

NOISE CONTROL STUDY - DRILLING RIGS



OPERATION

Drilling and Tripping

SECTOR

Oil and Gas

CLIENT

Major Oil and Gas Producers

SERVICE

Source Identification and Noise Mitigation Planning

➤ CHALLENGE

Patching Associates was retained by a major oil and gas company to provide a Noise Control Study for drilling operations in a noise sensitive area. The project was awarded to Patching Associates in order to assist with planning future drilling operations and to understand noise mitigation options and budget costs to achieve regulatory compliance.

The operator was required to demonstrate through an Noise Impact Assessment (NIA) that the noise emission from the drilling rig met the Permissible Sound Level (PSL) mandated by provincial regulations. The PSL for this location was 45 dBA during nighttime operation at the nearest residence. One of the key challenges of this project was to model the varying nature of rig operation, such as drilling, tripping and pipe clanging. Different sets of equipment operate in different scenarios, and the duration of operation of rig equipment varies depending on the type of rig activities. The design of effective and feasible noise control measures was also a major challenge due to limited space, safety considerations and the need to maintain portability.

The objectives of the project were to:

- Accurately identify the major noise sources for each phase of rig operations
- Predict the sound level at noise sensitive landowners
- Optimize noise mitigation costs
- Develop reliable planning tool for future noise sensitive sites

“The AER has received an increasing number of noise complaints related to drilling, servicing, and well testing operations...We recommend contacting an acoustical consultant or noise control provider for advice...”

[\(Click for Link\) Noise Key Message, Alberta Energy Regulator](#)



SOLUTION

Patching Associates targeted two phases of compliance: permanent noise control measures included in the rig package and implementable in every well location (target compliance at 500m); and site specific temporary noise control measures (target compliance at 200m).

Utilizing high precision Class 1 sound level meters and [sound intensity measurements](#), the rig noise components were accurately identified and segmented by operating scenarios and duration of operation. Noise sources were quantified using close-up measurements following international standards. Specialized noise modeling software was used to create a detailed 3D noise model of the rig based on drawings and actual noise emission data from each surface. The modeled levels were then compared to the measured levels to **validate** the accuracy of the model at multiple points.

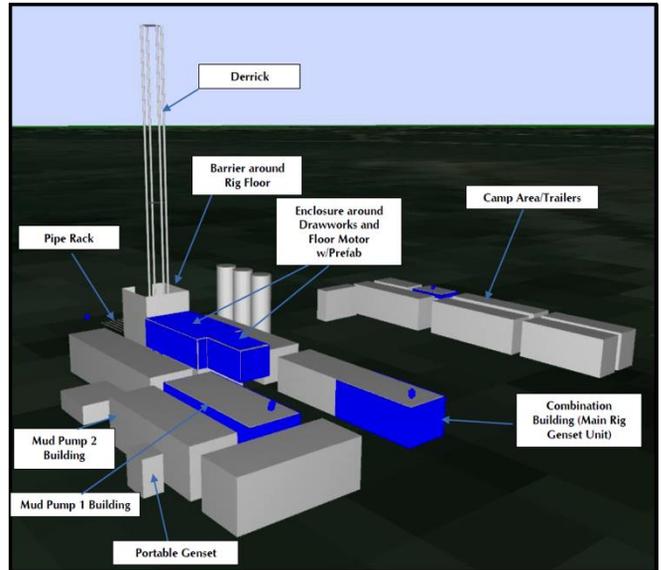
Predicted cumulative sound levels (rig sound plus ambient sound) were shown to exceed the PSL at hypothetical receivers located at 200m and 500m under downwind conditions during tripping and drilling operations.

RESULT

The complete and validated noise model was used to simulate and optimize noise control scenarios. These scenarios were assessed for feasibility by the operations team in charge of the rig and a noise control specification was written for each component. Specifications included:

- Replacement cooler fans
- Ventilation silencers
- Enclosure wall upgrades
- Exhaust mufflers
- Acoustic wall drawings

Each specification was offered to multiple acoustic equipment vendors to obtain competitive pricing. This pricing was assessed and the cost and benefit for each solution was calculated to ensure minimal cost for each dB reduced.



BENEFITS

- Operator had precise noise profile that can be used to plan future drilling locations.
- High detail study allowed operator to take advantage of site specific topography.
- The operator had the data to confidently budget for noise control, including comfort that the mitigation costs were competitive.
- The data, and report allows land agents to have informed discussions with residents proactively.
- A Noise Impact Assessment is the regulators' preferred first step in achieving compliance.

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