

## A-weighted sound pressure

The human ear is not equally sensitive to sound at different frequencies. People are more sensitive to sound in the range of 1kHz to 4 kHz (1000 – 4000 vibrations per second) and less sensitive to lower and higher frequency sound. During noise measurement an electronic “A-weighting” frequency filter is applied to the measured sound level *dB(A)* to account for these sensitivities. Other frequency weightings (B, C and D ) are less commonly used. Sound measured without a filter is denoted as linear weighted *dB(linear)*.

## Ambient noise

Tonal noise contains one or more prominent tones (and characterised by a distinct frequency components) and is considered more annoying. A 5 *dB(A)* penalty is typically applied to noise sources with tonal characteristics.

## Community annoyance

Includes noise annoyance due to:

- characterise of the noise (for example, sound pressure level, tonality, impulsiveness, low-frequency content)
- characterise of the environment (for example, very quiet suburban, suburban, urban, near industry)
- miscellaneous circumstances (for example, noise avoidance possibilities, cognitive noise, unpleasant associations)
- human activity being interrupted (sleep, communicating, reading, working, listening to radio / TV, recreation)

## Compliance

The process of checking that source noise levels meet with the noise limits in a statutory context.

## Cumulative noise level

The total level of noise from all sources.

## EP Licence

Environment Protection Licence.

## Extraneous noise

Noise resulting from activities that are not typical of the area. Atypical activities may include construction, and traffic generated by holiday periods and by special events such as concerts or sporting events. Normal daily traffic is not considered to be extraneous.

## Feasible and reasonable measures

Feasibility relates to engineering considerations and what is practical to build; reasonableness relates to the application of judgement in arriving at a decision, taking into account the following factors:

- noise mitigation benefits (amount of noise reduction provided, number of people protected)
- cost of mitigation (cost of mitigation versus benefit provided)

- community views (aesthetic impacts and community wishes)
- noise levels for affected land uses (existing and future levels, and changes in noise levels)

## Impulsiveness

Impulsive noise is noise having a high peak of short duration or a sequence of these peaks. Impulsive noise is also considered annoying.

## Low frequency

Noise containing major components in the low-frequency range (20 Hz to 250 Hz) of the frequency spectrum.

## Noise Criteria

The general set of non-mandatory noise levels for protecting against intrusive noise (for example, background noise plus 5 *dB*) and loss of amenity (for example, noise levels for various land use)

## Noise Level (goal)

A noise level that should be adopted for planning purposes as the highest acceptable noise level for the specific area, land use and time of day.

## Noise Limits

Enforceable noise levels that appear in conditions on consents and licences. The noise limits are based on achievable noise levels which the proponent has predicted can be met during the environmental assessment. Exceedance of the noise limits can result in the requirement for either the development of noise management plans or legal action.

## Non-compliance

A development is deemed to be in non-compliance with its noise consent / licence conditions if the monitored noise levels exceed its statutory noise limit by more than 2 *dB*.

## NSW DEC

New South Wales Department of Environment and Conservation.

## Performance-based goals

Goals specified in terms of the outcomes / performance to be achieved, but not in terms of the means of achieving them.

## Rating Background Level

The rating background level is the overall single figure background level representing each day, evening and night time period. The rating background level is the median *L<sub>A90</sub>* noise level measured over all day, evening and night time monitoring periods.

## Receiver

The noise-sensitive land use at which noise from a development can be heard.

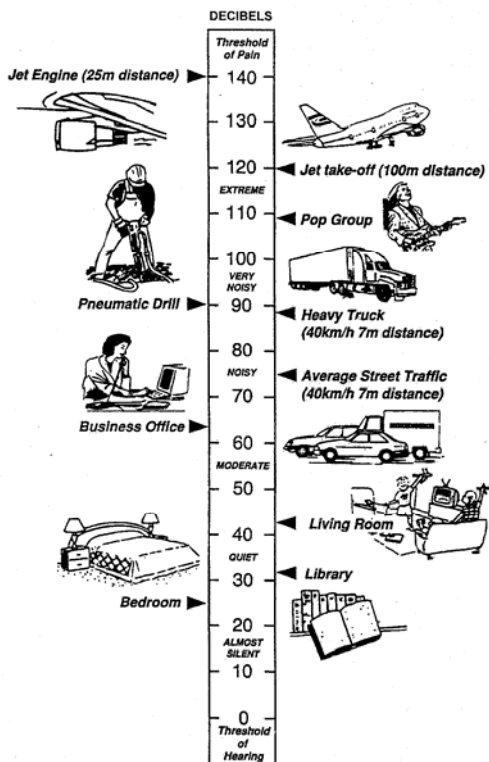
## Sleep disturbance

Awakenings and disturbance of sleep stages.

### Sound & decibels (dB)

Sound (or noise) is caused by minute changes in atmospheric pressure that are detected by the human ear. The ratio between the quietest noise audible and that which would cause permanent hearing damage is a million times the change in sound pressure. To simplify this range the sound pressures are logarithmically converted to decibels from a reference level of  $2 \times 10^{-5}$  Pa.

The picture below indicates typical noise levels from common noise sources



dB is the abbreviation for decibel – a unit of sound measurement. It is equivalent to 10 times the logarithm (to base 10) of the ratio of a given sound pressure to a reference pressure.

### Sound Power Level (SWL)

The sound power level of a noise source is the sound energy emitted by the source. Notated as SWL, sound power levels are typically presented in  $dB(A)$ .

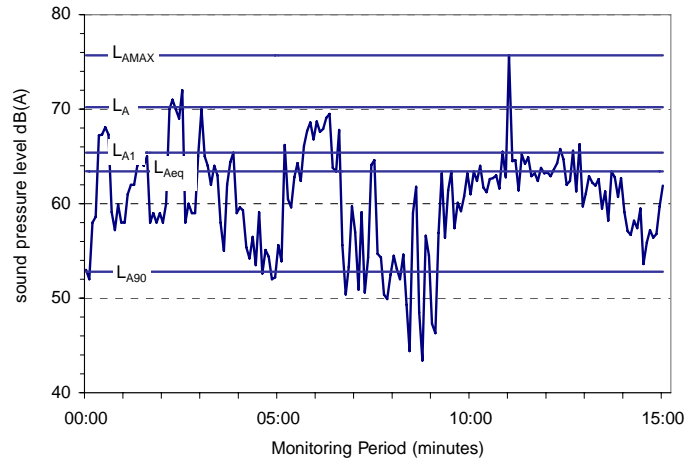
### Sound Pressure Level (SPL)

The level of noise, usually expressed as SPL in  $dB(A)$ , as measured by a standard sound level meter with a pressure microphone. The sound pressure level in  $dB(A)$  gives a close indication of the subjective loudness of the noise.

### Statistical noise levels

Noise levels varying over time (eg. community noise, traffic noise, construction noise) are described in terms of the statistical exceedance level.

A Hypothetical example of A weighted noise levels over a 15 minute measurement period is indicated in the following figure



### Key Descriptors:

- $L_{AMax}$  Maximum recorded noise level.
- $L_{A1}$  The noise level exceeded for 1% of the 15 minute interval.
- $L_{A10}$  Noise level present for 10% of the 15 minute interval. Commonly referred to the average maximum noise level.
- $L_{Aeq}$  Equivalent continuous (energy average) A-weighted sound pressure level. It is defined as the steady sound level that contains the same amount of acoustic energy as the corresponding time-varying sound.
- $L_{A90}$  Noise level present for 90% of time (background level). The average minimum background sound level (in the absence of the source under consideration).

### Steady State Noise Level

The steady state noise level is the operator observed baseline noise level where sources influencing the statistical results are determined.

### Threshold

The lowest sound pressure level that produces a detectable response (in an instrument / person).

### Tonality

Tonal noise contains one or more prominent tones (and characterised by a distinct frequency components) and is considered more annoying. A 5  $dB(A)$  penalty is typically applied to noise sources with tonal characteristics.