BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF THE APPLICATION BY ENGIE NORTH AMERICA, INC. FOR A PERMIT FOR A WIND ENERGY FACILITY IN HYDE COUNTY, SOUTH DAKOTA, FOR TRIPLE H WIND FARM

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PRE-FILED DIRECT TESTIMONY OF LESLIE KNAPP, TETRA TECH,
ON BEHALF OF ENGIE NORTH AMERICA, INC.

February 6, 2019

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

A. My name is Leslie Knapp and I am a Senior Consulting Project Manager with Tetra Tech, Inc. My office location is 2001 Killebrew Drive, Suite 141, Bloomington, MN.

Q. Briefly describe your educational background.

A. I have a Bachelor of Arts in General Science and a Master of Arts in Earth Science from the University of Northern Iowa, Cedar Falls, Iowa. I also have conducted post-graduate work in hydrogeology and restoration ecology at the University of Wisconsin, Sheboygan and University of Minnesota, St. Paul Campus, respectively.

Q. Briefly describe your professional experience.

A. I have more than 37 years of experience in environmental consulting, largely related to National Environmental Policy Act and state level environmental review and permitting of a wide range of projects in the Midwestern US. Over the last 11 years this work has consisted largely of energy projects.

Q. Have you attached a resume or CV.

A. Yes, my resume is attached.

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

A. No, I have not.

Q. What is the purpose of your direct testimony?

A. My purpose is to support several sections of the application including:

Section 7- Effect on Physical Environment.

Section 8-Effect on Hydrology

Section 10-Effect on Aquatic Ecosystems

Section 11.4-Visual Resources

Section 13-Water Quality

Section 14-Air Quality

Q. Please describe the physical environment of the proposed project area.

A. The Project Area lies within the Coteau du Missouri division of the Great Plains Province. The Coteau du Missouri is a north-south trending 25 to 80-mile-wide highland extending through North and South Dakota. The James Basin division, located east and northeast of the Project Area, is approximately 500 feet lower in elevation that the Coteau du Missouri. Transition from the Coteau du Missouri to the James Basin is gradual. In Hyde County, this broad low area, called the Great Ree Valley, is bounded by the Orient Hills to the north and by the Ree Hills to the south. The Project Area is in south-central Hyde County in the Ree Hills. The Ree Hills have the highest elevation in the county with an elevation of 2,190 feet above mean sea level located south of the Project Area. Topographic relief within the Project Area ranges from approximately 1,830 to 2,060 feet above mean sea level which represents a variation of approximately 230 feet (Figures 4a through 4c, Appendix A) (Helgerson et. al. 1987; USGS topographic quadrangles).

Q. What is the underlying geology of the region?

A. The surficial geology of Hyde County consists of late Wisconsin age glacial deposits,

which form a mantle up to 500 feet thick over the Pierre shale bedrock and consist primarily of till and outwash. In Hyde and Hughes counties, these surficial deposits average 200 feet in thickness (Helgerson et. al. 1987).

Q. Is there significant risk of seismic activity or subsidence in the area?

A. The risk of seismic activity in the Project Area is extremely low to negligible. The potential for subsidence within the Project Area is negligible.

Q. Are there expected impacts on local geological conditions?

A. The geologic conditions within the Project Area are appropriate for the construction of the Project and will result in negligible impacts on geologic resources. Excavation, bearing and groundwater conditions are anticipated to be conducive to construction and operation of the Project facilities.

Q. What about farmland in the area?

A. Approximately 62 percent of the Project Area is classified as not prime farmland and approximately 1 percent of the Project Area is classified as prime farmland (Table 7-2; Figures 5a–5b in Appendix A). Approximately 10 percent of the Project Area is classified as farmland of statewide importance. The remaining land within the Project Area is considered prime farmland if drained (2 percent) or prime farmland if irrigated (25 percent).

Q. Are there expected impacts to soils?

A. Construction activities such as clearing, grading, trench excavation and backfilling, as well as the movement of construction equipment within the construction workspace, may result in impacts to soil resources. Potential impacts on soil resources include soil erosion, soil compaction, reduction of soil fertility and changes to other soil characteristics. Clearing removes protective cover and exposes soil to the effects of wind and precipitation, which may increase the

potential for soil erosion and movement of sediments into sensitive environmental areas. Grading and equipment traffic may compact soil, reducing porosity and percolation rates, which could result in increased runoff potential. Contamination from release of fuels, lubricants and coolants from construction equipment could also impact soils. The majority of these impacts are temporary and related to construction activities; however, there will be permanent impacts associated with aboveground facilities.

Table 7-2 provides a summary of farmland types affected by the Project. Land impacted by the installation of these facilities will be converted to impervious surfaces, thereby resulting in long-term operational impacts altering the soil composition at these locations.

Q. What Mitigation Measures will be used for Soil Resources?

A. Wind facilities are predominantly designed with turbines situated at higher elevations to minimize obstructions to wind. The current layout sites access roads away from steep slopes to the degree possible. The underground collector lines also avoid crossing steep ravines. Geotechnical soil borings will be conducted at wind turbine foundation locations prior to construction to determine the soil suitability to support turbine foundations. This information will help dictate final design parameters of the turbine and structure foundations.

Q. What permits are required for construction due to impacts on soils?

A. Construction of the Project will require coverage under the South Dakota Department of Environment and Natural Resources (SDDENR) General Permit for Storm Water Discharges Associated with Construction Activities. To maintain compliance with provisions of this General Permit, Triple H will prepare a Stormwater Pollution Prevention Plan (SWPPP) to identify potential sources of stormwater pollution from the Project Area and specify best management practices (BMPs) to control erosion and sedimentation and minimize negative impacts caused by

stormwater discharges from the Project. The SWPPP will be prepared prior to construction of the Project. The SWPPP will be implemented from the initiation of construction and used through site restoration efforts. Once construction has been completed, Triple H will backfill graded and excavated areas with the stored native material and return surface conditions to pre-construction conditions. During Project operation, stormwater volume, stormwater flow and erosion and sediment impact to surface water and groundwater resources are not anticipated to change from pre-construction conditions.

Q. Have you considered impacts on groundwater resources?

A. Construction of the Project is not anticipated to have long-term impacts on groundwater resources. As discussed, disturbances associated with Project construction activities are primarily limited to the upper 3 to 6 feet with excavations for turbine foundations reaching up to 10 feet, which are above the water table of most of the aquifers in the Project Area. Construction activities such as trenching and backfilling and dewatering that encounter shallow surficial aquifers may result in negligible to minor short-term and very localized fluctuations in groundwater levels depending on the proximity and connectivity of groundwater and extent of the excavated area. Once the construction activity has been completed, the groundwater levels typically recover quickly.

Q. Are there mitigation techniques to be found in construction decisions?

A. Turbines and the MET tower will be constructed on higher elevation portions of the Project Area to maximize the wind resource and as such, generally avoid direct impacts to wetlands and waterbodies, which tend to be in lower topographic positions. Prior to construction, Triple H will conduct wetland and waterbody delineations within the Project Area according to the USACE Wetlands Delineation Manual, Great Plains Regional Supplement (Environmental

Laboratory 1987). Access roads, collector systems, O&M facility collection substation and interconnection switching station will be designed to avoid or minimize impacts to wetland and waterway features whenever feasible. Temporary impacts associated with crane paths will also be minimized. Installation of underground utilities is expected to avoid impacts by boring under water features as necessary and will minimize impacts to wetlands and waterbodies or where possible make them coincident with other impacts (e.g., crane paths). Where crossings of streams and drainageways cannot be avoided by access roads, appropriately designed crossings (i.e., culverts, low-water crossings) will be constructed to maintain existing drainage. Temporary impacts may also result from construction matting to access certain locations.

Q. What about impacts to surface waters and wetlands?

A. Temporary and long-term operational impacts to surface waters and wetlands are discussed in Sections 8.2.2.1 through 8.2.2.4. Construction activities in the vicinity of these waterbodies and wetlands may temporarily increase sedimentation due to erosion and from changes in runoff patterns and water volumes due to increased impervious surfaces. This could temporarily degrade the water quality of aquatic habitat supporting these species. Triple H will avoid development in proximity to Chapelle Lake. Impacts are anticipated to be short term and localized. As described in Section 8.2.3, for surface water and wetlands, BMPs will be designed and utilized to control sedimentation and erosion during the construction phase of the Project.

Q. Please discuss the visual impacts of the project.

A. As previously discussed, Triple H has collocated linear Project features such as access roads and collector and communication systems with existing disturbances where possible. This is consistent with the South Dakota Bat Working Group's and South Dakota Department of Game, Fish and Parks (SDGFP's, Undated) Siting Guidelines for Wind Power Projects in South

Dakota for reducing impacts to visual resources. Similarly, operation of the Project will not introduce new visual components into the Project vicinity. The Project vicinity already includes wind turbines from the South Dakota Wind Energy Center and the Titan Wind Project, as well as existing electrical transmission lines.

The magnitude of visual impacts associated with the Project will depend on several factors, including:

Distance of the proposed Project Facilities from viewers;

Duration of views (highway travelers vs. permanent residents);

Weather and lighting conditions;

The presence and arrangements of lights on the turbines and other structures; and

Viewer attitudes toward renewable energy and wind power.

To minimize visual impacts of the Project, Triple H has incorporated setback requirements and commitments into the design of the Project (Table 12-1). In accordance with Federal Aviation Administration (FAA) regulations, the towers will be painted to reduce potential glare and minimize visual impact.

Q. Are any impacts to surface or groundwater anticipated? If so, please describe them.

A. Groundwater and surface water resources are discussed in Section 8.0. As discussed, the excavation and exposure of soils during the construction and decommissioning of wind turbines, access roads, underground collector lines and other Project facilities may temporarily cause sediment runoff during rain events. This sediment may temporarily increase the total suspended solids loading in receiving waters. However, erosion control BMPs will keep sediments on site that might otherwise increase sediment loading in receiving waters.

Construction of the Project will require coverage under the General Permit for Storm

Water Discharges Associated with Construction Activities issued by the SDDENR. A condition of this permit is the development and implementation of a SWPPP. The SWPPP will be developed during civil engineering design of the Project and will prescribe BMPs to control erosion and sedimentation. The BMPs may include silt fence, wattles, erosion control blankets, temporary stormwater sedimentation ponds, revegetation and/or other features and methods designed to control stormwater runoff and mitigate erosion and sedimentation. The BMPs will be implemented to reduce the potential for impacts to drainage ways and streams by sediment runoff. Because erosion and sediment control will be in place for construction, operation and decommissioning of the Project, impacts to water quality are not expected to be significant.

The potential for fuel spills during construction and operation will be mitigated by secondary containment of any on-site fuel storage that will be inspected regularly, with containment being remediated promptly in accordance with the Project's Spill Prevention, Control and Countermeasures Plan (SPCC) Plan. Fuel handling activities and spill remediation will also adhere to the procedures outlined in the Project's SPCC Plan.

Q. What impacts from construction are anticipated to air quality in the area?

A. As found in Section 14, temporary construction impacts include fugitive dust emissions and short-term emissions from diesel trucks and construction equipment. Temporary impacts will result if a batch plant is required. Any air quality effects resulting from construction will be short term and limited to the time of construction activities and will not result in North American Ambient Air Quality Standards (NAAQS) exceedances for particulate matter or significantly contribute to greenhouse gas emissions.

Dated this _ day of February, 2019.

Leslie H. Knapp

Leslie Knapp, for ENGIE, NA