Introduction

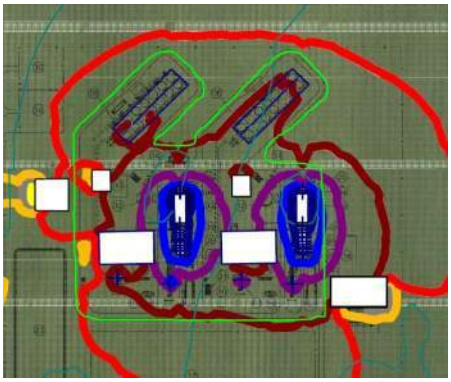
Tenaska is developing the River's Edge Generating Station (River's Edge) in Vermillion County, IN. River's Edge will consist of two blocks of 1x1 combined cycles, each utilizing one combustion gas turbine generator (GT;CTG), one heat recovery steam generator (HRSG), one steam turbine generator (ST;STG), and one cooling tower (CT). Tenaska retained Sargent & Lundy (S&L) to model expected sound levels around the site and at the site boundary. This report summarizes S&L's inputs, methodology, and conclusions.

Inputs

1. Sound data for the turbines (combustion turbines and steam turbines), including frequency breakdowns of the various sound emitting equipment was based on previous S&L project data.
2. Cases include a HRSG stack silencer. HRSG stack silencers represent industry best practice sound mitigation.
3. Site general arrangement drawing (RES-MSK-GA-02-REVB) and site boundary data informed placement of equipment and sound receptors.
4. USGS map 20240517 informed local topography.

Assumptions

1. HRSG stack height is 180ft, per representative OEM drawings.
2. Stack directivity is straight out of the stack.
3. Buildings in the site were assumed to be reflective to sound to conservatively increase the sound pressure levels at the site boundaries. Real-world buildings are not perfectly reflective to sound at all frequencies and would reduce the sound impact of reflections slightly.
4. A ground absorption of 0.0 was used for the power plant area within the site boundary to conservatively model reflective ground, such as concrete. The approximate area of reflective ground is outlined in green in the below screenshot from the results:



5. A ground absorption of 0.5 was used for the rest of the site area to model partially reflective ground, such as grassland or forested area. Real-world ground absorption of uncompacted, grassy farmland is likely closer to 1.0, but 0.5 was used as a maximum absorption to stay conservative.
6. Building and sound emitter heights were assumed based on typical heights for previous combined cycle projects.

Methodology

The program CadnaA (Computer Aided Noise Abatement) was used to predict the sound levels around the site and at the site boundary. This program implements ISO 9613 (Attenuation of Sound During Propagation Outdoors) for calculating outdoor sound propagation. It considers many factors that influence sound pressure levels, including sound sources, barriers, buildings, reflections, and ground absorption.

The site area was modeled per the USGS topographic information to capture the various elevation changes outside of the site grading area.

Sound data for a combined cycle power plant of this size was input to the program to model the site layout. Indoor sound sources are inside their respective buildings and the resulting outside sound is calculated by CadnaA.

Buildings or enclosures with modeled equipment inside them were modeled as vertical area sources emitting sound from the walls of the building, for example the STG building and CTG enclosure. Sound from equipment inside these structures tends to be consistent at the constructed walls and then passes through the wall to be uniformly emitted from the external wall surface. Building heights were estimated based on typical heights from previous S&L projects.

Results

Sound contour plots for both turbine blocks operating can be found in Attachment A. The highest sound at the site boundary with both turbine blocks is approximately 56dBA for the silenced HRSG.

Table 1: Site Boundary Sound – Two Turbine Blocks – Silenced HRSG

Location	dBA	Main Contributor
Location 1 (Participating Residence)	47.2	HRSG Stack, HRSG, CTG
Location 2 (Property Boundary)	55.4	HRSG Stack, HRSG, CTG
Location 3 (Property Boundary)	55.9	HRSG Stack
Location 4 (Closest Residence 1)	39.3	HRSG Stack
Location 5 (Closest Residence 2)	39.7	HRSG Stack

The main contributors to sound around the site are the HRSG stack, the GT/CTG inlet duct, the HRSG, and the cooling tower.

Conclusions

Based on the noted inputs and methodology, the base two turbine block configuration (Case 1) is not expected to exceed 60 dBA at the property boundary or 40 dBA at the closest non-participating residence.

Attachments

Attachment 1 – Case 1: Two Turbine Blocks, Silenced HRSG Results (dBA)

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