

NOISE IMPACT ASSESSMENT AND CERTIFICATES OF APPROVAL (AIR)

By Scott Penton, P.Eng., Project Director

Noise impacts from new or existing industrial facilities located close to residential areas can result in complaints, strained community relations, and eventually action by the Ontario Ministry of the Environment (MOE). Based on our experience, retrofitting noise control measures into an existing plant can be over five times more expensive than if the control measures had been installed during original construction. For these reasons, it is prudent to consider noise impacts from new facilities during the planning and design stages.

Figure 1: Example of industrial facility located near a residence



Noise and the Certificate of Approval Process

In Ontario, new facilities require a Certificate of Approval (C of A) from the MOE prior to the start of construction and operation. A complete C of A application should include supporting information for noise and vibration impact assessments. The MOE usually requires that a noise impact assessment be conducted that includes noise impact modelling and details any required mitigation methods. This is usually prepared by a "Qualified Acoustical Consultant" with experience in the acoustics field.

Guidelines for Noise Impact Assessment

The guidelines used by the MOE in assessing noise impacts are the Noise Pollution Control (NPC) documents published under the Model Municipal Noise Control Bylaw. These guidelines set standards for noise monitoring equipment and techniques, and set guideline limits for noise impacts from "stationary sources" such as industrial and commercial sites, as outlined in Figure 2.

It is important to note that "stationary" noise sources from a facility also include moving vehicle traffic within the facility boundaries (e.g., product shipping), as well as fixed equipment such as fans and air handling units.

Noise Impact Assessment Methodology

Noise impacts from industrial facilities are generally examined in residential areas or lands zoned for residential development, for distances up to 500 m from the facility. Noise impacts from certain large-scale industrial processes, such as arc furnaces, co-generation units, and crushing operations are examined for distances up to 1 km.

Equipment manufacturer's data and specifications, noise measurement data, building design and layout, and production schedules are used to produce a model of predicted noise levels from plant operations at surrounding critical receptors.

The applicable guideline limits in terms of allowable hourly sound exposures are established based on measurements of existing conditions, and road traffic noise modelling. Predicted levels from the plant are compared with the applicable guideline limits to determine whether any noise impacts exist, and to identify the problematic noise sources. The flow chart in Figure 3 shows a typical progression for a noise assessment.



Where impacts exist, various mitigation methods are examined, and based on discussions with the client, an acceptable mitigation plan is developed. Guidance concerning barrier design and locations, silencer specifications, and changes to plant procedures is provided. Pre-consultation with the MOE concerning the proposed mitigation methods and C of A Conditions can sometimes allow for phased approaches to mitigation installation and less onerous methods of control.

Application Costs

Under the new C of A fee structure (Regulation 363/98), the costs for MOE review of a noise assessment are based on the number of pieces of equipment. For "typical" noise sources (e.g., fans, boilers, heating, ventilation, and air conditioning units, etc.), the cost of review is \$400 for the first five units, and \$100 for each additional unit. For new large-scale industrial processes (e.g., arc furnaces, co-generation units, etc.), the cost is \$2,250 for each device.

Case Study

Proposed process changes to a century-old manufacturing plant meant that the plant would require a Certificate of Approval. RWDI was hired to prepare the required documentation. A noise impact assessment was carried out, and several mitigation options were proposed. Because of close setback distances to nearby residences, a prohibitively costly noise barrier was required to mitigate noise from engine runups and forklift activity. However, as part of ongoing process changes, the offending activities would be phased out in 2 years, removing the need for the wall. RWDI was successful in negotiating with the MOE, special Conditions in the C of A that allowed the industry to phase out the lift truck activities over the 2 year period without having to install the barrier.

Guidelines	Type of Surrounding Area	Guideline Limits, $L_{eq}(1)$ dBA ^[1]		
		Daytime (0700-1900h)	Evening (1900-2300h)	Nighttime (2300-0700h)
NPC-205	Urban	50	47	45
	Semi-Rural	50	45	45
NPC-232	Rural	45	40	40

Notes:
 [1] Guideline limit is value for each period or the existing ambient average hourly sound level (usually due to road traffic), whichever is greater.

Figure 2: Noise impact guidelines

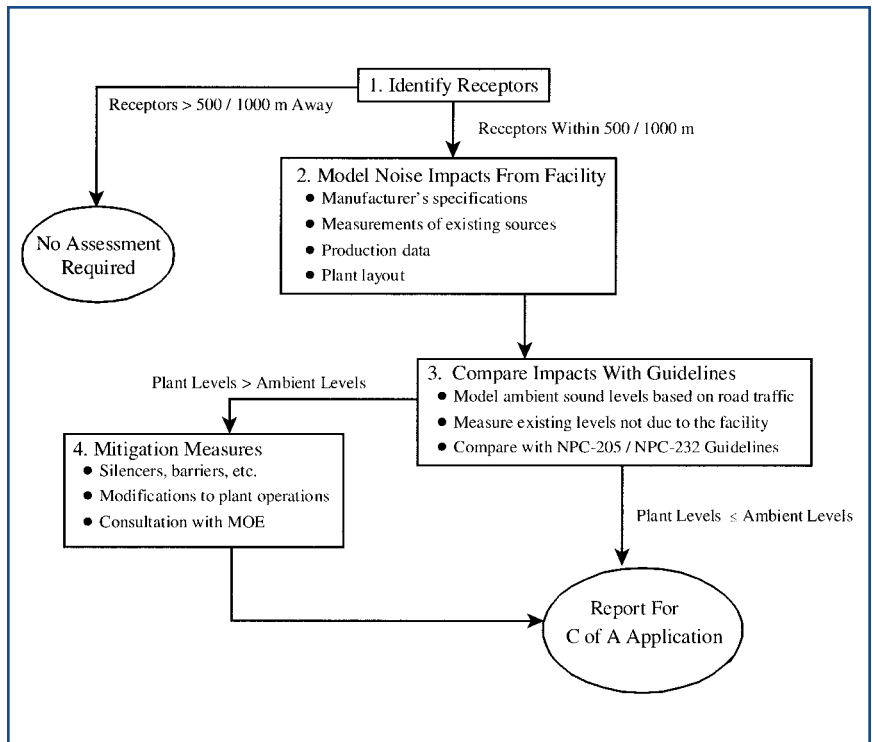


Figure 3: Noise assessment flow chart



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