

The following table is a summary of significant communication with federal, state, local agencies, and Tribes in chronological order.

Appendix C. Agency Coordination Dates and Correspondence

Date	Agency	Event and Participants
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.
November 8, 2016	Grant County Zoning and Planning Officer	In Person Meeting – Crowned Ridge Transmission Line Project Coordination ; Tyler Wilhelm, NEER Project Development, Clay Cameron, NEER Project Manager, Krista Atyeo-Gortmaker, Grant County Zoning and Planning Officer
December 20, 2016	Grant County Commission	Grant County Commissioner Meeting – Discussed the Crowned Ridge Transmission Line’s proposed ROW and siting within Grant County; Tyler Wilhelm, NEER Project

Date	Agency	Event and Participants
		Development, Miles Schumacher, Legal Counsel, Lynn, Jackson, Shultz & Lebrun P.C, Grant County Commissioners
January 17, 2017	Grant County Commission	Grant County Commissioner Meeting – Discussed the Crowned Ridge Transmission Line’s proposed ROW and siting within Grant County; Tyler Wilhelm, NEER Project Development, Miles Schumacher, Legal Counsel, Lynn, Jackson, Shultz & Lebrun P.C, Grant County Commissioners
February 9, 2017	Codington County Zoning Planner	In Person Meeting - Crowned Ridge Transmission Line and Wind Farm Project Coordination ; Tyler Wilhelm, NEER Project Development, Clay Cameron, NEER Project Manager, Luke Muller, Planner, First District Association of Local Governments
April 4, 2017	Grant County Commission	Grant County Commissioner Meeting – Discussed the Crowned Ridge Transmission Line’s proposed ROW and siting within Grant County; Tyler Wilhelm, NEER Project Development, Miles Schumacher, Legal Counsel, Lynn, Jackson, Shultz & Lebrun P.C , Grant County Commissioners
April 5, 2017	Codington County Zoning Planner	In Person Meeting - Crowned Ridge Transmission Line and Wind Farm Project Coordination ; Tyler Wilhelm, NEER Project Development, Jamie Gentile, NEER Project Manager, Luke Muller, Planner, First District Association of Local Governments
April 19, 2017	USFWS and SDGFP	Technical memorandum re: Crowned Ridge I Project Background. Delivered via email.
April 20, 2017	USFWS and SDGFP	Conference call to discuss Crowned Ridge I project. 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, Manager – Mid Continent Region, Environmental Services, NextEra Energy Resources (NextEra); Tyler Wilhelm, Project Manager – Wind Development

Date	Agency	Event and Participants
		NextEra; Kely Mertz, Senior Project Manager, SWCA Environmental Consultants (SWCA).
May 23, 2017	Codington County Zoning Planner	In Person Meeting - Crowned Ridge Transmission Line and Wind Farm Project Coordination ; Tyler Wilhelm, NEER Project Development, Jamie Gentile, NEER Project Manager, Miles Schumacher, Legal Counsel, Lynn, Jackson, Shultz & Lebrun P.C , Luke Muller, Planner, First District Association of Local Governments
May 24, 2017	Sisseton Wahpeton Oyate of the Lake Traverse Reservation (SWO)	Cultural resource survey planning meeting. Participants were: Dianne Desrosiers, SWO Tribal Historic Preservation Officer (THPO); Rick Wadleigh, Senior Environmental Analyst, SWCA; Rich Estabrook, Archaeologist, NextEra; Carolyn Stewart, Director Tribal Relations, NextEra; Michelle Phillips, Environmental Services, NextEra; Scott Phillips, Senior Cultural Anthropologist, SWCA; Norma Crumbley, Principal, SWCA; Stephen Sabatke, Archaeologist, HDR; Jenkins Cloud, CRP Ranger, SWO THPO; Vine T. Marks, Sr., SWO Cultural Preservation Board (CPB) Chair; Wayne Cloud, 106 Coordinator Assistant, SWO THPO; Jim Whitted, 106 Coordinator, SWO THPO.
June 6, 2017	Grant County Commission	Grant County Commissioner Meeting – Discussed the Crowned Ridge Transmission Line’s proposed ROW and siting within Grant County; Tyler Wilhelm, NEER Project Development, Miles Schumacher, Legal Counsel, Lynn, Jackson, Shultz & Lebrun P.C , Grant County Commissioners
June 14, 2017	South Dakota State Historical Society (SDSHS)	Technical memo - Crowned Ridge Wind Energy Facility Overview and Cultural Resources Review.
June 19, 2017	SDSHS	Project kickoff call to discuss June 14, 2017 memo. Participants were: Paige Olson, SDSHS; Kate Nelson, SDSHS; Jenna Dietmeir, SDSHS; Scott Phillips, Senior Cultural Anthropologist, SWCA; Norma Crumbley, Principal, SWCA; Kim Wells, Manager – Mid Continent Region, Environmental Services, NextEra; Carolyn Stewart, Director Tribal Relations,

Date	Agency	Event and Participants
		NextEra; Richard Estabrook, NextEra; Stephen Sabatke, Archaeologist, HDR.
June 19, 2017	SWO, Yankton Sioux Tribe (YST), and Spirit Lake Nation (SLN)	Cultural resource survey field work kickoff meeting. Participants were: Dianne Desrosiers, SWO THPO; Amaris Makesgood, SLN; Andrew Meng, SWO; Angelique Kitto, SWO; Carolyn Stewart, Director Tribal Relations, NextEra; Chris Shelton, SWCA; CJ Jones, YST; Dylan Eigenberger, Archaeologist, HDR; Erika Eigengerger, Archaeologist, HDR; Jason Burkard, Archaeologist, SWCA; Jenkins Cloud, SWO; Jim Whitted, 106 Coordinator, SWO THPO; Keith Winckler, YST; Londel Seaboy, SWO; Rich Estabrook, Archaeologist, NextEra; Rick Wadleigh, Senior Environmental Analyst, SWCA; Scott Phillips, Senior Cultural Anthropologist, SWCA; Stephen Sabatke, Archaeologist, HDR; Steve Cummins, Archaeologist, SWCA; Vine T. Marks, Sr., SWO CPB Chair.
June 20, 2017	Grant County Commission	Grant County Commissioner Meeting – Discussed the Crowned Ridge Transmission Line’s proposed ROW and siting within Grant County; Tyler Wilhelm, NEER Project Development, Miles Schumacher, Legal Counsel, Lynn, Jackson, Shultz & Lebrun P.C, Grant County Commissioners
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, USFWS.
July 17, 2017	Grant County Auditor	Email Correspondence – Discussed letter from Grant County for Crowned Ridge Transmission Line’s positioning along County ROW; Discussed the Crowned Ridge Transmission Line’s proposed ROW and siting within Grant County; Tyler Wilhelm, NEER Project Development, Karen Layher, Grant

Date	Agency	Event and Participants
		County Auditor
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.
August 2, 2017	Grant County Auditor	Email Correspondence – Received letter from Grant County for Crowned Ridge Transmission Line’s positioning along County ROW; Discussed the Crowned Ridge Transmission Line’s proposed ROW and siting within Grant County; Tyler Wilhelm, NEER Project Development, Karen Layher, Grant County Auditor
August 31, 2017	Codington County Zoning Planner	In Person Meeting - Crowned Ridge Transmission Line and Wind Farm Project Coordination ; Tyler Wilhelm, NEER Project Development, Jeffrey Bryce, NEER Project Development , Luke Muller, Planner, First District Association of Local Governments



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):

<u>Species</u>	<u>Status</u>	<u>Expected Occurrence</u>
American burying beetle (<u>Nicrophorus americanus</u>)	Endangered	Historic Records, No Recent Specimens, Brookings County.
Western prairie fringed orchid (<u>Platanthera praeclara</u>)	Threatened	Possible Habitat, No Recent Specimens, Brookings County.
Topeka shiner (<u>Notropis topeka</u>)	Endangered	Known Resident in Codington, Deuel, and Brookings Counties.
Whooping crane (<u>Grus americana</u>)	Endangered	Migration Records in Codington and McPherson Counties.
Dakota skipper (<u>Hesperia dacotae</u>)	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.sdgifp.info/Wildlife/Diversity/index.htm>. The guidelines themselves may be found on the internet at: <http://www.sdgifp.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, Construction, 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)

NAG:sl

U.S. FISH AND WILDLIFE SERVICE



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FACSIMILE TRANSMITTAL COVER

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, enk
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.sdgifp.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 mi²) in the EWRA range from 90 to over 420 basins/10 miles². 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	<i>Eptesicus fuscus</i>	Year-round resident
Fringed Myotis	<i>Myotis thysanodes</i>	Year-round resident
Little Brown Myotis	<i>Myotis lucifugus</i>	Year-round resident
Long-eared Myotis	<i>Myotis evotis</i>	Year-round resident
Long-legged Myotis	<i>Myotis volans</i>	Year-round resident
Northern Myotis	<i>Myotis septentrionalis</i>	Year-round resident
Townsend's Big-eared Bat	<i>Corynorhinus townsendii</i>	Year-round resident
Western Small-footed Myotis	<i>Myotis ciliolabrum</i>	Year-round resident
Hoary Bat	<i>Lasiurus cinereus</i>	Summer resident
Silver-haired Bat	<i>Lasionycteris noctivagans</i>	Summer resident
Evening Bat	<i>Nycticeius humeralis</i>	Migratory
Eastern pipistrell	<i>Pipistrellus subflavus</i>	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 these 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/batmanagementplan71304.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 (Hauffer 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 mi²). 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/mi². 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/batmanagementplan71304.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.sdgifp.info/Wildlife/Diversity/RareAnimal.htm>) or plant species (<http://www.sdgifp.info/Wildlife/Diversity/rareplant2002.htm>) monitored by the NHP, please contact myself or any of our NHP staff (http://www.sdgifp.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.sdgifp.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 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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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):

<u>Species</u>	<u>Status</u>	<u>Expected Occurrence</u>
Topeka shiner (<i>Notropis topeka</i>)	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 reseedling 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.sdgifp.info/Wildlife/Diversity/index.htm>. The guidelines themselves may be found online at: <http://www.sdgifp.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,



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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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

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@tetrattech.com. Thank you for your assistance.

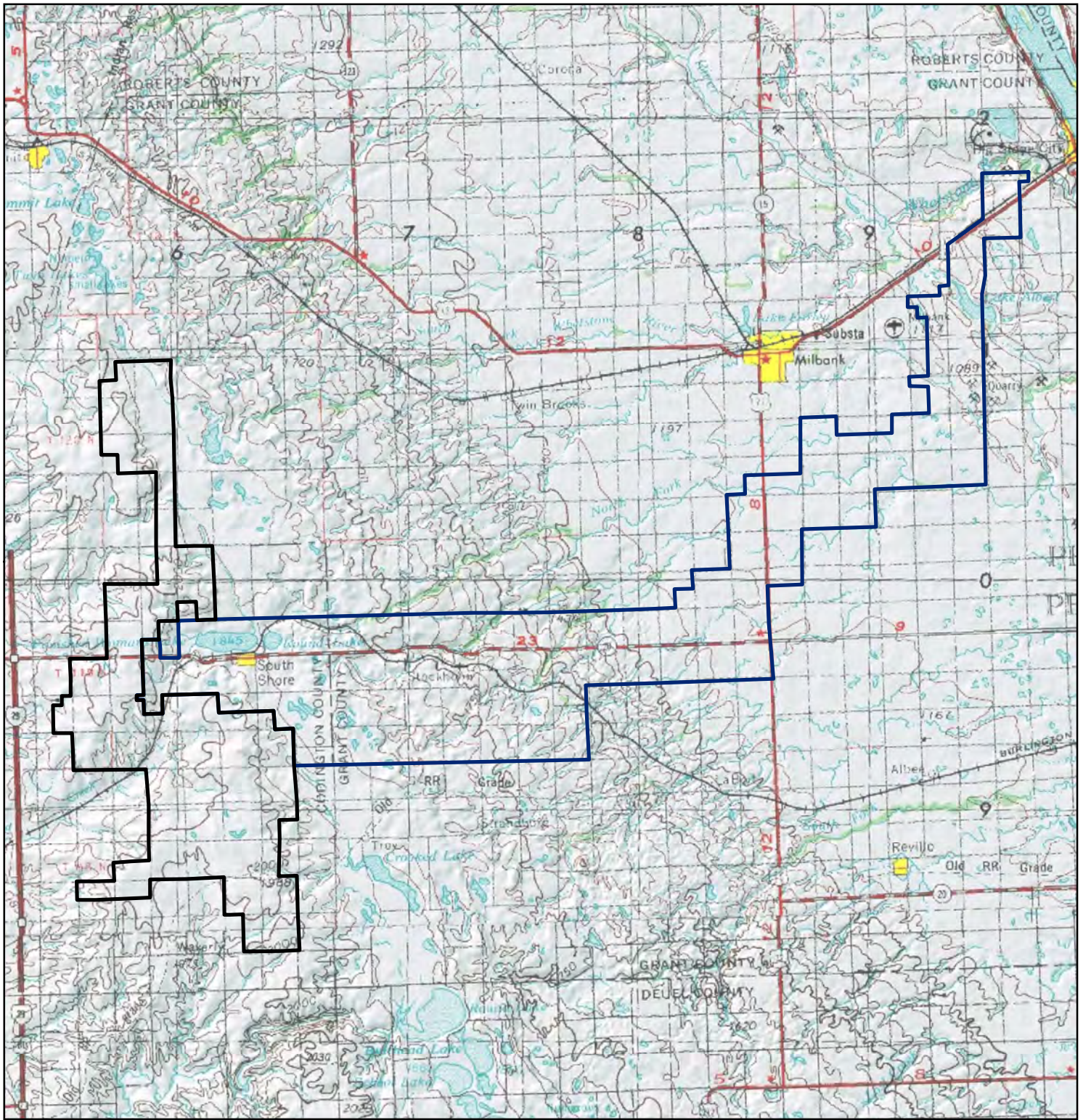
Respectfully submitted,



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







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)



Project Location



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.sdgifp.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 mi²) in the EWRA range from 90 to over 420 basins/10 miles². 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	<i>Eptesicus fuscus</i>	Year-round resident
Fringed Myotis	<i>Myotis thysanodes</i>	Year-round resident
Little Brown Myotis	<i>Myotis lucifugus</i>	Year-round resident
Long-eared Myotis	<i>Myotis evotis</i>	Year-round resident
Long-legged Myotis	<i>Myotis volans</i>	Year-round resident
Northern Myotis	<i>Myotis septentrionalis</i>	Year-round resident
Townsend's Big-eared Bat	<i>Corynorhinus townsendii</i>	Year-round resident
Western Small-footed Myotis	<i>Myotis ciliolabrum</i>	Year-round resident
Hoary Bat	<i>Lasiurus cinereus</i>	Summer resident
Silver-haired Bat	<i>Lasionycteris noctivagans</i>	Summer resident
Evening Bat	<i>Nycticeius humeralis</i>	Migratory
Eastern pipistrell	<i>Pipistrellus subflavus</i>	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 these 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/batmanagementplan71304.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 (Hauffer 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 mi²). 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/mi². 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.sdgifp.info/Wildlife/Diversity/batmanagementplan71304.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.sdgifp.info/Wildlife/Diversity/RareAnimal.htm>) or plant species (<http://www.sdgifp.info/Wildlife/Diversity/rareplant2002.htm>) monitored by the NHP, please contact myself or any of our NHP staff (http://www.sdgifp.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.sdgifp.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 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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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

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@tetrattech.com. Thank you for your assistance.

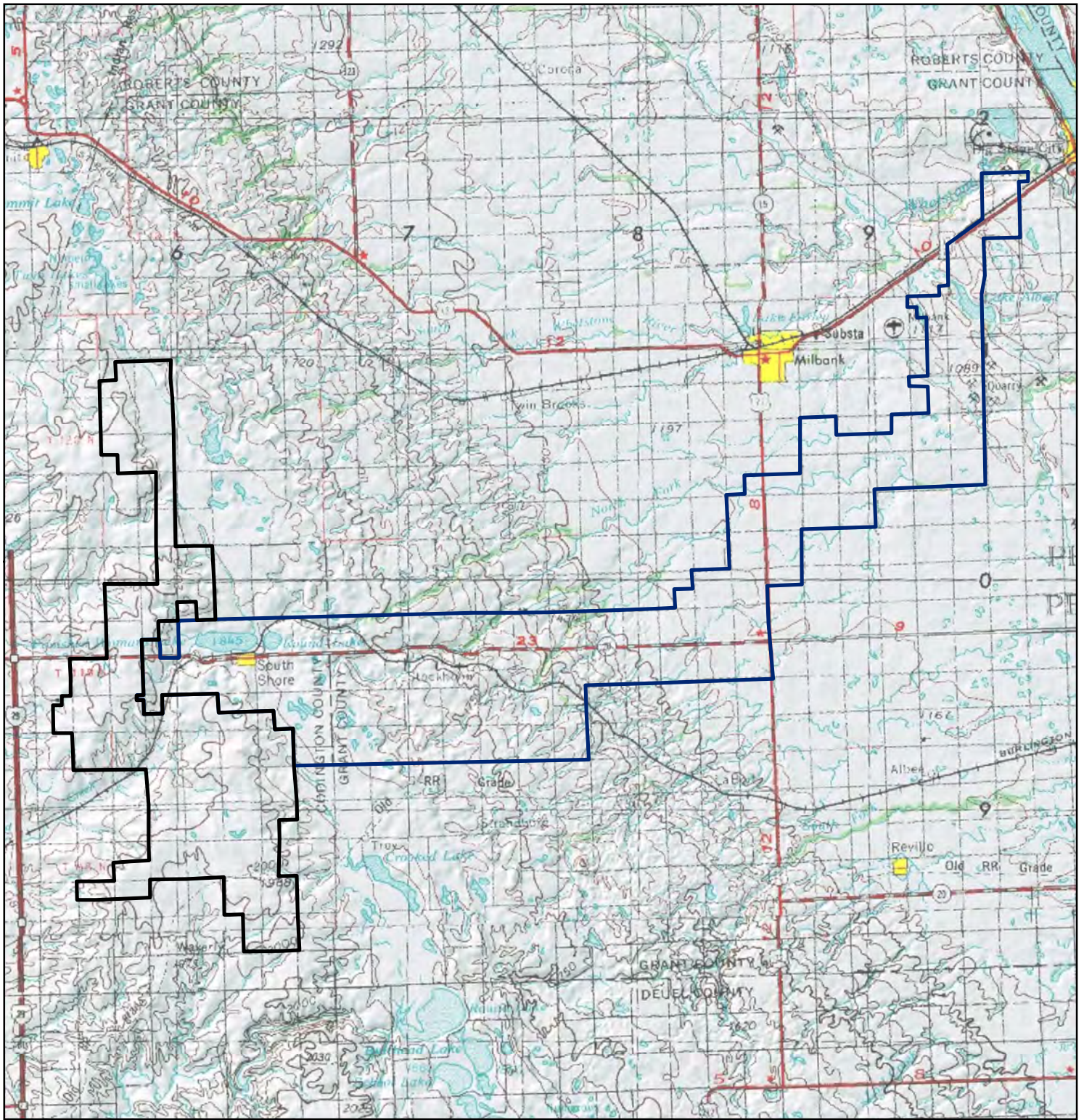
Respectfully submitted,



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







Crowded 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)



Project Location



APPENDIX 1

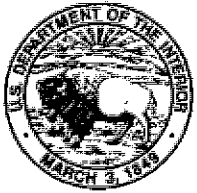
1) Eagle Use Surveys

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):

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

Rufa Red Knot (<i>Calidris canutus rufa</i>)	Threatened	Rare seasonal migrant
Whooping Crane (<i>Grus americana</i>)	Endangered	Migration

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

<u>Species</u>	<u>Status</u>	<u>Expected Occurrence</u>
Northern Long-eared Bat (<i>Myotis septentrionalis</i>)	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 deathcamas (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 sightings 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
4401 N. Fairfax Dr. -- MBSP-4107
Arlington, VA 22203
703/358-1963, albert_manville@fws.gov

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 \geq 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 11:00 AM
End: Thu 4/20/2017 12:00 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

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

866-740-1260
Passcode: 9003613

Agenda

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



CrownedRidge_

Memorandum

Date: April 19, 2017

Re: Crowned Ridge I 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 (Figure 1). The southern 300 MW is a build-own-transfer project, with Xcel Energy (Xcel) as the ultimate owner-operator. 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.

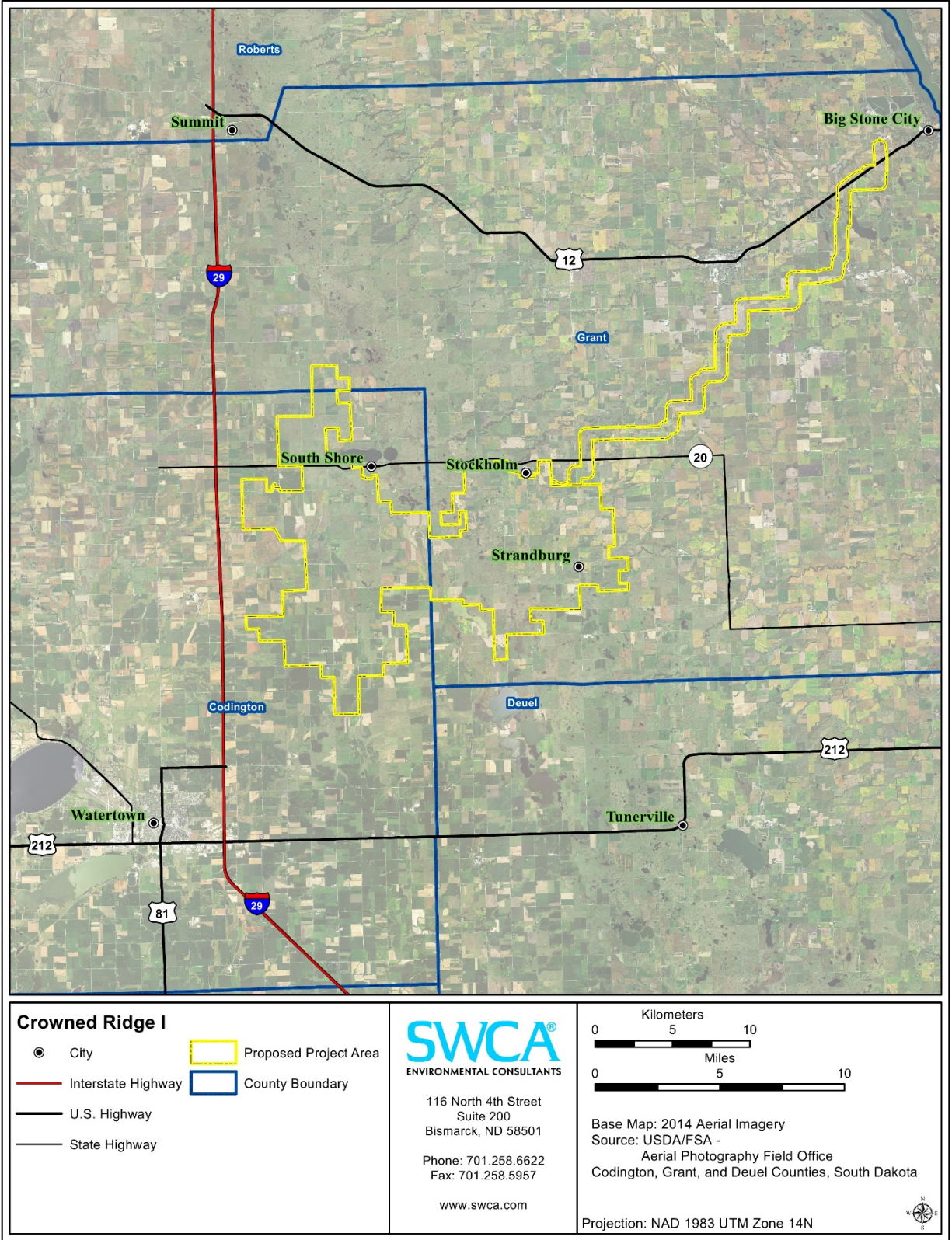


Figure 1. Crowned Ridge Wind Energy Facility, Crowned Ridge I, South Dakota.

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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 Codrington 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.

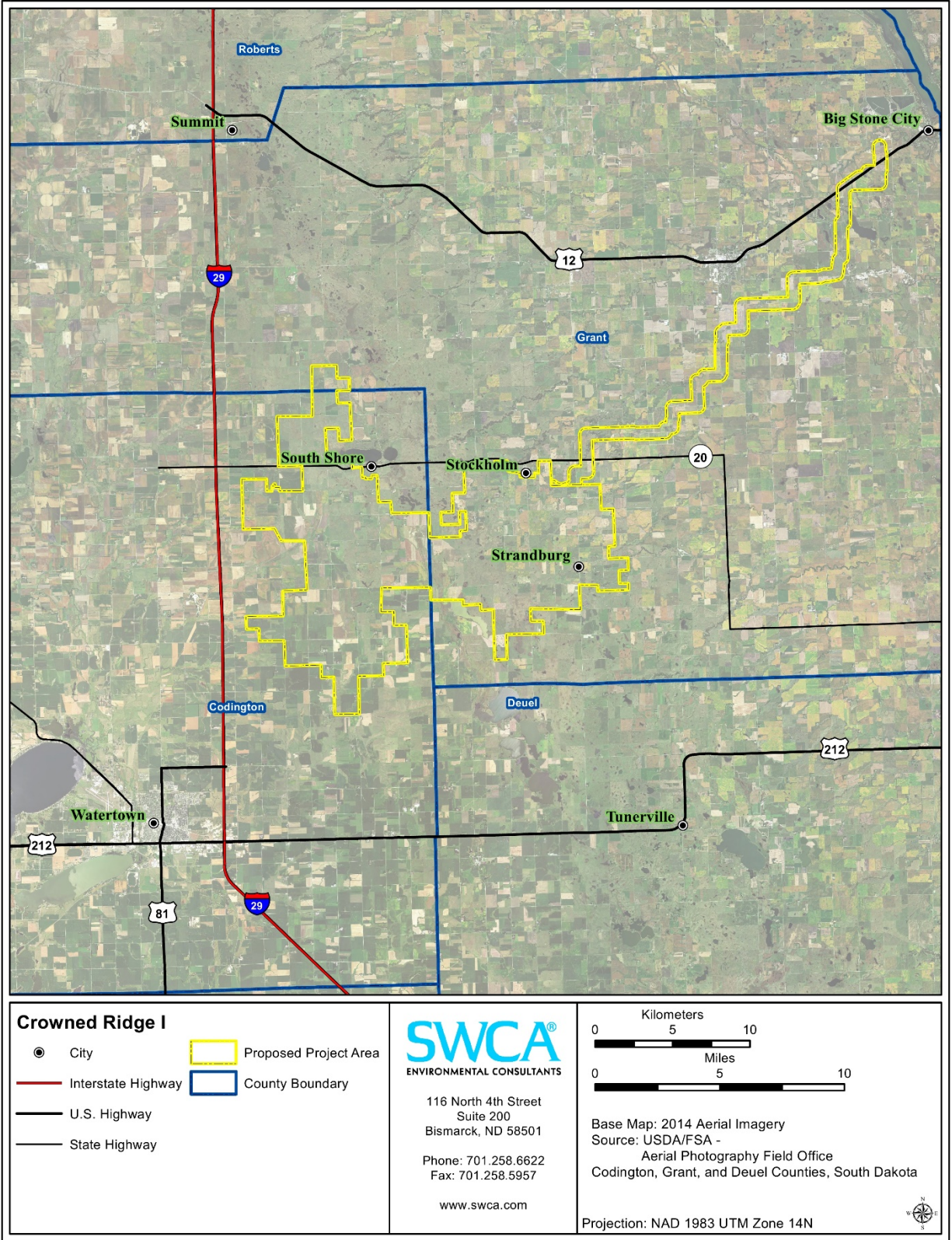


Figure 1. Crowned Ridge Wind Energy Facility, Crowned Ridge I, South Dakota.

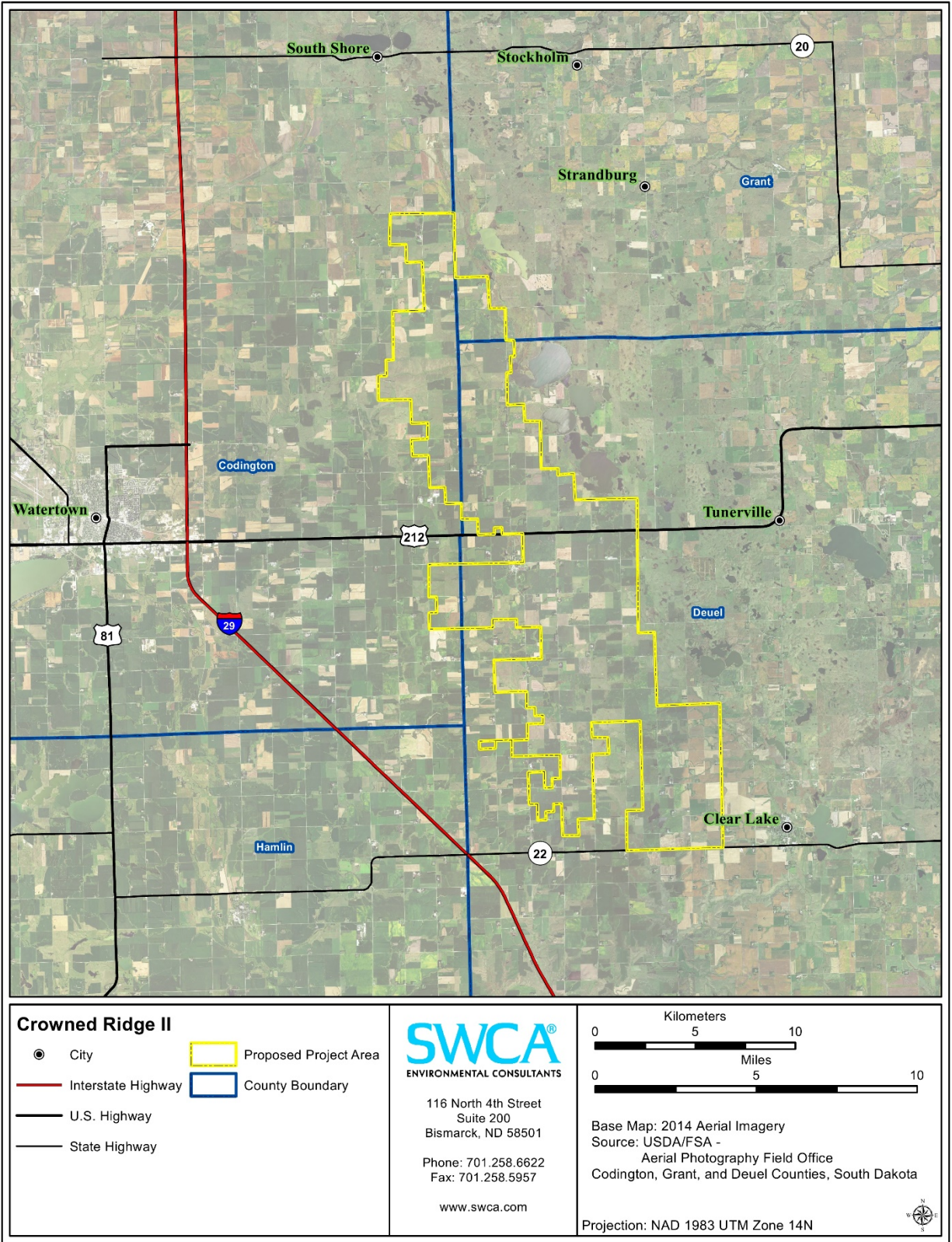


Figure 2. Crowned Ridge Wind Energy Facility, Crowned Ridge II, South Dakota.

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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.

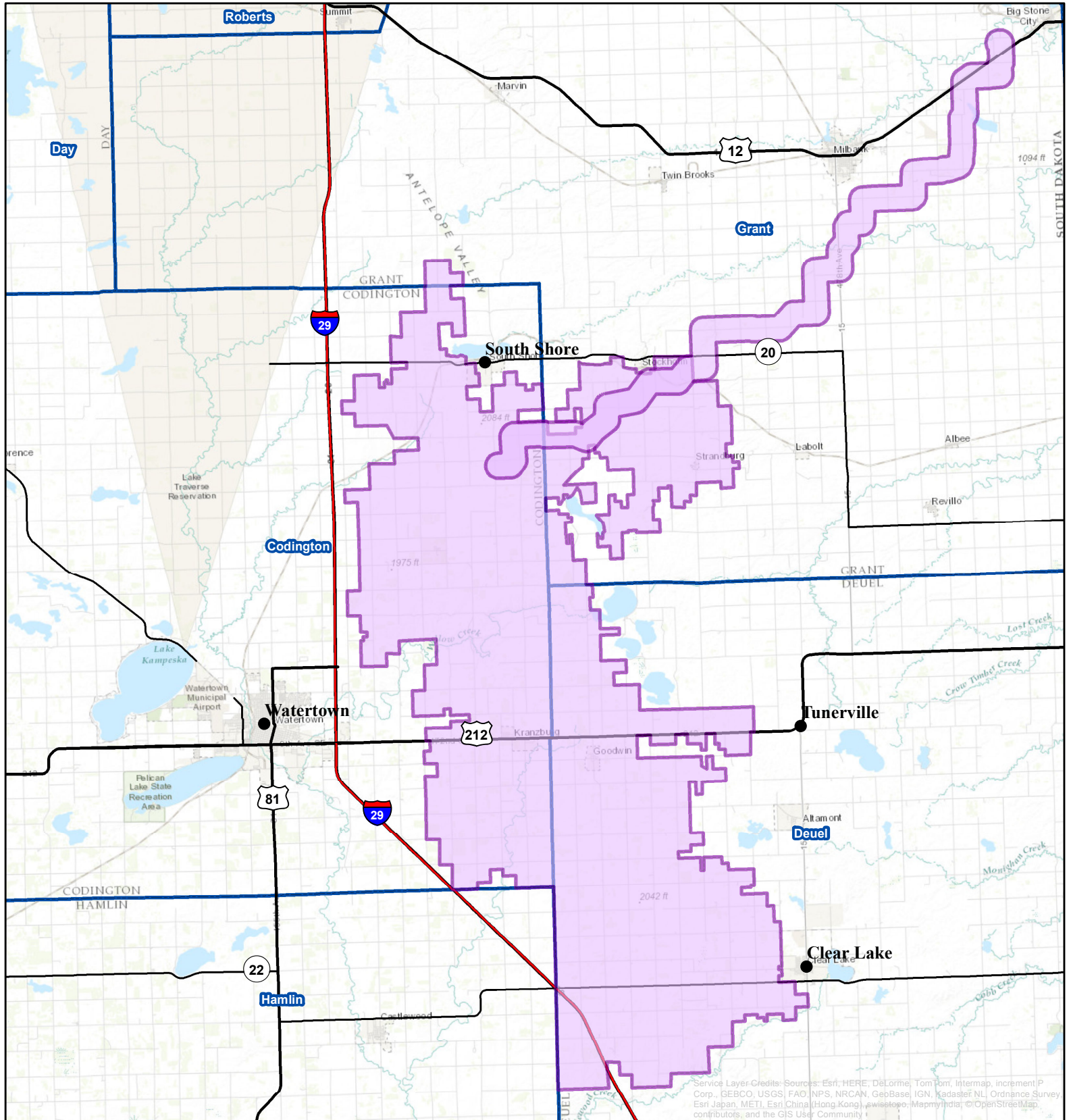
NEER has coordinated with the South Dakota Game, Fish, and Parks and US Fish and Wildlife Service (USFWS) since 2005 regarding potential wind energy development in this general region. Recent coordination includes our April 20, 2017 conference calls with you and the USFWS. As you are aware from this 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,

A handwritten signature in black ink, appearing to read "Kely Mertz". The signature is fluid and cursive, with a large loop at the end.

Kely Mertz
Senior Project Manager



Crowned Ridge I and II Wind Projects

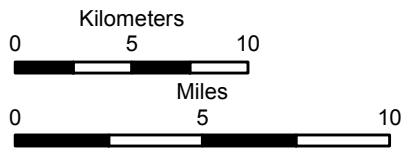
- City
- ▭ County Boundary
- Interstate Highway
- U.S. Highway
- State Highway
- Area of Interest



116 North 4th Street
Suite 200
Bismarck, ND 58501

Phone: 701.258.6622
Fax: 701.258.5957

www.swca.com



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

Projection: NAD 1983 UTM Zone 14N



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Lombard, Illinois 60148
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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.

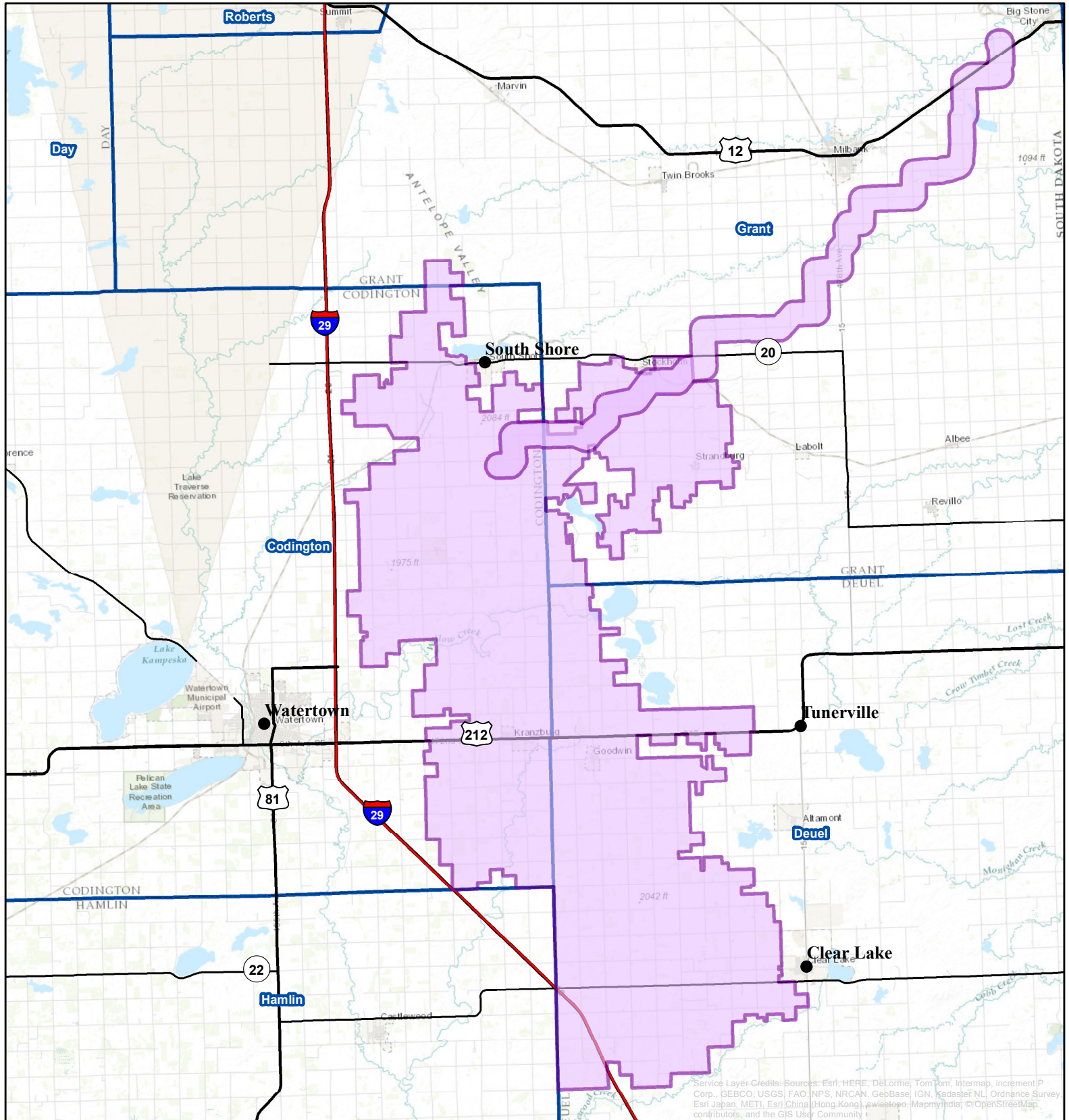
NEER has coordinated with the US Fish and Wildlife Service and South Dakota Game, Fish, and Parks (SDGFP) since 2005 regarding potential wind energy development in this general region. Recent coordination includes our April 20, 2017 conference calls with you and the SDGFP. As you are aware from this 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,

A handwritten signature in black ink, appearing to read 'Kely Mertz', written in a cursive style.

Kely Mertz
Senior Project Manager



Crowned Ridge I and II Wind Projects

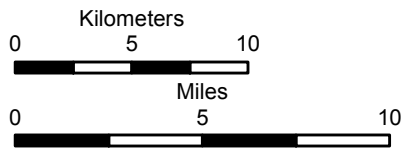
- City
- ▭ County Boundary
- Interstate Highway
- U.S. Highway
- State Highway
- ▭ Area of Interest



116 North 4th Street
Suite 200
Bismarck, ND 58501

Phone: 701.258.6622
Fax: 701.258.5957

www.swca.com



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

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.

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
Visit Our Website: <http://www.swca.com>

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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GRANT COUNTY



SOUTH DAKOTA

OFFICE OF COUNTY COMMISSIONERS
210 East 5th Avenue
Milbank, SD 57252-2499
Phone: 605-432-6711
Fax: 605-432-9004

August 1, 2017

Tyler Wilhelm
Associate Project Manager
Crowned Ridge Wind, LLC
700 Universe Blvd FEW/JB
Juno Beach, FL 33408

Dear Mr. Wilhelm,

It is my understanding that as part of the Crowned Ridge Wind, LLC project you will be proposing to construct a transmission line that runs, in part, through Grant County.

While we are supportive of the Crowned Ridge Wind project and transmission line, when permitting your transmission route before the South Dakota Public Utilities Commission, we only find it acceptable that you avoid siting the transmission line within public right of way. In this regard, in an effort to minimize impacts to private lands, Grant County will permit the transmission line to be situated adjacent to its public rights-of-way in such a manner as to allow for conductor blowout (i.e., the horizontal displacement/movement of the overhead wires due to wind) over those rights-of way.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael J. Mach". The signature is fluid and cursive, with a large, stylized "M" and "S" at the end.

Michael J Mach, Chairman
Grant County Commission

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United States Department of the Interior



FISH AND WILDLIFE SERVICE South Dakota Ecological Services

IN REPLY REFER TO:
Crowned Ridge Wind I and II

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

August 11, 2017

Ms. Kely Mertz
Senior Project Manager
SWCA Environmental Consultants
200 West 22nd Street, Suite 200
Lombard, Illinois 60148

Dear Ms. Mertz:

This letter is in response to your request dated July 12, 2017, for environmental comments regarding the Crowned Ridge I and II Wind Energy Projects in Codington, Deuel, and Grant counties, South Dakota. These two projects are proposed to be constructed adjacent to each other in late 2018, becoming operational in 2019. Each is 300 MW in size (total 600 MW), with a point of interconnection at the Big Stone South 230 kV substation near Bigstone, South Dakota. Per our agency/developer/consultant conference call on April 19, 2017, Crowned Ridge I is the northern project to be developed and owned by NextEra with Xcel Energy to purchase the power, while Crowned Ridge II is the southern project to be constructed by NextEra, eventually to be owned by Xcel Energy.

As noted in your letter, there has been coordination with our office on Crowned Ridge for some time, although the project size and boundary has changed, and now the single project has been divided into two.

Federal nexus and USFWS easements

In past correspondences, Western Area Power Administration was involved as a federal nexus, but during our April 19, 2017, call, we discussed the potential for the U. S. Fish and Wildlife Service (Service) to be the federal nexus if the projects will impact Service grassland or wetland easement properties. It is our current understanding that these areas will be avoided at the Crowned Ridge projects; please inform our office if that changes. For any questions regarding easement locations or regulations in Codington and Grant Counties please continue your coordination with Connie Mueller at our Waubay Wetland Management District and in Deuel County contact Natoma Hansen at our Madison Wetland Management District who administer the easement program in their respective districts.

Land-based Wind Energy Guidelines

In addition to easement discussions on our April call, you indicated your awareness of our Land Based Wind Energy Guidelines, noting past wildlife surveys. We recommend you continue to apply these guidelines to these two projects. Wildlife surveys have been done at the Crowned Ridge site but may need updating, particularly since the project size and boundary has changed. We request copies of all wildlife and habitat surveys conducted at the Crowned Ridge I and II sites.

Eagle Conservation Plan Guidance

Our Eagle Conservation Plan Guidance was also mentioned on our April, 2017, call. Golden eagles (*Aquila chrysaetos*) may be found throughout the state in winter or during migration. Bald eagles (*Haliaeetus leucocephalus*) occur throughout South Dakota in all seasons. Both species are protected under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act. These laws protect eagles from a variety of harmful actions and impacts. We recommend close adherence to our Eagle Conservation Plan Guidance to determine risk of take to eagles at the Crowned Ridge Project sites. Eagle take at wind farms may be authorized via permitting; should your survey data reveal a risk to eagles and you wish to obtain a permit please contact our office for further assistance. Please provide this office with results of eagle surveys and any modeling efforts per the Guidance.

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):

<u>Species</u>	<u>Status</u>	<u>Expected Occurrence</u>
Dakota Skipper (<i>Hesperia dacotae</i>)	Threatened	Resident in native prairie, northeastern SD
Poweshiek Skipperling (<i>Oarisma poweshiek</i>)	Endangered	Possible resident in native prairie, northeastern SD
Northern Long-eared Bat (<i>Myotis septentrionalis</i>)	Threatened	Summer resident, seasonal migrant, known winter resident in Black Hills
Rufa Red Knot (<i>Calidris canutus rufa</i>)	Threatened	Rare seasonal migrant
Topeka Shiner (<i>Notropis topeka</i>)	Endangered	Resident

Whooping Crane
(*Grus americana*)

Endangered

Migrant

Dakota skipper

The Dakota skipper is a small prairie butterfly listed as a threatened species under the ESA. 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 death camas (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. If such areas are unavoidable, surveys for Dakota skippers are advisable. Critical habitat has been designated for this species in South Dakota; for details and locations see the following website:

<https://www.fws.gov/Midwest/endangered/insects/dask/index.html>.

Poweshiek skipperling

The Poweshiek skipperling is a small prairie butterfly listed as endangered under the ESA. The habitat of Poweshiek skipperlings is similar to that of Dakota skipper and 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*). Like Dakota skippers, 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. If such areas are unavoidable, surveys for the skipperlings are advisable. Critical habitat has been designated for this species in South Dakota; for details and locations see the following website:

<https://www.fws.gov/midwest/endangered/insects/dask/finalch.html>.

Northern long-eared bat

The northern long-eared bat is a medium-sized bat listed as threatened under the ESA. Northern long-eared bats are known to be present in South Dakota during the summer months, 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 has been documented in other forested areas in the state during the summer months, as well as along the Missouri River 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. Currently, feathering turbine blades and increasing cut-in speeds are recommended measures to reduce the risk of bat mortality at wind generation facilities. A 4(d) rule has been published that exempts take of Northern long-eared bats in certain circumstances. For more information, see:

<https://www.fws.gov/Midwest/Endangered/mammals/nleb/index.html>.

Rufa red knot

The rufa red knot is a robin-sized shorebird listed as threatened under the ESA. 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. The red knot likely uses South Dakota habitats similar to those of the least tern and piping plover. The species does not breed in this state.

Topeka shiner

The Topeka shiner is a small endangered minnow known to occupy numerous small streams within eastern South Dakota. The species occurs within the Big Sioux, Vermillion, and James River watersheds and is a resident of several prairie streams in Codington and Deuel counties. Should project activities (*e.g.*, stream crossings, streamside vegetation removal) impact occupied streams or wetlands/streams that are connected to occupied streams, the species may be present and potential impacts may occur. We recommend avoidance of these habitats, and/or by actions such as spanning entire streams/riparian areas where crossings are necessary or directionally boring beneath streams and riparian areas to install connector lines. If impacts to known or potentially occupied streams are unavoidable, please contact this office for further guidance.

Whooping Crane

Endangered whooping cranes occurring in South Dakota are usually from the Aransas/Wood-Buffalo population that migrates through South Dakota twice annually on the way to northern breeding grounds and southern wintering areas; however, individuals from eastern populations are occasionally located in the State. The cranes 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. Whooping cranes are large birds with low maneuverability. Line strike mortality is the greatest known threat to fledged whooping cranes; more information on this topic is provided herein (see enclosure dated February 4, 2010, and Power Lines section below). Whooping crane mortality via turbine strikes may also pose a risk if the birds utilize habitat at/near wind farm sites. Loss of stopover habitat in the migration corridor is a concern that may be realized if whooping cranes tend to avoid wind farms in this area. 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 and should be avoided. These issues should be addressed prior to wind farm

development. Sightings of whooping cranes at any time should be reported to this office. Please note that use of the proposed project area by sandhill cranes may be indicative of the potential presence of whooping cranes since the two species are often observed utilizing the same habitats and migrating together.

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.

Migratory Birds

Birds of Conservation Concern; avian avoidance issues

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. Our Birds of Conservation Concern 2008 publication, online at <https://www.fws.gov/migratorybirds/pdf/grants/BirdsofConservationConcern2008.pdf> provides lists of species for which we recommend proactive measures be taken to ensure populations do not require future additional protections. During the April, 2017, call, we relayed concern for grassland impacts and associated avoidance of turbines by grassland nesting migratory birds, some of which may be listed in that 2008 publication. Some grassland nesting species avoid turbines out to 300 m (approximately a 70-acre circle around each turbine), and the degree of avoidance increases over time (Shaffer and Buhl 2015). A similar avoidance of wetlands has been exhibited by waterfowl (Loesch et al. 2013). We recommend avoidance of grassland and wetland habitats and placement of turbines and infrastructure in cropland or other disturbed sites whenever possible. Prairie habitat restoration or establishment of easements to protect grasslands and/or wetlands offsite is recommended to compensate for avian impacts. If such impacts are anticipated, please inform our office of the location and acreage of impacts and we will provide further assistance and guidance on this issue.

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. Of primary concern are the collision mortality risks posed to migratory birds as towers are currently estimated to kill 6.8 million birds per year in the United States and Canada (Longcore et al. 2012). We have enclosed Service guidance on this issue, our *2013 U.S. Fish and Wildlife Service (USFWS) Revised Voluntary Guidelines for Communication Tower Design, Siting, Construction, Operation, Retrofitting, and Decommissioning*. Among the primary concerns addressed within

our guidelines are the establishment of new towers on the landscape, the heights of these towers, their lighting scheme, and means of structural support. Collocation of communications tower facilities on an existing structure is strongly recommended to avoid any additional impacts to migratory birds. If a new tower is necessary, placement of the new tower near other existing structures is recommended to concentrate the risk posed by the towers to relatively small areas. Minimization of tower height (below 200 feet to preclude the need for Federal Aviation Administration lighting requirements), use of only strobe or flashing lights (no steady-burning lights), and avoidance of guy wires (a great deal of avian mortality is a result of collisions with supporting guy wires) are important components intended to minimize potential impacts to migratory birds.

Power Lines

The construction of additional overhead power lines associated with wind farms creates the threat of avian electrocution, particularly for raptors. 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: <http://www.eei.org/resourcesandmedia/products/Pages/products.aspx>, or by calling 202-508-5000.

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, increase 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.

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 feather tips) may vary from 66 to 96 inches depending on the species (golden or bald) and gender of the bird, and 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: <https://www.edmlink.com/component/zoo/item/video-raptors-at-risk>.

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 *Reducing Avian Collisions with Power Lines: The State of the Art in 2012* which, again, may be obtained by contacting the Edison Electric Institute via their website at: <http://www.eei.org/resourcesandmedia/products/Pages/products.aspx>, or by calling 202-508-5000.

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. As noted above, the whooping crane is particularly susceptible to this type of mortality, and your project occurs within the whooping crane migratory corridor. This region of the Service (Region 6) has developed *Guidance for Minimizing Effects From Power Line Projects Within the Whooping Crane Migration Corridor* (copy enclosed). Marking of existing lines elsewhere in the species' corridor is recommended. As indicated previously, a copy of the migration corridor of the Aransas-Wood Buffalo Population of whooping cranes is also enclosed for your information.

Bird and Bat Conservation Strategy

As with Eagle Conservation Plans for wind projects in this region, we have developed a document to further assist companies in following our established national guidance on BBCSs. We have enclosed our Region 6 *Outline for a Bird and Bat Conservation Strategy: Wind Energy Projects*. As stated in the introduction of that document: a BBCS "...is a life-of-a-project framework for identifying and implementing actions to conserve birds and bats during wind energy project planning, construction, operation, maintenance, and decommissioning. It is the responsibility of wind energy project developers and operators to effectively assess project-related impacts to birds, bats and their habitats, and to work to avoid and minimize those impacts." A BBCS explains the actions taken by developers as they progress through the tiers of our Land-Based Wind Energy Guidelines, describing the analyses, studies, and reasoning implemented with the purpose of mitigating for potential avian and bat impacts. It also addresses postconstruction monitoring and habitat impacts. We recommend you develop a BBCS if these projects progress.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act prohibits the taking, killing, possession, and transportation, (among other actions) of migratory birds, their eggs, parts, and nests, except when specifically permitted by regulations. While the MBTA has no provision for allowing unauthorized take, the Service realizes that some birds may be killed as a result of wind farm operations, even if all known reasonable and effective measures to protect birds 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 avoid take of migratory birds and by encouraging others to implement measures to avoid take of migratory birds. It is not possible to absolve individuals, companies, or agencies from liability even if they implement bird mortality avoidance or other similar protective measures. However, the Office of Law Enforcement focuses its resources on investigating and prosecuting individuals and companies that take migratory birds without identifying and implementing all reasonable, prudent and effective measures to avoid that take. Companies are encouraged to work closely with Service biologists to identify available protective measures when developing project plans and/or avian protection plans, and to implement those measures prior to/during construction, operation, or similar activities.

Summary

Below we reiterate the items discussed above that are pertinent to the proposed project, any associated recommended guidance, or related information and suggested actions.

- Service easement properties
 - Avoid easements if possible
 - Continue coordination with Waubay and Madison WMDs
 - Inform this office if easements will be impacted
- Wind farm guidance:
 - Adhere to Land-Based Wind Energy Guidelines
 - Update wildlife surveys
 - Provide results of surveys to this office
- Eagle Guidance:
 - Adhere to Eagle Conservation Plan Guidance
 - Provide results of eagle surveys and modeling to this office
- Threatened/Endangered Species
 - Avoid habitat impacts
 - Surveys may be needed to determine presence
- Wetlands
 - Avoid, minimize, compensate for any wetland impacts (in that order)
- Migratory Birds
 - Avoid impacts to grasslands and wetlands
 - Avoid impacts to Birds of Conservation Concern

- Compensate for unavoidable impacts
- Develop a Bird and Bat Conservation Strategy
- Address meteorological tower impacts
- Address power line impacts

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,



Field Supervisor
South Dakota Field Office

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Enclosures

cc: FWS/Waubay WMD, Connie Mueller
FWS/Madison WMD, Natoma Hansen
Silka Kempema, Biologist, South Dakota Game, Fish and Parks

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:

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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 \geq 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.

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U.S. Fish and Wildlife Service, Region 6, Mountain-Prairie Region

Outline for a Bird and Bat Conservation Strategy: Wind Energy Projects

A Bird and Bat Conservation Strategy (BBCS) is a life-of-a-project framework for identifying and implementing actions to conserve birds and bats during wind energy project planning, construction, operation, maintenance, and decommissioning. It is the responsibility of wind energy project developers and operators to effectively assess project-related impacts to birds, bats and their habitats, and to work to avoid and minimize those impacts.

A wind project BBCS should be updated regularly as new information, including monitoring of project impacts and technical advancements, becomes available. A BBCS is a strategy for assessing impacts, avoiding/minimizing impacts, guiding current actions, and planning future impact assessments and actions to conserve birds and bats. It provides reference to project history and previous impact assessments and actions. A BBCS contains the studies, analyses, and reasoning leading to project-specific decisions and implementation of actions. The 2012 U.S. Fish and Wildlife Service (USFWS) Land-Based Wind Energy Guidelines (WEG) provides comprehensive guidance on the process for addressing bird and bat conservation at all stages of wind energy development.

Decisions made through the BBCS framework include determining if there is a need to develop other bird and bat conservation plans such as an Eagle Conservation Plan (2013 USFWS Eagle Conservation Plan Guidance) or Habitat Conservation Plan (Endangered Species Act, section 10(a)(1)(B)). Specific surveys needed to support those plans may be most effectively conducted in tandem with surveys to develop the BBCS.

Wind energy projects currently in operation which have not been planned, developed, or operated following a BBCS framework, will, at a minimum, need to supplement assessments of impacts to birds and bats with Post-Construction Assessments and Adaptive Management Studies, working closely with the USFWS.

The following outline is provided by USFWS Region 6 as a guide for developing and organizing a BBCS.

Outline

I. Statement of Purpose

Identify how the BBCS functions as a strategy to address bird and bat conservation during all project phases.

II. Regulatory Framework

A. Fish and Wildlife Laws, Regulations, and Policies

Include the language provided and do not reference USFWS law enforcement or prosecutorial discretion in the BBCS.

1. Migratory Bird Treaty Act (MBTA)

The MBTA is the cornerstone of migratory bird conservation and protection in the United States. The MBTA implements four treaties that provide for international protection of migratory birds. It is a strict liability statute, meaning that proof of intent, knowledge, or negligence is not an element of an MBTA violation. The statute's language is clear that actions resulting in a "taking" or possession (permanent or temporary) of a protected species, in the absence of a USFWS permit or regulatory authorization, are a violation. The MBTA states, "Unless and except as permitted by regulations ... it shall be unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, kill ... possess, offer for sale, sell ... purchase ... ship, export, import ... transport or cause to be transported... any migratory bird, any part, nest, or eggs of any such bird ..." 16 U.S.C. 703. 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 USFWS maintains a list of all species protected by the MBTA at 50 CFR 10.13. This list includes over one thousand species of migratory birds, including eagles and other raptors, waterfowl, shorebirds, seabirds, wading birds, and passerines.

2. Bald and Golden Eagle Protection Act (Eagle Act)

Under authority of the Eagle Act, 16 U.S.C. 668–668d, bald eagles and golden eagles are afforded additional legal protection. The Eagle Act prohibits the take, sale, purchase, barter, offer of sale, purchase, or barter, transport, export or import, at any time or in any manner of any bald or golden eagle, alive or dead, or any part, nest, or egg thereof, 16 U.S.C. 668. The Eagle Act also defines take to include "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb," 16 U.S.C. 668c, and includes criminal and civil penalties for violating the statute. See 16 U.S.C. 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 either a decrease in productivity or nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior, 50 CFR 22.3.

3. Endangered Species Act (ESA)

The ESA directs the USFWS to identify and protect endangered and threatened species and their critical habitat, and to provide a means to conserve their ecosystems. Among its other provisions, the ESA requires the USFWS to assess civil and criminal penalties for violations of the Act or its regulations. Section 9 of the ESA prohibits take of federally-listed species. Take is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct" 16 U.S.C. 1532. The term "harm" includes significant habitat alteration which kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering, 50 CFR 17.3. Projects involving Federal lands, funding or authorizations will require consultation between the Federal agency and the USFWS, pursuant to section 7 of the ESA. Projects without a

Federal nexus should work directly with USFWS to avoid adversely impacting listed species and their critical habitats.

B. Other Federal, State, County, Local and Tribal Laws, Regulations, and Policies

III. Project Description

Provide descriptions and maps of all project elements (e.g., roads, power lines, met towers) during all phases of pre-construction, construction, operation, maintenance, and decommissioning. Describe and provide maps of the project impact area (inside and outside project area boundary) where the project may potentially impact birds, bats and their habitats..

IV. Project History of Bird and Bat Presence, and Risk Assessments

A. Preliminary Site Evaluation (WEG Tier 1)

1. Site Description

Describe proposed wind energy site(s) within the broader geographic landscape of bird and bat distribution, use, and habitats.

2. Decision to Abandon Site(s) or Select Site(s) for Additional Assessments in WEG Tier 2

Describe evaluations of sites by answering questions in WEG Tier 1, Chapter 2: (1) Are species or habitats of concern present? (2) Does the landscape contain areas precluded by law or areas that are designated as sensitive? (3) Are there critical areas of wildlife congregation? (4) Is there potential to fragment large intact habitats for species that are sensitive to habitat fragmentation? Based on the answers to these questions, describe the decision to abandon sites or identify project modifications to effectively avoid and minimize potential adverse impacts.

B. Site-specific Characterization and Decisions (WEG Tier 2)

Continue landscape-scale assessments and include site reconnaissance evaluations.

1. Site Description

Provide additional site information obtained through more detailed Tier 2 assessment.

2. Evaluation and Decisions

(a) Abandon Site or Advance to Field Surveys to Support a BBCS

Describe evaluations of sites by answering the four questions from WEG Tier 1, plus questions from WEG Tier 2, Chapter 3: (5) Are plant communities or vegetation habitats of conservation concern present? (6) What species of birds and bats are likely to use the proposed site? (7) Is there potential for significant adverse impacts to those species? If there is a high probability of significant adverse impacts that cannot be avoided or minimized, the site should be abandoned.

(b) Determine Need for Other Bird or Bat Conservation Plans

Describe determination of need, and reference field surveys, for an Eagle Conservation Plan) or Habitat Conservation Plan.

C. Field Studies to Document Wildlife and Habitat, and Predict Project Impacts (WEG Tier 3)

Describe the goals, methods, results, analyses and conclusions of field studies, and include maps to assess the presence of, and project risks to, birds and bats and their habitats. Describe potential project impacts by answering the seven questions from WEG Tier 1 and Tier 2, plus questions

from WEG Tier 3, Chapter 4: (8) What are the distributions, abundance, behaviors and site-use of birds and bats, and what project elements expose these species to risk? (9) What are the potential risks to individuals and local populations of birds and bats and their habitats? (10) How can impacts to birds and bats be avoided and minimized? (11) What studies should be initiated and continued post-construction to evaluate predictions of impacts to birds and bats? Describe the level of scientific rigor of studies, and coordination and sharing of data with USFWS field offices.

1. Bird and Bat Status Assessments

Describe how assessment studies were of sufficient duration and intensity to ensure adequate data were collected to accurately characterize bird and bat use of the area.

(a) Bird and Bat Species Presence

(i) Species Presence by Season

(ii) Species of Concern (WEG, p. 63)

(iii) Species of Habitat Fragmentation Concern (WEG, p. 63)

(b) Bird and Bat Habitats

Describe, quantify, and map.

(c) Bird and Bat Use Patterns

Describe, quantify and map survey data (e.g., from point counts, acoustic surveys, and migration surveys).

(d) Baseline (Pre-construction) Habitat Management

Describe the management of habitat at the proposed site prior to construction.

2. Bird and Bat Risk Assessment and Decisions Based on Assessments

Describe assessment methods and assumptions.

(a) Project Risk Assessment

(i) Direct Impacts:

Describe direct project impacts on birds and bats (e.g., wind turbine collisions, powerline electrocutions and collisions, vehicle collisions, barotrauma, disturbance, displacement, behavioral changes, and habitat loss, degradation and fragmentation).

(ii) Indirect Impacts

Describe indirect project impacts on birds and bats (e.g., loss of population vigor, attraction to modified habitats, and increased exposure to predation).

(iii) Cumulative Impacts

(b) Risk Assessment Decisions

(i) Decision Criteria to either Abandon Site or Advance Project

(ii) Decision of Need for Other Bird and Bat Conservation Plans

Describe decision to develop other plans such an Eagle Conservation Plan, Habitat Conservation Plan, Candidate Conservation Plan with Assurances, or a plan to address state-managed species.

V. Conservation Measures to Avoid and Minimize Adverse Impacts (during project construction, operation, maintenance, and decommissioning)
Describe conservation measures and when and how each measure will be applied. Some measures will apply to all project phases, but other measures will only apply to specific phases of the project (e.g., construction versus operation). See WEG Chapter 7 for examples. While the following topics in the outline should all be included, the organization of this section may be modified (e.g., conservation measures may be organized by project phase, project elements, or category of conservation action).

A. Measures to Avoid/Minimize Direct Impacts

1. Fatalities

2. Disturbance/Displacement/Behavioral Changes

(a) Nest/Roost/Hibernacula Management

Describe how impacts to nests and nesting attempts will be avoided or minimized during all phases of the project. For example, constructing outside the breeding season or using nest buffers may be appropriate during construction, but measures to discourage or prevent birds from nesting in a sub-station may be needed during operation.

(b) Management of Other Habitat-use Areas (e.g., Foraging Areas)

3. Habitat Loss/Degradation/Fragmentation

B. Measures to Avoid/Minimize Indirect Impacts

For example, address measures to avoid loss of population vigor and increased exposure to predation.

C. Measures to Offset and/or Compensate for Habitat-Related Impacts

D. Measures to Avoid and Minimize Other Identified Project-Specific Risks

VI. Post-construction Studies to Estimate Impacts (WEG Tier 4)

Provide assessments of ongoing project risks to birds and bats and the effectiveness of conservation measures. Describe study methods and the level of survey effort (i.e., how many of each survey type was conducted, over what time period and seasons, and location and geographic coverage).

A. Carcass Surveys

B. Nest/Roost/Hibernacula Surveys

C. Habitat Surveys

D. Other Surveys

A need for surveys, such as point counts, acoustic surveys, mist net surveys, may be identified through measuring project impacts.

VII. Other Post-construction Studies and Adaptive Management (WEG Tier 5)

Describe adaptive management studies which may (1) be planned during development of the BBCS via measuring impacts during post-construction and the discovery that conservation measures are not adequate to avoid and minimize impacts, or may (2) address unplanned or unforeseen impacts. Describe the actions taken during the following steps.

- A. Evaluate need for action (1) based on assessing effectiveness of conservation measures through post-construction monitoring of impacts, or (2) as determined by unforeseen impacts or circumstances.
- B. Identify potential technical/operational option(s) to avoid and minimize impacts (e.g., via scientific literature or industry innovation).
- C. Present technical/operational option(s) to agency/authority for review to determine if it merits field testing or application. If, after review, field testing or application is not merited, go to step B. If field testing or application is merited, go to step D.
- D. Field test or apply technical/operational option(s), with agency/authority concurrence of methods, in settings which will not increase adverse impacts to birds and bats nor will result in impacts exceeding those allowable in permits or other project-related plans.
- E. Evaluate and report effectiveness of technical/operational option(s) with review by agency/authority. If ineffective, go to step B. If effective go to step F.
- F. Apply effective avoidance and minimization measures.
- G. Monitor effectiveness (update post-construction monitoring in BBCS, if necessary, with agency/authority review).
- H. Update BBCS Section on Conservation Measures, return to step A to evaluate need for further action.

VIII. Project Permits Addressing Birds and Bats

Identify need for permits. For example, migratory bird permits would be required for active nest relocation, temporary possession, depredation, salvage/disposal, and scientific collection.

- A. Bird and Bat Permits
Identify permits needed for project construction, operation, and/or maintenance.
- B. Agency and Process for Permit Issuance
Identify the responsive agency and processes to apply for and comply with permits.

IX. Reporting Formats and Schedule

Describe formats and schedule for reporting data and study results to responsive agencies.

- A. Preconstruction Survey Data
- B. Operation/Post-construction Monitoring
- C. Adaptive Management
- D. Permits

X. Personnel Training

Describe process and curriculum for providing personnel and contractors with education about wildlife laws; processes to follow upon finding injured birds, bats or carcasses; and actions they can take to avoid impacts to birds and bats.

- XI. Contacts/Key Resources
 - A. List of Contacts and Key Resources
 - B. Coordination Processes
 - Who/when/where a company should initiate contact and under what circumstances.
- XII. References and Literature Cited
- XIII. Appendices
 - A. Baseline Survey Reports
 - B. Post Construction Reports
 - 1. Carcass Monitoring
 - 2. Nest/Roost/Hibernacula Surveys
 - 3. Habitat Surveys
 - 4. Other Surveys: For example, point counts, acoustic surveys, mist net surveys
 - C. Adaptive Management Studies
 - D. Other Plans Guiding Bird and Bat Conservation (e.g., ECP)
 - E. Permits Related to Birds and Bats



United States Department of the Interior

FISH AND WILDLIFE SERVICE Mountain-Prairie Region



IN REPLY REFER TO:
FWS/R6
ES


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FEB 04 2010

Memorandum

To: Field Office Project Leaders, Ecological Services, Region 6
Montana, North Dakota, South Dakota, Nebraska, Kansas

From: Assistant Regional Director, Ecological Services, Region 6 

Subject: Region 6 Guidance for Minimizing Effects from Power Line Projects Within the Whooping Crane Migration Corridor

This document is intended to assist Region 6 Ecological Services (ES) biologists in power line (including generation lines, transmission lines, distribution lines, etc.) project evaluation within the whooping crane migration corridor. The guidance contained herein also may be useful in planning by Federal action agencies, consultants, companies, and organizations concerned with impacts to avian resources, such as the Avian Power Line Interaction Committee (APLIC). We encourage action agencies and project proponents to coordinate with their local ES field office early in project development to implement this guidance.

The guidance includes general considerations that may apply to most, but not every, situation within the whooping crane migratory corridor. Additional conservation measures may be considered and/or discretion may be applied by the appropriate ES field office, as applicable. We believe that in most cases the following measures, if implemented and maintained, could reduce the potential effects to the whooping crane to an insignificant and/or discountable level. Where a Federal nexus is lacking, we believe that following these recommendations would reduce the likelihood of a whooping crane being taken and resulting in a violation of Endangered Species Act (ESA) section 9. If non-Federal actions cannot avoid the potential for incidental take, the local ES field office should encourage project proponents to develop a Habitat Conservation Plan and apply for a permit pursuant to ESA section 10(a)(1)(B).

Finally, although this guidance is specific to impacts of power line projects to the whooping crane within the migration corridor, we acknowledge that these guidelines also may benefit other listed and migratory birds.

If you have any questions, please contact Sarena Selbo, Section 7 Coordinator, at (303) 236-4046.

Region 6 Guidance for Minimizing Effects from Power Line Projects Within the Whooping Crane Migration Corridor

- 1) Project proponents should avoid construction of overhead power lines within 5.0 miles of designated critical habitat and documented high use areas (these locations can be obtained from the local ES field office).
- 2) To the greatest extent possible, project proponents should bury all new power lines, especially those within 1.0 mile of potentially suitable habitat¹.
- 3) If it is not economically or technically feasible to bury lines, then we recommend the following conservation measures be implemented:

a) Within the 95-percent sighting corridor (see attached map)

- i) Project proponents should mark² new lines within 1.0 mile of potentially suitable habitat and an equal amount of existing line within 1.0 mile of potentially suitable habitat (preferably within the 75-percent corridor, but at a minimum within the 95-percent corridor) according to the U.S. Fish and Wildlife Service (USFWS) recommendations described in APLIC 1994 (or newer version as updated).
- ii) Project proponents should mark replacement or upgraded lines within 1.0 mile of potentially suitable habitat according to the USFWS recommendations described in APLIC 1994 (or newer version as updated).

b) Outside the 95-percent sighting corridor within a State's borders

Project proponents should mark new lines within 1.0 mile of potentially suitable habitat at the discretion of the local ES field office, based on the biological needs of the whooping crane.

c) Develop compliance monitoring plans

Field offices should request written confirmation from the project proponent that power lines have been or will be marked and maintained (i.e., did the lines recommended for marking actually get marked? Are the markers being maintained in working condition?)

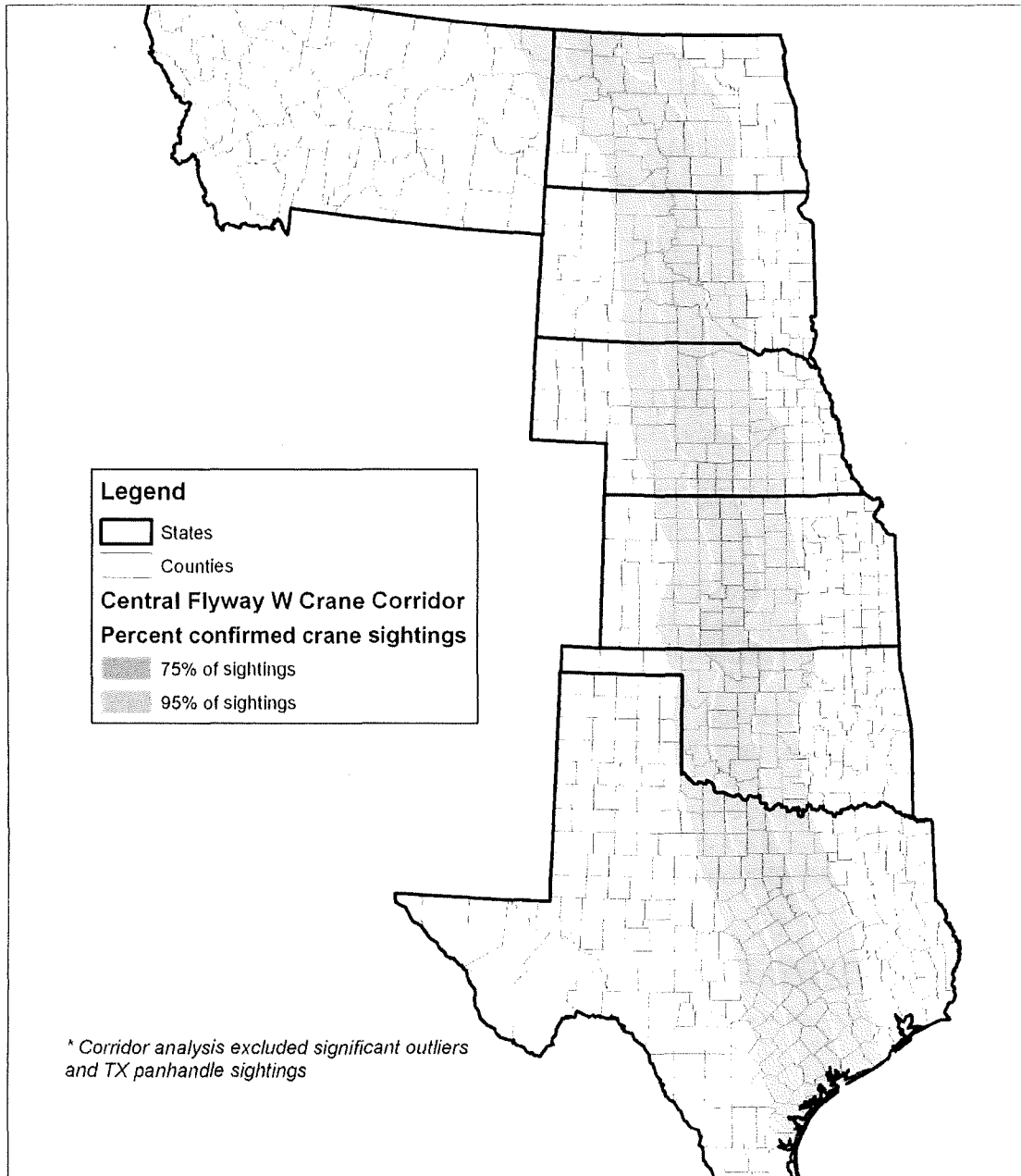
¹ Potentially suitable migratory stop over habitat for whooping cranes includes wetlands with areas of shallow water without visual obstructions (i.e., high or dense vegetation) (Austin & Richert 2001; Johns et al. 1997; Lingle et al. 1991; Howe 1987) and submerged sandbars in wide, unobstructed river channels that are isolated from human disturbance (Armbruster 1990). Roosting wetlands are often located within 1 mile of grain fields. As this is a broad definition, ES field office biologists should assist action agencies/applicants/companies in determining what constitutes potentially suitable habitat at the local level.

² Power lines are cited as the single greatest threat of mortality to fledged whooping cranes. Studies have shown that marking power lines reduces the risk of a line strike by 50 to 80 percent (Yee 2008; Brown & Drewien 1995; Morkill & Anderson 1991). Marking new lines and an equal length of existing line in the migration corridor maintains the baseline condition from this threat.

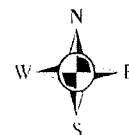
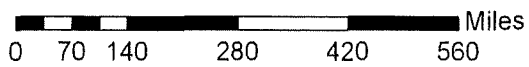


U.S. Fish & Wildlife Service

United States Central Flyway Whooping Crane Migration Corridor *



Produced for Ecological Services
Grand Island, NE
Current to: 2008
Basemap (Date): U.S. Counties
Meridian:
File:



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