United States Department of the Interior

FISH AND WILDLIFE SERVICE

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

May 18, 2016

Melissa Schmidt
Crocker Wind Farm, LLC
7650 Edinborough Way, Suite 725
Edina, Minnesota 55435

Re: Crocker Wind Farm, Clark County, South Dakota

Dear Ms. Schmidt:

This letter is in response to your request dated April 18, 2016, for environmental comments regarding the above referenced project involving a proposed wind farm located south and west of the town of Crocker in northern Clark County, South Dakota.

We note in your letter that Crocker Wind Farm, LLC, is a wholly owned subsidiary of Geronimo Energy, LLC. We previously submitted environmental comments regarding this project to Geronimo Energy, dated December 1, 2010. It appears the proposed project footprint has expanded since then. Per your letter, the project output would be up to 200 megawatts and include turbines with related equipment, roads, underground collection lines, an O & M building, substation, up to four meteorological towers and a (presumed overhead) transmission line (with exact route yet to be determined). Many of the comments provided in our December 1, 2010, letter (enclosed) still apply and are reiterated herein, with some updated information.

In this letter, we provide information regarding important wildlife habitats and U.S. Fish and Wildlife Service (Service) trust resources including federally listed species, eagles, birds of conservation concern and other migratory birds that may occur on 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 you in achieving compliance with Federal laws.

U.S. Fish and Wildlife Service Easements

The location of the proposed Crocker Wind Farm falls within an area under the jurisdiction of the Service's Waubay Wetland Management District (WMD). Our initial examination reveals that numerous Service easements and fee title properties exist in Clark County, including the proposed project area. This is a testament to the high wildlife value of the area and relatively greater environmental impacts that may be anticipated if the proposed project is constructed there. To determine the exact locations of these properties and any additional restrictions that

may apply regarding those sites, please contact Ms. Connie Mueller at: U.S. Fish and Wildlife Service, Waubay Wetland Management District, 44401 134A Street, Waubay, South Dakota, 57273, phone: (605) 947-4521.

Threatened/Endangered Species

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

Species	Status	Expected Occurrence
Whooping Crane (*Grus americana*)	Endangered	Migration
Rufa Red Knot (*Calidris canutus rufa*)	Threatened	Rare seasonal migrant
Northern Long-eared Bat (*Myotis septentrionalis*)	Threatened	Summer resident, seasonal migrant, known winter resident in Black Hills
Poweshiek Skipperling (*Oarisma poweshiek*)	Endangered	Resident in native prairie, northeastern SD

Whooping Crane:
The proposed wind farm location is within the documented migration corridor of the Aransas/Wood Buffalo population of whooping cranes - the only self-sustaining migratory population of whooping cranes in existence. A map of the portion of the migration corridor that exists in South Dakota and an associated "required reading" document for that corridor map are enclosed. These birds migrate through South Dakota twice annually 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. 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). While whooping crane interactions with wind turbines are not currently known, mortality via turbine strikes may also pose a risk if the birds utilize habitat at/near wind farm sites. Also, 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.

Rufa Red Knot:
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. The species does not breed in this state.

Northern Long-eared Bat:
The northern long-eared bat is a medium-sized brown bat listed as threatened under the Endangered Species Act. 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. The species has been documented in other forested areas in the state during the summer months and 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.

Poweshiek Skipperling:
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. Critical habitat has been designated for the Poweshiek skipperling

in South Dakota; for details and locations see the following website: http://www.fws.gov/midwest/endangered/insects/dask/finalch.html.

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, formal consultation with this office under section 7 of the ESA is required. 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.

If no Federal agency is involved with the proposed project and adverse impacts to federally listed species may occur, ESA compliance may be achieved by private entities via coordination with this office and development of a Habitat Conservation Plan (HCP). Our website provides more information on HCPs at: http://www.fws.gov/endangered/what-we-do/hcp-overview.html.

Bald Eagles

Bald eagles (*Haliaeetus leucocephalus*) occur throughout South Dakota in all seasons, and new nests are appearing each year. While ESA protection for the bald eagle has been removed, 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 eagles from a variety of harmful actions and impacts. Our agency has developed guidance for the public regarding means to avoid take of the eagle under these laws. The *National Bald Eagle Management Guidelines* are available online: http://www.fws.gov/northeast/ecologicalservices/eaglenationalguide.html. We recommend reviewing these guidelines as they advise of circumstances where these laws may apply and assist in avoiding potential violations on future projects. Additionally, permit regulations have been published for 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. *Eagle Conservation Plan Guidance* has also been developed by the Service. This document provides interpretive guidance in applying the regulatory permit standards as specified by the BGEPA and other federal laws, and facilitates the process of obtaining an eagle take permit. It is available online at: https://www.fws.gov/migratorybirds/pdf/management/eagleconservationplanguidance.pdf. South Dakota is part of the Service's Region 6, therefore we have enclosed a document intended to further assist wind companies working in this region as they develop Eagle Conservation Plans: *Final Outline and Components of an Eagle Conservation Plan (ECP) for Wind Development: Recommendations from USFWS Region 6.*

Wetlands

According to National Wetlands Inventory maps (available online at http://wetlands.fws.gov/), numerous wetlands exist within the proposed project area, including several relatively large water bodies which may attract high numbers of migratory birds. 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.

Birds of Conservation Concern and Other Grassland Birds

The Migratory Birds Division of the Service has published *Birds of Conservation Concern 2008*, which may be found online at: https://www.fws.gov/migratorybirds/pdf/grants/BirdsofConservationConcern2008.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. Primary threats impacting grassland species that occur in South Dakota are habitat loss and fragmentation. As mentioned above, the area proposed for construction of this wind development appears to be in an area of intact grassland with numerous associated wetlands - a highly valuable area for prairie wildlife. 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 a Bird and Bat Conservation Strategy (BBCS) (identified within our *Land-Based Wind Energy Guidance* – and explained further 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 grasslands. Some species of grassland nesting birds are known to exhibit avoidance behavior relative to wind turbines on the prairie landscape, out to a distance of 300 m or more (Shaffer and Buhl 2015), which equates to an area approximately 70 acres in size around each turbine. If prairie habitat impacts are unavoidable, we recommend implementing offsetting measures for this impact, such as prairie restoration, establishment of easements, or purchase of fee title lands. We can provide further guidance in this regard if the project progresses.

Wind Turbine Guidelines

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. 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 is recommended for this reason. The *U.S. Fish and Wildlife Service Land-Based Wind Energy Guidelines* are designed to help wind energy project developers avoid and minimize impacts of land-based wind projects on wildlife and their habitats are available at: http://www.fws.gov/windenergy/. If the proposed project is to be constructed, we request the

results of any pre-/post-construction wildlife monitoring, including any incidental mortality detected. The Before-After-Control-Impact (BACI) method for avian studies is recommended and described further in the guidelines.

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.

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 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: 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 *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 as this project progresses.

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 and high value grassland/wetland habitats exist onsite:
  - Contact Waubay WMD

- Wind farm guidance:
  - *Land-Based Wind Energy Guidelines*
    - *Bird and Bat Conservation Strategy*
      - USFWS Region 6 *Outline for a Bird and Bat Conservation Strategy: Wind Energy Projects*

- Address potential impacts to federally listed (ESA) species:
  - Whooping crane
  - Rufa red knot
  - Northern long-eared bat
  - Poweshiek skipperling

- Address potential impacts to eagles:
  - MBTA and BGEPA
  - *National Bald Eagle Management Guidelines*
  - *Eagle Conservation Plan Guidance*
    - *Final Outline and Components of an Eagle Conservation Plan (ECP) for Wind Development: Recommendations from USFWS Region 6*

- Address potential impacts to wetlands

- Address migratory bird impacts:
  - MBTA
  - *Birds of Conservation Concern 2008*
  - Mitigative/offsetting measures for habitat avoidance/loss
  - Meteorological Towers:
    - *2013 USFWS Revised Voluntary Guidelines for Communication Tower Design, Siting, Construction, Operation, Retrofitting, and Decommissioning*
  - Overhead Power Lines:
    - *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006*
    - *Raptors at Risk* video
    - *Reducing Avian Collisions with Power Lines: The State of the Art in 2012*

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

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

Sincerely,

Scott Larson

Scott Larson
Field Supervisor
South Dakota Field Office

Enclosures

Cc: Waubay Wetland Management District; Waubay, SD
(attn.: Connie Mueller)
SD Game, Fish, and Parks; Pierre, SD
(attn.: Silka Kempema)

LITERATURE CITED:

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