

**GUIDE FOR THE PREPARATION
OF AN
*ABBREVIATED ACOUSTIC
ASSESSMENT REPORT*
(A – AAR)**

DRAFT: October 2008



**Ministry of the
Environment**

Guide for the Preparation of an Abbreviated Acoustic Assessment Report

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1. SCOPE

In order to obtain an approval under Section 9 of the EPA¹, applicants are, at a minimum, required to assess and document the impacts of all noise emissions from their facility on any noise sensitive locations defined as a Point of Reception. Most industrial and commercial facilities applying for approval will either require the preparation of an Acoustic Assessment Report (AAR)^{2,3} or can be exempt from submitting such a report, under the provisions of the Noise Screening Process.⁴

However, the ministry recognizes that some facilities may fall slightly short of the conditions for exemption, but which nevertheless have low levels of sound emission, identifiably/substantially lower than the applicable limits.^{5,6} For this category of facility, and under certain conditions, an Abbreviated Acoustic Assessment Report (A-AAR) is satisfactory. This guide lists the conditions under which an Abbreviated Acoustic Assessment is appropriate and describes the necessary information and format for such a report.

It should be noted that the Abbreviated Assessment represents a special case. Acoustic consultants are directed first to read and understand the guidance documents for a detailed Acoustic Assessment Report^{12,13} before studying this guide.

2. REFERENCES

- [1] CAN/CSA-Z107.55-M86 (R2001) Recommended Practice for the Prediction of Sound Levels Received at a Distance From an Industrial Plant.
- [2] *Environmental Protection Act*, R.S.O. 1990, CHAPTER E.19.
- [3] International Standard ISO 9613-2 (1996): Acoustics – Attenuation of Sound during Propagation Outdoors. Part 2: General Method of Calculation.
- [4] *Noise Screening Process for S.9 Applications – Supplement to Application for Approval*. (PIBS 4178e).

- [5] NPC-101– NPC-101, Technical Definitions
- [6] NPC-102– NPC-102, Instrumentation
- [7] NPC-103 – NPC-103, Procedures
- [8] NPC-104– NPC-104, Sound Level Adjustments
- [9] NPC-205 – Sound Level Limits for Stationary Sources in Class 1 & 2 Areas (Urban),)
- [10] NPC-206 – Sound Levels Due to Road Traffic
- [11] NPC-232– Sound Level Limits for Stationary Sources in Class 3 Areas (Rural)
- [12] NPC-233 – Information to be Submitted for Approval of Stationary Sources of Sound
- [13] “Supporting Information for the Preparation of an Acoustic Assessment Report” Prepared by the Air and Noise Unit, Environmental Assessment and Approvals Branch, Ministry of Environment, November 2003

3. CONDITIONS FOR AN ABBREVIATED ASSESSMENT

The intent of the abbreviated assessment format is to allow for the generation of a simplified Acoustic Assessment Report which is less time consuming to prepare and more straightforward to review. This format is only applicable to facilities comprising a simple sound emission situation. The conditions under which an Abbreviated Assessment would be appropriate must include the following:

1. The application precipitating the Acoustic Assessment must not be for a Comprehensive Certificate of Approval (CCA). (*A full Acoustic Assessment, with complete source inventory tables, is required for a CCA*)
2. There should be a substantial difference between the background ambient sound levels due to traffic at the Points of Reception neighbouring the facility and the noise sources under investigation.
3. There must be several hundred metres of buffer space between the facility and nearest Points of Reception, with intervening:
 - a. densely massed industrial/commercial buildings, and/or
 - b. a deep grove of dense, tall permanent foliage, and/or
 - c. a major transportation corridor.
4. (a) The sound emission levels from significant noise sources at the facility (proposed or existing facilities) are demonstrated through measurements or prediction to be at least 6 dB less than the applicable limit(s).

Or

- (b) If the application does not meet all above conditions, but the acoustical consultant is certain that other mitigating circumstances warrant the use of the Abbreviated Acoustic Assessment format, then the format can be applied, provided a detailed rationale for its use is documented. If the Ministry does not accept the proposed rationale, the abbreviated format will not be accepted.

An application *may* be a suitable candidate for an Abbreviated Acoustic Assessment Report if it meets the above four conditions. However meeting the above conditions does not guarantee an application's eligibility to use the A-AAR format. In summary the abbreviated format will be accepted for applications where:

- a) compliance can be clearly demonstrated (through measurements or prediction to be at least 6 dB less than the applicable limit(s)), and
- b) where there is a high level of confidence with respect to the :
 - i. source emission levels,
 - ii. performance limits, and
 - iii. noise impact at the Points of Reception.

If an Abbreviated Acoustic Assessment Report does not fulfill the above requirements, the Ministry may reject the Abbreviated report (A-AAR) and require the submission of a full Acoustic Assessment Report (AAR).

4. CONTENT AND FORMAT OF AN ABBREVIATED ACOUSTIC ASSESSMENT REPORT

4.1 Introduction and Summary

The introduction should be several paragraphs which: provide an overview of the facility; explain what type of approval is being sought, and justify the use of the Abbreviated Assessment format; and provide a summary statement of compliance.

4.2 Site Description, Noise Sources & Points of Reception

Whereas the full Acoustic Assessment Report would typically include separate sections with headings for the Facility Description, the Noise Source Summary and the Point of Reception Summary, these three topics can be addressed in one condensed section of the Abbreviated report. This section should include concise descriptions of:

- 1) The facility location, with reference to a scaled location plan/ zoning map, having the plant location, significant noise sources and points of reception clearly identified.
- 2) The normal activities at the facility including hours of operation and significant noise sources.
- 3) Points of Reception in all compass directions, including distances from the facility and the audible contributors to the acoustic environment at those locations;
- 4) The intervening lands and structures;

4.3 Sound Level Criteria, Assessment & Conclusions

This section should establish the category of acoustical environment (Class 1, 2 or 3 as per Ministry Publications NPC-205 and NPC-232) and the limit(s) applicable at each Point of Reception. The methods and instrumentation used in determining the background sound levels and applicable noise limits should be described. Also, the meteorological data during measurements (such as wind speed, humidity, etc.) shall be provided). Observations and sound level measurements at the Points of Reception should be included, including notes as to whether any sound from the subject facility was audible during the hour(s) of minimum background sound.

If the sound levels of the facility cannot be measured directly at the Points of Reception due to interference from background sound (as would typically be the case for facilities eligible for the abbreviated format), the impact must be assessed by calculating the off-site sound levels from source sound power/pressure levels using an appropriate modeling method for outdoor sound propagation. Details should be provided regarding the method of determining the sound power emission levels for the various sources at the facility. Measured source sound levels and/or manufacturer's published data or generic sound levels used in the assessment should also be documented

The calculation methods used to determine the sound levels produced at the Points of Reception resulting from activities at the facility is also required. If the calculations take into account sound propagation factors other than simple geometric divergence (such as shielding effects, ground attenuation, atmospheric absorption, etc.), then sample calculations should be included in the Appendix. The results of the calculations should be presented in a concise assessment table, along with the applicable noise limits, as shown in the sample Table I below. Any special details regarding source character or operating characteristics should be provided as footnotes to the table.

Table I: Example Source and Point of Reception Acoustic Assessment Summary Table

Source Group	Lw [dBA]	Location A		Location B	
		Dist [m]	L _{EQ} [dBA]	Dist [m]	L _{EQ} [dBA]
Exhaust Fans (sum of five)	105	514	43	528	38
Open Overhead Door	90	442	30	465	25
Cooling Tower	108	493	46	512	41
Condenser Fans (2 banks of 4 fans)*	96	488	32	499	29
Total Levels	110		48		43
Performance Limit			56		56
Within Limit?			Y		Y
Verified by Audit Measurement?			Y		Y

Notes:

Lw = combined sound power level of source group [dBA re 10⁻¹² W]

Dist = distance between receiver and centre of the source group

L_{EQ} = energy equivalent sound exposure level at point of reception

* Sound levels of condenser fans include +5 dBA penalty for observed tonal character

** barrier attenuation (shielding) due to the edge of the building is also detailed in assessment and is detailed in the sample calculation.

The analysis results can optionally be presented as graphical contours of sound levels overlaid on an area map, in addition to the tabular results.

In addition to a hard copy of the report, the report should also be submitted in an editable electronic format, that will enable the extraction of relevant input parameters such as source locations, source heights, heights of intervening structures, ground attenuation factors, etc.

A statement of compliance must also be included in the main text of the report.

4.4 Appendix

The appendix must include the signed, two-page Abbreviated Acoustic Assessment Report Checklist, along with any appropriate supporting information such as sample calculations and manufacturer's source sound levels, if applicable.