BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF THE APPLICATION BY PREVAILING WIND PARK, LLC FOR A PERMIT FOR A WIND ENERGY FACILITY IN BON HOMME, CHARLES MIX, AND HUTCHINSON COUNTIES, SOUTH DAKOTA, FOR PREVAILING WIND PARK ENERGY FACILITY

SD PUC DOCKET EL-18-026

PRE-FILED DIRECT TESTIMONY OF KEITH THORSTAD
ON BEHALF OF PREVAILING WIND PARK, LLC

May 30, 2018

I. INTRODUCTION AND QUALIFICATIONS

Q. Please state your name, employer, and business address.

A. My name is Keith Thorstad. I am the owner of Thorstad Companies. My business address is 101 Second Street West, PO Box 321, Chokio, Minnesota.

Q. Briefly describe your educational and professional background.

A. I have a degree in Industrial Technology. I have worked in the construction industry for 40 years and have 20 years of experience working with wind energy developers and owners across the United States. I have worked on more than 200 projects. A copy of my resume is included as **Exhibit 1**.

Q. What is your company's role with respect to the Prevailing Wind Park Energy Facility ("Project")?

A. Thorstad Companies is serving as the Engineer-Procure-Construct ("EPC") contractor for the 200 megawatt ("MW") Project.

II. PURPOSE OF TESTIMONY

Q. What is the purpose of your Direct Testimony?

A. The purpose of my Direct Testimony is to describe the design and construction of the Project.

Q. What exhibits are attached to your Direct Testimony?

A. Exhibit 1: Resume

Q. Please identify the sections of the Application to the South Dakota Public Utilities Commission for a Facility Permit ("Application") that you are sponsoring for the record.

A. I am sponsoring the following sections of the Application:

- Section 8.0: General Site and Project Component Description

III. PROJECT OVERVIEW

Q. Please provide an overview of the Project and its components.

A. The proposed Project is an up to 200 MW wind energy facility and would include the following components:

- Up to 61 wind turbines;
- Access roads to each wind turbine and associated facilities;
- An underground electrical power collector and communications systems;
- A collector substation;
- Up to four permanent meteorological ("MET") towers;
- An operations and maintenance ("O&M") facility; and
- Additional temporary construction areas, including crane paths, public road improvements, a laydown yard, and one or more concrete batch plants (as needed).

Q. What is the proposed construction schedule for the Project?

A. As discussed in the Direct Testimony of James Damon and Section 19.0 of the Application, Prevailing Wind Park, LLC ("Prevailing Wind Park") expects Project construction to commence in the Fourth Quarter of 2018. Prevailing Wind Park anticipates that the Project will achieve commercial operation in the Fourth Quarter of 2019. A preliminary permitting and construction schedule is included in Table 19-1 of the Application.

IV. PROJECT DESIGN AND CONSTRUCTION

Q. From an engineering and operational design perspective, please describe the turbines that may be used for the Project.

A. The Project would consist of up to 61 wind turbines that will generate up to 200 MW of energy. Both representative turbine models, the GE 3.8-137 and Vestas 136-3.6, have Supervisory Control and Data Acquisition ("SCADA") communication technology to control and monitor the Project. The representative turbine models also contain

emergency power supplies to allow operation of the control systems, braking systems, yaw systems, and blade pitch systems to shut the turbine down safely if grid power is lost. Additional information concerning Project turbines is included in Section 8.2 of the Application.

Q. Please describe the foundations that will be constructed for the turbines.

A. The expected turbine foundation would be a spread foundation design. Foundations for the towers would be approximately 2,700 square feet, with a depth of up to 10 feet. Except for approximately 12 inches that would remain aboveground to allow the tower to be appropriately bolted to the foundation, the tower foundation would be underground. A specific foundation design would be chosen based on geotechnical surveys conducted at each turbine location, as well as turbine tower load specifications and cost considerations, among other factors.

Q. Will the collection system be installed underground?

A. Generally, yes. The 34.5-kilovolt ("kV") electrical collection system will be installed underground and bundled with the fiber-optic communication system cables. Occasional junction boxes will be located aboveground at points where the cables are spliced, and where the cables enter into the collector substation. Approximately 65 trench miles of underground collector and communication lines will be installed. Directional drilling may be used in wetland and stream areas. Additional detail is provided in Section 8.7.1 of the Application.

Q. Could you describe the Project collection substation?

A. A new collector substation would be constructed in the center of the Project Area, on private land, where the 34.5-kV electric collection grid and fiber-optic communication network would terminate. The Project collection substation will include a main transformer to step up the voltage of the collection grid from 34.5 kV to 115 kV, aboveground bus structures to interconnect the collector substation components, breakers, a control building, relays, switchgear, cable storage,

communications and controls, and other related facilities required for delivery of electric power to the 115-kV gen-tie transmission line.

The design of the collector substation is not finalized, but Prevailing Wind Park expects it would be enclosed by a chain link fence with dimensions of roughly 350 feet by 450 feet (4 acres). The collector substation components would be placed on concrete and steel foundations. Additional detail is provided in Section 8.7.2 of the Application.

Q. Please describe the O&M facility that will be constructed for the Project.

A. The O&M facility would be located within the Project Area, in a location with proper transportation, communications facilities, and easy access to Project facilities. The proposed O&M facility would house the equipment to operate and maintain the wind farm. A gravel parking pad would provide the building with a parking area and secured outside storage. Total permanent disturbance from the O&M facility, including parking, would be approximately 6 acres. Additional detail is provided in Section 8.4 of the Application.

Q. Please discuss the design and installation of the permanent MET towers.

A. Prevailing Wind Park anticipates that the Project would include permanent wind measurement equipment, which could consist of up to four permanent 80-meter meteorological towers. The permanent meteorological towers would be self-supporting and would not have guy wires. The towers would be lighted and painted as necessary to comply with Federal Aviation Administration guidelines and would be connected to the Project collection system for communications and power needs.

Q. With respect to Project access roads, how will access road requirements differ during and after construction?

The Project's access roads will provide access to turbines and other Project facilities during construction and for maintenance and monitoring during operations. During construction, most access roads will have temporary widths of approximately 50 feet

to accommodate heavy construction equipment; access roads required to accommodate movement of the turbine erection crane will have temporary widths of approximately 60 feet. After construction, access roads will be reduced to their permanent width of 16 feet and the crane paths will be restored. Additional information concerning access roads is included in Section 8.3 and Table 10-1 of the Application.

Q. Discuss the personnel that will be involved in the construction of the Project.

A. Construction of the Project will involve both skilled and unskilled labor, including foremen, carpenters, iron workers, electricals, millwrights, and heavy equipment operators. Thorstad Companies' employees will provide management-level oversight, safety, coordination with Prevailing Wind Park and other stakeholders, and quality assurance/quality control. Construction of the Project is anticipated to generate approximately 245 jobs during construction at peak demand.

Q. Will the Project components be designed and constructed in compliance with all applicable federal, state, and local regulations?

A. Yes.

V. CONCLUSION

Q. Does this conclude your Direct Testimony?

A. Yes.

Dated this 30th day of May, 2018.

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Keith Thorstad.

KEITH L. THORSTAD
President, Thorstad Companies

Overview

Keith has 40 years of experience in the construction industry, including 20 years in the wind energy industry, and has worked on over 200 projects. Keith's personal and company mission statement is to provide the best value construction services while maintaining safety, quality, and integrity. Keith is committed to providing the highest level of service and innovative thinking; providing a safe and rewarding work experience; and inspiring this same level of thinking and service in every community Thorstad Companies touches.

As the President of Thorstad Companies, Keith provides services such as: general contracting; civil design/construction (site and road); foundation design and construction; tower and turbine installation/heavy lift; and electrical design/transmission lines/installation (collection systems, substations, interconnections).

Representative Wind Projects by Thorstad Companies and Affiliates

Adams Wind Farm and Danielson Wind Farm, Meeker County, Minnesota—each a 20 MW wind farm consisting of 12 Alstom 1.65MW Ecotecnia 86 turbines. For ***Adams***, provided complete electrical collection construction and all BOP equipment and materials, turbine erection, and civil construction; for ***Danielson***, provided all civil construction, turbine erection, BOP equipment and materials, and complete electrical collection construction. Due to close proximity, Thorstad Companies or affiliate was able to reduce overhead costs by sharing resources and equipment. Both projects were built simultaneously, went very smoothly, and were completed ahead of schedule and under budget.

Beethoven Wind Farm, Tripp, South Dakota— 80 MW wind farm consisting of 43 GE 1.85MW turbines. Engineered, procured, and constructed wind farm, including installation of turbine foundations, turbine erection and mechanical completion, collection system, SCADA system, substation, seven miles of transmission line, and all necessary roads. Worked with the local utility company to tie the project substation into Tripp Junction substation via seven miles of T-Line. Collaborated to ensure that construction had zero wetlands impact.

Buffalo Bear Wind Farm, Buffalo, Oklahoma— 18.9 MW wind project consisting of 9 2.0MW Suzlon S88 turbines. Acted as Engineer-Procure-Construct Contractor ("EPC Contractor"). Designed and constructed roads, foundations, and substation, erected wind turbines, and installed collection system.

Community Wind North Wind Farm, Benton, Minnesota— 30 MW wind farm consisting of 12 2.5MW Clipper turbines. Improved existing roadways to accommodate heavy and long loads, provided all civil design and construction, erected turbines, provided EPC supply of BOP equipment and materials, and complete electrical construction. C−Bed (community-based energy development) project—ownership comprised of local individuals.

Elkhorn Ridge Wind Farm, Bloomfield, Nebraska— 27 3.0MW turbines. Served as EPC Contractor. Turbines used in this project are some of the largest commercial turbines currently in use in the United States. Designed and constructed the roads, foundations, substation, and operations and maintenance building, erected the wind turbines, and installed the collection system. Worked with local government officials to improve existing roadways to accommodate heavy and long loads. Moving the erection crane from site to site made it necessary to drop existing power lines. Collaboration with the local utilities minimized disruption to area businesses, farms and residences. Project completed ahead of schedule.

Odin Wind Farm — 10 2.1MW Suzon S88 turbines. Served as EPC contractor. Designed and constructed roads, foundations, and substation, erected wind turbines, and installed collection system. A strategy for construction of roads, crane paths, and pads, as well as the weight of the crane and its site-to-site movement, was required to compensate for soft soils.

Pioneer Wind Park I, Glenrock, Wyoming— 80 MW wind farm consisting of 46 GE, 1.8MW wind turbines. Served as EPC Contractor. Wind turbine generators span from a canyon to a mountain range. Project's single surface access point is through six miles of canyon road, portions of it containing a 14% grade. Installed the first aircraft detection system approved by the Federal Aviation Authority. Radar-activated lighting technology mitigates impact of flashing lights on local community. FAA lights are activated when aircraft is detected. As part of this project, also built the Amasa Switchyard for PacificCorp.

Ridgewind Wind Farm — 25 MW wind farm consisting of 11 2.3MW Siemens turbines. Served as the EPC contractor on this project while designing and constructing the roads, foundations, switch yard, O & M Building and installing the collection system.

Spanish Fork — 18.9 MW wind farm consisting of 9 2.1MW Suzon S88 turbines. Served as EPC contractor. Located at base of a mountain with a river running through it, the windy conditions required special schedule adaptations. Provided temporary lighting to create a safe environment for working at night when winds were less severe.

Spion Kop Wind Project, Geyser, Montana— 40 MW wind farm consisting of 25 GE 1.6MW turbines. Served as EPC Contractor and designed and constructed roads, foundations, and substation, erected wind turbines, O & M Building, and installed collection system. Also brought construction financing to the project and purchased turbines. Terrain presented numerous challenges in the form of steep inclines and elevation changes. Ensured delivery of materials and turbine parts was executed smoothly, planned site logistics, and worked closely with experienced transportation specialists.

Single Turbine Projects:

GL Wind, Lewiston, Minnesota— 5 MW wind project consisting of 2 2.5MW Clipper turbines. Thorstad Companies or affiliate provided all civil construction, turbine erection, BOP equipment and materials, and complete electrical construction. The project was completed on time and within budget.

Goldwind Iowa Turbines, Iowa—The project consisted of simultaneously installing 3 1.5 Goldwind turbines in separate locations in central Iowa. Goldwind is new to the US market and this project was the first with a new turbine design. Thorstad Companies or affiliate provided all civil construction, turbine erection, BOP equipment and materials, and complete electrical construction. Working closely with Goldwind and maintaining open communication were key components in delivering this project on time and within budget.

University Of Minnesota - Morris Wind Conversion System, Morris, Minnesota— The project consisted of 1 Vestas, 1.65MW wind turbine. Thorstad Companies or affiliate was the BOP contractor that constructed the roads, foundation, interconnects, erected the wind turbine and installed the collection system.

Osage Municipality, Osage, Iowa— The project included 1 1.5MW GE turbine. Thorstad Companies or affiliate served as the BOP contractor.

Education

Degree in Industrial Technology
Alexandria Technical Institute
Moorhead State University