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 HUGHES AND HYDE COUNTIES, SOUTH DAKOTA, FOR NORTH BEND WIND PROJECT

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

June 11, 2021

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

A. My name is Tricia Pellerin and I am a Senior Acoustic Engineer with Tetra Tech at 10 Post Office Square, 11th Floor, Boston MA, 02109.

Q. Briefly describe your educational background.

A. I have both Bachelor and Master of Engineering Science degrees from the University of Western Ontario in London, Ontario.

Q. Briefly describe your professional experience.

A. I have approximately 16 years of environmental consulting experience, focusing on acoustic analysis. I have supported the permitting of more than 50 wind energy facilities, both onshore and offshore, in more than 20 states, including South Dakota. My work includes conducting acoustic studies required to adhere to the applicable noise requirements, such as completing baseline sound surveys, acoustic modeling analysis, and post-construction sound surveys.

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 testimony is to discuss the acoustic modeling used to design the project, discuss its anticipated impacts on residents in the project area, and discuss mitigation efforts made in design.

Q. Which sections of the application are you responsible for?

A. Section 11.3, Acoustics.

Q. Did the project model its expected acoustic impacts and if so, what were the results?

A. A pre-construction wind turbine Acoustic Assessment was conducted for the Project in June 2021 and is included in Appendix D. The pre-construction Acoustic Assessment analyzed the Project implementing the GE 2.82-127 wind turbine model with the addition of Low Noise Trailing Edge (LNTE) technology, which modifies the wind turbine blades resulting in reduced sound emissions.

The results of the acoustic assessment show that, when using the GE 2.82-127 with LNTE technology, the Project will comply with the Hyde and Hughes counties 45 A-weighted decibel (dBA) limit at all receptors, except for two participating landowner properties, which may periodically experience sound levels above the noise threshold criteria.

Q. What are the Hughes and Hyde County Ordinances?

A. Hyde County proposed regulations for wind energy facilities under Zoning Ordinance Section 9-104.A.18 limiting sounds levels to 45 dBA at the perimeter of occupied residences existing at the time the permit application unless a signed waiver is obtained from the landowner or the land is leased. The noise level may be exceeded during short-term events such as utility outages or wind storms.

Hughes County proposed regulations for wind energy facilities under Zoning Ordinance Article 2 Section 2-117, as amended by Ordinance 2020-05, limits sound levels to 45 dBA at the perimeter of occupied residences existing at the time the permit application unless a signed waiver is obtained from the landowner or the land is leased.

Sound levels resulting from the Project at all identified receptors located in the vicinity of the Project were assessed against a 45 dBA for Hyde and Hughes counties to determine whether

compliance was achieved. The Hyde and Hughes County Zoning Ordinance noise limits are absolute and independent of the existing acoustic environment; therefore, a baseline sound survey is not required to assess conformity.

Q. Are there acoustical impacts from construction?

A. Potential noise associated with construction and decommissioning of the Project includes site clearing, grading, foundation work and wind turbine generator installation. While most heavy construction work is anticipated to occur during daylight hours, some construction operations may be conducted outside of normal working hours. In these cases, the necessary construction efforts generally require activities that must be completed in their entirety once initiated (i.e., pouring concrete). The list of construction equipment that may be used on the Project and estimates of near and far sound source levels are presented in Table 11-1.

Q. Will the project undertake efforts to mitigate impacts from construction activity?

A. All reasonable efforts will be made to minimize the impact of noise resulting from construction activities. Sounds generated by construction activities are typically exempt from state and local noise oversight if they occur within weekday, daytime periods. All construction and decommissioning related noise producing activities will be undertaken as to comply with applicable permit requirements and applicable ordinances.

Q. What about impacts from operation of the wind farm?

A. When in motion, the wind turbines generate sound primarily from aerodynamic flow across and around the blades. Secondary contributors to turbine noise are associated with the mechanical and electrical equipment within the nacelle including gearboxes, motors, cooling systems and pumps. Sound level is strongly dependent on the speed of the tip of the blade, the design of the blade and on atmospheric conditions such as the degree of turbulence. Blade noise

increases with wind speed until full rated electrical power is achieved. However, it is also important to recognize that, as wind speed increases, the ambient sound level will generally increase, which will aid in masking sound produced by wind turbines.

Q. How did you model the project acoustics?

A. Sound propagation modeling was conducted using the CadnaA (Computer-Aided Noise Abatement) program (version 2020 MR1), a comprehensive 3-dimensional acoustic modeling computer simulation software, with calculations made in accordance with the International Organization for Standardization (ISO) Standard 9613-2 "Attenuation of Sound during Propagation Outdoors." Further information is found in Section 11.3.2.3 of the application.

Q. What were the results?

A. The pre-construction wind turbine Acoustic Assessment using the GE 2.82-127 wind turbine model equipped with LNTE technology.

The Project using the GE 2.82-127 wind turbine equipped with LNTE technology, the maximum calculated noise level, based on assumptions incorporated into the Cadna-A model and the turbine layout, resulted in a received sound level of above 45 dBA at two participating NSRs. Acoustic modeling results show that received sound levels under maximum rotational wind turbine operation during both moderate downwind and anomalous meteorological conditions will be 48 dBA at NSR 26 and 47 dBA at NSR 51. As both NSRs involve landowners participating in the project, no written waivers are required. All other NSRs were shown to comply with the 45 dBA limit. Lastly, modeling results also showed that all NSRs were anticipated to remain below the 45 dBA limit at cut-in wind speeds.

Q. Are there mitigation measures to implement in either the construction or operation of the project?

A. North Bend Wind does not anticipate that noise mitigation will be necessary. However, North Bend Wind will establish a process for documenting, investigating and resolving Project-related noise complaints. With respect to the short-term construction-related noise, mitigation measures will include maintaining all equipment in good working order in accordance with manufacturer specifications (e.g., suitable mufflers and/or air-inlet silencers should be installed on all internal combustion engines and certain compressor components); and enforcing speed limits for all vehicles and construction equipment traveling within and around the Project Area.

Dated this 11th day of June, 2021.

/s/

Tricia Pellerin, Acoustics – Tetra Tech