Guidelines,"* APLIC's *"Avian Protection Plan Guidelines,"* and the Service's "Bird Fatality/Injury Reporting Program"

If changes are made in the project plans or operating criteria, or if additional information becomes available, the Service should be informed so that the above determinations can be reconsidered.

The Service appreciates the opportunity to provide comments. If you have any questions on these comments, please contact Natalie Gates of this office at (605) 224-8693, Extension 234.

Sincerely,

P Gober

Pete Gober
Field Supervisor
South Dakota Field Office

cc: Service/Waubay WMD; Waubay, SD
(Attention: Larry Martin)
Secretary, SDDGFP; Pierre, SD
(Attention: Silka Kempema)
USGS/NPWRC; Jamestown, ND
(Attention: Jill Shaffer)
SDPUC; Pierre, SD
(Attention: Brian Rounds)

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TETRA TECH

February 11, 2015

Mr. Jeff Vonk
Secretary
South Dakota Game Fish and Parks
523 East Capitol Avenue
Pierre, SD 57501

RE: Crowned Ridge Wind Energy Center in Codington and Grant Counties, South Dakota

Dear Mr. Vonk:

As part of our Tier 1 preliminary site evaluation and Tier 2 site characterization under the U.S. Fish and Wildlife Service (USFWS) voluntary Land-Based Wind Energy Guidelines, Tetra Tech, Inc. (Tetra Tech) is writing on behalf of NextEra Energy Resources, LLC (NextEra), to request information regarding ecologically significant areas and listed endangered, threatened or special concern species including eagles at a potential wind energy development site in Codington and Grant counties, South Dakota. We contacted your agency in 2007 regarding a much larger area for wind energy development that NextEra may develop in a later phase (see attached response letter dated December 3, 2007); however, the current project area in in Codington and Grant counties is the subject of this inquiry.

The proposed Crowned Ridge Wind Energy Center (Project) is anticipated to have a nameplate capacity of 200 megawatts and to begin commercial operation in 2016. A 40-mile, 230-kV transmission line is also proposed. We will submit an application to the South Dakota Public Utilities Commission (PUC) for a Facility Permit, as required under South Dakota Codified Law (SDCL) Chapter 49-41B and South Dakota Administrative Rules, Section 20:10:22.

The 26,038-acre Project Area is depicted on the enclosed United States Geological Survey (USGS) topographic map; a corridor for the proposed 40-mile transmission line is also shown on the map. The land sections within the Project Area and transmission line corridor are listed in the tables below. We have provided the map to facilitate your review and greatly appreciate your efforts to treat the Project and its location as confidential at this time.

Project Area:

County	Township Name	Township	Range	Sections
Grant	Mazeppa	120N	51W	7-8, 17-20, 29, 32
Codington	Germantown	119N	52W	24-26, 36
	Leola	119N	51W	4-5, 7-9, 17-19, 26-35
	Germantown	118N	52W	24
	Waverly	118N	51W	2-5, 8-11, 14-19, 22-23, 26-27

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Transmission Line Corridor:

County	Township Name	Township	Range	Sections
Codington	Leola	119N	51W	13-17, 20-30, 36
Grant	Vernon	119N	48W	6,7,19
Grant	Madison	119N	49W	1-2, 10-24, 30, 31
Grant	Stockholm	119N	50W	13-36
Grant	Alban	120N	48W	1-2, 11-14, 20-33
Grant	Grant Center	120N	49W	25, 36
Grant	Big Stone	121N	46W	18
Grant	Big Stone	121N	47W	13, 24-26, 34-36

In addition to federally protected wildlife and plant species, Tetra Tech is interested in sensitive habitats and wildlife management areas that may be located in or proximate to the proposed Project Area. In particular, we would like information on documented eagle nests within 10 miles of the Project Area and 2 miles of the transmission line corridor. Tetra Tech has also contacted the USFWS South Dakota Field Office, the USFWS Habitat and Population Evaluation Team, and the Waubay Wetland Management District.

Additionally, we have initiated Tier 3 field studies at the Project Area. We have previously conducted fall and spring avian use surveys and native prairie surveys and performed wetland delineations. In March 2014, we initiated a year of eagle use surveys. Our survey protocol for the eagle use surveys are attached as Appendix 1 for your review and comment. We also conducted fall avian point-count surveys in 2014 and will conduct spring avian point-count surveys in 2015. It is our goal to perform a thorough analysis of environmental concerns within the potential Project Area. We will use the information provided by the USFWS and South Dakota Game Fish and Parks to help guide Project development in a manner that avoids impacts to sensitive resources to the extent possible. If possible, we would appreciate a response by March 10, 2015.

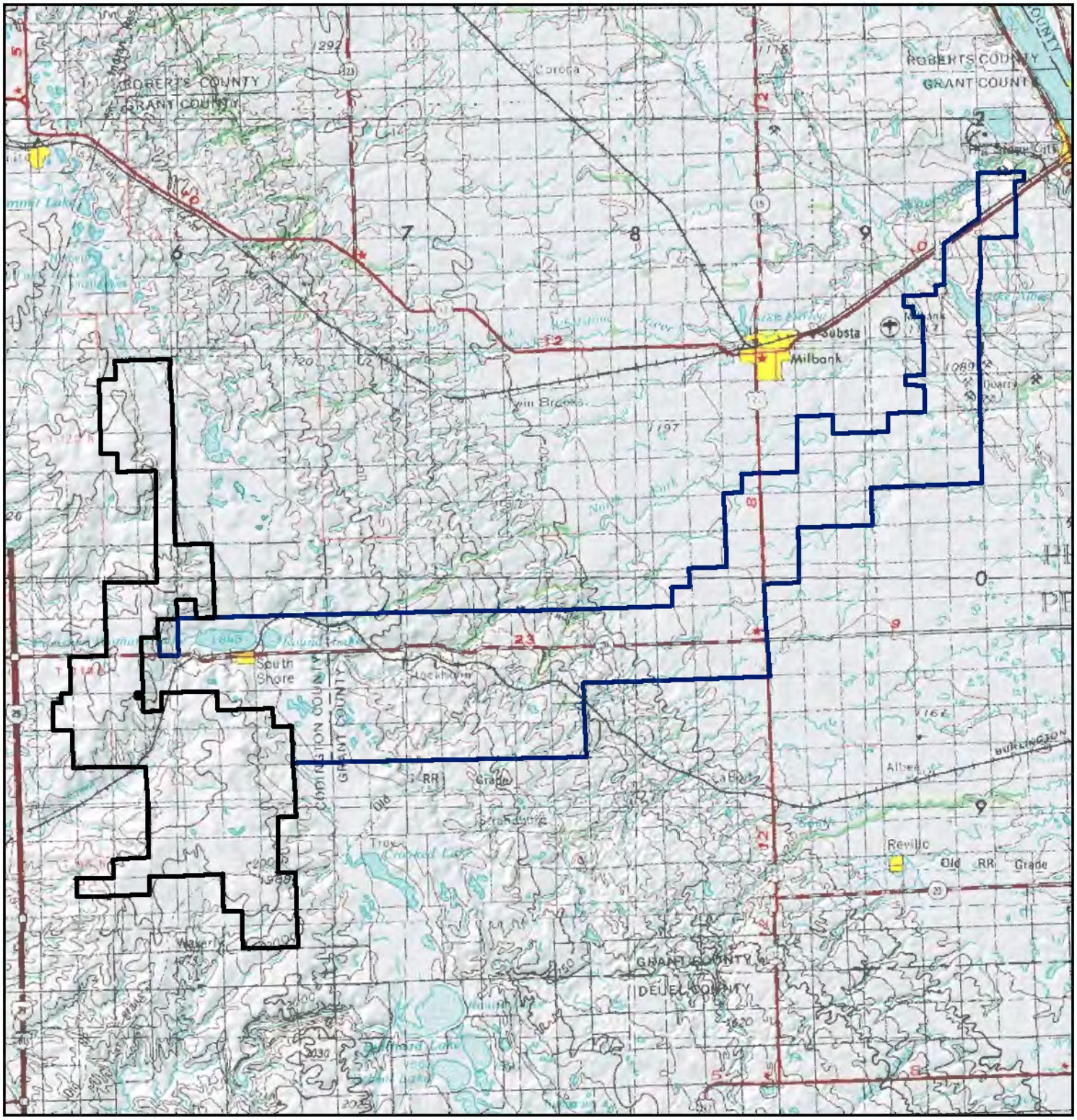
Should you have any questions or require additional information, please do not hesitate to contact me directly by phone at 512-213-8501 or email at anne-marie.griger@tetratech.com. Thank you for your assistance.

Respectfully submitted,

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

Attachments: SDGFP letter dated December 3, 2007
Map
Appendix 1

TETRA TECH



NEXTera ENERGY RESOURCES

Crowned Ridge

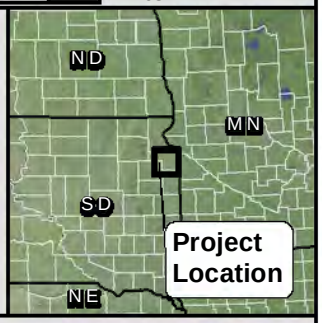
Codington and Grant Counties, SD
February 2015

1:238,000 WGS84 UTM Zone 14N

0 0.5 1 2 3 4 Miles

Project Boundary (11-24-2014)

Transmission Line Boundary (2015-02-04)



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APPENDIX 1

1) Eagle Use Surveys

The objective of eagle use surveys is to document eagle movements and behavior within and adjacent to the Project Area in all four seasons in order to assess risk to eagle species. Tetra Tech will conduct eagle use surveys following the general methods outlined in the Eagle Conservation Plan Guidance. Eagle use surveys will focus exclusively on eagles, and will occur at up to 18 survey plots. This number of point-count locations is sufficient to provide spatial coverage of approximately 26 percent of a 1-km buffer around turbine locations.

Eagle use surveys will be conducted by a qualified avian biologist beginning in spring 2014 and continue for one calendar year to capture temporal variation in eagle use of the Project Area. Surveys will be conducted twice per month during the spring (March 16 – June 15), summer (June 16 – August 15), fall (August 16 – November 15), and winter (November 16 – March 15). Each survey visit will occur over 2.5 days. There will be 26 survey weeks in total. Individual surveys will consist of a 1-hour observation period at each of the 18 point-count locations during each week of surveys, for a total of 468 hours of observations.

Eagle use data will be collected in 1-minute intervals so that the data can be translated into eagle exposure minutes, as recommended in the ECP Guidance. The data recorded for each survey will include the count start and stop times, eagle species observed, numbers and age classes of eagles seen, minutes of eagle flight in two height categories based on the ECP Guidance (≤ 200 and >200 meters {m} above ground), notes on flight and other behaviors, and an individual identifier for each flight observation allowing it to be linked to a flight map. Each eagle flight observed will be drawn on a topographic map or aerial image of the Project Area and digitized using a GIS so that eagle locations and behaviors can be overlaid with Project features. Numerical data will be collected within 800-m-radius plots, but flight lines will be documented across line-of-sight and will not be limited to the 800-m-radius survey plot.

DEPARTMENT OF GAME, FISH AND PARKS
Foss Building
523 East Capitol
Pierre, South Dakota 57501-3182

December 3, 2007

Erik W. Jansen, Biologist
Tetra Tech EC, Inc.
1750 SW Harbor Way, Suite 400
Portland, OR 97201

RE: Environmental review of Eastern and North-central Wind Resource Area as potential wind power project areas

Dear Mr. Jansen:

The following comments are in response to your letter dated 19 October 2007 requesting environmental considerations and concerns of the Eastern (W1/2 Grant Co., NE 1/4 Codington Co., W1/2, S1/2 Duel Co., and NE1/4 Brookings Co.) and North-central (McPherson County) Wind Resource Areas.

The proposed siting and operation of these wind power projects have potential to directly and indirectly impact area wildlife by killing bats and birds through wind turbine and power line strikes and altering important and declining habitats and breeding and movement behavior of wildlife. While we applaud efforts to provide alternative energy sources, we offer the following considerations for your planning efforts, encouraging responsible siting and mitigation where appropriate to avoid or lessen direct and indirect impacts. As requested, I have provided separate comments for each wind resource area in addition to final comments that apply to any other potential wind power project in South Dakota.

Eastern Wind Resource Area (EWRA)

Grasslands - The EWRA is located within the tall-grass prairie zone. Native grasslands within this zone are decreasing at an alarming rate. Less than one percent of native tall-grass prairie habitat in South Dakota remains (Samson et al. 1998). Other grassland types such as rangeland (grazed grasslands with native plant spp.), pasture (grazed grasslands with non-native plant spp.) and Conservation Reserve Program lands (tilled land planted to vegetative cover) serve as grassland wildlife habitat (Haufler 2005). Fragmentation resulting from woody encroachment, road construction, and conversion of surrounding habitat has resulted in the remaining grassland habitats existing as smaller disjunct patches. Patches often provide less suitable habitat for many native species of grassland wildlife. Some of the last remaining contiguous grasslands tracts occur along the Coteau escarpment that angles through the EWRA.

Grassland birds - Placement of turbines in this area may fragment grassland wildlife habitat reducing its suitability to serve as habitat and modify behavior of grassland bird species, a group of species which has shown the most consistent and long term declines of any other group of bird species in North America (Peterjohn and Sauer 1999). This area is known to have abundant sharp-tailed grouse populations. Greater prairie chickens also are present. The greater prairie chicken is a species known to be area-sensitive, requiring comparatively large tracts of open, contiguous grassland. The lesser prairie chicken, a similar species found more commonly in the southern Great Plains, avoids nesting within 400 m of transmission lines or improved roads (Pitman et al 2004). This highly suggests that placement of turbines and associated infrastructure (roads and transmission lines) may also negatively affect greater prairie chickens.

Birds are susceptible to direct strikes with wind turbines. Based on a study conducted in the Buffalo Ridge area of Minnesota, species with known wind turbine strike mortality and are known to occur in the EWRA include grasshopper sparrow and western meadowlark (Higgins et al 2007).

Properly timed, species-appropriate surveys for prairie grouse (greater prairie chickens and sharp-tailed grouse) and other grassland bird species should be conducted pre-construction. Prairie grouse surveys should be conducted in spring when breeding individuals are on communal display grounds (leks). Surveys for other breeding grassland birds are best conducted in June, although mid-May through early July is acceptable.

Butterflies - Four rare butterfly species are located within the EWRA. These species are classified as Species of Greatest Conservation Need, as listed in our State Wildlife Action Plan (http://www.sdgfp.info/Wildlife/Diversity/Comp_Plan.htm) and are rare species monitored by our Natural Heritage Program (NHP). They include: 1) Dakota skipper, 2) Powesheik skipperling, 3) regal fritillary, and 4) Ottoe skipper.

The range of the Dakota skipper in South Dakota is limited to eleven counties in the north eastern portion of the state. The Dakota skipper requires native mid- to tall-grass prairie and is found on rolling rangeland with abundant wetlands. Larval host plants are grasses, especially little bluestem. Flight of emerging adults occurs from June to mid-July. This species is a candidate for listing under the Federal Endangered Species Act (ESA). As such, I recommend contacting the U.S. Fish and Wildlife Ecological Services Field office in Pierre, South Dakota (605-224-8693) for further information regarding the protection of this species required under ESA. Current threats to this species include, but are not limited to, improper land management uses, agricultural cultivation, road construction, and invasive plant species. South Dakota populations are important to the existence of this species and approximately half of known populations are located on private lands.

The Powesheik skipperling distribution in South Dakota also is limited to eleven counties in the north eastern portion of the state. The Powesheik skipperling prefers native tall-grass prairie and wetlands. Larval host plants are sedges. Flight of emerging adults occurs primarily in July. Threats include excessive prescribed burning, loss of habitat due to conversion to other uses, invasive plants, population isolation, and extreme population crashes.

The regal fritillary is rapidly declining across its range in the United States. In South Dakota, its range is restricted to native prairie sites. Some of the last strongholds of this species are located in prairie states, such as South Dakota, with areas of large expanses of suitable habitat (such as the EWRA) that support larval host plants (violets). Flight periods are from June to September. Threats include loss and fragmentation of habitat to agriculture (excluding grazing or haying), conversion to cropland, woody encroachment, chemicals (e.g., pesticides and herbicides), and improper fire management.

The Ottoe skipper also requires relatively undisturbed native prairie with nectar sources (coneflowers, grayfeathers, asters, etc). It is uncommon to rare throughout the state. Peak flight for the Ottoe skipper is in mid-July. The reduction and degradation of prairie habitat is the main threat to this species.

The conservation of the four rare butterfly species documented in the EWRA requires protection of remaining undisturbed tracts of native prairie with associated nectar sources and larval host plants. There are potential disturbances to these rare butterfly species associated with the construction and maintenance of a wind power project. Road construction and turbine pad maintenance increases the chances of non-native, invasive plant species invasion. Chemical control of these species is a known threat. Pre-construction surveys for these species should be conducted during the appropriate times (flight periods). Construction in areas that are or potential butterfly habitat should be avoided.

Wetlands - The proposed project area is located within the Prairie Pothole region. This glaciated region, characterized by high densities of wetland basins of various depths and sizes, extends from Iowa into Minnesota, the Dakotas, Montana and parts of Canada. It is the major waterfowl production area in North America. Wetland losses in the Prairie Pothole Region are staggering and range from 99% in Iowa to 35% in South Dakota. Wetland basin densities (# of basins/10 mi^2) in the EWRA range from 90 to over 420 basins/10 $miles^2$. More specifically, this area is known to have some of the highest seasonal and semipermanent wetland basin densities in the state (Johnson and Higgins 1997). These remaining, high density wetlands provide critical wildlife habitat.

Wetland birds - Waterbird species such as loons, black terns, great egrets, and green backed herons are known to occur in the EWRA. Abundant waterfowl such as mallard, blue-winged teal, redhead, ruddy duck, American coot, and bufflehead also can be found in the area. Birds are susceptible to direct strikes with wind turbines. Based on a study conducted in the Buffalo Ridge area of Minnesota, species with known wind turbine strike mortality and are known to occur in the EWRA include ruddy duck, American coot, and Franklin's gull (Higgins et al 2007). Proper siting of turbines outside of daily and seasonal migration routes of waterbirds and waterfowl and the protection of remaining wetlands within the proposed project area is crucial to reduce the impact to wetland dependent species.

Bats - Bats forage and migrate along rivers, streams, and lakes. Construction of a wind power plant may affect daily and seasonal bat movements between breeding and foraging areas. Thirteen species of bats are found in South Dakota, some of which are summer residents, year-round residents, or migratory (Table 1).

Table 1. South Dakota Bats

Common Name	Scientific Name	State Residency
Big Brown Bat	*Eptesicus fuscus*	Year-round resident
Fringed Myotis	*Myotis thysanodes*	Year-round resident
Little Brown Myotis	*Myotis lucifugus*	Year-round resident
Long-eared Myotis	*Myotis evotis*	Year-round resident
Long-legged Myotis	*Myotis volans*	Year-round resident
Northern Myotis	*Myotis septentrionalis*	Year-round resident
Townsend's Big-eared Bat	*Corynorhinus townsendii*	Year-round resident
Western Small-footed Myotis	*Myotis ciliolabrum*	Year-round resident
Hoary Bat	*Lasiurus cinereus*	Summer resident
Silver-haired Bat	*Lasionycteris noctivagans*	Summer resident
Evening Bat	*Nycticeius humeralis*	Migratory
Eastern pipistrell	*Pipistrellus subflavus*	unclassified

There has been limited research conducted on bats in South Dakota. However, Swier (2006) reported four species of bats occurring near the EWRA: 1) big brown bat, 2) Eastern red bat, 3) hoary bat, and 4) little brown myotis.

Six bat species are considered rare and monitored by the NHP: 1) long-eared myotis, 2) fringed myotis, 3) Northern myotis, 4) silver-haired bat, 5) Townsend's big-eared bat, and 6) evening bat. Although the NHP data base has no records of theses species in the proposed project area, this does not preclude the presence of any of these species in the area. Because of limited, EWRA-specific data, we would suggest pre-construction surveys of the area for potential bat habitat and species. Surveys for species should be conducted for at least one full year before construction.

Recently, South Dakota Department of Game, Fish and Parks (SDGFP) in cooperation with the South Dakota Bat Working Group (SDGWG), developed a South Dakota Bat Management Plan specific to bats and their habitats in South Dakota (http://www.sdgfp.info/Wildlife/Diversity/batmanagmentplan71304.pdf). Please review this document for pertinent information. Again, because bats reside and migrate through South Dakota, it is important to evaluate the propose project area for roosting, feeding, migration and/or stopover habitat and to survey these areas for bats.

Landscape considerations - Placement of a wind power project should take into account larger landscape-level (e.g. surrounding land uses) and cumulative impacts (e.g. existing and potential wind power projects) as well as project associated infrastructure (i.e. transmission lines and roads).

Public lands - Several Game Production Areas within the EWRA are managed by SDGFP. Placement of public lands is often done so in areas with existing and potential wildlife habitat. Management of these lands, for wildlife, is conducted in the public interest. In addition, several USFWS Waterfowl Protection Areas are also located within the EWRA. Public lands managed

for wildlife may be affected by the placement of a wind power project in the vicinity.

Migrating wildlife - The resulting mosaic of grassland and wetland basins and corridors makes it an important migration route for birds (e.g., neotropical migrants, shorebirds, and waterfowl). The Central Flyway, an important pathway for migratory ducks, geese, swans, and cranes runs through the midsection of the country, including South Dakota. Species using this flyway during migration, and particularly during inclement weather when birds alter their flight altitude, may suffer increased mortality due to direct strikes with wind turbines and associated power lines. Appropriately timed, pre-construction surveys for migratory bird species should be conducted. Spring migration can begin as early as late-March, early-April, tapering off in mid-May, depending on the species. Fall migration can begin as early as mid-July and extend through October/November depending on weather conditions and species.

Powerlines - Construction of powerlines is often associated with a proposed wind power project. Power line strikes are a known cause of mortality to birds (Erickson et al. 2005). Waterfowl (ducks, geese, swans, and cranes), raptors, and passerines are species most susceptible to powerline collisions. The Avian Protection Power line Interaction Committee (APLIC) has developed two documents that may be of use to reduce powerline strikes and mortality: 1) 'Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006' and 2) 'Mitigating Bird Collisions with Power lines'. Both of these documents are available from the Edison Institute (http://www.aplic.org/, under 'products and services'). The new and existing power lines associated with the proposed project should be buried, marked, or retrofitted to reduce strikes and electrocutions of bird species.

Non-native species - During the construction and maintenance phase of a wind power project existing roads often experience increased traffic and new roads are constructed. This increases the amount of area disturbed and allows for the introduction and establishment of non-native species. Resulting control of those species through pesticides and herbicides may also impact habitats of rare wildlife species. Non-native species are one of the major threats to rare and declining wildlife species. Improved access can also increase human activity in the area.

The matrix of grassland and wetland habitats in the proposed project area plays a crucial role in the life history of several wildlife species whether migratory or resident. Because of the potential impacts placement of the proposed wind power project would have on unique and declining habitats in the region and their associated species, we recommend the placement of turbines in areas currently disturbed (e.g. cultivated areas) and the use of existing infrastructure (roads and transmission lines) as much as possible.

North-central Wind Resource Area (McPherson County)

Grassland habitat - McPherson County is located within the mixed-grass prairie zone. In the United States, native mixed-grass prairie is disappearing at an alarming rate. In South Dakota, the area of mixed-grass prairie has decreased 70% (Samson et al. 1998). The native prairie that still remains is most often grazed (i.e. rangeland). These and other grassland types such as pasture (grazed grasslands of non-native plant spp.) and Conservation Reserve Program lands (tilled land idled and planted to vegetative cover) also serve as grassland wildlife habitat (Haufler 2005). Fragmentation resulting from woody encroachment, road construction, and conversion of surrounding habitat has resulted in the remaining grassland habitats existing as smaller disjunct patches. Patches often provide less suitable habitat for many native species of grassland wildlife. McPherson County has large tracts of contiguous grassland habitat (including rangeland) located along the ridge extending through Wacker, Weber, Hoffman, and Central McPherson townships.

Grassland birds - Placement of turbines in this area may fragment grassland wildlife habitat reducing its suitability to serve as habitat and modify behavior of grassland bird species, a group of species which has shown the most consistent and long term declines of any other group of species in North America (Peterjohn and Sauer 1999). Two grassland bird species, Baird's sparrow and Sprague's pipit, are known to occur in McPherson County. Range-wide, both of these species have exhibited significant long term negative population trends. In South Dakota, these species hold special conservation status and are classified as Species of Greatest Conservation Need, as listed in our State Wildlife Action Plan (http://www.sdgfp.info/Wildlife/Diversity/Comp_Plan.htm) and are rare species monitored by our NHP. In addition, these species are considered Grassland Species of Concern in South Dakota (Bakker 2005). Regionally they are Species of Special Concern as defined by Partner's in Flight and are considered a Species of Conservation Concern by the USFWS. The amount of emphasis placed on the conservation of these species indicates populations are declining.

Baird's sparrows breed in the north-western and north-central part of the state. Throughout most of its breeding range, it is known to prefer native mixed grass prairie interspersed with forbs (broad-leaved, herbaceous plant), moderate amounts of litter (dead layers of vegetation), and little to no shrub cover. Although the Baird's Sparrow has a strong tendency to prefer native prairie, it can be observed in non-native grasslands (e.g. crested wheatgrass) that provide appropriate habitat structure. Baird's sparrows are known to prefer large patches of grassland habitat and show avoidance of areas with extensive woody vegetation and areas near roads.

Sprague's pipits are found in the northwestern portion of the state, preferring plains and short-grass prairie with intermediate vegetation height. This species prefers native prairie, although they are known to occupy habitat consisting of non-native plant species. Sprague's pipits are most common in large contiguous grassland areas and are known to be area sensitive.

Properly timed, species-appropriate pre-construction surveys should be conducted for grassland bird species. Surveys for most breeding grassland birds are best conducted in June, although mid-May through early July is suitable. Prairie grouse surveys should be conducted in spring when breeding individuals are on communal display grounds (leks).

Wetland habitats - McPherson County is located within the Prairie Pothole Region. This glaciated region, characterized by a diversity and quantity of basin wetlands, extends from Iowa into Minnesota, the Dakotas, Montana and parts of Canada. It is the major waterfowl production area in North America. Wetland losses in the Prairie Pothole Region are staggering and ranging from 99% in Iowa to 35% in South Dakota. Throughout McPherson County, wetland basin density is high (270 - over 420 basins/10 mi^2). More specifically, the eastern quarter of the County has some of the highest concentrations of temporary and seasonal wetlands (Johnson and Higgins 1997) in the state. Remaining wetlands provide important wildlife habitat.

Wetland birds - In terms of waterfowl breeding activity, the western two-thirds of McPherson County has over 100 breeding duck pairs/mi^2. This is some of the highest breeding waterfowl densities in the Prairie Pothole region. Conservation of this habitat also is critical to waterbirds and shorebirds for breeding, feeding, and migration habitat.

Bird diversity - Reflective of the diversity and quality of native wetland and grassland habitats in the region, the northeastern portion of McPherson County has some of the highest bird species richness in the state (Peterson 1995). This is based upon data gathered from a five-year, state-wide breeding bird survey efforts.

Bats - Bats forage and migrate along rivers, streams and lakes. Construction of a wind power project may affect daily and seasonal bat movements between breeding and foraging areas. Thirteen species of bats are found in South Dakota, some of which are summer residents, year-round residents, or migratory (Table 1). There has been limited research conducted on bats in South Dakota, especially in McPherson County. The NHP database has no records of bat species considered rare in the proposed project. However, this does not preclude the presence of any of these or other bat species in the area. Because of limited information on bats in McPherson County, we would suggest pre-construction surveys of the area for potential bat habitat and species. Surveys for species should be conducted for at least one full year before construction.

Recently, SDGFP in cooperation with the SDBWG, developed a South Dakota Bat Management Plan specific to bats and their habitats in South Dakota (http://www.sdgfp.info/Wildlife/Diversity/batmanagmentplan71304.pdf). Please review this document for pertinent information. Again, because bats reside and migrate through South Dakota, it is important to evaluate the propose project area for roosting, feeding, migration and/or stopover habitat and to survey these areas for bats.

Landscape considerations - Placement of a wind power project should take into account larger landscape-level (e.g. surrounding land uses) and cumulative impacts (e.g. existing and potential wind power projects) as well as project associated infrastructure (i.e. transmission lines, roads).

Public lands - Several Game Production Areas within McPherson County are managed by SDGFP. Placement of public lands is often done so in areas with existing and potential wildlife habitat. Management of these lands, for wildlife, is conducted in the public interest. In addition, several U. S. Fish and Wildlife Service Waterfowl Protection Areas are also located within McPherson County. Public lands managed for wildlife may be affected by the placement of a

wind power project in the vicinity.

Migrating wildlife - The resulting mosaic of grassland and wetland basins and corridors in the County make it an important migration route for birds (e.g., neotropical migrants, shorebirds, waterfowl). The Central Flyway, an important pathway for migratory ducks, geese, swans, and cranes runs through the midsection of the country, including South Dakota. Species using this flyway during migration, and particularly during inclement weather when birds alter their flight altitude, may suffer increased mortality due to direct strikes with wind turbines and associated power lines. Appropriately timed, pre-construction surveys for migratory bird species should be conducted. Spring migration can begin as early as late-March, early-April, tapering off in mid-May, depending on the species. Fall migration can begin as early as mid-July and extend through October/November depending on weather conditions and species.

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Non-native species - During the construction and maintenance phase of a wind power projects existing roads often experience increased traffic and new roads are constructed. This increases the amount of area disturbed and allows for the introduction and establishment of non-native species. Resulting control of those species through pesticides and herbicides may also impact habitats of rare wildlife species. Non-native species are one of the major threats to rare and declining wildlife species. Improved access can also increase human activity in the area.

The matrix of grassland and wetland habitats in the proposed project area plays a crucial role in the life history of several wildlife species whether migratory or resident. Because of the potential impacts placement of the proposed wind power project would have on unique and declining habitats in the region and their associated species, we recommend the placement of turbines in areas currently disturbed (e.g. cultivated areas) and the use of existing infrastructure (roads and transmission lines) as much as possible.

Research and Monitoring

As outlined above, our agency has concerns regarding direct and indirect impacts to wildlife and habitats in association with the siting of the proposed project. Before project construction, appropriate monitoring should be conducted to determine bird and bat use of the project areas. Based upon results of these studies, project construction should be modified, continued, or cancelled. If the project is continued, monitoring should be conducted for a minimum of two years post-construction to determine if and how many bird and bat strikes are caused by this project, if habitats have been significantly altered, and if the surrounding public lands and their uses have been impacted. Any mitigation should be carefully planned, funded, and followed.

If monitoring involves live trapping or collection of wildlife species, you must first obtain a collection permit from our agency. Also, we kindly request that if you or your associates observe any of the animal (http://www.sdgfp.info/Wildlife/Diversity/RareAnimal.htm) or plant species (http://www.sdgfp.info/Wildlife/Diversity/rareplant2002.htm) monitored by the NHP, please contact myself or any of our NHP staff (http://www.sdgfp.info/Wildlife/Diversity/staff_contact.htm).

In coordination with the SDBWG, the SDGFP has developed 'Siting Guidelines for Wind Power Projects in South Dakota' This document addresses many of the concerns involved with siting wind power projects in South Dakota and may be found at on the world wide web (http://www.sdgfp.info/Wildlife/Diversity/windpower.htm). I have enclosed a copy for your convenience.

The SDGFP appreciates the opportunity to provide comments on the proposed project wind resource areas. As plans are further refined, I would be willing to conduct a site visit with you or your associates to continue to provide siting recommendations to reduce conflicts with wildlife. If you have any questions on the above comments, please feel free to contact me at 605-773-2742 or Silka.Kempema@state.sd.us.

Regards,

Silka Kempema

Silka L. F. Kempema
Terrestrial Wildlife Biologist

CC: Natalie Gates, US Fish and Wildlife Service, Pierre, SD
Will Morlock, SD Game, Fish and Parks, Watertown, SD
Mary Clawson, SD Game, Fish and Parks, Aberdeen, SD

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TETRA TECH

February 11, 2015

Mr. Scott Larson
Field Supervisor
USFWS – South Dakota Field Office
420 S. Garfield Avenue, Suite 400
Pierre, SD 57501-5408

RE: Crowned Ridge Wind Energy Center in Codington and Grant Counties, South Dakota

Dear Mr. Larson:

As part of our Tier 1 preliminary site evaluation and Tier 2 site characterization under the U.S. Fish and Wildlife Service (USFWS) Land-Based Wind Energy Guidelines, Tetra Tech, Inc. (Tetra Tech) is writing on behalf of NextEra Energy Resources, LLC (NextEra), to request information regarding ecologically significant areas and listed endangered, threatened or special concern species including eagles at a potential wind energy development site in Codington and Grant counties, South Dakota. We contacted your agency in 2007 regarding a much larger area for wind energy development that NextEra may develop in a later phase (see attached response letter dated November 26, 2007); however, the current the project area in Codington and Grant counties is the subject of this inquiry.

The proposed Crowned Ridge Wind Energy Center (Project) is anticipated to have a nameplate capacity of 200 megawatts and to begin commercial operation in 2016. A 40-mile, 230-kV transmission line is also proposed. We will submit an application to the South Dakota Public Utilities Commission (PUC) for a Facility Permit, as required under South Dakota Codified Law (SDCL) Chapter 49-41B and South Dakota Administrative Rules, Section 20:10:22.

The 26,038-acre Project Area is depicted on the enclosed United States Geological Survey (USGS) topographic map; a corridor for the proposed 40-mile transmission line is also shown on the map. The land sections within the Project Area and transmission line corridor are listed in the tables below. We have provided the map to facilitate your review and greatly appreciate your efforts to treat the Project and its location as confidential at this time.

Project Area:

County	Township Name	Township	Range	Sections
Grant	Mazeppa	120N	51W	7-8, 17-20, 29, 32
Codington	Germantown	119N	52W	24-26, 36
	Leola	119N	51W	4-5, 7-9, 17-19, 26-35
	Germantown	118N	52W	24
	Waverly	118N	51W	2-5, 8-11, 14-19, 22-23, 26-27

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Transmission Line Corridor:

County	Township Name	Township	Range	Sections
Codington	Leola	119N	51W	13-17, 20-30, 36
Grant	Vernon	119N	48W	6,7,19
Grant	Madison	119N	49W	1-2, 10-24, 30, 31
Grant	Stockholm	119N	50W	13-36
Grant	Alban	120N	48W	1-2, 11-14, 20-33
Grant	Grant Center	120N	49W	25, 36
Grant	Big Stone	121N	46W	18
Grant	Big Stone	121N	47W	13, 24-26, 34-36

In addition to federally protected wildlife and plant species, Tetra Tech is interested in sensitive habitats and wildlife management areas that may be located in or proximate to the proposed Project Area. In particular, we would like information on documented eagle nests within 10 miles of the Project Area and 2 miles of the transmission line corridor. Tetra Tech has also contacted the USFWS Habitat and Population Evaluation Team, the Waubay Wetland Management District, and the South Dakota Game, Fish, and Parks Department (SDGFP).

Additionally, we have initiated Tier 3 field studies at the Project Area. We have previously conducted fall and spring avian use surveys and native prairie surveys and performed wetland delineations. In March 2014, we initiated a year of eagle use surveys. Our survey protocol for the eagle use surveys are attached as Appendix 1 for your review and comment. We also conducted fall avian point-count surveys in 2014 and will conduct spring avian point-count surveys in 2015. It is our goal to perform a thorough analysis of environmental concerns within the potential Project Area. We will use the information provided by the USFWS and SDGFP to help guide Project development in a manner that avoids impacts to sensitive resources to the extent possible. If possible, we would appreciate a response by March 10, 2015.

Should you have any questions or require additional information, please do not hesitate to contact me directly by phone at 512-213-8501 or email at anne-marie.griger@tetratech.com. Thank you for your assistance.

Respectfully submitted,

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

Attachments: USFWS letter dated November 26, 2007
Map
Appendix 1

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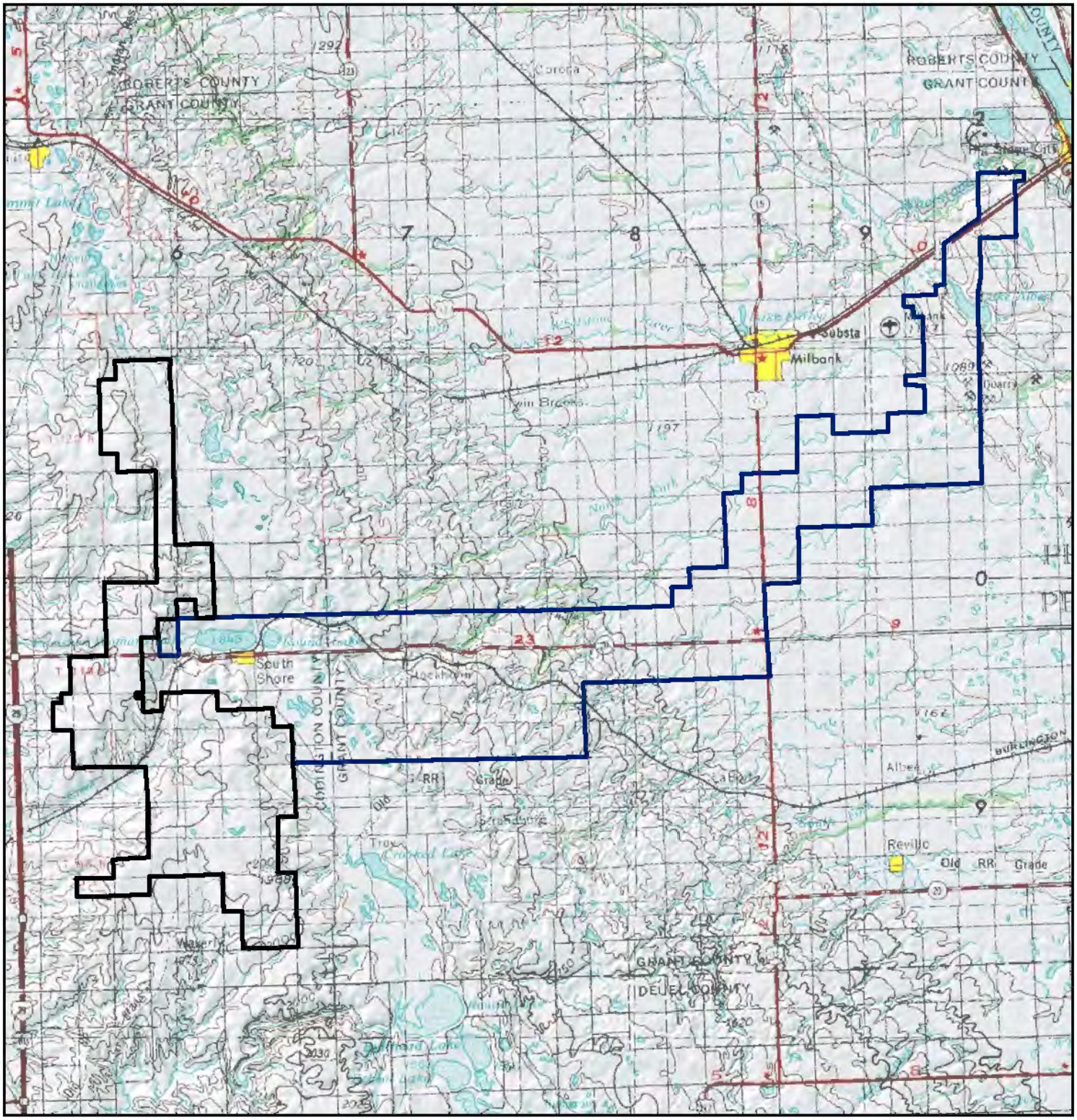
ROBERTS COUNTY
GRANT COUNTY
Milbank
Substa
South Shore
CODINGTON COUNTY
GRANT COUNTY
Revillo
GRANT COUNTY
DEUEL COUNTY
Project Boundary (11-24-2014)
Transmission Line Boundary (2015-02-04)
1:238,000 WGS84 UTM Zone 14N
0 0.5 1 2 3 4
Miles
ND
MN
SD
NE
Project Location
Crowned Ridge
Codington and Grant Counties, SD
February 2015

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TETRA TECH

APPENDIX 1

1) Eagle Use Surveys

The objective of eagle use surveys is to document eagle movements and behavior within and adjacent to the Project Area in all four seasons in order to assess risk to eagle species. Tetra Tech will conduct eagle use surveys following the general methods outlined in the Eagle Conservation Plan Guidance. Eagle use surveys will focus exclusively on eagles, and will occur at up to 18 survey plots. This number of point-count locations is sufficient to provide spatial coverage of approximately 26 percent of a 1-km buffer around turbine locations.

Eagle use surveys will be conducted by a qualified avian biologist beginning in spring 2014 and continue for one calendar year to capture temporal variation in eagle use of the Project Area. Surveys will be conducted twice per month during the spring (March 16 – June 15), summer (June 16 – August 15), fall (August 16 – November 15), and winter (November 16 – March 15). Each survey visit will occur over 2.5 days. There will be 26 survey weeks in total. Individual surveys will consist of a 1-hour observation period at each of the 18 point-count locations during each week of surveys, for a total of 468 hours of observations.

Eagle use data will be collected in 1-minute intervals so that the data can be translated into eagle exposure minutes, as recommended in the ECP Guidance. The data recorded for each survey will include the count start and stop times, eagle species observed, numbers and age classes of eagles seen, minutes of eagle flight in two height categories based on the ECP Guidance (≤ 200 and >200 meters {m} above ground), notes on flight and other behaviors, and an individual identifier for each flight observation allowing it to be linked to a flight map. Each eagle flight observed will be drawn on a topographic map or aerial image of the Project Area and digitized using a GIS so that eagle locations and behaviors can be overlaid with Project features. Numerical data will be collected within 800-m-radius plots, but flight lines will be documented across line-of-sight and will not be limited to the 800-m-radius survey plot.

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United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
420 South Garfield Avenue, Suite 400
Pierre, South Dakota 57501-5408

March 23, 2014

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

Re: Crowned Ridge Wind Energy Center, Codington and Grant Counties, South Dakota

Dear Ms. Griger:

This letter is in response to your February 11, 2015, request for environmental comments regarding the above referenced project involving installation of the 200-MW Crowned Ridge Wind Energy Center and an associated 40- mile 230 kV transmission line. The 26,038-acre wind project area includes numerous sections in Townships 118-120 North, Ranges 51 and 52 West; the transmission line includes numerous sections in Townships 119-121 North, Ranges 46-51 West, all within Grant and Codington Counties, South Dakota.

Your current letter includes a previous (November 26, 2007) response from our office to Tetra Tech's October 19, 2007, inquiry for the Crowned Ridge facility; however, we sent an additional letter to you dated February 5, 2010 (copy enclosed) and a similar letter to Western Area Power Administration dated December 30, 2010. Herein we provide updated information.

In accordance with section 7(c) of the Endangered Species Act, as amended, 16 U.S.C. 1531 et seq., we have determined that the following federally listed/proposed species may occur in the project area (this list is considered valid for 90 days):

Species	Status	Expected Occurrence
Topeka Shiner (*Notropis topeka*)	Endangered	Known resident
Dakota Skipper (*Hesperia dacotae*)	Threatened	Resident in native prairie, northeastern SD
Poweshiek Skipperling (*Oarisma poweshiek*)	Endangered	Possible resident in native prairie, northeastern SD

Rufa Red Knot (*Calidris canutus rufa*)	Threatened	Rare seasonal migrant
Whooping Crane (*Grus americana*)	Endangered	Migration

Additionally, the following species have been proposed for listing under the Endangered Species Act and may occur in the project area:

Species	Status	Expected Occurrence
Northern Long-eared Bat (*Myotis septentrionalis)*	Proposed Endangered	Summer resident, seasonal migrant, known winter resident in Black Hills

The Topeka shiner is an endangered minnow known to occupy numerous small streams within the Big Sioux, Vermillion and James watersheds of eastern South Dakota. Willow Creek in Codington County is a known occupied stream, tributaries of which occur within the proposed project area. We recommend avoidance of impacts to this waterway and its tributaries. If instream work in the Willow Creek watershed is proposed, specific measures may be necessary to ensure that adverse impacts to the Topeka shiner are not incurred as a result of this project.

The Dakota skipper is a small prairie butterfly listed as a threatened species under the Endangered Species Act (see: http://www.gpo.gov/fdsys/pkg/FR-2014-10-24/pdf/2014-25190.pdf). Dakota skippers are obligate residents of high quality prairie ranging from wet-mesic tallgrass prairie to dry-mesic mixed grass prairie. In northeastern South Dakota, Dakota skippers inhabit dry-mesic hill prairies with abundant purple coneflower *(Echinacea angustifolia)*, but also use mesic to wet-mesic tallgrass prairie habitats characterized by wood lily (*Lilium philadelphicum*) and mountain deathacamas (smooth camas; *Zigadenus elegans*). Their dispersal ability is very limited due in part to their short adult life span and single annual flight. Extirpation from a site may be permanent unless it occurs within about 0.6 miles of an inhabited site that generates a sufficient number of emigrants. Avoidance of impacts to native prairie habitat is recommended to reduce the risk of adverse effects to this species.

The Poweshiek skipperling is a small prairie butterfly listed as endangered under the Endangered Species Act (see: http://www.gpo.gov/fdsys/pkg/FR-2014-10-24/pdf/2014-25190.pdf). The habitat of Poweshiek skipperlings includes prairie fens, grassy lake and stream margins, moist meadows, and wet-mesic to dry tallgrass prairie. Preferred nectar plants for adult Poweshieks include smooth ox-eye (*Heliopsis helianthoides*) and purple coneflower *(Echinacea angustifolia)*, but they also use stiff tickseed (*Coreopsis palmate*), black-eyed susan (*Rudbeckia hirta*), and palespike lobelia (*Lobelia spicata*). Larval food plants are assumed to include spike-rush, sedges, prairie dropseed (*Sporobolus heterolepis*) and little bluestem (*Schizachyrium scoparium*). Poweshiek skipperlings have one flight per year from about the middle of June through the end of July (depending upon weather). They have a low dispersal capability, and may not cross areas that are not structurally similar to native prairies. Extirpation from

fragmented and isolated prairie remnants may be permanent unless it occurs within about 0.6 miles of an inhabited site that generates a sufficient number of emigrants. They are vulnerable to extreme weather conditions, dormant season fire, and other disturbances (e.g., intense cattle grazing). Avoidance of impacts to native prairie habitat is recommended to reduce the risk of adverse effects to this species.

Whooping cranes migrate through South Dakota on their way to northern breeding grounds and southern wintering areas. They occupy numerous habitats such as cropland and pastures; wet meadows; shallow marshes; shallow portions of rivers, lakes, reservoirs, and stock ponds; and both freshwater and alkaline basins for feeding and loafing. Overnight roosting sites frequently require shallow water in which to stand and rest. Line strike mortality is one of the greatest threats to this species. More information on this topic is provided below. Additionally, should construction occur during spring or fall migration, the potential for disturbances to whooping cranes exists. Disturbance (flushing the birds) stresses them at critical times of the year. We recommend remaining vigilant for these birds. There is little that can be done to reduce disturbance besides ceasing construction at sites where the birds have been observed. The birds normally do not stay in any one area for long during migration. Any whooping crane sightings should be reported to this office.

The rufa red knot is a robin-sized shorebird listed as threatened under the Endangered Species Act (see: < http://www.gpo.gov/fdsys/pkg/FR-2014-12-11/pdf/2014-28338.pdf> for more information). The red knot migrates annually between its breeding grounds in the Canadian Arctic and several wintering regions, including the Southeast United States, the Northeast Gulf of Mexico, northern Brazil, and Tierra del Fuego at the southern tip of South America. Although it is primarily a coastal species, small numbers of rufa red knots are reported annually across the interior United States (i.e., greater than 25 miles from the Gulf or Atlantic Coasts) during spring and fall migration. These reported sightings are concentrated along the Great Lakes, but multiple reports have been made from nearly every interior State, including South Dakota. Any rufa red knot sightins should be reported to this office.

The northern long-eared bat is a medium-sized brown bat that has been proposed for listing as endangered under the Endangered Species Act primarily due to impacts of White Nose Syndrome (see: <http://www.fws.gov/midwest/endangered/ mammals /nlba/pdf /FRpropListNLBA2Oct2013.pdf > for more information). Their proposed status defines these bats as a species in decline that the Service believes needs to be listed. Northern long-eared bats are known to be present in South Dakota during the summer months in forested habitat, primarily roosting singly or in colonies underneath bark, in cavities or in crevices of both live and dead trees. Some hibernacula have been documented in caves/mines in the Black Hills and the species have been documented in the Missouri River corridor during migration. White nose syndrome, a fungus affecting hibernating bats, is considered a significant threat to this species, but individuals may be harmed by other activities such as modifications to hibernacula, timber harvest, human disturbance, and collisions with wind turbines. Actions that may jeopardize the continued existence of this proposed species may require formal conference procedures in coordination with the Service. A decision regarding listing of the northern long-eared bat is anticipated to be made April 2, 2015. Interim guidance has been issued for this species that may be helpful to you (see: <http://www.fws.gov/midwest/endangered/mammals/nlba/pdf/

NLEBinterimGuidance6Jan2014.pdf>. We request any northern long-eared bat survey data you may collect.

Per earlier correspondence, it is our understanding that the Western Area Power Administration (Western) is the federal action agency for this project. If Western or their designated representative determines that the project "may adversely affect" listed species in South Dakota, it should request formal consultation from this office. If a "may affect - not likely to adversely affect" determination is made for this project, it should be submitted to this office for concurrence. If a "no effect" determination is made, further consultation may not be necessary. However, a copy of the determination should be sent to this office.

Bald Eagles

Our U.S. Fish and Wildlife Service (USFWS) *Eagle Conservation Plan Guidance* (ECPG) was issued in April 2013, and per your letter you are familiar with the guidance and will be conducting eagle surveys at the project site. We have reviewed the protocol you provided. We note that the ECPG suggests at least 2 years of preconstruction surveys for eagles, as well as coverage of at least 30% of a 1-km buffer around turbine locations, while your protocol currently includes only 1 year of study, and 26% coverage. Following the ECPG more closely will strengthen the data used to estimate the risk to eagles and determine the appropriate risk category of the proposed project. Additionally, you have requested locations of documented eagle nests within 10 miles of the project area. The South Dakota Department of Game, Fish and Parks (SDDGFP) monitors known eagle nests annually, thus you may obtain this information from SDDGFP. Consider conducting surveys for eagle nests within the 10 mile radius of the project to identify any nests not currently known to SDDGFP.

Birds of Conservation Concern

In our February 5, 2010, letter we indicated the potential for occurrence of species listed in our Birds of Conservation Concern 2008 publication. That information remains relevant to this project with exception of our recommendation to develop an Avian and Bat Protection plan for the wind facility. Although that type of plan would be appropriate for the transmission portion of this project, impacts from the wind energy facility may be better addressed via development of a Bird and Bat Conservation Strategy as outlined in our *Land-Based Wind Energy Guidelines* (see page 55 of the Guidelines: <http://www.fws.gov/windenergy/docs/ WEG_final.pdf>).

Note that some species of migratory birds, particularly grassland dependent species such as the grasshopper sparrow, may tend to avoid wind turbines. This equates to habitat loss via negative behavioral response to turbines. We recommend offsetting that loss, perhaps via establishment of grassland easements, or restoration of degraded prairie/former grasslands. If the Crowned Ridge facility will impact intact grasslands, we recommend further coordination on this issue with both this office and the USFWS Waubay Wetland Management District whom you have already contacted. We request any survey data collected at the Crowned Ridge project area.

Agency Coordination

Our February 5, 2010, letter included recommended coordination with other agencies, including the U.S. Geological Survey at the Northern Prairie Wildlife Research Center, as they were conducting wind energy/wildlife interaction studies, but it is our understanding that that work has been completed. Again, continued coordination is recommended with USFWS Waubay Wetland Management District and SDDGFP regarding their areas of expertise.

Other Guidance Updates

No changes from our February 5, 2010, recommendations and advisories are provided herein regarding fisheries, wetlands, or the Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act. Your letter indicates you are familiar with our 2013 *Land-based Wind Energy Guidelines* which have been finalized since our last correspondence, and you are following the tiered steps therein, which we highly recommend. We provided information in our February 5, 2010, letter regarding meteorological towers, but note that we have updated our communication tower guidance which extends to meteorological towers; that updated guidance is enclosed. Also note that the publication *Mitigating Bird Collisions with Power Lines: The State of the Art in 1994* we had previously recommended has been updated with a 2012 version: *Reducing Avian Collisions with Power Lines: The State of the Art in 2012* which may be obtained by contacting the Edison Electric Institute at: <http://www.eei.org/resourcesandmedia/products/Pages/ProductDetails.aspx?prod=F20558BF-A097-4289-A8BA-1674B6096523&type=P>.

If changes are made in the project plans or operating criteria, or if additional information becomes available, the Service must be informed so that the above determinations can be reconsidered.

We appreciate the opportunity to provide comments on this project. If you have any questions on these comments, please contact Natalie Gates of this office at (605) 224-8693, Extension 227.

Sincerely,

Scott Larson
Field Supervisor
South Dakota Field Office

Enclosures

Cc: USFWS Waubay NWR; Waubay, SD
(Attn: Connie Mueller)
Western Area Power Administration; Billings, MT
(Attn: Matt Marsh)
SDDGFP; Pierre, SD
(Attn: Silka Kempema)
USFWS HAPET; Bismarck, ND

2013 U.S. Fish and Wildlife Service (USFWS) Revised Voluntary Guidelines for Communication Tower Design, Siting, Construction, Operation, Retrofitting, and Decommissioning –

Suggestions Based on Previous USFWS Recommendations to FCC Regarding WT Docket No. 03-187, FCC 06-164, Notice of Proposed Rulemaking, "Effects of Communication Towers on Migratory Birds" (2007), Docket No. 08-61, FCC's Antenna Structure Registration Program (2011), Service 2012 Wind Energy Guidelines, and Service 2013 Eagle Conservation Plan Guidance

Submitted by:

Albert M. Manville, II, Ph.D., C.W.B.
Senior Wildlife Biologist & Avian-Structural Lead
Division of Migratory Bird Management, U.S. Fish & Wildlife Service
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Arlington, VA 22203
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Last updated: September 27, 2013

[Comm Tower 2013 Revised Guidance-to FCC-AMM.docx]

1. Collocation of the communications equipment on an existing communication tower or other structure (e.g., billboard, water and transmission tower, distribution pole, or building mount) is strongly recommended. Depending on tower load factors and communication needs, from 6 to 10 providers should collocate on an existing tower or structure provided that frequencies do not overlap/"bleed" or where frequency length or broadcast distance requires higher towers. New towers should be designed structurally and electronically to accommodate the applicant's antenna, and antennas of at least 2 additional users – ideally 6 to 10 additional users, if possible – unless the design would require the addition of lights and/or guy wires to an otherwise unlit and/or unguyed tower. This recommendation is intended to reduce the number of towers needed in the future.

2. If collocation is not feasible and a new tower or towers are to be constructed, it is strongly recommended that the new tower(s) should be not more than 199 feet above ground level (AGL), and that construction techniques should not require guy wires. Such towers should be unlighted if Federal Aviation Administration (FAA) regulations and lighting standards (FAA 2007, Patterson 2012, FAA 2013 lighting circular anticipated update) permit. Additionally, the Federal Communications Commission (FCC) through recent rulemaking now requires that new towers ≥ 450 ft AGL contain no red-steady lights. FCC also recommends that new towers 350-450 ft AGL also contain no red-steady lights, and they will eventually recommend that new towers < 350 ft AGL convert non-flashing lights to flash with existing flashing lights. LED lights are being suggested as replacements for all new construction and for retrofits, with the intent of future synchronizing the flashes. Given these dynamics, the Service recommends using lattice tower or monopole structures for all towers < 200 ft AGL and for taller towers where feasible. The Service considers the less than 200 ft AGL option the "gold standard" and suggests that this

is the environmentally preferred industry standard for tower placement, construction and operation – i.e., towers that are unlit, unguyed, monopole or lattice, and less than 200 ft AGL.

3. If constructing multiple towers, the cumulative impacts of all the towers to migratory birds – especially to Birds of Conservation Concern (FWS 2008) and threatened and endangered species, as well as the impacts of each individual tower, should be considered during the development of a project.

4. The topography of the proposed tower site and surrounding habitat should be clearly noted, especially in regard to surrounding hills, mountains, mountain passes, ridge lines, rivers, lakes, wetlands, and other habitat types used by raptors, Birds of Conservation Concern, and state and federally listed species, and other birds of concern. Active raptor nests, especially those of Bald and Golden Eagles, should be noted, including known or suspected distances from proposed tower sites to nest locations. Nest site locations for Golden Eagles may vary between years, and unoccupied, inactive nests and nest sites may be re-occupied over multiple years. The Service's 2013 Eagle Conservation Plan Guidance, Module 1, Land-based Wind Energy, Version 2, available on our website, is a useful document (USFWS 2013).

5. If at all possible, new towers should be sited within existing "antenna farms" (i.e., clusters of towers), in degraded areas (e.g., strip mines or other heavily industrialized areas), in commercial agricultural lands, in Superfund sites, or other areas where bird habitat is poor or marginal. Towers should not be sited in or near wetlands, other known bird concentration areas (e.g., state of federal refuges, staging areas, rookeries, and Important Bird Areas), in known migratory, daily movement flyways, areas of breeding concentration, in habitat of threatened or endangered species, or key habitats for Birds of Conservation Concern (FWS 2008). Disturbance can result in effects to bird populations which may cumulatively affect their survival. The Service has recommended some disturbance-free buffers, e.g., 0.5 mi around raptor nests during the nesting season, and 1-mi disturbance free buffers for Ferruginous Hawks and Bald Eagles during nesting season in Wyoming (FWS WY Ecological Services Field Office, referenced in Manville 2007:23). The effects of towers on "prairie grouse," "sage grouse," and grassland and shrub-steppe bird species should also be considered since tall structures have been shown to result in abandonment of nest site areas and leks, especially for "prairie grouse" (Manville 2004). The issue of buffers is currently under review, especially for Bald and Golden Eagles. Additionally, towers should not be sited in areas with a high incidence of fog, mist, and low cloud ceilings.

6. If taller (> 199 ft AGL) towers requiring lights for aviation safety must be constructed, the minimum amount of pilot warning and obstruction avoidance lighting required by the FAA should be used. Unless otherwise required by the FAA, only white strobe or red strobe lights (red preferable since it is generally less displeasing to the human eye at night), or red flashing incandescent lights should be used at night, and these should be the minimum number, minimum intensity (< 2,000 candela), and minimum number of flashes per minute (i.e., longest duration between flashes/"dark phase") allowable by the FAA. The use of solid (non-flashing) warning lights at night should be avoided (Patterson 2012, Gehring et al. 2009) – see recommendation #2 above. Current research indicates that solid red lights attract night-migrating birds at a much higher rate than flashing lights (Gehring et al. 2009, Manville 2007, 2009). Recent research

indicates that use of white strobe, red strobe, or red flashing lights alone provides significant reductions in bird fatalities (Patterson 2012, Gehring et al. 2009).

7. Tower designs using guy wires for support, which are proposed to be located in known raptor or waterbird concentrations areas, daily movement routes, major diurnal migratory bird movement routes, staging areas, or stopover sites, should have daytime visual markers or bird deterrent devices installed on the wires to prevent collisions by these diurnally moving species. The efficacy of bird deterrents on guy wires to alert night migrating species has yet to be scientifically validated. For guidance on markers, see Avian Power Line Interaction Committee (APLIC). 2006. *Suggested Practices for Avian Protection on Power Lines -- State of the Art in 2006.* Edison Electric Institute, APLIC, and the California Energy Commission. Washington, DC, and Sacramento, CA. 207 pp, and APLIC. 2012. *Reducing Avian Collisions with Power Lines -- the State of the Art in 2012.* Edison Electric Institute and APLIC. Washington, DC. 159 pp. Also see www.aplic.org, www.energy.ca.gov, or call 202-508-5000.

8. Towers and appendant facilities should be designed, sited, and constructed so as to avoid or minimize habitat loss within and adjacent to the tower "footprint." However, a larger tower footprint is preferable to the use of guy wires in construction. Several shorter, un-guyed towers are preferable to one, tall guyed, lighted tower. Road access and fencing should be minimized to reduce or prevent habitat fragmentation, disturbance, and the creation of barriers, and to reduce above ground obstacles to birds in flight.

9. If, prior to tower design, siting and construction, if it has been determined that a significant number of breeding, feeding and roosting birds, especially of Birds of Conservation Concern (FWS 2008), state or federally-listed bird species, and eagles are known to habitually use the proposed tower construction area, relocation to an alternate site is highly recommended. If this is not an option, seasonal restrictions on construction are advised in order to avoid disturbance, site and nest abandonment, especially during breeding, rearing and other periods of high bird activity.

10. Security lighting for on-ground facilities, equipment and infrastructure should be motion- or heat-sensitive, down-shielded, and of a minimum intensity to reduce nighttime bird attraction and eliminate constant nighttime illumination, but still allow safe nighttime access to the site (USFWS 2012, Manville 2011).

11. Representatives from the USFWS or researchers from the Research Subcommittee of the Communication Tower Working Group should be allowed access to the site to evaluate bird use; conduct dead-bird searches; place above ground net catchments below the towers (Manville 2002); and to perform studies using radar, Global Position System, infrared, thermal imagery, and acoustical monitoring, as necessary. This will allow for assessment and verification of bird movements, site use, avoidance, and mortality. The goal is to acquire information on the impacts of various tower types, sizes, configurations and lighting protocols.

12. Towers no longer in use, not re-licensed by the FCC for use, or determined to be obsolete should be removed from the site within 12 months of cessation of use, preferably sooner.

13. In order to obtain information on the usefulness of these guidelines in preventing bird strikes and better understanding impacts from habitat fragmentation, please advise USFWS personnel of the final location and specifications of the proposed tower, and which measures recommended in these guidelines were implemented. If any of these recommended measures cannot be implemented, please explain why they are not feasible. This will further advise USFWS in identifying any recurring problems with the implementation of the guidelines, which may necessitate future modifications.

Reference Sources:

Federal Aviation Administration. 2007. Obstruction marking and lighting. Advisory Circular AC 70/7460-1K. U.S. Department of Transportation.

Gehring, J., P. Kerlinger, and A.M. Manville, II. 2009. Communication towers, lights and birds: successful methods of reducing the frequency of avian collisions. Ecological Applications 19(2): 505-514. Ecological Society of America.

Gehring, J., P. Kerlinger, and A.M. Manville, II. 2011. The role of tower height and guy wires on avian collisions with communication towers. Journal of Wildlife Management 75(4): 848-855. The Wildlife Society.

Manville, A.M., II. 2002. Protocol for monitoring the impact of cellular telecommunication towers on migratory birds within the Coconino, Prescott, and Kaibab National Forests, Arizona. Protocol requested by U.S. Forest Service. 9 pp.

Manville, A.M., II. 2004. Prairie grouse leks and wind turbines: U.S. Fish and Wildlife Service justification for a 5-mile buffer from leks; additional grassland songbird recommendations. Division of Migratory Bird Management, USFWS, Arlington, VA, peer-reviewed briefing paper. 17 pp.

Manville, A.M., II. 2007. Comments of the U.S. Fish and Wildlife Service Submitted Electronically to the FCC on 47 CFR Parts 1 and 17, WT Docket No. 03-187, FCC 06-164, Notice of Proposed Rulemaking, "Effects of Communication Towers on Migratory Birds." February 2, 2007. 32 pp.

Manville, A.M., II. 2009. Towers, turbines, power lines, and buildings – steps being taken by the U.S. Fish and Wildlife Service to avoid or minimize take of migratory birds at these structures. Pages 262-272 *In* T.D. Rich, C. Arizmendi, D. Demarest, and C. Thompson (eds.). Tundra to Tropics: Connecting Habitats and People. Proceedings 4th International Partners in Flight Conference, McAllen, TX.

Manville, A.M., II. 2011. Comments of the U.S. Fish and Wildlife Service's Division of Migratory Bird Management Filed Electronically on WT Docket No. 08-61 and WT Docket No. 03-187, Regarding the Environmental Effects of the Federal Communication's Antenna Structure Registration Program. January 14, 2011. 12 pp.

Patterson, J.T., Jr. 2012. Evaluation of new obstruction lighting techniques to reduce avian fatalities. DOT/FAA/TC-TN12/9, Federal Aviation Administration, U.S. Department of Transportation. 28 pp, plus appendices.

U.S. Fish and Wildlife Service. 2000. Service Guidance on the Siting, Construction, Operation, and Decommissioning of Communication Towers. September 14, 2000. http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

U.S. Fish and Wildlife Service. 2008. Birds of Conservation Concern 2008. United States Department of Interior, Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, VA. 85 pp. http://www.fws.gov/migratorybirds/>

U.S. Fish and Wildlife Service. 2012. U.S. Fish and Wildlife Service Land-Based Wind Energy Guidelines. March, 82 pp.

U.S. Fish and Wildlife Service. 2013. Eagle Conservation Plan Guidance, Module 1, Land-based Wind Energy, Version 2. Division of Migratory Bird Management. April, 103 pp.

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Kely Mertz

Subject:	Information included: Crowned Ridge project discussion
Location:	Conference Line
Start:	Thu 4/20/2017 12:00 PM
End:	Thu 4/20/2017 1:00 PM
Show Time As:	Tentative
Recurrence:	(none)
Meeting Status:	Not yet responded
Organizer:	Kely Mertz
Required Attendees:	Kempema, Silka; Natoma Hansen; Natalie_Gates@fws.gov; Mueller, Connie; Wells, Kimberly; Tyler.Williams@nexteraenergy.com; patrick.flowers@xcelenergy.com

Good morning,

Below, please find the agenda and call-in information for the call. We are also attaching a project overview, which we will walk through during the call. We understand the late circulation and do not expect review prior to the call.

We look forward to talking tomorrow.
Thank you,
Kely

Call-in Information
305-552-3001
11855446#

Agenda

I. Introductions
II. Project overview
III. Current studies
IV. PUC process
V. USFWS easements
VI. Questions

Memorandum

Date: April 19, 2017

Re: Crowned Ridge II Project Background

PROJECT OVERVIEW

Crowned Ridge Wind, LLC, an indirect subsidiary of NextEra Energy Resources, LLC (NEER), plans to develop a 600-megawatt (MW) wind facility known as the Crowned Ridge Wind Energy Facility (the project) in Deuel, Grant, and Codington Counties. The northern 300 MW will produce energy sold to Xcel through a Power Purchase Agreement. The southern 300 MW is a build-own-transfer project, with Xcel Energy (Xcel) as the ultimate owner-operator (Figure 1). The project's point of interconnection will be Otter Tail Power's Big Stone South 230-kilovolt (kV) substation near Big Stone City, South Dakota. Construction is anticipated to commence in early 2019, and the project is scheduled to achieve commercial operation on or before the end of 2019. For purposes of discussion, the northern 300 MW can be referenced as Crowned Ridge I, and the southern 300 MW can be referenced as Crowned Ridge II.

STUDIES AND SURVEYS

NEER has completed numerous studies in the general vicinity of the project area (Table 1). NEER has coordinated with the U.S. Fish and Wildlife Service and South Dakota Game, Fish and Parks multiple times (2005, 2007, 2009, 2010, 2015, 2017) to request information regarding ecologically significant areas (e.g., easements) and endangered, threatened, or special status species (e.g., eagles) in this general area of South Dakota.

Table 1. Surveys and Studies Completed or in Progress for the Crowned Ridge Wind Energy Facility Project Area and Vicinity

Survey/Study Date	Survey/ Study Description	Description or Summary of Results	Federal or State Listed Species Observed? If Y, describe.
Fall 2007	Critical Issues Analysis (CIA) Bemis Wind Resource Area (WRA)	Recommended additional investigations; identified potential constraints.	NA
Mar 2007 – Jun 2008	Avian Surveys – Spring (Bemis WRA)	Identified 27 active raptor nests (mostly red-tailed hawks); several leks.	Y (11 South Dakota state-sensitive species)
Jun 2008	Native Prairie Surveys (Bemis WRA)	Delineated grassland, native and tame, and potential Dakota skipper habitat.	N
Aug – Nov 2008	Avian Surveys – Fall (Bemis WRA)	Documented avian species.	Y (12 South Dakota sensitive species)
Jun – Jul 2009	Native Prairie Surveys (Crowned Ridge WRA)	Delineated native and tame grassland and potential Dakota skipper habitat.	N

Table 1. Surveys and Studies Completed or in Progress for the Crowned Ridge Wind Energy Facility Project Area and Vicinity (Continued)

Survey/Study Date	Survey/ Study Description	Description or Summary of Results	Federal or State Listed Species Observed? If Y, describe.
2013	CIA (Crowned Ridge Wind Energy Center [WEC])	Recommended additional investigations and identified potential constraints or resources for consideration.	NA
Aug – Nov 2014	Avian Surveys – Fall (Crowned Ridge WEC)	Documented avian species.	N
Mar – Nov 2014; Nov – Mar 2015	Eagle Survey (Crowned Ridge WEC)	Documented eagle presence and use.	NA
2015	Dakota Skipper Habitat Evaluation (Crowned Ridge WEC)	Identified approximately five areas (ranging from 39 to 193 acres each and comprising 3% of the Project Area) of potential Dakota skipper habitat in the Project Area.	N
Summer 2015	Northern long-eared bat (NLEB) summer bat habitat assessment (Crowned Ridge Transmission Line Route)	Identified marginal potential suitable NLEB roosting habitat.	NA
Aug – Oct 2015; April – Oct 2016	Bat acoustic survey (Crowned Ridge WEC)	Documented bat activity.	NA
Apr, May 2017	Aerial Raptor Survey (Crowned Ridge Wind Energy Facility [WEF])	Identified raptor nests within project area plus 2- and 10-mile buffers. April complete.	TBD
April – Nov 2017	Avian point count surveys (Crowned Ridge WEF)	In progress. April point count complete.	TBD
Apr – Nov 2017	Bat Acoustic monitoring (Crowned Ridge WEF)	In progress.	TBD

Notes:

N = No.

NA = Not Applicable.

TBD = To Be Determined.

Y = Yes.

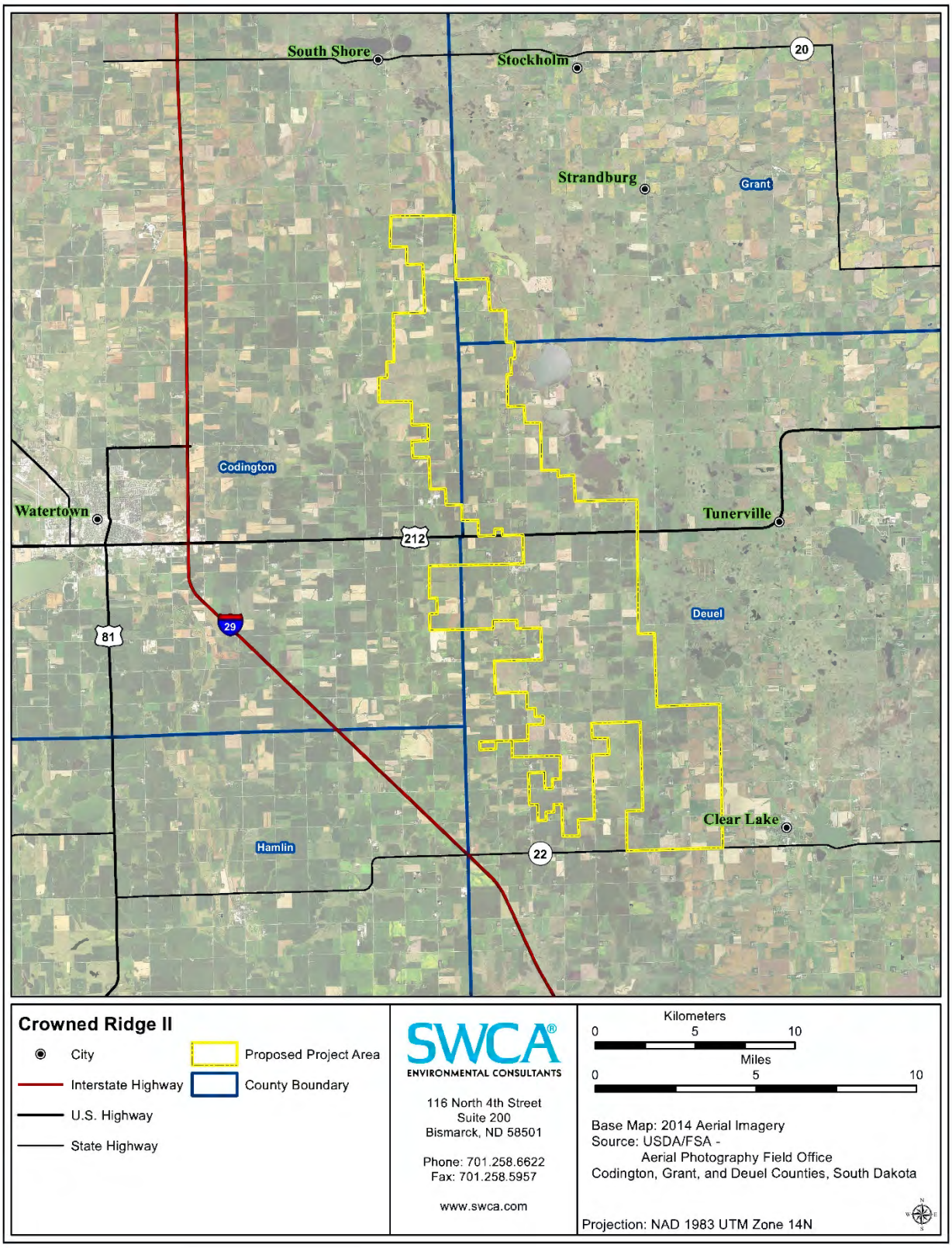

Figure 1. Crowned Ridge Wind Energy Facility, Crowned Ridge II, South Dakota.

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Scott Phillips

From: Zonna Barnes
Sent: Friday, June 16, 2017 5:02 PM
To: Paige Olson; Scott Phillips; Carolyn.Stewart@nexteraenergy.com; Richard.Estabrook@nexteraenergy.com; Tyler.Wilhelm@nexteraenergy.com; Kimberly.Wells@nexteraenergy.com
Cc: Norma Crumbley; Stephen Sabatke
Subject: RE: Crowned Ridge Project Meeting
Attachments: Cultural Resources_overview-methods_memo_swca_14Jun2017.docx

Hi all,
In preparation for the call on Monday morning, the cultural resource overview document is attached.

Thanks!
Zonnie

-----Original Appointment-----
From: Zonna Barnes
Sent: Monday, June 12, 2017 5:07 PM
To: Zonna Barnes; Paige Olson; Scott Phillips; Carolyn.Stewart@nexteraenergy.com; Richard.Estabrook@nexteraenergy.com; Tyler.Wilhelm@nexteraenergy.com; Kimberly.Wells@nexteraenergy.com
Cc: Norma Crumbley; Stephen Sabatke
Subject: Crowned Ridge Project Meeting
When: Monday, June 19, 2017 9:00 AM-10:00 AM (UTC-07:00) Mountain Time (US & Canada).
Where: 866.740.1260 Access Code: 9951661

9 am (MDT)/10 am (CDT)

Conference Call information:
1-866-740-1260
Access code: 9951661

Memorandum

Date: June 14, 2017

Re: Crowned Ridge Wind Energy Facility Overview and Cultural Resources Review

PROJECT OVERVIEW

Crowned Ridge Wind, LLC, an indirect subsidiary of NextEra Energy Resources, LLC (NEER), plans to develop a 600-megawatt (MW) wind facility known as the Crowned Ridge Wind Energy Facility (the project) in Deuel, Grant, and Codington Counties. The northern 300 MW will produce energy sold to Xcel Energy (Xcel) through a Power Purchase Agreement. The southern 300 MW is a build-own-transfer project, with Xcel as the ultimate owner-operator (Figures 1 and 2). The project's point of interconnection will be Otter Tail Power's Big Stone South 230-kilovolt (kV) substation near Big Stone City, South Dakota. Construction is anticipated to commence in early 2019, and the project is scheduled to achieve commercial operation on or before the end of 2019. For purposes of discussion, the northern 300 MW can be referenced as Crowned Ridge I, and the southern 300 MW can be referenced as Crowned Ridge II.

CULTURAL RESOURCE REVIEW

Cultural resources review for the project is to meet the requirements of the South Dakota Public Utilities Commission (PUC) for project permitting. No federal involvement is triggered for the project that would require review under Section 106 of the National Historic Preservation Act. NEER has engaged the Sisseton-Wahpeton Oyate of the Lake Traverse Reservation (SWO), HDR, Inc. (HDR), and SWCA Incorporated (SWCA) to conduct the tribal resource, archaeological, and historic—or collectively "cultural resource"—review for the project. SWCA is leading and coordinating this combined effort.

Existing Knowledge Bases

Records searches from the South Dakota Archaeological Research Center (SARC) databases indicate 562 cultural resources previously recorded within the vicinity of the project by 103 previous surveys (Table 1). Identification of tribal resources, such as sacred sites, Traditional Cultural Properties (TCPs), sites of religious importance, and historic properties, will be identified by SWO and may overlap with sites identified by others in the SARC databases. SWO is also working with NEER to lead outreach to other concerned tribes. As a result, the Spirit Lake Tribe and the Yankton Sioux Tribe are anticipated to participate in field survey efforts.

Field Survey

A Level III intensive inventory of tribal, archaeological, and historic resources of the project area will be conducted including all turbine locations, collection lines, roads, 230-kV substations, and 230-kV transmission lines connecting the project to the Otter Tail Power 230-kV Big Stone Substation. Resource specialists from SWCA, HDR, SWO, and other engaged tribes will cover these areas with systematic pedestrian transects spaced no more than 30 meters (m) apart for an intensive survey of cultural resources.

Table 1. Previously Recorded Cultural Resources in the Project Vicinity per SARC Databases

Cultural Resource Category	Quantity Identified
Archaeological Sites	118
Historic Districts	1
Historic Bridges	49
Cemeteries	11
Historic Structures	383
Total	**562**

During the inventory, any previously recorded sites will be re-evaluated and re-recorded as necessary. Newly discovered cultural resources will be mapped to scale and recorded in accordance with South Dakota State Historic Preservation Officer (SHPO) guidelines. Global positioning system shapefiles will be created and additionally used to assist NEER in planning project design in relation to cultural resources.

Principal Investigators from this team will evaluate the significance of all identified historic and prehistoric resources in terms of eligibility for the National Register of Historic Places and in relation to tribal significance. While evaluations of significance for an archaeological resource might use information from subsurface testing of both sites and isolated finds, subsurface testing will largely be limited to historical archaeological sites and excluded from potentially tribally significant resources that may be alternately assessed through nonintrusive means.

Based upon the PUC permits required for project components, NEER anticipates that up to four phases of cultural resources reporting may be required: one each for the Off-site and On-site Gen-ties, and one each for Crowned Ridge I and II. The Off-Site Gen-tie will connect from the northern end of the project to the Big Stone South 230- kV substation and is to begin PUC permitting by August 2017. The On-site Gen-tie will connect between Crown Ridge I and II, and these project components are to begin PUC permitting by October 2017.

Reporting

The team will prepare Level III intensive inventory reports to current SHPO standards. Reporting will include a project description, environmental setting, cultural setting, background research results, research design, methods, results of investigations, recommendations, and references cited. The report will provide recommendations regarding the management of cultural resources identified in the project area, with particular recommendations for avoidance, minimization, and other mitigation, as needed, for significant (National Register of Historic Places–eligible) cultural resources. The information will assist NEER with micrositing, focusing upon the avoidance of effects to cultural resources to the extent achievable. An unanticipated discovery plan will also be drafted in consultation with NEER and the SHPO. This plan will detail specific actions to take during the construction phase of the project should any cultural resource discoveries be identified.

This memorandum was prepared for NEER by SWCA.

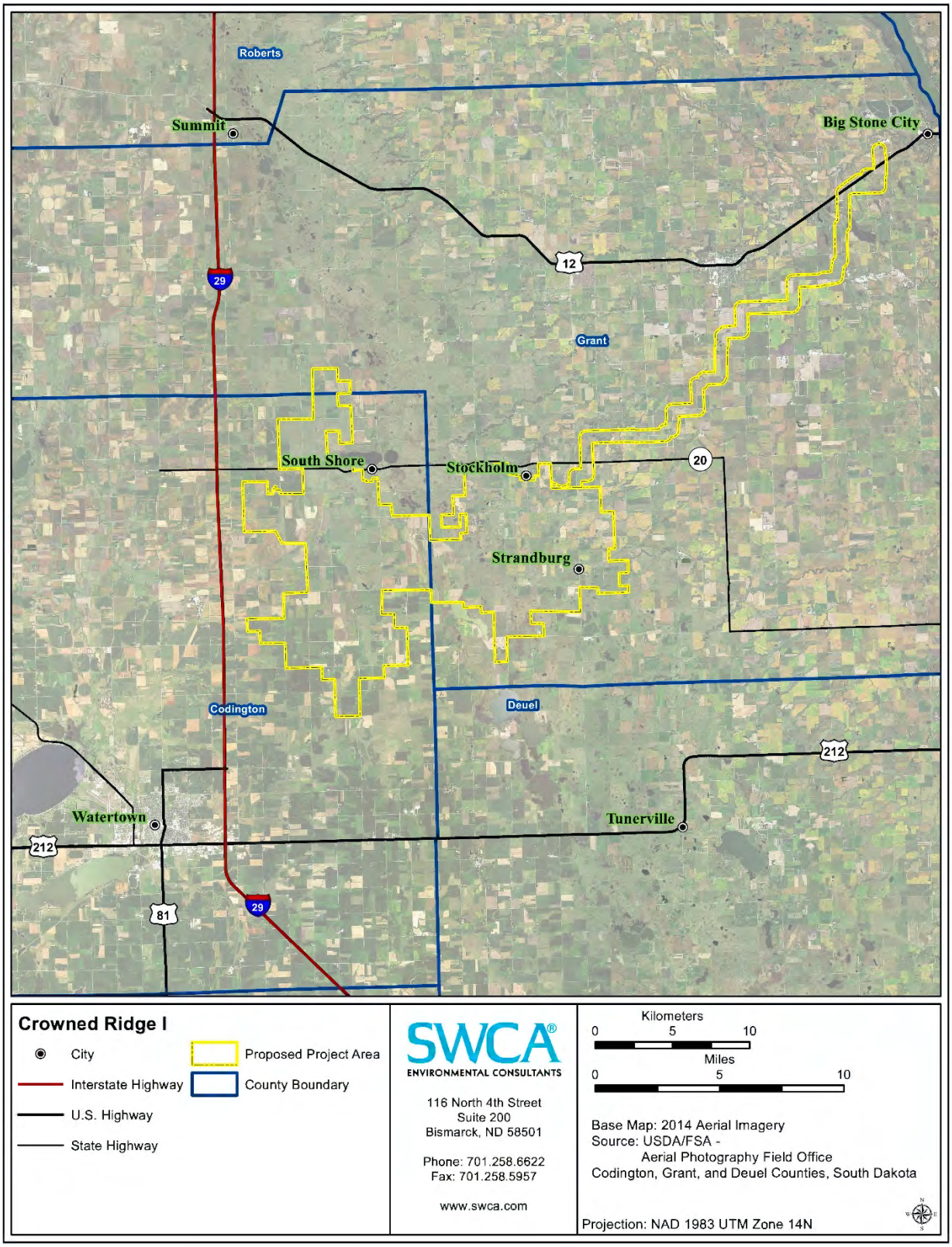

Figure 1. Crowned Ridge Wind Energy Facility, Crowned Ridge I, South Dakota.

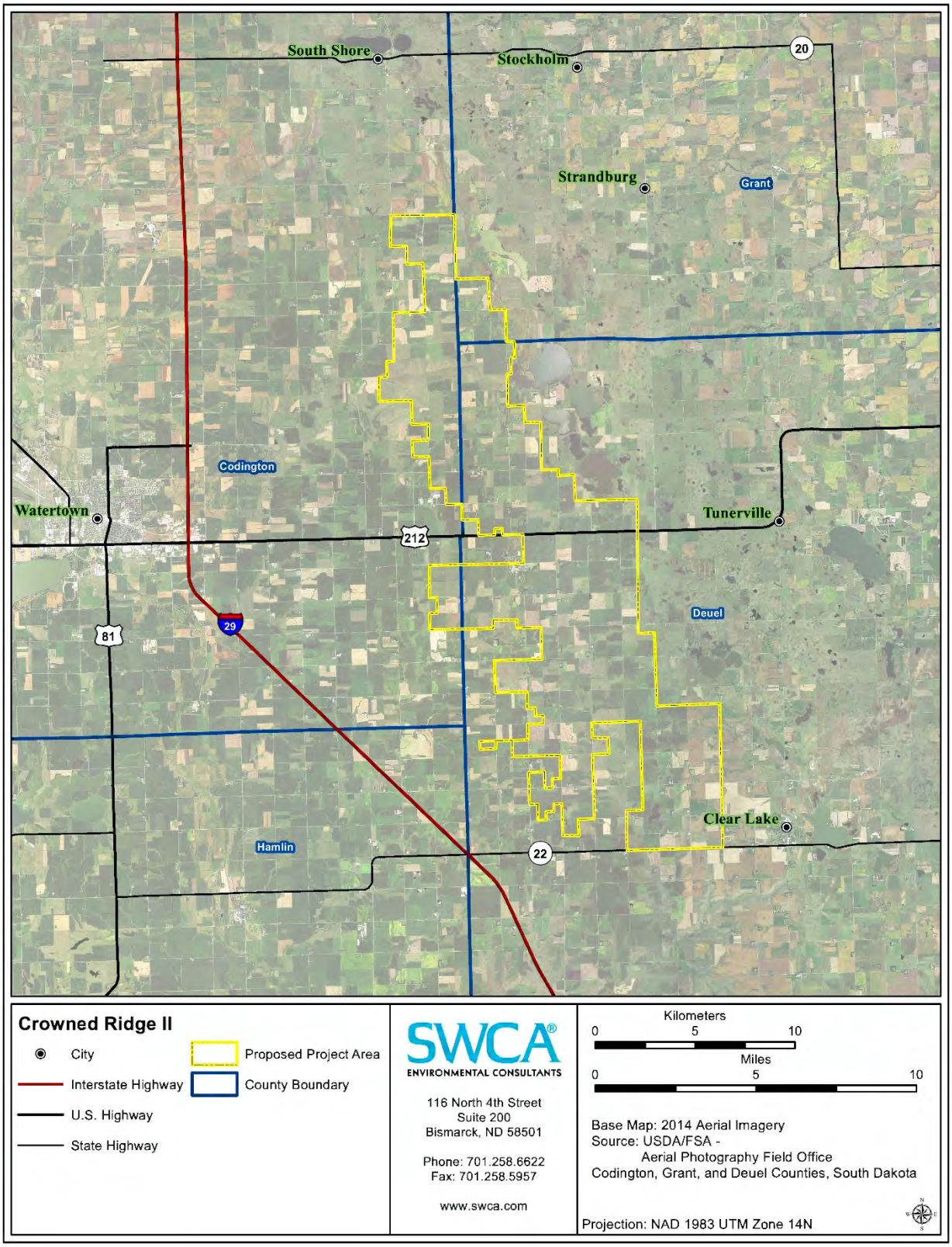

Figure 2. Crowned Ridge Wind Energy Facility, Crowned Ridge II, South Dakota.

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From: Kely Mertz
To: Runia, Travis
Subject: RE: Lek data
Date: Thursday, June 15, 2017 10:53:00 AM
Attachments: Generalized_Polygon.zip

Travis,
Attached is the general area of interest, which is confidential at this time.
Thank you!
Kely

From: Runia, Travis [mailto:Travis.Runia@state.sd.us]
Sent: Thursday, June 15, 2017 8:43 AM
To: Kely Mertz <KMertz@swca.com>
Subject: RE: Lek data

Hi Kely,

Do you have a shapefile of the area of interest? I understand you might not be able to share the exact project boundary.

We usually respond to these requests by providing any lek data we may have, but we also let the developer know what surveys have been completed in the area. Our survey foot print is quite small, so many times we do not have any known lek locations in the proposed project area, but it is because surveys have not been conducted.

Thanks,

Travis Runia | *Senior Upland Game Biologist*
South Dakota Department of Game, Fish and Parks
895 3rd St. SW | Huron, SD 57350
605.353.8477 | Travis.Runia@state.sd.us

From: Kely Mertz [mailto:KMertz@swca.com]
Sent: Thursday, June 15, 2017 7:39 AM
To: Runia, Travis
Subject: FW: [EXT] Lek data

Good morning Travis,
I was inquiring about current data regarding lek locations, and Casey indicated you might have more information. Is this data that your agency has, and can share? This is in reference to ongoing coordination with SDGFP and USFWS regarding a potential wind project in eastern South Dakota.
Thank you in advance,

Kely

Kely Mertz
Senior Project Manager

200 W. 22nd Street, Suite 220
Lombard, IL 60148
Office 630.705.1762
Cell 614.580.6715
Visit Our Website: http://www.swca.com

From: Heimerl, Casey [mailto:Casey.Heimerl@state.sd.us]
Sent: Thursday, June 15, 2017 8:36 AM
To: Kely Mertz <KMertz@swca.com>
Subject: RE: Lek data

Hi Kely,

We do not keep lek data in our Natural Heritage Database. I recommend you contact our upland gamebird biologist to see what he may be able to provide. His email is Travis.Runia@state.sd.us

~Casey

From: Kely Mertz [mailto:KMertz@swca.com]
Sent: Thursday, June 15, 2017 7:15 AM
To: Heimerl, Casey
Subject: [EXT] Lek data

Hi Casey,
We are interested in the most current information regarding lek data also. Can we make that request under the same data use agreement form, or would we need to do another request separately? I would need to provide you with a slightly updated shapefiles and buffer.
Thank you,
Kely

Kely Mertz
Senior Project Manager

200 W. 22nd Street, Suite 220
Lombard, IL 60148
Office 630.705.1762
Cell 614.580.6715
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From: Kely Mertz
To: Runia, Travis
Cc: Heimerl, Casey
Subject: RE: Lek data
Date: Tuesday, July 11, 2017 9:44:00 AM

This is very helpful, thank you Travis!
Kely

From: Runia, Travis [mailto:Travis.Runia@state.sd.us]
Sent: Tuesday, July 11, 2017 9:43 AM
To: Kely Mertz <KMertz@swca.com>
Cc: Heimerl, Casey <Casey.Heimerl@state.sd.us>
Subject: RE: Lek data

Hi Kely,

We have very limited survey effort for prairie grouse leks in your project area. However, see below the information for 4 recent lek locations.

2014 – STGR – 11 males - -96.877056, 44.960364
2016 – GPCH – 25 birds - -96.879337, 45.161802
2016 – Unknown Species – 6 birds - -96.912922, 45.131501
2016 – Unknown Species – 20 birds - -96.872471, 45.129682

Thanks,

Travis Runia | *Senior Upland Game Biologist*
South Dakota Department of Game, Fish and Parks
895 3rd St. SW | Huron, SD 57350
605.353.8477 | Travis.Runia@state.sd.us

From: Kely Mertz [mailto:KMertz@swca.com]
Sent: Monday, July 10, 2017 12:52 PM
To: Runia, Travis
Subject: RE: [EXT] Lek data

Good afternoon, Travis –
I was just following up to see if you had any lek data available for the area of interest I provided in June?
Thank you!
Kely

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Tel 630.705.1762
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July 12, 2017

Silka Kempema
South Dakota Game Fish and Parks
523 East Capitol Avenue
Pierre, SD 57501

Re: Crowned Ridge I and II Wind Energy Projects in Codington, Deuel, and Grant Counties, South Dakota

Dear Ms. Kempema:

SWCA Environmental (SWCA) is writing on behalf of NextEra Energy Resources, LLC (NEER), to request information regarding ecologically sensitive areas and federally and state listed endangered, threatened, or special concern species occurrences in reference to the proposed Crowned Ridge Wind, LLC and Crowned Ridge Wind II, LLC projects in Codington, Deuel, and Grant counties, South Dakota.

The two projects are adjacent and will total 600 megawatts (MW). The northern 300 MW and northern gen-tie are known as the Crowned Ridge I project. The southern 300 MW and southern (on-site) gen-tie is known as the Crowned Ridge II project. The projects' point of interconnection will be Otter Tail Power's Big Stone South 230-kilovolt substation near Big Stone City, South Dakota. Construction is anticipated to commence in late 2018, and the projects are scheduled to achieve commercial operation on or before the end of 2019.

We have provided Shapefiles and a figure to facilitate your review, and we greatly appreciate your ongoing efforts to treat the projects and their locations as confidential at this time. Please note that the area provided is larger than what ultimately will be needed to develop the projects. However, querying this area will allow NEER to accommodate micro-siting adjustments to avoid sensitive resources to the extent possible.

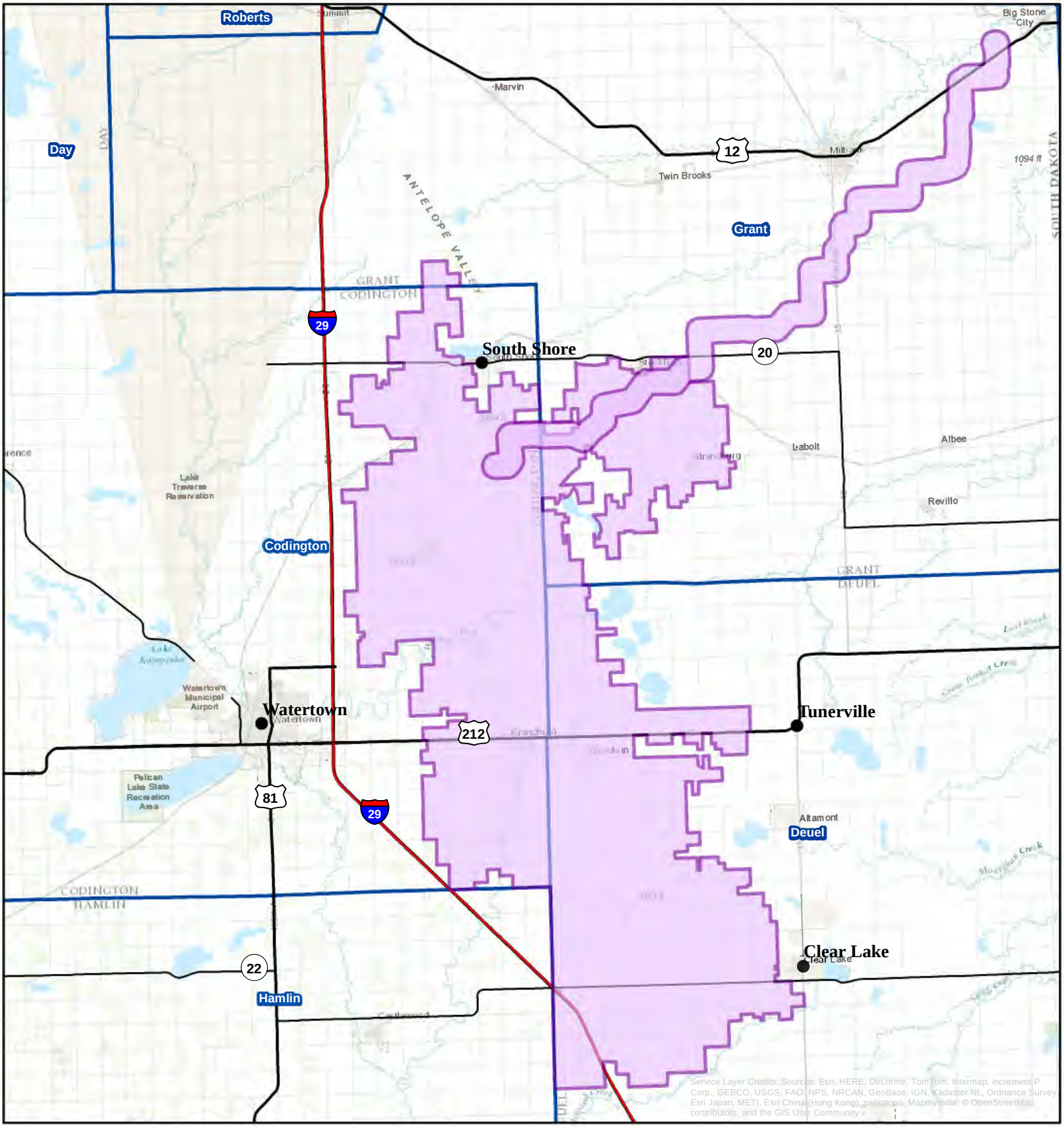
NEER has coordinated with the South Dakota Game, Fish, and Parks and US Fish and Wildlife Service (USFWS) since 2005 regarding potential wind energy development in this general region. Recent coordination includes our April 20, 2017 conference calls with you and the USFWS. As you are aware from this past and ongoing coordination, NEER's goal is to perform a thorough analysis of environmental resources using the best available information.

Should you have any questions or require additional information, please do not hesitate to contact me at 614.580.6715 or kmertz@swca.com. Thank you for your assistance.

Sincerely,

Kely Mertz
Senior Project Manager

021218



Crowned Ridge I and II Wind Projects

- City
- County Boundary
- Interstate Highway
- U.S. Highway
- State Highway
- Area of Interest

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116 North 4th Street
Suite 200
Bismarck, ND 58501

Phone: 701.258.6622
Fax: 701.258.5957

www.swca.com

Kilometers
0 5 10

Miles
0 5 10

Base Map: USGS 7.5' Topographic Map
Source: Esri ArcGIS Online service
Codington, Grant, and
Deuel Counties, South Dakota

021219

Projection: NAD 1983 UTM Zone 14N

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Lombard, Illinois 60148
Tel 630.705.1762
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July 12, 2017

Natalie Gates
US Fish and Wildlife Service
420 S. Garfield Avenue, Suite 400
Pierre, SD 57501

Re: Crowned Ridge I and II Wind Energy Projects in Codington, Deuel, and Grant Counties, South Dakota

Dear Ms. Gates:

SWCA Environmental (SWCA) is writing on behalf of NextEra Energy Resources, LLC (NEER), to request information regarding ecologically sensitive areas and federally and state listed endangered, threatened, or special concern species occurrences in reference to the proposed Crowned Ridge Wind, LLC and Crowned Ridge Wind II, LLC projects in Codington, Deuel, and Grant counties, South Dakota.

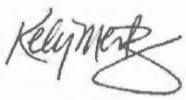
The two projects are adjacent and will total 600 megawatts (MW). The northern 300 MW and northern gen-tie are known as the Crowned Ridge I project. The southern 300 MW and southern (on-site) gen-tie is known as the Crowned Ridge II project. The projects' point of interconnection will be Otter Tail Power's Big Stone South 230-kilovolt substation near Big Stone City, South Dakota. Construction is anticipated to commence in late 2018, and the projects are scheduled to achieve commercial operation on or before the end of 2019.

We have provided Shapefiles and a figure to facilitate your review, and we greatly appreciate your ongoing efforts to treat the projects and their locations as confidential at this time. Please note that the area provided is larger than what ultimately will be needed to develop the projects. However, querying this area will allow NEER to accommodate micro-siting adjustments to avoid sensitive resources to the extent possible.

NEER has coordinated with the US Fish and Wildlife Service and South Dakota Game, Fish, and Parks (SDGFP) since 2005 regarding potential wind energy development in this general region. Recent coordination includes our April 20, 2017 conference calls with you and the SDGFP. As you are aware from this past and ongoing coordination, NEER's goal is to perform a thorough analysis of environmental resources using the best available information.

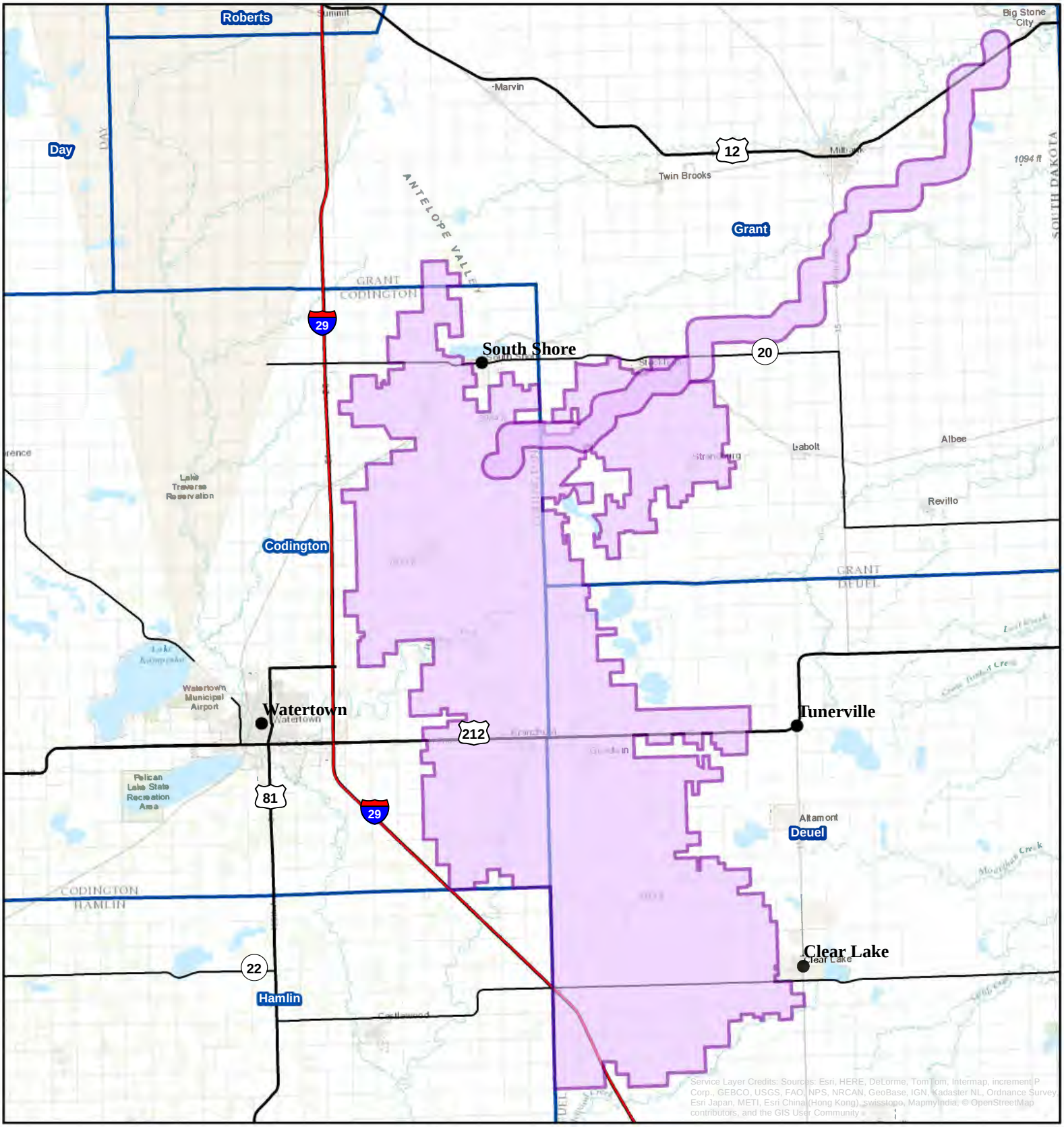
Should you have any questions or require additional information, please do not hesitate to contact me at 614.580.6715 or kmertz@swca.com. Thank you for your assistance.

Sincerely,



Kely Mertz
Senior Project Manager

021221



Crowned Ridge I and II Wind Projects

- City
- County Boundary
- Interstate Highway
- U.S. Highway
- State Highway
- Area of Interest

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Phone: 701.258.6622
Fax: 701.258.5957

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Kilometers
0 5 10

Miles
0 5 10

Base Map: USGS 7.5' Topographic Map
Source: Esri ArcGIS Online service
Codington, Grant, and
Deuel Counties, South Dakota

021222

Projection: NAD 1983 UTM Zone 14N

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Kely Mertz

From: Heimerl, Casey <Casey.Heimerl@state.sd.us>
Sent: Tuesday, August 01, 2017 11:57 AM
To: Kely Mertz
Cc: Kempema, Silka
Subject: RE: Data request - Crowned Ridge projects
Attachments: SDNHD_8-1-17.zip; Invoice SDNHP-08-01-17-01.pdf; EOdatafields.pdf

Hi Kely,

Attached is a zipped shapefile of the Element Occurrence within your request area along with an invoice for your data request.

The SDNHD tracks species at risk. These species are those that are legally designated as either state or federally threatened or endangered (legally protected) or rare. Rare species are those that are declining and restricted to limited habitat, peripheral to a jurisdiction, isolated or disjunct due to geographic or climatic factors, or that are classified as such due to lack of survey data. A list of all monitored species can be found at http://gfp.sd.gov/wildlife/threatened-endangered.

I also included a description of the data fields included in the attribute table of the shapefile.

Please note that many places in South Dakota have not been surveyed for rare or protected species and the absence of any additional species from the database does not preclude its presence.

If you have any question please feel free to contact me,

~Casey

From: Kely Mertz [mailto:KMertz@swca.com]
Sent: Monday, July 31, 2017 10:03 AM
To: Heimerl, Casey
Subject: RE: [EXT] Data request - Crowned Ridge projects

Hi Casey,
Yes, we are fine with the fees.
Thank you,
Kely

From: Heimerl, Casey [mailto:Casey.Heimerl@state.sd.us]
Sent: Monday, July 31, 2017 9:32 AM
To: Kely Mertz <KMertz@swca.com>
Subject: RE: Data request - Crowned Ridge projects

Hi Kely,

Silka forwarded me your request. I can conduct a search of our Natural Heritage Database and provide you with any records of rare, threatened or endangered species within the project areas. Silka will be providing you with a review of the projects.

021224

Before I proceed with the data search, I want to make sure you are aware of the fees associated with data requests. Fees include $30/hour of staff time required and $30 per database search. If needed, I can provide you with a cost estimate for your request.

Thanks,

~Casey

From: Kely Mertz [mailto:KMertz@swca.com]
Sent: Wednesday, July 12, 2017 10:15 AM
To: Kempema, Silka
Subject: [EXT] Data request - Crowned Ridge projects

Good morning Silka,

Attached please find a data request, and accompanying figure and shapefiles for the Crowned Ridge I and II projects.

Please let me know if you have any questions.
Thank you!
Kely

Kely Mertz
Senior Project Manager

200 W. 22nd Street, Suite 220
Lombard, IL 60148
Office 630.705.1762
Cell 614.580.6715
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EO Data Fields

FIELD	DEFINITION
EO_ID	Element Occurrence ID - Unique identifier for the EO record in the Biotics database system; used as the primary key.
EO_NUM	Element Occurrence Number - A number identifying the particular occurrence in a subnation.
SNAME	Subnational (state) recognized scientific name.
SCOMNAME	Subnational (state) recognized common name.
GNAME	Global Scientific Name - The standard global (i.e., rangewide) scientific name (genus and species) adopted for use by the NatureServe Central Databases based on selected standard taxonomic references.
GCOMNAME	Global Common Name - Species: The common name of an element adopted for use by NatureServe. Associations: A colloquial name for the association. Note: Common names have not been tracked for all plants. Names for other groups may be incomplete. Many elements have several common names, often in different languages. Spellings of common names follow no standard conventions and are not systematically edited.
NAME_CAT_1	Broad zoological, botanical or ecological category for the species to which the Scientific Name applies.
G_RANK	Global Rank - The NatureServe Conservation Status of a species from a global (i.e., rangewide) perspective, characterizing the relative rarity or imperilment of the species or community. The basic global ranks are: GX - Presumed Extinct, GH - Possibly Extinct, G1 - Critically Imperiled, G2 – Imperiled, G3 – Vulnerable, G4 - Apparently Secure, and G5 – Secure. For more detailed definitions and additional information, please see: http://www.natureserve.org/explorer/granks.htm.
S_RANK	Subnational Conservation Rank - The conservation status of a species from the subnational jurisdiction perspective, characterizing the relative rarity or imperilment of the species. Together these values provide national distribution data. The basic subnational conservation ranks are: SX - Presumed Extirpated, SH - Possibly Extirpated (Historical), S1 – Critically Imperiled, S2 – Imperiled, S3 – Vulnerable, S4 - Apparently Secure, S5 – Secure, SNR – Rank not yet assessed, SU – Unrankable, SHB – State Hybrid, SNA – Rank Not Applicable. For more detailed definitions and additional information, please see: http://www.natureserve.org/explorer/nsranks.htm.
CONFIDENCE	Confidence Extent - Indicator whether the full extent of the Element is known (i.e., has been determined through field survey) at that location and, therefore, is represented by the Element Occurrence (EO).
BASIC_EO_RANK	EO Rank Codes - Value that indicates the relative value of the Element Occurrence (EO) with respect to other occurrences of the Element, based on an assessment of estimated viability (i.e., probability of persistence) for species. In other words, EO ranks provide an assessment of the likelihood that if current conditions prevail the occurrence will persist for a defined period of time, typically 20-100 years. EO ranks may be used effectively in conjunction with NatureServe Conservation Status Ranks for the Element to guide which occurrences should be recorded and mapped, and to help prioritize EOs for purposes of conservation planning or action, both locally and rangewide. The basic EORANKs are: A – Excellent, B – Good, C – Marginal / Fair, D – Poor, E – Verified Extant, F – Failed to Find, X – Extirpated, H – Historic (possibly extirpated), U – Unrankable, NR – Not Ranked.

FIRST_OBS_DATE	First Observation Date - Date that the Element Occurrence (EO) was first reported at the site. If the EO is known from only one field report, then the date entered in this field should be the same as in the Last Observation Date field.
LAST_OBS_DATE	Last Observation Date - The date that the Element Occurrence (EO) was last observed to be extant at the site. Note that the last observation date is not necessarily the date the site was last visited (i.e., the survey date) or the date on which the occurrence was assigned an EO rank (i.e., the EO rank date). However, for E-ranked (extant) EOs, the last observation date should be the same as the date on which the occurrence was ranked.
EO_DATA	EO Data - Data collected on the biology of this EO, including the number of individuals, vigor, habitat, soils, associated species, particular characteristics, etc.
GEN_DESC	General Description - A general (capsule) description or word picture of the area where the Element Occurrence (EO) is located (i.e., the physical setting/context surrounding the EO).
DIRECTIONS	Direction to Element Occurrence
STATE_STAT	State Protection Status, i.e. ST=State Threatened, SE=State Endangered
FED_STAT	Federal Protection Status, i.e. LT=Federally Threatened, LE=Federally Endangered, C=Candidate Species

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From:	Kely Mertz
To:	"Heimerl, Casey"
Subject:	Request for nest data
Date:	Friday, April 20, 2018 9:44:00 AM
Attachments:	PROJECT_AREA_BUFFER_20180419.zip

Hi Casey,

We would like to submit an updated request (current area of interest attached) for raptor nest data. Could you please review and let me know if you have any questions?

Thank you,
Kely

From: Kely Mertz
Sent: Tuesday, April 4, 2017 10:35 AM
To: Heimerl, Casey <Casey.Heimerl@state.sd.us>
Subject: Request for nest data (shapefiles 2 of 2)

Casey,

The attached shapefiles depict a corridor (2 of 2 project shapefiles) for which we would like to request nest data. Please let me know if you have any questions.

Thank you,
Kely

Kely Mertz
Senior Project Manager

200 W. 22nd Street, Suite 220
Lombard, IL 60148
Office 630.705.1762
Cell 614.580.6715
Visit Our Website: http://www.swca.com

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From: Heimerl, Casey
To: Kely Mertz
Subject: RE: Request for nest data
Date: Tuesday, April 24, 2018 11:32:00 AM
Attachments: SDNHP-4-24-18.zip

Hi Kely,

Attached is an updated shapefile of raptor records. I will waive the fee since there are only a few additional records from last year. The data use agreement that you signed last year is also good for another year.

Please let me know if you have any questions,

~Casey

From: Kely Mertz [mailto:KMertz@swca.com]
Sent: Tuesday, April 24, 2018 9:17 AM
To: Heimerl, Casey
Subject: FW: [EXT] Request for nest data

Hi Casey,
Sorry about that, not sure what happened. Can you see if this file works?
Thank you,
Kely

From: Mike Sobiech
Sent: Tuesday, April 24, 2018 10:16 AM
To: Kely Mertz <KMertz@swca.com>
Subject: RE: Request for nest data

Interesting. This contains the shapefile.

Mike Sobiech
GIS Lead/OSR - Bismarck

From: Kely Mertz
Sent: Tuesday, April 24, 2018 9:14 AM
To: Mike Sobiech <MSobiech@swca.com>
Subject: FW: Request for nest data

Mike,
Casey says this folder is empty when she opens it?

From: Kely Mertz
Sent: Friday, April 20, 2018 9:45 AM

To: 'Heimerl, Casey' <Casey.Heimerl@state.sd.us>
Subject: Request for nest data

Hi Casey,

We would like to submit an updated request (current area of interest attached) for raptor nest data. Could you please review and let me know if you have any questions?

Thank you,
Kely

From: Kely Mertz
Sent: Tuesday, April 4, 2017 10:35 AM
To: Heimerl, Casey <Casey.Heimerl@state.sd.us>
Subject: Request for nest data (shapefiles 2 of 2)

Casey,

The attached shapefiles depict a corridor (2 of 2 project shapefiles) for which we would like to request nest data. Please let me know if you have any questions.

Thank you,
Kely

Kely Mertz
Senior Project Manager

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Tel 630.705.1762
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April 3, 2019

Silka Kempema
South Dakota Game Fish and Parks
523 East Capitol Avenue
Pierre, SD 57501

Re: Crowned Ridge I Wind Energy Project in Codington and Grant Counties, South Dakota

Dear Ms. Kempema:

SWCA Environmental (SWCA) is writing on behalf of NextEra Energy Resources, LLC (NextEra), to request updated information regarding ecologically sensitive areas and federally and state listed endangered, threatened, or special concern species occurrences in reference to the proposed Crowned Ridge I Wind Energy Facility (the project) in Codington and Grant Counties, South Dakota. We have provided Shapefiles and a figure to facilitate your review.

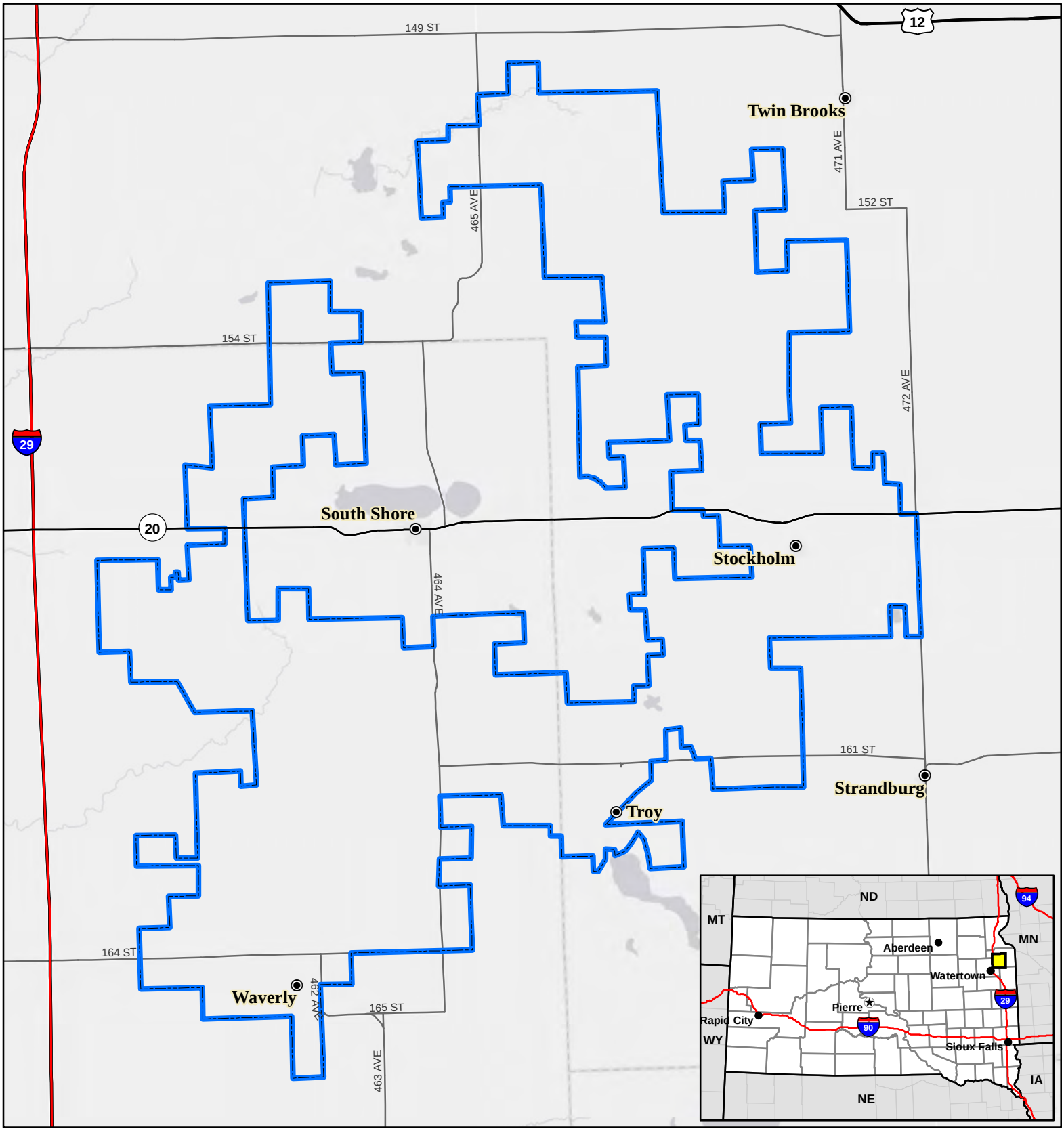
Crowned Ridge Wind, LLC, an indirect, wholly owned subsidiary of NextEra, plans to develop the approximately 300-megawatt (MW) project. The project will produce energy sold to Xcel Energy through a Power Purchase Agreement. A new approximately 34-mile transmission line will be constructed to connect the project to Otter Tail Power's Big Stone South 230-kilovolt (kV) substation near Big Stone City, South Dakota.

NEER has coordinated with the South Dakota Game, Fish, and Parks and U.S. Fish and Wildlife Service since 2005 regarding potential wind energy development in this general region. Recent coordination includes a data request letter dated July 2017, and an updated raptor nest data request dated April 2018. As you are aware from this past and ongoing coordination, NextEra's goal is to perform a thorough analysis of environmental resources using the best available information.

Should you have any questions or require additional information, please do not hesitate to contact me at 614.580.6715 or kmertz@swca.com. Thank you for your assistance.

Sincerely,

Kely Mertz
Senior Project Manager



Project Area

- City
- Project Boundary
- Interstate Highway
- U.S. Highway
- State Highway
- County Road

Kilometers
0 5 10

Miles
0 2.5 5

N
W E
S

Base Map: World Light Gray Canvas Base
Sources: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Codington and Grant Counties, South Dakota

Projection: NAD 1983 UTM Zone 14N

021235

SWCA ENVIRONMENTAL CONSULTANTS

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From: Heimerl, Casey
To: Becky Braeutigam
Cc: Meyer, Hilary; Kempema, Silka
Subject: RE: EXTERNAL:RE: Data request - Crowned Ridge I
Date: Friday, April 26, 2019 10:35:56 AM
Attachments: image001.png
CRI_SDNHD_4-26-19.zip
CRII_SDNHP_4-26-19.zip
CRII_AdditionalTopekaShiner_4-26-2019.zip
EOdatafields.pdf
Invoice SDNHP_4_26_19_01.pdf

Good morning Becky,

Attached are shapefiles for documented records from the SD Natural Heritage Database (SDNHD) that occurred within the Crown Ridge I and Crown Ridge II project areas. There were also additional records of Topeka Shiners (Federally Endangered) within CRII that had not yet been entered into the Heritage Database but I included these as a separate shapefile.

Also included is a description of the main fields in the attribute table and an invoice for your request.

Please note that the SDGFP does not conduct annual surveys for rare species and communities and the absence of data in your project area does not preclude its presence.

If you have any questions please feel free to contact me.

~Casey

From: Becky Braeutigam [mailto:becky.braeutigam@swca.com]
Sent: Thursday, April 25, 2019 11:00 AM
To: Heimerl, Casey
Subject: RE: [EXT] EXTERNAL:RE: Data request - Crowned Ridge I

Hi Casey-
Just within the provided shapefile would be great. Thanks for checking.
Becky

From: Heimerl, Casey <Casey.Heimerl@state.sd.us>
Sent: Thursday, April 25, 2019 11:45 AM
To: Becky Braeutigam <becky.braeutigam@swca.com>
Subject: RE: EXTERNAL:RE: Data request - Crowned Ridge I

Thanks Becky,

Would you like me to conduct the search for record occurring within your provided shapefile, or should I extend the search any distance beyond the boundary?

~Casey

From: Becky Braeutigam [mailto:becky.braeutigam@swca.com]

Sent: Thursday, April 25, 2019 9:43 AM
To: Heimerl, Casey
Subject: RE: [EXT] EXTERNAL:RE: Data request - Crowned Ridge I

Hi Casey-
Thanks for getting back with me. The signed data use agreement is attached. We are indeed aware of the fees and the $120 estimate sounds in line with what we were anticipating. Please let me know if you need anything else to complete the request.
Thanks,
Becky

From: Heimerl, Casey <Casey.Heimerl@state.sd.us>
Sent: Thursday, April 25, 2019 9:37 AM
To: Becky Braeutigam <becky.braeutigam@swca.com>
Subject: EXTERNAL:RE: Data request - Crowned Ridge I

Good morning Becky,

My apologies for not responding sooner, somehow your email got buried in my inbox. I can conduct a search of the Natural Heritage Database for records of rare, threatened or endangered species within the project areas you provided for the Crowned Ridge I and II projects.

The SDNHD tracks species at risk. These species are those that are legally designated as either state or federally threatened or endangered (legally protected) or rare. Rare species are those that are declining and restricted to limited habitat, peripheral to a jurisdiction, isolated or disjunct due to geographic or climatic factors, or that are classified as such due to lack of survey data. A list of all monitored species can be found at https://gfp.sd.gov/natural-heritage-program/

Before I proceed, I will need you to read over and sign the attached data use agreement form. Also, I want to make sure you are aware of the fees associated with data requests. Fees include $30/hr of staff time required and $30 database search. I would estimate your cost to be around $120.00

Please let me know if you have any questions,

~Casey

Casey Heimerl | *Wildlife Biologist*
South Dakota Game, Fish and Parks
523 East Capitol Avenue | Pierre, SD 57501
605.773.4345 | Casey.Heimerl@state.sd.us

From: Kempema, Silka
Sent: Wednesday, April 03, 2019 9:59 AM
To: Kirschenmann, Tom; Meyer, Hilary; Heimerl, Casey
Subject: FW: [EXT] Data request - Crowned Ridge I

From: Becky Braeutigam [mailto:becky.braeutigam@swca.com]
Sent: Wednesday, April 03, 2019 9:03 AM
To: Kempema, Silka
Cc: Kely Mertz
Subject: [EXT] Data request - Crowned Ridge I

Good morning Silka-
Please find attached a data request and associated overview map and shapefiles for the Crowned Ridge I project in Codington and Grant counties. Please let me know if you have any questions or if you require any additional information to complete the request.
Thanks,
Becky

Becky Braeutigam
Natural Resources Project Manager

SWCA Environmental Consultants
200 W. 22nd St., Suite 220

Lombard, IL 60148
M 937.405.8256

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
South Dakota Ecological Services
420 South Garfield Avenue, Suite 400
Pierre, South Dakota 57501-5408
(605) 224-8693, southdakotafieldoffice@fws.gov

IN REPLY REFER TO:
CROWNED RIDGE
I AND II

July 2, 2019

Ms. Kimberly Wells
NextEra Energy Resources, LLC
601 Travis Street, Suite 1900
Houston, Texas 77002

Darren Kearney
South Dakota Public Utilities Commission
500 E. Capitol Avenue
Pierre, South Dakota 57501

Dear Ms. Wells/Mr. Kearney:

This letter is in regard to the Crowned Ridge wind energy projects (I and II); we request that the South Dakota Public Utilities Commission include this letter as part of the record of evidence for these projects. Herein we convey our primary concerns, provide associated updated recommendations, and raise additional issues related to information obtained via the South Dakota Public Utilities Commission (SDPUC) website.

We have provided several letters since at least 2007 regarding this project and participated in an April 19, 2017, conference call where we learned the Crowned Ridge project would be divided into parts I and II. Summaries of wildlife/habitat studies and results to date were conveyed over the phone during that call, but prior to that, we had relatively little information on project activities, and it was not clear how or whether environmental recommendations provided to date had been considered or applied. We accessed SDPUC's website to obtain Crowned Ridge I and II application materials, including updated project maps, and wildlife/habitat surveys and information. We request that NextEra provide any existing/future Crowned Ridge reports not already on the SDPUC website; if the projects move forward this includes information regarding post-construction studies.

Our foremost concerns with the Crowned Ridge projects are potential impacts to the Topeka shiner, the Dakota skipper, and grassland/wetland habitats and associated wildlife (direct and indirect effects).

Topeka shiner

Our concerns regarding the Topeka shiner are in relation to information within the SDPUC application materials submitted by NextEra. It appears a portion of a known occupied tributary to Willow Creek exists within the Crowned Ridge I project boundary; we are uncertain whether this waterway will be affected by the project. The Crowned Ridge II project will require four crossings of Willow Creek and Stray Horse Creek during construction; these are both known occupied Topeka shiner streams. The nature of these crossings is unknown to us. The applications for both Crowned Ridge projects state: "There is no information available to determine whether the Topeka shiner currently inhabits streams in the actual Project Area or Project Construction Easement." When actions will occur in/adjacent to waterways known to be occupied by the species, we recommend working with the assumption that Topeka shiners may be present at the sites and could be directly and/or indirectly affected by the actions. This also applies to potentially occupied waterways that are connected to the known occupied habitats (assuming water is present in both cases). We refer you to the 2018 Species Status Assessment for the Topeka shiner for maps and additional species information: https://ecos.fws.gov/ServCat/Reference/Profile/95656. Please note that instream activities in known/potential Topeka shiner occupied habitats, as well as actions conducted adjacent to these areas, have the potential to adversely affect this endangered minnow (and, depending on activities conducted, may include latent impacts when water returns to a site that was impacted when the stream was dry). Best Management Practices (BMPs) are proposed in the Crowned Ridge I and II application materials to protect water quality due to actions adjacent to the stream, but without additional information, it is not clear these BMPs are adequate to preclude the potential for adverse affects to this species. If complete avoidance is not possible, further coordination with this office may be needed to ensure the proposed action does not result in section 9 violations of the Endangered Species Act (ESA). Additionally, a permit may be required for work within these waters via the U.S. Army Corps of Engineers, and section 7 consultation with this office may then be necessary to ensure ESA compliance.

Dakota skipper/Poweshiek skipperling

Regarding the Dakota skipper/Poweshiek skipperling, BMPs were submitted with the application materials that will likely reduce the risk of impacts, but it appears potential habitats for these species may still be impacted. A single survey was conducted by consultant SWCA for Dakota skippers and Poweshiek skipperlings for each Crowned Ridge project area in 2018 following the Service's *2018 Dakota Skipper (Hesperia dacotae) North Dakota Survey Protocol*. Neither species was detected. During our review of the reports submitted for these surveys, however, we noticed several issues of concern:

- The survey reports appear to indicate that thousands of acres identified as potentially suitable habitat via desktop methods were not field verified due partly to lack of landowner access and an undefined criteria describing some areas "qualitatively assessed as occurring in small or isolated patches" among other screening factors. Note that these species are known to occur in remnant small and isolated patches. The reports lack information on the number of acres omitted from field verification due to these criteria, the specifics of the criteria (e.g. how small the omitted patches were, their distances from other suitable patches), and whether these unchecked areas will be impacted by project activities.

- Among the unknown acreages that were field verified, 1,038 acres on Crowned Ridge I and 174.5 acres on Crowned Ridge II were identified as suitable habitat for these butterflies. Of these suitable acreages, only 12% (127.5 acres) and 23% (40.4 acres) for Crowned Ridge I and II respectively were selected for flight surveys, with larger patch sizes prioritized. It is not clear how the surveyors arrived at these acreages as subsets or the adequacy of this level of effort, but it appears the majority of suitable habitat locations were not surveyed for presence of the species.

- It also appears the flight-period survey areas these butterflies at Crowned Ridge II overlapped with disturbance areas for turbine construction sites, but it is not clear whether the same is true within the Crowned Ridge I survey report. Additionally, the overlap of surveyed suitable habitat with other ground-disturbing activities (e.g. roads, underground lines, crane paths, laydown areas) is not mentioned, thus the extent to which these potential habitats will be impacted is not clear, nor quantified.

- We are not certain whether another year of surveys for these butterflies will occur at either project site (we recommend at least 2 years of surveys), but the reports describe single-year protocols (e.g. three surveys, 48 hours apart, during peak flight period), thus it appears surveys will be limited to 2018. Missing from the single-year protocols in the survey reports is whether buffers to the sites of interest were also surveyed. The protocols include surveying 250 m buffer areas to the site of interest when there are no known populations nearby and 500 m buffers when there are records within 1 km (0.6 mi). The reports do not indicate the presence/absence of observation records in/near the project areas, nor surveys of buffer areas of any size.

- There is also no mention of designated critical habitat for these species in the reports. Critical habitat unit 4 for both the Dakota skipper and Poweshiek skipperling is located approximately one mile from the Crowned Ridge I project boundary. Dakota Skipper critical habitat unit 3/Poweshiek skipperling unit 3A exists only two miles from the project boundary of Crowned Ridge II. The Crowned Ridge projects are located between these two sites. Critical habitat tracts are located close to the projects and suitable habitat is present in the project areas, thus a thorough survey effort is appropriate. Given the above-described issues it is not clear this occurred.

We encourage revision of the reports, and/or addendums to them, to address the above concerns and further explain the methods/rationale so that the risks posed to these listed butterfly species as a result of the Crowned Ridge projects may be better understood and addressed appropriately.

The application materials for these projects describe the potential for impacts to suitable habitat and the possibility these sites will be determined occupied by the species in the future. BMPs proposed for these species are likely helpful, but concerns for impacts remain if the species are present. To preclude the risk of take of these federally listed species, we recommend complete avoidance of suitable habitats which are described in the final listing rule (79 FR 63672-63748, October 24, 2014). If this is not possible, and take of these species may occur as a result of these projects, development of a Habitat Conservation Plan to achieve Endangered Species Act

compliance is available to non-federal entities. See: https://www.fws.gov/endangered/what-we-do/hcp-overview.html.

Grassland/wetland habitats and wildlife

Regarding grassland/wetland habitats at these project sites, based on our review of revised boundary maps for both Crowned Ridge projects, it appears efforts were made to avoid many of these areas by altering project boundaries; we commend efforts to focus project impacts in previously disturbed areas. However, it appears wildlife habitats are not entirely avoided and the proposed projects will still incur impacts to these sites. The Crowned Ridge I and II project areas are within the Big Sioux Basin and Prairie Coteau Ecoregions within the larger Prairie Pothole Region. The Prairie Coteau in particular, with intact grassland and wetland habitats, harbors high numbers of breeding waterfowl and other migratory birds. These habitats exist within and adjacent to the projects' boundaries. The native grasslands in this part of eastern South Dakota are composed of tallgrass prairie species. A small percentage of the original tallgrass prairie remains intact today and this habitat is considered one of North America's most endangered ecosystems. Our agency has implemented conservation programs targeting this habitat type, and have purchased easements to conserve remaining tracts, help maintain biodiversity, and slow habitat fragmentation in this area. It is a priority conservation habitat for the Service.

Our Madison and Waubay Wetland Management Districts manage the Service's grassland and wetland easements in the counties that would be impacted by the Crowned Ridge I and II projects. While we are aware that NextEra has committed to avoiding direct impacts to the Service's grassland easements, thereby avoiding the associated federal nexus, construction is still proposed on tracts of land that have Service wetland easements. On these easement tracts, the wetland basins are protected by easement restrictions, but adjacent uplands are not. While project development on these tracts will not directly impact these protected basins, indirect impacts affecting wildlife use (see below) of those wetlands will occur due to proximity of project facilities. Similarly, indirect impacts are anticipated on grassland easements if facilities are placed adjacent to these protected tracts of land. Further, facilities for both projects that will be placed on/or adjacent to wetland/grassland habitats that are not protected by easements will incur direct and indirect impacts. We continue to recommend that all project facilities be placed on previously disturbed sites (e.g. croplands) to avoid direct habitat impacts, and encourage situating facilities as far from intact wildlife habitats as possible to reduce indirect impacts.

For those direct and indirect effects that cannot be avoided, we also continue to recommend quantifying and offsetting those impacts. Proposed BMPs submitted for these projects may serve to reduce, but not preclude, impacts. As you know per our prior coordination on this and other NextEra projects, we regard several published literature sources as the best available science regarding avian avoidance of turbines. The U.S. Geological Survey research project funded by NextEra (Shaffer and Buhl 2016) revealed displacement of grassland nesting birds by turbines occurs out to at least 300 m. The Service's own research (Loesch et al. 2013) revealed displacement of breeding waterfowl pairs from wetlands within ½ mile of turbines. Additionally, an independent study of avian species in replanted grasslands (Conservation Reserve Program) (Leddy et al. 1999) also identified grassland nesting bird displacement within 180 m of turbines. Offsetting these impacts is consistent with our March 2012 U.S. Fish and

Wildlife Service Land-Based Wind Energy Guidelines (WEG), developed in coordination with wind industry.

NextEra has committed to development and implementation of habitat offset plans in relation to wind energy facilities in North Dakota; South Dakota harbors similar habitat and wildlife resources and conservation of those resources is important in this state as well. To ensure compliance with the WEG, reduce the environmental impacts of your projects, and help sustain and conserve native South Dakota wildlife species and habitats long-term, we recommend you evaluate the Crowned Ridge projects for any opportunities to further reduce impacts to habitat and wildlife. Then, quantify the remaining direct and indirect impacts to these resources and utilize the aforementioned published studies to develop/implement a plan to offset those impacts. We are willing to work with you in that regard.

Some other items of concern based on our review of NextEra's SDPUC permit application information for the Crowned Ridge projects include the following:

- Grouse Leks Although prairie grouse leks are known to exist in the vicinity of the projects, the only measure currently proposed by NextEra to reduce impacts to these leks is adjustment of the timing of construction (presumably to avoid the lekking season). While this may reduce impacts within the year of construction, it will have no bearing on operational impacts that are likely to displace grouse from leks in subsequent years. Avoiding leks by at least one mile is recommended by South Dakota Game, Fish and Parks; we submit further distance may be needed to preclude displacement.

- Line Marking A significant length (34+ miles) of overhead transmission lines will be constructed with these projects. It is not clear whether line-marking to make lines visible to birds or designs to prevent electrocutions will be applied. We refer you to our earlier letters on these topics and recommend application of the Avian Powerline Interaction Committee's (APLIC) guidelines to reduce the risk of avian mortality at these structures, including eagles (potential violations of the Bald and Golden Eagle Protection Act). Overhead lines in the vicinity of wetlands pose an increased risk to birds. We recommend marking those lines in particular, and ensuring the long-term maintenance of all marking devices and measures used to prevent electrocutions.

- Tallgrass Prairie Crowned Ridge application materials indicate use of Bauman et al. (2016), which identified areas of unbroken prairie in South Dakota. However, while the methods in that publication are described and quantity of unbroken prairie in the project areas are given, it is not clear whether these areas will be avoided – we recommend doing so. As stated above, the tallgrass prairie remaining in South Dakota is a very limited and valuable habitat.

- Bat Surveys Acoustic surveys for bats were conducted for these projects, resulting in detections of several bat species, but no northern long-eared bats. However, based on our review of the survey reports, the survey locations and level of effort appear inadequate to determine whether the northern long-eared bat may occur in the project areas. Each of the six bat species with potential to occur in the project area is associated with forested habitats, yet it appears forested habitats were not surveyed. At Crowned Ridge I, consultant SWCA identified 246 acres of suitable moderate quality habitat (based on patch size between 15-114 acres), but only two sites were surveyed, neither within the identified suitable habitat, and one was outside the project boundary. At Crowned Ridge II, 123 acres of suitable moderate quality (15-114 ac size) habitat were identified, yet only one location was surveyed, and it was not in suitable habitat. It appears all potential habitat patches were consolidated into a single acreage for each Crowned Ridge project, and the values were used to determine the number of bat survey locations. This method is not recommended to evaluate project area use by tree-roosting bat species, as it does not address the nature (small, isolated, scattered patches) of forested habitats in South Dakota and the potential occupancy of those areas by bats. As you know, the 4(d) rule for the northern long-eared bat does not prohibit mortality via collisions with wind turbines. However, if the intent of habitat evaluations and acoustic surveys is to determine the potential presence of this species, the survey methods applied for these projects appear inadequate for that purpose. We recommend targeting suitable habitats for surveys and surveying an increased number of those small, isolated, scattered patches of forest to detect a bat species that prefers trees and does not often utilize open areas.

- Eagles Raptor nest surveys revealed no eagle nests within project boundaries, but six nests were located within the 10-mile buffer surrounding these projects. One nest by the town of South Shore, while not technically within project boundaries, would ultimately be surrounded by turbines if the project area is developed as proposed. Bald eagles were observed during avian use surveys on Crowned Ridge II, but none at Crowned Ridge I. We recommend closely following the Service's *Eagle Conservation Plan Guidance* (https://www.fws.gov/migratorybirds/pdf/management/eagleconservationplanguidance.pdf) including implementation of the eagle model used to determine risk and evaluate whether an eagle take permit may be appropriate for these projects.

If changes are made in the project plans or operating criteria, or if additional information becomes available, the Service should be informed so that the above determinations can be reconsidered.

The Service appreciates the opportunity to provide comments. If you have any questions on these comments, please contact Natalie Gates of this office at (605) 224-8693, Extension 227.

Sincerely,

Scott Larson
Field Supervisor
North and South Dakota Field Offices

Cc (email): Hilary Meyer, SDDGFP, Pierre, SD
Brad Johnson, USFWS, Waubay, SD
Natoma Hansen, USFWS, Madison, SD

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Crowned Ridge Wind, LLC
700 Universe Boulevard
Juno Beach, FL 33408

July 8, 2019

VIA Electronic Mail
Kristen N. Edwards
Staff Attorney
South Dakota Public Utilities Commission
500 East Capitol Avenue
Pierre, SD 57501
Phone (605)773-3201
Kristen.edwards@state.sd.us

Dear Ms. Edwards:

Thank you for forwarding the July 2, 2019 letter from the U.S. Fish and Wildlife Service (the USFWS), that was filed in Docket No. EL19-003. The purpose of this response is to elaborate on Crowned Ridge Wind, LLC's (Crowned Ridge) commitment to continued coordination with the Service, and also to address certain topics discussed by the Service in its letter.

By way of summary, this response shows the following:

- While the USFWS does not have jurisdiction over the Crowned Ridge Wind Project (Project), Crowned Ridge has voluntarily consulted with the USFWS for many years, most recently via email and telephone to discuss the issues raised in this letter on July 3, 2019;

- Crowned Ridge is committed to continue the voluntary consultation with the USFWS, including describing the commitments Crowned Ridge has made in this proceeding that address the items set forth in the letter. For example:

    - Crowned Ridge will avoid impacts to the Topeka Shiner;

    - Crowned Ridge will use seed mixes that incorporate vegetation that supports federally listed butterfly species during revegetation efforts in native prairie that occur in potentially suitable Dakota Skipper and Poweshiek Skipperling habitat;

    - Crowned Ridge will implement a Stormwater Pollution Prevention Plan (SWPPP) that addresses restoration of any disturbed areas following construction, including revegetating non-cultivated grasslands using a seed mix that is recommended by the

Natural Resource Conservation Service (NRCS), or other land management agency, unless otherwise agreed upon with the landowner in writing; and

- A 1.5 mile buffer from any known occupied bald eagle nest.

- Crowned Ridge's voluntary consultation with the Service has been interactive. For example:

  - The Service approved the biologist and the protocols used to conduct the Dakota skippers and Poweshiek Skipperling survey; and

  - The Service also indicated to Crowned Ridge that Northern Long-Eared Bat is generally located in the Black Hills region, except for periods of migration where it is unlikely to occur at the Project.

Crowned Ridge has already reached out to the USFWS, and is confident it can provide the additional information to further demonstrate Crowned Ridge's commitment to protect the environment.

By way of background, the NextEra Energy Resources, LCC ("NEER") family of companies, which includes its indirect, wholly-owned subsidiary Crowned Ridge Wind, LLC (Crowned Ridge), have a long history of coordination with USFWS on its wind projects throughout the U.S. As the record in EL19-003 demonstrates, Crowned Ridge has coordinated with the USFWS for many years on the Project. For example, Appendix B of the Application (Ex. A1-B) shows that Crowned Ridge's first coordination with the USFWS occurred in 2007 and Crowned Ridge has continued to coordinate with the USFWS throughout the development of the Project. Crowned Ridge remains committed to continuing coordination with USFWS, and reached out to discuss the letter last week, but was unable to reach USFWS personnel.

Crowned Ridge will continue, as would be the normal course of business on any NEER wind project, to voluntarily coordinate with the USFWS throughout the Project's development, construction, and operation on the Crowned Ridge Wind project. For example, in its letter the USFWS requests that Crowned Ridge provide copies of post-construction studies. Crowned Ridge commits to provide these studies to the USFWS in the spirit of voluntary coordination, as the Service has no jurisdiction over the Project. In its letter, the USFWS acknowledges that the Project has been sited to avoid federal impacts, thus there is no federal nexus and jurisdiction over the Project. Therefore, while the USFWS' citation in its letter to federal statutes and regulations may be informative for Crowned Ridge's voluntary coordination with the USFWS, these legal authorities are not controlling or applicable to the Project.

The remainder of our response addresses the specific topics discussed by the USFWS. The purpose is to provide context and demonstrate Crowned Ridge's commitment to working with the USFWS as well as state agencies on similar issues throughout the development process, and, if approved for a Facility Permit, the construction and operation of the Project.

Topeka Shiner

In its letter, the USFWS questions whether the Project will avoid impacts to the Topeka Shiner. As Crowned Ridge's Application at pages 11 and 70-71 indicate, Crowned Ridge is aware of the potential for Topeka Shiner to be found in the Project area, which includes the Willow and Stray Horse Creeks. Crowned Ridge plans to completely avoid potential impacts to the Willow and Stray Horse Creeks by boring under the streams. This avoidance measure will be included in the Wildlife Conservation Strategy that will be filed with the Commission prior to construction, and will also be communicated to the Service as a courtesy.

Dakota Skipper

In its letter, the USFWS questions whether the Project appropriately surveyed for the presence of Dakota Skipper and included an avoidance strategy. It is puzzling why the USFWS raised this concern. The Application clearly demonstrates that Crowned Ridge's surveying for the Dakota Skipper was conducted by a USFWS–approved biologist and in accordance with protocols approved by the USFWS. With respect to surveying, in Appendix C of the Application (Ex. A1-C) Crowned Ridge submitted a Dakota Skipper and Poweshiek Survey Report. The Report shows that Jake Powell of SWCA, a contractor for the Project, is a USFWS–approved biologist authorized to complete protocol-level surveys for Dakota Skippers and Poweshiek Skipperlings. Attachment A of the Dakota Skipper and Poweshiek Survey Report also describes concurrence *issued by the USFWS* that the required protocol proposed for survey use was appropriate and sufficiently based on USFWS requirements. The survey results that show no detections of either butterfly species were shared with the USFWS via email in January 2019, including a copy sent to Scott Larson of the Service. A copy of that report was also included as Appendix C of Application filed with the Commission in January 2019.

A summary of the findings regarding the absence of Dakota Skippers is set forth in Section 11.3.1.2.1 and Section 11.3.1.4.1 of the Application. These sections explain there is a small proportion of suitable habitat for Dakota Skippers within the Project area. Nonetheless, Crowned Ridge set forth an avoidance strategy to minimize any impacts to suitable habitat areas of the Dakota Skipper during the flight season in Section 11.3.2.1 and 11.3.2.5 of the Application. Further, Crowned Ridge committed to use seed mixes that incorporate vegetation that supports these prairie butterfly species during revegetation efforts in potentially suitable Dakota Skipper and Poweshiek Skipperling habitat areas. Crowned Ridge will ensure the USFWS understands we have properly surveyed and documented the lack of the presence of Dakota Skipper and our commitments to protect the Dakota Skipper, should it occur.

Tallgrass Prairie and Wetlands

In its letter, the Service asserts that not all wildlife habitats, such as grasslands and wetlands, were avoided by the Crowned Ridge Project. As the Application in Section 2.1 shows, Crowned Ridge is committed to avoiding and minimizing the impacts to grasslands and wetlands. Further, the Application sets forth an analysis of the potential presence of native prairie in Section 11.1.1 of the Application, showing approximately 47% of the Project area is grass/pasture and approximately 36% is in agriculture. The Project Construction Easement or subset of the Project area that will be potentially disturbed, is 26% in grass/pasture and 71% in agriculture that further demonstrates the Project's avoidance and

minimization efforts. Section 11.1.2 of the Application also states the permanent impact to grass/pasture is approximately 21.5 acres of the total 53,186 acre Project area or less than one tenth of one percent (< 0.004%). Further, as Crowned Ridge's Exhibit A70 shows, only 19 of the proposed 130 turbines impact native prairie as mapped by Bauman et al. 2016; and native prairie makes up approximately 17,889 acres of the Project area (Application at 50).[1] Of the 19 turbines on mapped native prairie, all 19 were sited due to minimize impacts on other environmental constraints, such as wetlands or cultural resources, or to incorporate landowner preferences not to have the turbine in land used to produce crops, or to incorporate specific turbine placement if the landowner only owned land in grasslands. Further, only 17 of the 19 turbine locations are actually located on native prairie based on field surveys that refined regional scale mapping of native prairie completed by Bauman et al. 2016 that was used in the preliminary analysis for the Project.

To minimize the impact to grasslands and native prairie, Crowned Ridge has committed to implement a Stormwater Pollution Prevention Plan that addresses restoration of any disturbed areas following construction. Crowned Ridge has also committed to address temporary impacts by revegetating non-cultivated grasslands using a seed mix that is recommended by the Natural Resource Conservation Service (NRCS), or other land management agency, unless otherwise agreed upon with the landowner in writing.

Project impacts to wetlands are described in Section 11.2.1 and avoidance and minimization measures are described in Section 11.2.2 of the Application. The Project committed to avoiding temporary and permanent impacts to wetlands and waters to the extent practical, including boring under potentially regulated features for collection lines and shifting roads for avoidance, where practical. The Project has also committed to keeping any unavoidable impacts below thresholds necessary to qualify for the conditions of the U.S. Army Corps of Engineers (USACE) Nationwide 12 permit for utility lines and associated facilities. The Project has further committed to a restoration process that will include revegetating native prairie areas with a seed mix recommended by NRCS unless otherwise agreed upon with the landowner.

USFWS Easements

The potential for Project impacts to USFWS easements are described in Section 10.2.1.1 and avoidance and minimization measures are described in Section 10.2.2 of the Application. The Project has avoided (1) all parcels with grassland or combination wetland/grassland USFWS easements on them, and (2) all protected basins within USFWS' jurisdiction. In fact, while there are turbines sited within a parcel containing a wetland easement, none of the turbines in that easement are sited on a wetland protected basin. As the USFWS specifically acknowledges in their letter, USFWS easements do not extend to the uplands on a USFWS wetland easement surrounding the protected basin and only cover the protected basin. The Project avoids all direct impacts to protected basins on USFWS wetland easements, which is documented in Section 2.1 of the Application.

[1] Bauman, P., B. Carlson, and T. Butler. 20 1 6. Quantifying Undisturbed (Native) Lands in Eastern South Dakota: 2013. Brookings: South Dakota State University Extension.

As part of its continued coordination with the USFWS, Crowned Ridge will explain the Project's impacts on native prairie and the lack of turbine impacts to protected basins, and explain the commitments Crowned Ridge made in its Application and in the stipulated conditions proposed for adoption in EL19-003.

Grouse Leks

The record in EL19-003 shows that Crowned Ridge has made more specific commitments to protect the Grouse Lek than is claimed in the USFWS letter. Crowned Ridge has made the following commitments: (1) to avoid construction activities within 2 miles of known leks during the lekking period (March 1 to June 30) (Ex. A42 at 13) and (2) to impose a 0.3 mile buffer for turbine siting from any known historic lek (Evid. Hrg. Tr. at 196). Also, Crowned Ridge used survey data of known historic leks when siting its infrastructure, and has only sited 17 of the 130 turbines on native prairie, both of which help protect grouse leks. In addition, Crowned Ridge is unaware of any empirical peer-reviewed data reviewing the effects of wind turbine development on greater prairie-chicken or sharp-tailed grouse activities at lek locations in the Upper Great Plains (including South Dakota, North Dakota, and Minnesota) supporting the hypothesis that prairie grouse exhibit avoidance or displacement behavior around turbines. The avoidance and minimization efforts of the Project were also acknowledged by Staff witness Kirschenmann of the South Dakota, Department of Game, Fish, and Parks during the evidentiary hearing. Evid. Hrg. Tr. at 500 (June 12, 2019). During Crowned Ridge's continued coordination with the USFWS, it will explain these commitments to protecting leks.

Line Marking

The USFWS letter questions whether the Project used Avian Powerline Interaction Committee's (APLIC) guidelines in the planned construction of transmission for the Project. The transmission lines were approved by Commission in EL17-050 and EL18-018, and Crowned Ridge and Crowned Ridge Wind, II, LLC, respectively agreed to design the transmission lines following APLIC suggested practices. Crowned Ridge, during its coordination with USFWS, will explain this commitment in further detail.

Northern Long-Eared Bats

In its letter, the USFWS recommends targeting suitable habitats for bat surveys and surveying an increased number of those small, isolated, scattered patches of forest to detect a bat species that prefers trees and does not often utilize open areas. Crowned Ridge's Application (in Section 11.3.2.1) acknowledges that removal and fragmentation of forested patches could impact the Northern Long-Eared Bat, if present. As explained further in Section 11.3.2.4 of the Application, Crowned Ridge minimized tree clearing to avoid impacts to potential bat habitat, if occupied. In support of appropriate implementation of avoidance and minimization measures for bats, Crowned Ridge conducted a habitat suitability assessment (Appendix F to the Application) and an acoustic survey (Appendix G to the Application).

The intent of the habitat assessment was to determine the availability and suitability of bat habitat within the study area and used that information to determine a likelihood of occurrence for listed bat

species. The definition of "suitable habitat" was specific to each species. Suitable summer habitat for northern long-eared bats, as defined by the available, peer-reviewed literature, makes up less than 1 percent of the Project area. The known distribution of Northern Long-Eared Bats in South Dakota, according to coordination with USFWS, is primarily limited to the Black Hills region in the summer and winter, though a potential migrant throughout the State. Thus, it is reasonable to conclude that the species has a low likelihood of occurrence at most within the Project area. Email correspondence from Ms. Natalie Gates of the USFWS to SWCA's biologist Drew Carson on June 6, 2018 regarding the Project is consistent with this conclusion and describes no known hibernacula of Northern Long-Eared Bats in South Dakota outside of the Black Hills, and that if the species were to occur in the Project area, it would likely be as a migrant only. Correspondence attached.

The intent of the acoustic surveys was to assess relative bat activity in habitat where construction of turbines is likely (i.e., open agricultural land) and determine if the activity is similar to that at operational wind energy facilities in the same region. This survey showed that a reasonable conclusion is that relative activity in habitat where turbines are planned for construction is lower than that at operational wind energy facilities in the region. Crowned Ridge will explain the results of these surveys and its avoidance and minimization measures to address potential Northern Long-Eared Bat habitat during its continued coordination with the Service.

Eagles

In Section 11.3.2.5 of its Application, Crowned Ridge committed not to site a turbine within 1.5 miles of a known occupied bald eagle nest. This buffer is comparable to the 1.6 mile buffer recommended by the USFWS in the Region 3 Midwest Wind Multi Species Habitat Conservation Plan (HCP) for Wind released in April 2016. This USFWS Plan describes expected measures for an applicant who is pursuing a voluntary HCP under Section 10 of the Endangered Species Act and although not the intention for Crowned Ridge, represents the best available science to inform turbine siting. As with all topics discussed in the July 2, 2019 Letter, Crowned Ridge will continue to coordinate with the Service on eagles.

Again, thank you for the opportunity to reiterate Crowned Ridge's strong commitments to environmental protection.

Sincerely,

/s/

Kimberly Wells, PhD
Senior Manager, Environmental Services
NextEra Energy Resources, LLC
On behalf of Crowned Ridge Wind, LLC

Attachments: Email correspondence from USFWS to SWCA

Wells, Kimberly

From: Gates, Natalie <natalie_gates@fws.gov>
Sent: Wednesday, June 6, 2018 3:58 PM
To: Kely Mertz <KMertz@swca.com>
Cc: Drew Carson <DCarson@swca.com>
Subject: Re: [EXTERNAL] South Dakota project area

At this time, the only known NLEB hibernacula in South Dakota are in the Black Hills, and I'm not aware of any maternity roosts in the state (though there almost certainly are some in the Hills and could be others so far undetected).

So while the bat could occur in the area, its more likely to be migrant rather than breeding or hibernating.

Natalie Gates / U.S. Fish and Wildlife Service / Ecological Services South Dakota Field Office
420 South Garfield Avenue, Suite 400 / Pierre, South Dakota 57501
Phone: 605-224-8693, Ext. 227 / Fax: 605-224-1416
http://www.fws.gov/southdakotafieldoffice/

On Wed, Jun 6, 2018 at 12:54 PM, Kely Mertz <KMertz@swca.com> wrote:

> Hi Natalie,
>
> Can you share whether or not either of the attached polygons are within 0.25 mile of a known northern long-eared bat hibernacula or within 150 feet of a known maternity roost tree? Please note that these polygons are not final project boundaries.
>
> Thank you,
>
> Kely
>
> **Kely Mertz**
>
> Senior Project Manager

SWCA Environmental Consultants

200 W. 22nd Street, Suite 220

Lombard, IL 60148

M 614.580.6715 | O 630.705.1762

Visit Our Website!

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From:	Wells, Kimberly
To:	Gates, Natalie
Cc:	Kely Mertz; Wells, Kimberly
Subject:	Crowned Ridge follow up
Date:	Tuesday, July 9, 2019 2:46:31 PM
Attachments:	CRI USFWS response to PUC 07082019 app.pdf

Hi Natalie,

I am following up on my email and voice mail from 7/3 on our Crowned Ridge I project. The attached letter provides a copy of what we shared with PUC and can discuss with you when we connect.

I will try you again today via telephone to see if we can schedule a future conversation or meeting to discuss in more detail.

Kim

Kimberly Wells, Ph.D.
Senior Manager, Environmental Services
Mid Continent Region
NEXTera Energy Resources, LLC
708 Main Street, 10th Floor (mail c/o WeWork)
Houston, TX 77002
713.951.5372 (office)
832.538.7935 (mobile)
Kimberly.Wells@NEE.com

** NOTE new physical mailing address

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From:	Wells, Kimberly
To:	Larson, Scott
Cc:	Gates, Natalie; Kely Mertz
Subject:	FW: Crowned Ridge follow up
Date:	Tuesday, July 9, 2019 3:05:27 PM
Attachments:	CRI USFWS response to PUC 07082019 app.pdf

Hi Scott,

I see Natalie is out this week, so forwarding the email below and attachment to you while she is out to make sure you receive. Should we work with you to set up our next conversation?

Kim

Kimberly Wells, Ph.D.
Senior Manager, Environmental Services
Mid Continent Region
NEXTera Energy Resources, LLC
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Houston, TX 77002
713.951.5372 (office)
832.538.7935 (mobile)
Kimberly.Wells@NEE.com

** NOTE new physical mailing address

From: Wells, Kimberly
Sent: Tuesday, July 09, 2019 1:46 PM
To: Gates, Natalie
Cc: Kely Mertz; Wells, Kimberly
Subject: Crowned Ridge follow up

Hi Natalie,

I am following up on my email and voice mail from 7/3 on our Crowned Ridge I project. The attached letter provides a copy of what we shared with PUC and can discuss with you when we connect.

I will try you again today via telephone to see if we can schedule a future conversation or meeting to discuss in more detail.

Kim

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713.951.5372 (office)
832.538.7935 (mobile)
Kimberly.Wells@NEE.com

** NOTE new physical mailing address

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From:	Kely Mertz
To:	Kely Mertz
Subject:	FW: Crowned Ridge response
Date:	Monday, August 19, 2019 2:11:59 PM
Attachments:	USFWS ES response to NextEra July 8, 2019 letter.pdf ATT00001.htm

---

From: Wells, Kimberly <Kimberly.Wells@nexteraenergy.com>
Sent: Wednesday, July 17, 2019 6:08 PM
To: Kely Mertz <KMertz@swca.com>; Sarah Sappington <SSappington@swca.com>
Subject: Fwd: Crowned Ridge response

EXTERNAL: This email originated from outside SWCA. Please use caution when replying.

Begin forwarded message:

From: "Gates, Natalie" <natalie_gates@fws.gov>
Date: July 17, 2019 at 3:47:52 PM CDT
To: "Wells, Kimberly" <Kimberly.Wells@nexteraenergy.com>
Cc: Kristen Edwards <Kristen.Edwards@state.sd.us>, Scott Larson <Scott_Larson@fws.gov>, Hilary Meyer <Hilary.Meyer@state.sd.us>
Subject: Crowned Ridge response

CAUTION - EXTERNAL EMAIL

Hi Kim,

Thank you for sending your response to our recent letter and for the conversation yesterday.

FYI, I've attached some thoughts on these issues and incorporated some of the information we discussed.

-Natalie

Natalie Gates / U.S. Fish and Wildlife Service / Ecological Services South Dakota Field Office
420 South Garfield Avenue, Suite 400 / Pierre, South Dakota 57501
Phone: 605-224-8693, Ext. 227 / Fax: 605-224-1416

Crowned Ridge Wind, LLC
700 Universe Boulevard
Juno Beach, FL 33408

July 8, 2019

VIA Electronic Mail

Kristen N. Edwards
Staff Attorney
South Dakota Public Utilities Commission
500 East Capitol Avenue
Pierre, SD 57501
Phone (605)773-3201
Kristen.edwards@state.sd.us

Dear Ms. Edwards:

Thank you for forwarding the July 2, 2019 letter from the U.S. Fish and Wildlife Service (the USFWS), that was filed in Docket No. EL19-003. The purpose of this response is to elaborate on Crowned Ridge Wind, LLC's (Crowned Ridge) commitment to continued coordination with the Service, and also to address certain topics discussed by the Service in its letter.

By way of summary, this response shows the following:

- While the USFWS does not have jurisdiction over the Crowned Ridge Wind Project (Project), Crowned Ridge has voluntarily consulted with the USFWS for many years, most recently via email and telephone to discuss the issues raised in this letter on July 3, 2019;

- Crowned Ridge is committed to continue the voluntary consultation with the USFWS, including describing the commitments Crowned Ridge has made in this proceeding that address the items set forth in the letter. For example:

    - Crowned Ridge will avoid impacts to the Topeka Shiner;

    - Crowned Ridge will use seed mixes that incorporate vegetation that supports federally listed butterfly species during revegetation efforts in native prairie that occur in potentially suitable Dakota Skipper and Poweshiek Skipperling habitat;

    - Crowned Ridge will implement a Stormwater Pollution Prevention Plan (SWPPP) that addresses restoration of any disturbed areas following construction, including revegetating non-cultivated grasslands using a seed mix that is recommended by the

Natural Resource Conservation Service (NRCS), or other land management agency, unless otherwise agreed upon with the landowner in writing; and

- A 1.5 mile buffer from any known occupied bald eagle nest.

- Crowned Ridge's voluntary consultation with the Service has been interactive. For example:

  - The Service approved the biologist and the protocols used to conduct the Dakota skippers and Poweshiek Skipperling survey; and

  - The Service also indicated to Crowned Ridge that Northern Long-Eared Bat is generally located in the Black Hills region, except for periods of migration where it is unlikely to occur at the Project.

Crowned Ridge has already reached out to the USFWS, and is confident it can provide the additional information to further demonstrate Crowned Ridge's commitment to protect the environment.

By way of background, the NextEra Energy Resources, LCC ("NEER") family of companies, which includes its indirect, wholly-owned subsidiary Crowned Ridge Wind, LLC (Crowned Ridge), have a long history of coordination with USFWS on its wind projects throughout the U.S. As the record in EL19-003 demonstrates, Crowned Ridge has coordinated with the USFWS for many years on the Project. For example, Appendix B of the Application (Ex. A1-B) shows that Crowned Ridge's first coordination with the USFWS occurred in 2007 and Crowned Ridge has continued to coordinate with the USFWS throughout the development of the Project. Crowned Ridge remains committed to continuing coordination with USFWS, and reached out to discuss the letter last week, but was unable to reach USFWS personnel.

Crowned Ridge will continue, as would be the normal course of business on any NEER wind project, to voluntarily coordinate with the USFWS throughout the Project's development, construction, and operation on the Crowned Ridge Wind project. For example, in its letter the USFWS requests that Crowned Ridge provide copies of post-construction studies. Crowned Ridge commits to provide these studies to the USFWS in the spirit of voluntary coordination, as the Service has no jurisdiction over the Project. In its letter, the USFWS acknowledges that the Project has been sited to avoid federal impacts, thus there is no federal nexus and jurisdiction over the Project. Therefore, while the USFWS' citation in its letter to federal statutes and regulations may be informative for Crowned Ridge's voluntary coordination with the USFWS, these legal authorities are not controlling or applicable to the Project.

The remainder of our response addresses the specific topics discussed by the USFWS. The purpose is to provide context and demonstrate Crowned Ridge's commitment to working with the USFWS as well as state agencies on similar issues throughout the development process, and, if approved for a Facility Permit, the construction and operation of the Project.

Topeka Shiner

In its letter, the USFWS questions whether the Project will avoid impacts to the Topeka Shiner. As Crowned Ridge's Application at pages 11 and 70-71 indicate, Crowned Ridge is aware of the potential for Topeka Shiner to be found in the Project area, which includes the Willow and Stray Horse Creeks. Crowned Ridge plans to completely avoid potential impacts to the Willow and Stray Horse Creeks by boring under the streams. This avoidance measure will be included in the Wildlife Conservation Strategy that will be filed with the Commission prior to construction, and will also be communicated to the Service as a courtesy.

Dakota Skipper

In its letter, the USFWS questions whether the Project appropriately surveyed for the presence of Dakota Skipper and included an avoidance strategy. It is puzzling why the USFWS raised this concern. The Application clearly demonstrates that Crowned Ridge's surveying for the Dakota Skipper was conducted by a USFWS–approved biologist and in accordance with protocols approved by the USFWS. With respect to surveying, in Appendix C of the Application (Ex. A1-C) Crowned Ridge submitted a Dakota Skipper and Poweshiek Survey Report. The Report shows that Jake Powell of SWCA, a contractor for the Project, is a USFWS–approved biologist authorized to complete protocol-level surveys for Dakota Skippers and Poweshiek Skipperlings. Attachment A of the Dakota Skipper and Poweshiek Survey Report also describes concurrence *issued by the USFWS* that the required protocol proposed for survey use was appropriate and sufficiently based on USFWS requirements. The survey results that show no detections of either butterfly species were shared with the USFWS via email in January 2019, including a copy sent to Scott Larson of the Service. A copy of that report was also included as Appendix C of Application filed with the Commission in January 2019.

A summary of the findings regarding the absence of Dakota Skippers is set forth in Section 11.3.1.2.1 and Section 11.3.1.4.1 of the Application. These sections explain there is a small proportion of suitable habitat for Dakota Skippers within the Project area. Nonetheless, Crowned Ridge set forth an avoidance strategy to minimize any impacts to suitable habitat areas of the Dakota Skipper during the flight season in Section 11.3.2.1 and 11.3.2.5 of the Application. Further, Crowned Ridge committed to use seed mixes that incorporate vegetation that supports these prairie butterfly species during revegetation efforts in potentially suitable Dakota Skipper and Poweshiek Skipperling habitat areas. Crowned Ridge will ensure the USFWS understands we have properly surveyed and documented the lack of the presence of Dakota Skipper and our commitments to protect the Dakota Skipper, should it occur.

Tallgrass Prairie and Wetlands

In its letter, the Service asserts that not all wildlife habitats, such as grasslands and wetlands, were avoided by the Crowned Ridge Project. As the Application in Section 2.1 shows, Crowned Ridge is committed to avoiding and minimizing the impacts to grasslands and wetlands. Further, the Application sets forth an analysis of the potential presence of native prairie in Section 11.1.1 of the Application, showing approximately 47% of the Project area is grass/pasture and approximately 36% is in agriculture. The Project Construction Easement or subset of the Project area that will be potentially disturbed, is 26% in grass/pasture and 71% in agriculture that further demonstrates the Project's avoidance and

minimization efforts. Section 11.1.2 of the Application also states the permanent impact to grass/pasture is approximately 21.5 acres of the total 53,186 acre Project area or less than one tenth of one percent (< 0.004%). Further, as Crowned Ridge's Exhibit A70 shows, only 19 of the proposed 130 turbines impact native prairie as mapped by Bauman et al. 2016; and native prairie makes up approximately 17,889 acres of the Project area (Application at 50).[1] Of the 19 turbines on mapped native prairie, all 19 were sited due to minimize impacts on other environmental constraints, such as wetlands or cultural resources, or to incorporate landowner preferences not to have the turbine in land used to produce crops, or to incorporate specific turbine placement if the landowner only owned land in grasslands. Further, only 17 of the 19 turbine locations are actually located on native prairie based on field surveys that refined regional scale mapping of native prairie completed by Bauman et al. 2016 that was used in the preliminary analysis for the Project.

To minimize the impact to grasslands and native prairie, Crowned Ridge has committed to implement a Stormwater Pollution Prevention Plan that addresses restoration of any disturbed areas following construction. Crowned Ridge has also committed to address temporary impacts by revegetating non-cultivated grasslands using a seed mix that is recommended by the Natural Resource Conservation Service (NRCS), or other land management agency, unless otherwise agreed upon with the landowner in writing.

Project impacts to wetlands are described in Section 11.2.1 and avoidance and minimization measures are described in Section 11.2.2 of the Application. The Project committed to avoiding temporary and permanent impacts to wetlands and waters to the extent practical, including boring under potentially regulated features for collection lines and shifting roads for avoidance, where practical. The Project has also committed to keeping any unavoidable impacts below thresholds necessary to qualify for the conditions of the U.S. Army Corps of Engineers (USACE) Nationwide 12 permit for utility lines and associated facilities. The Project has further committed to a restoration process that will include revegetating native prairie areas with a seed mix recommended by NRCS unless otherwise agreed upon with the landowner.

USFWS Easements

The potential for Project impacts to USFWS easements are described in Section 10.2.1.1 and avoidance and minimization measures are described in Section 10.2.2 of the Application. The Project has avoided (1) all parcels with grassland or combination wetland/grassland USFWS easements on them, and (2) all protected basins within USFWS' jurisdiction. In fact, while there are turbines sited within a parcel containing a wetland easement, none of the turbines in that easement are sited on a wetland protected basin. As the USFWS specifically acknowledges in their letter, USFWS easements do not extend to the uplands on a USFWS wetland easement surrounding the protected basin and only cover the protected basin. The Project avoids all direct impacts to protected basins on USFWS wetland easements, which is documented in Section 2.1 of the Application.

[1] Bauman, P., B. Carlson, and T. Butler. 20 1 6. Quantifying Undisturbed (Native) Lands in Eastern South Dakota: 2013. Brookings: South Dakota State University Extension.

As part of its continued coordination with the USFWS, Crowned Ridge will explain the Project's impacts on native prairie and the lack of turbine impacts to protected basins, and explain the commitments Crowned Ridge made in its Application and in the stipulated conditions proposed for adoption in EL19-003.

Grouse Leks

The record in EL19-003 shows that Crowned Ridge has made more specific commitments to protect the Grouse Lek than is claimed in the USFWS letter. Crowned Ridge has made the following commitments: (1) to avoid construction activities within 2 miles of known leks during the lekking period (March 1 to June 30) (Ex. A42 at 13) and (2) to impose a 0.3 mile buffer for turbine siting from any known historic lek (Evid. Hrg. Tr. at 196). Also, Crowned Ridge used survey data of known historic leks when siting its infrastructure, and has only sited 17 of the 130 turbines on native prairie, both of which help protect grouse leks. In addition, Crowned Ridge is unaware of any empirical peer-reviewed data reviewing the effects of wind turbine development on greater prairie-chicken or sharp-tailed grouse activities at lek locations in the Upper Great Plains (including South Dakota, North Dakota, and Minnesota) supporting the hypothesis that prairie grouse exhibit avoidance or displacement behavior around turbines. The avoidance and minimization efforts of the Project were also acknowledged by Staff witness Kirschenmann of the South Dakota, Department of Game, Fish, and Parks during the evidentiary hearing. Evid. Hrg. Tr. at 500 (June 12, 2019). During Crowned Ridge's continued coordination with the USFWS, it will explain these commitments to protecting leks.

Line Marking

The USFWS letter questions whether the Project used Avian Powerline Interaction Committee's (APLIC) guidelines in the planned construction of transmission for the Project. The transmission lines were approved by Commission in EL17-050 and EL18-018, and Crowned Ridge and Crowned Ridge Wind, II, LLC, respectively agreed to design the transmission lines following APLIC suggested practices. Crowned Ridge, during its coordination with USFWS, will explain this commitment in further detail.

Northern Long-Eared Bats

In its letter, the USFWS recommends targeting suitable habitats for bat surveys and surveying an increased number of those small, isolated, scattered patches of forest to detect a bat species that prefers trees and does not often utilize open areas. Crowned Ridge's Application (in Section 11.3.2.1) acknowledges that removal and fragmentation of forested patches could impact the Northern Long-Eared Bat, if present. As explained further in Section 11.3.2.4 of the Application, Crowned Ridge minimized tree clearing to avoid impacts to potential bat habitat, if occupied. In support of appropriate implementation of avoidance and minimization measures for bats, Crowned Ridge conducted a habitat suitability assessment (Appendix F to the Application) and an acoustic survey (Appendix G to the Application).

The intent of the habitat assessment was to determine the availability and suitability of bat habitat within the study area and used that information to determine a likelihood of occurrence for listed bat

species. The definition of "suitable habitat" was specific to each species. Suitable summer habitat for northern long-eared bats, as defined by the available, peer-reviewed literature, makes up less than 1 percent of the Project area. The known distribution of Northern Long-Eared Bats in South Dakota, according to coordination with USFWS, is primarily limited to the Black Hills region in the summer and winter, though a potential migrant throughout the State. Thus, it is reasonable to conclude that the species has a low likelihood of occurrence at most within the Project area. Email correspondence from Ms. Natalie Gates of the USFWS to SWCA's biologist Drew Carson on June 6, 2018 regarding the Project is consistent with this conclusion and describes no known hibernacula of Northern Long-Eared Bats in South Dakota outside of the Black Hills, and that if the species were to occur in the Project area, it would likely be as a migrant only. Correspondence attached.

The intent of the acoustic surveys was to assess relative bat activity in habitat where construction of turbines is likely (i.e., open agricultural land) and determine if the activity is similar to that at operational wind energy facilities in the same region. This survey showed that a reasonable conclusion is that relative activity in habitat where turbines are planned for construction is lower than that at operational wind energy facilities in the region. Crowned Ridge will explain the results of these surveys and its avoidance and minimization measures to address potential Northern Long-Eared Bat habitat during its continued coordination with the Service.

Eagles

In Section 11.3.2.5 of its Application, Crowned Ridge committed not to site a turbine within 1.5 miles of a known occupied bald eagle nest. This buffer is comparable to the 1.6 mile buffer recommended by the USFWS in the Region 3 Midwest Wind Multi Species Habitat Conservation Plan (HCP) for Wind released in April 2016. This USFWS Plan describes expected measures for an applicant who is pursuing a voluntary HCP under Section 10 of the Endangered Species Act and although not the intention for Crowned Ridge, represents the best available science to inform turbine siting. As with all topics discussed in the July 2, 2019 Letter, Crowned Ridge will continue to coordinate with the Service on eagles.

Again, thank you for the opportunity to reiterate Crowned Ridge's strong commitments to environmental protection.

Sincerely,

/s/

Kimberly Wells, PhD
Senior Manager, Environmental Services
NextEra Energy Resources, LLC
On behalf of Crowned Ridge Wind, LLC

Attachments: Email correspondence from USFWS to SWCA

Wells, Kimberly

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> **Kely Mertz**
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> Senior Project Manager

SWCA Environmental Consultants

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Lombard, IL 60148

M 614.580.6715 | O 630.705.1762

Visit Our Website!

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From:	Wells, Kimberly
To:	Gates, Natalie; hilary.meyer (hilary.meyer@state.sd.us)
Cc:	Larson, Scott; Kely Mertz; Sarah Sappington; Wilhelm, Tyler; HART, DARYL; Wells, Kimberly
Subject:	Crowned Ridge Follow up
Date:	Tuesday, August 6, 2019 4:05:44 PM
Attachments:	Crowned Ridge Wind Final Order 7.26.19.pdf CRI and II USFWS follow up draft minutes 08062019.docx

Natalie/Hilary,

Please review the draft minutes we recorded from our conference call on Crowned Ridge earlier this month and let us know if any comments or corrections. We file these in our PUC docket.

I am also attaching the Final Order for the wind farm and have highlighted the grouse condition below that we discussed briefly.

45. Applicant will undertake a minimum of two years of independently-conducted postconstruction
grouse lek monitoring of known leks that are located less than 1 mile from a wind turbine. Known leks are SDGFP confirmed lek locations and leks documented during any wildlife surveys conducted by Applicant for Project development. Applicant shall file with the Commission its proposed independent third-party's credentials and survey methodology for approval by the Commission 60 days prior to the commencement of Project operation. The study shall be conducted on the ground. Applicant shall consult with SDGFP and USFWS on the proposed survey methodology for the post-construction lek monitoring. Results of the post-construction lek monitoring shall be reported to the SDGFP and USFWS after the first year of monitoring and a final report should be compiled and submitted to the SDGFP and USFWS at the end of the second year of monitoring. Within 90 days of the issuance of this Final Order, Applicant and Staff shall work together to develop a mitigation plan that will be incorporated into Applicant's Wildlife Conservation Strategy in case impacts to prairie grouse leks are found.

Lastly, is there a particular seed mix recommended for restoration of native prairie for pollinators/DASK you all like or have had success with?

Thanks!

Kim

Kimberly Wells, Ph.D.
Senior Manager, Environmental Services
Mid Continent Region

NEXTera Energy Resources, LLC
708 Main Street, 10th floor
c/o WeWork
Houston, TX 77002
713.951.5372 (office)
832.538.7935 (mobile)
Kimberly.Wells@NEE.com

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF THE APPLICATION BY CROWNED RIDGE WIND, LLC FOR A PERMIT OF A WIND ENERGY FACILITY IN GRANT AND CODINGTON COUNTIES	))))))	**FINAL DECISION AND ORDER GRANTING PERMIT TO CONSTRUCT FACILITY; NOTICE OF ENTRY** **EL19-003**

APPEARANCES

Commissioners Gary Hanson, Chris Nelson, and Kristie Fiegen.

Miles Schumacher, Lynn, Jackson, Shultz and Lebrun, PC, 110 N. Minnesota Ave., Suite 400, Sioux Falls, South Dakota 57104, and Brian Murphy, NextEra Energy Resources, LLC, 700 Universe Blvd., Juno Beach, FL 33408, appeared on behalf of Applicant, Crowned Ridge Wind, LLC.

Kristen Edwards, Amanda Reiss, and Mikal Hanson, 500 E. Capitol Ave., Pierre, South Dakota 57501, appeared on behalf of the South Dakota Public Utilities Commission Staff (Staff).

David Ganje, Ganje Law Offices, 17220 N. Boswell Blvd., Suite 130L, Sun City, AZ 85373, appeared on behalf of intervenors Allen Robish, Amber Christenson, Kristi Mogen, Patrick Lynch, and Melissa Lynch (Intervenors).

PROCEDURAL HISTORY

On January 30, 2019, the South Dakota Public Utilities Commission (Commission) received an Application for a Facility Permit for a wind energy facility (Application) from Crowned Ridge Wind, LLC (Crowned Ridge or Applicant) to construct a wind energy conversion facility to be located in Grant County and Codington County, South Dakota (Project).[1] Also on January 30, 2019, Crowned Ridge filed the prefiled Direct Testimony and Exhibits of Jay Haley, Kimberly Wells, Mark Thompson, Tyler Wilhelm, and Sam Massey.

On January 31, 2019, the Commission electronically transmitted notice of the filing and the intervention deadline of April 1, 2019, to interested individuals and entities on the Commission's PUC Weekly Filings electronic listserv.

On January 31, 2019, Crowned Ridge filed copies of the Application with the Grant and Codington County auditors.

On February 6, 2019, the Commission issued a Notice of Application; Order for and Notice of Public Input Hearing; Notice of Opportunity to Apply for Party Status (Order). The Order scheduled a public input hearing for March 20, 2019, at 5:30 p.m., CDT, at the Waverly-South Shore School Gymnasium, 319 Mary Place, Waverly, South Dakota.

[1] *See* Ex. A1 (Application).

On February 7, 2019, Crowned Ridge filed a Supplemental Figure 3a.

On February 22, 2019, the Commission issued an Order Assessing a Filing Fee; Order Authorizing Executive Director to enter into Necessary Consulting Contracts; Order Granting Party Status (Amber Christenson, Allen Robish, Kristi Mogen).

On February 27, 2019, Crowned Ridge filed updated appendices for Appendix H and Appendix I.

On February 28, 2019, Crowned Ridge filed additional Updated Supplements to Appendix H and Appendix I.

On March 12, 2019, Crowned Ridge filed a Supplement to Appendix B.

On March 20, 2019, a public input hearing was held as noticed at the Waverly-South Shore School Gymnasium, 319 Mary Place, Waverly, South Dakota.

On March 21, 2019, the Commission issued an Order Granting Party Status (Melissa Lynch).

On March 25, 2019, Patrick Lynch filed an Application for Party Status.

On March 26, 2019, Staff filed a Motion for Procedural Schedule.

On March 27, 2019, Crowned Ridge filed its Response to the Motion for Procedural Schedule.

On March 28, 2019, Intervenors filed a Response to Crowned Ridge's Response to the Motion for Procedural Schedule.

On March 28, 2019, Affidavits of Publication were filed by Staff confirming that the Notice of Public Hearing was published in the *Watertown Public Opinion* on February 20 and March 13, 2019, in the *South Shore Gazette* on February 21 and March 14, 2019, and in the *Grant County Review* on February 20 and March 13, 2019.

On April 2, 2019, Affidavits of Publication were filed by Crowned Ridge confirming that the Notice of Public Hearing was published in the *Watertown Public Opinion* on February 13 and 20, 2019, in the *South Shore Gazette* on February 14 and 21, 2019, and in the *Grant County Review* on February 13 and 20, 2019.

On April 2, 2019, Crowned Ridge filed a Proof of Mailing to affected landowners pursuant to SDCL 49-41B-5.2.

On April 5, 2019, the Commission issued an Order Granting Party Status (Patrick Lynch); Order Establishing Procedural Schedule.

On April 9, 2019, Crowned Ridge filed the prefiled Supplemental Testimony and Exhibits of Mark Thompson, Jay Haley, Tyler Wilhelm, Sam Massey, and Dr. Christopher Ollson.

On April 10, 2019, Crowned Ridge filed the prefiled Direct Testimony and Exhibits of Sarah

Sappington adopting the Direct Testimony of Kimberly Wells.

On April 25, 2019, Intervenors filed a Motion to Deny and Dismiss.

On April 30, 2019, the Commission issued an Order for and Notice of Motion Hearing on Less Than 10 Days' Notice.

On April 30, 2019, Staff and Crowned Ridge each filed a Response to Motion to Deny and Dismiss.

On May 6, 2019, Intervenors filed a Reply Brief in Support of Motion to Deny and Dismiss.

On May 10, 2019, the Commission issued an Order Denying Motion to Deny and Dismiss; Order to Amend Application.

On May 10, 2019, the Commission issued an Order for and Notice of Evidentiary Hearing.

On May 10, 2019, Intervenors filed the testimony of John Thompson and Allen Robish.[2]

On May 15, 2019, Applicant filed an Amendment to the Application.

On May 17, 2019, Intervenors filed a Second Motion to Deny and Dismiss.

On May 22, 2019, the Commission issued an Order for and Notice of Motion Hearing.

On May 23, 2019, Crowned Ridge filed a Response to Intervenors' Second Motion to Deny and Dismiss.

On May 23, 2019, Staff filed a Request for Exception to Procedural Schedule.

On May 23, 2019, Crowned Ridge filed Revised Maps.

On May 24, 2019, Crowned Ridge filed the prefiled Rebuttal Testimony and Exhibits of Mark Thompson, Jay Haley, Tyler Wilhelm, Sam Massey, Andrew Baker, Dr. Robert McCunney, Richard Lampeter, Sarah Sappington, and Dr. Christopher Ollson.

On May 28, 2019, Crowned Ridge filed the prefiled Rebuttal Exhibits 1 and 2 of Tyler Wilhelm and Sam Massey.

On May 28, 2019, Intervenors filed a Reply Brief in Support of Motion to Deny and Dismiss and a Motion to Take Judicial Notice.

On May 30, 2019, the Commission issued an Order for and Notice of Motion for Exception to Procedural Schedule on Less Than 10 Days' Notice.

On May 30, 2019, Staff filed the prefiled Direct Testimony and Exhibits of David Hessler, Darren Kearney, Tom Kirschenmann, and Paige Olson.

[2] During the evidentiary hearing, Intervenors did not move for its testimony to be made part of the evidentiary record, and, therefore, it is not part of the evidentiary record.

On May 31, June 3, and June 5, 2019, Intervenors filed its prefiled Exhibits.

On June 6, 2019, the evidentiary hearing commenced to hear the testimony of Staff witness, David Hessler.

On June 7, 2019, Crowned Ridge filed a Final Land Status Map.

On June 10, 2019, Crowned Ridge filed a Replacement Final Land Status Map.

On June 11, 2019, prior to the start of the evidentiary hearing, the Commission heard the Second Motion to Deny and Dismiss. The Commission voted unanimously to deny the Second Motion to Deny and Dismiss.

On June 11, 2019, the evidentiary hearing was resumed, as scheduled, and concluded on June 12, 2019.

On June 12, 2019, the Commission issued an Order Granting Request for Exception to Procedural Schedule; Order Denying Motion to Take Judicial Notice; Order Denying Motion to Strike.

On June 13, 2019, the Commission received a late-filed Application for Party Status from Timothy and Linda Lindgren.

On June 18, 2019, the Commission issued an Order Setting Post-Hearing Briefing Schedule and Decision Date.

On June 18, 2019, Staff filed its Response to Late Application for Party Status.

On June 19, 2019, Intervenors filed an email regarding the Late Application for Party Status.

On June 25, 2019, at its regularly scheduled meeting, the Commission heard the late-filed Application for Party Status and denied it.

On June 26, 2019, the Commission issued an Order Denying Late-Filed Application for Party Status.

On July 2, 2019, post-hearing briefs were filed by Crowned Ridge, Staff, and Intervenors.

On July 9, 2019, at its regularly scheduled meeting, the parties made oral arguments. After questions of the parties by the Commissioners and public discussion among the Commissioners, the Commission voted unanimously to grant a permit to construct the Project to Crowned Ridge, subject to the approved Permit Conditions.

Having considered the evidence of record, applicable law, and the briefs and arguments of the parties, the Commission makes the following Findings of Fact, Conclusions of Law, and Final Decision and Order Granting Permit to Construct Facility:

FINDINGS OF FACT

I. PROCEDURAL FINDINGS.

1. The Procedural History set forth above is hereby incorporated by reference in its entirety in these Procedural Findings. The procedural findings set forth in the Procedural History are a substantially complete and accurate description of the material documents filed in this docket and the proceedings conducted and decisions rendered by the Commission in this matter.

II. PARTIES.

2. Applicant, Crowned Ridge Wind, LLC, is a wholly-owned, indirect subsidiary of NextEra Energy Resources, LLC (NextEra).[3] NextEra, through its affiliates, is the world's largest generator of renewable energy from the wind and sun, generating over 19,000 MWs in 29 states and Canada.[4]

3. Amber Christenson, Allen Robish, Kristi Mogen, Melissa Lynch, and Patrick Lynch were granted party status (Intervenors).

4. Staff fully participated as a party in this matter, in accordance with SDCL 49-41B-17.

III. PROJECT DESCRIPTION.

5. The Project is an up to 300 MW wind facility to be located in Codington County and Grant County, South Dakota.[5] It will be owned and operated by Applicant.[6] The Project is situated within an approximately 53,186-acre Project Area and will include the following: (i) up to 130 GE 2.3 MW wind turbine generators; (ii) access roads to turbines and associated facilities; (iii) underground 34.5-kilovolt (kV) electrical collector lines connecting the turbines to the collection substation; (iv) underground fiber-optic cable for turbine communications co-located with the collector lines; (v) the low-side of a 34.5 to 345-kV collection substation; (vi) one permanent meteorological (met) tower; (vii) an operations and maintenance (O&M) facility; and (viii) temporary construction areas, including laydown and batch plant areas.[7] The estimated construction cost associated with the wind facility is approximately $400 million.[8] Fluctuations in Project costs could be as much as 20% percent, dependent on final micrositing and MISO interconnection costs.[9] The Project will utilize the Crowned Ridge 34-mile 230 kV generation tie line and a new reactive power compensation substation[10] to transmit the generation from the Project's collector substation to the Project's point of interconnection located at the Big Stone South 230 kV Substation, which is owned by Otter Tail Power Company.[11] Applicant has no plans for future expansion of the Project.[12]

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[3] Ex. A1 at 1 (Application).
[4] Ex. A5 at 1 (Wilhelm and Massey Direct Testimony).
[5] Ex. A1 at 1 (Application); Ex A1-A (Figures); Ex. A42-1 (Sappington Rebuttal Testimony); and Ex. A54 (Final Land Status Map).
[6] Ex. A1 at 14 (Application) and Ex. A29 (Amendment to Application on Ownership).
[7] Ex. A1 at 1, 17-25 (Application); Ex. A1-A (Figures 4a, 4b, and 5); Ex. A54 (Final Land Status Map); and Ex. A59 (Final Land Status and Hessler 7 Turbine Moves).
[8] Ex. A1 at 17 (Application).
[9] *Id.*
[10] The transmission gen-tie and reactive compensation substation were approved in Docket No. EL17-050.
[11] Ex. A1 at 1 (Application).
[12] *Id.* at 112.

6. All turbines will be constructed within the Project Area consistent with the configuration presented in Exhibit A44-2 (Updated Project Layout Map) and subject to all commitments, conditions, and requirements of the Commission's Final Order and Permit Conditions.

7. Applicant has agreed, if feasible, to use alternative turbine locations instead of the following primary turbine locations: CR-16, CR-19, CR-23, CR-49, CR-60, CR-67, and CR-68.[13] Applicant testified that based on the final land status map, there would be a shift in turbines CR-50 and CR-Alt22.[14] Crowned Ridge further testified that final land status required the dropping of CR-17 and CR-40, to be replaced with CR-Alt42 and CR-Alt45.[15] Crowned Ridge also testified that turbines CR-56, CR-57, CR-79, CR-Alt20, and CR-Alt19 will be removed due to Crowned Ridge not having leases for those properties.[16]

8. Crowned Ridge presented evidence of consumer demand and need for the Project.[17] Applicant has executed a PPA with Northern States Power Company (NSP) to sell NSP the full output of the Project.[18] On July 6, 2017, the Minnesota Public Utilities Commission approved NSP's Petition for Approval of the Acquisition of Wind Generation from the Company's 2016-2030 Integrated Resource Plan, including the PPA with Applicant. On December 6, 2018, North Dakota Public Service Commission issued an order granting an advance determination of prudence for the PPA between NSP and Applicant.[19] The commercial operation date for the Project is projected to be in or before the first quarter of 2020.[20]

9. With regard to micrositing, Crowned Ridge identified the need for turbine and associated facility flexibility.[21] With respect to turbine flexibility, Crowned Ridge and Staff agreed to the turbine flexibility and "material change" provisions set forth in Permit Condition 22. With respect to the access roads, the collector and communications systems, meteorological towers, Aircraft Detection Lighting System (ADLS) facilities, the O&M facility, the Project Substation, and temporary facilities, Crowned Ridge and Staff agreed to Permit Condition 23.

10. Applicant has entered into lease and easement agreements with private landowners within the Project Area for the placement of Project infrastructure.[22] Applicant anticipates that the life of the Project will be approximately 25 years, which is consistent with the Project's contracted term.[23] At the end of the Project's contracted life there may be opportunities to extend the life of the Project by repowering the Project by retrofitting the turbines and power system with upgrades based on new technology, which may allow the wind farm to produce efficiently and successfully for many more years.[24]

11. In the event the Project's contracted life is not extended, the record demonstrates that Applicant has appropriate and reasonable plans for decommissioning.[25] The Project will be

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[13] Permit Conditions ¶ 27.
[14] Ex. A59 (Final Land Status and Hessler 7 Turbine Moves); Ex. A55 (Proposed Turbine Drops and Moves). Evid. Hrg. Tr. at 229-230 (Wilhelm).
[15] Ex. A59 (Final Land Status and Hessler 7 Turbine Moves). Ex. A 55 (Proposed Turbine Drops and Moves). Evid. Hrg. Tr. at 231 (Wilhelm).
[16] Evid. Hrg. Tr. at 229- 230 (Wilhelm).
[17] *See, e.g.,* Ex. A1 at Ch. 4.0 (Application).
[18] Ex. A1 at 1, 15 (Application).
[19] *Id.* at 1.
[20] *Id.* at 1, 94.
[21] Ex. A5 (Wilhelm and Massey Direct Testimony); Ex. A44 (Wilhelm and Massey Rebuttal Testimony).
[22] Ex. A1 at 113 (Application) and Ex. A54 (Final Land Status Map).
[23] Ex. A1 at 113 (Application).
[24] *Id.*
[25] *Id.* at Appendix L and Ex. A4 at 9-11 (Thompson Direct Testimony).

decommissioned in accordance with applicable state and county regulations.[26] Applicant has agreed to establish an escrow account for the purpose of financing the decommissioning of the Project.[27]

12. The record demonstrates that Crowned Ridge submitted substantial evidence on the potential cumulative impacts of the Project, and that the Project will not have a significant impact.[28]

IV. APPLICABLE STATUTES AND REGULATIONS FOR AN ENERGY FACILITY PERMIT.

13. The following South Dakota statutes are applicable: SDCL 49-41B-1, 49-41B-2, 49-41B-2.1, 49-41B-4, 49-41B-5.2, 49-41B-12 through 49-41B-19, 49-41B-22, 49-41B-25, 49-41B-26, 49-41B-35, 49-41B-36, and applicable provisions of SDCL Chapters 1-26 and 15-6.

14. The following South Dakota administrative rules are applicable: ARSD Chapters 20:10:01 and 20:10:22.

15. Pursuant to SDCL 49-41B-22, Applicant has the burden of proof to establish that:

a) The proposed facility will comply with all applicable laws and rules;

b) The facility will not pose a threat of serious injury to the environment nor to the social and economic condition of inhabitants or expected inhabitants in the siting area;

c) The facility will not substantially impair the health, safety or welfare of the inhabitants; and

d) The facility will not unduly interfere with the orderly development of the region with due consideration having been given the views of governing bodies of affected local units of government.

16. SDCL 49-41B-25 provides that the Commission must make a finding that the construction of the facility meets all of the requirements of Chapter 49-41B.

17. There is sufficient evidence on the record for the Commission to assess the proposed Project using the criteria set forth above.

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[26] Ex. A1 at 113 (Application).
[27] Ex. A44 at 5 (Wilhelm and Massey Rebuttal Testimony); Permit Conditions ¶ 32.
[28] Ex. A7 at 5-7 (Applicant's Responses to Staff First Set of Data Requests); Ex. A26 at 2-3 (Applicant's Responses to Staff's Third Set of Data Requests); Ex. A43 at 2 (Haley Rebuttal); Ex. A56 (Appendix D and ISO-Lines Map Book); Ex. A57 (Appendix C-3 Sound Results Table Rev 6); Ex. A67 (Appendix C-1 Shadow Flicker Results Table Rev 5); and Ex. A68 Appendix C-2 Shadow Flicker Results Table Rev 5).

V. SATISFACTION OF REQUIREMENTS FOR THE ISSUANCE OF AN ENERGY FACILITY PERMIT.

A. The proposed facility will comply with all applicable laws and rules.

18. The evidence submitted by Crowned Ridge demonstrates that the Project will comply with applicable laws and rules.[29] Applicant committed that it will obtain all governmental permits which reasonably may be required by any township, county, state agency, federal agency, or any other governmental unit for the construction and operation activity of the Project prior to engaging in the particular activity covered by that permit.[30]

19. The record demonstrates that construction of the Project, subject to the Permit Conditions, meets all applicable requirements of SDCL Chapter 49-41B and ARSD Chapter 20:10:22.[31]

B. The facility will not pose a threat of serious injury to the environment nor to the social and economic condition of inhabitants or expected inhabitants in the siting area.

1. Environment.

20. The evidence demonstrates that the Project does not pose a threat of serious injury to the environment in the Project Area.[32] The evidence also shows that Crowned Ridge will implement reasonable avoidance and mitigation measures, as well as commitments, to further limit potential environmental impacts.[33]

21. With respect to geological resources, the evidence shows that construction of the Project will not pose a threat of serious injury to these resources.[34] The risk of seismic activity in the vicinity of the Project Area is "low" according to data from the South Dakota Dept of Natural Resources.[35] The evidence further shows that the impact to geological resources from the Project will be minimal.[36]

22. The evidence demonstrates that the Project does not pose a threat of serious injury to soil resources, including prime farmland.[37] The Project during construction will only impact 2,134.4-acres of the 53,186.2-acre Project Area, and only 86.0 acres on a permanent basis.[38] Table 11.1.2 of the Application sets forth additional detail on the temporary and permanent impacts from the Project, broken down by land cover type.[39] During and after construction a number of mitigation measures, including best management practices (BMP), a Storm Water Pollution Prevention Plan (SWPPP), and a Spill Prevention, Control, and Countermeasures Plan (SPCCP), will be implemented to minimize the impacts to soil resources.[40] Applicant has

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[29] Ex. A1 at 75-78, 118-119 (Application) and Ex. A5 at 8-11 (Wilhelm and Massey Direct Testimony).
[30] Permit Conditions ¶ 1; Evid. Hrg. Tr. at 243 (Wilhelm); Evid. Hrg. Tr. at 295 (Massey).
[31] Ex. A1 through Ex. A61.
[32] Ex. A1 at 29-87, 89-93 (Application); Ex. A25 at 3-11 (Sappington Direct Testimony); Ex. A42 at 3-10, 12-21, 23-24 (Sappington Rebuttal Testimony); Ex. A42-1 (Updated Maps); and Ex. A54 (Final Land Status Map).
[33] Ex. A1 at 24-25, 29-87, 89-93 (Application); Ex. A4 at 4-5 (Thompson Direct Testimony); Ex. A25 at 3-11 (Sappington Direct Testimony); and Ex. A42 at 3-10, 12-21, 23-24 (Sappington Rebuttal Testimony).
[34] Ex. A1 at 32-35 (Application) and Ex. A42-1, Figures 9a, 9b, and 10 (Updated Maps). *See* Ex. A1 at § 9.0 (Application).
[35] Ex. A1 at 34 (Application).
[36] Ex. A1 at 34-35 (Application).
[37] Ex. A1 at 28-29, 35-39 (Application) and Ex. A42-1, Figure 11 (Updated Maps).
[38] Ex. A1 at 37 and 50 (Application) and Ex. A42 at 5, 13-14, 23-24 (Sappington Rebuttal Testimony).
[39] Ex. A1 at 50 (Application); Ex. A25 at 5-7 (Sappington Direct Testimony); Ex. A42 at 6-7 (Sappington Rebuttal Testimony).
[40] Ex. A1 at 24, 38-39 (Application).

committed that during construction, it will protect topsoil and minimize soil erosion. Soil areas disturbed during construction will be decompacted and returned to preconstruction contours to the extent practicable and in accordance with landowner agreements.[41]

23. The evidence also demonstrates that the Project does not pose a threat of serious injury to hydrological resources.[42] The evidence shows there will only be limited and temporary impacts to: (i) groundwater resources; (ii) existing surface water resources; and (iii) current and planned water uses.[43] To minimize impacts, Applicant has committed to implement BMPs, a SWPPP, and SPCCP to mitigate impacts to hydrology resources.[44] The evidence also shows there will be no impact to impaired waters and flood storage areas.[45] Applicant has indicated the amount of water it will likely use during construction, and has committed to obtain any necessary permits for water sources used during construction and operations.[46]

24. The evidence demonstrates that the Project does not pose a threat of serious injury to terrestrial ecosystems.[47] Specifically, there are no anticipated impacts to federally or state-listed plants.[48] The Project will not involve any major tree-clearing.[49] Also, Crowned Ridge has designed the Project so that turbines will not be sited in wetlands.[50] To minimize temporary impacts to vegetation due to construction, Applicant has also committed to implement BMP, a SWPPP, and SPCCP. Applicant will avoid impacts to United States Fish and Wildlife Services (USFWS) grasslands and grassland-wetland combination easements, as well as avoid impacts to native grassland to the extent practicable.[51] BMPs will include re-vegetation practices and erosion control devices.[52] Applicant has also agreed to compensate landowners for crop damage.[53] Applicant will develop and implement a plan to control noxious weeds.[54] Further, Applicant indicated that the minor shifts in the siting of collector lines, access roads, two turbines, and the use of alternative turbine sites does not change the overall impact of the Project on the terrestrial environment.[55]

25. The evidence demonstrates that the Project does not pose a threat of serious injury to wildlife however, the potential impact to prairie grouse leks is unknown.[56] Applicant has conducted extensive studies and consulted relevant studies to understand the potential impact to wildlife.[57] Applicant will implement an avoidance, minimization, and mitigation approach to lessen the impact the Project has on wildlife.[58]

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[41] *Id.* at 38.
[42] *Id.* at 40-46; Ex. A42-1, Figure 12.
[43] Ex. A1 at 40-46 (Application).
[44] *Id.*
[45] *Id.* at 45.
[46] Ex. A1 at 23, 41, 42 (Application) and Ex. A45 at 5-10 and 5-11 (Applicant's Responses to Intervenors' Fifth Set of Data Requests).
[47] Ex. A1 at 46-69 (Application); Ex. A1-C (Dakota Skipper and Poweshiek Skipperrling Survey); Ex. A1-D (2017-2018 Raptor Nest Survey Report); Ex. A1-E (Avian Use Survey Report); Ex. A1-F (Bat Habitat Assessment Report); and Ex. A1-G (Bat Acoustic Survey Report).
[48] Ex. A1 at 50 (Application).
[49] *Id.* at 51.
[50] Ex. A1 at 52 (Application) and Ex. A42 at 8 (Sappington Rebuttal Testimony).
[51] Ex. A1 at 12, 43 (Application).
[52] *Id.* at 51.
[53] Ex. A1 at 50 (Application) and Ex. A23 at 3-7 (Wilhelm and Massey Supplemental Testimony); Permit Conditions ¶ 20.
[54] Permit Conditions ¶ 16.
[55] Ex. A42 at 11 (Sappington Rebuttal Testimony); Ex. A42-1 (Updated Maps); Ex. A59 (Final Land Status and Hessler 7 Turbine Moves); Evid. Hrg. Tr. at 173, 308 (Sappington).
[56] Ex. A1 at 53-69 (Application).
[57] Ex. A1 at 53-66 (Application); Ex. A1-C (Dakota Skipper and Poweshiek Skipperrling Survey); Ex. A1-D (2017-2018 Raptor Nest Survey Report); Ex. A1-E (Avian Use Survey Report); Ex. A1-F (Bat Habitat Assessment Report); and Ex. A1-G (Bat Acoustic Survey Report); Ex. A42 at 9-10 (Sappington Rebuttal Testimony).
[58] Ex. A1 at 69 (Application); Ex. A25 at 3 and 12-13 (Wells Direct Testimony adopted by Sappington); Evid. Hr. Tr. at 172-173.

26. Prairie grouse leks are the locations at which male prairie grouse make displays to attract females to mate.[59] Prairie grouse are known to historically use the same areas for leks year after year.[60] Crowned Ridge acknowledges that "sharp-tailed grouse and greater prairie-chicken could be affected by Project development if Project infrastructure disturbs or displaces grouse from leks or areas of preferred habitat (grasslands)."[61]

27. Crowned Ridge observed several active greater prairie-chicken leks during a spring survey in 2007-2008 and four active leks were recorded during a spring 2016 survey in, or near, an earlier iteration of the Project Area, including two greater prairie-chicken leks and two unknown leks.[62] The SD GF&P recommended Crowned Ridge place a one-mile buffer around leks when siting and placing infrastructure and that a two-mile buffer should be placed around known leks for construction occurring during the lekking period (March 1 to June 30).[63] Applicant agreed to follow the SD GF&P's construction buffer recommendation of 2-miles during the lekking period, however Crowned Ridge elected to use a reduced buffer from Project infrastructure and sited wind turbines as close as 0.3 miles from known lek locations.[64]

28. Both the SD GF&P and Crowned Ridge wildlife experts testified that the effect of wind turbines on leks is still not well known.[65] SD GF&P recommended 2 years of post-construction grouse lek monitoring of confirmed leks less than 1 mile from proposed turbines in order to gain additional information on the effect of operating wind turbines on leks and to aide with future discussions around cumulative effects of wind energy development on prairie grouse.[66]

29. The Commission finds that Crowned Ridge decided to site wind turbines less than 1 mile from known leks and not implement the SD GF&P's recommendation for siting project infrastructure at least 1 mile from known leks. Further, the Commission finds that the effects of wind turbines on prairie grouse leks is still not sufficiently understood. Therefore, to add to the scientific knowledge on the impact operating wind turbines may have on prairie grouse leks, if any, the Commission adopts Staff's proposed condition.[67]

30. The Commission's review of correspondence and comment letters from the South Dakota Game, Fish & Parks (SD GF&P) and USFWS wildlife experts found that neither of the agencies recommended general mammal studies be done, therefore general mammal studies are not needed in the Project Area.[68] The wildlife experts did recommend a survey to be conducted for bats, which are a mammal, and Crowned Ridge conducted the recommend survey.[69]

31. Intervenors argue that Crowned Ridge's Application is materially incomplete since the Avian Use Survey[70] did not include the portion of the Crowned Ridge Project Area that was formerly known as Cattle Ridge. Crowned Ridge's expert witness, Ms. Sarah Sappington, testified that while the avian use survey did not include the Cattle Ridge portion of the Project Area, the

[59] Evid. Hrg. Tr. at 193 (Sappington).
[60] *Id.*; Evid. Hrg. Tr. at 504, 505 (Kirschenmann).
[61] Ex. S2 at 430 (Kearney Direct Testimony).
[62] Ex. A1 at 61 (Application).
[63] Ex. S2 at 440 (Kearney Direct Testimony).
[64] *Id.*; Ex. A1-A, Figure 6 at 25 (Application).
[65] Ex. S6; Evid. Hrg. Tr. at 198 (Sappington); Evid. Hrg. Tr. at 508 (Kirschenmann).
[66] Ex. S3 at 20 (Kirschenmann Direct Testimony).
[67] Permit Conditions ¶ 45.
[68] Ex. A1-B; Ex. A12.
[69] Ex. A1-G.
[70] Ex. A1-E.

raptor nest surveys did include that area.[71] Ms. Sappington further testified that Crowned Ridge did study the full extent of the Project Area as detailed in the Application and that shapefiles of the full extent of the Project Area were sent to the SD GF&P.[72] Staff's witness, Mr. Tom Kirschenmann, from the SD GF&P, testified that the survey methods used by Crowned Ridge followed the USFWS guidelines, and were reasonable and appropriate.[73] The Commission finds that the lack of an avian use survey in the Cattle Ridge portion of the Project Area is not fatal to the Application since Section 11.3 of the Application[74] identified the Project's potential effects to wildlife for the entire Project Area, as testified to by Ms. Sappington, and that proper survey methods were used by Crowned Ridge, as testified to by Mr. Kirschenmann.

32. Crowned Ridge will also mitigate temporary impacts to habitat consistent with Mr. Kirschenmann's recommendations.[75] There will be no turbines on game production areas, with the closest two turbines .24 mile and .35 mile away from a game production area.[76] Further, Applicant is required to conduct two years of independently-conducted post-construction avian and bat mortality monitoring for the Project.[77] Applicant committed to file a Wildlife Conservation Strategy, which includes both direct and indirect effects as well as the wildlife mitigations measures set forth in the Application, prior to the start of construction.[78] Applicant will file a Bird and Bat Conservation Strategy prior to the start of construction.[79] Also, Mr. Kirschenmann testified that Applicant had appropriately coordinated with SD GF&P on the impact of the Project on wildlife.[80]

33. The evidence demonstrates that the Project does not pose a threat of serious injury to aquatic ecosystems.[81] Similarly, the evidence demonstrates that the Project does not pose a threat of serious injury to land use and will comply with local controls.[82] Applicant has coordinated with landowners to locate infrastructure in a manner that minimizes the impact to their land uses.[83] The evidence further demonstrates that there are no anticipated material impacts to existing air and water quality, and the Project will comply with applicable air and water quality standards and regulations.[84] Applicant also committed to implement a number of BMPs to mitigate the impact of the Project on air and water quality.[85]

34. Applicant will install and use lighting required by the Federal Aviation Administration (FAA).[86] Applicant has also committed to use an FAA-approved Aircraft Detection Lighting System to minimize visual impact of the Project.[87]

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[71] Evid. Hrg. Tr.at 178.
[72] Evid. Hrg. Tr.at 180.
[73] Ex. S3 at 6.
[74] Ex. A1.
[75] Ex. A42 at 4 (Sappington Rebuttal Testimony); S3 (Kirschenmann Direct Testimony).
[76] Ex. A42 at 10 (Sappington Rebuttal Testimony.
[77] Permit Conditions ¶ 29.
[78] Ex. A42 at 6 (Sappington Rebuttal Testimony) and Evid. Hrg. Tr. at 212-213 (June 11, 2019).
[79] Permit Conditions ¶ 30.
[80] Ex. S3 at 3-5 (Kirschenmann Direct Testimony).
[81] Ex. A1 at 70-73 (Application).
[82] Ex. A1 at 73-88 (Application); Ex. A1-A (Figures); Ex. A5 at 8-11 (Wilhelm and Massey Direct Testimony); Ex. A2 (Haley Direct Testimony); Ex. A1-H (Sound Modelling Report), Ex. A1-J (Shadow Flicker Report); Ex. A1-L (Decommissioning Plan); Ex. A22 (Haley Supplemental Testimony); Ex. A43 (Haley Rebuttal Testimony); Ex. A43-1 (Shadow Flicker ISO-Lines); Ex. A43-2 (Sound Pressure ISO-Lines); Ex. A56 (Appendix D Sound ISO-Lines Map Book); Ex. A57 (Appendix C3 Sound Results Table Rev 6); Ex. A67 (Appendix C-1 Shadow Flicker Results) and Ex. A68 Appendix C-2 Shadow Flicker Results).
[83] Ex. A5 at 11-12 (Wilhelm and Massey Direct Testimony).
[84] Ex. A1 at 89-91, 92-93 (Application).
[85] Ex. A1 at 90-93 (Application) and Ex. A42 at 12-13, 18-20 (Sappington Rebuttal Testimony).
[86] Ex. A1 at 87 (Application). *See also,* Permit Conditions ¶33.
[87] *Id.*

35. Applicant has undertaken extensive study, surveys, and consultation with applicable tribes to identify and avoid sites of cultural, archaeological, and historical importance.[88] For example, Applicant's Records Search per the South Dakota State Historic Preservation Office (SD SHPO) guidance identified 133 previously documented archaeological sites, 6 previously documented historic bridges, 83 previously documented standing historic structures, and 5 previously documented cemeteries that have been recorded inside and within 1 mile of the Project Area.[89] As a mitigation measure, Applicant will avoid direct physical impacts to National Register of Historic Places listed sites.[90]

36. Applicant also consulted with the tribal members from the Sisseton Wahpeton Oyate, Yankton Sioux, and Spirit Lake Nation tribes (who were selected by the affected tribes to represent those all applicable tribes) to identify significant tribal resources, and Applicant included them as part of the survey field team.[91] Applicant further consulted with the SD SPHO on the type and content of surveys.[92] Applicant agrees to avoid direct impacts to cultural resources not previously identified and evaluated or notify the Commission and the SD SHPO if avoidance cannot be achieved so to coordinate minimization and/or treatment measures.[93] Applicant will also develop a plan to address any unanticipated discovery of cultural resources, consistent with SDCL 34-27-25, 34-27-26, and 34-27-28.[94] Applicant will file with the Commission a Level III Archaeological survey for, among other facilities, access roads, crane paths, and collection lines prior to commercial operation.[95] Further, Applicant will implement specific avoidance, minimization, and mitigation measures for Traditional Cultural Properties.[96] Based on the record in this proceeding and the Permit Conditions, Applicant has demonstrated that it will minimize or avoid impacts to cultural resources.[97]

2. *Social and Economic*.

37. Applicant has been developing the Project for 10 years through an iterative process to identify the Project Area.[98] During this time, Applicant worked closely with federal and state agencies, landowners, and tribal and local governments to properly design and site the infrastructure for the Project.[99] After accounting for land status and Project changes as identified in Finding of Fact 7, Applicant has all land rights needed to construct and operate the Project.[100]

38. Applicant has demonstrated that the Project does not pose a threat of serious injury to the community.[101] The Project will only permanently impact approximately 86 acres of farmland.[102] The Project is expected to have a negligible effect, if any, on the assessed values of private property and, therefore, on property taxes.[103] Applicant has committed to coordinate with first responders and provide them with the Applicant's safety plan.[104] Further, Applicant has

[88] Ex. A1 at 104-110 (Application); Ex. A25 13-16 (Sappington Direct Testimony); and Ex. A42 at 2-3 (Sappington Rebuttal Testimony).
[89] Ex. A1 at 105 (Application); Ex. A16 at 2-30 and Attachment 1 to 2-30 Confidential (Applicant's Responses to Staff Second Set of Data Requests).
[90] Ex. A1 at 108 (Application).
[91] Ex. A25 at 15 (Sappington Direct Testimony).
[92] Ex. A25 at 15-16 (Sappington Direct Testimony); Ex. A1-B (Agency Coordination); Ex. S4 at 3-7 (Olson Direct Testimony).
[93] Permit Conditions ¶ 11.
[94] Permit Conditions ¶ 12.
[95] Permit Conditions ¶ 13.
[96] Permit Conditions ¶ 37.
[97] Permit Conditions ¶ 48.
[98] Ex. A1 at 2, 26-28, 88 (Application).
[99] Ex. A1 at 2, 26-28, 88; Ex. A5 at 6-15.
[100] Exs. A52, A53, A54, A64, and A65; Evid. Hear. Tr. at 228-231 and 260 (Wilhelm Testimony).
[101] Ex. A1at 95-110, 117 (Application); Ex. A1-K (Property Value Effects Studies); and Ex. A1-M (Telecommunication Study).
[102] Ex. A1 at 102 (Application).
[103] Ex. A1 at 100 (Application) and Ex. A1-K (Property Value Effects Studies); Ex. S8.
[104] Ex. A1 at 101 (Application); Permit Conditions ¶¶ 8, 28, 43.

demonstrated that the construction and operation of the Project will result in benefits to South Dakota and local economies through payment of property taxes and lease payments.[105] Also, there will be approximately 250 temporary workers used during the construction or the Project, and 12 permanent workers in South Dakota to conduct operation and maintenance activities, including 10 wind technicians, 1 lead wind technician, and 1 site manager.[106]

39. The record also demonstrates that the Project is not expected to adversely impact communication systems, such as microwave, AM, FM, cellular, TV, and aviation towers.[107] Also, Applicant has agreed to take action to minimize interference the Project causes to radio, television, and other licensed communication transmitting or receiving equipment.[108]

40. The record demonstrates that Applicant will avoid and/or minimize impacts to transportation.[109] Applicant has committed to coordinate with the South Dakota Department of Transportation (SDDOT), Codington County and Grant County, and Project Area townships to manage construction traffic, and to ensure that equipment and components are delivered safely to the Project. Applicant will also obtain SDDOT Highway Access and Utility Permits prior to construction, and contractors will be required to obtain applicable over height or overweight haul permits. County road permits required for right-of-way occupancy, utility crossings, road approaches, and overweight loads will be obtained by Applicant from Codington County and Grant County prior to beginning construction activities for which the permit is required.[110] Applicant is required to obtain applicable road use agreements and implement specific road protection practices.[111]

41. Crowned Ridge has demonstrated that the Project will not adversely impact property values. Applicant's witness, Mr. Andrew Baker, a licensed appraiser in South Dakota, with experience evaluating the impact of wind turbines on property values, conducted a Market Analysis to analyze the potential impact of the Project on the value of the surrounding properties and found no market data indicating property values will be adversely impacted due to proximity to the Project.[112] This conclusion is also consistent with the Commission's recent findings regarding property values in the Prevailing Wind Park, Dakota Range I and II, Crocker, and Deuel Harvest wind farm proceedings.[113]

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[105] Ex. A1 at 15, 98 (Application).
[106] Ex. A1 at 111 (Application); Ex. A4 at 8 (Thompson Direct Testimony); Ex. A5 at 12 (Wilhelm and Massey Direct Testimony); and Ex. A28 (Allocation of Tax Revenues).
[107] Ex. A1 at 103-104 (Application) and A1-M (Telecommunication Study).
[108] Permit Conditions ¶ 24.
[109] Ex. A1 at 103 (Application).
[110] Permit Conditions ¶¶ 7, 8, 9.
[111] *Id.*
[112] Ex. A1 at 99-100 (Application); Ex. A1-K (Property Value Effects Studies); Exs. A39; A39-1; A39-2; A39-3 (Baker Rebuttal Testimony); Ex. S8.
[113] *See In the Matter of the Application by Prevailing Wind Park, LLC for a Permit of a Wind Energy Facility in Bon Homme County, Charles Mix County and Hutchinson County, South Dakota, for the Prevailing Wind Park Project*, Docket EL18-026, Final Decision and Order Granting Permit to Construct Facilities and Notice of Entry (Nov. 28, 2018); *In the Matter of the Application by Dakota Range I, LLC and Dakota Range II, LLC for a Permit of a Wind Energy Facility in Grant County and Codington County, South Dakota, for the Dakota Range Wind Project*, Docket EL18-003, Final Decision and Order Granting Permit to Construct Wind Energy Facility; Notice of Entry (July 23, 2018); *In the Matter of the Application by Crocker Wind Farm, LLC for a Permit of a Wind Energy Facility and a 345 kV Transmission Line in Clark County, South Dakota, for Crocker Wind Farm*, Docket EL17-055, Final Decision and Order Granting Permit to Construct Facilities and Notice of Entry (June 12, 2018); *In the Matter of the Application of Deuel Harvest Wind Energy, LLC*, Docket No. EL18-053, Final Decision and Order (May 30, 2019).*see also* Ex. S8 (Surrebuttal Testimony of David Lawrence in Docket EL18-003).

42. The FAA has not yet issued a Determination of No Hazard for five of the Project's proposed turbine sites.[114] Applicant has committed to not build any wind turbines that do not have an FAA Determination of No Hazard.[115]

43. In prior contested siting dockets, the Commission has considered the following socioeconomic issues in evaluating whether a project would pose a threat of serious injury to the social and economic condition: temporary and permanent jobs; tax revenue; and impacts on commercial, agricultural, and industrial sectors, housing, land values, labor market, health facilities, energy, sewage and water, solid waste management facilities, fire protection, law enforcement, recreational facilities, schools, transportation facilities, and other community and government facilities.[116]

44. The record demonstrates that the Project will not pose a threat of serious injury to the social and economic condition of inhabitants or expected inhabitants in the siting area.[117]

C. The facility will not substantially impair the health, safety or welfare of the inhabitants.

45. The record demonstrates that Applicant has appropriately minimized the sound level produced from the Project to the following: (1) no more than 45 dBA at any non-participants' residence and (2) no more than 50 dBA at any participants' residence.[118] These sound levels were modeled using the following conservative assumptions: (1) the wind turbines were assumed to be operating at maximum sound emission levels; (2) a 2 dBA adder was applied to the wind turbines sound emission levels; (3) the wind turbines were assumed to be downwind of the receptor; and (4) the atmospheric conditions were assumed to be the most favorable for sound to be transmitted.[119] The Project will also not result in sound above 50 dBA at any non-participants property boundaries for those residences in Codington County.[120] Applicant modelled sound levels with consideration of the cumulative sound impacts from Dakota Range I and II and Crowned Ridge Wind, II, LLC wind projects.[121] Further, Applicant agreed to further reduce certain non-participant sound levels, consistent with the Permit Condition agreed to by Staff and

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[114] Ex. S7 at 31 (Applicant's Additional Data Request Responses to Staff) (Public); Ex. A62; Evid. Hrg. Tr. at 253.
[115] Evid. Hrg. Tr. at 243; Evid. Hrg. Tr. at 253.
[116] *See, e.g.*, *In the Matter of the Application of Dakota Access, LLC for an Energy Facility Permit to Construct the Dakota Access Pipeline*, Docket HP14-002, Final Decision and Order; Notice of Entry (Dec. 14, 2015); *In the Matter of the Application by TransCanada Keystone Pipeline, LP for a Permit Under the South Dakota Energy Conversion and Transmission Facilities Act to Construct the Keystone XL Project*, Docket HP09-001, Amended Final Decision and Order; Notice of Entry (June 29, 2010) (discussing socioeconomic effects, including tax revenue, jobs, and impacts on agricultural, commercial, and industrial sectors and public facilities); *In the Matter of the Application of Dakota Range I, LLC and Dakota Range II, LLC for a Permit of a Wind Energy Facility in Grant County and Codington County, South Dakota, for the Dakota Range Wind Project*, Final Decision and Order Granting Permit to Construct Wind Energy Facility; Notice of Entry (July 23, 2018); *In the Matter of the Application of Montana-Dakota Utilities Co. and Otter Tail Power Company for a Permit to Construct the Big Stone South to Ellendale 345 kV Transmission Line*, Docket EL13-028, Final Decision and Order; Notice of Entry (Aug. 22, 2014) (discussing impacts to agriculture, property values, and local roads under this criterion). *See In the Matter of the Application by Prevailing Wind Park, LLC for a Permit of a Wind Energy Facility in Bon Homme County, Charles Mix County and Hutchinson County, South Dakota, for the Prevailing Wind Park Project*, Docket EL18-026, Final Decision and Order Granting Permit to Construct Facilities and Notice of Entry (Nov. 28, 2018); *In the Matter of the Application by Crocker Wind Farm, LLC for a Permit of a Wind Energy Facility and a 345 kV Transmission Line in Clark County, South Dakota, for Crocker Wind Farm*, Docket EL17-055, Final Decision and Order Granting Permit to Construct Facilities and Notice of Entry (June 12, 2018); *In the Matter of the Application of Deuel Harvest Wind Energy, LLC*, Docket No. EL18-053, Final Decision and Order (May 30, 2019).
[117] *See, e.g.*, Ex. A1 at § 18 (Application).
[118] Ex. A56 (Appendix D Sound ISO-Lines Map Book); Ex. A57 (Appendix C-3 Sound Results Table Rev 6).
[119] Ex. A22 at 3 (Haley Supplemental Testimony); Evid. Hrg. Tr. at 358 (Haley).
[120] Evid. Hrg. Tr. at 358 (Haley).
[121] Ex. A26 at 3-3 (Applicant's Responses to Staff Third Set of Data Requests); Ex. A56 (Appendix D Sound ISO-Lines Map Book); Ex. A57 (Appendix C-3 Sound Results Table Rev 6); Evid. Hrg. Tr. at 361 (Haley).

Applicant.[122] Applicant agreed to a post construction sound protocol to be used in the event the Commission orders post construction sound monitoring.[123]

46. Similarly, the record also demonstrates that Applicant has appropriately minimized the shadow flicker for the Project to no more than 30 hours for participants and non-participants, with the understanding that there is one participant (CR1-C10-P) who is at 36:57 hours of shadow flicker.[124] Applicant modelled the cumulative impacts of shadow flicker from Dakota Range I and II and Crowned Ridge Wind, II, LLC wind projects when calculating its total shadow flicker hours.[125] Applicant also used conservative assumptions, such as the greenhouse-mode, to model shadow flicker, which, in turn, produces conservative results.[126]

47. Receptor CR1-C10-P is a participating landowner in Codington County.[127]

48. Receptor CR1-C10-P will experience 36 hours and 57 minutes of shadow flicker per year.[128]

49. Nothing in the record indicates that Receptor CR1-C10-P has signed a waiver.

50. Applicant will work with the one participant that will experience 36 hours of shadow flicker to either waive the 6:57 hour overage or implement mitigation, such as curtailing the turbine for the 6:57 hours of shadow flicker.[129]

51. There is no record evidence that the Project will substantially impair human health or welfare. To the contrary, Crowned Ridge witnesses Dr. Robert McCunney and Dr. Christopher Ollson submitted evidence that demonstrates that there is no human health or welfare concern associated with the Project as designed and proposed by Applicant.[130] Both Crowned Ridge witnesses analyzed the scientific peer-reviewed literature in the context of the proposed Project, and Dr. McCunney testified based on his experience and training as a medical doctor specializing in occupational health and the impact of sound on humans.[131]

52. There is no evidence in the record that the Project will substantially impair safety. Applicant will meet or exceed required setbacks established for safety,[132] and, also, implement safety practices during construction, operation, and maintenance, including grounding wind turbines in accordance with National Electrical Safety Code standards.[133] Applicant will monitor the operation of the Project twenty-four hours a day, seven days a week through the Supervisory Control and Data Acquisition system.[134] Also, Applicant will implement a SWPPP and SPCCP, part of which will ensure that state and local disaster services are coordinated with in the event of the accidental release of contaminants.[135] Applicant will illuminant the wind turbines as required

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[122] Ex. A58 (Final Land Status and Hessler 7 on Intervenors); Ex. A60 (Hessler 7 on Hessler Identified Non-Participants); Permit Conditions ¶ ¶ 26, 27.
[123] Permit Conditions ¶ 26.
[124] Ex. A67 (Appendix C-1 Shadow Flicker Results); Ex. A68 Appendix C-2 Shadow Flicker Results).
[125] Ex. A26 at 3-3 (Applicant's Responses to Staff Third Set of Data Requests); Ex. A43 at 2 (Haley Rebuttal Testimony).
[126] Ex. A2 at 7 (Haley Direct Testimony); Evid. Hrg. Tr. at 359-360 (Haley).
[127] *Id.*
[128] *Id.*
[129] Ex. A44 at 2-3 (Wilhelm and Massey Rebuttal Testimony); Evid. Hrg. Tr. at 361 (Haley); Permit Conditions ¶ ¶ 34, 41.
[130] Ex. A24 (Ollson Supplemental Testimony); Ex. A24-1 and through Ex. A24-17; Ex. A38 (Ollson Rebuttal Testimony); Ex. A38-1 through Ex. A38-7; Ex. A40 (McCunney Rebuttal Testimony); Ex. A 40-2 through Ex. A40-9; Evid. Hrg. Tr. at 433-435 (McCunney); Evid. Hrg. Tr. at 452-458 (Ollson).
[131] *Id.*
[132] Ex. A1 at 12, 27, 75-78 (Application); Ex. A5 at 9-11 (Wilhelm and Massey Direct Testimony).
[133] Ex. A1 at 20, 114-115 (Application); Ex. A4 at 3, 7 (Thompson Direct Testimony).
[134] Ex. A1 at 23 (Application); Ex. A4 at 5, 7-8 (Thompson Direct Testimony).
[135] Ex. A1 at 41, 90-91, 100, 102 (Application).

by the FAA.[136] Applicant is required to use two methods to detect icing conditions on turbine blades to shut down turbines when they are accumulating ice.[137]

53. Applicant, prior to construction, is required to notify public safety agencies on the location of construction work.[138]

54. Applicant is required to provide each participating and non-participating landowner detailed safety information, including safety precautions, 14 days prior to the commencement of construction.[139]

55. Therefore, the record shows that Crowned Ridge has met its burden to demonstrate that the Project will not substantially impair the health, safety or welfare of the inhabitants of the siting area; indeed, there is no evidence in the record that the Project would substantially impair human health.

D. The facility will not unduly interfere with the orderly development of the region with due consideration having been given the views of governing bodies of affected local units of government.

56. The Commission must give due consideration to the views of governing bodies of affected local units of government pursuant to SDCL 49-41B-22(4).

57. The record demonstrates that the Project will not unduly interfere with the orderly development of the region. The Project complies with all applicable local land use requirements as demonstrated by the granting of conditional use permits for the Project by Grant County and Codington County.[140]

58. Applicant has also committed to decommissioning the Project at the end of its 25 year useful life, provided the life of the Project is not extended by retrofitting the turbines and power systems.[141] In support of decommissioning, Applicant will establish an escrow agreement consistent with the Commission's past rulings.[142] The escrow agreement covers decommissioning of the entire project, and, therefore, the Commission finds the escrow agreement required in this proceeding will provide sufficient financial protection for the decommissioning of the Project, and, accordingly, there is no need for Grant County and Codington County to require duplicative financial security related to decommissioning.

59. Staff witness Darren Kearney attached to his testimony 37 proposed conditions that the Intervenors indicated they desired to advance in this proceeding.[143] While Mr. Kearney provided Staff's initial reaction to the 37 conditions, he, also, testified that Staff had not seen supporting information from the Intervenors on the 37 conditions.[144] During the proceeding, the Intervenors submitted no evidence in support of the 37 conditions. In contrast, the Applicant

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[136] *Id.* at 12.
[137] Permit Conditions ¶35.
[138] Permit Conditions ¶43.
[139] Permit Conditions ¶4.
[140] Ex. A1 at 88 (Application); Ex. A1-J (County Conditional Use Permits); Ex. A5 at 8-11 (Wilhelm and Massey Direct Testimony); Ex. A44 at 3-4 (Wilhelm and Massey Rebuttal Testimony).
[141] Ex. A1 at 113 (Application); Ex. A1-L (Decommission Plan).
[142] *In the Matter of the Application of Deuel Harvest Wind Energy, LLC*, Docket No. EL18-053, Final Decision and Order (Condition No. 36) (May 30, 2019). The Commission, however, will allow the Crowned Ridge escrow agreement to be filed 30 days (instead of the 60 days in past cases) prior to the commencement of commercial operations in order to allow Crowned Ridge with additional time to work with Grant County and Codington County so that they do not require duplicative escrow agreement(s).
[143] Ex. S2 at 12 (Exhibit DK-9) (Kearney Direct Testimony).
[144] *Id.*

provided evidence that the conditions should not be adopted.[145] Therefore, the 37 conditions proposed by the Intervenors will not be adopted.

VI. GENERAL.

60. Applicants have furnished all information required by the applicable statutes and Commission regulations.

61. Applicants have satisfied their burden of proving all of the requirements imposed by SDCL 49-41B-22 for issuance of the permit to construct by the preponderance of the evidence.

62. An application may be denied, returned, or amended, at the discretion of the Commission, for failure to file an application generally in the form and content required by SDCL Chapter 49-41B and ARSD Chapter 20:10:22.[146] The Commission finds that Applicant filed its application generally in the form and content required by SDCL Chapter 49-41B and ARSD Chapter 20:10:22. The Commission notes that the supplementation of an application with additional information is common.[147]

63. An application may be denied, returned, or amended, at the discretion of the Commission, if there are any deliberate misstatements of material facts in the application or in accompanying statements or studies.[148] The Commission finds that the application and its accompanying statements and studies did not contain any deliberate misstatements of material facts.

64. The Commission finds that the Permit Conditions attached hereto and incorporated herein by reference are supported by the record, are reasonable and will help ensure that the Project will meet the standards established for approval of a construction permit for the Project set forth in SDCL 49-41B-22.

65. The Commission finds that the Project, if constructed in accordance with the Permit Conditions of this decision, will comply with all applicable laws and rules, including all requirements of SDCL Chapter 49-41B and ARSD Chapter 20:10:22.

66. The Commission finds that the Project, if constructed in accordance with the Permit Conditions of this decision, will not pose an unacceptable threat of serious injury to the environment nor to the social and economic conditions of inhabitants or expected inhabitants in the siting area.

67. The Commission finds that the Project, if constructed in accordance with the Permit Conditions of this decision, will not substantially impair the health, safety or welfare of the inhabitants in the siting area.

68. The Commission finds that the Project, if constructed in accordance with the Permit Conditions of this decision, will not unduly interfere with the orderly development of the region

[145] Ex. A1-K (Property Value Effects Study); Ex. A37 at 4-11 (Thompson Rebuttal Testimony); Ex. A38 at 8-12 (Ollson Rebuttal Testimony); Ex. A39 at 2-6 (Baker Rebuttal Testimony); Ex. A40 at 3-11 (McCunney Rebuttal Testimony); Ex. A42 at 12-24 (Sappington Rebuttal Testimony); Ex. A43 at 6-7 (Haley Rebuttal Testimony); and Ex. A44 at 9-19 (Wilhelm and Massey Direct Testimony).
[146] SDCL 49-41B-13(2).
[147] Ex. S2 at 8 (Kearney).
[148] SDCL 49-41B-13(1).

with due consideration having been given the views of governing bodies of affected local units of government.

69. The Commission finds the Intervenors have not presented evidence sufficient to deny the permit under the applicable statutes and Commission regulations.

70. The Commission finds that a permit to construct the Project should be granted subject to the attached Permit Conditions.

71. To the extent that any Conclusion of Law set forth below is more appropriately a finding of fact, that Conclusion of Law is incorporated herein by reference as a Finding of Fact as if set forth in full herein.

72. To the extent that any of the Findings of Fact in this decision are determined to be Conclusions of Law or mixed findings of fact and conclusions of law, the same are incorporated herein by this reference as a Conclusion of Law as if set forth in full herein.

Based on the foregoing Findings of Fact and the record in this proceeding, the Commission hereby makes the following:

CONCLUSIONS OF LAW

From the foregoing Findings of Fact and the record in this proceeding, the Commission now makes the following Conclusions of Law:

1. The Commission has jurisdiction to consider the Application under SDCL Chapter 49-41B.

2. The wind energy conversion facility proposed by Applicant is a wind energy facility as defined under SDCL 49-41B-2(13).

3. The Application submitted by Applicant, as amended and supplemented through the proceedings in this matter, meets the criteria required by SDCL 49-41B-25, and construction of the Project meets the requirements of SDCL 49-41B and ARSD Chapter 20:10:22.

4. The Commission concludes that it possesses the authority under SDCL 49-41B-25 to impose conditions on the construction, operation and maintenance of the Project, that the Conditions set forth in the attached Permit Conditions are supported by the record, are reasonable, and will help ensure that the Project will meet the standards established for approval of a construction permit for the Project set forth in SDCL 49-41B-22 and that the Permit Conditions are hereby adopted.

5. The Commission concludes that it needs no other information to assess the impact of the proposed facility or to determine if Crowned Ridge has met its burden of proof.

6. The Commission satisfied the hearing and notice requirement in SDCL Chapter 49-41B.

7. Applicant satisfied the applicable notice requirements in SDCL Chapter 49-41B.

8. All other applicable procedural requirements in SDCL Chapter 49-41B have been satisfied.

9. Applicant has demonstrated that the proposed facility will comply with all applicable laws and rules.

10. When considered with all Permit Conditions, Applicant has demonstrated that the facility will not pose a threat of serious injury to the environment nor to the social and economic condition of inhabitants or expected inhabitants in the siting area.

11. When considered with all Permit Conditions, Applicant has demonstrated that the facility will not substantially impair the health, safety or welfare of the inhabitants.

12. When considered with all Permit Conditions, Applicant has demonstrated that the facility will not unduly interfere with the orderly development of the region with due consideration having been given the views of governing bodies of affected local units of government.

13. Crowned Ridge must comply with the requirements in the Grant County and Codington County ordinances.

14. No party has provided sufficient evidence to impose any of the 37 proposed Intervenor conditions.

15. The standard of proof is by the preponderance of evidence. Applicant has met its burden of proof imposed by SDCL 49-41B-22 for issuance of the permit to construct by the preponderance of the evidence and is entitled to a permit to construct as provided in SDCL 49-41B-25.

16. Based on the preponderance of the evidence presented to the Commission, the Commission concludes that all of the requirements of SDCL 49-41B-22 have been satisfied.

17. The Commission thus concludes that the Application should be granted, and a facility permit should be issued for the Project for the reasons stated in these Findings of Fact and Conclusions of Law. The Commission grants the permit to construct requested in the Application, as amended, subject to the Permit Conditions.

ORDER

From the foregoing Findings of Fact and Conclusions of Law, it is therefore:

ORDERED, that a permit to construct the Crowned Ridge Wind Project is granted to Crowned Ridge Wind, LLC for the construction and operation of the Project. It is further

ORDERED, that Applicant shall comply with all of the attached Permit Conditions, which are incorporated by reference into this Order the same as if they had been set forth in their entirety herein. It is further

ORDERED, that Intervenors' Second Motion to Dismiss is hereby denied.

NOTICE OF ENTRY

PLEASE TAKE NOTICE that this Final Decision and Order Granting Permit to Construct Facility was duly issued and entered on the 26th day of July 2019.

Dated at Pierre, South Dakota, this 26th day of July 2019.

CERTIFICATE OF SERVICE

The undersigned hereby certifies that this document has been served today upon all parties of record in this docket, as listed on the docket service list, electronically or by mail.

By: Karen E. Cremer

Date: 07/26/19

(OFFICIAL SEAL)

BY ORDER OF THE COMMISSION:

Gary Hanson

GARY HANSON, Chairman

Chris Nelson

CHRIS NELSON, Commissioner

Kristie Fiegen

KRISTIE FIEGEN, Commissioner

PERMIT CONDITIONS

1. Applicant will obtain all governmental permits which reasonably may be required by any township, county, state agency, or federal agency, or any other governmental unit for construction and operation activity of the Project prior to engaging in the particular activity covered by that permit. Copies of any permits obtained by Applicant shall be filed with the Commission.

2. Applicant shall construct, operate, and maintain the Project in a manner consistent with (1) descriptions in the Application, (2) Application supplements and corrections, (3) commitments made by Applicant in response to data requests, (4) the Final Decision and Order Granting Permit to Construct Facility, and attached Permit Conditions, (5) all applicable industry standards, (6) all applicable permits issued by a federal, state, or local agency with jurisdiction over the Project, and (7) evidence presented by Applicant at the evidentiary hearing.

3. Applicant agrees that the Commission's complaint process as set forth in ARSD Chapter 20:10:01 shall be available to landowners and other persons sustaining or threatened with damage as the result of Applicant's failure to abide by the conditions of the Permit or otherwise having standing to seek enforcement of the conditions of the Permit. Participating landowners are free to use the complaint process free from retribution or consequence regardless of any private easement term to the contrary.

4. At least 14 days prior to commencement of construction, Applicant shall provide each participating and non-participating landowner in the Project Area, using the addresses designated to receive the property tax bill sent by the county treasurer, with the following information:

    a) A copy of the Final Decision and Order Granting Permit to Construct Facilities with attached Permit Conditions;

    b) Detailed safety information describing:

        i. Reasonable safety precautions for existing activities on or near the Project;

        ii. Known activities or uses that are presently prohibited near the Project; and

        iii. Other known potential dangers or limitations near the Project;

    c) Construction/maintenance damage compensation plans and procedures (only to participating landowners);

    d) The Commission's address, website, and phone number;

    e) Contact person for Applicant, including name, e-mail address, and phone number.

5. In order to ensure compliance with the terms and conditions of this Permit pursuant to SDCL 49-41B-33, it is necessary for the enforcement of this Order that all employees, contractors, and agents of Applicant involved in this Project be made aware of the terms and conditions of this Permit.

6. Except as otherwise provided in the Permit Conditions, Applicant shall comply with all mitigation measures set forth in the Application and Applicant's commitments in its responses to data requests, and Applicant exhibits and testimony at the evidentiary hearing. Material modifications to the mitigation measures shall be subject to prior approval of the Commission.

7. Applicant will negotiate road use agreements with Codington and Grant Counties and all affected townships, if required. Applicant will comply with such road use agreements. When using haul roads specified in applicable road use agreements, Applicant shall take appropriate action to mitigate wind-blown particles created throughout the construction process, including implementation of dust control measures such as road watering, covering of open haul trucks when transporting material subject to being windblown, and the removal of any soils or mud deposits by construction equipment when necessary.

8. In accordance with applicable road use agreements or applicable law, Applicant shall comply with the following conditions regarding road protection:

   a) Applicant shall acquire all necessary permits authorizing the crossing of federal, state, county, and township roads.

   b) Applicant shall coordinate road closures with federal, state, and local governments and emergency responders.

   c) Applicant shall implement a regular program of road maintenance and repair through the active construction period to keep paved and gravel roads in an acceptable condition for residents and the public.

   d) After construction, Applicant shall repair and restore deteriorated roads resulting from construction traffic or compensate governmental entities for their repair and restoration of deteriorated roads, such that the roads are returned to their preconstruction condition.

   e) Within 180 days of completing construction and reclamation of the Project, Applicant shall submit documentation to the Commission identifying that the roads were repaired in accordance with this Condition 8 and to the satisfaction of affected townships and county. If the townships or county will not provide such documentation, then Applicant shall provide a report to the Commission on the outstanding road repair issues and how those issues have been or will be resolved.

   f) Privately owned areas used as temporary roads or crane paths during construction will be restored to their preconstruction condition, except as otherwise requested or agreed to by the landowner.

   g) Should Applicant need to widen any existing roadways during construction of the Project, Applicant shall return the roadways back to original width after completion of the Project, unless otherwise agreed upon with the federal, state, county, or township entities, or the landowner.

9. Applicant shall provide signage that identifies road closures and disturbances resulting from the Project in accordance with the most recent editions of the Manual on Uniform Traffic Control Devices as published by the Federal Highway Administration.

10. Applicant shall promptly report to the Commission the presence of any critical habitat of threatened or endangered species in the Project Area that Applicant becomes aware of and that was not previously reported to the Commission.

11. Applicant agrees to avoid direct impacts to cultural resources that are unevaluated, eligible for, or listed in the National Register of Historic Places (NRHP). When a NRHP unevaluated, eligible, or listed resource cannot be avoided, Applicant shall notify the South Dakota State Historic Preservation Office (SHPO) and the Commission of the reasons that complete avoidance cannot be achieved in order to coordinate minimization and/or treatment measures.

12. Prior to the commencement of construction, Applicant agrees to develop an unanticipated discovery plan for cultural resources and comply with SDCL 34-27-25, 34-27-26, and 34-27-28 for the discovery of human remains.

13. Applicant shall file a Level III Archaeological survey of the remaining facilities (i.e. access roads, crane paths, collection lines, O&M facilities, concrete batch plant, and laydown areas) with the Commission and provide a copy of the survey to SHPO prior to commercial operation. The survey report may contain confidential information and all confidential portions of the survey report shall be filed as confidential and not for public disclosure. If any potential adverse impacts to NRHP unevaluated, listed, or eligible cultural resources are identified in the survey, Applicant shall file with the Commission a report describing the SHPO-approved planned measures to ameliorate those impacts.

14. Applicant shall provide the Stormwater Pollution Prevention Plan (SWPPP) to the Commission when Applicant has a final design for the Project. The SWPPP will outline the water and soil conservation practices that will be used during construction to prevent or minimize erosion and sedimentation and be in a form consistent with the South Dakota Department of Environment and Natural Resources guidelines. The SWPPP will be completed before submittal of an application for a National Pollutant Discharge Elimination System (NPDES) general permit for construction activities. All contractors to be engaged in ground disturbing activities will be given a copy of the SWPPP and the requirements will be reviewed with them prior to the start of construction.

15. Applicant shall repair and restore areas disturbed by the construction or maintenance of the Project. Except as otherwise agreed to by the landowner, restoration shall include the replacement of the original pre-construction topsoil or equivalent quality topsoil to its original elevation, contour, and compaction and re-establishment of original vegetation as close thereto as reasonably practical. In order to facilitate compliance with this Permit Condition, Applicant shall:

    a) Strip the topsoil to the actual depth of the topsoil, or as otherwise agreed to by the landowner in writing (e-mail is sufficient), in all areas disturbed by the Project; however, with respect to access roads, Applicant may remove less than the actual depth of the topsoil to ensure roads remain low-profile and the contours align with the surrounding area;

    b) Store the topsoil separate from the subsoil in order to prevent mixing of the soil types;

    c) All excess soils generated during the excavation of the turbine foundations shall remain on the same landowner's land, unless the landowner requests, and the landowner agrees otherwise; and

d) When revegetating non-cultivated grasslands, Applicant shall use a seed mix that is recommended by the Natural Resource Conservation Service (NRCS), or other land management agency, unless otherwise agreed upon with the landowner in writing.

16. Applicant shall work closely with landowners or land management agencies, such as the NRCS, to determine a plan to control noxious weeds and Applicant shall implement the plan.

17. Applicant shall stage construction materials in a manner that minimizes the adverse impact to landowners and land users as agreed upon between Applicant and landowner or Applicant and the appropriate federal, state, and/or local government agency. All excess (non-permanent) construction materials and debris shall be removed upon completion of the Project, unless the landowner agrees otherwise.

18. In order to mitigate interference with agricultural operations during and after construction, Applicant shall locate all structures, to the extent feasible and prudent, to minimize adverse impacts and interferences with agricultural operations, shelterbelts, and other land uses or activities. Applicant shall take appropriate precautions to protect livestock and crops during construction. Applicant shall repair all fences and gates removed or damaged during construction or maintenance unless otherwise agreed upon with the landowner or designee. Applicant shall be responsible for the repair of private roads damaged when moving equipment or when obtaining access to the right-of-way.

19. Applicant shall bury the underground collector system at a minimum depth of 48 inches, or deeper if necessary, to ensure the current land use is not impacted.

20. Applicant shall repair or replace all property removed or damaged during all phases of construction, including but not limited to, all fences, gates, and utility, water supply, irrigation, or drainage systems. Applicant shall compensate the owners for damages or losses that cannot be fully remedied by repair or replacement, such as lost productivity and crop and livestock losses. All repair, replacement and/or compensation described above shall be in accordance with the terms and conditions of written agreements between Applicant and affected landowners where such agreements exist.

21. Applicant shall, in the manner described in its written agreement with a landowner, indemnify and hold the landowner harmless for loss, damage, claim, or actions resulting from Applicant's use of the easement, including any damage resulting from any release, except to the extent such loss, damage claim, or action results from the negligence or willful misconduct of the landowner or his employees, agents, contractors, invitees, or other representatives.

22. Applicant may make turbine adjustments of 250 feet or less from the turbine locations identified at the time a Facility Permit is issued without prior Commission approval, so long as the specified noise and shadow flicker thresholds are not exceeded, cultural resource impacts and documented habitats for listed species are avoided, and wetland impacts are avoided or are in compliance with applicable U.S. Army Corps of Engineers (USACE) regulations. Prior to implementing the turbine adjustment, Applicant will file in the docket an affidavit demonstrating compliance with the limitations set forth above. Any turbine adjustment that does not comply with the aforesaid limitations, or turbine model change, would be considered a "material change," and Applicant shall file a request for approval of the "material change" prior to making the adjustment pursuant to the following approval process:

Applicant will file with the Commission and serve on the official Service List a request for approval of the material change that includes:

- An affidavit describing the proposed turbine adjustment, the reason for the adjustment, the reason the adjustment does not comply with one or more turbine flexibility limitations set forth above, and information regarding compliance with all other applicable requirements; and
- A map showing both the approved location and the proposed adjustment (in different colors).
- Once received, the information would be reviewed by Commission staff, and Commission staff will have 10 calendar days within which to request further Commission review.
- If no further review is requested, Applicant may proceed with the adjustment.
- If further review is requested, the Commission will issue a decision regarding Applicant's request at its next available regularly scheduled Commission meeting, subject to notice requirements, after the request for further review is made by Commission staff.

23. Applicant may adjust access roads, the collector and communications systems, meteorological towers, Aircraft Detection Lighting System facilities, the operations and maintenance facility, the Project Substation, and temporary facilities, so long as they are located on land leased for the Project, cultural resources are avoided or mitigated in consultation with the SHPO; documented habitats for listed species are avoided; wetland impacts are avoided or are in compliance with applicable USACE regulations; and all other applicable regulations and requirements are met.

24. If the Project causes interference with radio, television, or any other licensed communication transmitting or receiving equipment, Applicant shall take all appropriate action to minimize any such interference and shall make a good faith effort to restore or provide reception levels equivalent to reception levels in the immediate areas just prior to construction of the Project. This mitigation requirement shall not apply to any dwellings or other structures built after completion of the Project.

25. Applicant will provide Global Positioning System (GPS) coordinates of structure locations to affected landowners at any time during the life of the Project. Coordinates will be provided in writing to landowners within 30 days of a request.

26. The Project, exclusive of all unrelated background noise, shall not generate a sound pressure level (10-minute equivalent continuous sound level, Leq) of more than 45 dBA as measured within 25 feet of any non-participating residence unless the owner of the residence has signed a waiver, or more than 50 dBA (10-minute equivalent continuous sound level, Leq) within 25 feet of any participating residence unless the owner of the residence has signed a waiver. The Project Owner shall, upon Commission formal request, conduct field surveys and provide monitoring data verifying compliance with specified noise level limits. If the measured wind turbine noise level exceeds a limit set forth above, then the Project Owner shall take whatever steps are necessary in accordance with prudent operating standards to rectify the situation.

    If a field survey and monitoring data is requested by the Commission, the Project Owner shall submit the test protocol to the Commission prior to conducting the survey and sound monitoring for approval. The test protocol shall include and be implemented as follows:

a) The post-construction monitoring survey shall be conducted following applicable American National Standard Institute (ANSI) methods.

b) Sound levels shall be measured continuously for 14 days in an effort to capture a sufficient quantity of valid readings meeting the wind conditions delineated below in subpart (e). A sufficient quantity shall be defined as 0.5% of the total number of samples, or a minimum of 10 for a 14-day measurement period. As a precaution against the possibility that a sufficient number of valid readings are not automatically recorded during the chosen 14-day sampling period, 10 on/off tests shall be carried out during the survey period when the Project is operating at full power production irrespective of the ground level wind speed. For the on/off tests, all units in the Project shall be shut down for a 10-minute period synchronized with the monitor's clocks (starting, for example, at the top of the hour or 10 minutes after, 20 minutes after, etc.). The background level measured during the shutdown interval can then be subtracted from the average of the levels measured immediately before and after it to determine the Project-only sound level. The results from these tests may be used to make up for any shortfall in collecting 10 samples measured when the ground level wind speed is less than or equal to 5 m/s.

c) Measurements shall be conducted at a select number of non-participating and participating residences with the highest expected noise levels and/or at specific residences identified in the Commission's formal request. Typically, 4 to 6 measurement locations total should be selected.

d) Measurements shall be conducted using sound level meters meeting ANSI Type 1 specifications. An anemometer shall be placed within 20 feet of each microphone, and at a height of approximately 2 meters above the ground.

e) The measurement data shall be analyzed as follows:

i. At a minimum, the closest five wind turbines will be operating for evaluation periods and when at least the closest wind turbine is operating at a condition at full (within one decibel of maximum sound power levels) acoustic emissions.

ii. Discard those samples measured when the 10-minute average ground wind speed is greater than 5 m/s.

iii. Discard those samples measured during periods with precipitation.

iv. If measured (total) sound levels exceed the sound level limits, determine Project-only sound levels by removing transient background noise (i.e. occasional traffic, activities of residents, farming activities, and wind gusts) based upon audio recordings, excessive wind gusts, personal observations, and/or comparison of sound level metrics.

v. If measured (total) sound levels exceed the sound level limits, determine Project-only sound levels by removing, continuous background noise. This approach requires wind turbine shut-downs, where the background noise is measured directly. Background noise levels will be subtracted from total noise levels measured during these wind conditions to calculate turbine-only noise levels.

vi. As necessary, review of the frequency spectra of potential turbine-only samples to identify and remove outliers (spectral shape clearly differing from those samples measured under very low (less than 2 m/s) ground wind conditions, which are the samples most representative of turbine-only noise).

f) Compare the resulting turbine-only noise levels to the 45 and 50 dBA limits. Compliance shall be demonstrated if all samples are less than the limits.

27. Applicant agrees to use alternative turbine locations instead of the following primary turbine locations CR-16, CR19, CR-23, CR-49, CR-60, CR-67, and CR-68. If during construction at an alternative turbine, Applicant determines that the location is not suitable for a turbine due to geotechnical, cultural, environmental issues or other constructability issues, Applicant shall file an affidavit with the Commission setting forth why the alternative turbine cannot be used and identifying which primary turbine will be used. If there is a dispute over the use of a primary turbine, Applicant and Commission staff shall meet and attempt to resolve the dispute within 10 business days of the filing of the affidavit. If the dispute cannot be resolved within 10 business days, Applicant shall file a request for a material change with the Commission.

28. Applicant shall seek input from local emergency response personnel to properly and effectively coordinate an emergency response plan consistent with local resources and response abilities. Upon completion of construction, a Project operation emergency response plan shall be provided to Commission staff to make available to the general public on the Commission's website.

29. Applicant agrees to undertake a minimum of two years of independently-conducted post-construction avian and bat mortality monitoring for the Project, and to provide a copy of the report and all further reports to the United States Fish and Wildlife Services, South Dakota Game, Fish and Parks, and the Commission.

30. Applicant shall file a Bird and Bat Conservation Strategy (BBCS) prior to beginning construction of the Project. The BBCS shall be implemented during construction and operation of the Project.

31. If the Project is decommissioned, Applicant will follow Section 21 of the Application and the decommissioning plan laid out in Appendix L of the Application. The Commission shall be notified prior to any decommissioning action.

32. At least 30 days prior to commencement of commercial operation, Applicant shall file an escrow agreement with the Commission for Commission approval that provides a decommissioning escrow account. The escrow agreement shall incorporate the following requirements:

a) The escrow account is funded by the turbine owner annually at a rate of $5,000 per turbine per year for the first 30 years, commencing no later than the commercial operation date.

b) Beginning in year ten following commercial operation of the Project and each fifth year thereafter, the turbine owner shall submit to the Commission an estimated decommissioning date, if established, and estimated decommissioning costs and salvage values. Based on the verification of the information in the filing the Commission may determine that funds in escrow are sufficient to cover the costs

of decommissioning and that reduced, or no additional deposits are required. The Commission also may determine that additional funding is required and may require additional funding equal to the estimated amount needed for decommissioning.

c) All revenues earned by the account shall remain in the account.

d) An account statement shall be provided annually to the Commission and become a public record in this docket.

e) The escrow account obligations will be those of Crowned Ridge and the escrow agreement shall include terms providing that the agreement binds Crowned Ridge's successors, transferees, and assigns. A sale of Project assets shall include the associated Permit that requires Commission approval per SDCL §49-41B-29.

f) The escrow account agent shall be a South Dakota chartered state bank or a nationally chartered bank with an office located in South Dakota.

g) The escrow agreement shall be subject to the laws of South Dakota and any disputes regarding the agreement shall be venued in South Dakota.

h) To minimize the risk that the escrow account would be subject to foreclosure, lien, judgment, or bankruptcy, the escrow agreement will be structured to reflect the follow factors:

i. That Crowned Ridge agreed to the creation of the escrow account;

ii. Crowned Ridge exercises no (or the least amount possible of) control over the escrow;

iii. The initial source of the escrow account;

iv. The nature of the funds put into the escrow account;

v. The recipient of its remainder (if any);

vi. The target of all its benefit; and

vii. The purpose and its creation.

i) Account funds are to be paid to the Project owner at the time of decommissioning, to be paid out as decommissioning costs are incurred and paid.

j) If the Project owner fails to execute the decommissioning requirement found in this section of the Permit Conditions, the account is payable to the landowner who owns the land on which associated Project facilities are located as the landowner incurs and pays decommissioning costs.

33. Applicant shall utilize an Aircraft Detection Lighting System approved by the Federal Aviation Administration.

34. Shadow flicker at residences shall not exceed 30 hours per year unless the owner of the residence has signed a waiver. Prior to construction, Applicant shall obtain and file with the Commission and the Codington County Zoning Officer a waiver for any occupied structure which will experience more than thirty hours of shadow flicker per year. If no waiver is obtained, Applicant shall file a mitigation plan with the Commission prior to construction and obtain Commission approval of the mitigation plan.

35. Applicant will use two methods to detect icing conditions on turbine blades: (1) sensors that will detect when blades become imbalanced or create vibration due to ice accumulation; and (2) meteorological data from on-site permanent meteorological towers, on-site anemometers, and other relevant meteorological sources that will be used to determine if ice accumulation is occurring. These control systems will either automatically shut down the turbine(s) in icing conditions (per the sensors) or Applicant will manually shut down turbine(s) if icing conditions are identified (using meteorological data). Turbines will not return to normal operation until the control systems no longer detect an imbalance or when weather conditions either remove icing on the blades or indicate icing is no longer a concern. Applicant will pay for any documented damage caused by ice thrown from a turbine.

36. Turbines shall be set back at least 1.1 times the tip height, with a minimum set back distance of 500 feet, from any surrounding property line. However, if the owner of the wind turbine tower has a written agreement with an adjacent land owner allowing the placement of the tower closer to the property line, the tower may be placed closer to the property line shared with that adjacent land owner.

37. Applicant shall implement the avoidance, minimization, and mitigation measures identified as follows for Traditional Cultural Properties (TCPs):

    a) Implement standard avoidance or resource protection practices (e.g., barrier fencing, contractor training) for TCPs, where feasible, in collaboration with the Sisseton-Wahpeton Oyate, Yankton Sioux, Rosebud Sioux and Spirit Lake Tribal Historic Preservation Officers (THPOs) and Applicant;

    b) Make reasonable efforts to identify participating landowners who may be willing to work with the tribes on site preservation, accessibility, and protection of TCPs on their property;

    c) Conduct site revisits prior to construction;

    d) Help facilitate post-construction site revisits for tribes with the landowners; and

    e) Identify and implement education/interpretation opportunities regarding tribal resource preservation and/or Native American perspectives which may include sensitivity training when needed.

38. For purposes of this Project and the commitments herein, “residences,” “business(es),” “structures,” “schools,” “churches,” “cemeteries,” and “public buildings” shall include only those that are in existence and in use as of the date of the Commission’s order issuing a permit.

39. The terms and conditions of the Permit shall be made a uniform condition of construction and operation, subject only to an affirmative written request for an exemption addressed to the Commission. A request for an exemption shall clearly state which particular condition should not be applied to the property in question and the reason for the requested exemption. The Commission shall evaluate such requests on a case-by-case basis, which evaluation shall be completed within 60 days unless exigent circumstances require action sooner.

40. Applicant shall provide a copy of the Commission's Final Decision and Order Granting Permit to Construct Facility; Notice of Entry and attached Permit Conditions in this docket to the affected county, townships, and municipalities in the Project Area.

41. At least 30 days prior to the commencement of construction work in the field for the Project, Applicant will provide to Commission staff the following information:

a) the most current preconstruction design, layout, and plans, including the turbine model selected;

b) a sound level analysis showing compliance with the applicable sound level requirements;

c) a shadow flicker analysis showing the anticipated shadow flicker levels will not exceed applicable requirements per year at any residence, absent a waiver agreement executed by the residence owner(s);

d) should Applicant decide at a later point to use a different turbine model, it shall provide the information required in parts a-c above. Applicant shall also demonstrate that in selecting locations for the other turbines, it considered how to reduce impacts on non-participating landowners; and

e) additional Project preconstruction information as Commission staff requests.

42. At least 30 days prior to commencement of construction, Applicant shall submit the identity and qualifications of a public liaison officer to the Commission for approval to facilitate the exchange of information between Applicant, including its contractors, landowners, local communities, and residents, and to facilitate prompt resolution of complaints and problems that may develop for landowners, local communities, and residents as a result of the Project. Applicant shall file with the Commission its proposed public liaison officer's credentials for approval by the Commission prior to the commencement of construction. After the public liaison officer has been approved by the Commission, the public liaison officer may not be removed by Applicant without the approval of the Commission. The public liaison officer shall be afforded immediate access to Applicant's on-site Project manager, its executive Project manager, and to the contractors' on-site managers and shall be available at all times to Commission staff via mobile phone to respond to complaints and concerns communicated to the Commission staff by concerned landowners and others. Within 10 working days of when Applicant's public liaison officer has been appointed and approved, Applicant shall provide contact information for him/her to all landowners in the Project Area and to law enforcement agencies and local governments in the vicinity of the Project. The public liaison officer's contact information shall be provided to landowners in each subsequent written communication with them. If the Commission determines that the public liaison officer has not been adequately performing the duties set forth for the position in this Order, the Commission may, upon notice to Applicant and the public liaison officer, take action to

remove the public liaison officer. The public liaison's services shall terminate 90 days after the Project commences commercial operations, unless the appointment is extended by order of the Commission.

43. Prior to the construction of the Project, Applicant will notify public safety agencies by providing a schedule and the location of work to be performed within their jurisdiction. The agencies contacted will include the South Dakota Department of Public Safety, the sheriffs of Codington County and Grant County, and the Codington County and Grant County Offices of Emergency Management.

44. Within 90 days after the Project's commercial operation date, Applicant shall submit a report to the Commission that provides the following information:

    a) as-built location of structures and facilities, including drawings clearly showing compliance with the setbacks required by state and local governments set forth in Table 13.1.2 of the Application;

    b) ArcGIS shapefiles of the final turbine and facility layout;

    c) the status of remedial activities for road damage, landowner property damage, crop damage, environmental damage, or any other damage resulting from Project construction activities; and,

    d) a summary of known landowner complaints and Applicant's plan for resolving those complaints.

45. Applicant will undertake a minimum of two years of independently-conducted post-construction grouse lek monitoring of known leks that are located less than 1 mile from a wind turbine. Known leks are SDGFP confirmed lek locations and leks documented during any wildlife surveys conducted by Applicant for Project development. Applicant shall file with the Commission its proposed independent third-party's credentials and survey methodology for approval by the Commission 60 days prior to the commencement of Project operation. The study shall be conducted on the ground. Applicant shall consult with SDGFP and USFWS on the proposed survey methodology for the post-construction lek monitoring. Results of the post-construction lek monitoring shall be reported to the SDGFP and USFWS after the first year of monitoring and a final report should be compiled and submitted to the SDGFP and USFWS at the end of the second year of monitoring. Within 90 days of the issuance of this Final Order, Applicant and Staff shall work together to develop a mitigation plan that will be incorporated into Applicant's Wildlife Conservation Strategy in case impacts to prairie grouse leks are found.

Crowned Ridge I and II Follow-up Conference Call

Date: July 16, 2019

Attendees: Kimberly Wells (KW), Michelle Phillips, and Tyler Wilhelm (NextEra)
Scott Larson (SL) and Natalie Gates (NG) (USFWS)
Hillary Meyers (HM) (SDGFP)
Sarah Sappington and Kely Mertz (KM) (SWCA)

Call began at approximately 11:00 am central.

All parties gave introductions, and KW provided intent of call which was to address questions USFWS raised in its July 2, 2019 letter.

Project Overview

KW: There are four separate SDPUC filings: CRI T-line, which has been approved; CRI Wind Farm, which has been approved; CRII T-line which has been approved; and CRII Wind Farm which was refiled with SDPUC last week. All applications, including most wildlife survey reports are located on the SDPUC website. The Dakota skipper (DASK) survey report also was submitted to USFWS as part of its annual permit reporting requirements.

Dakota Skipper

KM: Provided overview of the DASK survey effort. It was a phased approach beginning with desktop habitat assessment and resulting in targeted surveys in a subset of potentially suitable DASK habitat proposed to be impacted by the design at that time .

SL: Why was a subset of DASK habitat surveyed?

KM: CRW prioritized conducting surveys in areas their permitted biologists felt optimized their opportunity to observe the species if it were present and in an area proposed for impact. It was not feasible to survey the entire project area which includes 53,186 acres for the Crowned Ridge I Wind Farm and 60,996 acres for the Crowned Ridge II Wind Farm, of which only approximately 2,220 acres (4%) and 2,016 acres (3%), respectively, are expected to be temporarily or permanently impacted. The area within which impacts may occur is described in the applications as the "Project Construction Easement." If there are specific questions on methods we can go through those.

NG: Not clear exactly which areas of suitable habitat were not surveyed. Critical Habitat was not addressed.

KM: The project's proximity to DASK Critical Habitat is discussed in the applications, Section 11. CRW has put into place seasonal restrictions regarding activities in suitable DASK habitat. CRW will be avoiding the flight period.

SL: Can you generate a map of suitable habitat areas vs. areas of disturbance?

KW: Yes.

NG: USFWS understands many areas may be degraded, contain invasive species, and provide minimal habitat for DASK within the project boundary.

KW: CRW has avoided placing turbines in grasslands where feasible. CRW has attempted to minimize conflicts between grasslands, tribal, and other Endangered Species Act concerns. In several cases, landowners prefer turbines outside of the land they actively farm.

Topeka Shiner

KW: CRW is considering a number of avoidance measures to avoid impacts to streams potentially occupied by Topeka shiner. Measures include boring, overland collection, rerouting, and total avoidance.

NG: Acknowledged CRW would pursue total avoidance for the species. Noted that avoidance measures should be implemented in the streams where Topeka shiner may occur and their tributaries.

KW: agreed, CRW current plan is to bore under Willow and Stray Horse creeks identified in the USFWS letter or to completely avoid.

Effects to Habitats and Wildlife

NG: Interested in discussing grassland, wetland, and effects to birds such as displacement. Is CRW considering offsets?

KW: Yes, CRW will consider voluntary offsets to address potential direct and indirect effects. What is the funneling mechanism for conservation benefits?

SL: The agency is open to non-governmental organizations and others.

KW: NextEra has worked with several non-profit groups including Ducks Unlimited and Audubon in the past. Are there restrictions for the state? In North Dakota, there are restrictions on the state agency receiving and managing funds, but there do not appear to be the same restrictions for South Dakota.

HM: Is not aware of any restrictions but is following up with her supervisor.

NOTE: After the call and in a follow-up email to KW on 7/23/19, HM indicates there are no restrictions on the state having conservation easements and there may be a specific non-profit entity available to receive offset funds from wind energy projects in general for conservation delivery.

KW: Does GFP have funding opportunities like private match foundations or other stacking opportunities? CRW is summarizing acreage for wetlands and proximity to turbines. Noted that of 130 turbines, only 19 are in grassland areas due to other concerns including landowner preference and only 17 of those are in field-verified grasslands.

SL: How many turbines are in grasslands for CRII?

KW: Not sure but can get that information to USFWS. CRW will treat CRI and CRII separately for offsets. NextEra is the owner and operator for CRI, but CRII will be owned and operated by Xcel.

NOTE: Since the call, CRW verified that 11 of the CRII wind turbines are in mapped grasslands and only 2 of those are in field verified grasslands.

Grouse Leks

KW: The SDPUC conditioned the approval of the CRI Wind Farm with a requirement for CRW to conduct post-construction grouse lek monitoring to potentially gather information on effects of wind energy development on leks. The plan is not yet developed. CRW will work with SDGFP and SDPUC subject matter experts to develop the protocol for post-construction monitoring.

Line Marking

KW: CRW plans to mark the CRI transmission line following the general approach outlined in Upper Great Plains HCP that is a calculation based on proximity to wetland stopover habitat for whooping cranes.

NG: Migratory birds are an issue. She has seen birds hit powerlines this year due to water increases associated with flooding when surrounding sides of a road merge or abut power lines.

KW: CRW and SWCA will take a look at aquatic resources proximate to transmission lines and identify any potential areas to hold additional waters in substantial rainfall years.

Bats

NG: Northern long-eared bats (NLEB): CRW is aware of the 4D rule and under the rule, CRW would not be in violation of ESA for take of a NLEB as a result of operating the wind farm. However, survey methods didn't appear to follow Indiana Bat Survey Guidelines. CRW did not look specifically at forested habitats. How many sites did CRW survey? If the goal was to find the bats, then one has to look in the habitat. CRW did not.

KM: Our objective was not to survey for presence/probably absence of NLEB. CRW did a desktop habitat assessment for the entire project area. CRW conducted the desktop assessment to derive a likelihood of occurrence for the species. Potential summer habitat is less that 1% of the project area.

NG: Did CRW use 15 acres? Information out of Michigan suggests could be lower, approximately 10 acres, in South Dakota. NG will try to obtain those data to share with SWCA.

KM: Yes, CRW used 15 acres for the assessment. Given the paucity of forested area and potentially suitable habitat, and the known distribution for the species, CRW believes it is reasonable to assume low likelihood of NLEB occurrence in the project area. CRW recognizes NLEB may occasionally migrate through the project area. From there, the objective of the acoustic survey was to assess relative bat activity in areas similar to where turbines would be constructed. Therefore, CRW assessed relative bat activity in agricultural lands because that is where the majority of turbines will be placed. Had CRW found more suitable habitat, they may have had different objectives for the acoustic survey. The lack of suitable habitat, in other words, informed the objectives for the acoustic survey.

NG: Did you not identify species? Did you use Anabat?

KM: Yes, CRW used Anabat and analyzed by frequency groups. No calls observed were consistent with those made by *Myotis* species. No Myotis species were detected.

NG: Prevailing Winds detected NLEB in the Coulee area. Bats are less likely in the CRW project area. USFWS would like to learn more about species in state. There are some NLEB in the Black Hills and in northwestern South Dakota with proximity to hibernacula.

KM: Did Prevailing Winds survey summer habitat?

NG: Yes.

Eagles

NG: CRW should adhere to the ECPG, and run the risk model to determine appropriate risk category and whether or not an incidental take permit is appropriate. Has CRW run the model? Will CRW pursue a permit?

KW: Based on data collected at the site, CRW does not see that this area is a high risk area, and CRW does not believe a permit is warranted based on the existing data.

Other

KW: Ensured USFWS and SDGFP was aware that CRW's team coordinates regularly with USFWS to map USFWS easements, and to avoid USFWS interests.

NG: Reiterated concern about indirect impacts to birds on easement lands. CRW did make effort to avoid grassland areas. Agency's recommendation is to not site turbines on grassland.

KW: summarized action items:

- CRW will model for offsets and indirect effects.
- CRW will provide map of suitable DASK habitat and areas of disturbance.
- CRW will compile further information regarding vegetation and quality of potentially suitable DASK habitat to share with agencies.
- CRW will look at aquatic resources proximate to transmission lines and identify any potential areas to hold additional waters in substantial rainfall years.
- HM will look at available options for offsets and conservation through the state (since completed on 7/23).
- NG will share 10-acre information re: NLEBs if she is able to obtain.

Call concluded at approximately 11:52 am central time.

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From:	Wells, Kimberly
To:	Gates, Natalie; hilary.meyer (hilary.meyer@state.sd.us)
Cc:	Larson, Scott; Kely Mertz; Sarah Sappington; Wilhelm, Tyler; HART, DARYL
Subject:	RE: Crowned Ridge Follow up
Date:	Thursday, August 15, 2019 5:51:31 PM
Attachments:	CRI DASK survey map 08152019.pdf

Hi Natalie/Hilary,

Were there any comments on the draft minutes I circulated on 8/6 for our Crowned Ridge I Project (see below)? We haven't received any so are assuming these are accurate unless we hear otherwise.

I am also attached a revised map showing how our DASK survey areas and areas of proposed impact overlap.

Please let us know when you have reviewed.

Thanks!

Kim

Kimberly Wells, Ph.D.
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832.538.7935 (mobile)
Kimberly.Wells@NEE.com

From: Wells, Kimberly
Sent: Tuesday, August 6, 2019 3:05 PM
To: Gates, Natalie <natalie_gates@fws.gov>; hilary.meyer (hilary.meyer@state.sd.us)

<hilary.meyer@state.sd.us>
Cc: Larson, Scott <scott_larson@fws.gov>; Kely Mertz <KMertz@swca.com>; Sarah Baer <SBaer@swca.com>; Wilhelm, Tyler <Tyler.Wilhelm@nexteraenergy.com>; HART, DARYL <DARYL.HART@nexteraenergy.com>; Wells, Kimberly <Kimberly.Wells@nexteraenergy.com>
Subject: Crowned Ridge Follow up

Natalie/Hilary,

Please review the draft minutes we recorded from our conference call on Crowned Ridge earlier this month and let us know if any comments or corrections. We file these in our PUC docket.

I am also attaching the Final Order for the wind farm and have highlighted the grouse condition below that we discussed briefly.

45. Applicant will undertake a minimum of two years of independently-conducted postconstruction
grouse lek monitoring of known leks that are located less than 1 mile from a wind turbine. Known leks are SDGFP confirmed lek locations and leks documented during any wildlife surveys conducted by Applicant for Project development. Applicant shall file with the Commission its proposed independent third-party's credentials and survey methodology for approval by the Commission 60 days prior to the commencement of Project operation. The study shall be conducted on the ground. Applicant shall consult with SDGFP and USFWS on the proposed survey methodology for the post-construction lek monitoring. Results of the post-construction lek monitoring shall be reported to the SDGFP and USFWS after the first year of monitoring and a final report should be compiled and submitted to the SDGFP and USFWS at the end of the second year of monitoring. Within 90 days of the issuance of this Final Order, Applicant and Staff shall work together to develop a mitigation plan that will be incorporated into Applicant's Wildlife Conservation Strategy in case impacts to prairie grouse leks are found.

Lastly, is there a particular seed mix recommended for restoration of native prairie for pollinators/DASK you all like or have had success with?

Thanks!

Kim

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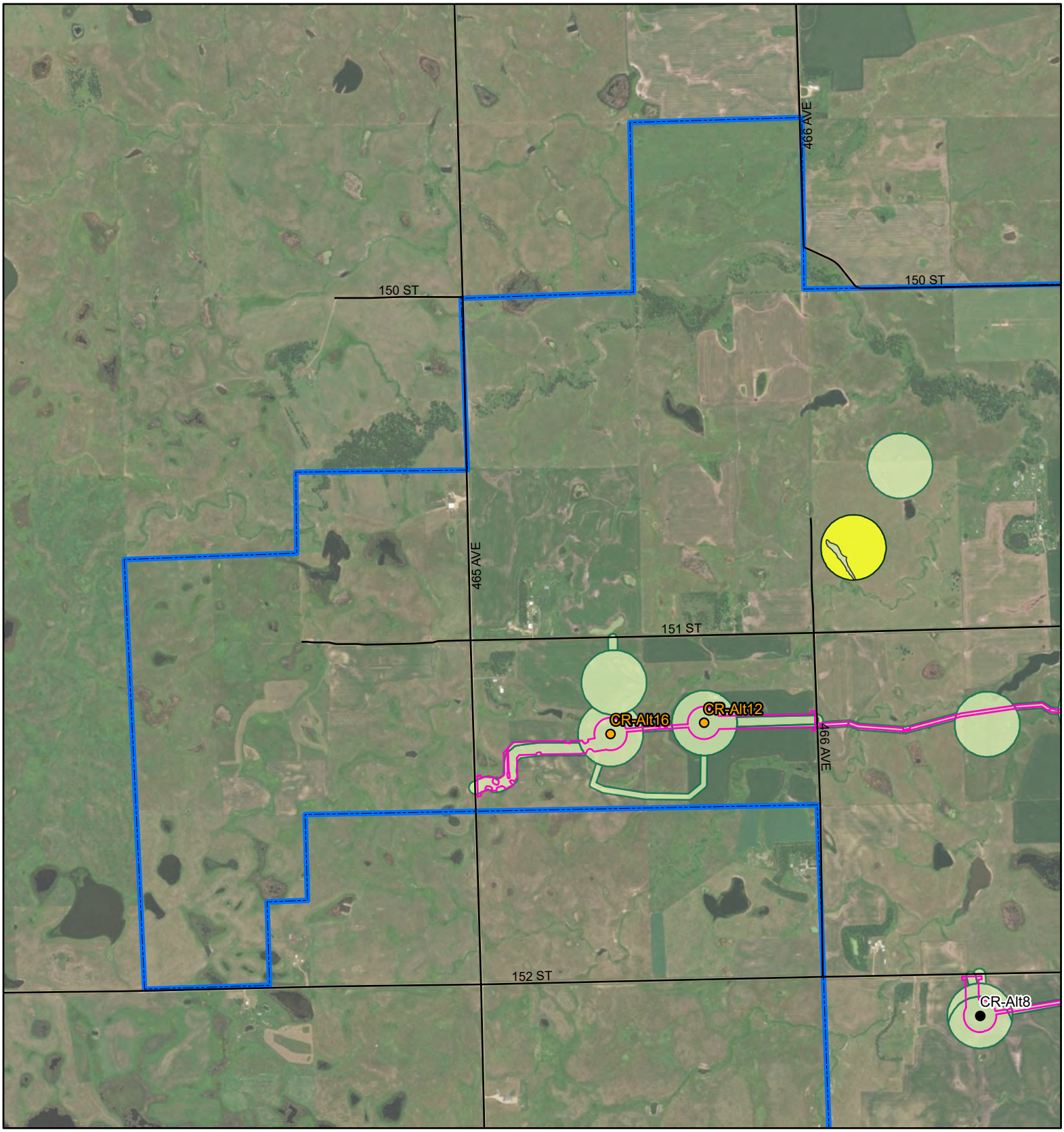
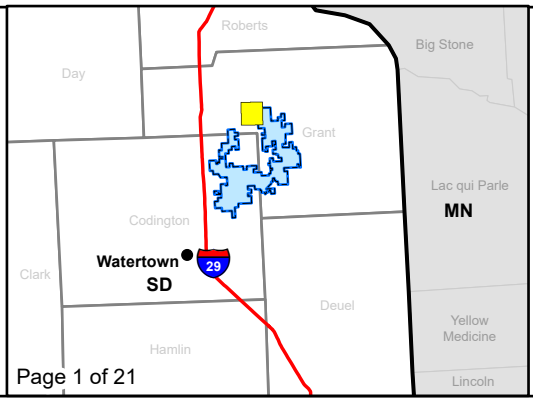


Dakota Skipper

Crowned Ridge Wind Farm

- Primary Turbine
- Alternate Turbine
- City
- Construction Easement
- Existing Road
- Field-Assessed Dakota Skipper Habitat
- Field-Assessed Dakota Skipper Habitat and Presence/Absence Survey Location 2018
- O&M Facility/ Substation
- Batch Plant
- Laydown Yard
- Survey Area
- Project Boundary
- County Boundary



Kilometers

0 0.5 1

Miles

0 0.25 0.5

N W E S

Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community

Quadrangle: Antelope Valley (1973), Twin Brooks (1973)

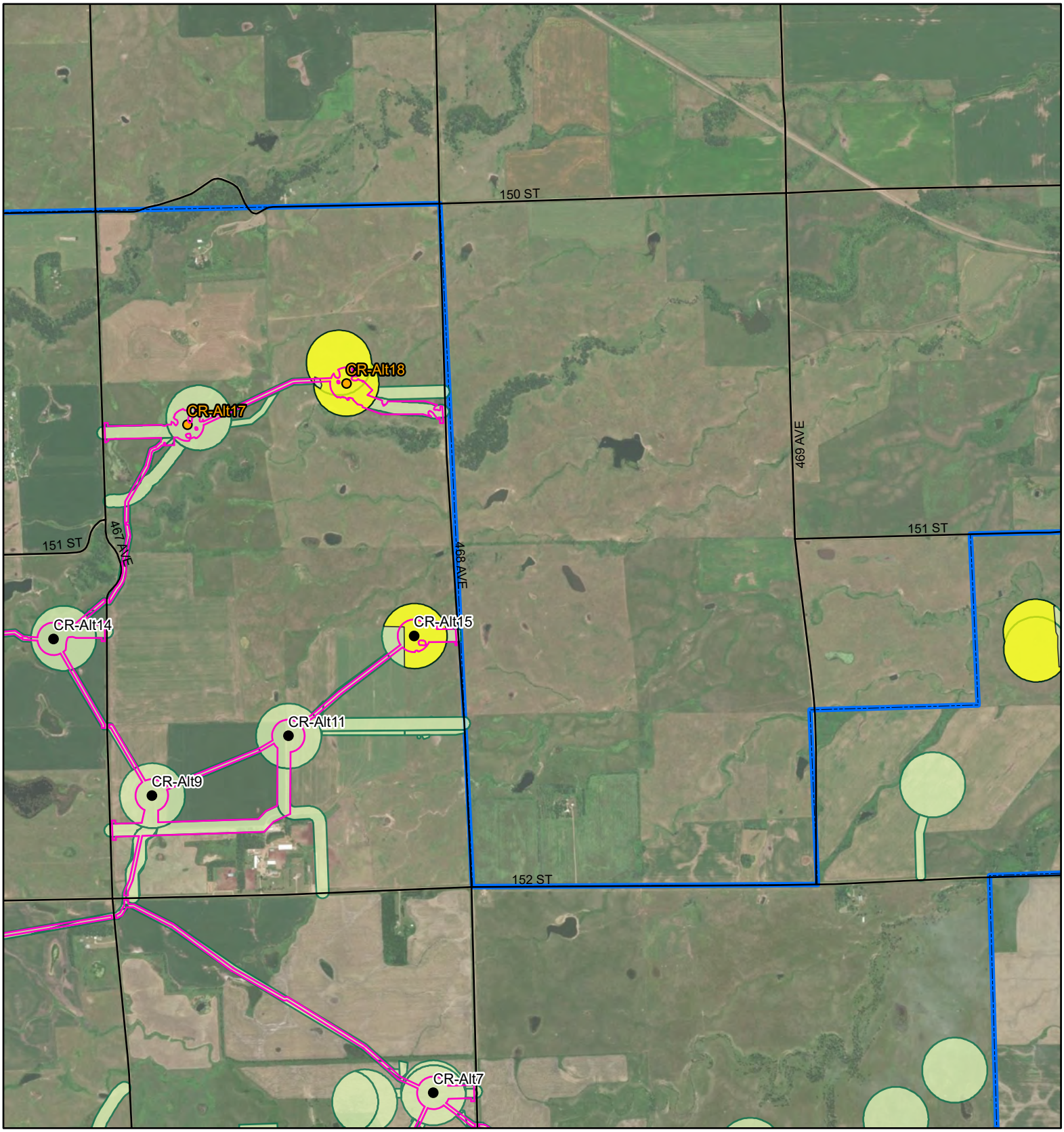
Township/Range: T120N, R51W, T120N, R50W

Grant County, South Dakota

021316

SWCA ENVIRONMENTAL CONSULTANTS

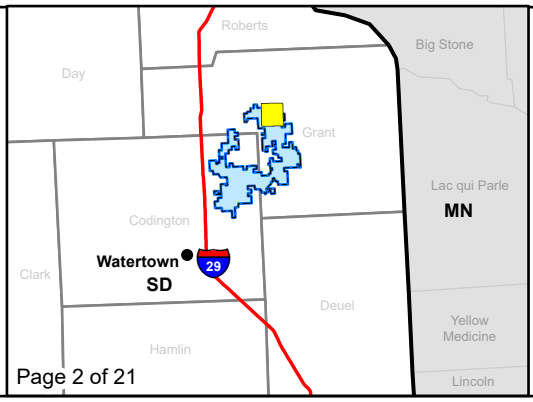
Projection:



Dakota Skipper

Crowned Ridge Wind Farm

- Primary Turbine
- Alternate Turbine
- City
- Construction Easement
- Existing Road
- Field-Assessed Dakota Skipper Habitat
- Field-Assessed Dakota Skipper Habitat and Presence/Absence Survey Location 2018
- O&M Facility/ Substation
- Batch Plant
- Laydown Yard
- Survey Area
- Project Boundary
- County Boundary



Kilometers

0 0.5 1

Miles

0 0.25 0.5

N W E S

Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community

Quadrangle: Twin Brooks (1973)

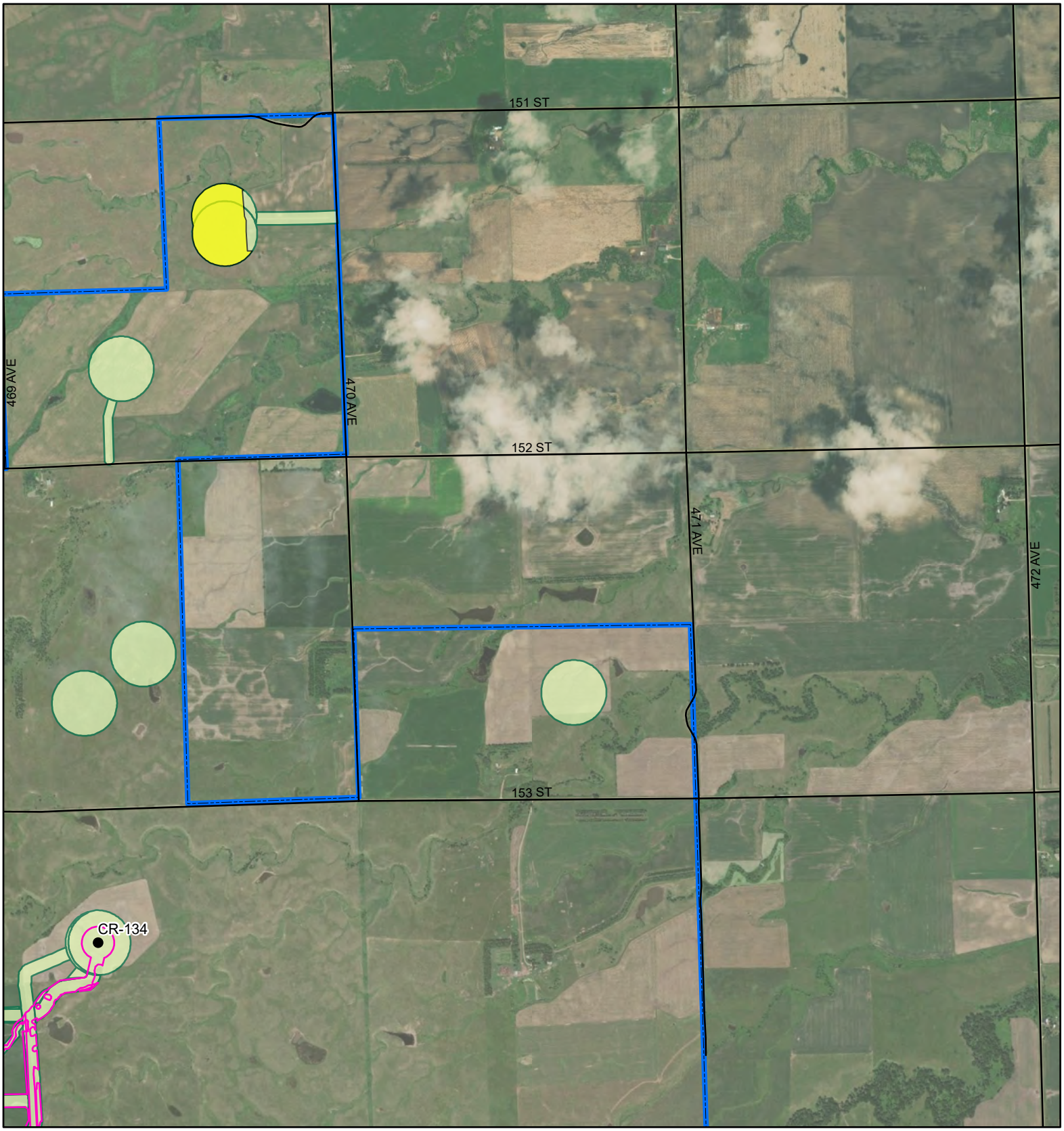
Township/Range: T120N, R50W

Grant County, South Dakota

Projection:

021317

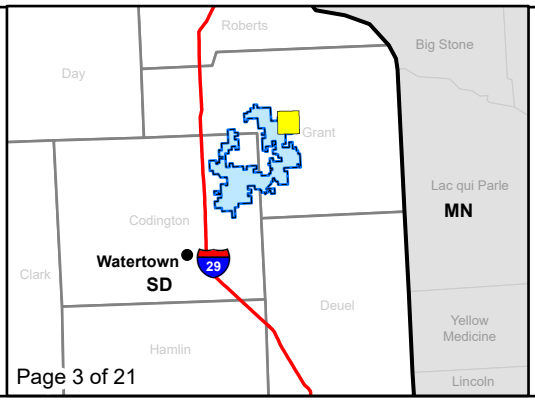
SWCA ENVIRONMENTAL CONSULTANTS



Dakota Skipper

Crowned Ridge Wind Farm

- Primary Turbine
- Alternate Turbine
- City
- Construction Easement
- Existing Road
- Field-Assessed Dakota Skipper Habitat
- Field-Assessed Dakota Skipper Habitat and Presence/Absence Survey Location 2018
- O&M Facility/ Substation
- Batch Plant
- Laydown Yard
- Survey Area
- Project Boundary
- County Boundary



Kilometers

0 0.5 1

Miles

0 0.25 0.5

Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community

Quadrangle: Twin Brooks (1973)

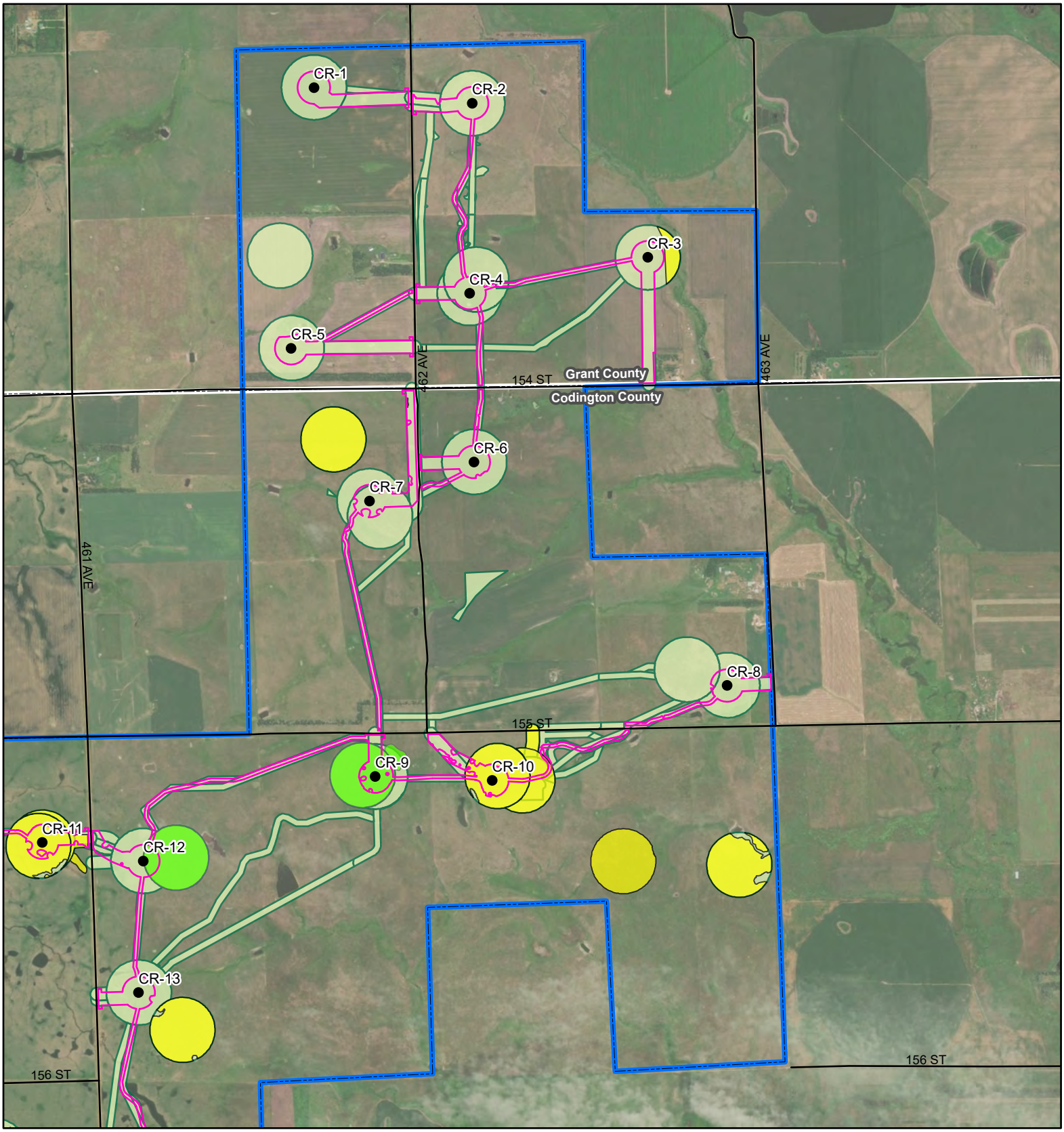
Township/Range: T120N, R50W

Grant County, South Dakota

021318

Projection:

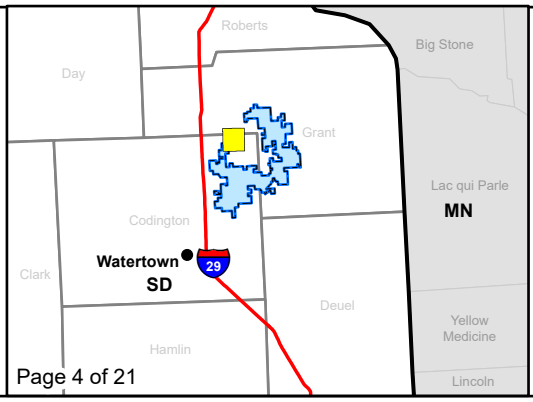
SWCA ENVIRONMENTAL CONSULTANTS



Dakota Skipper

Crowned Ridge Wind Farm

- Primary Turbine
- Alternate Turbine
- City
- Construction Easement
- Existing Road
- Field-Assessed Dakota Skipper Habitat
- Field-Assessed Dakota Skipper Habitat and Presence/Absence Survey Location 2018
- O&M Facility/ Substation
- Batch Plant
- Laydown Yard
- Survey Area
- Project Boundary
- County Boundary



Kilometers
0 0.5 1

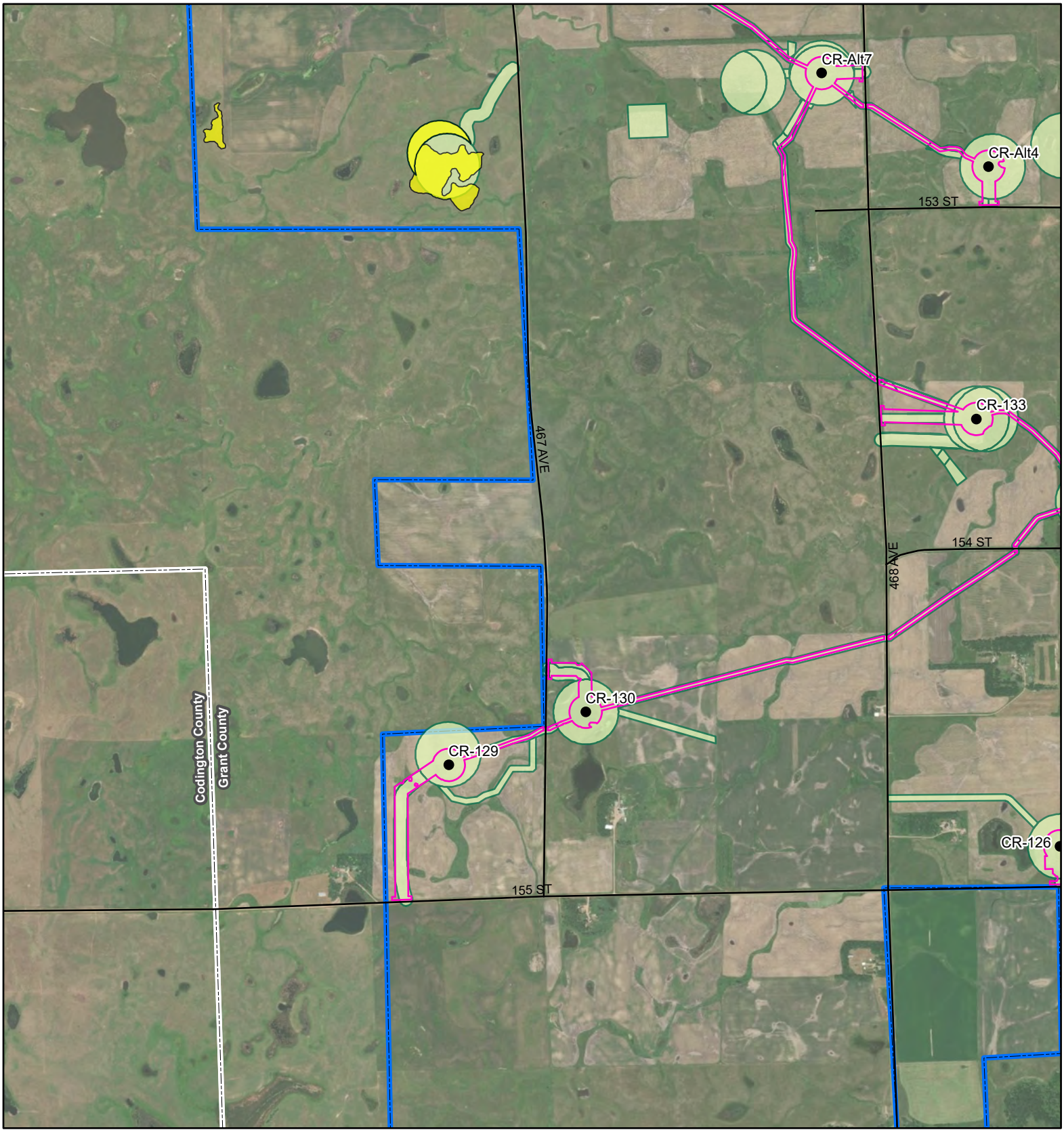
Miles
0 0.25 0.5

Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Quadrangle: Antelope Valley (1973), South Shore (1973)
Township/Range: T120N, R51W, T119N, R51W,
Codington and Grant Counties, South Dakota

021319

Projection:

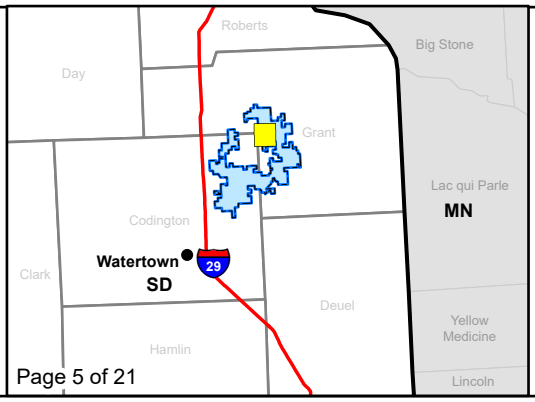
SWCA ENVIRONMENTAL CONSULTANTS



Dakota Skipper

Crowned Ridge Wind Farm

- Primary Turbine
- Alternate Turbine
- City
- Construction Easement
- Existing Road
- Field-Assessed Dakota Skipper Habitat
- Field-Assessed Dakota Skipper Habitat and Presence/Absence Survey Location 2018
- O&M Facility/ Substation
- Batch Plant
- Laydown Yard
- Survey Area
- Project Boundary
- County Boundary



Kilometers
0 0.5 1

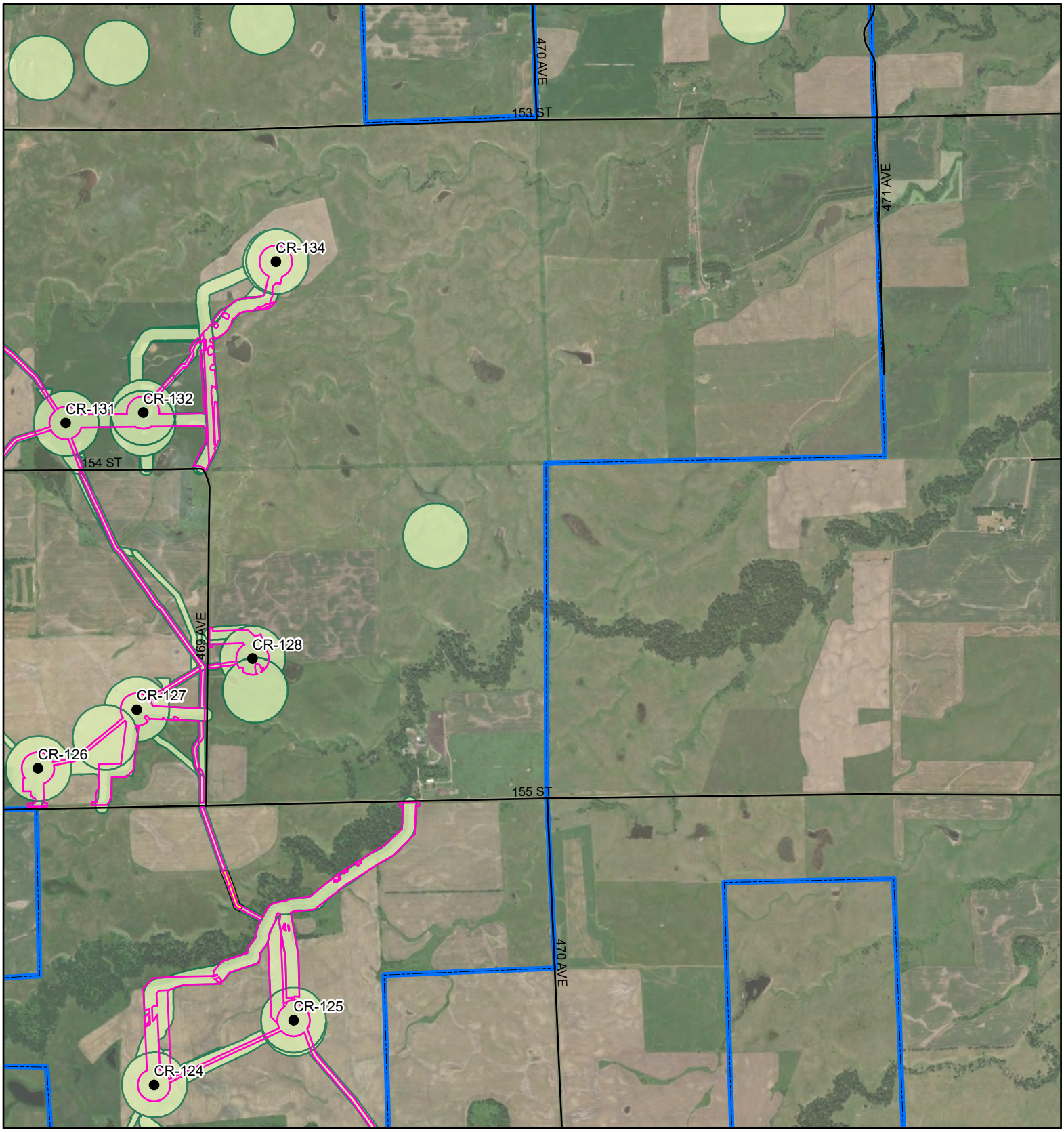
Miles
0 0.25 0.5

N W E S

Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Quadrangle: Antelope Valley (1973), Twin Brooks (1973)
Township/Range: T120N, R51W, T120N, R50W, T119N, R51W, T119N, R50W
Codington and Grant Counties, South Dakota

Projection:

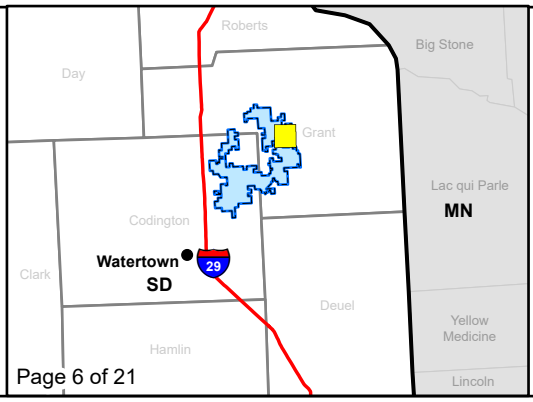
021320 SWCA ENVIRONMENTAL CONSULTANTS



Dakota Skipper

Crowned Ridge Wind Farm

- Primary Turbine
- Alternate Turbine
- City
- Construction Easement
- Existing Road
- Field-Assessed Dakota Skipper Habitat
- Field-Assessed Dakota Skipper Habitat and Presence/Absence Survey Location 2018
- O&M Facility/ Substation
- Batch Plant
- Laydown Yard
- Survey Area
- Project Boundary
- County Boundary



Kilometers
0 0.5 1

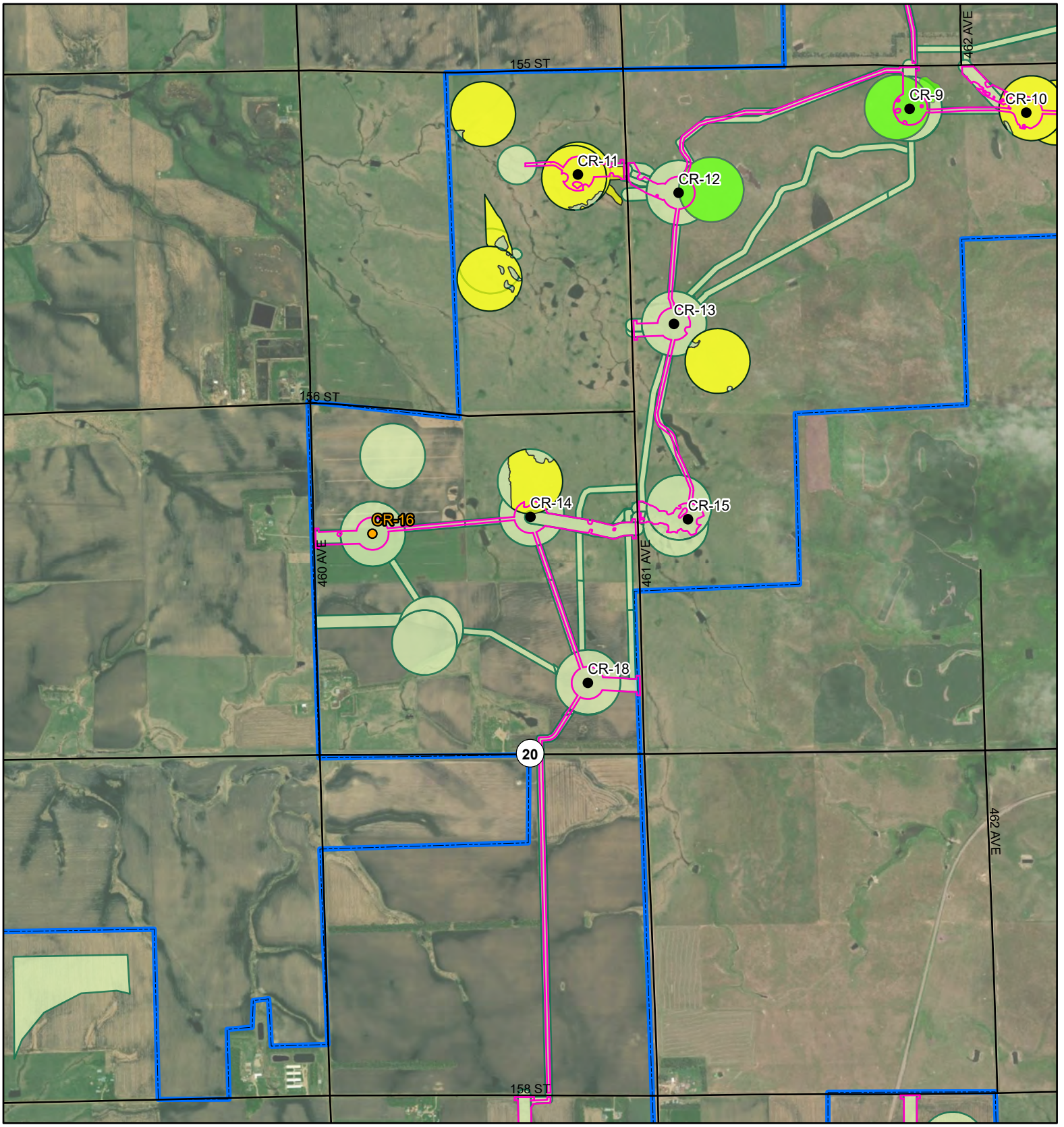
Miles
0 0.25 0.5

N W E S

Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Quadrangle: Twin Brooks (1973), Stockholm (1973)
Township/Range: T120N, R50W, T119N, R50W
Grant County, South Dakota

Projection:

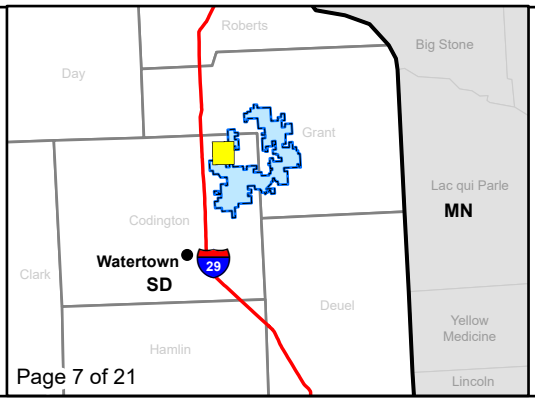
021321 SWCA ENVIRONMENTAL CONSULTANTS



Dakota Skipper

Crowned Ridge Wind Farm

- Primary Turbine
- Alternate Turbine
- City
- Construction Easement
- Existing Road
- Field-Assessed Dakota Skipper Habitat
- Field-Assessed Dakota Skipper Habitat and Presence/Absence Survey Location 2018
- O&M Facility/ Substation
- Batch Plant
- Laydown Yard
- Survey Area
- Project Boundary
- County Boundary



Kilometers

0 0.5 1

Miles

0 0.25 0.5

Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community

Quadrangle: Still Lake NE (1970), Antelope Valley (1973), Still Lake SE (1970), South Shore (1973)

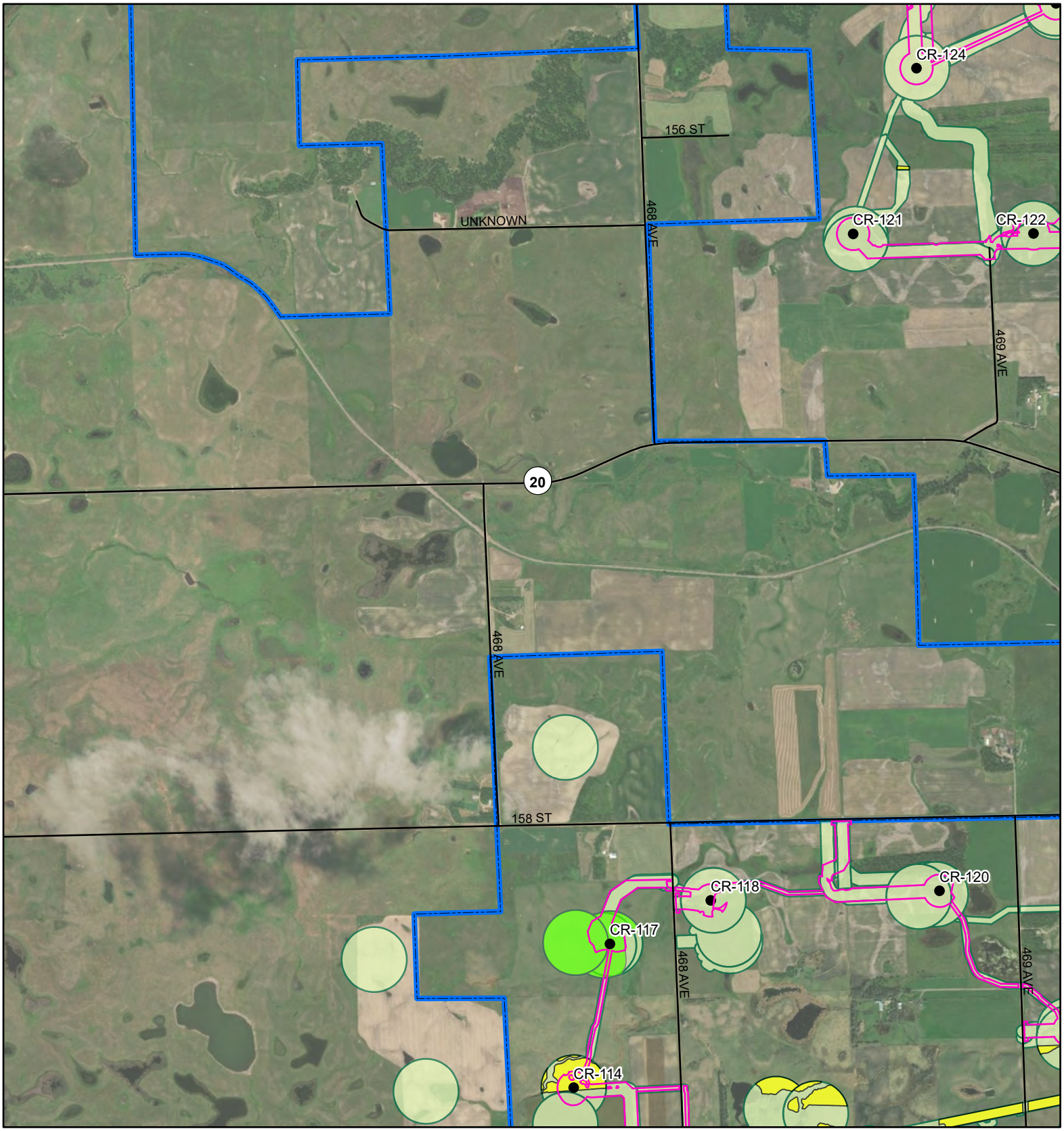
Township/Range: T119N, R52W, T119N, R51W

Codington County, South Dakota

021322

SWCA ENVIRONMENTAL CONSULTANTS

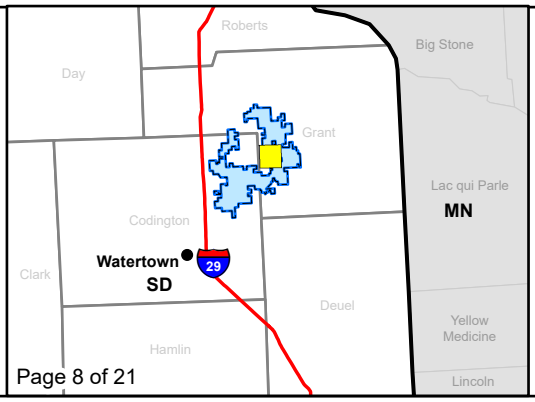
Projection:



Dakota Skipper

Crowned Ridge Wind Farm

- Primary Turbine
- Alternate Turbine
- City
- Construction Easement
- Existing Road
- Field-Assessed Dakota Skipper Habitat
- Field-Assessed Dakota Skipper Habitat and Presence/Absence Survey Location 2018
- O&M Facility/ Substation
- Batch Plant
- Laydown Yard
- Survey Area
- Project Boundary
- County Boundary



Kilometers

0 0.5 1

Miles

0 0.25 0.5

N W E S

Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community

Quadrangle: Stockholm (1973), Antelope Valley (1973), Twin Brooks (1973), South Shore (1973)

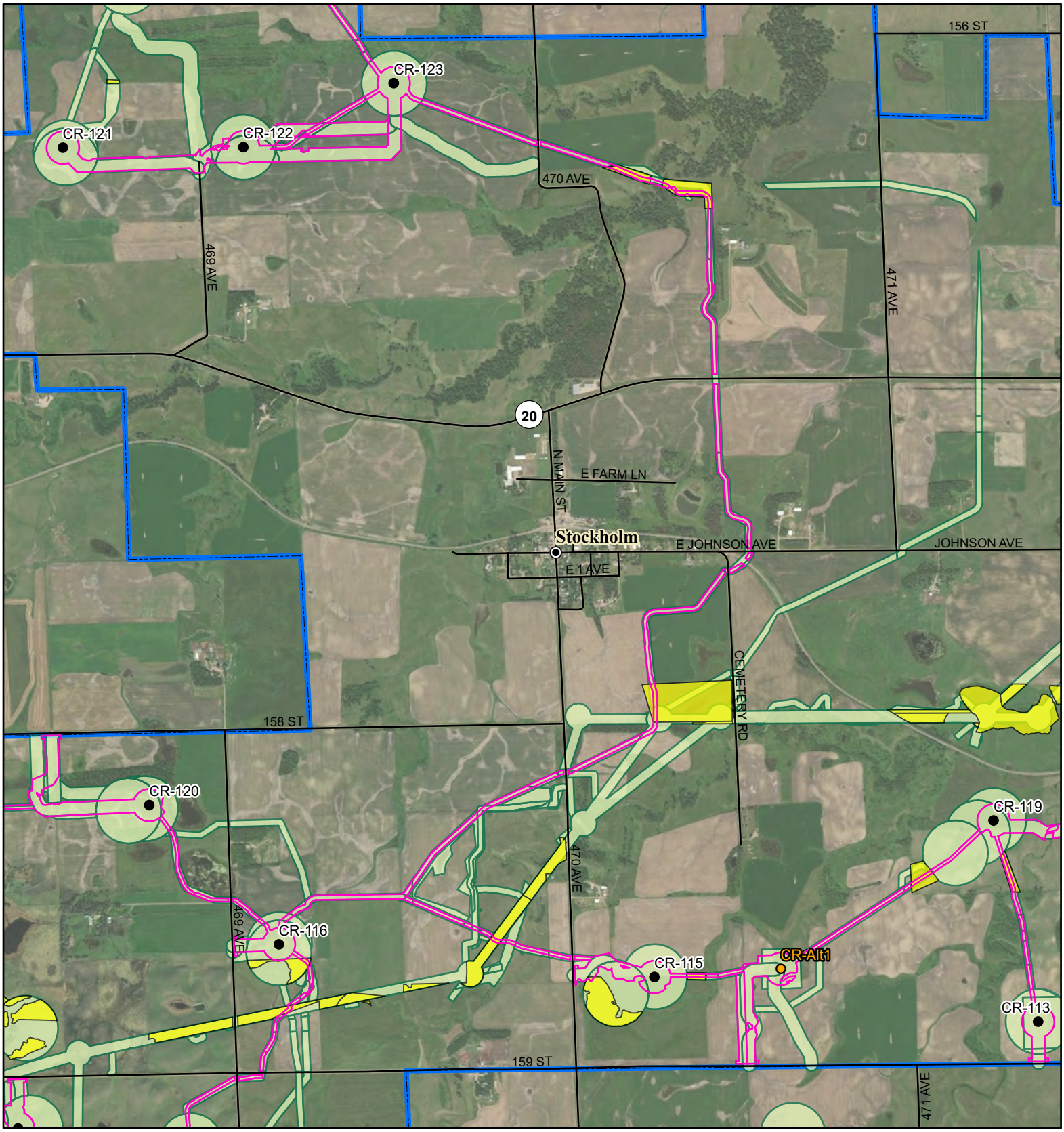
Township/Range: T119N, R50W

Grant County, South Dakota

Projection:

021323

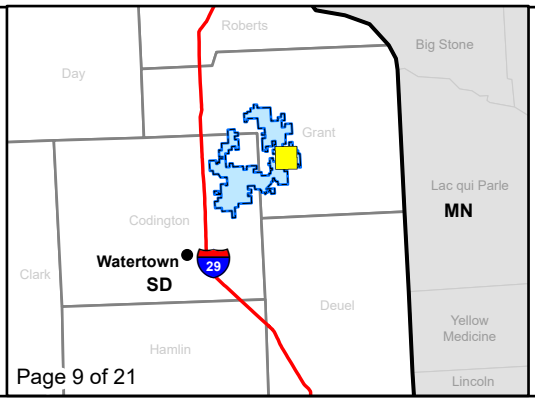
SWCA ENVIRONMENTAL CONSULTANTS



Dakota Skipper

Crowned Ridge Wind Farm

- Primary Turbine
- Alternate Turbine
- City
- Construction Easement
- Existing Road
- Field-Assessed Dakota Skipper Habitat
- Field-Assessed Dakota Skipper Habitat and Presence/Absence Survey Location 2018
- O&M Facility/ Substation
- Batch Plant
- Laydown Yard
- Survey Area
- Project Boundary
- County Boundary



Kilometers

0 0.5 1

Miles

0 0.25 0.5

Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community

Quadrangle: Stockholm (1973)

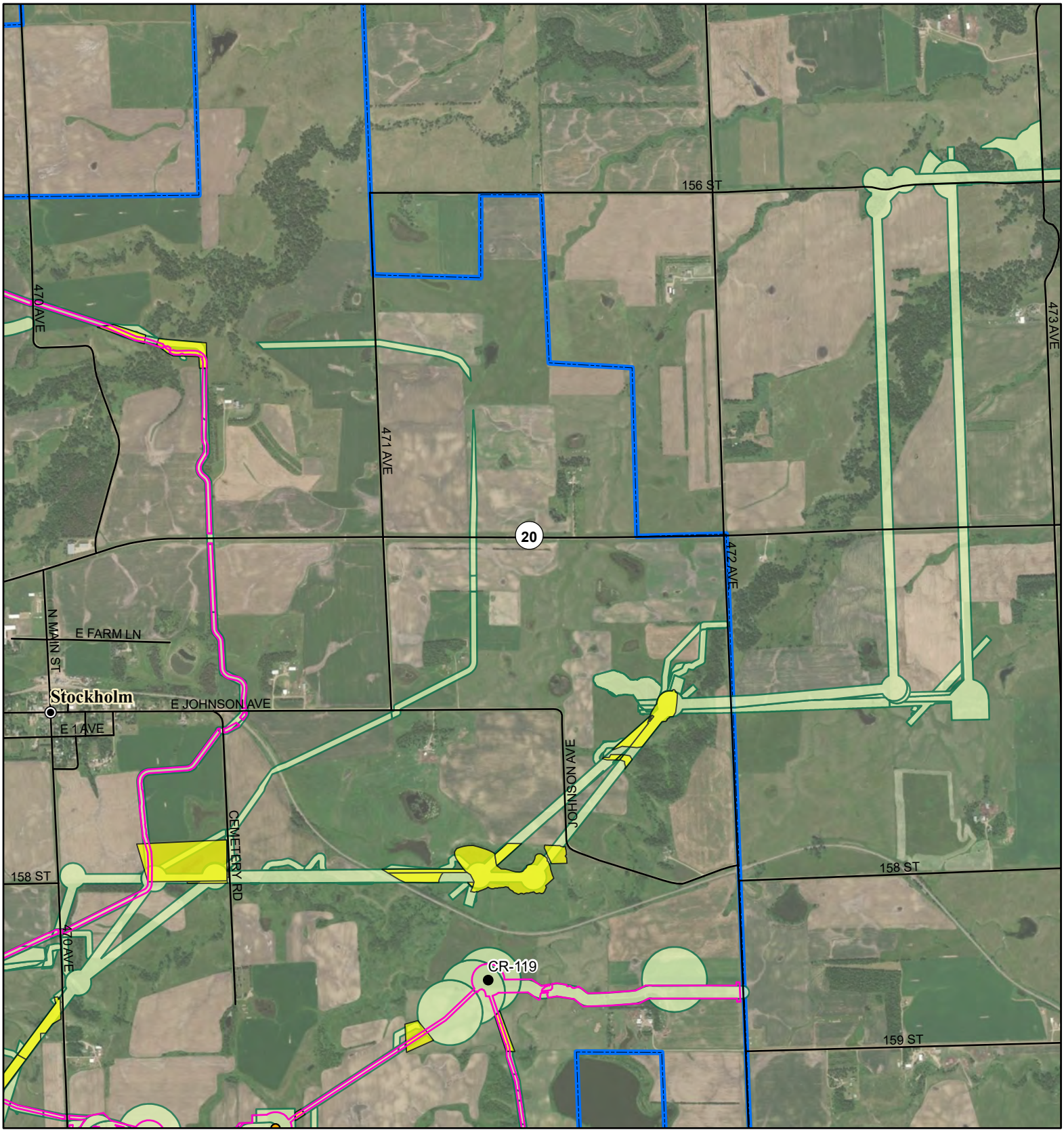
Township/Range: T119N, R50W

Grant County, South Dakota

Projection:

021324

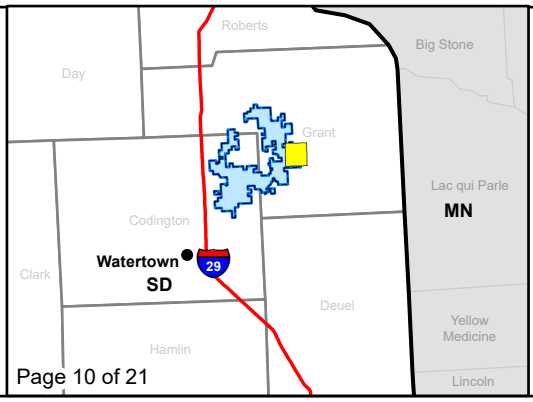
SWCA ENVIRONMENTAL CONSULTANTS



Dakota Skipper

Crowned Ridge Wind Farm

- Primary Turbine
- Alternate Turbine
- City
- Construction Easement
- Existing Road
- Field-Assessed Dakota Skipper Habitat
- Field-Assessed Dakota Skipper Habitat and Presence/Absence Survey Location 2018
- O&M Facility/ Substation
- Batch Plant
- Laydown Yard
- Survey Area
- Project Boundary
- County Boundary



Kilometers
0 0.5 1

Miles
0 0.25 0.5

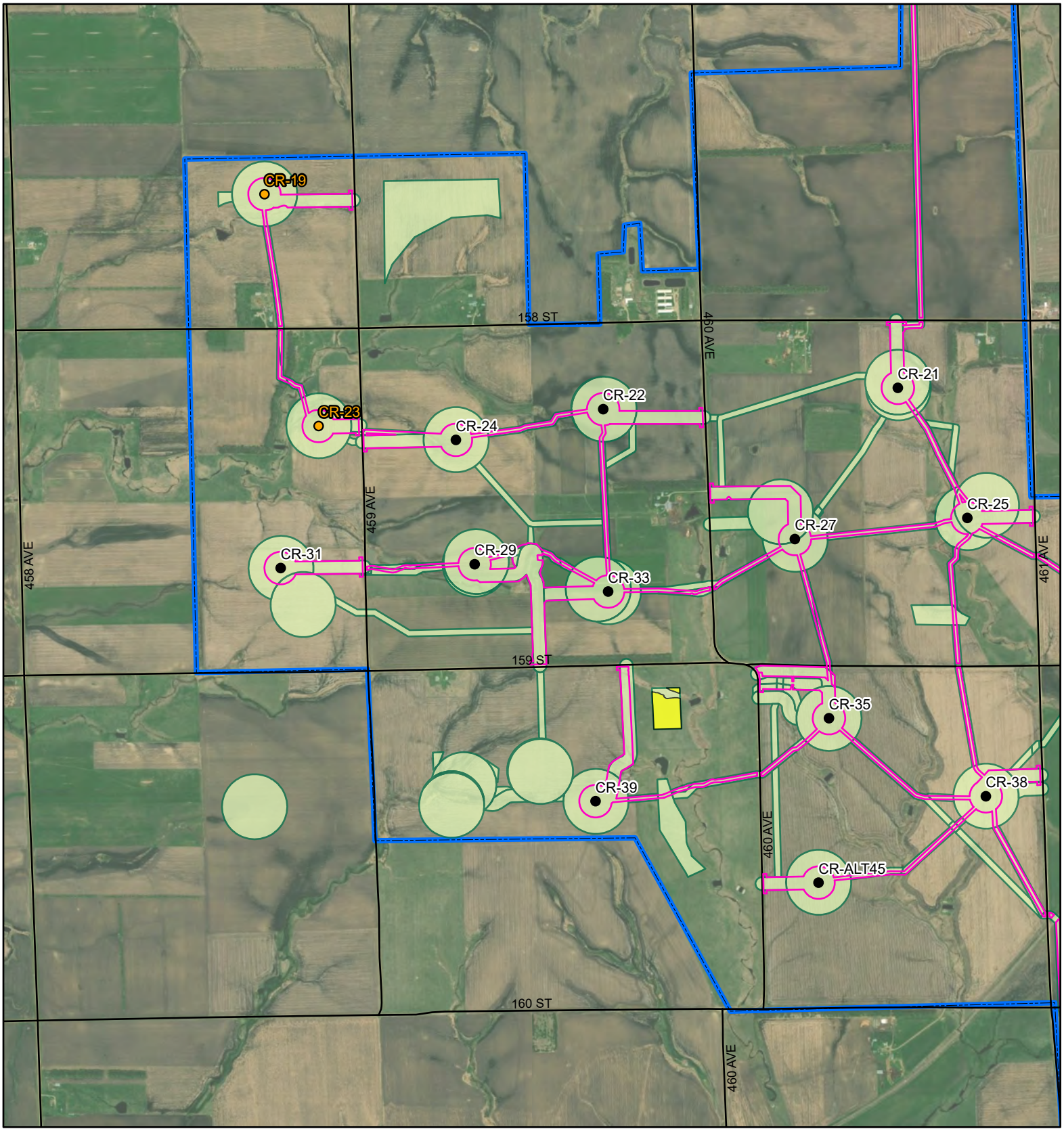
N W E S

Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Quadrangle: Twin Brooks (1973), Stockholm (1973)
Township/Range: T119N, R50W, T119N, R49W
Grant County, South Dakota

Projection:

021325

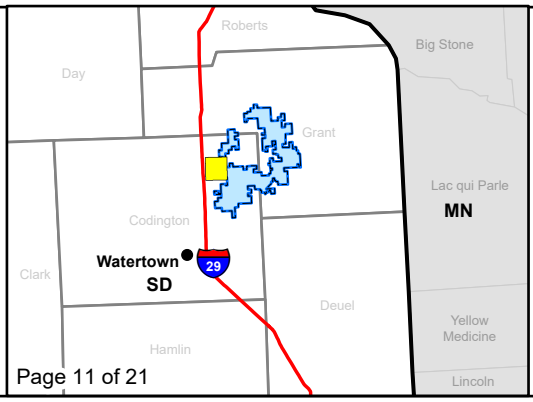
SWCA ENVIRONMENTAL CONSULTANTS



Dakota Skipper

Crowned Ridge Wind Farm

- Primary Turbine
- Alternate Turbine
- City
- Construction Easement
- Existing Road
- Field-Assessed Dakota Skipper Habitat
- Field-Assessed Dakota Skipper Habitat and Presence/Absence Survey Location 2018
- O&M Facility/ Substation
- Batch Plant
- Laydown Yard
- Survey Area
- Project Boundary
- County Boundary



Kilometers
0 0.5 1

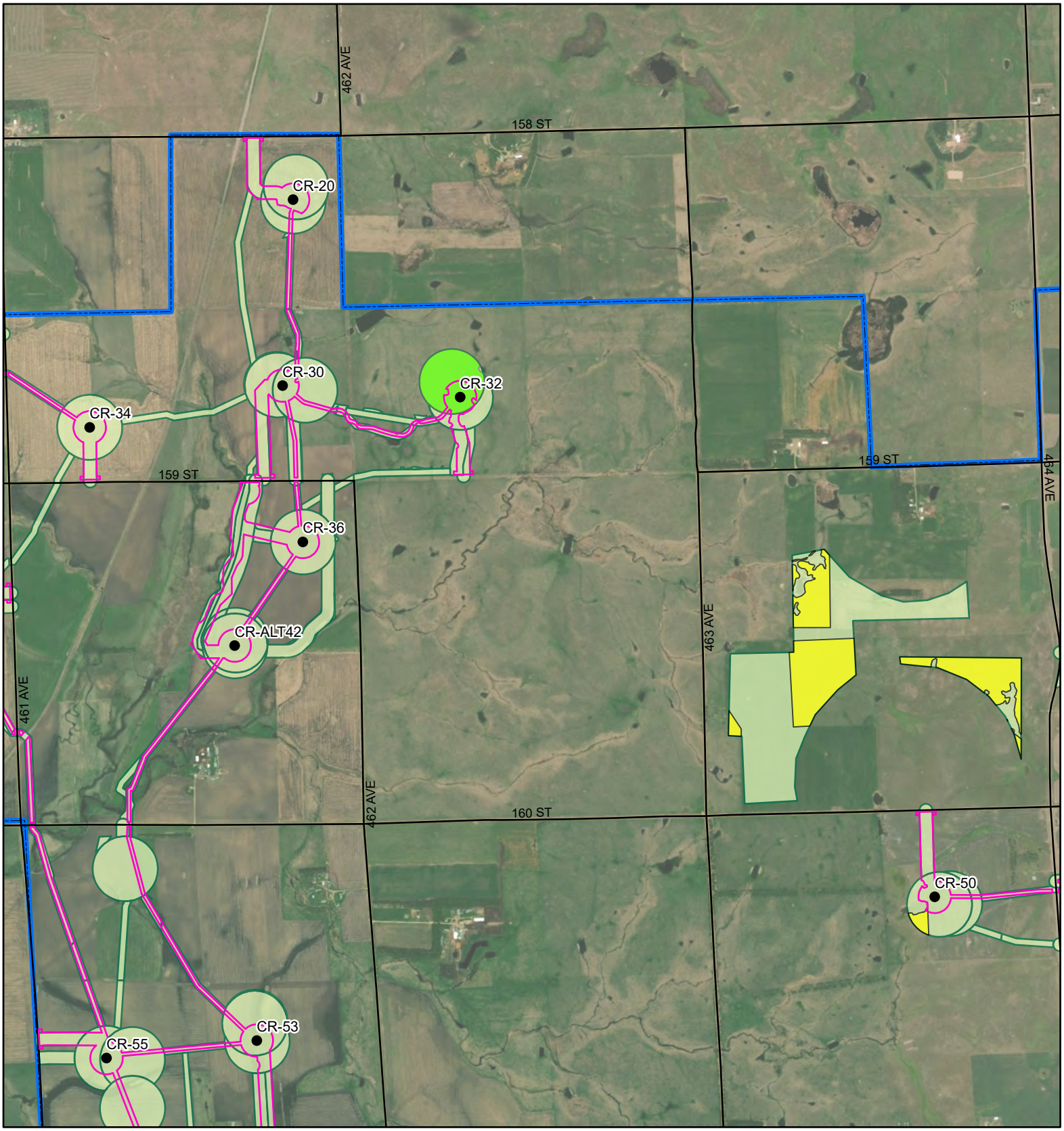
Miles
0 0.25 0.5

N W E S

Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Quadrangle: Still Lake SE (1970), South Shore (1973)
Township/Range: T119N, R52W, T119N, R51W, T118N, R52W, T118N, R51W
Codington County, South Dakota

Projection:

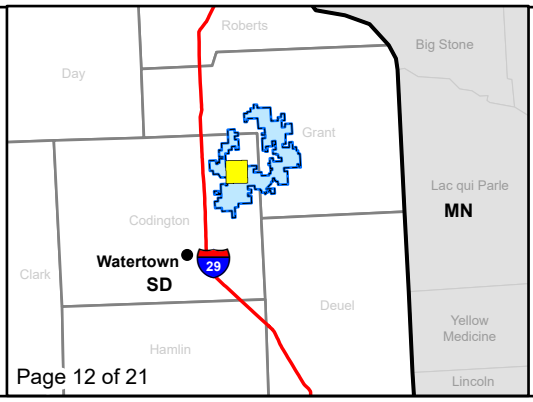
021326 SWCA ENVIRONMENTAL CONSULTANTS



Dakota Skipper

Crowned Ridge Wind Farm

- Primary Turbine
- Alternate Turbine
- City
- Construction Easement
- Existing Road
- Field-Assessed Dakota Skipper Habitat
- Field-Assessed Dakota Skipper Habitat and Presence/Absence Survey Location 2018
- O&M Facility/ Substation
- Batch Plant
- Laydown Yard
- Survey Area
- Project Boundary
- County Boundary



Kilometers
0 0.5 1

Miles
0 0.25 0.5

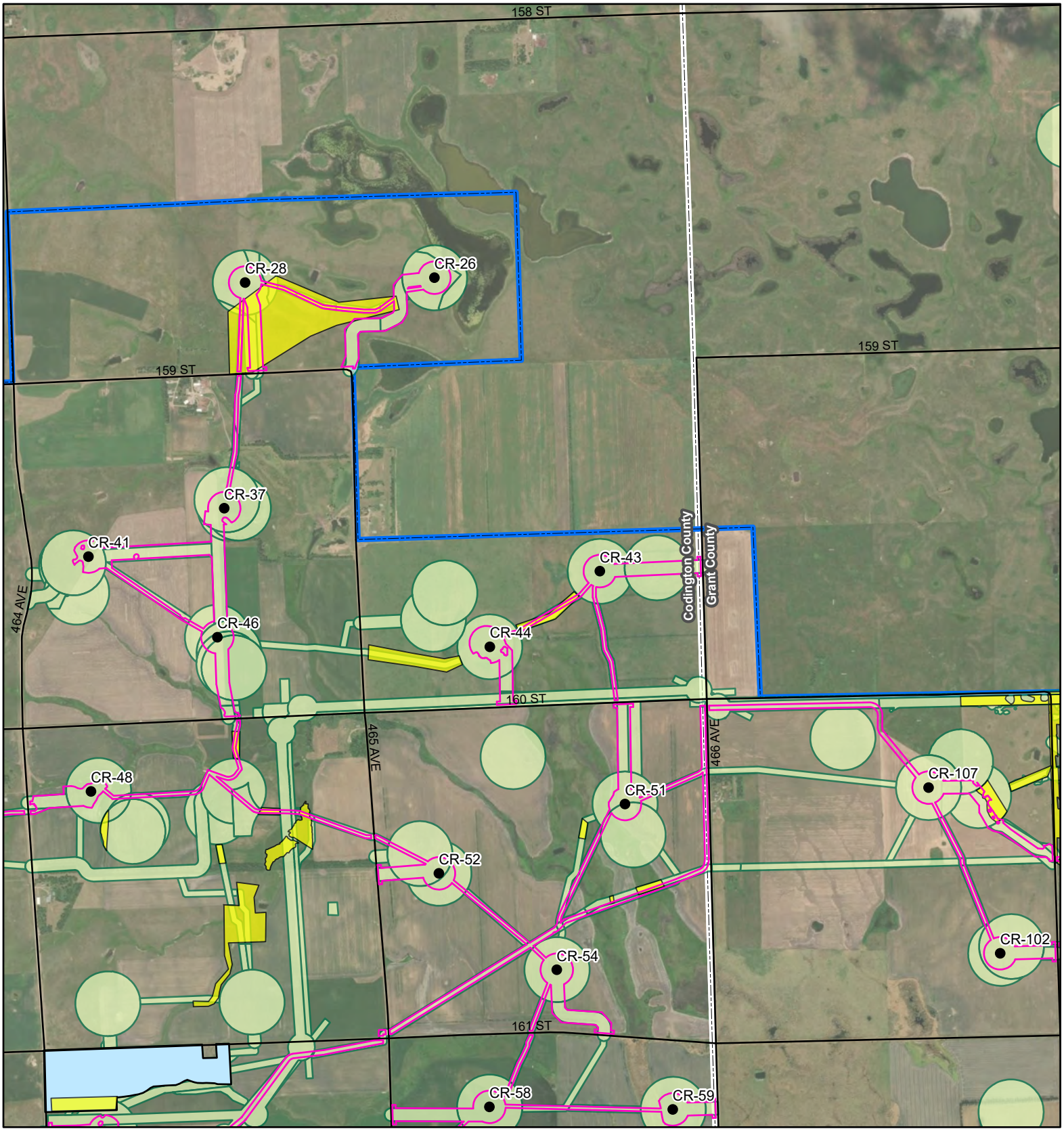
Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Quadrangle: South Shore (1973)

Township/Range: T119N, R51W, T118N, R51W
Codington County, South Dakota

Projection:

021327

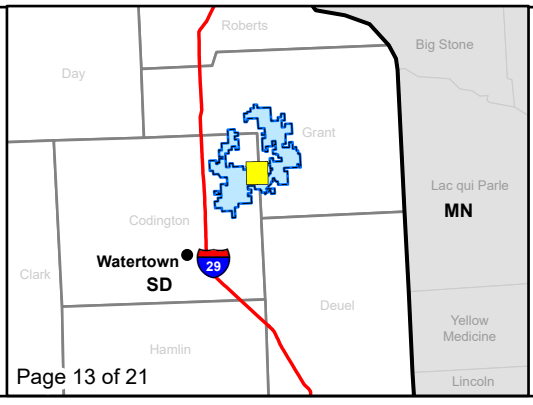
SWCA ENVIRONMENTAL CONSULTANTS



Dakota Skipper

Crowned Ridge Wind Farm

- Primary Turbine
- Alternate Turbine
- City
- Construction Easement
- Existing Road
- Field-Assessed Dakota Skipper Habitat
- Field-Assessed Dakota Skipper Habitat and Presence/Absence Survey Location 2018
- O&M Facility/ Substation
- Batch Plant
- Laydown Yard
- Survey Area
- Project Boundary
- County Boundary



Kilometers

0 0.5 1

Miles

0 0.25 0.5

Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community

Quadrangle: South Shore (1973), Stockholm (1973)

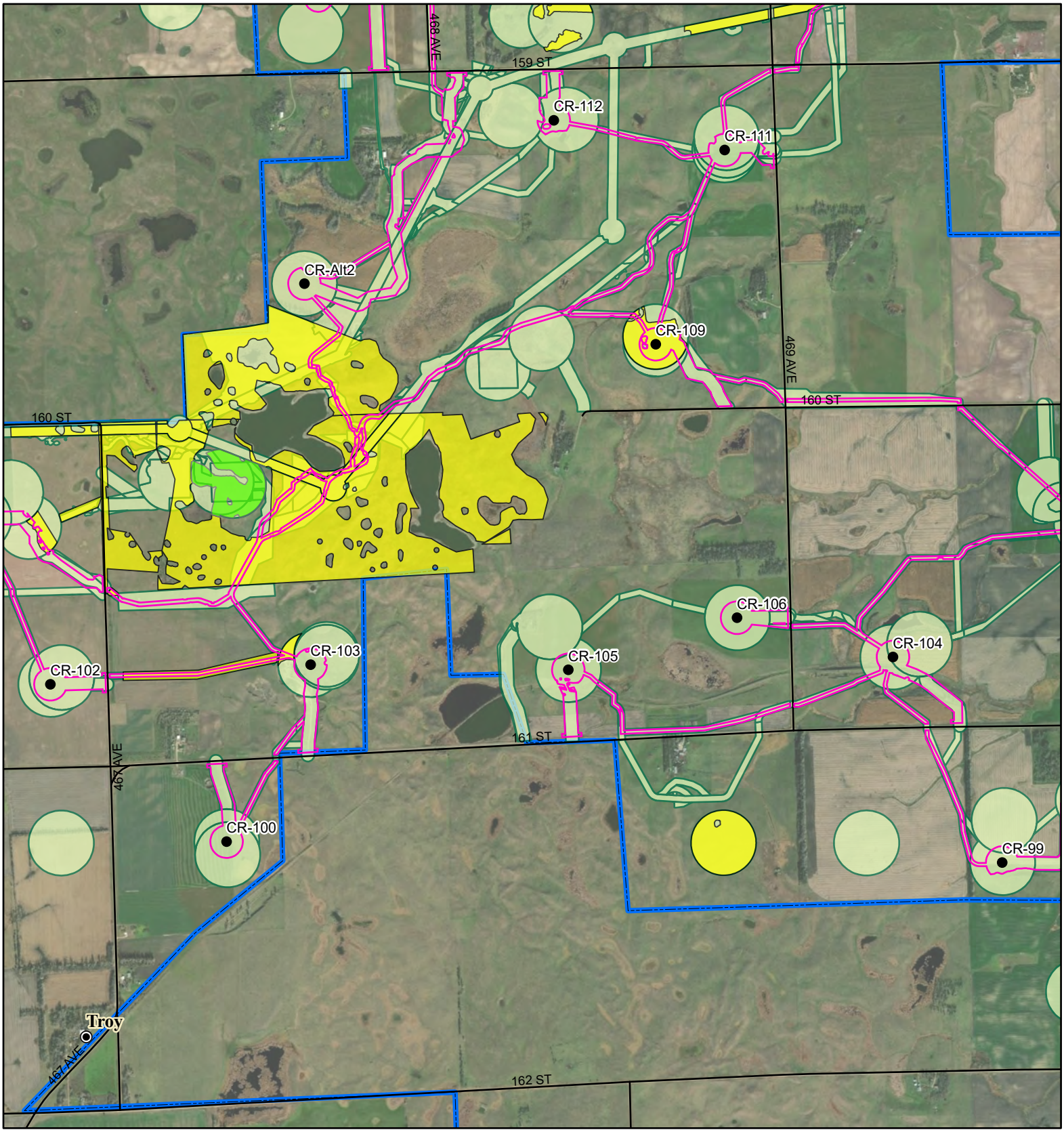
Township/Range: T119N, R51W, T119N, R50W, T118N, R51W, T118N, R50W

Codington and Grant Counties, South Dakota

Projection:

021328

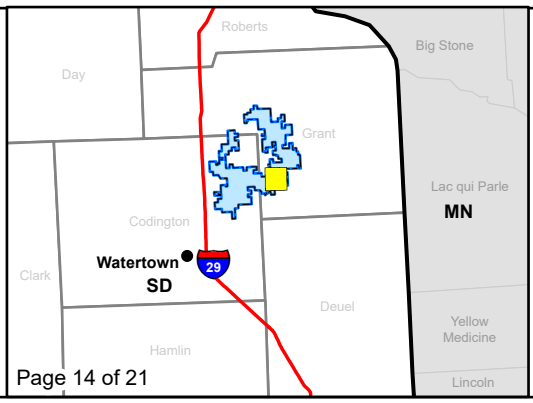
SWCA ENVIRONMENTAL CONSULTANTS



Dakota Skipper

Crowned Ridge Wind Farm

- Primary Turbine
- Alternate Turbine
- City
- Construction Easement
- Existing Road
- Field-Assessed Dakota Skipper Habitat
- Field-Assessed Dakota Skipper Habitat and Presence/Absence Survey Location 2018
- O&M Facility/ Substation
- Batch Plant
- Laydown Yard
- Survey Area
- Project Boundary
- County Boundary



Kilometers
0 0.5 1

Miles
0 0.25 0.5

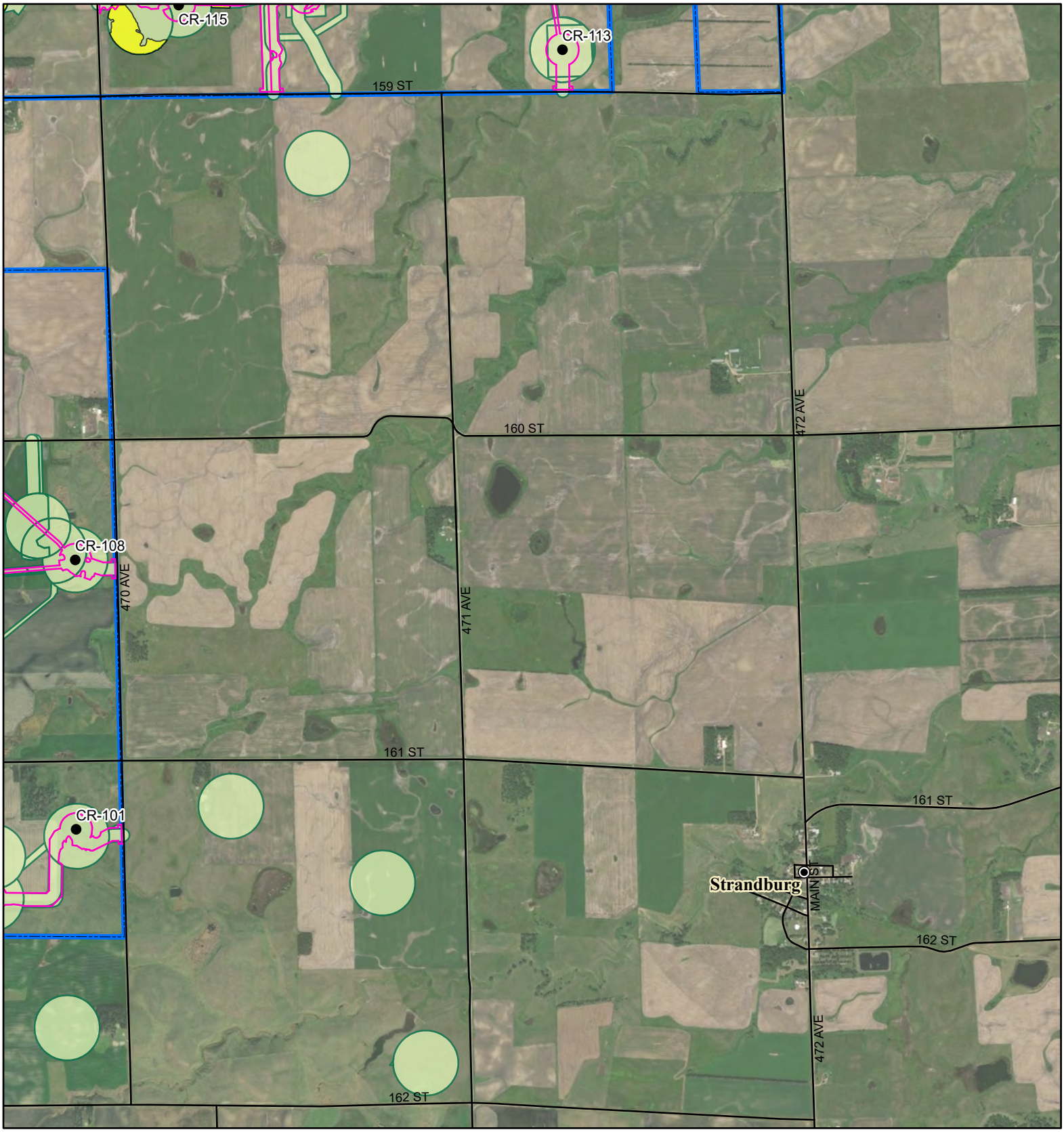
Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Quadrangle: Stockholm (1973)

Township/Range: T119N, R50W, T118N, R50W
Grant County, South Dakota

Projection:

021329

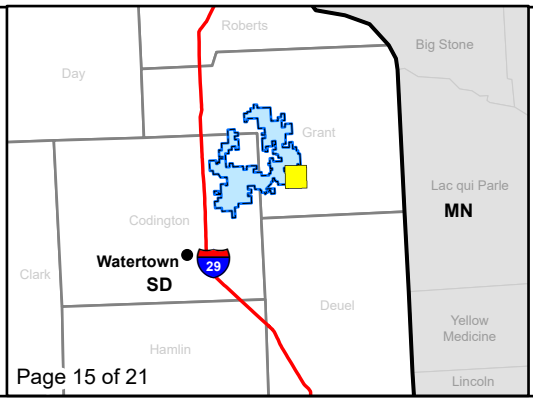
SWCA ENVIRONMENTAL CONSULTANTS



Dakota Skipper

Crowned Ridge Wind Farm

- Primary Turbine
- Alternate Turbine
- City
- Construction Easement
- Existing Road
- Field-Assessed Dakota Skipper Habitat
- Field-Assessed Dakota Skipper Habitat and Presence/Absence Survey Location 2018
- O&M Facility/ Substation
- Batch Plant
- Laydown Yard
- Survey Area
- Project Boundary
- County Boundary



Kilometers

0 0.5 1

Miles

0 0.25 0.5

Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community

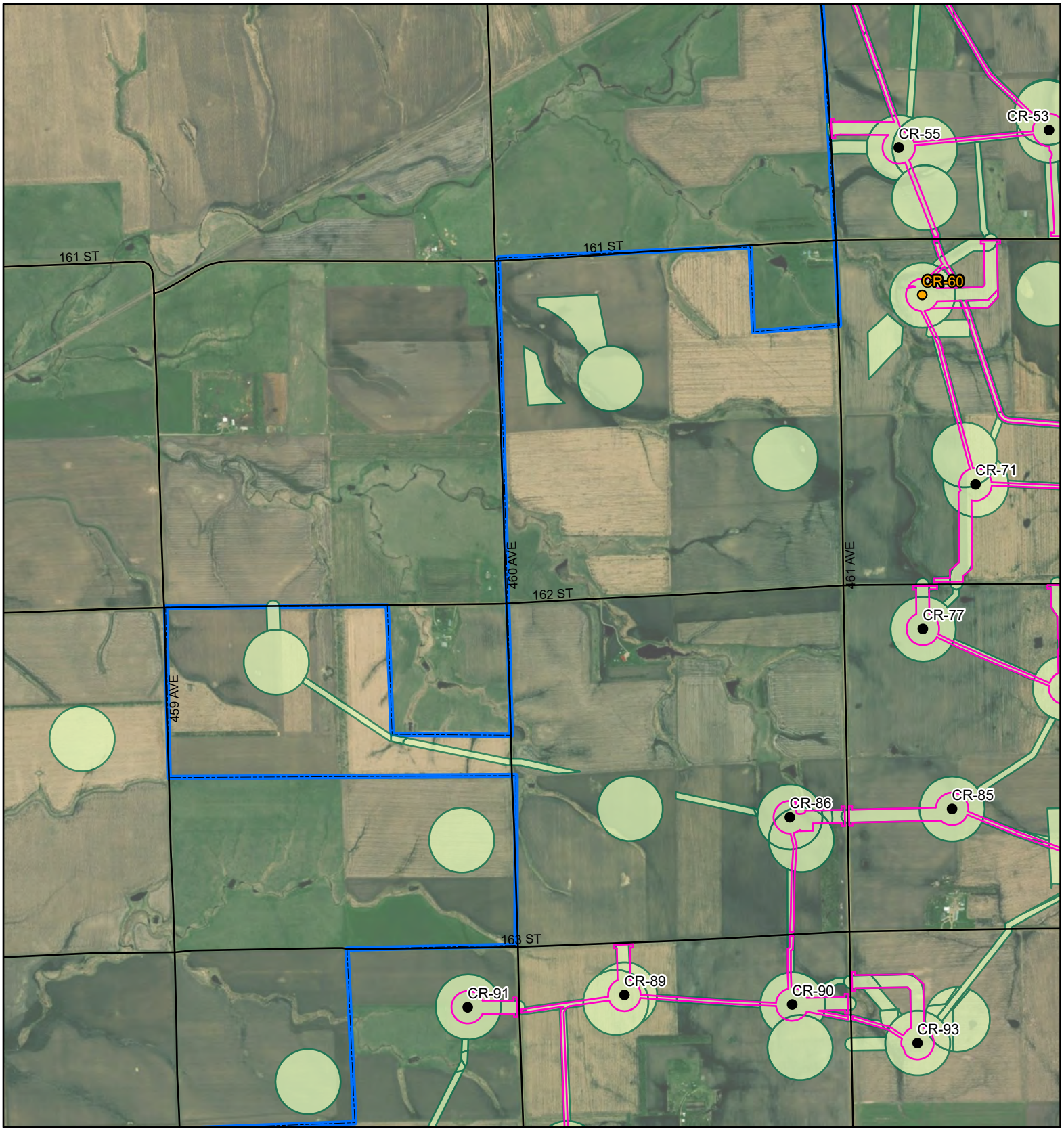
Quadrangle: Stockholm (1973)

Township/Range: T119N, R50W, T118N, R50W

Grant County, South Dakota

Projection:

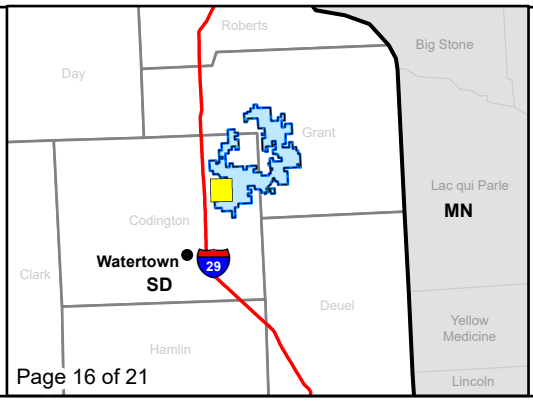
021330 SWCA ENVIRONMENTAL CONSULTANTS



Dakota Skipper

Crowned Ridge Wind Farm

- Primary Turbine
- Alternate Turbine
- City
- Construction Easement
- Existing Road
- Field-Assessed Dakota Skipper Habitat
- Field-Assessed Dakota Skipper Habitat and Presence/Absence Survey Location 2018
- O&M Facility/ Substation
- Batch Plant
- Laydown Yard
- Survey Area
- Project Boundary
- County Boundary



Kilometers

0 0.5 1

Miles

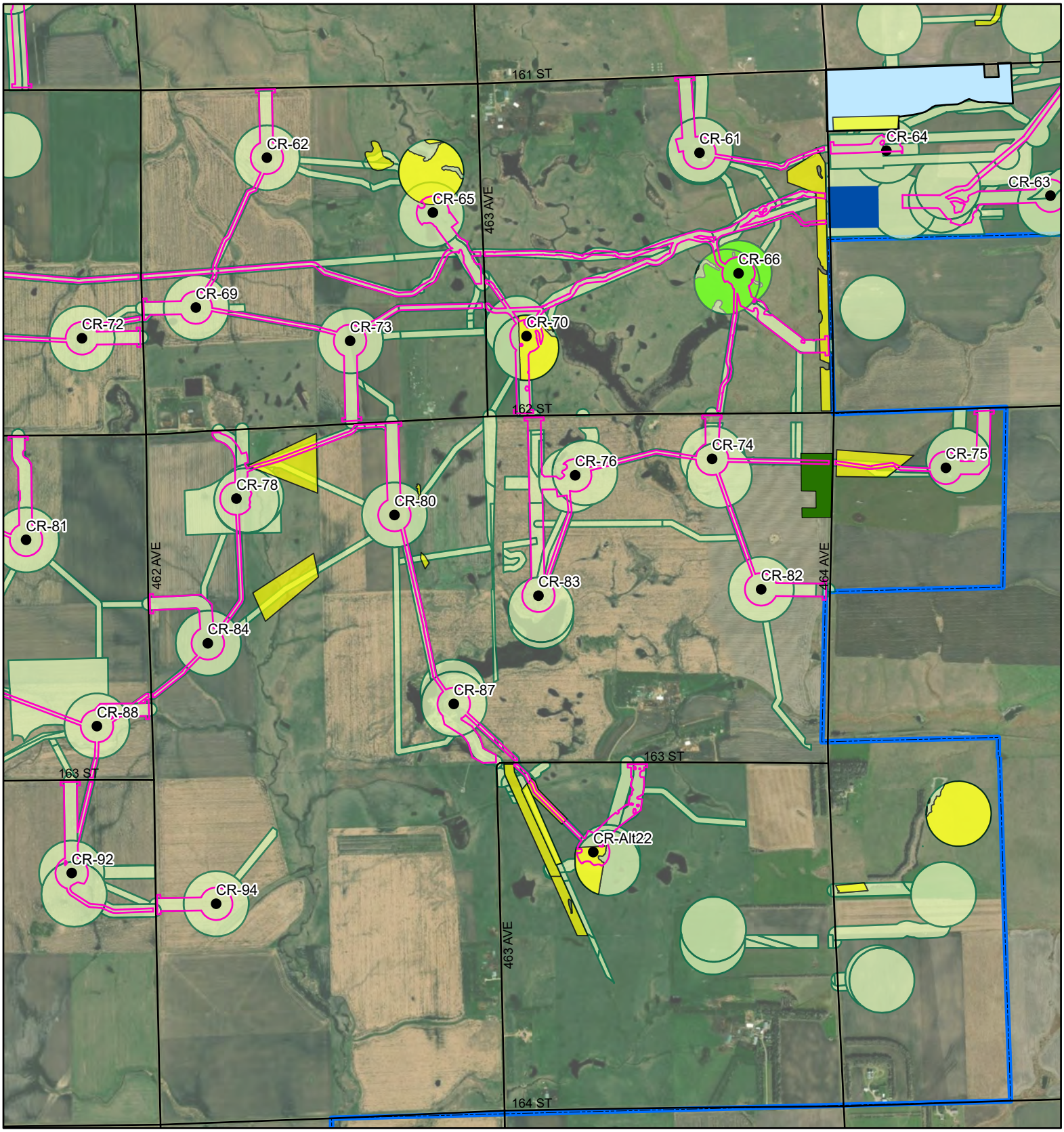
0 0.25 0.5

N W E S

Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Quadrangle: Still Lake SE (1970), South Shore (1973)
Township/Range: T118N, R52W, T118N, R51W
Codington County, South Dakota

Projection:

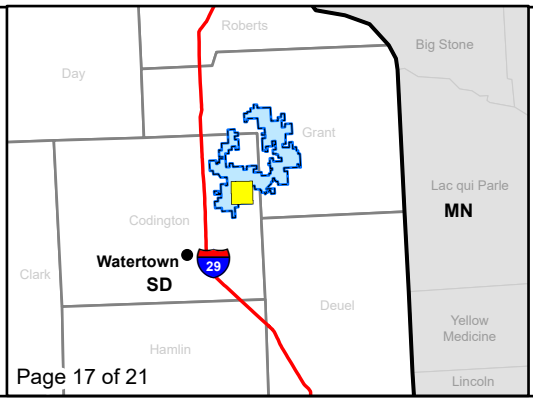
021331 SWCA ENVIRONMENTAL CONSULTANTS



Dakota Skipper

Crowned Ridge Wind Farm

- Primary Turbine
- Alternate Turbine
- City
- Construction Easement
- Existing Road
- Field-Assessed Dakota Skipper Habitat
- Field-Assessed Dakota Skipper Habitat and Presence/Absence Survey Location 2018
- O&M Facility/ Substation
- Batch Plant
- Laydown Yard
- Survey Area
- Project Boundary
- County Boundary



Kilometers
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Miles
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N W E S

Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Quadrangle: South Shore (1973)

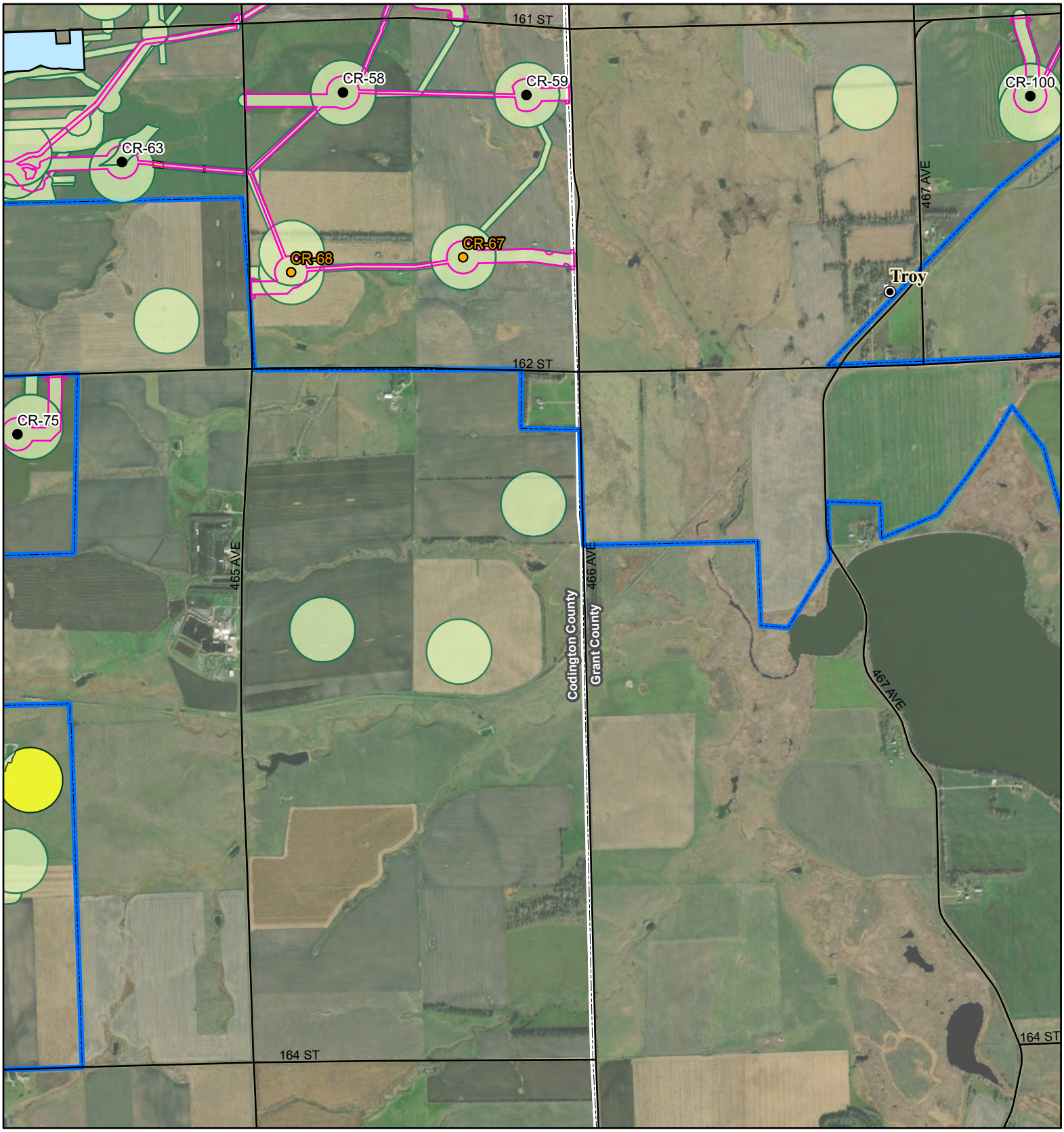
Township/Range: T118N, R51W

Codington County, South Dakota

Projection:

021332

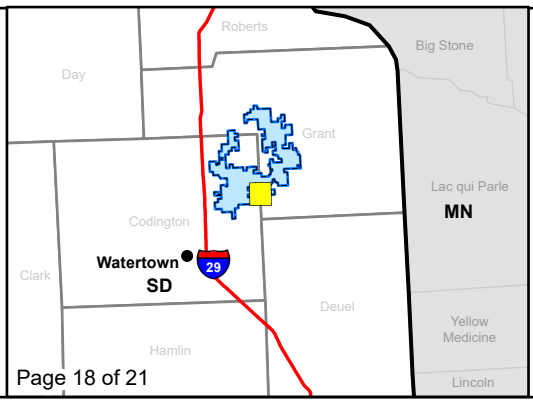
SWCA ENVIRONMENTAL CONSULTANTS



Dakota Skipper

Crowned Ridge Wind Farm

- Primary Turbine
- Alternate Turbine
- City
- Construction Easement
- Existing Road
- Field-Assessed Dakota Skipper Habitat
- Field-Assessed Dakota Skipper Habitat and Presence/Absence Survey Location 2018
- O&M Facility/ Substation
- Batch Plant
- Laydown Yard
- Survey Area
- Project Boundary
- County Boundary



Kilometers
0 0.5 1

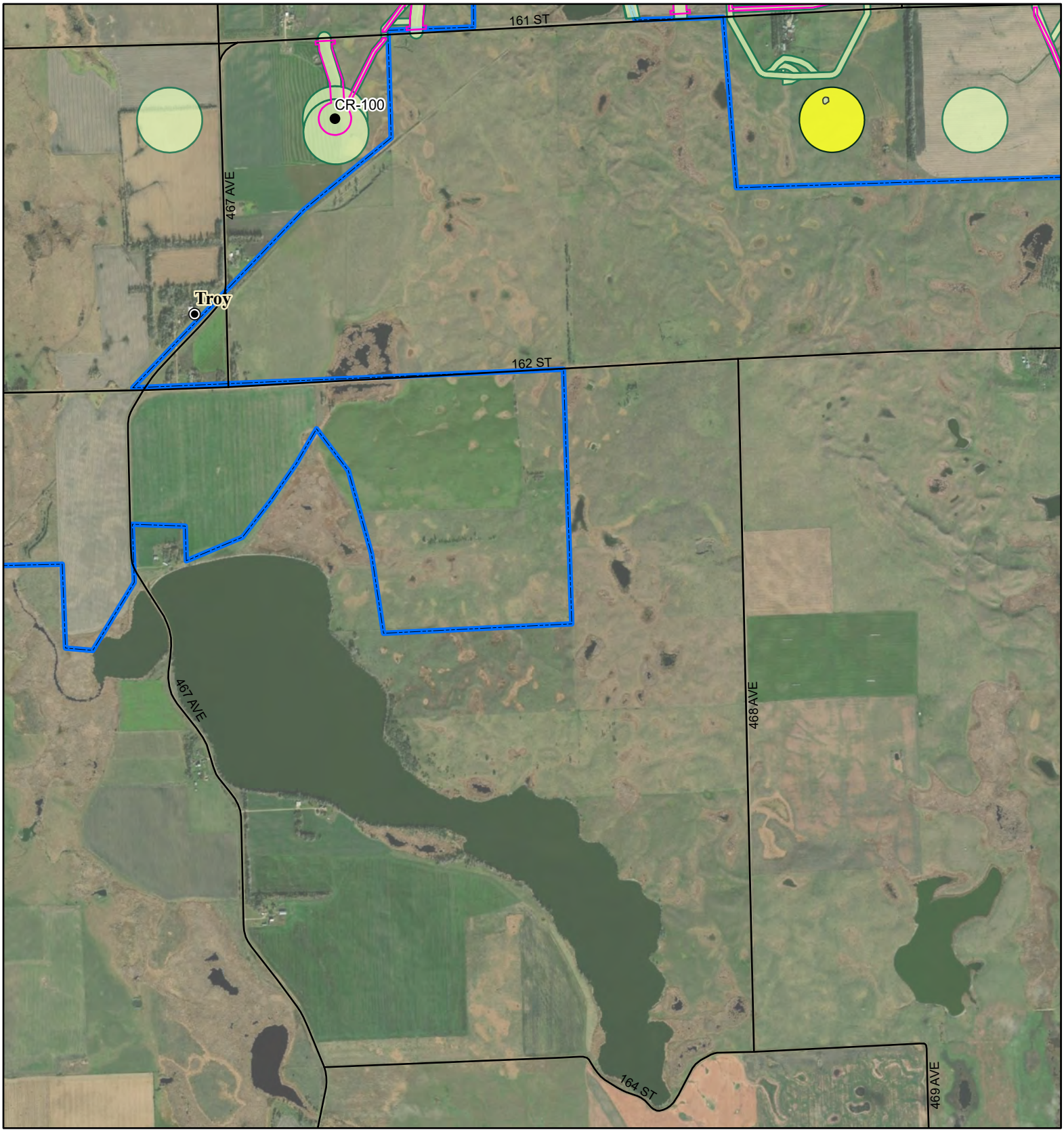
Miles
0 0.25 0.5

Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Quadrangle: South Shore (1973), Stockholm (1973)
Township/Range: T118N, R51W, T118N, R50W
Codington and Grant Counties, South Dakota

Projection:

021333

SWCA ENVIRONMENTAL CONSULTANTS



Dakota Skipper

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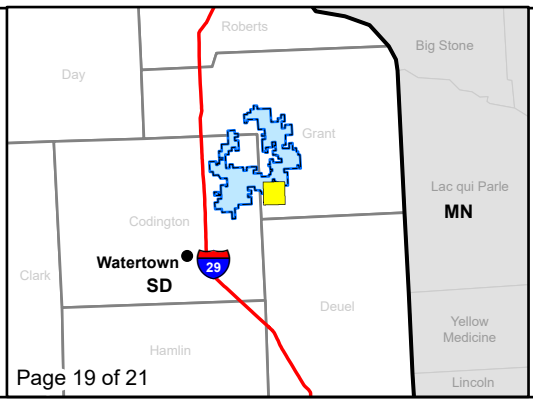

Kilometers
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Miles
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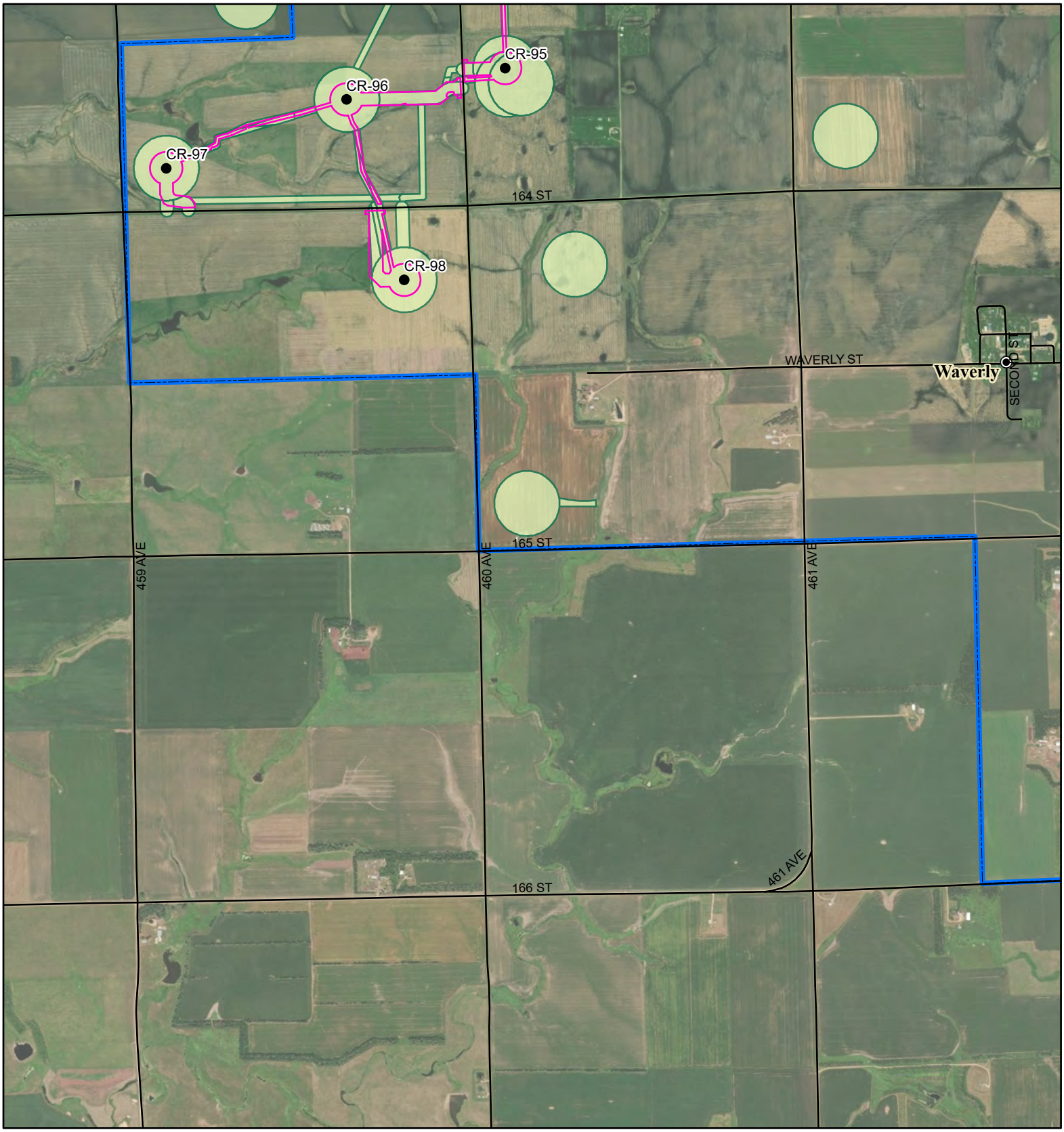
Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Quadrangle: South Shore (1973), Stockholm (1973)
Township/Range: T118N, R50W

Grant County, South Dakota

021334

SWCA ENVIRONMENTAL CONSULTANTS

Projection:



Dakota Skipper

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- Alternate Turbine
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- Construction Easement
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- Field-Assessed Dakota Skipper Habitat and Presence/Absence Survey Location 2018
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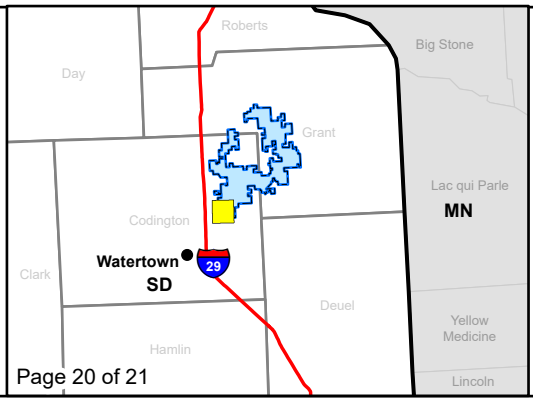

Kilometers
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Miles
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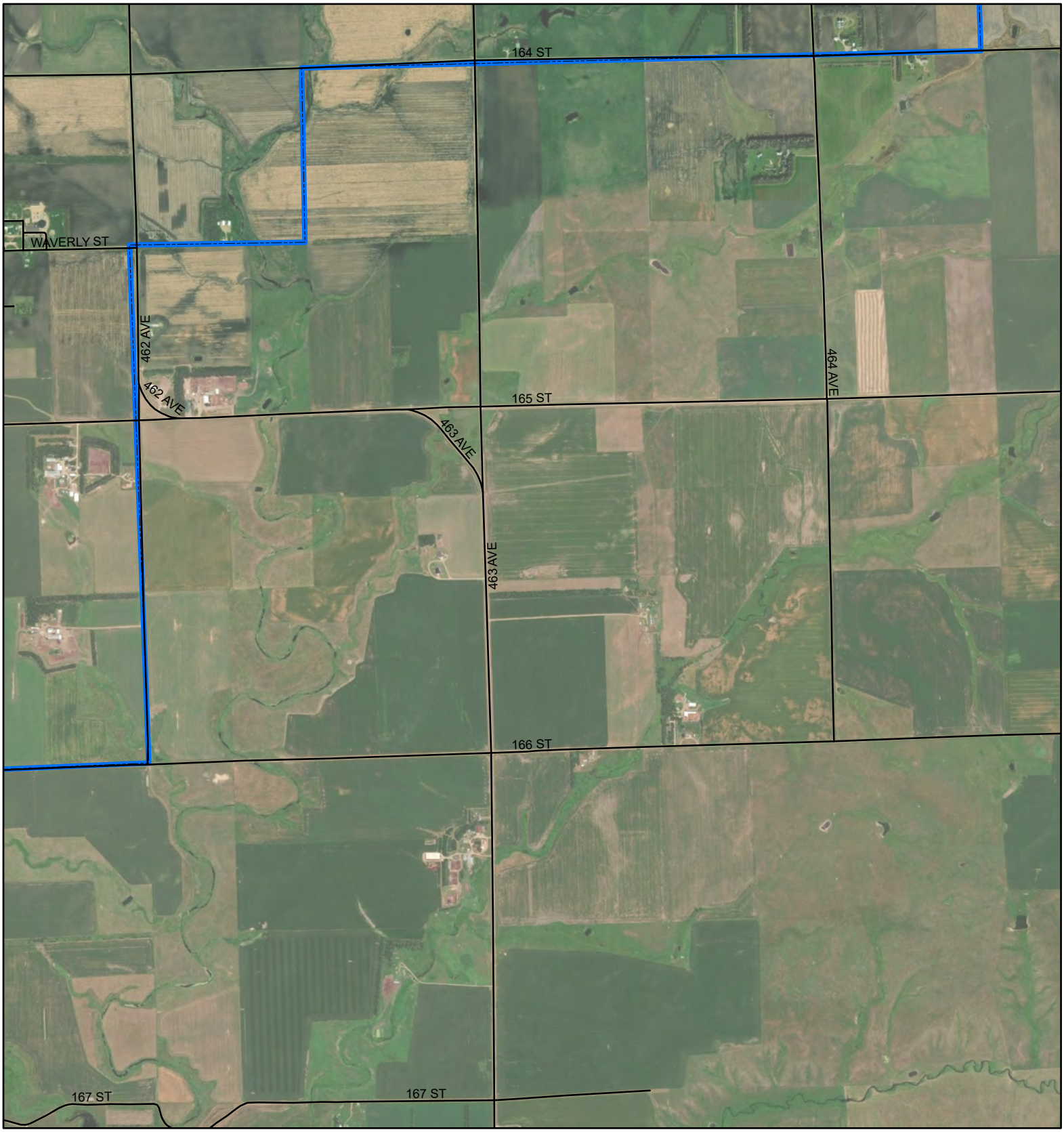
Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Quadrangle: Still Lake SE (1970), Watertown East (1969), South Shore (1973), Kranzburg (1970)
Township/Range: T118N, R52W, T118N, R51W, T117N, R52W, T117N, R51W
Codington County, South Dakota

Projection:

021335

SWCA ENVIRONMENTAL CONSULTANTS



Dakota Skipper

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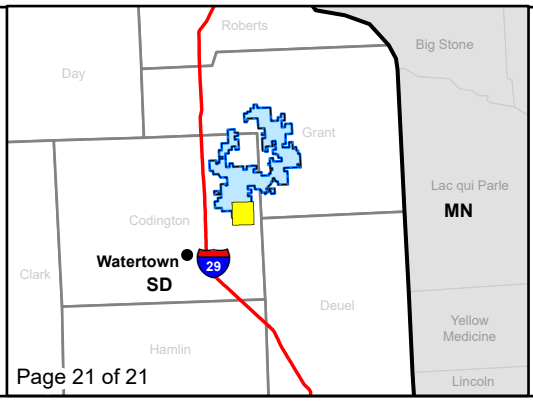

Kilometers

0 0.5 1

Miles

0 0.25 0.5

N W E S

Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community

Quadrangle: South Shore (1973), Kranzburg (1970)

Township/Range: T118N, R51W, T117N, R51W

Codington County, South Dakota

Projection:

021336

SWCA ENVIRONMENTAL CONSULTANTS

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From:	Wells, Kimberly
To:	hilary.meyer (hilary.meyer@state.sd.us)
Cc:	Gates, Natalie; Kely Mertz; Wells, Kimberly
Subject:	Crowned Ridge follow up: proposed post-construction lek survey quals
Date:	Friday, August 16, 2019 1:53:47 PM
Attachments:	CRI SWCA grouse survey quals - Marcel.pdf

Hi Hilary,

I am following up on our last conversation regarding post-construction grouse lek surveys at Crowned Ridge I and our collaboration. Do you have any comments or questions on the qualifications of the proposed surveyor described in the attached document from SWCA? If not, we can go ahead and file with PUC staff.

Also, do you have any more details for us on suggested methods or should we just draft a proposal and provide for review? I imagine there is a lot to coordinate with the off-site monitoring discussed and to coordinate between projects so that Crowned Ridge and Sweetwater Wind are providing comparable data.

Thanks in advance for your help.

Kim

Kimberly Wells, Ph.D.
Senior Manager, Environmental Services
Mid Continent Region
NEXTera Energy Resources, LLC
708 Main Street, 10th floor
c/o WeWork
Houston, TX 77002
713.951.5372 (office)
832.538.7935 (mobile)
Kimberly.Wells@NEE.com

MARCEL SUCH, B.S., BIOLOGICAL FIELD TECHNICIAN

Marcel Such is a biologist working for SWCA as a wildlife field technician, specializing in avian ecology and botany in the Rocky Mountain and Great Plains regions. With sixteen years of experience in ornithology, he is skilled in the identification of all regularly occurring bird species of the Interior West and Midwest, by sight and sound, and has worked with federal threatened and endangered species including the Gunnison sage-grouse and Preble's meadow jumping mouse. Mr. Such's in-field experience includes proficiency in many established survey protocols and techniques, including post-construction mortality surveys on wind farms; excellence in safe backcountry and off-road navigation by foot, ski, and four-wheel drive vehicles; and use of GIS hardware technologies such as Garmin GPS units and Android tablets. He is proficient in training field technicians in avian identification and survey protocol; has produced post-fieldwork reports for various government and academic agencies; and has published several papers in peer-reviewed ornithological journals on a variety of subjects.

EXPERTISE

Lifelong student of ornithology, highly experienced in visual and auditory bird identification in North America

Ten years' experience conducting various avian surveys, including bird banding, breeding bird surveys, point counts, distance-sampling techniques, and lek surveys

Experienced in botanical anatomy, lab- and field-based plant identification

Five years' experience conducting vegetation surveys in the Interior West, including point-intersect fuels surveys and general species inventories

Experienced in report preparation and review, has provided reports to several government, academic, and private institutions

EDUCATION

B.S., Environmental Biology and Ecology; Western State Colorado University; Gunnison, Colorado; 2018

B.S., Mathematics; Western State Colorado University; Gunnison, Colorado; 2018

TRAINING

Yellow-billed Cuckoo Training Workshop, U.S. Fish and Wildlife Service; 2015

SELECTED PROJECT EXPERIENCE (∗ denotes project experience prior to SWCA)

Confidential Wind Energy Development; Various Counties, Kansas. *Role: Biological Technician. Avian point counts, avian use surveys, greater prairie-chicken lek surveys, data quality control.*

*Siskadee; Western State Colorado University; Gunnison County, Colorado. *Role: Volunteer Gunnison sage-grouse lek monitor. Four seasons. Lek counts, habitat restoration, public watchable wildlife lek liaison, interpretive naturalist.*

Confidential Year 2 Environmental Surveys; Confidential Client; Wyoming. *Role: Biological Technician. Data quality control, report preparation, avian point count and use surveys.*

Pioneer Wind Park Post Construction Monitoring; Pioneer Wind Park I, LLC; Converse County, Wyoming. SWCA provided post-construction avian and bat monitoring as well as Phase I ESA and worker environmental training support for the Pioneer Wind Park in compliance with the approved Project Conservation Plan and Eagle Conservation Plans (ECP). *Role: Biological Technician. Data quality control, post-construction mortality surveys.*

Pumpkin Creek Wind; Invenergy Wind Development, LLC; Carbon County, Kansas. *Role: Biological Technician. Multiple years - avian point count and large bird surveys.*

Rattlesnake Creek Avian Mortality; Enel Green Power North America, Inc.; Nebraska. *Role: Biological Technician. Administered bird and bat fatality training, conducted post-construction mortality surveys.*

Diamond Vista Avian Mortality; Enel Green Power North America, Inc.; Kansas. *Role: Biological Technician. Administered bird and bat fatality training, conducted post-construction mortality surveys.*

Confidential Wind Energy Development; Colorado. *Role: Biological Technician. Avian point count and large bird surveys.*

XTO RNPU 197-23A SSPS Monitor; XTO Energy; Meeker, Rio Blanco County, Colorado. *Role: Biological Technician. Botanical monitor for pipeline construction project.*

*Bird Conservancy of the Rockies; Colorado Parks and Wildlife; Montrose,

Colorado. *Role: Assistant Field Technician. Assisted with project trapping, banding, and collecting genetic material from brown-capped rosy-finches as part of a multi-agency research project.*

*Bird Conservancy of the Rockies; Fort Collins, Colorado. *Role: Avian Field Biologist. Independently conducted avian point counts and vegetation surveys in southern Colorado, often in remote, rugged backcountry areas. Communicated and organized access with private landowners.*

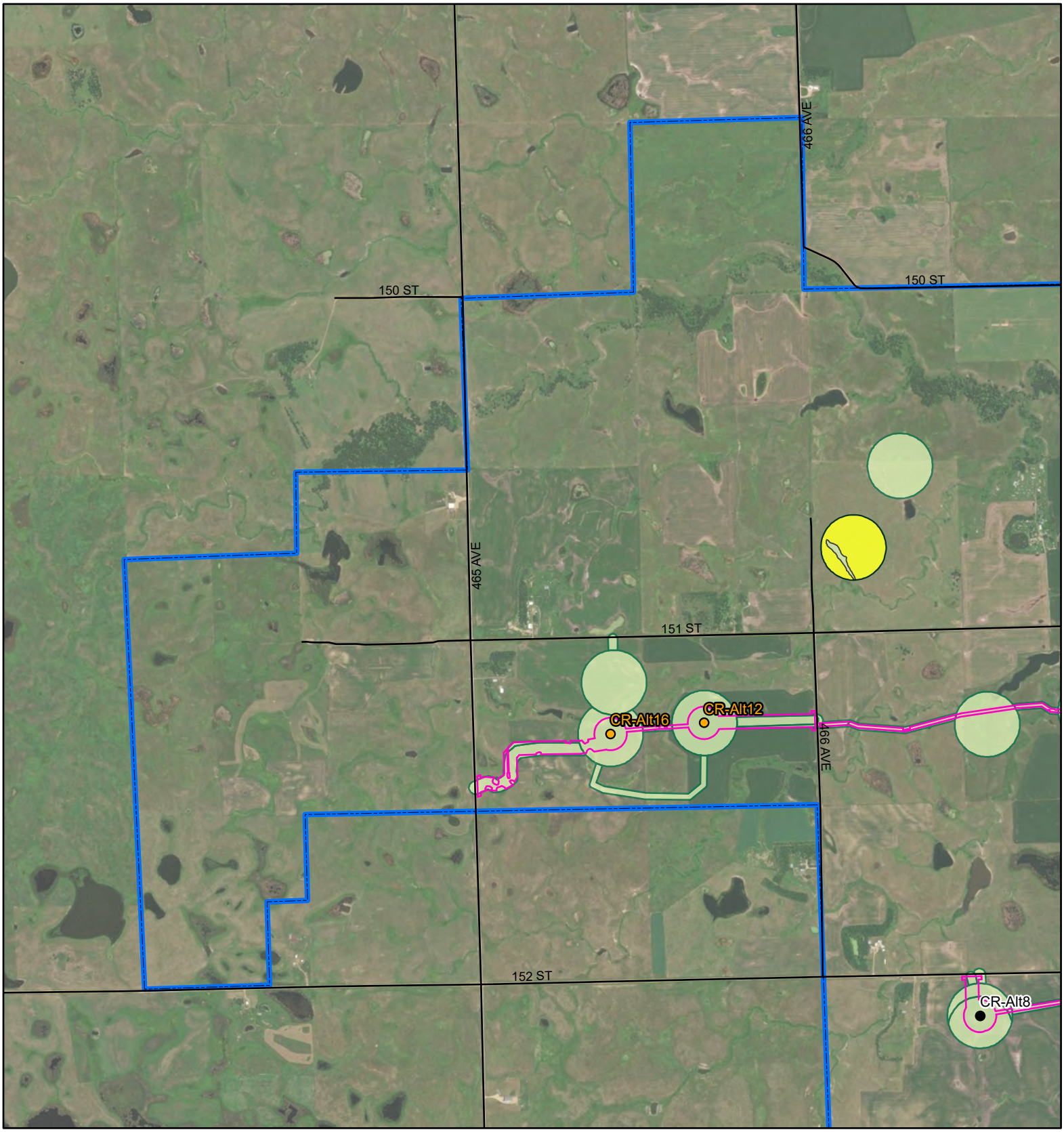
*Western State Colorado University; Gunnison, Colorado. *Role: Lead Research Project Supervisor. Designed, organized, and led a research project studying the effect of Douglas-fir forest health on birds of the Gunnison Basin. Responsibilities included grant writing, logistical planning, fieldwork (both avian point counts and vegetation surveys), training and supervision of a field assistant, data entry, data analysis, post-project report preparation, and presentation at professional paper sessions.*

*Western State Colorado University; Curecanti National Recreation Area, Gunnison, Colorado. *Role: Yellow-billed cuckoo surveyor. Conducted playback surveys for a federally threatened population of yellow-billed cuckoos in Curecanti National Recreation Area. Coordinated with National Park Service, wrote grant, and received USFWS training and certification.*

*Western State Colorado University; Bureau of Land Management; Coaldale, Colorado. *Role: Field Technician. Worked cooperatively with field crew to conduct avian and botanical surveys as part of a land management research project in the Piñon-Juniper Woodland between Salida and Cañon City, Colorado.*

APPENDIX B

Dakota Skipper Habitat and Survey Area Mapbook



Dakota Skipper

Crowned Ridge Wind Farm

- Primary Turbine
- Alternate Turbine
- City
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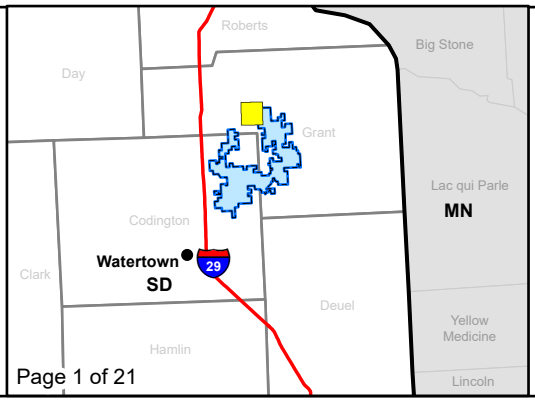

Kilometers

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Miles

0 0.25 0.5

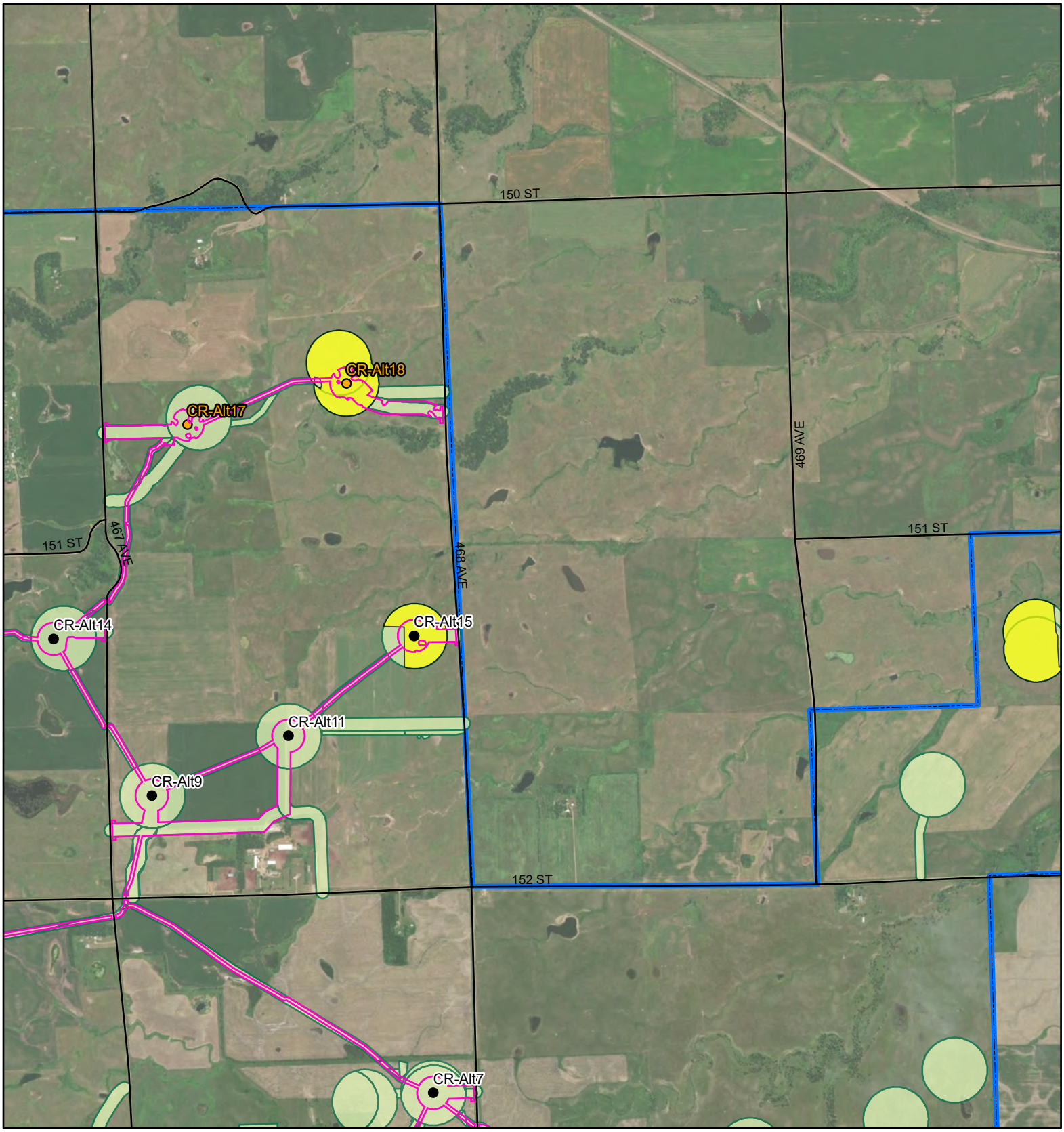
N W E S

Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Quadrangle: Antelope Valley (1973), Twin Brooks (1973)
Township/Range: T120N, R51W, T120N, R50W
Grant County, South Dakota

Projection:

021343

SWCA ENVIRONMENTAL CONSULTANTS



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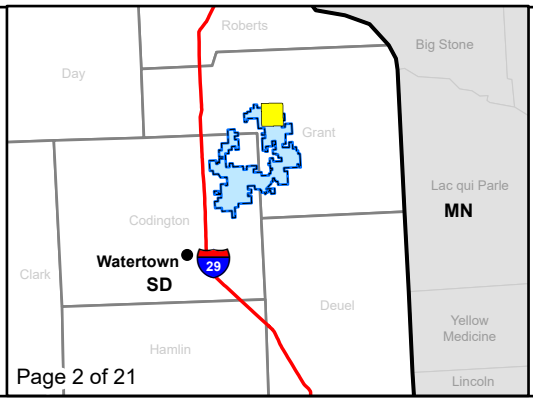

Kilometers

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Miles

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Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community

Quadrangle: Twin Brooks (1973)

Township/Range: T120N, R50W

Grant County, South Dakota

Projection:

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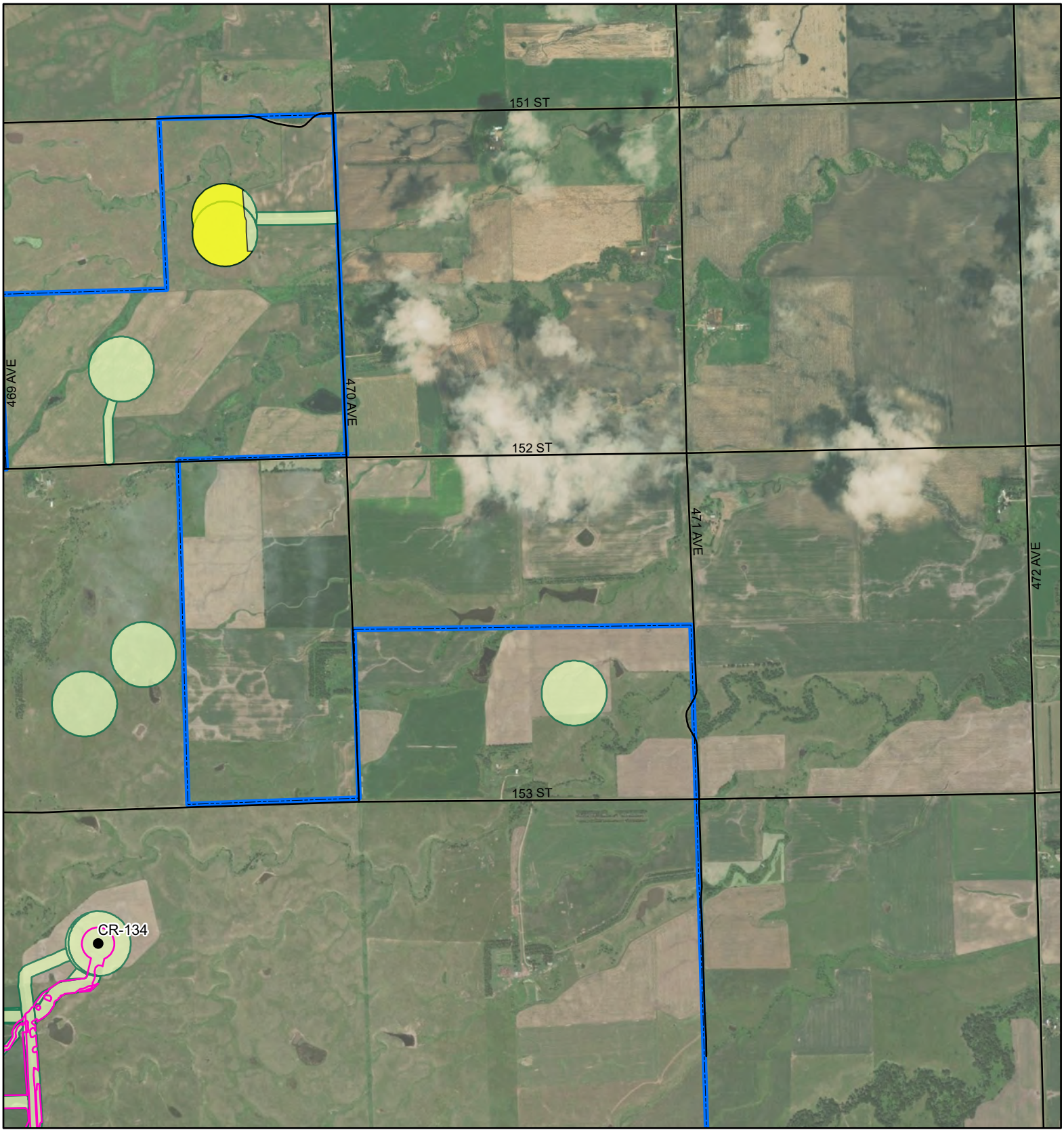

Dakota Skipper

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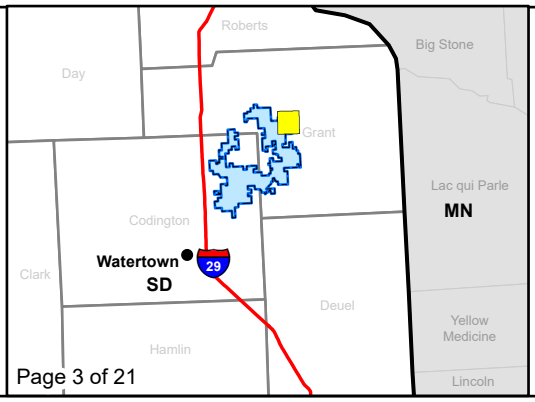

Kilometers

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Miles

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Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community

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Township/Range: T120N, R50W

Grant County, South Dakota

Projection:

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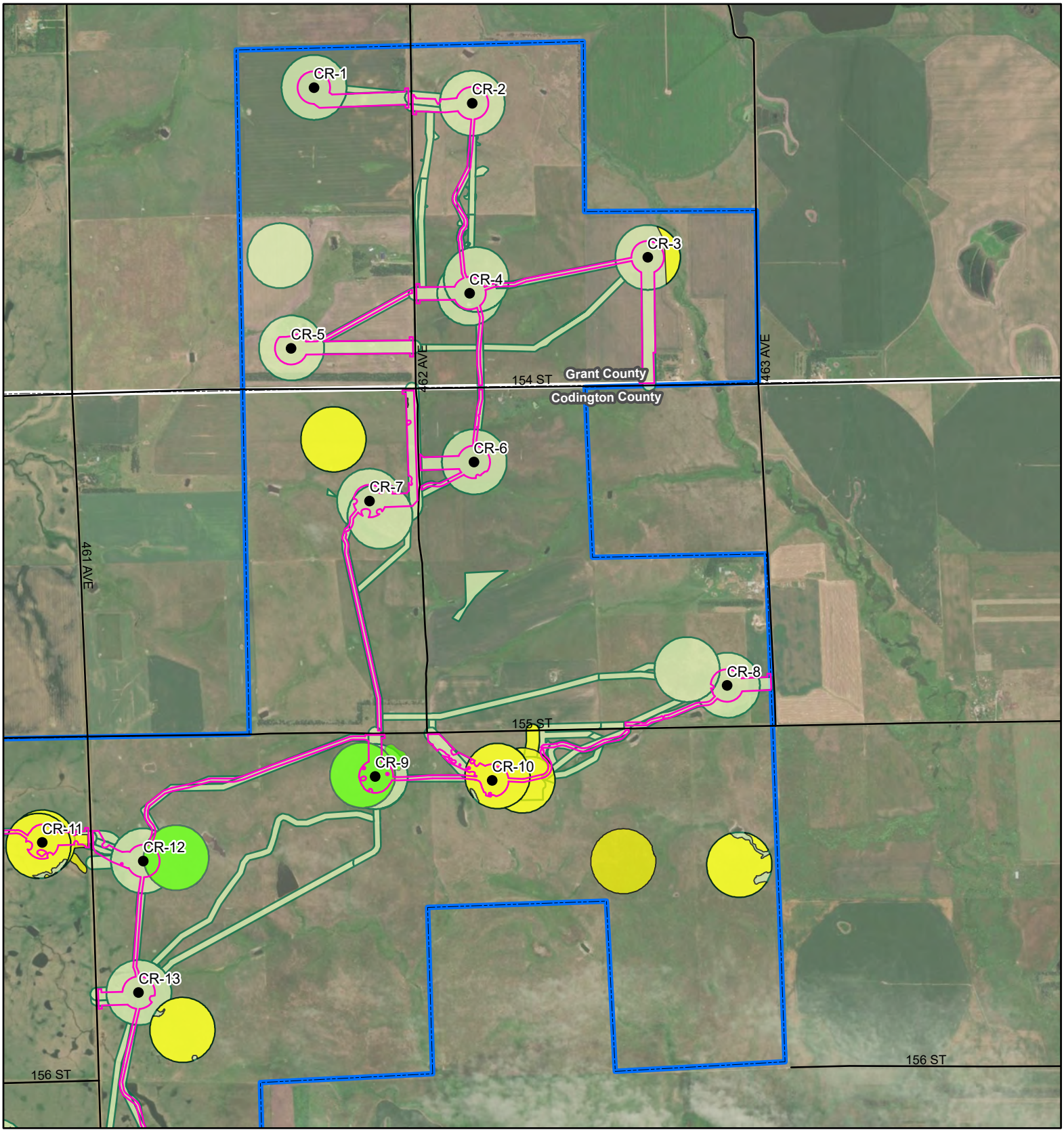

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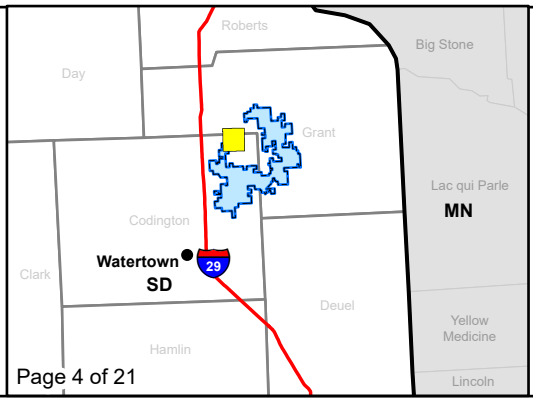

Kilometers
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Miles
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Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Quadrangle: Antelope Valley (1973), South Shore (1973)
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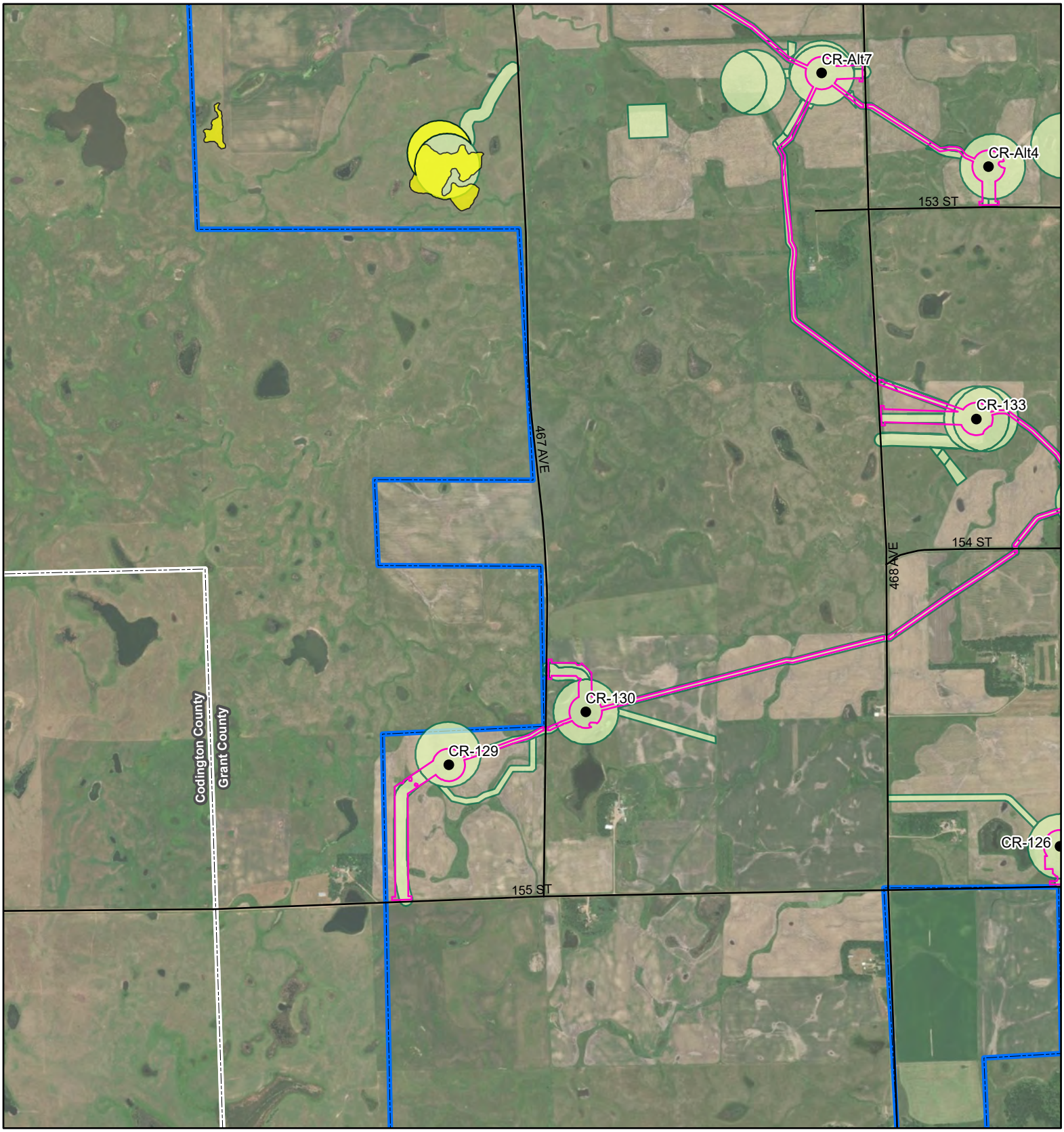
Codington and Grant Counties, South Dakota

Projection:

021346 SWCA ENVIRONMENTAL CONSULTANTS



Dakota Skipper

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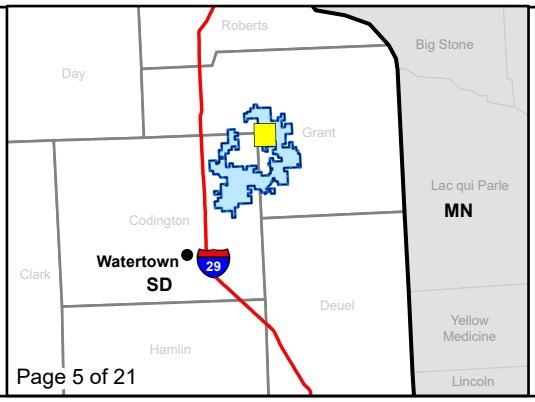

Kilometers
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Miles
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Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Quadrangle: Antelope Valley (1973), Twin Brooks (1973)
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Codington and Grant Counties, South Dakota

Projection:

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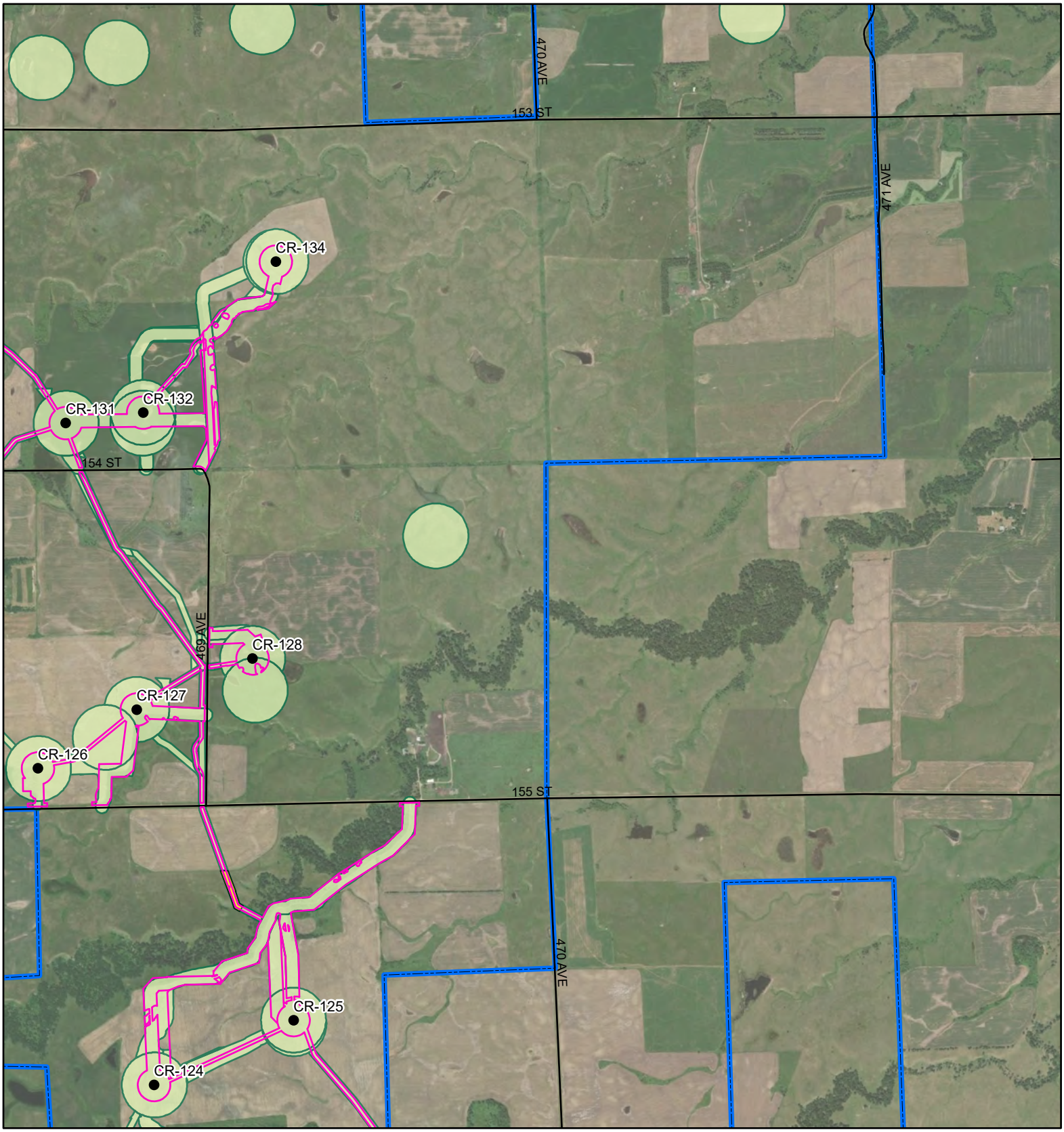

Dakota Skipper

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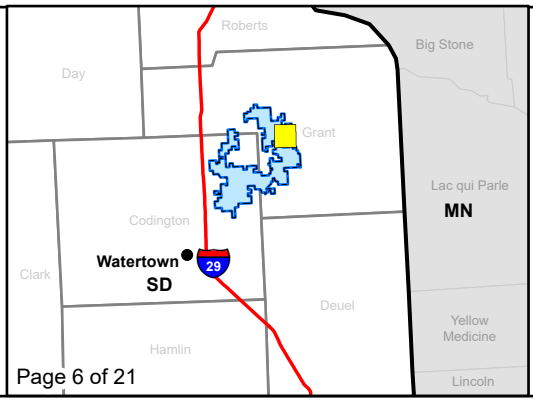

Kilometers

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Miles

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Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Quadrangle: Twin Brooks (1973), Stockholm (1973)
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Grant County, South Dakota

Projection:

021348

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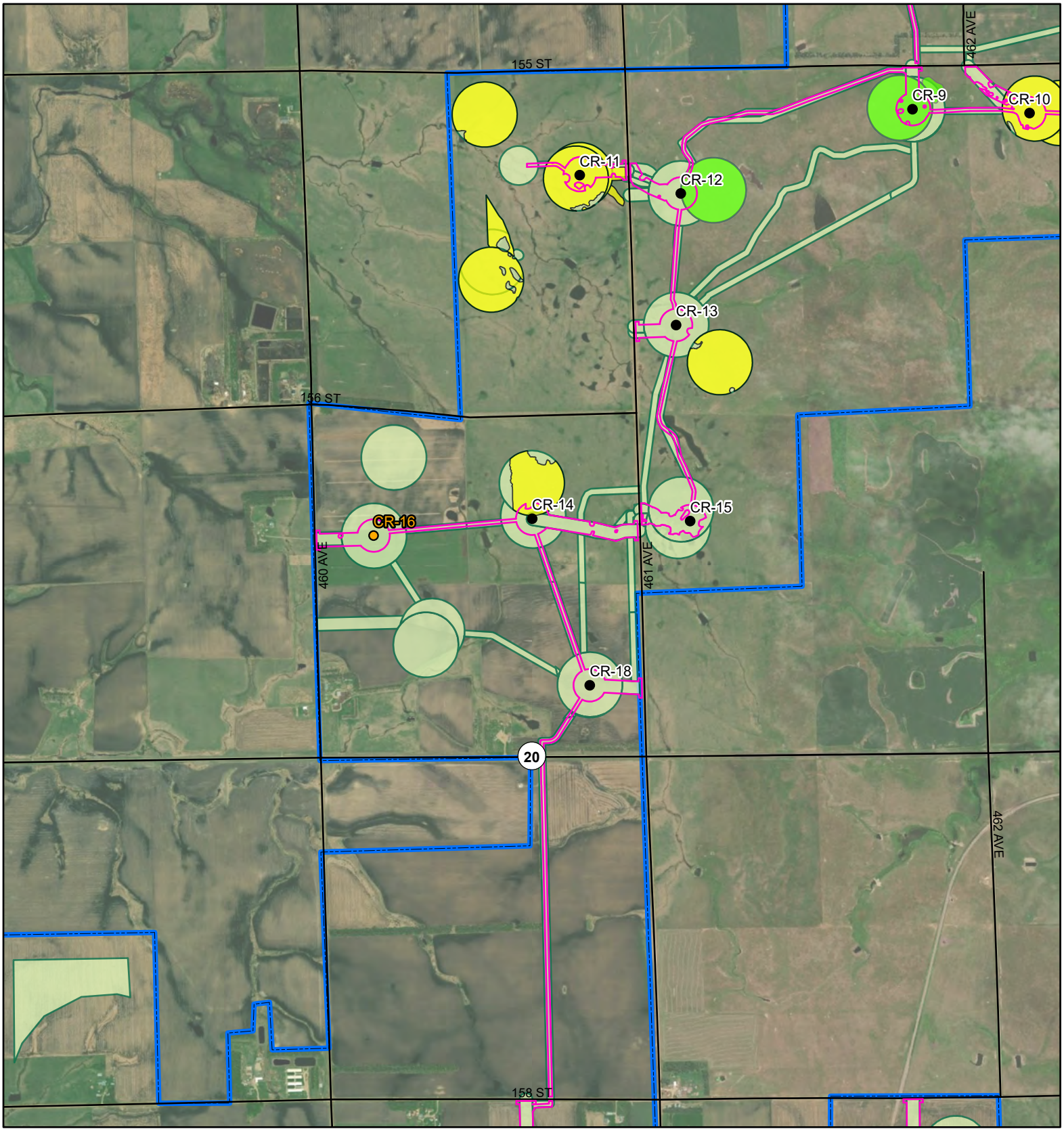

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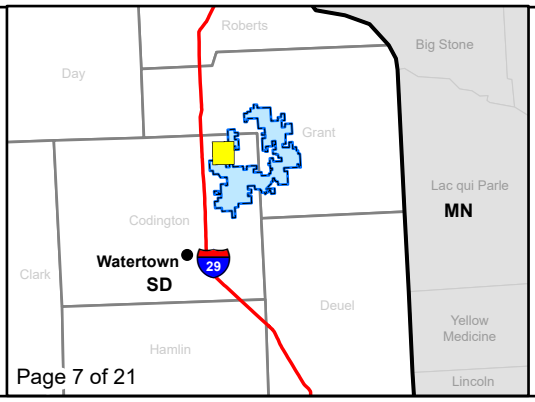

Kilometers
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Miles
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Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Quadrangle: Still Lake NE (1970), Antelope Valley (1973), Still Lake SE (1970), South Shore (1973)
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Codington County, South Dakota

Projection:

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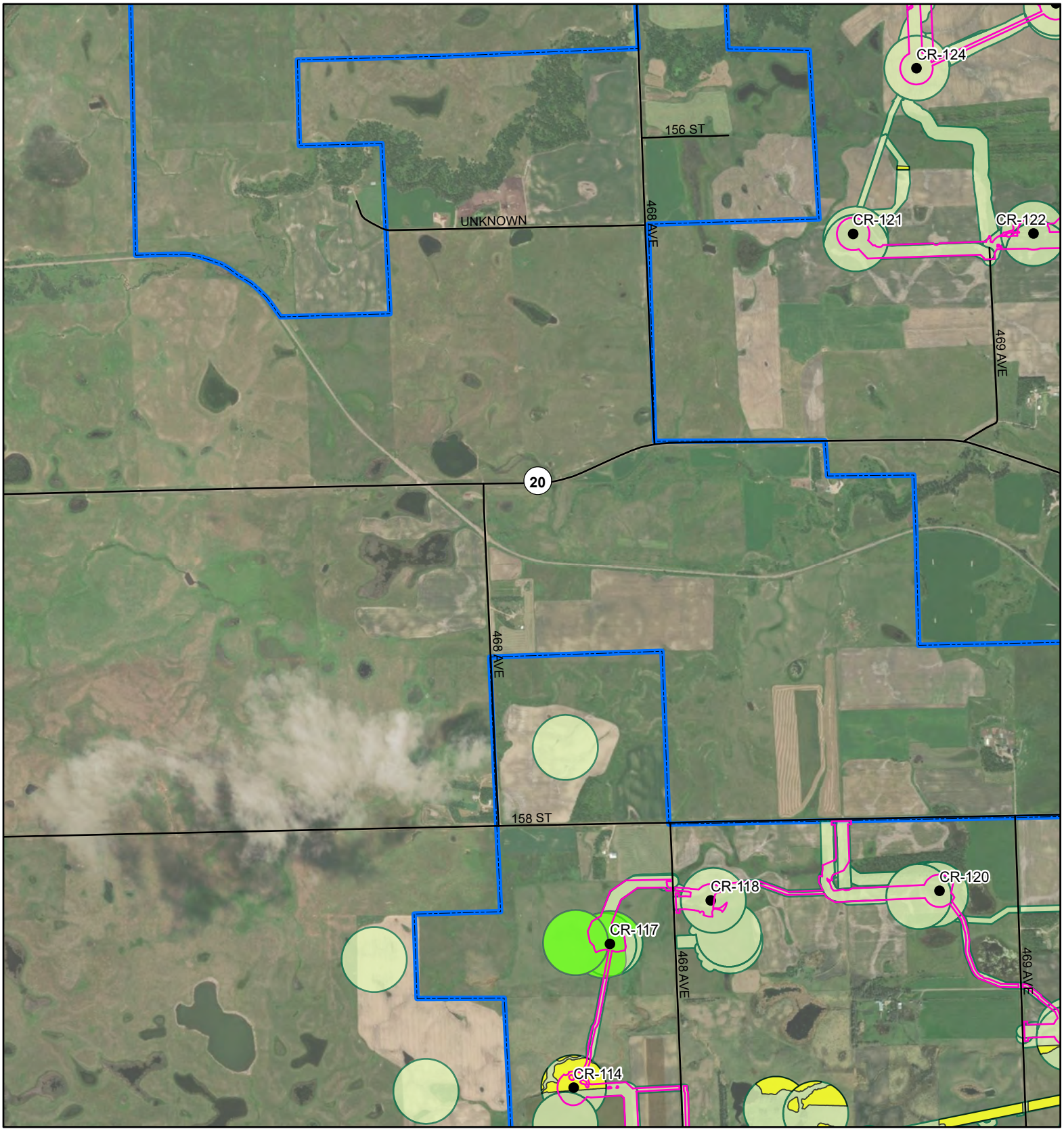

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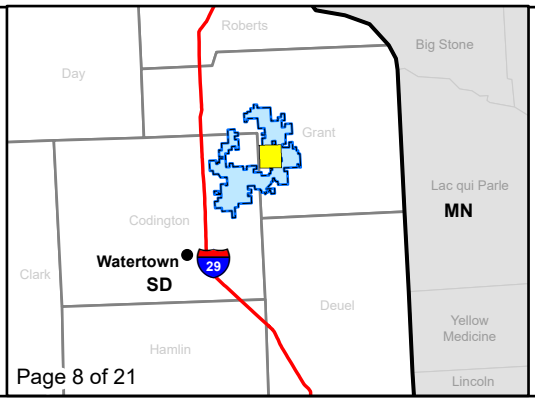

Kilometers
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Miles
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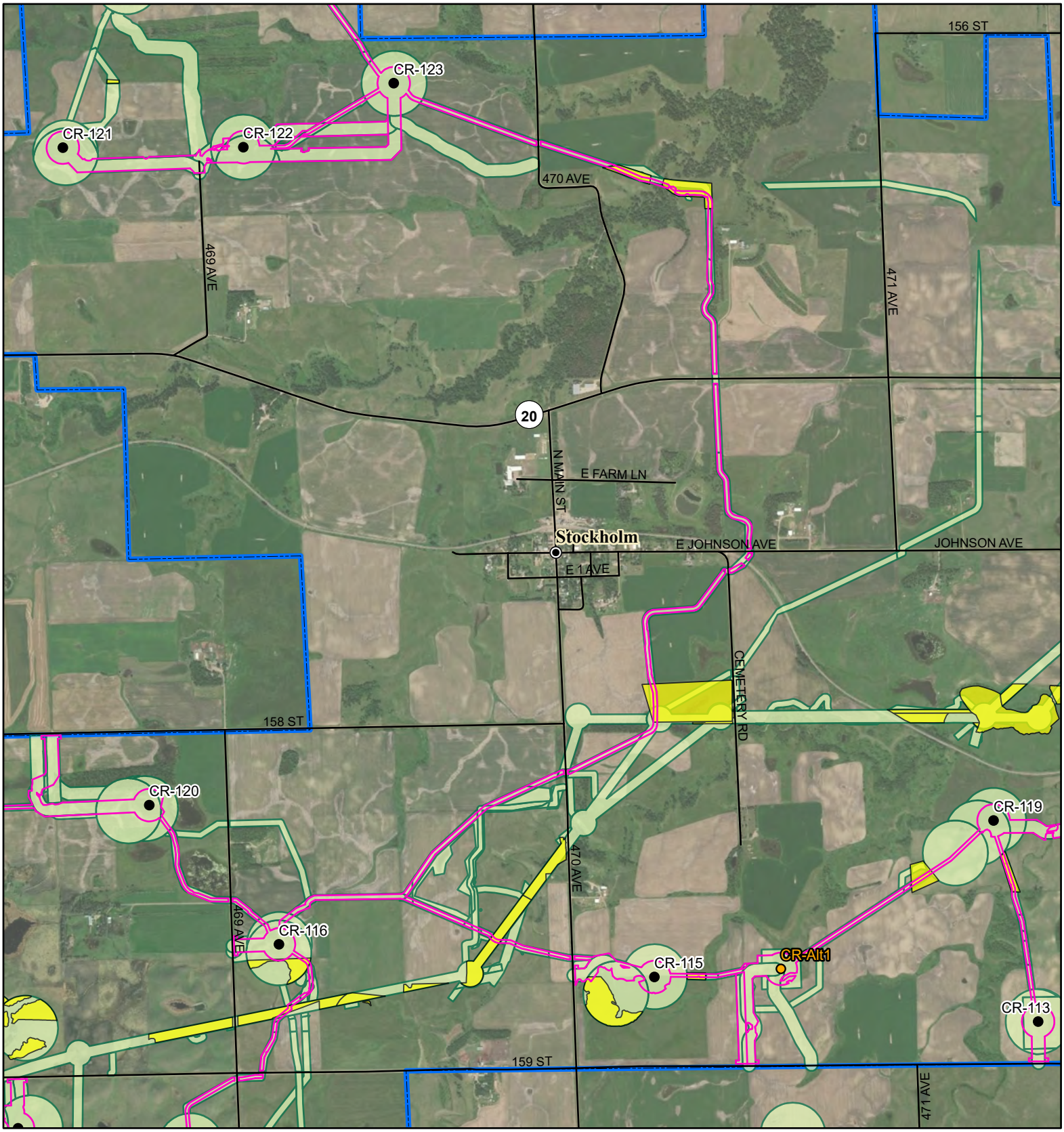
N W E S

Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Quadrangle: Stockholm (1973), Antelope Valley (1973), Twin Brooks (1973), South Shore (1973)
Township/Range: T119N, R50W

Grant County, South Dakota

Projection:

021350 SWCA ENVIRONMENTAL CONSULTANTS



Dakota Skipper

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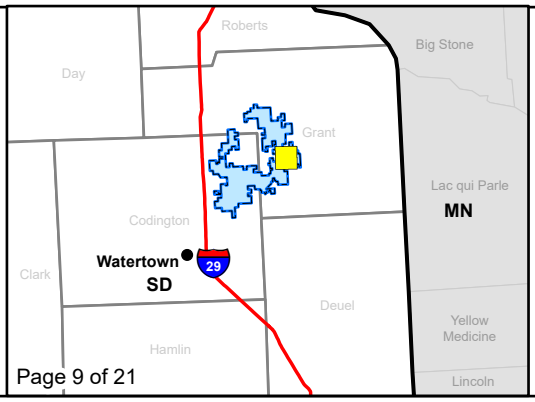
- Field-Assessed Dakota Skipper Habitat
- Field-Assessed Dakota Skipper Habitat and Presence/Absence Survey Location 2018
- O&M Facility/ Substation
- Batch Plant
- Laydown Yard
- Survey Area
- Project Boundary
- County Boundary



Kilometers
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Miles
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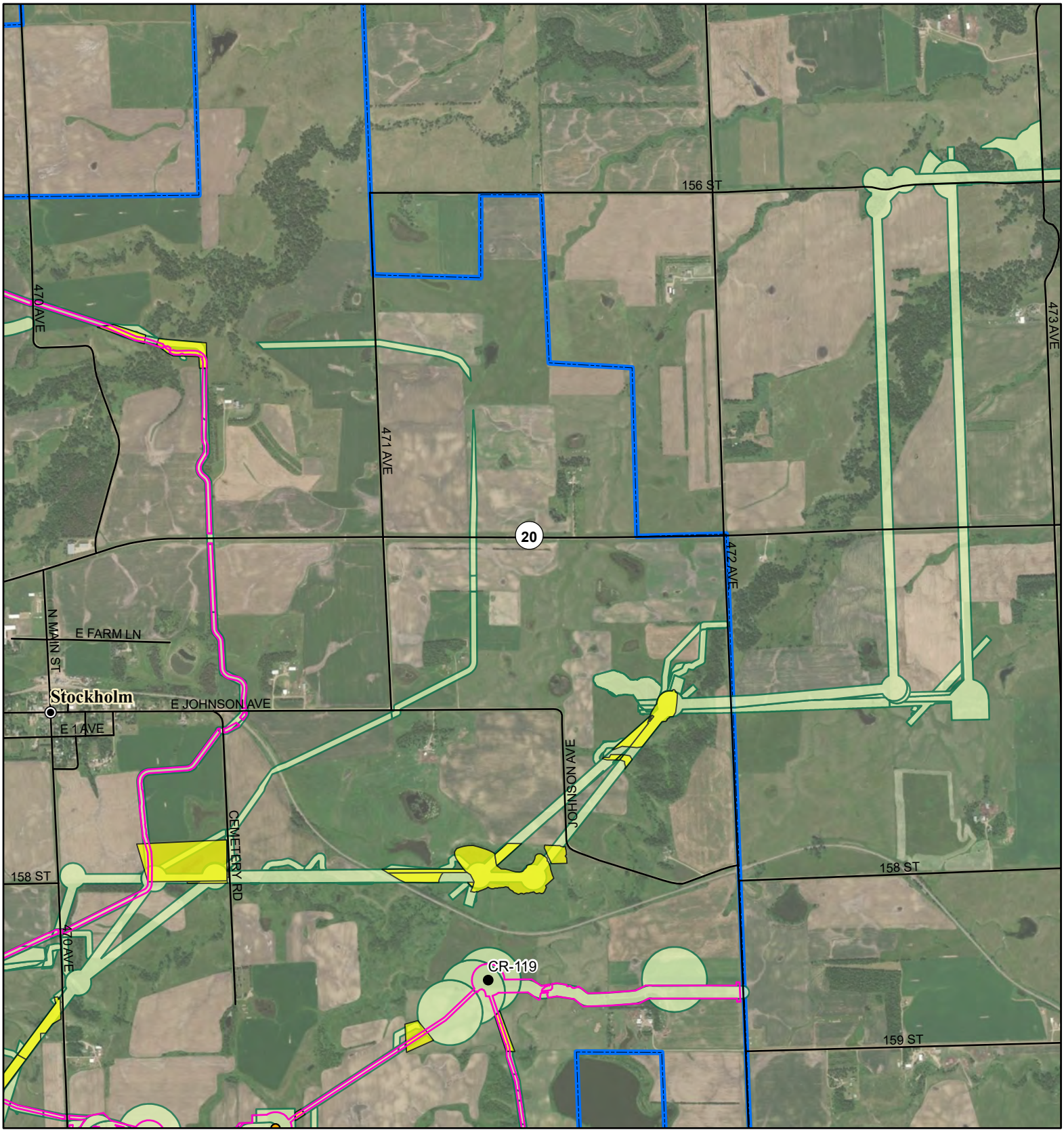
Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Quadrangle: Stockholm (1973)

Township/Range: T119N, R50W

Grant County, South Dakota

Projection:

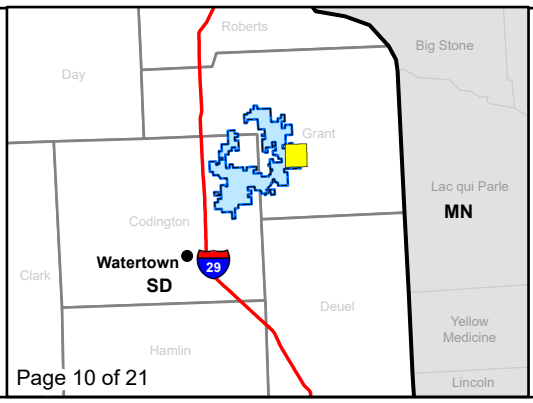
021351 SWCA ENVIRONMENTAL CONSULTANTS



Dakota Skipper

Crowned Ridge Wind Farm

- Primary Turbine
- Alternate Turbine
- City
- Construction Easement
- Existing Road
- Field-Assessed Dakota Skipper Habitat
- Field-Assessed Dakota Skipper Habitat and Presence/Absence Survey Location 2018
- O&M Facility/ Substation
- Batch Plant
- Laydown Yard
- Survey Area
- Project Boundary
- County Boundary



Kilometers
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Miles
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Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Quadrangle: Twin Brooks (1973), Stockholm (1973)
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Grant County, South Dakota

Projection:

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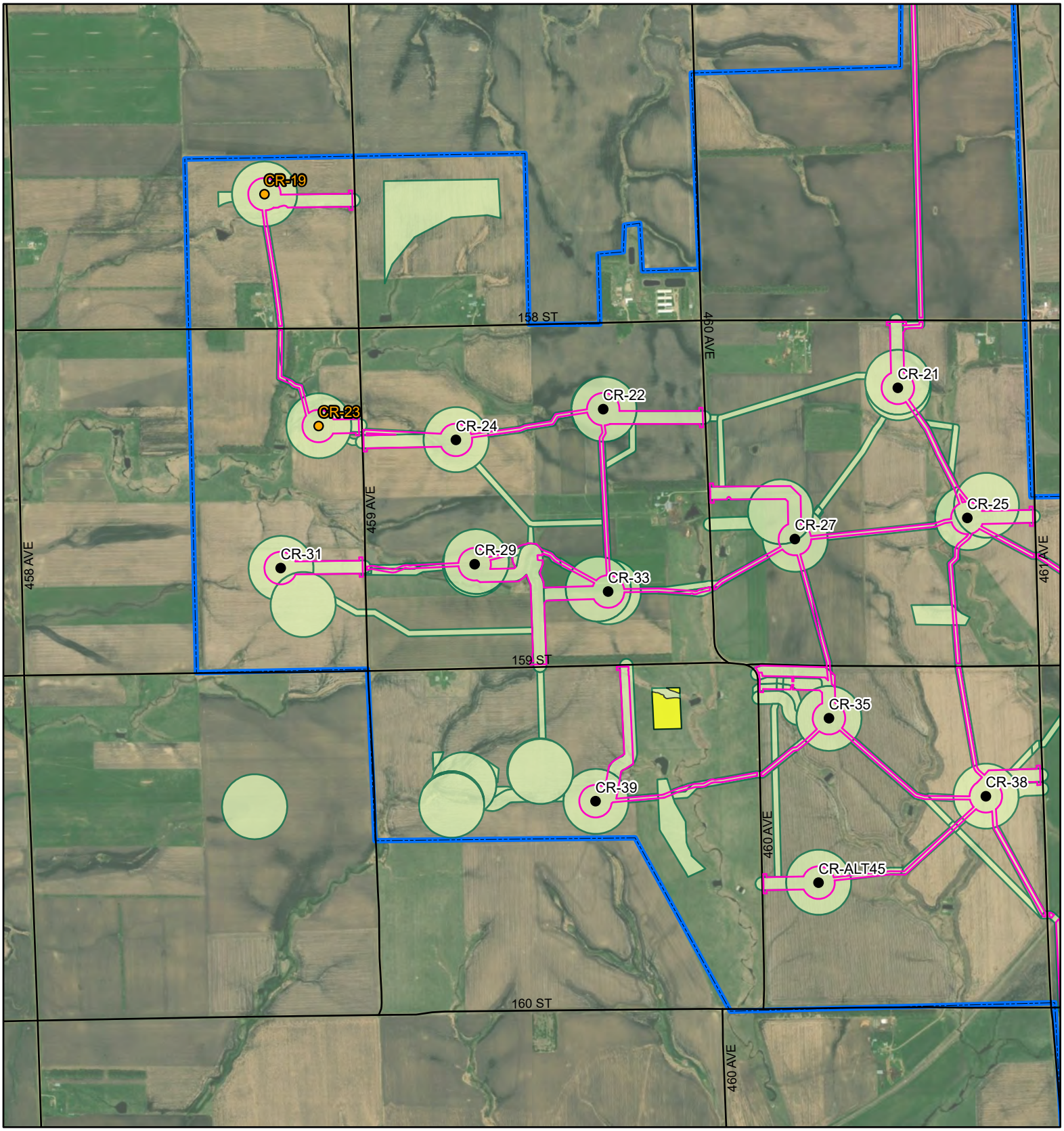
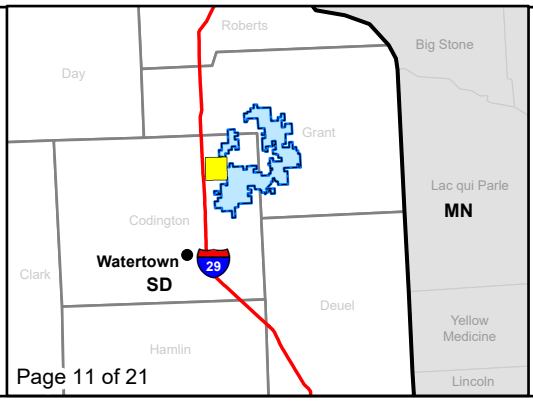


Dakota Skipper

Crowned Ridge Wind Farm

- Primary Turbine
- Alternate Turbine
- City
- Construction Easement
- Existing Road
- Field-Assessed Dakota Skipper Habitat
- Field-Assessed Dakota Skipper Habitat and Presence/Absence Survey Location 2018
- O&M Facility/ Substation
- Batch Plant
- Laydown Yard
- Survey Area
- Project Boundary
- County Boundary



Kilometers
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Miles
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N W E S

Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Quadrangle: Still Lake SE (1970), South Shore (1973)
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Codington County, South Dakota

Projection:

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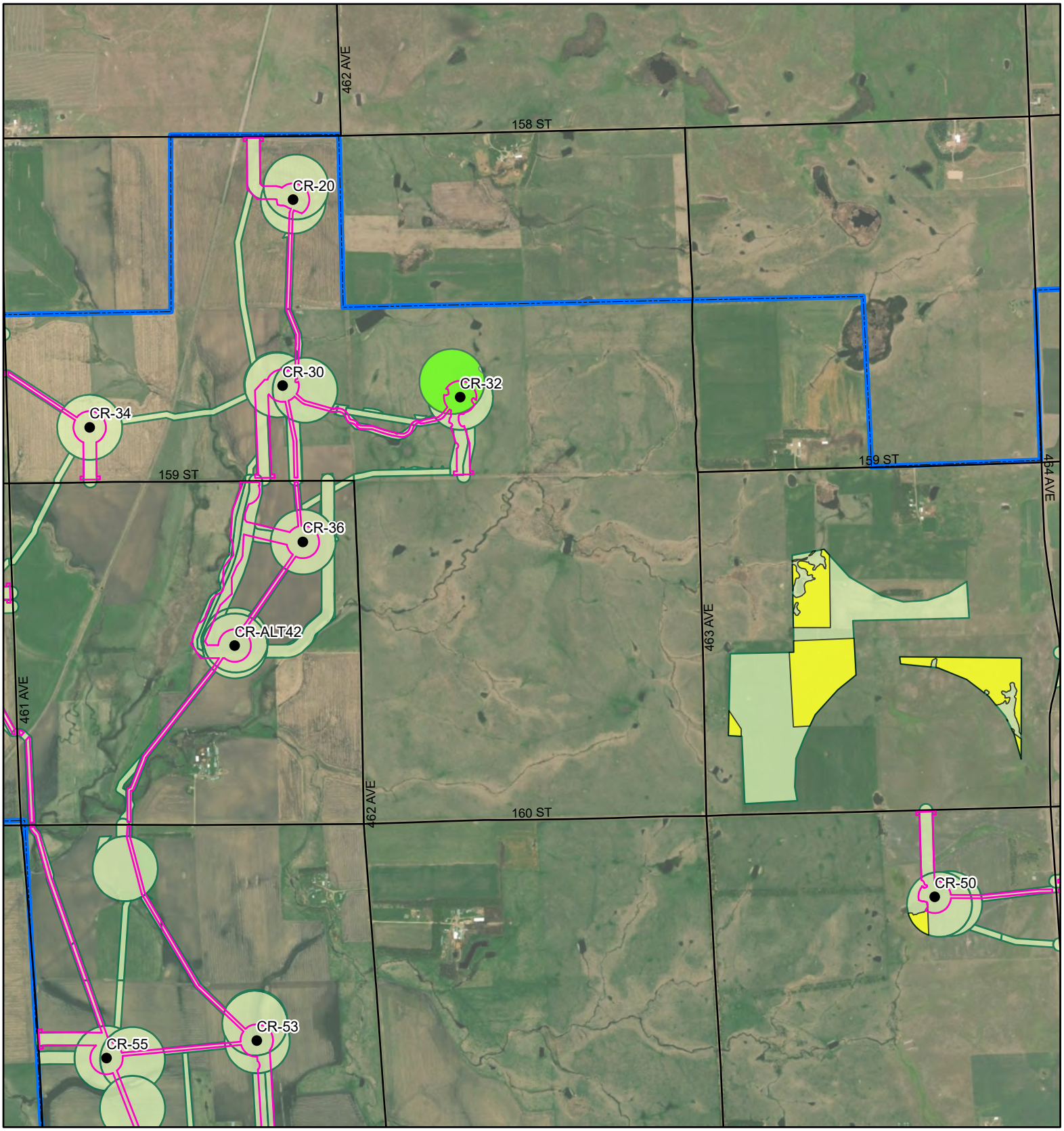

Dakota Skipper

Crowned Ridge Wind Farm

- Primary Turbine
- Alternate Turbine
- City
- Construction Easement
- Existing Road
- Field-Assessed Dakota Skipper Habitat
- Field-Assessed Dakota Skipper Habitat and Presence/Absence Survey Location 2018
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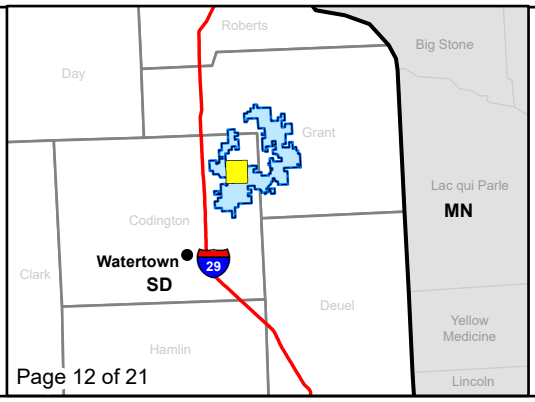
- Batch Plant
- Laydown Yard
- Survey Area
- Project Boundary
- County Boundary



Kilometers
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Miles
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Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Quadrangle: South Shore (1973)

Township/Range: T119N, R51W, T118N, R51W
Codington County, South Dakota

Projection:

021354

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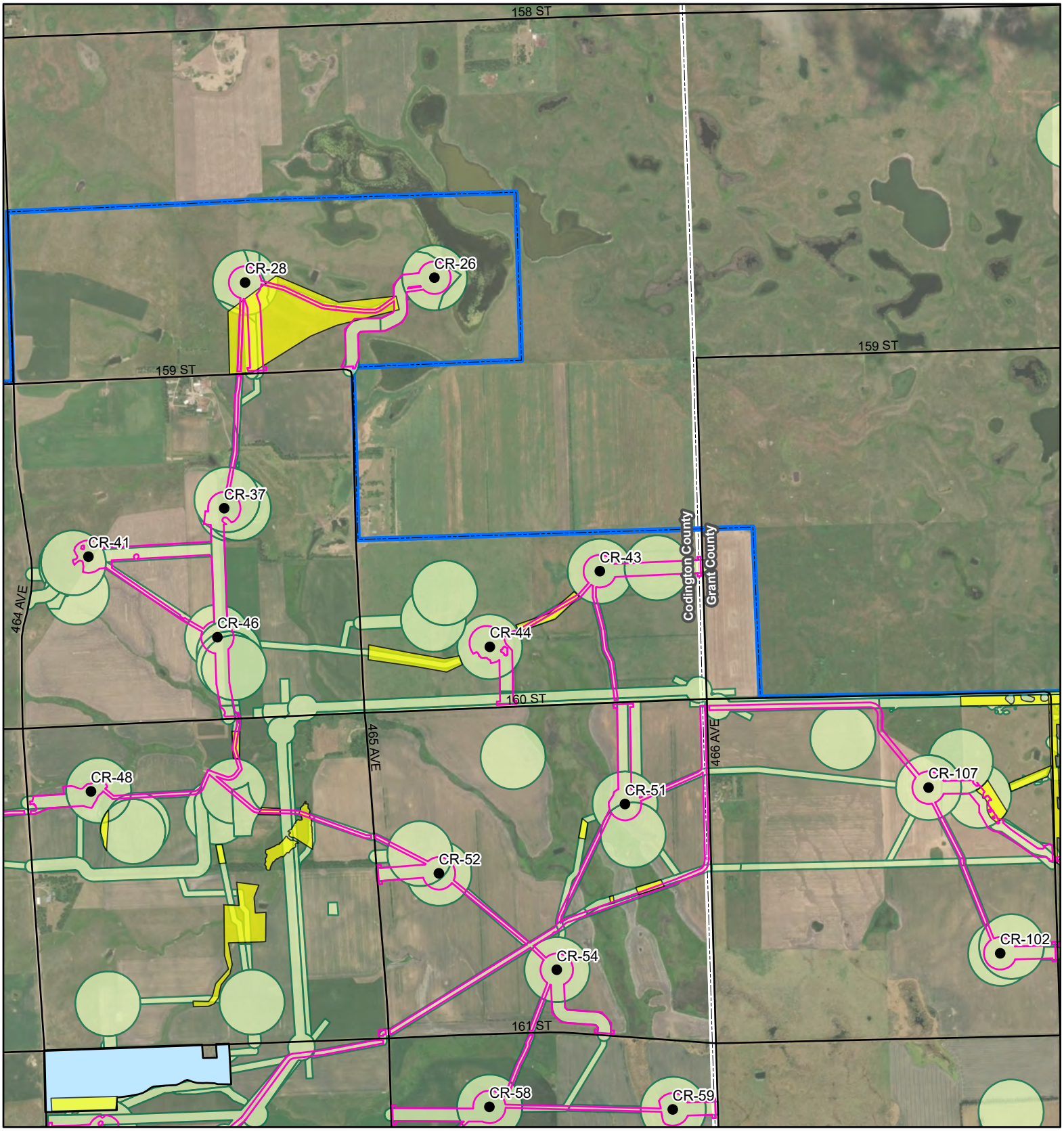

Dakota Skipper

Crowned Ridge Wind Farm

- Primary Turbine
- Alternate Turbine
- City
- Construction Easement
- Existing Road
- Field-Assessed Dakota Skipper Habitat
- Field-Assessed Dakota Skipper Habitat and Presence/Absence Survey Location 2018
- O&M Facility/ Substation
- Batch Plant
- Laydown Yard
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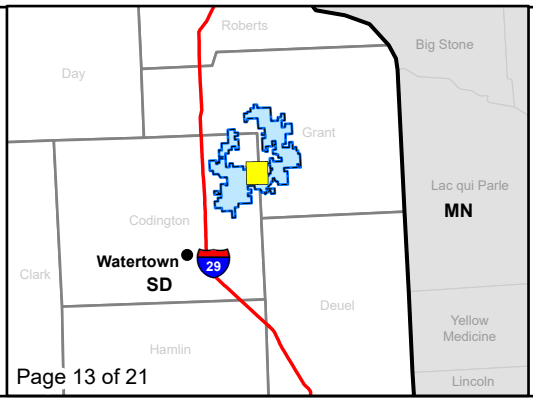
- County Boundary



Kilometers

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Miles

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Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community

Quadrangle: South Shore (1973), Stockholm (1973)

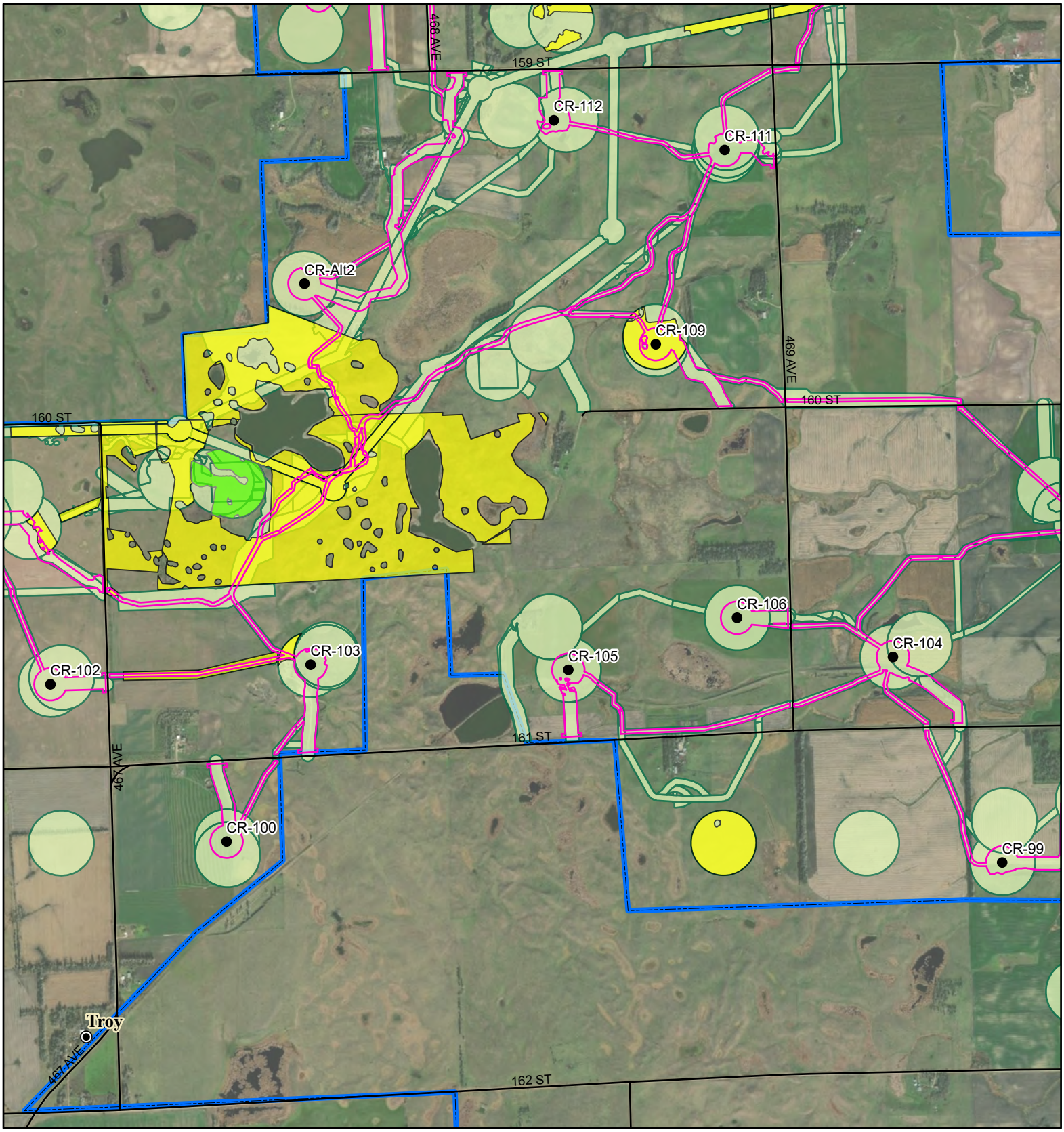
Township/Range: T119N, R51W, T119N, R50W, T118N, R51W, T118N, R50W

Codington and Grant Counties, South Dakota

Projection:

021355

SWCA ENVIRONMENTAL CONSULTANTS



Dakota Skipper

Crowned Ridge Wind Farm

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- Alternate Turbine
- City
- Construction Easement
- Existing Road
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- Field-Assessed Dakota Skipper Habitat and Presence/Absence Survey Location 2018
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- Laydown Yard
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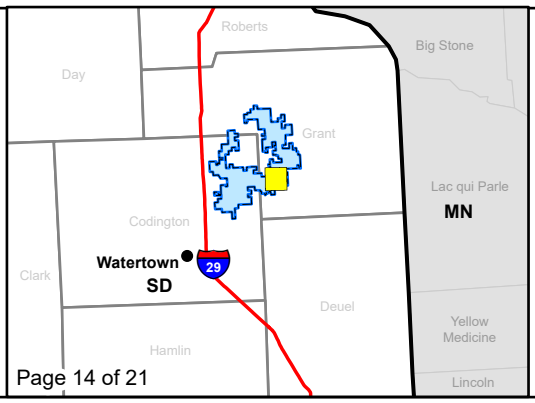
- County Boundary



Kilometers

0 0.5 1

Miles

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N W E S

Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community

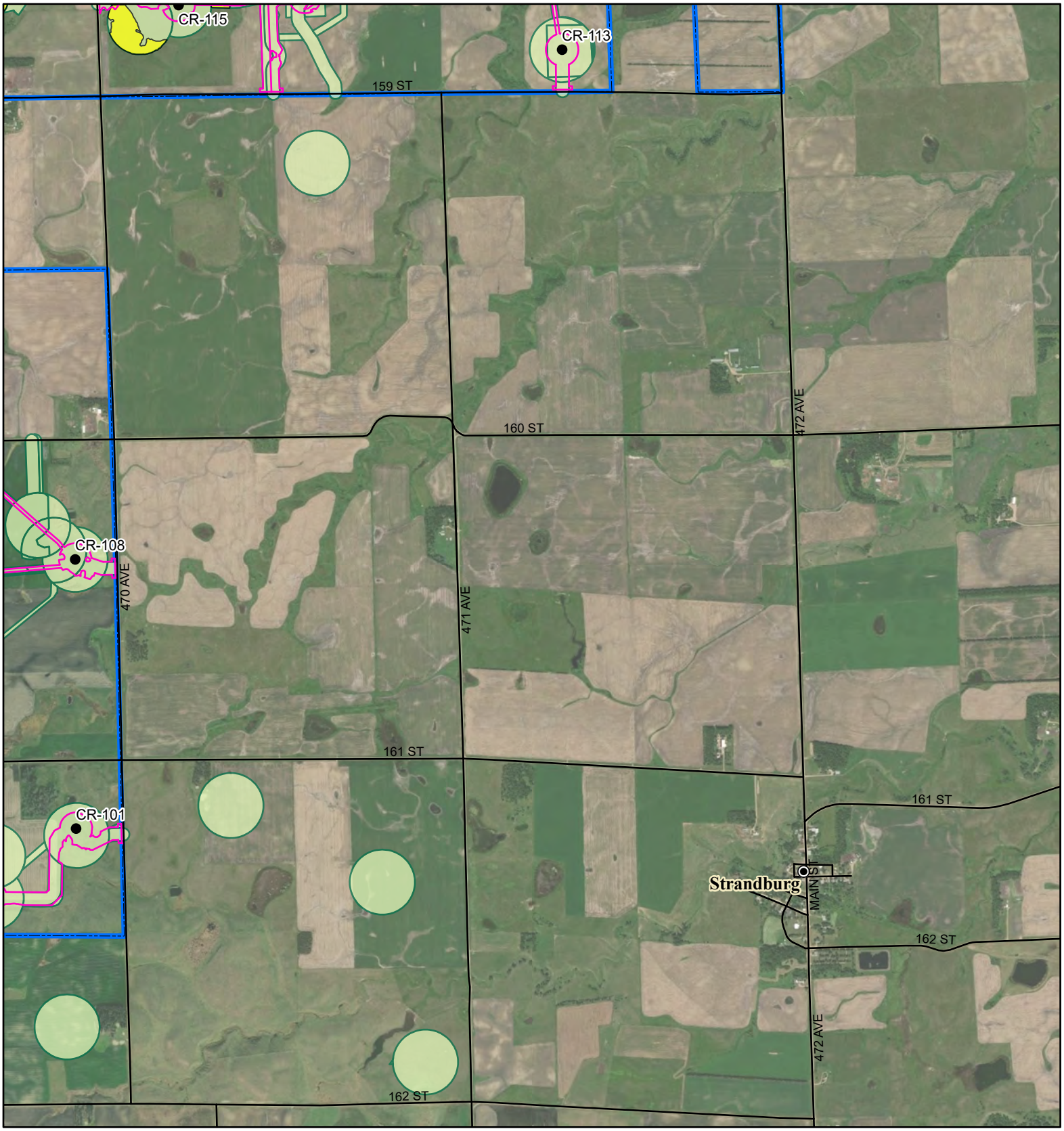
Quadrangle: Stockholm (1973)

Township/Range: T119N, R50W, T118N, R50W

Grant County, South Dakota

Projection:

021356 SWCA ENVIRONMENTAL CONSULTANTS



Dakota Skipper

Crowned Ridge Wind Farm

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- Alternate Turbine
- City
- Construction Easement
- Existing Road
- Field-Assessed Dakota Skipper Habitat
- Field-Assessed Dakota Skipper Habitat and Presence/Absence Survey Location 2018
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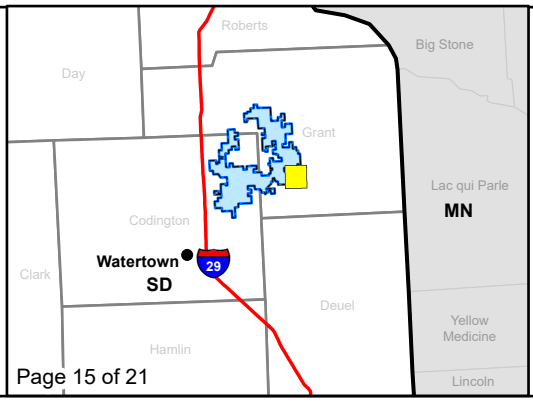
- Batch Plant
- Laydown Yard
- Survey Area
- Project Boundary
- County Boundary



Kilometers
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Miles
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N W E S

Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Quadrangle: Stockholm (1973)

Township/Range: T119N, R50W, T118N, R50W
Grant County, South Dakota

021357

SWCA ENVIRONMENTAL CONSULTANTS

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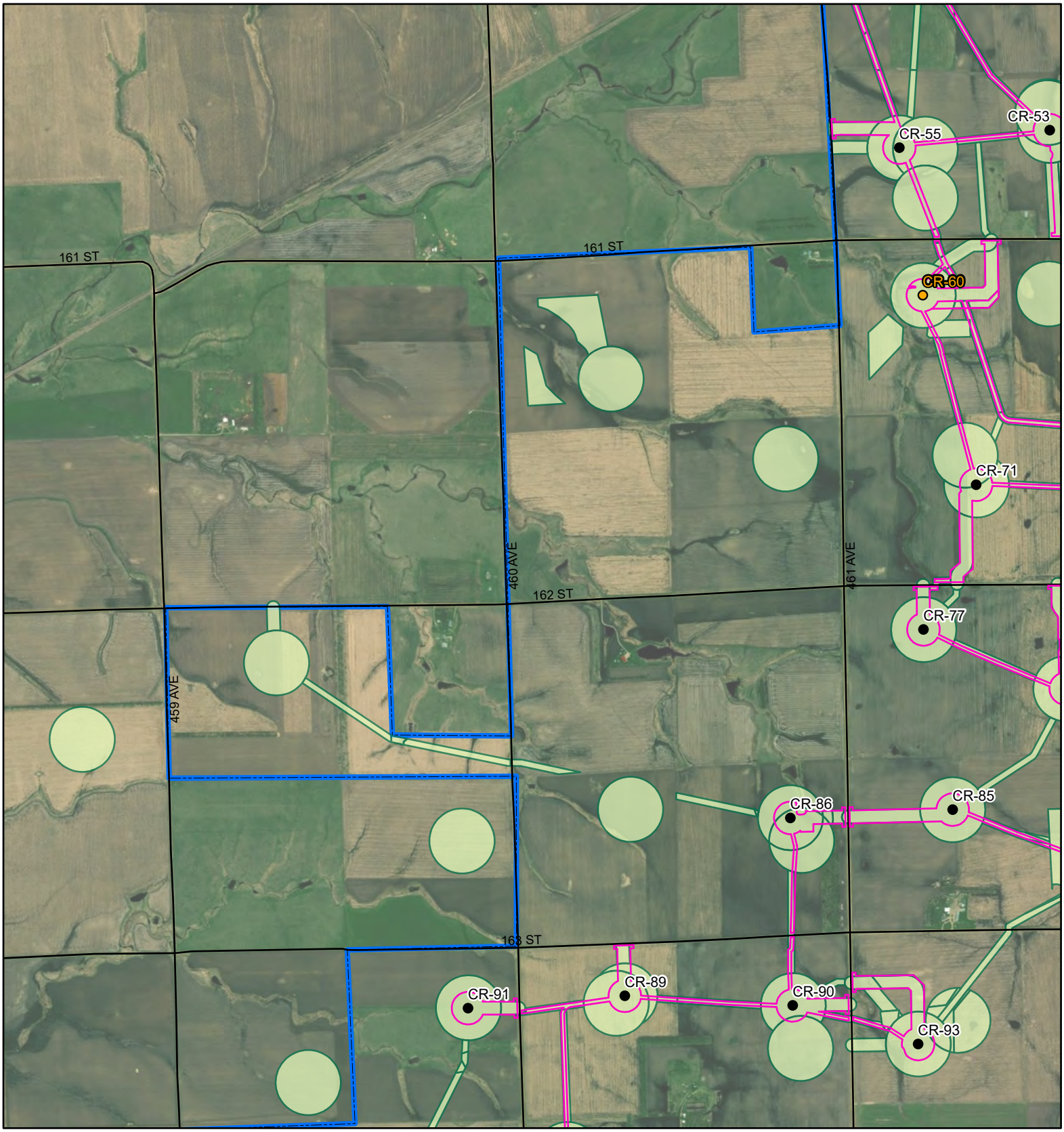

Dakota Skipper

Crowned Ridge Wind Farm

- Primary Turbine
- Alternate Turbine
- City
- Construction Easement
- Existing Road
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- Field-Assessed Dakota Skipper Habitat and Presence/Absence Survey Location 2018
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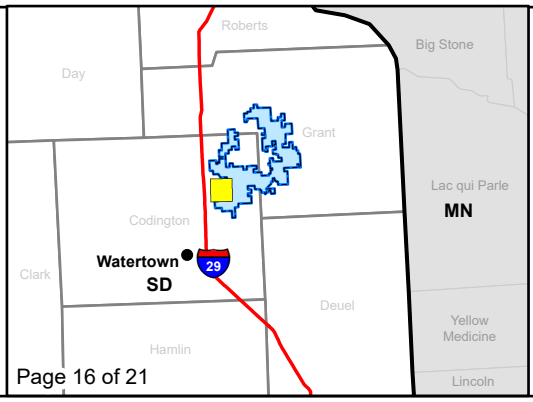
- Batch Plant
- Laydown Yard
- Survey Area
- Project Boundary
- County Boundary



Kilometers

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Miles

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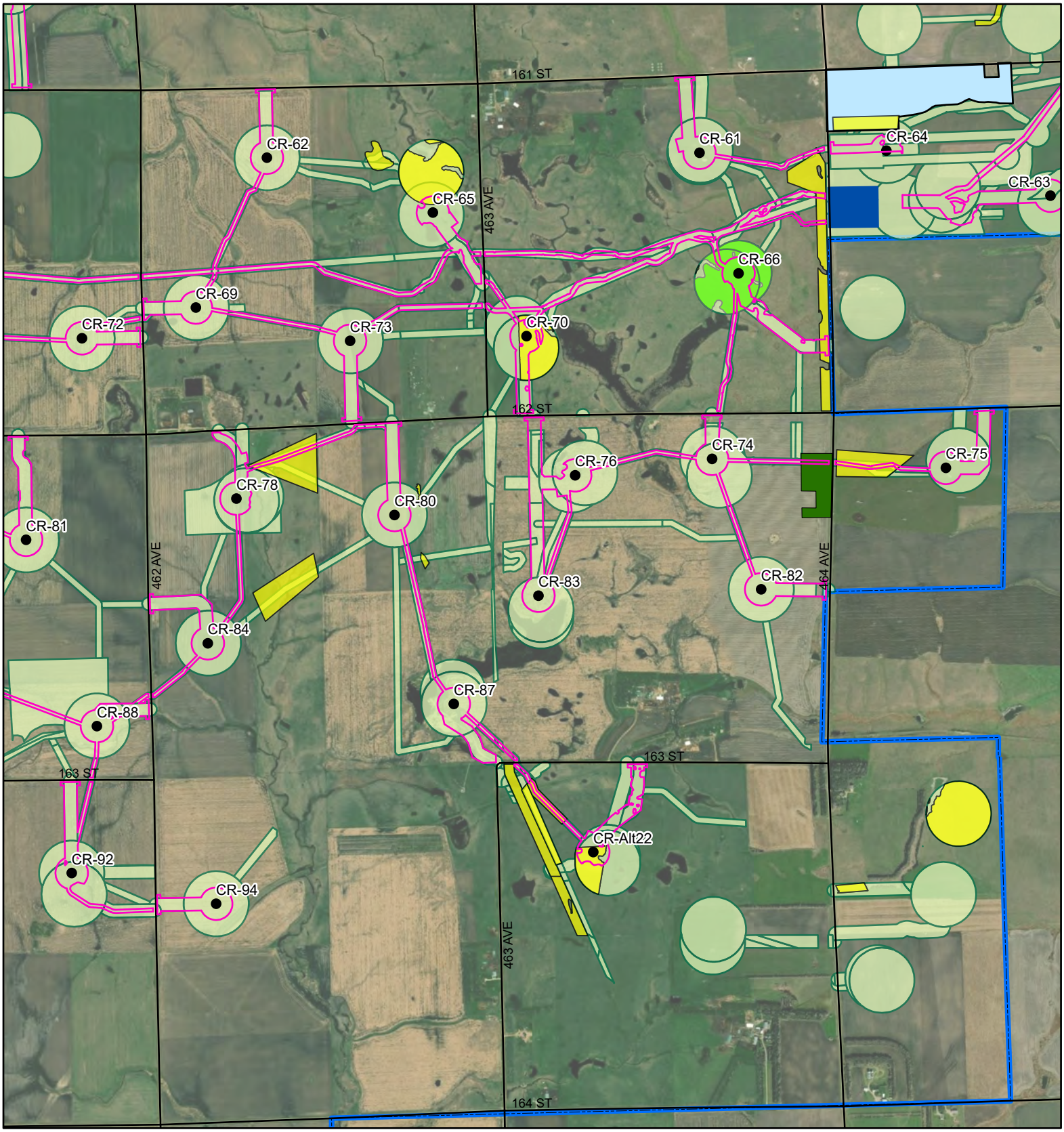
N W E S

Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Quadrangle: Still Lake SE (1970), South Shore (1973)
Township/Range: T118N, R52W, T118N, R51W
Codington County, South Dakota

Projection:

021358 SWCA ENVIRONMENTAL CONSULTANTS



Dakota Skipper

Crowned Ridge Wind Farm

- Primary Turbine
- Alternate Turbine
- City
- Construction Easement
- Existing Road
- Field-Assessed Dakota Skipper Habitat
- Field-Assessed Dakota Skipper Habitat and Presence/Absence Survey Location 2018
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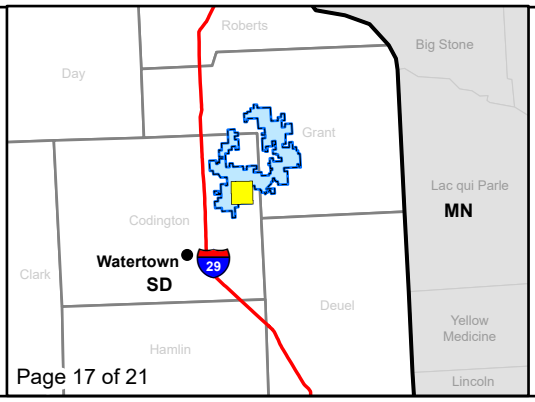
- Batch Plant
- Laydown Yard
- Survey Area
- Project Boundary
- County Boundary



Kilometers
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Miles
0 0.25 0.5

N W E S

Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Quadrangle: South Shore (1973)

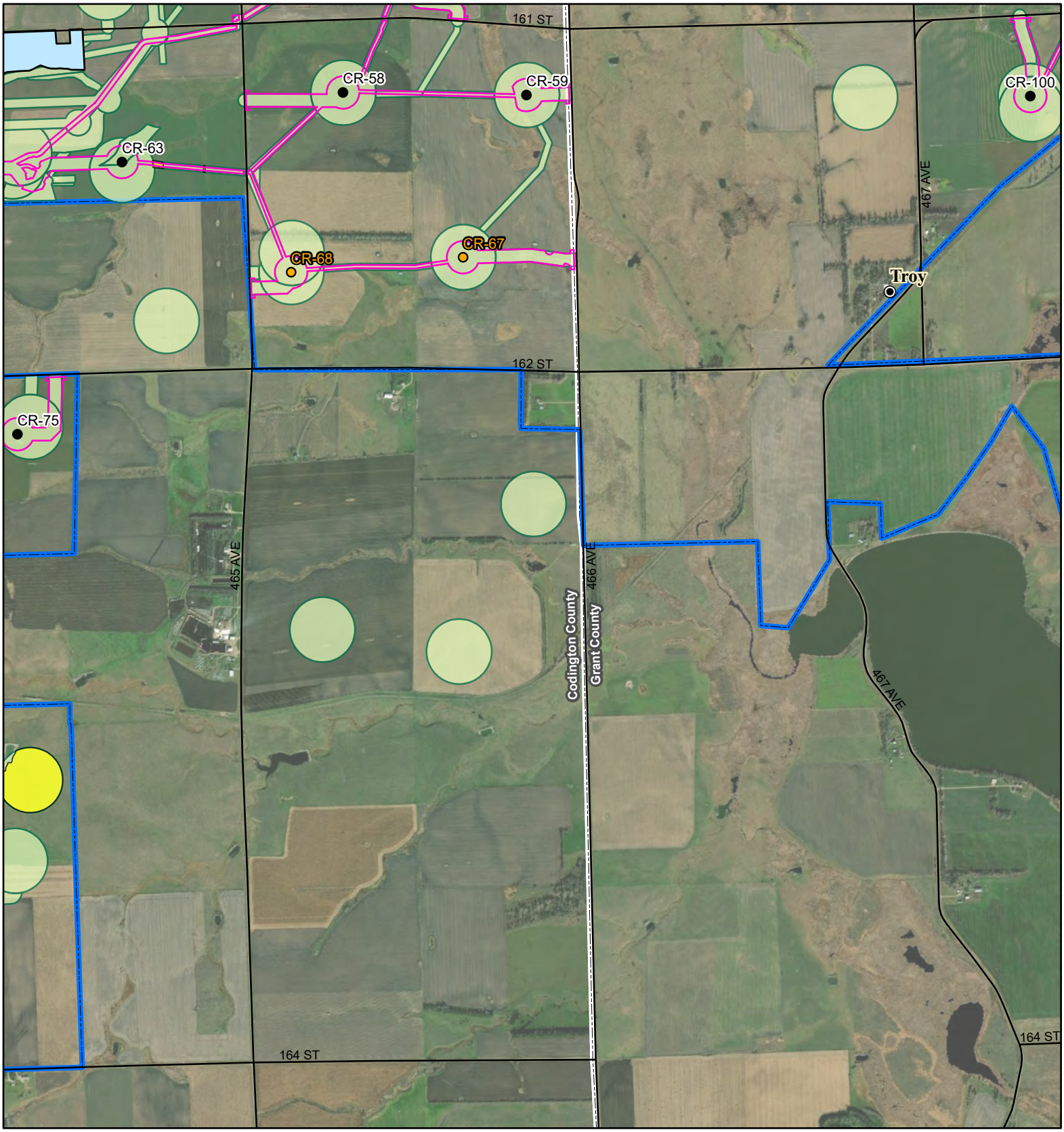
Township/Range: T118N, R51W

Codington County, South Dakota

Projection:

021359

SWCA ENVIRONMENTAL CONSULTANTS



Dakota Skipper

Crowned Ridge Wind Farm

- Primary Turbine
- Alternate Turbine
- City
- Construction Easement
- Existing Road
- Field-Assessed Dakota Skipper Habitat
- Field-Assessed Dakota Skipper Habitat and Presence/Absence Survey Location 2018
- O&M Facility/ Substation
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- Laydown Yard
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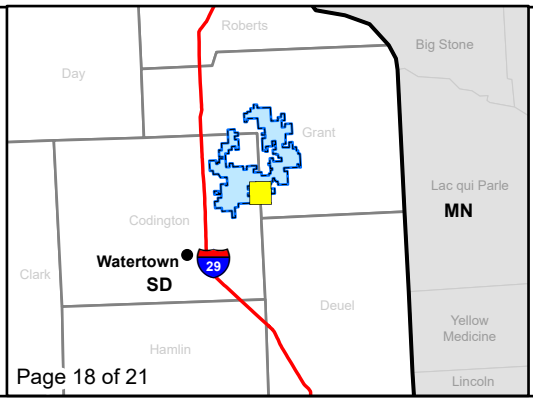

Kilometers
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Miles
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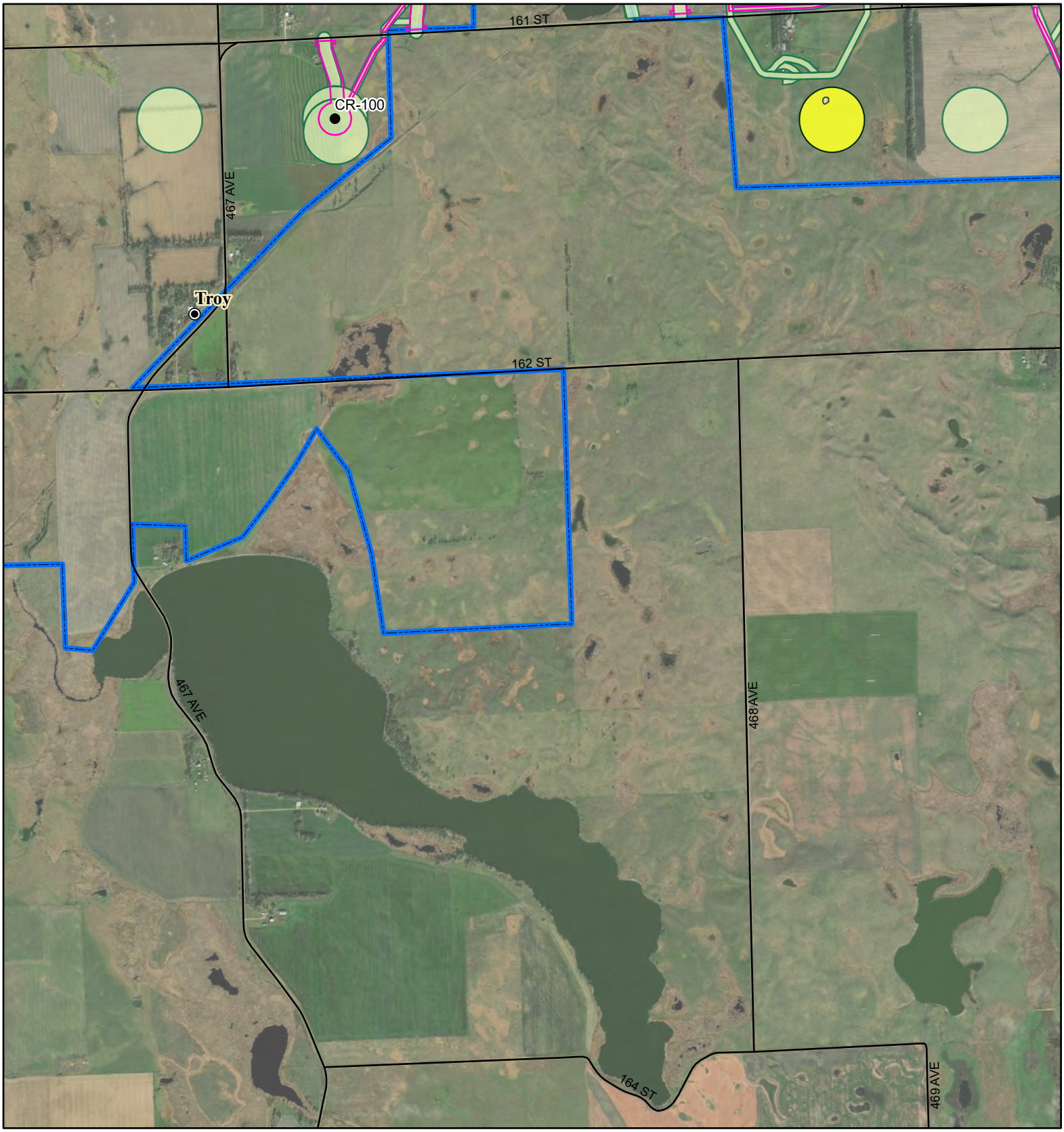
Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Quadrangle: South Shore (1973), Stockholm (1973)
Township/Range: T118N, R51W, T118N, R50W
Codington and Grant Counties, South Dakota

Projection:

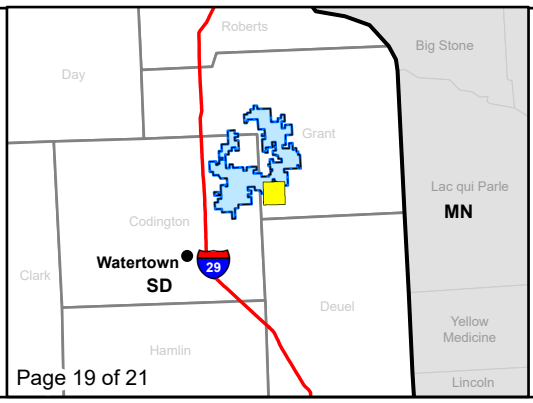
021360 SWCA ENVIRONMENTAL CONSULTANTS



Dakota Skipper

Crowned Ridge Wind Farm

- Primary Turbine
- Alternate Turbine
- City
- Construction Easement
- Existing Road
- Field-Assessed Dakota Skipper Habitat
- Field-Assessed Dakota Skipper Habitat and Presence/Absence Survey Location 2018
- O&M Facility/ Substation
- Batch Plant
- Laydown Yard
- Survey Area
- Project Boundary
- County Boundary



Kilometers
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Miles
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Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Quadrangle: South Shore (1973), Stockholm (1973)
Township/Range: T118N, R50W

Grant County, South Dakota

Projection:

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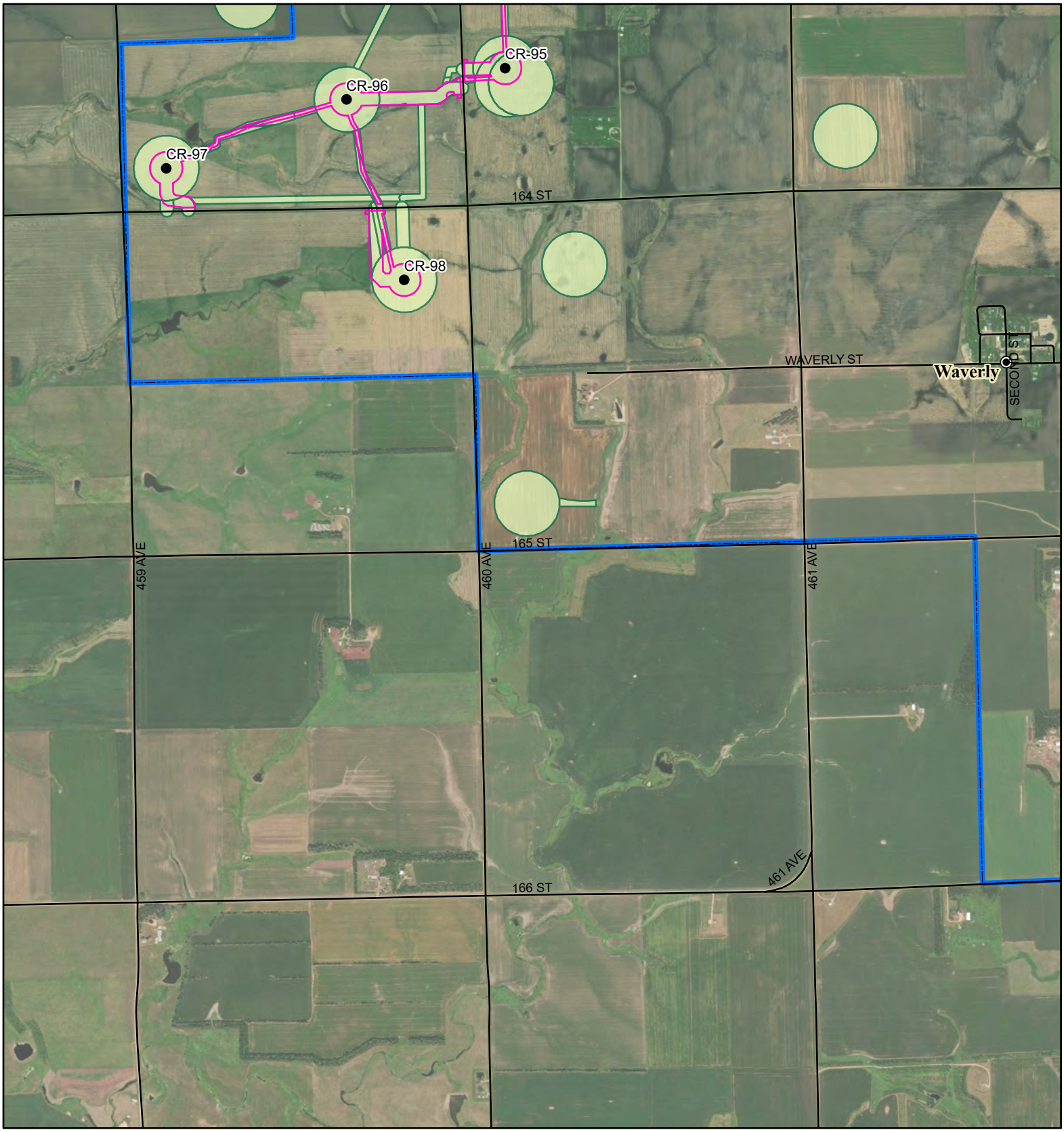

Dakota Skipper

Crowned Ridge Wind Farm

- Primary Turbine
- Alternate Turbine
- City
- Construction Easement
- Existing Road
- Field-Assessed Dakota Skipper Habitat
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- Batch Plant
- Laydown Yard
- Survey Area
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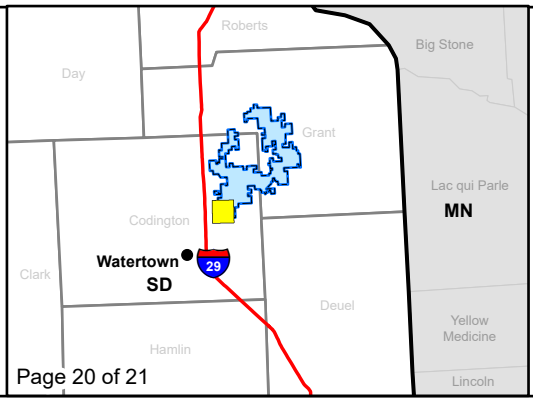
- County Boundary



Kilometers
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Miles
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Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Quadrangle: Still Lake SE (1970), Watertown East (1969), South Shore (1973), Kranzburg (1970)
Township/Range: T118N, R52W, T118N, R51W, T117N, R52W, T117N, R51W
Codington County, South Dakota

Projection:

021362

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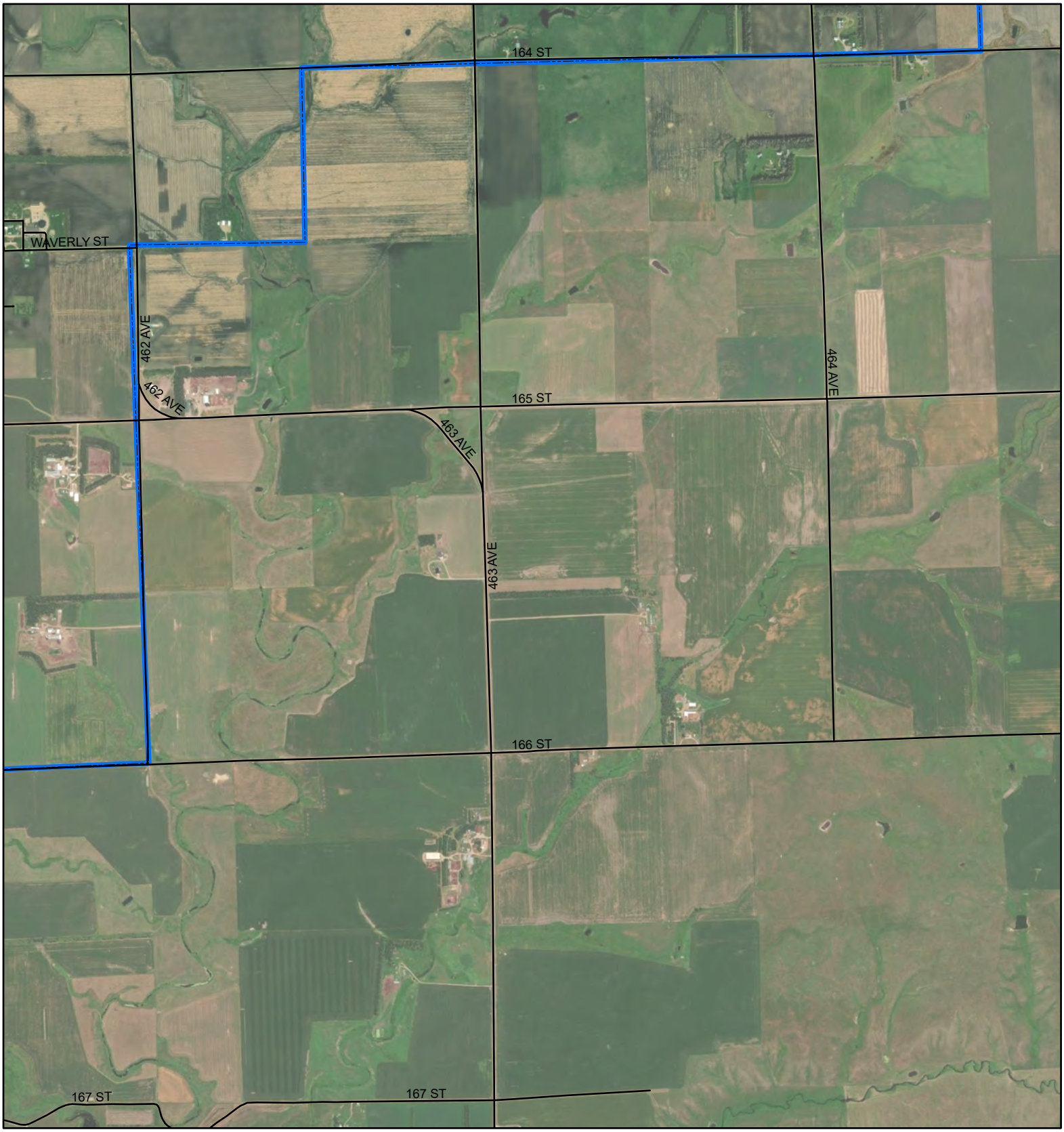

Dakota Skipper

Crowned Ridge Wind Farm

- Primary Turbine
- Alternate Turbine
- City
- Construction Easement
- Existing Road
- Field-Assessed Dakota Skipper Habitat
- Field-Assessed Dakota Skipper Habitat and Presence/Absence Survey Location 2018
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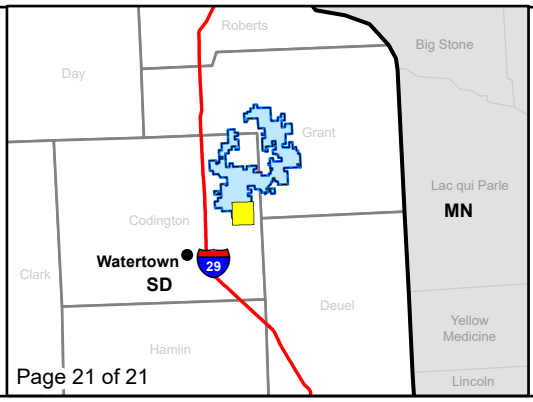

Kilometers
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Miles
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Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Quadrangle: South Shore (1973), Kranzburg (1970)
Township/Range: T118N, R51W, T117N, R51W
Codington County, South Dakota

Projection:

021363

SWCA ENVIRONMENTAL CONSULTANTS

APPENDIX C

Post-construction Fatality Monitoring Protocol

PROPOSED STANDARDIZED POST-CONSTRUCTION FATALITY MONITORING

The following sections describe the protocol for standardized fatality monitoring. This monitoring framework consists of standardized carcass searches conducted at a sample of the Project turbines. The number of fatalities found during searches represents a minimum number of fatalities at a project because not all fatalities that occur are found by observers. Therefore, carcass persistence trials and searcher efficiency trials will be conducted concurrently with standardized fatality monitoring to account for the bias attributable to carcass removal by scavengers and searcher efficiency. Fatality rates (e.g., birds/turbine/year and birds/operational MW/year) will then be estimated using statistical methods that adjust the number of carcasses found for detection biases. Per-turbine and per-megawatt estimates provide different ways of scaling fatality information to be comparable to other projects. Annual fatality rates will be calculated for all bird species combined, small (less than or equal to 10 inches) and large (greater than10 inches) birds, raptors, and sensitive species (collectively). In some cases, the sample size for a species group of interest, such as eagles or other sensitive species, may be too small to allow for the calculation of accurate fatality estimates. In these cases, numerical counts of total fatalities detected during standardized and operational searches for each of these species or species groups will be substituted in place of rate estimates.

The field and analytical methods described below are consistent with post-construction fatality monitoring being conducted, or proposed, for other wind projects elsewhere in the United States (Johnson et al. 2003; Young et al. 2003; Jain et al. 2007; Huso 2011; Strickland et al. 2011).

Methods and timing outlined here may be modified over the course of the study as Project-specific information is gained to maximize the effectiveness and efficiency of the monitoring program (e.g., search interval, number of turbines searched, plot size).

STANDARDIZED CARCASS SEARCHES

The objective of the fatality monitoring is to identify the bird and bat species found as fatalities at the Project and to statistically estimate fatality rates. This section outlines the methods for the standardized carcass searches, which constitutes the initial step in generating the fatality estimate (i.e. finding the carcasses under the turbines). These values then will be adjusted to account for detection bias (see below). The methods for standardized carcass searches include the sampling duration and intensity, search plot size and configuration, and fatality documentation.

SAMPLING DURATION AND INTENSITY

Standardized post-construction fatality monitoring will consist of standardized searches of approximately 30 percent of the turbines and will be conducted for the first year of operation. To avoid bias in the fatality estimate, turbines will be selected in a stratified random manner based on habitat type and topography. To do this, habitat and topography will be determined for each turbine location and the sample turbines randomly selected from the habitat and topography categories in proportion to how often they occur in these categories. The same turbines will be searched the entire year of the baseline monitoring period to avoid confounding effects from individual turbines.

The survey year will be divided into seasons to allow for the inclusion of season-specific searcher efficiency probabilities and carcass persistence times. Searches at each of the designated turbines will initially be conducted every 2 weeks. However, search frequency may be adjusted based on the results of seasonal carcass persistence trials in order to ensure that on average, the search interval minimizes the bias associated with carcass removal by scavengers (see below).

Seasonal sampling intervals will be as follows:

- Spring: March 16–June 15
- Summer: June 16–September 14
- Fall/Winter: September 15–December 15

SEARCH PLOT SIZE AND CONFIGURATION

It is anticipated that the turbine and roads will remain clear of vegetation. The search area will consist of a square search plot centered on the turbine. The minimum distance from the turbine to the perimeter of the square will be eighty (80) percent of the turbine height. The search plot size is based on recommendations from the USFWS (2012). Search areas will include maintained turbine pads and access roads, as well as adjacent unmaintained areas. The actual area searched will ultimately be dependent on the configuration of the maintained areas, as well as the portion of the unmaintained area that can be realistically searched as determined during the initial surveys.

Linear transects will be established within the search plots approximately 6 meters (20 feet) apart (USFWS 2012). The searchers will walk along each transect searching both sides out to 3 meters (10 feet) for fatalities. Personnel trained and tested in proper search techniques will conduct the carcass searches.

FATALITY DOCUMENTATION

During the set-up for carcass surveys, a sweep survey will be conducted to remove any fatalities that occurred before the study is initiated. These carcasses will be documented in the same manner as those found during the standardized carcasses searches; however, they will not be included in the statistical analysis because the statistical analysis requires a known search interval (i.e. an estimate of when fatalities occurred).

Searchers will assume that carcasses found are a result of turbine collisions unless the cause of death can be clearly attributed to a non-turbine cause. Although an unknown number of fatalities may result from natural predation, disease, or anthropogenic events (e.g., shooting), the condition of the carcasses when found rarely facilitates determining the cause of death.

Carcasses found during standardized carcass searches will be assigned a unique number, and species, sex, age, date, time found, location (global positioning system [GPS] coordinate, and distance/direction from the turbine), condition (e.g., intact, scavenged, feather spot), observer, turbine number, and any comments that may indicate cause of death will be collected. All carcasses will be photographed in situ. Once documented, carcasses will be marked in a standardized fashion (e.g., clipping of primary flight feathers) to indicate they have already been recorded. Carcasses will be left in place unless otherwise specified by Project-specific collection permits, if applicable.

Searchers may discover carcasses incidental to standardized carcass searches (e.g., outside of a search plot or of a scheduled survey date). For each incidentally discovered carcass, the searcher will identify,

photograph, and record data for the carcass, as would be done for carcasses found during standardized scheduled searches but will code these carcasses as incidental discoveries. Incidental discoveries will not enter into the statistical calculation of fatality rate for reasons noted above for carcasses found during initial set-up.

All native birds in North America are protected under the MBTA and cannot be salvaged without a permit from the USFWS. In addition to a federal permit, a South Dakota Scientific Collectors permit is needed from SDGFP to handle native wildlife. This plan assumes that bird carcasses will be left in place and will not be salvaged unless otherwise directed by the appropriate agencies after discovery. If the carcass of a federally listed species is found, searchers will follow procedures identified within the Wildlife Response and Reporting System (Appendix C).

BIAS CORRECTION TRIALS

Carcass persistence time estimates the amount of time a carcass remains on-site prior to its disappearance from the search area due to scavenging or other means (e.g., due to forces such as wind and rain or decomposition beyond recognition). The objective of the carcass persistence trials is to document the length of time carcasses remain in the search area. Carcass persistence trials will be conducted in multiple seasons to evaluate seasonal differences in carcass persistence (i.e. due to changes in scavenger population density or type) and possible differences in the size of the animal being scavenged.

Carcasses used in the trials will be selected to represent a range of species sizes, including bats. For large birds, carcasses may include domestic waterfowl, pheasant, or similar species legally obtained from game farms. For small birds and bats, carcasses may include European starlings, house sparrows, or other non-native species not legally protected. For bats, we may also use mice.

Assuming adequate carcass availability, one carcass persistence trial will be conducted during each of the spring, summer, and fall/ winter seasons with at least 15 carcasses of each bird size class (large bird, small bird, and bat) placed per season.

Each carcass used for the carcass persistence trial will be placed randomly within the area used for the trials. Random locations will be generated and loaded into a GPS as waypoints to allow the accurate placement of the carcasses by field personnel. Carcasses will be dropped from waist height and allowed to land in a random posture. Each trial carcass will be discreetly marked (e.g., small tag or wire wrapped around one leg) prior to dropping so that it can be identified as a study carcass if it is found by other searchers or wind facility personnel. Personnel will monitor the trial carcasses on days 1, 2, 3, 4, 7, 10, 14, 21, and 30. When checking the carcass, searchers will record the condition as intact (normal stages of decomposition), scavenged (feathers pulled out, chewed on, or parts missing), feather spot (only feathers left), or gone (cannot be found). Changes in carcass condition will be cataloged with pictures and detailed notes; photographs will be taken at placement and any time major changes have occurred. At the end of the 30-day period, any evidence of carcasses that remain will be removed and properly disposed of.

Estimates of the probability that a carcass persisted between search intervals and therefore was available to be found by searchers, will be used to adjust carcass counts for bias using methods presented in Huso 2011 or similar analysis method. To date, Huso (2011) presents the most bias-free equation for determining the average probability of persistence, which takes into account the length of the search interval and the carcass persistence time:

$$\hat{r} = \frac{\hat{\bar{t}}(I - e^{-I/\hat{\bar{t}}})}{I}$$

Where t is the estimated mean persistence time and I is the length of the interval. A bootstrapped estimate and 90 percent confidence interval will be calculated based on 5,000 iterations for carcass persistence time. Bootstrapping is a statistical re-sampling procedure where the data are re-sampled with replacement to obtain an estimate and confidence interval.

SEARCHER EFFICIENCY TRIALS

The ability of searchers to detect carcasses is influenced by a number of factors including the skill of an individual searcher in finding the carcasses, the vegetation composition within the search area, and the characteristics of individual carcasses (e.g., body size, color). The objective of searcher efficiency trials is to estimate the percentage of bird and bat fatalities that searchers are able to find. Estimates of searcher efficiency are then used to adjust carcass counts for detection bias. Searcher efficiency trials will be conducted in all seasons to account for seasonal differences in searcher efficiency. Carcass species used in the trials and marking and placement techniques will be the same as those in the carcass persistence trials.

Searcher efficiency trials will begin when standardized carcass searches start. Personnel conducting the searches will not know when trials are conducted or the location of the efficiency-trial carcasses. Trials will be conducted multiple times throughout each season and will incorporate testing of each member of the field crew. Assuming adequate carcass availability, at least 15 carcasses of each bird size class (large bird, small bird, and bat) will be placed per season for searcher efficiency trials. A minimum of 10 carcasses per size and season are needed to estimate searcher efficiency. Searcher efficiency trials will be conducted at the monitored turbines. The number of carcasses placed prior to the search (i.e. the number available for detection during each trial) will be verified immediately after the trial by the person responsible for distributing the trial carcasses. Any carcasses not found by searchers will be collected after the trial.

The probability of a carcass being observed is expressed as p, the proportion of trial carcasses that are detected by searchers in the searcher efficiency trials. The probability will be estimated by carcass size class (large bird, small bird, bat) and season. A bootstrapped estimate and 90 percent confidence interval will be calculated based on 5,000 iterations for searcher efficiency.

FATALITY RATE ESTIMATION

To calculate the Project-wide fatality rate (fatalities/turbine/year and fatalities/MW/year) and the total Project fatalities, the Huso estimator (Huso 2011) or other appropriate statistical methods will be used. The fatality rate can be calculated for subgroups, including large birds, small birds, raptors (including eagles), bats, or sensitive species (including BCC and state species of conservation priority) if at least 5 fatalities within the subgroup are found.

The estimation of fatality rates will incorporate fatalities documented during standardized carcass searches adjusted for bias. Specifically, fatality estimates will take into account:

- Search interval;
- Observed number of carcasses found during standardized searches during the monitoring year for which operation of the facility cannot be ruled out as the cause of death;
- Carcass persistence, expressed as the probability that a carcass is expected to remain in the study area (persist) and be available for detection by the searchers during carcass persistence trials; and

- Searcher efficiency, expressed as the probability of trial carcasses found by searchers during searcher efficiency trials.

The Huso estimator (2011) uses the following equation to estimate fatalities:

$$\hat{f}_{ijk} = \frac{c_{ijk}}{\hat{p}_{jk*}\,\hat{r}_{jk*}\,\hat{v}_{jk}}$$

Where f^_ijk is the estimated fatality at the ith turbine during the jth search in the kth category and cijk is the observed number of carcasses at the ith turbine during the jth search in the kth category. The variable r^_jk is a function of the average carcass persistence time, which was described earlier, and the length of the search interval preceding a carcass being discovered. The variable r^_jk is calculated using the lower value of I, the actual search interval when a carcass is found or (I,)˜ ^the effective search interval, and is estimated through searcher efficiency trials previously described. v^_jk is the proportion of the effective search interval sampled where v^= min (1, Ĩ/I). p^_jk is the estimated probability that a carcass in the kth category that is available to be found will be found during the jth search. The variables p^_(jk,) r^_(jk,) and v^_jk are assumed not to differ among turbines but can differ with carcass type, size class, and season. To obtain an estimate of the number of fatalities per turbine the following equation is used:

$$\hat{f} = \frac{\sum_{i=1}^{u}\sum_{j=1}^{n_i}\sum_{k=1}^{2}\hat{f}_{ijk}}{t}$$

Where ni is the number of searches at turbine i (i = 1…u) and t is the effective number of turbines searched. A bootstrapped estimate and 90 percent confidence interval will be calculated based on 5,000 iterations for the fatality estimate. The 90 percent confidence interval represents the upper and lower bounds of the range of fatality rates that has a 90 percent probability of containing the true fatality rate. The 90 percent confidence interval is useful in a management context as a means of assessing the range of fatality rates that are probable given the number of carcasses that were detected. It should be noted that the upper 90 percent confidence limit corresponds to 95 percent probability that the true fatality rate is lower than the upper 90 percent confidence limit.

APPENDIX D

Wildlife Response and Reporting System

WILDLIFE RESPONSE & REPORTING SYSTEM (WRRS) MANUAL

FOR
WIND ENERGY CENTERS

Revised:

AUGUST 2019

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1.0 WILDLIFE MANAGEMENT PROGRAM

1.1 OUR COMMITMENT

As employees of NextEra Energy Resources, we have a responsibility to be good stewards of the environment and to adhere to the law.

Most birds that are seen across the country, including in NextEra Energy Resources' wind plants are protected by one of two laws; the Bald and Golden Eagle Protection Act or the Migratory Bird Treaty Act. Some species have the additional classification of "endangered" or "threatened". Eagles and endangered species have special reporting requirements, and therefore have a special reporting procedure.

Bald and Golden Eagle Protection Act - 16 U.S.C.S. 668 (a)

"Whoever, ...shall ...take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or in any manner, any bald eagle, commonly known as the American eagle, or any golden eagle, alive or dead, or any part, nest, or egg thereof of the forgoing eagles, ...shall be fined not more than $5,000 or imprisoned not more than one year or both for each such violation."

Migratory Bird Treaty Act - 16 U.S.C.S. 703

The Act makes it unlawful to: ship, transport or carry from one state, territory or district to another, or through a foreign country, any bird, part, nest or egg that was captured, killed, taken, shipped, transported or carried contrary to the laws from where it was obtained; import from Canada any bird, part, nest or egg obtained contrary to the laws of the province from which it was obtained. § 705.

Endangered Species Act – 16 U.S.C.S 35

"...it shall be unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to barter, barter, offer to purchase, purchase, deliver for shipment, ship, export, import, cause to be shipped, exported, or imported, deliver for transportation, transport or cause to be transported, carry or cause to be carried, or receive for shipment, transportation, carriage, or export, any migratory bird, any part, nest, or egg of any such bird, or any product, whether or not manufactured, which consists, or is composed in whole or part, of any such bird or any part, nest, or egg thereof..."

1.2 PURPOSE/SUMMARY

The purpose of this manual is to standardize the actions taken by NextEra Energy Resources in response to any wildlife fatalities and/or injuries found within the wind plant boundaries.

Any wildlife injury or fatality found within wind-plant boundaries, regardless of cause of death, should be reported immediately to the operations leader who shall complete an incident report and take photographs. Environmental Services – PGD Support shall be notified and further actions will be determined at that time based on the species and the circumstances surrounding the incident.

1.3 WILDLIFE FATALITIES

In addition to any complete or partial carcasses, any portion of a bird, bat or other animal, including individual feathers and/or bones, are all considered reportable wildlife fatalities. Report all finds even if the carcass and/or parts are not thought to be associated with wind plant operations. All wildlife species shall be reported.

1.4 WILDLIFE INJURIES

The majority of injured birds will have a broken wing. A broken wing will usually hang down oddly or blow in the wind. An injured bird will most likely be on the ground and unwilling or unable to fly. Raptors (any bird of prey or bird with a hooked beak and sharp talons) will sometimes perch on the ground and raptors will sometimes walk on the ground, but not often. If a bird is seen walking or perched on the ground, approach it slowly to see if it will fly away, if it runs away, refusing to fly, it is most likely injured.

Injured animals are dangerous. PGD prohibits personnel from getting too close or touching any wildlife without prior regulatory or PGD approval. This practice is enforced to avoid potential injury to self and to wildlife. Prior to completing any inspection related tasks or the collection of information needed for a report, conduct a risk assessment to define potential risks (e.g., uneven walking surfaces, snakes, etc.). Once safety is

assessed, maintain visual contact with the injured animal while reporting the incident to the operations leader so that the correct process can be determined.

1.5 NON-AVIAN CARCASSES

Non-avian and mammal carcasses pose a potential risk to wind sites, as they may draw avian scavengers to the site. If you see any of the types listed below, it is important to take action to prevent an impact with large raptors.

A **large mammal carcass** is defined as a partial or entire livestock or game animal carcass present on the property. These include, but are not limited to, sheep, cows, horses, elk, and deer. All on-site finds shall be reported even if the carcass and/or parts are not believed to be related to site operations.

A **small mammal carcass** is defined as a small to medium sized animal, including, but not limited to, rabbits, dogs, foxes, coyotes, and prairie dogs. Multiple (5 or more) small mammal carcasses in close proximity to each other shall be reported even if the carcass and/or parts are not believed to be related to site operations.

A **gathering of avian scavengers** is defined as an unusual concentration of scavenging avian species such as crows, ravens, vultures, or eagles. All personnel on site should be observant of any atypical bird activity while traversing the site or visiting turbines for maintenance. Some examples of unusual bird activity that might represent a gathering of scavengers on a carcass could be:

1. Groups of eagles or vultures circling in a focused area
2. Groups of crows or ravens congregating in a specific area
3. Eagles, crows, ravens, or vultures seen perching in unusually high numbers

A significant event is defined as an event in which several large mammal carcasses, or multiple small animal carcasses (including bats), are located on site. Even if avian scavengers are not yet present, it is imperative that significant events are reported immediately, so that steps can be taken to remove the carcasses (if determined to be the course of action by Environmental Services) before avian scavengers are attracted to the site. Additionally, special notifications may be required if multiple bats are found

on-site in a short period of time.

Contact Environmental Services – PGD Support to discuss implications and develop a plan of action. It may be necessary to contact the landowner to have the carcass removed from their property. Environmental Services – PGD Support may also suggest that the State wildlife agency be notified of the potential risk to the site.

In some cases, Law Enforcement may need to be notified in the case of carcasses purposely left on site.

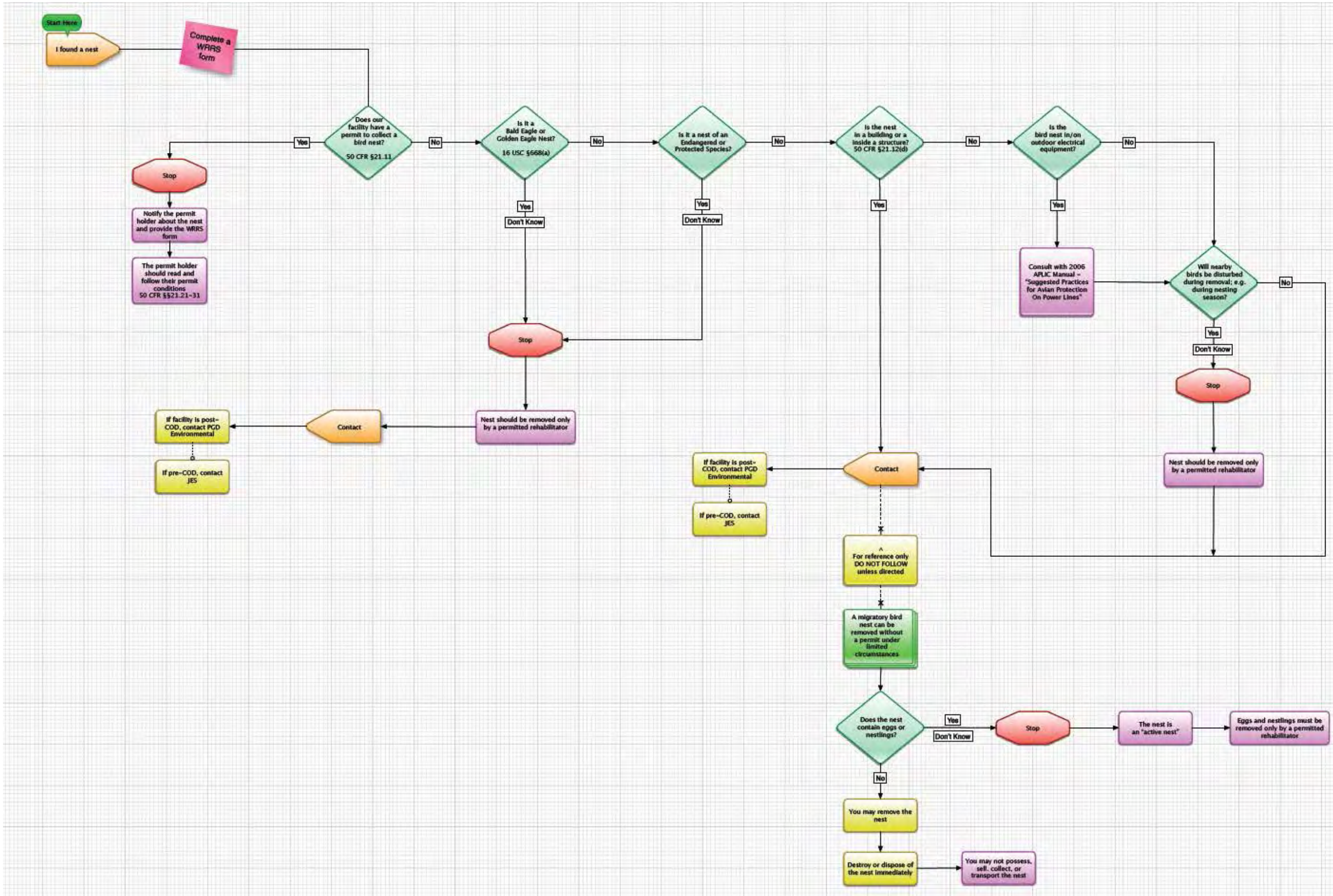
1.6 FINDS WITH BANDS

If you find a wildlife fatality with a band(s) (sometimes found in or around legs, ears or wings of animals), please notify your operations leader, and include this information in your WRRS reporting form. There are several different wildlife and agencies that may need to be contacted.

1.7 NESTS

If you find a nest in, on or around a turbine, power pole, substation, or transformer, please contact your Wildlife Program Manager for guidance. **Do not remove or touch a nest without permission.** Please note that a bird nest could be a collection of eggs with no nesting material below them (barn owl nests, for example).

The following flow chart (I Found a Nest Flow chart (OpModel) was developed as guidance for when the discovery of a nest has been made.


Start Here
I found a nest
Complete a WRRS form
Does our facility have a permit to collect a bird nest?
50 CFR §21.11
Yes
No
Stop
Notify the permit holder about the nest and provide the WRRS form
The permit holder should read and follow their permit conditions
50 CFR §§21.21-31
Is it a Bald Eagle or Golden Eagle Nest?
16 USC §668(a)
No
Yes
Don't Know
Is it a nest of an Endangered or Protected Species?
No
Yes
Don't Know
Stop
Nest should be removed only by a permitted rehabilitator
Contact
If facility is post-COD, contact PGD Environmental
If pre-COD, contact JES
Is the nest in a building or a inside a structure?
50 CFR §21.12(d)
No
Yes
Is the bird nest in/on outdoor electrical equipment?
No
Yes
Consult with 2006 APLIC Manual - "Suggested Practices for Avian Protection On Power Lines"
Will nearby birds be disturbed during removal; e.g. during nesting season?
No
Yes
Don't Know
Stop
Nest should be removed only by a permitted rehabilitator
Contact
If facility is post-COD, contact PGD Environmental
If pre-COD, contact JES
^
For reference only DO NOT FOLLOW unless directed
A migratory bird nest can be removed without a permit under limited circumstances
Does the nest contain eggs or nestlings?
Yes
Don't Know
Stop
The nest is an "active nest"
Eggs and nestlings must be removed only by a permitted rehabilitator
No
You may remove the nest
Destroy or dispose of the nest immediately
You may not possess, sell, collect, or transport the nest

FPL Energy, 700 Universe Boulevard, Juno Beach, FL, 33408
561-694-3107

FPL Energy

MEMO

To Skelly Holmbeck

From David Cleary

Date May 13, 2008

Subject Bird Nest Management

PRIVILEGED & CONFIDENTIAL
ATTORNEY – CLIENT COMMUNICATION

Question Presented: If a wind facility encounters a bird nest, what options does the facility have regarding removal?

Response: Our options rely primarily on whether the nest is "inactive" (has no eggs or young in it). If no eggs or young are present in the nest, the US Fish & Wildlife Service has opined that there is no Migratory Bird Treaty Act violation if the nest is removed without subsequent possession. Bald Eagle or Golden Eagle nests may not be removed without a permit, even if the nest is inactive. The inactive nest of an unidentified bird, or a bird otherwise suspected to be listed as threatened or endangered under the Endangered Species Act should not be disturbed without consulting JES and legal counsel.

On April 15, 2003, the US Fish & Wildlife Service issued an interpretive memorandum to resolve issues surrounding nest destruction and the Migratory Bird Treaty Act. See Attachment 1. The general concept is that USFWS agrees that unoccupied nests of birds protected only by the MBTA may be removed. In no event is the nest to be "possessed," retained, or transported, or sold by FPLE in any way without first obtaining a permit.

On October 5, 2007, the USFWS amended its rules (50 CFR Part 21.12. See Attachment 2) regarding the removal of migratory birds (other than ESA listed or bald or golden eagles) from a building or structure by the general public without a permit. The permit exceptions are found in 50 CFR 21.12(d)(1), and include removal of a trapped bird because of a health threat, a threat to human safety, and even a "threat to commercial interests," such as products for sale.

However, the new rule carries an important exception regarding active nests. As stated in 50 CFR 21.12(d)(10), if a nest with eggs or nestlings is present, then the 21.12(d)(1) exceptions do not apply, and the assistance of a "federally permitted migratory bird rehabilitator" must be obtained to remove the eggs or nestlings.

A lawfully removed nest may not be possessed in any way after removal unless a permit is obtained, since an unpermitted nest will be deemed to be held for a commercial purpose, which is prohibited.

The USFWS advises that all actions must comply with State and local laws and ordinances. In the case of a mere migratory bird's empty nest, violation of such laws (including animal cruelty laws) would be remote, but consult with JES and legal counsel before taking any action where doubt exists.

For advice regarding other types of bird nest encounters with electrical equipment, please consult the APLIC's final report, *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006.* I believe JES has many extra copies, and the book includes a searchable CD in the back as well.

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2.0 PROCEDURES

2.1 INSPECTIONS

The NextEra Energy Resources Wildlife Response and Reporting System relies solely on wind technicians and other site personnel to find and report birds, bats and other animals. Wildlife Inspections shall be completed as part of the Inspection of Watch (IOW) procedure.

Wildlife inspections must be conducted in accordance with our lease/easement agreements with individual landowners. Confirm these conditions prior to conducting any wildlife inspections. It is expected that the entire inspection process is completed during the Inspection of Watch. However, if damage to crops or other landowner property could occur during the inspection, do not trespass or damage property.

CRITICAL SUCCESS FACTORS:

- Ability to safely and legally walk the terrain around the wind turbine
- Awareness of animals or signs of animals on site property
- Ability to recognize when an animal is in distress
- Ability to immediately contact operations leader / Environmental Services to report the find
- Ability to ensure full compliance with any permit requirements, if any
- Knowledge of procedures for inspections and reporting

INSPECTION PROCEDURE

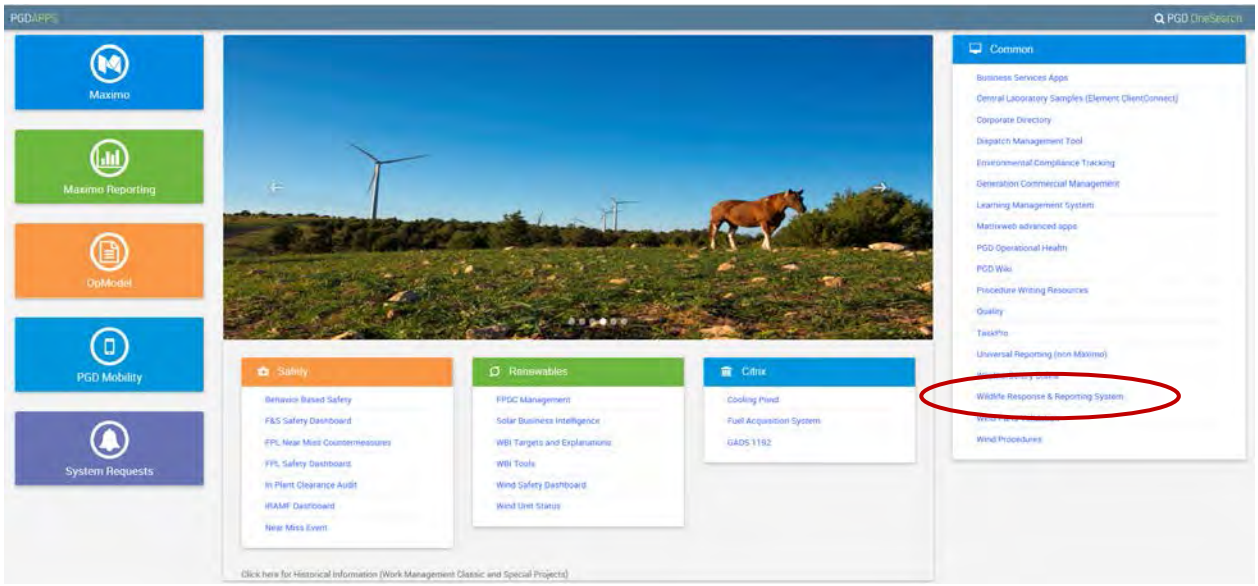
1. Upon arrival at the turbine complete all safety requirements. Please be aware of special on site hunting seasons while performing the inspections. This includes Risk Assessment Mitigation Forms (RAMF). Put on all applicable personal protective equipment (PPE). Remember that if at any time you feel your safety is compromised, **DO NOT** complete the Inspection. Beware of uneven walking surfaces, snake hazards, or other potential risks.
2. A complete Wildlife Inspection consists of three “Inspection Circles” that shall be walked. Each Inspection Circle consists of slowly walking around the turbine, scanning the ground as you walk, looking to the right and left, and checking on any suspicious objects in the distance. End “Inspection Circle” where you began.
3. To complete the first circle: Begin at the base of the turbine, walk away from the turbine 30 feet and complete one full Inspection Circle (see step 2) keeping **30** feet from the turbine. A good estimate of distance is 1 long step = 1 yard (3 feet).
4. To complete the second circle, walk out another 60 feet, and complete another Inspection Circle; keeping **90** feet away from the turbine.
5. To complete the third and final circle, walk out another 60 feet and complete another Inspection Circle keeping **150** feet from the turbine.
6. When the last circle is completed, answer the appropriate questions on the IOW checklist.
7. Immediately notify the operations leader if an animal is found, and then continue with the Reporting Procedures.
8. The IOW checklist shall be synced by the end of the day and accessible via the IOW dashboard.
9. All wildlife fatalities or injuries found during wildlife inspections shall be reported following the site procedures. Ensure a full report is submitted to Environmental Services using the SharePoint application (PGD Applications; common applications; Wildlife Response and Reporting System). See section 2.2.

2.2 INCIDENT REPORTS

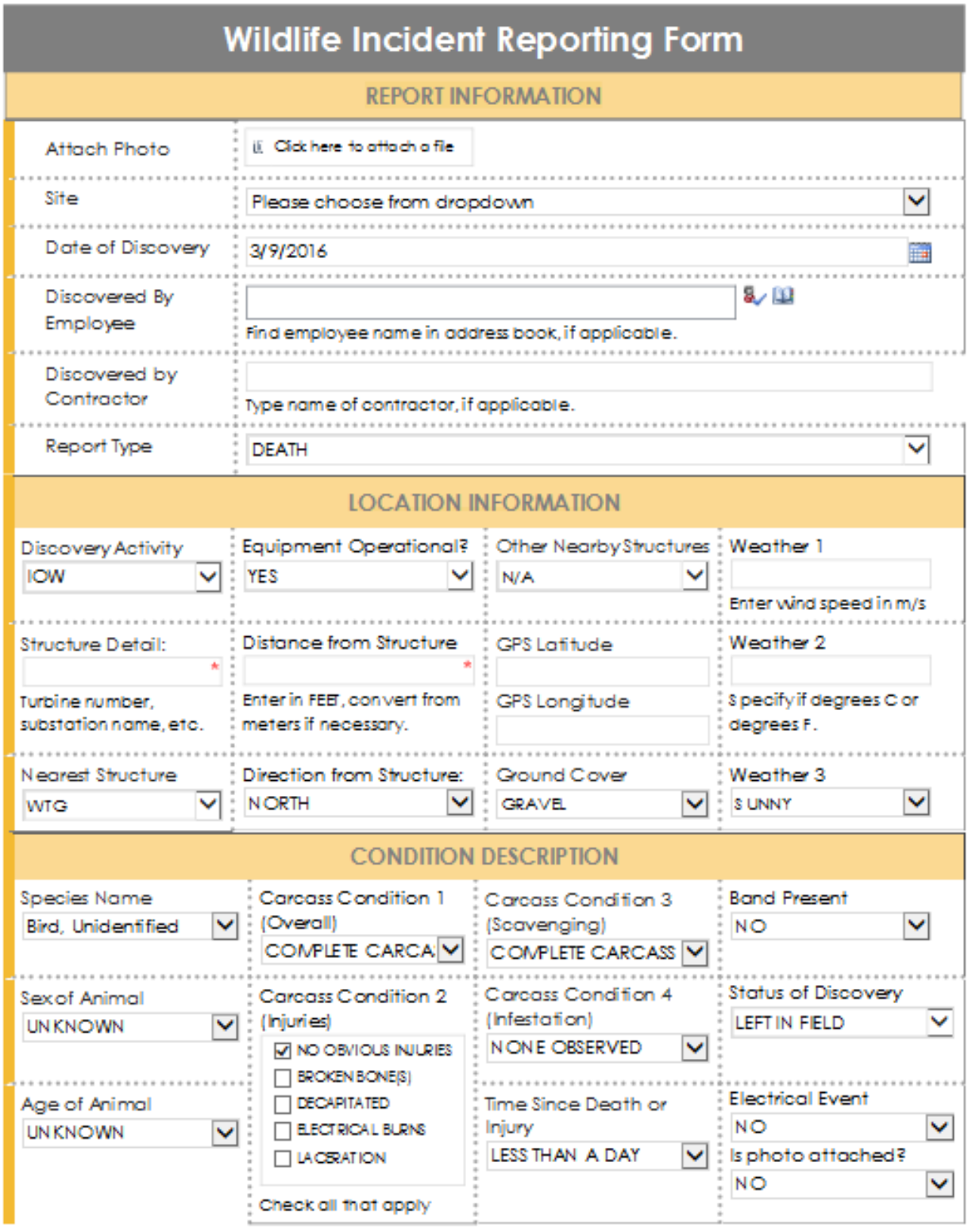
Every individual animal discovery requires a separate Wildlife Incident Report. Answer every question and include any additional information that may be helpful. Too much information is better than not enough. All questions shall be answered, even if the answer is “unknown.”

The incident report should include at least one photograph of the discovery. Photographs should show a close up of the head and/or feet, as well as the carcass in relation to the closet structure, if possible. A common item placed next to, but not touching the carcass, helps indicate the size of the animal.

The WRRS Incident Report can be accessed via PGD Applications, under the Common Applications.



Complete the Wildlife Incident Reporting Form. Fields with a red asterisk * are required



Wildlife Incident Reporting Form

REPORT INFORMATION

Attach Photo	Click here to attach a file
Site	Please choose from dropdown
Date of Discovery	3/9/2016
Discovered By Employee	Find employee name in address book, if applicable.
Discovered by Contractor	Type name of contractor, if applicable.
Report Type	DEATH

LOCATION INFORMATION

Discovery Activity: IOW	Equipment Operational?: YES	Other Nearby Structures: N/A	Weather 1: Enter wind speed in m/s
Structure Detail: * Turbine number, substation name, etc.	Distance from Structure: * Enter in FEET, convert from meters if necessary.	GPS Latitude / GPS Longitude	Weather 2: Specify if degrees C or degrees F.
Nearest Structure: WTG	Direction from Structure: NORTH	Ground Cover: GRAVEL	Weather 3: SUNNY

CONDITION DESCRIPTION

Species Name: Bird, Unidentified	Carcass Condition 1 (Overall): COMPLETE CARCA	Carcass Condition 3 (Scavenging): COMPLETE CARCASS	Band Present: NO
Sex of Animal: UNKNOWN	Carcass Condition 2 (Injuries): ☑ NO OBVIOUS INJURIES; ☐ BROKEN BONE(S); ☐ DECAPITATED; ☐ ELECTRICAL BURNS; ☐ LACERATION. Check all that apply	Carcass Condition 4 (Infestation): NONE OBSERVED	Status of Discovery: LEFT IN FIELD
Age of Animal: UNKNOWN		Time Since Death or Injury: LESS THAN A DAY	Electrical Event: NO; Is photo attached?: NO

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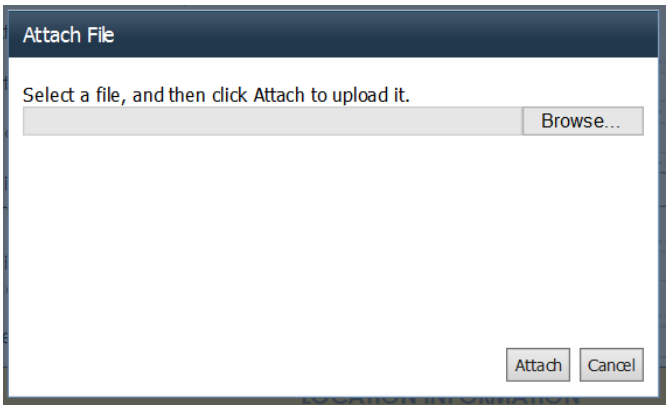
WILDLIFE INCIDENT REPORTING FORM

REPORT INFORMATION

Attach Photo: System will accept multiple photos, but must be added individually



Site: Drag down to specific site

Date of Discovery: Defaults to entry date, but allows options

Discovered by Employee: Enter SLID (Search by name)

Discovered by Contractor: Manual entry field

Report Type: Death, Injury, Nest, Other

LOCATION INFORMATION

Discovery Activity: IOW, Maintenance, Driving, Other

Structure Detail*: Manual entry field, should include Turbine Number, substation name, etc.

Nearest Structure: WTG, Substation, O&M, T-Line, Other

Equipment Operational: Yes, No, N/A

Distance From Structure*: Manual entry field (enter in feet)

Direction From Structure: North, South, East, West, NE, SE, NW, SW

Other Nearby Structures: N/A, Overhead Line, Fence, Road, Other

GPS Lattitude: Manual entry field

GPS Longitude: Manual entry field

Ground Cover: Gravel, WTG Pad, PMT Pad, Grass/Dirt, Other

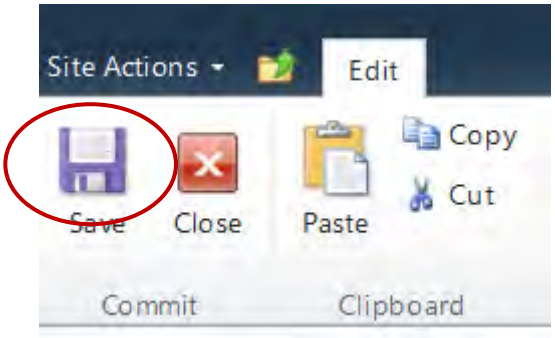
Weather 1: Manual entry field, Windspeed in m/s (numeric only)

Weather 2:	Manual entry field, Temperature in numeric (F or C)
Weather 3:	Sunny, Clear, Foggy, Rainy, Overcast, Snowing

CONDITION DESCRIPTION

Species name:	Defaults to “Bird, Unidentifed”. Drag down options
Sex of Animal:	Unknown, Female, Male
Age of Animal:	Unknown, Adult, Juvenile
Carcass Condition 1:	Complete Carcass, Dismembered, Feathers Only, Bones Only, Feathers/Bones
Carcass Condition 2:	No Obvious Injuries; Broken Bone(s), Decapitated, Electrical Burns, Laceration
Carcass Condition 3:	Complete Carcass, Scavenged, N/A (injury)
Carcass Condition 4:	None Observed, Flies, Maggots, Ants, Beetles, Other
Time Since Death:	< Day, < Week, < Month, > Month
Band Present:	No, Yes, N/A
Status of Discovery:	Left in Field, Bagged & Tagged, USFWS, State FWS, Other
Electrical Event:	No, Yes
Photo Attached:	No, Yes

After completing the form, select the “save” option in the upper left corner of the screen.



2.3 EXTERNAL & INTERNAL NOTIFICATIONS

All wildlife discoveries at NextEra Energy wind sites must be reported internally via the WRRS Incident Report. Once the report is saved, Environmental Services – PGD Support receives an e-mail notification of the new entry. A review of the entry and information is completed, and changes made at the time. This may include corrected species identification information.

In some cases, notification to Federal or State agencies may be required, if a discovery of an injured or dead Eagle, or protected species is made.

Check with your operations leader to determine the process for landowner or rancher notifications if livestock carcasses are discovered. Livestock notifications should be made to ensure removal of carcasses of cattle or sheep. If an injured sheep or cow is found, a courtesy notification should be made as well.

GENERAL PROCEDURE

Due to the sensitivity of eagle and federally endangered species fatalities or injuries, it is very important these fatalities or incidents are recorded and reported immediately to the appropriate persons. Discussions and notifications with appropriate persons are critical to determine species, facts and potential risks (legal, operational, media).

1. The operations leader shall receive all pertinent information regarding incident, e.g., discovery of event, banding information, location, contact person, condition of find, photographs, etc.
2. Once the information is collected, the operations leader should immediately report to Environmental Services - PGD Support and enter into the information into the WRRS database. In addition, the operations leader should notify the Regional / General Operations Managers, and VP of Wind operations.
3. The operations leader should contact Environmental Services – PGD Support for guidance on making notifications, including a determination of what agencies to notify. After this discussion, notifications should be made by the operations leader by phone or e-mail, whichever is deemed appropriate. The operations leader should

document the date & time of the call, as well the name of the person receiving the report.

4. Environmental Services shall forward incident details via e-mail to the Division's Regional Business Manager, legal counsel, and corporate communications personnel. If necessary, Environmental Services – PGD Support will conference with the appropriate parties to discuss potential implications.

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3.0 THREATENED & ENDANGERED SPECIES

All wind site personnel should have basic knowledge of the Federal and/or State-specific species that may be protected as a Threatened or Endangered species at their site. In many cases, discovery of an injured or dead animal will require notifications.

3.1 FEDERAL SPECIES

The United States Fish & Wildlife Service (USFWS) has compiled a list of animal species native to North America that are considered to be threatened or endangered.

The following definitions are included to illustrate the terms commonly used by the USFWS.

The "**endangered**" classification provided to an animal or plant in danger of extinction within the foreseeable future throughout all or a significant portion of its range.

The term "**threatened species**" means any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range, as defined in the Endangered Species Act.

"**Species of concern**" is an informal term that refers to those species which might be in need of concentrated conservation actions. Such conservation actions vary depending on the health of the populations and degree and types of threats. Species of concern receive no legal protection and the use of the term does not necessarily mean that the species will eventually be proposed for listing as a threatened or endangered species

Plants and animals that have been studied and the Service has concluded that they should be proposed for addition to the Federal endangered and threatened species list are referred to as **candidate species,** and once they receive this designation are treated and reported as special status species until a final determination is made by the USFWS.

3.2 STATE SPECIES

In addition to the Federal Threatened & Endangered Species list, each state's wildlife agency has developed a similar list that is specific to the individual state.

Federal & State Threatened & Endangered Species lists, as well as species profile sheets have been archived on the Wind Operations/Environmental Tactical Team SharePoint page: 6.0 Natural Resources/T and E Species

These lists will be periodically uploaded by NEER, but the status of species can be updated yearly by agencies. Please confirm you are referencing a recent list. If you have any questions about the status of an animal, please contact Environmental Services – PGD Support.

4.0 ANNUAL TRAINING

Annual Wildlife Response & Reporting System (WRRS) training should be done at the site and consist of the following subjects:

- Location and content of the WRRS Manual
- WRRS Inspections (Inspection of Watch)
- Incident Reporting (SharePoint)
- Species Identification tools
- Federal & State Threatened & Endangered Species
- Internal / External Notification Procedures (including contact for general questions)

The corporate Learning Management System (LMS) has a training module for the WRRS program (REG-1206A). This training is required for all new employees, and is generally completed during the onboarding process.

In addition to the LMS course, Environmental Services has prepared a PowerPoint module and training roster for use at wind sites for a more detailed presentation. This presentation and roster can be found on the Wind Operations/Environmental Tactical Team SharePoint page: Natural Resources/WRRS Program

This manual includes a roster to be signed by participants during annual training at wind sites. The completed form should be filed in Section 6.2.6 of the EMS filing system. It is recommended that the operations leader create a reminder in the Environmental Compliance Tracker to trigger annual training.

In addition to the annual training, a review of the manual should be completed by each site once a year to ensure that contact information is complete and accurate.

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Site: ______________________________

Facilitator: ______________________________

Date: ______________________

Course:
- ☐ Spill Prevention, Control & Countermeasures (7.1.6)
- ☐ Universal Waste & Emergency Response (8.3.6)
- ☐ Wildlife Response & Recording System (6.2.6)

NEXTera ENERGY RESOURCES

EMPLOYEE	SLID	SIGNATURE
File Completed Training Roster in EMS filing system		

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5.0 APPENDICES

This section of the plan is reserved for any other wildlife related documentation appropriate to the site. This may include the following documents:

- Pre-construction wildlife reports
- Site Operating Permit
- Environmental Impact Reports/Assessments (EIR/EIA)
- Avian / Bat Protection Plans (APBB, APP)
- Bird / Bat Conservation Strategies (BBCS)
- Adaptive Management Plans
- Post-Construction Mortality Monitoring reports (annual and final reports)
- Site specific agency agreements or legal agreements
- Other site-specific wildlife information

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CROWNED RIDGE WIND ENERGY CENTER

WILDLIFE PROGRAM CONTACTS

PGD WIND OPERATIONS

Gerard Nostra Wind Regional General Manager	Office: Cell:	(561) 691-2324 (561) 319-7969
Will Rosenboom Lead Project Manager	Office/Cell:	(402) 806-1233

ENVIRONMENTAL SERVICES – PGD SUPPORT

Brian Wysong, Environmental Services PGD Support	Office: Cell:	(561) 691-2935 (561) 319-5202
Renee Culver, NextEra Energy Resources Sr. Environmental Specialist	Office: Cell:	(925) 245-5522 (925) 353-0976

ENVIRONMENTAL SERVICES - WILDLIFE

Jim Lindsay Subject Matter Expert, Wildlife	Office: Cell:	(561) 691-7032 (561) 762-1296
Janine Bacquie, Subject Matter Expert, Wildlife	Office: Cell:	(561) 691-2818 (561) 329-0914

INJURED BIRD or BAT RESPONSE

Jacquie Ermer	Office:	(605) 345-3381

REGULATORY AGENCIES *(Contact Environmental Services before calling)*

US Fish and Wildlife Service, South Dakota Ecological Services Field Office Natalie Gates	Office:	(605) 224-8693 ext. 227
South Dakota Game Fish and Parks Hilary Meyer	Office:	(605) 773-6208

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF THE APPLICATION BY CROWNED RIDGE WIND, LLC FOR A PERMIT OF A WIND ENERGY FACILITY IN GRANT AND CODINGTON COUNTIES	)))))	EL19-003 **CERTIFICATE OF SERVICE**

I hereby certify that true and correct copies of a Wildlife Conservation Strategy for the Crowned Ridge Wind I facility were served electronically to the parties listed below on the 22nd day of August, 2019, addressed to:

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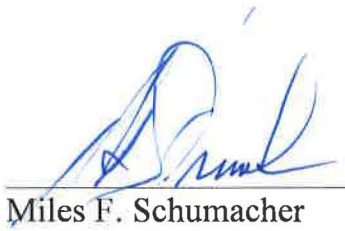

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