APPENDIX 4.11-1

Inputs for Noise Modeling Assessment

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Inputs for Noise Modeling Assessment

Noise sources are input in terms of frequency distributed sound power levels, which are outlined in the source tables below. This provides not only an overall noise source, but also how that overall noise is distributed across octave band frequencies (low to high). Coordinates for sources, receptors, and any other object can be specified by the user. All noise sources are assumed to be point sources.

Sound propagation is calculated by accounting for distance attenuation via hemispherical spreading and three other user-identified noise attenuation options: atmospheric attenuation, path-specific attenuation, and barrier attenuation. Atmospheric attenuation is calculated using the data specified in the International Standards Organization Attenuation of Sound During Propagation Outdoors, Part 1: Calculations of the Absorption of Sound by the Atmosphere (ISO 19931). Path-specific attenuation can be specified to account for the effects of ground, vegetation, foliage, and wind shadow. Directional source characteristics and reflection can be simulated using path-specific attenuation. Attenuation due to barriers can be specified by giving the coordinates of the barrier. Barrier attenuation is calculated by assuming a defined barrier perpendicular to the source-receptor path. Total and A-weighted sound pressure levels (SPLs) are calculated.

Table 4.11-1A lists the configuration of the calculation parameters used to complete noise modeling for the Project.

Table 4.11-1A: Noise Model Configuration Parameters

Parameter	Model Setting	Description/Notes
Standards	ISO 9613 only	All sources and attenuators are treated as required by the cited standard.
Directivity	k-factor = 2 dBA (for Turbine blade noise sources)	Assumed that turbine blade directivity and sound-generating efficiencies are inherently incorporated in the noise source data used in developing the acoustic model. The specification for the turbines includes an expected warranty confidence interval, or k-factor, which was added to the nominal sound power level in the acoustic model.
Ground Absorption	0.5	Mixed (semi-reflective) soft and hard ground, conservative assumption given the area is mostly composed of fields.
Temperature/humidity	10°C (50° F) / 70% relative humidity	Assumed weather conditions.
Wind Conditions	Default ISO 9613-2 – moderate inversion condition	The propagation conditions in the ISO standard are valid for wind speeds between 4 and 18 km/hr; all points are considered downwind (omnidirectional).
Terrain	Existing terrain considered	Existing ridgeline and changes in elevation in the impact area will affect sound propagation.
Operations	Continuous	All equipment operating continuously during the daytime and at night. Conservative assumption considering operations will be dependent on weather conditions.
Noise Mitigation	None	The model does not include natural buffers, existing or future foliage, or existing or future buildings or structures.

Source: Horse Heaven Wind Farm, LLC. 2022. Horse Heaven Wind Farm Washington Energy Facility Site Evaluation Council Updated Application for Site Certification EFSEC Docket Number: EF-210011. February 2021, Revised December 2022.
°C = degrees Celsius; °F = degrees Fahrenheit; dBA = A-weighted decibels; ISO = International Standards Organization; km/hr = kilometers per hour

[1] ISO (International Organization for Standardization). 1993. Standard ISO 9613-2 Acoustics – Attenuation of Sound during Propagation Outdoors. Part 2 General Method of Calculation. Geneva, Switzerland.

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