BEFORE THE SOUTH DAKOTA PUBLIC UTILITIES COMMISSION

DOCKET NO. EL17-055

IN THE MATTER OF THE APPLICATION BY CROCKER WIND FARM, LLC FOR A PERMIT OF A WIND ENERGY FACILITY AND A 345 KV TRANSMISSION LINE IN CLARK COUNTY, SOUTH DAKOTA, FOR CROCKER WIND FARM

Direct Testimony of Tom Kirschenmann
On Behalf of the Staff of the South Dakota Public Utilities Commission
March 28, 2018

Q: State your name.

A: Tom Kirschenmann

Q: State your employer.

A: State of South Dakota, Department of Game, Fish, and Parks

Q: State the program for which you work.

A: Division of Wildlife, Terrestrial Resource Section

Q: State the program roles and your specific job with the department.

A: The role of the Terrestrial Resources section is to study, evaluate, and assist in the management of all wildlife and associated habitats. Management includes game and non-game wildlife populations, habitat management on public lands and technical assistance and habitat development on private lands, population and habitat inventory, and environmental review of local and landscape projects. As the Deputy Director of the Wildlife Division and Chief of the Terrestrial Resources Section, I oversee and am involved with wildlife management and research, as well as habitat management consisting of the department's public lands and private lands programs.

Q: Explain the range of duties you perform.

A: Duties include leading the Terrestrial Resources section that includes three program administrators (Wildlife, Habitat, Wildlife Damage) and 23 wildlife biologists; coordinate and assist with the Division of Wildlife's Operations at four administrative regions; oversee wildlife research, management, and the establishment of hunting seasons for game species; oversee private lands habitat programs; coordinate environmental review evaluations and responses related to terrestrial issues with department staff; serve as the Department's liaison for several state and federal agencies; and represent the Department on state and national committees.

Q: On whose behalf was this testimony prepared?

A: This testimony was prepared on behalf of the Staff of the South Dakota Public Utilities Commission.

Q: What role does the Department of Game, Fish and Parks have in the permitting process of a wind energy development project?

A: Game, Fish and Parks has no regulatory authority when it comes to permitting wind energy development projects. The agencies role is to consult with developers and provide recommendations and suggestions on how to minimize or remove potential impacts to wildlife and associated habitats or provide available information to make informed decisions as related to natural resources.

Q: Have you reviewed the Application, attachments, and Crocker's responses to PUC Staff data requests?

A: Yes, relevant sections of the application and attachments and also received briefings provided by GFP biologists.

Q: Did the GF&P provide comments and recommendations to Crocker about the project area? Please identify who provided those comments and provide a brief summary of them.

A: Yes, Silka Kempema, Wildlife Biologist, provided comments initially in March of 2016. Comments were in response to a request for Natural Heritage data and review of potential concerns under one of the earlier proposed project boundaries. During this initial consultation, information and concerns were shared with the applicant. This consultation continued with conference calls, emails, a site visit, and review of reports and draft documents associated with the proposed project.

A summary of those comments include suggestions on the types, timing and number of surveys for grassland birds (songbirds and grouse), survey recommendations for raptors, placement of turbines and associated infrastructure considering the avoidance of untilled native prairie and large contiguous blocks of grasslands and to focus on disturbed lands such as fields currently cultivated, avoidance of activities that will fragment contiguous blocks of grasslands, avoidance of wetland basins or areas of

high concentrations of wetlands, pre-construction surveys for bat use and habitats plus post-construction mortality surveys, and recommendations on transmission line placement.

Q: Do you agree with the comments and recommendations provided to Crocker by Ms. Kempema? If not, please explain.

A: Yes. These are typical recommendations our Department would provide to wind power companies to identify, minimize, or reduce impacts to wildlife and wildlife habitats, especially those projects that are proposed in grassland and wetland habitats.

Q: Based on the information provided in the Application, in your opinion did Crocker utilize the proper studies and wildlife surveys necessary to identify potential impacts to the terrestrial environment?

A: Consultation with wildlife agencies early in the application process included the recommendation of several types of wildlife surveys to understand the potential impacts and issues that may occur in the project area. The pre-construction surveys were implemented and carried out by the applicant or are in progress. It would have been advantageous to have all surveys completed and final reports available at the time of application for review purposes. It is also recommended to carry out post-construction mortality monitoring for at least two years; one year minimum is currently documented in the application.

Q: Are there different types of grasslands?

A: Yes.

Q: Please define the following: native prairie, hayland, pasture, CRP, grassland, cropland and agriculture.

A: Grasslands are areas that contain plants species such as graminoids and commonly used for grazing or set aside for conservation purposes. They can also be areas which are planted to a mixture of grasses and legumes for livestock grazing or feed. Native prairie is grassland upon which the soil has not undergone a mechanical disturbance associated with agriculture or any other type of development. Hayland is grassland that is managed by frequent mowing and often contains non-native plant species either intentionally or by encroachment. Pasture is grassland that may contain non-native plant species either intentionally or by encroachment and is managed by through grazing. Rangeland is similar to pasture however; these areas are often larger and less invaded by exotic plant species. In some instances, hayland, pasture, and rangeland could be native prairie; in other situations hayland and pasture in particular could be land once cultivated and restored to grassland habitat. CRP is grassland that occurs on land that was once tilled and used for crop production. These lands are often not as productive as other cropland and grassland restoration is intentional.

Q: What are remnant prairie tracts?

A: Remnant prairie tracts are pieces of native prairie remaining in a landscape that is dominated by tillage agriculture that have never been tilled or have never undergone other mechanical disturbances for agriculture or other purposes. Prairie is a naturally occurring ecosystem in central North America characterized by certain precipitation levels, grazing pressure and fire. Dominant plant forms characteristic of and adapted to these environmental conditions include native grass, forb and sedge species.

Q: Do remnant prairie tracts have high conservation value?

A: Yes.

Q: Why do remnant prairie tracts have high conservation value?

A: North American prairies (tallgrass, mixed-grass and shortgrass), especially those with higher precipitation levels have had a long history of being converted to cropland. Once tilled, this system cannot be fully restored. North American prairie, especially tallgrass prairie, is still being lost at rates that make it one of the world's most endangered ecosystems. In the Prairie Coteau ecoregion, 1 million acres of potentially undisturbed lands (e.g. prairie) remain (Bauman et al. 2014) and represent some of the last remaining areas of native prairie habitat. There are several endemic grassland bird species that require native prairie. Many of these

populations are rare or declining and one of the main reasons for their decline is habitat loss.

Q: To your knowledge, are there grazed grasslands in the project area?

A: Yes.

Q: Do grazed grasslands have any conservation value?

A: All grasslands have a conservation value when considering both wildlife and livestock. While most attention and concern typically focuses on native prairie remnants, grassland habitat that has been restored from being previously cultivated has high value to a multitude of wildlife species. All grasslands (native prairie, restored/replanted grasslands, pastures, hayland, etc.) provide habitat that can and will be used by grassland birds and waterfowl. Management activities, in particular managed grazing, can help maintain healthy grassland habitats or enhance its current state. Grazing strategies applied will also determine which bird species and other wildlife will use individual tracts.

Q: Briefly explain the role of grazing on grasslands.

A: Grazing provides different plant heights that result in different types of wildlife cover, allows for nutrient recycling, and helps to maintain grassland especially in areas with higher levels of precipitations. Grazing

can be used as a management activity to either manage for a specific diversity or to manage unwanted plant species.

Q: One of the GF&P's recommendations was that efforts should be made to avoid placement of turbines and new roads in grasslands, especially untilled native prairie. Based on the information in the Application and the proposed turbine layout, did Crocker demonstrate efforts to address this recommendation? Please explain.

A: From reviewing the available maps, resources, and other information available there were efforts to avoid placement of turbines on untilled native prairie. It appears that in some instances the placement of the turbine is on the edge of native prairie and other land use types which is also a positive approach. Some turbines were placed on other types of grassland habitats that are classified as agricultural land (hay and pasture) within the application; none-the-less these are still important grassland habitats to many wildlife species. Avoidance of all grassland habitat will be challenging in this part of the state and in the project area as a high proportion of the total area is some type of grassland/herbaceous habitat. Placement of turbines in cultivated land (disturbed) is a positive siting approach.

Q. Does the state or GF&P have specific mitigation recommendations that will minimize or compensate potential impacts from wind energy development if they cannot be avoided?

A. At the current time South Dakota does not have a state mitigation policy that can be provided to wind energy developers. However, there are resources available which can provide guidance and suggestions that can be considered as well as self-imposed actions or activities that can minimize natural resource impacts.

Q: Beyond avoidance, the initial consultation letter provided by GF&P recommended that impacts to native prairie and wetlands should be mitigated. What does mitigation mean?

A: In its broader context, it can be an enhancement, restoration, creation and/or a preservation project or activity that serves to offset unavoidable impacts to a resource. It can also be measures taken in the design, materials, timing, layout/siting locations and all associated infrastructure during construction and operation.

Q: What are potential mitigation considerations?

A: Mitigation can take multiple forms and accomplished in a multitude of ways. It could be an approach which implements an applied management activity/strategy on impacted lands which elevates these lands to a more productive state or higher ecological state (example – grazing

management) to an approach which is more sophisticated and detailed using tools developed to calculate acres of habitat to be restored or created based on impacted acres and other relevant research data (example – decision support tool). Two examples that are available specifically for wind energy projects is a decision support tool based off the research conducted by Loesch et al. (2013) that considers breeding waterfowl and another which focuses on breeding grassland songbirds resulting from research findings of Shaffer and Buhl (2016). As stated earlier South Dakota does not have a state mitigation policy nor does the state endorse either study and resulting products, however it is worthy of mentioning these tools demonstrating resources available to developers and managers.

Q: Can you explain the difference between temporary and permanent habitat impacts and suggested methods to address these changes?

A: There will be temporary and permanent losses of grassland and potentially wetland habitats resulting from the construction of turbine pads, roads, and other associated infrastructure. Construction of a wind farm often requires wider roads, crane paths, laydown yards, etc., to erect turbines. These construction activities will have temporary impacts that likely can be reclaimed by restoring impacted areas by grading and reseeding. Disturbed areas should be restored using native seed sources

to reduce the introduction of new or discourage encroachment of already present exotic and/or invasive species.

For those areas that are permanently changed, the lost grassland or wetland acres are typically replaced. Disturbed areas again should be restored using native seed sources to reduce the introduction of new or discourage encroachment of already present exotic and/or invasive species. It would also be recommended to replace lost acres within the Prairie Coteau ecoregion.

Q: Are there any other impacts besides temporary and permanent habitat impacts that are likely to occur as a result of the project?

A: Indirect habitat impacts are also a consideration. Indirect impacts caused by wind turbines and associated infrastructure raise concerns with habitat fragmentation and potential displacement, especially with regards to breeding grassland and wetland species. Research into the effects of wind energy on habitat avoidance has shown that some species will not use grassland or wetland habitat within a certain distance of a wind turbine (Loesch et al. 2013, Shaffer and Buhl 2016).

Q: One of GF&P's concerns involved the fragmentation of contiguous blocks of grasslands. Why is fragmentation a concern?

A: Fragmentation results in the direct loss of habitat and diminishes the value of remaining habitat. Habitat fragmentation is the division of large contiguous blocks of habitat into smaller, and in some instances isolated patches.

Q: The GF&P recommended avoiding the placement of turbines and roads in contiguous blocks of grassland. Based on the information provided in the Application, did Crocker address this recommendation?

A: Based on reviewing available information, fragmentation of grassland habitats were avoided/minimized in some of the project area through the proposed layout of the infrastructure of the wind farm. This is a result of using existing roads, placing new roads along edges or through cultivated lands, and following existing corridors (roads) for power lines. There are other locations of the project area which currently are void of roads and the placement of service roads to turbines will create some level of fragmentation of larger grassland blocks (comprised of different grassland cover types: hay, pasture, etc.). Based on the location of the project area and the existing land-use, it will be challenging not to create some additional fragmentation of grassland habitat, and in some situations larger contiguous blocks comprised of different grassland cover types.

Q: If fragmentation of contiguous blocks of grasslands couldn't be avoided, the GF&P recommended the impacts should then be mitigated. Does the GF&P have any recommendations on adequate types of mitigation measures Crocker should undertake to offset any adverse impacts due to fragmentation? Please explain.

A: As stated earlier, the state does not have a mitigation policy, however other resources and approaches exist that could be considered to help minimize the impacts of additional fragmentation.

Q: The GF&P recommended that turbines should not be placed in or near wetland basins and special care should be made to avoid areas with high concentrations of wetlands. Do you believe that Crocker's proposed turbine layout incorporates this recommendation?

A: The application mentions under mitigation measures for wildlife that wetlands will be avoided or minimize disturbance of individual wetlands during project construction as well as identifying wetland boundaries by delineating them prior to construction. These are appropriate measures. No turbines are planned in wetland basins. Reviewing the turbine layout and using NWI wetland information for the project area, several turbines appear to be placed in areas of higher concentrations of wetland basins. It will be challenging to avoid areas of high wetland concentrations because of the high number of wetland acres and basins found in this part of state and project area.

Q: Are you aware of any other wind farms near this proposed project?

A: Yes.

Q: Given that the Day County wind farm is north of the Project and Oak Tree wind farm is southeast of the project, does the GF&P have any thoughts regarding the potential for cumulative impacts the Project may have?

A: Native prairie grasslands continue to decline in eastern South Dakota. Knowing the importance of these native prairie tracts to several grassland dependent species, continued development on these types of lands could result in reduced or limited habitat value. Placement of turbines in lands currently under cultivation and avoiding where possible the different varieties of grassland and wetland habitats will help minimize potential cumulative impacts. Species sensitive to habitat fragmentation may show different responses based on the landscape context (surrounded by grasslands or surrounded by cropland and other development or disturbance).

Our agency will continue to work with wind developers and provide recommendations that we believe will help minimize cumulative impacts. No different than offered to this project, the focus could include, but not limited to, recommendations on avoiding grassland habitats, in particular

native prairie remnants, avoidance of high wetland complex areas, maximize the use of existing corridors for infrastructure, and pre and post construction surveys to assess the proposed project area.

Q: Do any State threatened or endangered species have the potential to be impacted by the wind farm?

A: There are records of the state and federal endangered Whooping Crane in Clark County. A chance exists where one may be struck by a wind turbine blade. The other state listed species present is the Northern River Otter and there are not likely to be impacts to this species from the proposed wind farm.

Q: Are there any GF&P lands or other public lands that may be impacted by the wind farm?

A: There are two Game Production Areas within the project area boundary and three outside but adjacent to the boundary; and one School and Public Lands property within the project area and two immediately adjacent but outside.

Q: Does the GF&P have any recommendations to protect those GF&P lands or other public lands?

A: The state does not have an established set-back policy or recommendation for wind turbine placement in proximity to state

properties such as Game Production Areas. Set-back policies have been established at local levels by local government entities and in some instances have been suggested as the potential set-back distance from state properties. At this time it is the state's belief that these types of policies be established at the local level and at the discretion of the PUC Commission to impose such set-backs when considering wind energy permits.

Q: If the final turbine locations changed from those provided in the proposed turbine layout, could the potential terrestrial environment impacts change?

A: Yes.

Q: You mentioned the applicant requesting data from the Natural Heritage Database. What is the South Dakota Natural Heritage database? What type of information does it contain?

A: The South Dakota Natural Heritage database tracks species at risk. Species at risk are those that are listed as threatened or endangered at the state or federal level or those that are rare. Rare species are those found at the periphery of their range, those that have isolated populations or those for which we simply do not have extensive information on.

This database houses and maintains data from a variety of sources including site-specific surveys, research projects and incidental reports of species that cover a time period from 1979 to the present. It is important to note that the absence of data from this database does not preclude a species presence in the proposed project area.

Q: Does this conclude your testimony?

A: Yes.

Bauman, P., J. Blastick, C. Grewing, and A. J. Smart. 2014. Quantifying undisturbed land on South Dakota's prairie coteau. SDSU Extension.

Loesch, C. R., J. A. Walker, R. E. Reynolds, J. S. Gleason, N. D. Niemuth, S. E. Stephens, and M. A. Erickson. 2013. Effect of wind energy development on breeding duck densities in the Prairie Pothole Region. The Journal of Wildlife Management 77:587-598.

Shaffer, J. A., and D. A. Buhl. 2016. Effects of wind-energy facilities on breeding grassland bird distributions. Conservation Biology 30:59-71.

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Education:

Eureka High School, Eureka, SD, 1989
BS: Wildlife and Fisheries Sciences, South Dakota State University, May 1993
MS: Wildlife Management, South Dakota State University, May 1996

Certifications:
Certified Wildlife Biologist, The Wildlife Society, July 2000
Level III Career Development Training, SD GF&P, 2007

Experience:

SOUTH DAKOTA GAME, FISH, AND PARKS, Pierre, SD
Wildlife Division Deputy Director (2016 - present) & Chief of Terrestrial Resources (11/08 - present)
Supervisor: Tony Leif, Director, Division of Wildlife, 605-773-4518

- Serve as the Wildlife Division's Deputy Director to assist with the overall management of the Division.
- Coordinate the management and research of game and non-game species statewide.
- Coordinate the management of the Departments habitat programs, including the private lands programs, public lands management, access programs, terrestrial environmental assessments, and programs related to the federal Farm Bill.
- Oversee a staff that includes a Program Administrator for Wildlife, Habitat and Wildlife Damage programs and 23 biologists.
- Serve as the Department's liaison or representative for several state and federal agencies and associated committees.
- Coordinate with non-government organizations, constituency groups, and agricultural groups on resource management programs, projects, and issues.
- Manage an annual budget of approximately $16M which includes research, direct payments to landowners for habitat, hunting access, and wildlife damage, and contracts to complete surveys, programs, and projects.
- Lead rules promulgation process for respective duties by presenting to the GFP Commission and assisting in writing administrative rules.

SOUTH DAKOTA GAME, FISH, AND PARKS, Pierre, SD
Wildlife Program Administrator, Game Management (12/07 – 11/08)
Supervisor: George Vandel, Assistant Director, Division of Wildlife, retired

- Coordinated the management and research of all game species statewide.
- Coordinated the accumulation and organization of data and regional suggestions in the development of hunting season recommendations.
- Drafted action sheets and present season recommendations to GF&P Commission.
- Assisted with the development and a team member that reviews hunting season applications and the Hunting Handbook.
- Supervised 9 biologists and 1 secretary stationed in five locations across the state.

- Served as department representative on committees (wildlife disease boards and poultry advisory board) and liaison to the SDSU Diagnostic Lab and APHIS Wildlife Services for Avian Influenza monitoring.
- "Press Release" review team member.
- Oversaw the Game Budget, including the contractual research projects with SDSU Wildlife and Fisheries Department and other academic institutions.
- Worked with the media addressing game and related issues, including live interviews, newspaper articles, and the writing of short articles.
- Team member in the development and implementation of the Mentored Hunting Program.
- Presented research and management information at regional meetings, Commission meetings, and to conservation organizations.

SOUTH DAKOTA GAME, FISH, AND PARKS, Huron, SD
Sr. Wildlife Biologist (1/05 – 12/07)
Supervisor: Tony Leif, Director, Division of Wildlife, 605-773-4518

- Oversaw management and research of upland game species statewide.
- Directed internal upland game research, analyses, and reports.
- Part of game staff committee that provided recommendations on all game seasons and license allocations.
- Served as Office Manager at the Huron GF&P District Office: directing day to day activities of Resource Biologist and Secretary within the Upland Game Section.
- Served as field co-leader with waterfowl biologist in the coordination of statewide Avian Influenza (AI) sampling.
- Worked with regional game staff on management, survey, research, and mortality projects.
- Administered the departments Wildlife Partnership Program for two years and provided guidance and direction upon request.
- Assisted with the coordination of meetings and trainings, including serving as chair person of the Prairie Grouse Technical Council (PGTC) meeting in October 2007.
- Served as department representative on several committees such as Midwest Pheasant Study Group, PGTC, Sage Grouse Council, Poultry Advisory Board (AI matters), and the National Wild Turkey Federation Technical Representative.
- Wrote management and scientific reports, as well as magazine and newspaper articles.
- Conducted presentations internally, as well as landowner and sportsmen club meetings.

PHEASANTS FOREVER, INC., St. Paul, MN
Regional Wildlife Biologist
South Dakota & Wyoming (4/00 – 1/05)
Illinois & Indiana (7/95 – 4/00)
Supervisor: Richard Young, VP Field Operations, 877-773-2070

- Established and maintained chapters comprised of grassroots volunteers and guided them in the development of habitat programs, fundraising efforts, and youth programs.
- Worked with chapters to develop wildlife habitat programs designed to fit the needs for both local and regional areas.
- Directed and assisted chapters with annual fund-raising events. Wrote grants to support local and state habitat efforts.
- Built partnerships between Pheasants Forever (both chapters and national) with local, state, and federal conservation agencies. Primary PF representative in developing SD Wildlife Habitat Extension Biologist (WHEB) program with SD GF&P and SD NRCS.
- Developed reporting system, submitted reports to GF&P, NRCS, and PF national, wrote grants, and some supervisory duties related to the WHEB program.
- Served on several state and federal habitat committees (State Technical Committee for both SD and WY, SD CRP sub-committee, WHIP sub-committee for SD and WY, SD School and

Public Lands, Northern Great Plains Joint Venture, Great Lakes and Upper Mississippi Joint Venture, IL Pheasant Fund Committee, IN DNR Gamebird Partnership Committee, IL DNR Conservation Congress).

- Organized and conducted wildlife habitat workshops for chapters, landowners, and other agency personnel.
- Established agenda, budget, and organized annual meeting for subgroup of co-Regional Wildlife Biologists, while serving as Mentor Group Leader.
- Wrote newspaper articles, interviewed for radio and TV shows, conducted presentations, and distributed newsletters.
- Educated volunteers about wildlife biology, habitat, wildlife interactions, and counsel on current, upcoming, and changes to state and federal conservation programs.

SOUTH DAKOTA STATE UNIVERSITY; Brookings, SD
Graduate Research Assistant (4/93 - 7/95; graduated 1996)
Supervisor: Dr. Daniel Hubbard, Professor, retired
Graduate Research Project.

- Research involved the comparison of avian and aquatic invertebrate abundances on conventional, organic, and no-till farming systems.
- Efforts included breeding waterfowl pair counts, waterfowl brood counts, wetland bird surveys, upland bird surveys, and aquatic invertebrate sampling.
- Other duties included surveying aquatic plants and collecting soil seed bank samples.
- Prepared bi-annual reports for USDA and EPA.

SOUTH DAKOTA STATE UNIVERSITY; Brookings, SD
Research Technician (3/92 - 8/92)
Supervisor: Diane Granfors, Graduate Research Assistant
Seasonal position.

- Assisted with wood duck study determining brood habitat and survival.
- Built, repaired, and placed wood duck nesting structures.
- Candled eggs, web tagged ducklings, banded hens, placed radio telemetry collars and acquired locations.

SOUTH DAKOTA STATE UNIVERSITY; Brookings, SD
Research Technician (10/90 - 3/91; 10/91 - 3/92)
Supervisor: Todd Bogenschutz, Graduate Research Assistant
Seasonal position.

- Aided on the research study that evaluated corn and sorghum as a winter food source for the ring-neck pheasant.
- Shared duties to feed pen birds on restricted diets.
- Sampled winter food plots.
- Assisted in extracting intestinal organs and taking anatomical measurements and weights.

SOUTH DAKOTA STATE UNIVERSITY; Brookings, SD
Research Technician (5/91 - 8/91)
Supervisor: John Lott, Graduate Research Assistant
Seasonal position.

- Worked on yellow perch food habit study.

- Used various equipment to sample fish and zooplankton. Aged fish and processed stomach contents. Sorted and tabulated zooplankton samples.

THE NATURE CONSERVANCY, Ordway Prairie, Leola, SD
Intern/Preserve Worker (5/90 - 8/90)
Supervisor: Andy Schollett, Preserve Manager
Seasonal position.

- Monitored grazing leases and rotations, conducted brome and prairie plant surveys, spraying of noxious weeds, fencing and general maintenance.