BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

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	)))))))	EL 17-028

DIRECT TESTIMONY OF

BRIE ANDERSON

ON BEHALF OF

CROCKER WIND FARM, LLC

TABLE OF CONTENTS

Q. Please state your name and business address for the record.

A. Brie Anderson. My business address is 800 Washington Avenue North, Suite 315, Minneapolis, Minnesota 55401

Q. Can you briefly describe your education and experience?

A. I have a Bachelor of Science degree in Ecology and Field Biology with a wildlife emphasis and a Master of Science degree in Geographic Information Systems for Natural Resources. I have ten years of experience permitting various infrastructure at the federal, state, and local levels.

Q. Have you attached a resume or CV.

A. Yes.

Q. Have you previously submitted or prepared testimony in this proceeding in South Dakota?

A. No.

Q. What is the purpose of your direct testimony?

A. To support and further explain the portions of the application for which I am responsible.

Q. For which sections of the application are you responsible?

A. I oversaw or participated in the preparation of the following sections:

- 3.0 – Completeness Check;
- 10.0 – Environmental Information;
- 12.0 – Effect on Hydrology;
- 13.1.1 and 13.1.2 – Existing Terrestrial Ecosystems: vegetation (Wind Farm Project Area and Transmission Line Route, respectively);
- 13.1.3 and 13.1.4 – Existing Terrestrial Ecosystems: cropland and pasture (Wind Farm

Project Area and Transmission Line Route, respectively);

- 13.1.5 and 13.1.6 – Existing Terrestrial Ecosystems: conservation easements (Wind Farm Project Area and Transmission Line Route, respectively);
- 13.1.7 – Existing Terrestrial Ecosystems: noxious weeds;
- 13.1.8-13.1.9 – Wetlands (Wind Farm Project Area and Transmission Line Route)
- 13.2.1-13.2.2 – Impacts to Terrestrial Ecosystems: vegetation (Wind Farm Project Area and Transmission Line Route);
- 14.0 – Effect on Aquatic Ecosystems (Wind Farm Project Area and Transmission Line Route);
- 17.0 – Water Quality (Wind Farm Project Area and Transmission Line Route);
- 18.0 – Air Quality (Wind Farm Project Area and Transmission Line Route); and
- Figures

Q. Where in South Dakota is the facility expected to be developed?

A. Clark County, South Dakota

Q. Please describe the information provided in Section 3.0 – Completeness Check.

A. Section 3.0 provides an overview of each matter set forth in South Dakota Codified Laws Chapter 49-41B and in Administrative Rules of South Dakota Chapter 20:10:22 (Energy Facility Siting Rules) related to wind energy facilities and transmission lines. The Completeness Checklist presented in Table 3-1 indicates where in the application each rule requirement is addressed.

Q. Please describe the information provided in Section 10.0 – Environmental Information.

A. Section 10.0 provides a brief introduction of the subsequent Sections environmental information is located.

Q. Please describe the existing hydrogeology within the project area.

A. According to the United States Geologic Survey, the Wind Farm Project Area and Transmission Line Route are located within the Northern Great Plains aquifer system. This aquifer system is comprised of permeable rocks from the Tertiary and Cretaceous periods, and upper and lower Paleozoic eras. The principal aquifers in the Project Area are the Prairie Coteau 1 and Altamont Aquifer 2.

Q. Please describe the surface water resources in the project area.

A. The Project is located within the Missouri River Basin and Middle James, Upper Big Sioux, and Mud sub-basins. Based on National Wetland Inventory data, there are nearly 1,400 wetlands and waterbodies in the Project Area. These include lakes, freshwater ponds, riverine systems, freshwater emergent wetlands, freshwater scrub-shrub, and freshwater forested wetlands. Adam Holven will talk directly about wetlands.

Q. Please describe the floodplains in the project area.

A. The Federal Emergency Management Agency (FEMA) has not completed a study to determine flood hazards in Clark County. Therefore, there is no floodplain data available.

Q. Are there any National Park Service Nationwide Rivers Inventory rivers in the Project Area?

A. No. The nearest NRI segment is the James River in Spink County, approximately 23 miles southwest of the Project Area.

Q. Are there any impaired waters in the Project Area?

A. No. There are no 303(d) listed waterbodies in the Project Area. There are three lakes within Clark County that are impaired for mercury in fish tissue; however, all three lakes are outside the Project Area.

Q. Please describe the wetlands in the Wind Farm Project Area.

A. Based on U.S. Fish and Wildlife Service National Wetlands Inventory (NWI) data, approximately 8 percent of the Wind Farm Project Area is mapped as wetlands or ponds. These include palustrine emergent wetlands, palustrine forested wetlands, palustrine shrub-scrub wetlands, and freshwater pond/lake/riverines.

Q. Please describe the wetlands in the Transmission Line Route.

A. Based on U.S. Fish and Wildlife Service National Wetlands Inventory (NWI) data, there is less than half of one acre in the Transmission Line Route.

Q. Why did you use the USFWS NWI data to map wetlands?

A. USFWS NWI data is the best available wetland data that provides systematic coverage of the Project Area. It is typically used as a baseline data set prior to field verification or delineation.

Q. Have you included a map of surface waters?

A. Yes – Figures 5a-5d.

Q. Please describe the proposed facility's impact on current or planned water use.

A. The Project will not require surface water appropriation, permanent dewatering, or deep well injection, and water storage, reprocessing, or cooling will not be required for either construction or operation of the Project. The facilities will not impact municipal or private water uses. Due to the lack of a rural water supply, the O&M facility will require a water supply well. Water usage will be similar to a household volume, or 400 gallons per day. The Applicant will install a private wastewater treatment system that meets the requirements of South Dakota Department of Environmental and Natural Resources and the Clark County Zoning Ordinance. Domestic wells will not be impacted by construction dewatering due to a minimum setback of

2,000 feet from non-participating residences and 1,000 feet from participating residences. Construction dewatering will be conducted in compliance with South Dakota law. Surface water availability for communities, schools, agriculture, recreation, fish, or wildlife will not be impacted.

Q. Please describe the proposed facility's impact to drainage patterns.

A. The dispersed nature of the wind farm facility and transmission line structures would not provide enough of a concentration of increased impervious surfaces to change drainage patterns. These facilities are generally sited at higher elevations. Additionally, the transmission line will be designed to span larger wetlands or other water features where practicable. Trenching the collection system may temporarily impact drainageways, but existing contours and drainage patterns would be restored as soon as practicable. If an access road will cross a drainage, it will be appropriately designed to maintain the existing drainage (i.e., culverts or low water crossings).

Q. Please describe the proposed facility's impact to flood storage areas.

A. Although FEMA has not conducted a study to determine flood hazards, it is unlikely that the Project would impact floodplains because the facilities are located at higher elevations. Any potential impacts would be temporary in nature, and existing contours and elevations restored upon construction completion.

Q. Will the Project cause increased runoff?

A. No. The creation of approximately 243 acres of impervious surfaces represents less than one percent of the Project Area. Crocker will implement stormwater Best Management Practices that will adequately mitigate any increases in runoff as a result of construction.

Q. Please describe the existing vegetation in the project area.

A. According to the US EPA, the Project Area is located within the Prairie Coteau Level IV Ecoregion of South Dakota. Vegetation communities in this ecoregion are typically comprised of dry-hill prairie and northern mesic tallgrass prairie. Cultivation occurs in the flatter outwash plains and on gentler slopes void of rocks. Based on the National Land Cover Dataset, hay/pasture, grassland/herbaceous, and cultivated crops are the three predominant land cover types in the Project Area (86%). Wheat, corn, soybeans, oats, barley, and alfalfa are the main crops grown in Clark County. Hay/pasture lands represent the majority of the land cover type (37%). Grassland/herbaceous areas are second most abundant at 33%; however site visits and grassland-specific studies indicate that much of the mapped grassland is actively grazed pasture. Grassland/herbaceous and hay/pasture also make up the majority of the transmission line route along with developed open space due to the fact that the transmission line parallels existing roads for most of the route.

Q. Please describe the why you used the national land cover dataset.

A. The national land cover dataset is a produced by the multi-resolution land characteristics consortium. This dataset was created to provide a standard land cover dataset throughout the continental United States that is updated every 5 years. The consistent methodology allows comparison amongst years to detect changes in land cover. It also allows comparison between different geographic areas.

Q. Have you included a map of land cover types?

A. Yes – Figures 6a-6d .

Q. Please describe the cropland and pasture land in the project area.

A. Approximately 16 percent of the project area is cultivated crops and 70 percent is grassland and pastureland. The U.S. Department of Agriculture Census of Agriculture data from

2012, the most recent year for which data is available, indicates that 66 percent of the land area in Clark County is cropland with corn and soybeans being the most common. Other common cultivated crops include forage-land, wheat, and spring wheat. Site visits confirm that a significant portion of the mapped grassland/herbaceous land cover is actually utilized for grazed pasture.

Q. Is there prime farmland in the project area?

A. Yes. According to the Natural Resources Conservation Service, approximately 35 percent of the Project is classified as prime farmland, and 22 percent as farmland of statewide importance. Approximately 37 percent of the Project is classified as "not prime farmland."

Q. Please describe the conservation easements in the project area.

A. Based on data from the U.S. Fish and Wildlife Service, here are several U.S. Fish and wetland and grassland easements in the project area. A USFWS wetland easement protects the wetland area of a parcel; the upland area outside the wetland is not covered by the easement. Land covered by a USFWS grassland easement may not be cultivated and mowing, haying, and grass seed harvesting must be delayed until after July 15 each year. This restriction is to help grassland nesting species, such as ducks and pheasants, complete their nesting before the grass is disturbed.

Q. Have you included a map of easements?

A. Yes – Figures 7a-7d .

Q. Please describe the potential for noxious weeds in the project area.

A. According to the South Dakota Department of Agriculture, 7 listed species of noxious weeds have the potential to occur and area regulated within Clark County. These include three species listed statewide (leafy spurge, Canada thistle, and perennial sow thistle) and four species

listed locally for Clark County (absinth wormwood, field bindweed, musk thistle, and plumeless thistle).

Q. Please describe the permanent impacts to vegetation in the project area.

A. vegetation will be removed for the installation of turbine pads, access roads, substations, and the O&M facility. Less than one percent of the land within the project area will be permanently converted to sites for these facilities (up to 243 acres). The areas surrounding each turbine will still be able to be farmed, grazed, or otherwise managed as it was prior to the installation of the wind farm. Impacts to each land cover type are proportional to their abundance, meaning hay/pasture will have the most acres of impact followed by grassland/herbaceous, and cultivated crops for all four layouts. Permanent impacts were calculated using a 75 foot radius of the turbine location to create the foundation, 18 foot wide access roads, and the footprints for the Project substation, interconnection switchyard, and O&M facility. Permanent impacts from the transmission line will be limited to the structure foundations, which will range from 6 to 11 feet.

Q. Please describe the temporary impacts to vegetation in the project area.

A. Temporary impacts from the project will be associated with the temporary workspace during construction around each turbine, trenching collection lines, and the crane paths. For the purposes of calculating temporary impacts in this application, we assumed a 200 foot radius around turbines and a collection line/crane path corridor 35 feet wide. These assumptions were based on the developer's experience constructing other wind facilities in the Region. Assuming the Vestas V110 layout is constructed, which has the most turbines, up to approximately1000 acres will be temporarily disturbed. These areas will be restored to pre-construction contours and re-vegetated with a seed mix to match the

surrounding landscape. Agricultural activities, including cultivating crops, haying, and ranching, that were conducted prior to conduction will be accessible post-construction in areas that will be temporarily disturbed.

Q. Please describe the how the Project will avoid the spread of noxious weeds.

A. Crocker will work with construction contractors entering the project area to control and prevent the introduction of noxious weeds and invasive species. Best Management Practices will be implemented and may include checking equipment and periodically washing equipment.

Q. Please describe the how BMPs used during construction to protect topsoil and minimize soil erosion.

A. The Applicant will prepare a construction stormwater pollution and prevention plan and secure a National Pollutant Discharge Elimination System permit. Under this permit and outlined in the SWPPP, the project will include construction practices that may include containing excavated material, protecting exposed soil and stabilizing restored material, revegetating non-cropland and range areas with wildlife conservation species and, wherever feasible, planting native tall grass prairie species in cooperation with landowners and/or agencies.

Q. Please describe the existing aquatic ecosystem in the project area.

A. According to National Wetlands Inventory data, there are several lakes, freshwater ponds, riverine systems, freshwater emergent wetlands, freshwater scrub-shrub, and freshwater forested wetlands in the project area. These water features comprise approximately eight percent of the land in the project area and less than half of one acre within the transmission line route.

Q. Are there any aquatic species of concern in the project area?

A. Potentially. The USFWS lists the Topeka shiner as potentially occurring in Clark

County.

Q. Please describe the proposed facility's potential impacts to aquatic ecosystems.

A. The project is not anticipated to significantly affect aquatic ecosystems as project facilities will be sited in higher elevation uplands. The primary potential for the Project to impact aquatic ecosystems would be due to increased sedimentation caused by erosion during construction, and from changes in runoff patterns and water volumes due to impervious surfaces. However, implementation of BMPs in the SWPPP and coverage under the General Permit for Stormwater Discharges associated with Construction Activities will control erosion and sedimentation. BMPs may include silt fence, straw wattles, erosion control blankets, and project staging.

Q. Please describe the proposed facility's potential impacts to Topeka shiner

A. The project is not anticipated to impact the Topeka shiner. Construction will occur in upland areas and BMPs will be implemented to minimize soil erosion and sedimentation. Further, the project will not cause significant changes to runoff patterns.

Q. Please describe the proposed facility's potential to impact water quality.

A. As discussed in Sections 12 and 14 of the application, project facilities will be sited at higher elevations. The delivery of sediment into receiving waters during Project construction due to the excavation and exposure of soils, as well as potential increased in stormwater runoff dur to impervious surfaces are the primary potential impacts to water quality. Sediment and erosion control BMPs would prevent water quality issues that might otherwise cause issues in receiving waters. The implementation of the SWPPP as required under the General Permit for Storm Water Discharges Associated with Construction Activities that will be issued by the SDDENR will ensure the minimization of impacts to water quality.

Q. Please describe the existing air quality in the project area.

A. The nearest SDDENR ambient air monitoring location is located approximately 35 miles southeast of the project in Watertown, South Dakota. The primary emission sources within the project area include agricultural equipment and vehicle use along State Highway 20.

Q. Please describe the proposed facility's potential to impact air quality.

A. Impacts to air quality will be limited to the construction phase and may occur as fugitive dust and short-term emissions from diesel fuel equipment and limited to the time of construction activities. The Project would not result in National Ambient Air Quality Standard exceedances for particulate matter. Operation of the project would not produce air emissions which would impact the Project areas' ambient air quality. The Project will obtain a general air quality permit for construction through SDDENR and implement BMPs during construction to suppress fugitive dust emissions.

Q. Please describe the where you acquired data for the Figures.

A. Data was obtained from publicly available sources, such as South Dakota GIS website, U.S. Geological Survey, and Multi-Resolution Land Consortium. In some instances, project-specific environmental data was incorporated into the analysis (i.e., wetlands). Data was also obtained by reaching out to agencies, such as the USFWS for easement data. The data displayed on the figures are consistent with data provided on other wind project permits.

Q. Have you reviewed the list and map of the proposed turbine locations in the application?

A. Yes.

Q. Do your comments and conclusions apply to each of those locations individually?

A. Yes.

Q. Would your answers change for any of the locations?

A. No. If turbine locations were to shift, they would be subject to compliance with the same rules and regulations.

Q. Do you have any specific concerns about moving turbine locations?

A. No, as long as these requirements are met, there should be no unique concerns or problems that arise.

Q. Would your answers change for any of the locations?

A. No.

Q. If the applicant later moved any tower locations, would there be any adverse impacts?

A. No.

Dated this 26th day of September, 2017.

BRIE ANDERSON