

# Approved methods for the measurement and analysis of environmental noise in NSW

We consulted stakeholders on a draft of this document (Approved Methods) from 19 April to 31 May 2021.

Stakeholders included:

- EPA licensed entities
- laboratories
- consultants
- technical and professional bodies
- government agencies.

We invited stakeholders to make submissions or respond to a survey. We received:

- 3 written submissions
- 6 survey responses.

The tables below summarise the key issues raised and the EPA's responses.

We took this stakeholder feedback into account when finalising the Approved Methods for environmental noise.

Table 1 Overall

Issues raised by stakeholders	EPA response
<p><b>Value of document</b></p> <ul style="list-style-type: none"> <li>• Most survey respondents thought that:               <ul style="list-style-type: none"> <li>○ the document will help improve consistency of compliance with measurement and analysis of noise</li> <li>○ the document was sufficiently clear on how it relates to standards and guidelines and that persons regulated by the EPA are responsible for ensuring that any required monitoring complies with the document</li> <li>○ the ‘good practice’ methods were adequate</li> <li>○ the record keeping requirements were clear.</li> </ul> </li> </ul>	<p>Noted.</p>
<p><b>Extra inclusions</b></p> <ul style="list-style-type: none"> <li>• There were some suggestions for including:               <ul style="list-style-type: none"> <li>○ example monitoring/survey sheets</li> <li>○ photos</li> <li>○ flow charts.</li> </ul> </li> </ul>	<p>It’s not appropriate to include example monitoring/survey sheets in a formal document, but we may put such guidance material on our website.</p>
<p><b>‘Must’ versus ‘should’</b></p> <ul style="list-style-type: none"> <li>• More clarity is need about what ‘must’ be done.</li> <li>• There has to be a clear distinction between ‘musts’ and ‘shoulds’.</li> </ul>	<p>We’ve included a statement in section 1.3 to clarify the distinction between ‘must’ and ‘should’.</p> <ul style="list-style-type: none"> <li>• ‘Must’ is used throughout the document for those requirements that must be adhered to and that are the minimum requirements that EPA requires for a regulated premises.</li> <li>• ‘Should’ is used where some degree of professional judgement is needed to determine whether a requirement is applicable and important for the specific measurement situation.</li> </ul> <p>We’ve reviewed to the document to check that all the ‘musts’ and ‘shoulds’ are appropriate, and have changed them where necessary.</p>
<p><b>Transitional arrangements</b></p> <ul style="list-style-type: none"> <li>• What will the transitional arrangements be?</li> <li>• A simple fast-tracked process would enable users to opt in and have their licence updated.</li> </ul>	<p>The document will apply from the time of release and can be referenced in licenses as needed. The transitional arrangements are outlined on our <a href="#">website</a>.</p>
<p><b>Differences from existing licence conditions</b></p> <p>Where the new guidance differs from existing conditions in licences, which will prevail?</p>	<p>The document does not change conditions in environment protection licences. These will continue to apply and will prevail. The document only applies where no information is provided in licences about how to measure noise and a condition in the licence specifically refers to the Approved Methods. Section 1.3 of the document is clear on this and no change has been made.</p>

**Table 2 Section 1: Introduction**

Issues raised by stakeholders	EPA response
<p><b>Vibration</b></p> <ul style="list-style-type: none"> <li>Be clearer about how the document relates to vibrations noise measurement and noise that is structure-borne or ground-borne.</li> </ul>	<p>The document applies to environmental noise only, but some parts – for example, competency and reporting sections – may supplement standards and guidelines for vibration measurement. We’ve added a note to this effect in section 1.1.</p>
<p><b>AS1055</b></p> <ul style="list-style-type: none"> <li>Be clearer about the relationship between the document and requirements in AS1055.</li> </ul>	<p>AS1055 contains information on impact assessment, measurements and instrumentation. Not all of AS1055 applies to, or is relevant to, the purposes of the noise Approved Methods, which focuses on measurement and analysis. The document clearly references parts of AS1055 as appropriate. No change made.</p>
<p><b>Design standards for noise sources not covered</b></p> <p>Specifically mention the use of particular design standards for particular noise sources</p>	<p>The EPA has no jurisdiction to mandate as-built design limit standards for transportation sources, which are regulated at a national level. The Approved Methods document already mentions relevant in-service/operational standards and guidelines for various sources, in section 1.3.</p>
<p><b>Regulatory authority</b></p> <p>Be clearer about how the document applies to the EPA and other authorities that reference it.</p>	<p>The legislation mentioning the Approved Methods for water document specifically states that the requirements do not apply to a person who is acting in the administration or execution of the environment protection legislation. (See cl 64(4), Protection of the Environment Operations (General) Regulation 2021.)</p> <p>Furthermore:</p> <ul style="list-style-type: none"> <li>any testing requirements specified in a licence apply only to the licence holder under sections 65 and 66 of the <i>Protection of the Environment Operations Act 1997</i></li> <li>any notices issued would only apply to the recipient of the notice.</li> </ul> <p>Other authorities intending to require the use of this document are responsible for providing guidance on how they intend this document to apply in the context of their statutory instruments. We’ve included a note to this effect in section 1.2.</p>

**Table 3 Section 2: Requirements for measuring and analysing noise**

Issues raised by stakeholders	EPA response
<p><b>Older instruments</b></p> <ul style="list-style-type: none"> <li>The document does not allow for the use of older instrumentation.</li> </ul>	<p>The document does allow for the use of older instrumentation in section 2.1. However, it requires that where an older instrument is used, that must be reported, along with the standard the instrument meets. No change made.</p>

Issues raised by stakeholders	EPA response
<p><b>Meteorological monitoring</b></p> <ul style="list-style-type: none"> <li>The document should also provide instrumentation requirements for monitoring general meteorological conditions in addition to those already provided for meteorological conditions at the microphone location.</li> </ul>	<p>We agree that it is important to include instrumentation requirements for monitoring the meteorological conditions prevailing in an area at the time noise measurements are made there. We've added additional text in section 2.1, requiring that instrumentation for this purpose must meet requirements in AS 3580: 2011, <i>Methods for sampling and analysis of ambient air</i>, Part 14: Meteorological monitoring for ambient air quality monitoring applications.</p>
<p><b>Competence</b></p> <ul style="list-style-type: none"> <li>More flexibility is needed in relation to who can be considered competent for the purpose of measuring and analysing noise in compliance with the Approved Methods. This would serve the interest of practicability, agility, and responsiveness. (Note, other stakeholders wanted a tightening of requirements).</li> <li>Give more detail about: <ul style="list-style-type: none"> <li>which qualifications/training the EPA recognises</li> <li>how can competence be demonstrated.</li> </ul> </li> </ul>	<p>We've considered the suggestions put forward for both increasing and reducing flexibility, as well as the call for more detail about what evidence is needed for demonstrating competence. We think that the current requirements strike the right balance between flexibility and prescription, and don't unduly constrain who might be considered a competent person. For this reason, no change has been made.</p>
<p><b>Calibrator checks</b></p> <ul style="list-style-type: none"> <li>Other calibration set-ups (such as charge-injection calibration for long-term measurement set-ups) may also be appropriate.</li> </ul>	<p>Pre- and post-calibration checks are a standard requirement and necessary for compliance noise measurements. We agree that alternative calibration methods may also be appropriate, as long as they can be fully justified. We've added text to this effect in section 2.3.</p>
<p><b>Noise descriptors</b></p> <ul style="list-style-type: none"> <li>Noise descriptors to be measured should be consistent with section 6.5 of AS 1055:2018.</li> <li>The LA10 descriptor should also be included as a minimum.</li> </ul>	<p>The noise descriptors to be measured are the minimum required, but we agree there is merit in requiring that the LA10 descriptor also be measured. We've changed the text to include the LA10 descriptor and clarify that the listed descriptors are the minimum to be measured.</p>
<p><b>Contemporaneous notes</b></p> <ul style="list-style-type: none"> <li>Many additional items should be noted to adequately capture information relevant to the noise source being measured.</li> </ul>	<p>Recording accompanying notes is standard practice when noise is being measured and analysed for compliance purposes. We've added four items to the list of notes to be recorded:</p> <ul style="list-style-type: none"> <li>information related to estimating the source-specific LAeq</li> <li>noise source observations</li> <li>dominant noise source</li> <li>extraneous noise.</li> </ul>

Issues raised by stakeholders	EPA response
<p><b>Measurement location</b></p> <ul style="list-style-type: none"> <li>• Provide more prescriptive information about measurement location to cover all potential situations, including: <ul style="list-style-type: none"> <li>○ façade measurements and other sources of reflection</li> <li>○ upstairs measurements</li> <li>○ boundary measurements</li> <li>○ internal noise levels</li> <li>○ passive recreation areas</li> <li>○ other assessment locations (such as noise management groups).</li> </ul> </li> </ul>	<p>We've reviewed this section (section 2.6) and think that the current text covers most measurement situations, while also allowing for other locations to be used where that can be justified: see the last two sentences of the third paragraph of section 2.6. This is a matter of professional judgement by a competent person, so we've changed the 'must' in the first sentence of the third paragraph to 'should'.</p> <p>We've clarified the measurement location for passive recreation areas to ensure that measurements are made where people are likely to visit.</p> <p>The document does not cover measurement of indoor noise levels.</p> <p>Assessment locations set out in conditions of licences are often developed on a case-by-case basis. They override requirements in the Approved Methods. The locations set out in the Approved Methods are for assessing compliance with noise limits where no locations have been specified in the licence.</p>
<p><b>Annoying noise characteristics</b></p> <ul style="list-style-type: none"> <li>• There are concerns about the assessment of intermittent and impulsive noise.</li> <li>• How are intermittent and impulsive noise defined and measured?</li> </ul>	<p>The issues raised here and in relation to the descriptors to be measured are about the technical appropriateness and suitability of the EPA's assessment of intermittent and impulsive noise. This issue goes beyond the scope of the Approved Methods document, which covers measurement and analysis and does not set 'criteria'. The <i>Noise Policy for Industry</i> (EPA 2017) is the appropriate guidance on assessment and annoyance. We'll keep abreast of research and review our position on these characteristics when appropriate. No change made.</p>

**Table 4 Section 3: Good practice for measuring and analysing noise**

Issues raised by stakeholders	EPA response
<p><b>Meteorological measurements</b></p> <ul style="list-style-type: none"> <li>• Noise measurements required by environment protection licence often include specific meteorological conditions that are appropriate for the assessment of compliance. This is not properly accounted for in the document.</li> </ul>	<p>We agree that the reference to avoiding conditions that 'adversely influence the results' should be linked to conditions that are outside the specific conditions of the environment protection licence, notice or statutory instrument. We've amended the fifth bullet point of section 3.1 to reflect this.</p>
<p><b>Microphone array systems</b></p> <ul style="list-style-type: none"> <li>• Provide for the use of other monitoring techniques where they can be justified.</li> </ul>	<p>We agree that other techniques may be suitable and may be used with adequate justification. We've added text to this effect in the second paragraph of section 3.4.</p>
<p><b>Calculation of noise</b></p> <ul style="list-style-type: none"> <li>• Be more prescriptive about the use of noise models for noise calculation.</li> <li>• Section 3.5 should refer to 'calculation' rather than 'prediction'.</li> <li>• It may not always be feasible (or may be of little to no value) to require a comparison of the calculated noise level against the measure noise level.</li> </ul>	<p>We think it is up to consultants to demonstrate the model being used is fit for purpose. Being prescriptive about noise models is beyond the scope of this document. No change made.</p> <p>We agree with the suggestion regarding the use of terms and have replaced 'prediction' with 'calculation'.</p> <p>The requirement to provide a comparison of the calculated noise level against a measured noise level is good practice and subject to professional judgement. No change made.</p>

**Table 5 Section 4: Record keeping**

Issues raised by stakeholders	EPA response
<p><b>Length of time for keeping records</b></p> <ul style="list-style-type: none"> <li>The four-year requirement for keeping records may not be useful, because the noise environment will have changed in this time frame.</li> </ul>	<p>Four years is the standard length of time required for the retention of records for environment protection licences. Regardless of any change in noise environment, it is important to retain a record of conditions at the time of measurement. No change made.</p>
<p><b>General requirements</b></p> <ul style="list-style-type: none"> <li>Too many items must be recorded.</li> </ul>	<p>The items to be recorded are the EPA's minimum requirements for a regulated premises, and reflect good industry practice.</p>
<p><b>Impulsive noise</b></p> <p>The use of the term 'impulsive' is inconsistent with the <i>Noise Policy for Industry</i> (EPA 2017), which has removed this term and possible penalties associated with it.</p>	<p>We agree, and have removed 'impulsive' from the list of characteristics to be reported on in section 4.1 and section 4.3.</p>
<p><b>Prevailing meteorological conditions</b></p> <ul style="list-style-type: none"> <li>Allow the use of meteorological data from a nearby Bureau of Meteorology or other weather station, and/or qualitative site observations, as a minimum during monitoring of works that are: <ul style="list-style-type: none"> <li>not affected by meteorology (e.g. close to noise source)</li> <li>or</li> <li>not required to be assessed/comply under specific meteorological conditions.</li> </ul> </li> </ul>	<p>We think the list of records to be kept is flexible enough to capture other meteorological measurements. No change made.</p>

**Table 6 Section 5: Glossary**

Issues raised by stakeholders	EPA response
<p><b>Definitions</b></p> <ul style="list-style-type: none"> <li>Amend definitions of dB(A), <math>L_{Aeq,T}</math>, <math>L_{Amax}</math>.</li> <li>Include definitions for steady and non-steady noise.</li> </ul>	<p>We think no change is needed to the definitions of dB(A) and <math>L_{Aeq,T}</math> because these are general definitions: no further prescription is warranted for these terms.</p> <p>We've amended the <math>L_{Amax}</math> descriptor to <math>L_{AFmax}</math> to signify that this involves fast-time weighting.</p> <p>The EPA appreciates that there can be views on some aspects of noise descriptors and definitions but considers there is no need to provide definitions for steady and non-steady noise for the purpose of this document.</p>

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**References**

EPA (2017), *Noise Policy for Industry*

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