EcoAcoustics

Proposed Dog Day Care Centre

35 Jarrad Street, Cottesloe

Environmental Noise Assessment

11 May 2022

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Executive Summary

EcoAcoustics Pty Ltd was commissioned by The Canine Lounge to conduct an assessment of a proposed dog day care centre located at 35 Jarrad Street in Cottesloe. The noise impact assessment has been completed to support the proposal, as part of the development application. The purpose of this report is to assess the noise emissions from the site in accordance with the prescribed standards contained in the *Environmental Protection (Noise) Regulations 1997*.

The results of the noise predictions show that the proposed dog day care centre can comply with the assigned noise levels associated with the *Environmental Protection (Noise) Regulations 1997* at nearby residential and commercial receivers.

1 Introduction

EcoAcoustics Pty Ltd was commissioned by The Canine Lounge to conduct a noise impact assessment of a proposed dog day care centre located at 35 Jarrad Street in Cottesloe. The noise impact assessment has been completed to support the proposal, as part of the development application. The purpose of this report is to assess the noise emissions from the site in accordance with the prescribed standards contained in the *Environmental Protection (Noise) Regulations 1997*.

Appendix A contains a description of some of the terminology used throughout this report.

1.1 Site Locality & Surroundings

The site is located in Cottesloe. The site and surroundings are shown in an aerial photo in *Figure 1.1*. As can be seen on the aerial photo, there are no residential premises adjoining the proposed dog day care centre. The closest residential premises are located across Jarrad Street to the north at a distance of 45 metres and behind an existing commercial building along Brixton Street, at a distance of 25 metres. Commercial premises adjoin the site on the south, east and west sides.

Figure 1.1: Site and Surroundings (Source: Google Earth)

1.2 Site Layout

It is proposed to use the existing building as it currently is on site to house a day care centre for dogs. It is proposed to utilize the entire building, as one tenancy. The day care centre will be the large warehouse style area split into two dog play areas, with associated office/shop to the front of the premises and a mezzanine level used for storage. The building is constructed from double brick with a metal deck roof. Car parking is currently located at the front of the building, in existing bays

with staff parking alongside the building in existing bays. As there are no additions or alterations to the existing car parking, this has not been considered further in this report.

The building is currently vacant and will be repurposed into the dog day care centre. The proposed internal layout is shown in *Figure 1.2*. The proposed dog areas will contain removable/relocatable pens depending on the required configuration of site for each day. All other facilities will remain in their current locations.

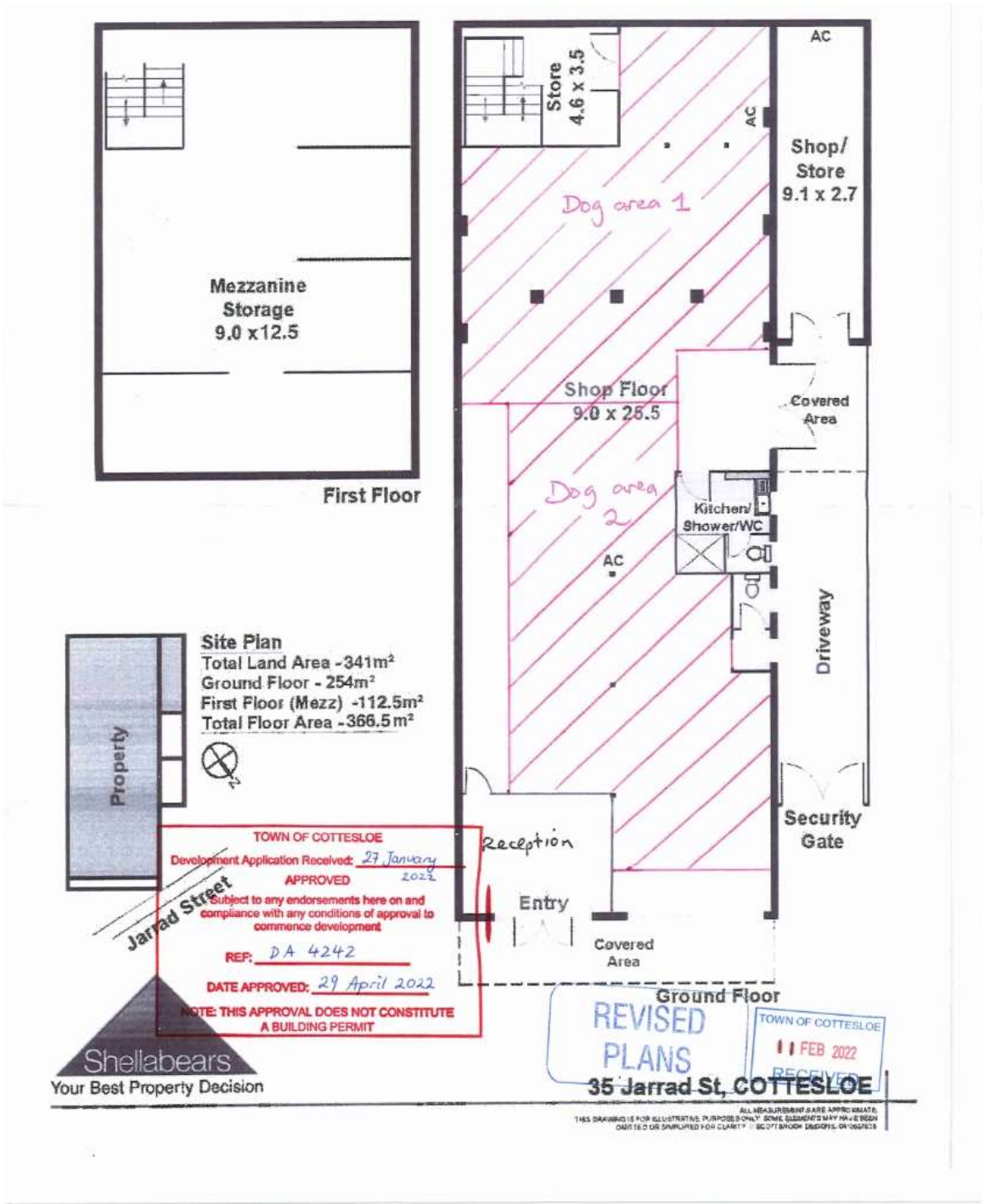


Figure 1.2: Floor Plan (NTS) (Source: The Canine Lounge)

The site will cater to a maximum of 30 dogs. The centre will operate from 7:30am to 6:00pm Monday to Friday. No animals will not be kept on the site overnight.

It is understood that the site is currently air conditioned, and no changes will be made to this. As such, mechanical plant has not been considered further in this report.

2 Criteria

In Western Australia all Environmental noise is regulated by the *Environmental Protection Act 1986* and the *Environmental Protection (Noise) Regulations 1997*. Noise emissions from the dog day care centre are required to satisfy the assigned noise levels specified in Regulations 7, 8 and 9.

The standard stipulated in Regulation 7 of the Environmental Protection (Noise) Regulations 1997 states:

7. (1) Noise emitted from any premises or public place when received at other premises –

a) Must not cause or significantly contribute to, a level of noise which exceeds the assigned level in respect of noise received at premises of that kind; and

b) Must be free of –

- *Tonality;*
- *Impulsiveness; and*
- *Modulation.*

A…noise emission is taken to significantly contribute *to a level of noise if the noise emission exceeds a value which is 5dB below the assigned level…*

Regulation 9 defines tonality, impulsiveness and modulation. It is regarded that noise is free of these characteristics if:

a) Tonality, impulsiveness and modulation cannot be equitably removed by means other than decreasing the overall level of noise emission; and

b) Subsequent to any adjustments as displayed in *Table 2.1* noise emissions remain compliant with the required standards when measured at the point of reception.

Table 2.1: Adjustments for Intrusive Characteristics

Tonality	Modulation	Impulsiveness
+ 5dB	+ 5dB	+ 10dB

The baseline assigned levels (prescribed standards) are specified in Regulation 8 and are shown below in *Table 2.2*.

Table 2.2: Baseline Assigned Noise Levels

Premises Receiving Noise	Time Of Day	Assigned Level (dB)		
		L_{A10}	L_{A1}	L_{Amax}
Noise Sensitive	0700 to 1900 hours Monday to Saturday **(Day)**	45 + influencing factor	55 + influencing factor	65 + influencing factor
	0900 to 1900 hours Sunday and public holidays **(Sunday)**	40 + influencing factor	50 + influencing factor	65 + influencing factor
	1900 to 2200 hours all days **(Evening)**	40 + influencing factor	50 + influencing factor	55 + influencing factor
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays **(Night)**	35 + influencing factor	45 + influencing factor	55 + influencing factor
Commercial	All hours	60	75	80
Industrial	All hours	65	80	90

For the nearest residences located within close proximity to the site, an influencing factor of 8 has been determined. It is important to note that the site is located between two major roads and a major rail corridor, thus contributing to very high ambient noise within the area. Unfortunately, the calculated influencing factor does not consider all transportation sources within this location. Table 2.3 shows the calculations used in determining the influencing factor at the nearest residential premises.

Table 2.3: Calculation of Influencing Factor

Premises Receiving Noise (ref Figure 1.1)	Description	Within 100 metre Radius	Within 450 metre Radius	Total
Nearby Residential Premises	Industrial Land	0%	0%	0
	Commercial Land	41%	12%	2.7
	Major Road	6 (Stirling Highway approx. 34,000vpd)	0 (Curtin Avenue approx. 17,000vpd)	6
	Minor Road	0	0	0
			Total Influencing Factor	**9dB**

Based on the influencing factors contained in Table 2.3, the assigned noise levels are shown in Table 2.4.

Table 2.4: Assigned Noise Levels

Premises Receiving Noise	Time Of Day	Assigned Level (dB)		
		L_{A10}	L_{A1}	L_{Amax}
Noise Sensitive	0700 to 1900 hours Monday to Saturday **(Day)**	54	64	74
	0900 to 1900 hours Sunday and public holidays **(Sunday)**	49	59	74
	1900 to 2200 hours all days **(Evening)**	49	59	64
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays **(Night)**	44	54	64
Commercial	All hours	60	75	80

It is important to note that in a recent State Administrative Tribunal Judgement (*Allen and City of Wanneroo 2011 WASAT 109*); the use of a similar facility, namely a dog day care centre, was considered to be an "unlisted use" rather than a Kennel. It deemed that a "Kennel" includes the overnight boarding of dogs and the provision of food other than as treats as part of play or training or with medication. Such centres do not allow for the overnight boarding of dogs within the premises nor do they feed the animals (apart from treats).

3 Methodology

Computer modelling software SoundPlan 8.2 has been used to calculate the noise levels at nearby residences. Noise modelling is used as it is not affected by background noise sources and can provide the noise level for various weather conditions.

The software incorporates algorithms enabling the modelling to include the influence of wind and atmospheric stability. Input data required in the model are:

- Meteorological Information;
- Topographical data;
- Ground Absorption; and
- Source sound power levels.

3.1.1 Meteorological Information

Meteorological information utilised is based on that specified in the now repealed document EPA *Guidance for the Assessment of Environmental Factors No.8 Environmental Noise draft* and are shown below in Table 3.1.

Table 3.1: Modelling Meteorological Conditions

Parameter	Night (1900-0700)	Day (0700-1900)
Temperature (°C)	15	20
Humidity (%)	50	50
Wind Speed (m/s)	3	4
Wind Direction*	All & Prevailing	All & Prevailing
Pasquil Stability Factor	F	E

Note that the modelling package used allows for all wind directions to be modelled simultaneously.

The above conditions approximate the typical worst-case for enhancement of sound propagation. The EPA policy is that compliance with the assigned noise levels needs to be demonstrated for 98% of the time, during the day and night periods, for the month of the year in which the worst-case weather conditions prevail. In most cases, the above conditions occur for more than 2% of the time and therefore must be satisfied.

At wind speeds greater than those shown above, sound propagation may be further enhanced, however background noise from the wind itself and from local vegetation is likely to be elevated and dominate the ambient noise levels.

3.1.2 Topographical Data

Topographical data was based on information provided by the client, Google Maps and Intramaps.

3.1.3 Ground Absorption

Ground absorption varies from a value of 0 to 1, with 0 being for an acoustically reflective ground (e.g. water or bitumen) and 1 for acoustically absorbent ground (e.g. grass). In this instance value of 0.4 has been used.

3.1.4 Source Sound Levels

Table 3.1 shows the sound power levels used in the calculations. The noise associated with dogs barking was obtained from the EcoAcoustics database.

Table 3.1: Source Sound Power Levels

Description	Octave Band Centre Frequency, dB (Hz)							Overall dB(A)
	63	125	250	500	1k	2k	4k	
Barking Dogs in socialisation situation (up to 15 small to medium sized dogs) L_{A10}	105	95	96	108	102	90	80	**107**

4 Assessment of Dogs

Calculations have been made based on dogs barking within the building. The assumptions include:

- doors and windows closed facing Jarrad Street;
- side door adjacent to the staff carpark is to be closed;
- up to 15 dogs barking simultaneously within the two dog areas inside the building;
- attenuation from building fabric;
- a penalty adjustment of +5dB has been applied to the results to allow for tonality, however owing to the very high ambient noise that is likely in this area, this addition may not be applicable;
- similarly, a +10dB adjustment has been applied to the L_{Amax} calculations from one dog barking on the way into the centre. In reality, these dogs are controlled on leash by a handler at all times and barking during this time is unlikely.

Based on the usage of the centre and the presence of handlers at all times, it is unlikely that dogs will bark for more than 1% of the time. Generally, compliance with the L_{A1} assigned level is considered appropriate. However, to provide a worst case scenario, the noise has been assessed against the L_{A10} assigned level. The calculations assume that up to fifteen dogs are barking simultaneously. It is unlikely that fifteen dogs will bark simultaneously, therefore this is considered to represent a worst case scenario, therefore the modelling also considered to be conservative. When assessing barking dogs, it more likely that one or two dogs will start barking, then they will stop and another one or two will start. It is considered inappropriate to model 30 dogs barking simultaneously in a chorus style scenario.

Calculations have also been made to determine the noise associated with a dog barking while in the car park of the building. These dogs will be under the control of a handler, will be on lead and will only be outside for a very short duration; therefore it is appropriate to assess this against the L_{Amax} parameter. These calculations assume that only one dog is barking.

Table 4.1 summarises the noise predictions from dogs barking and compares the predicted noise levels associated with dogs barking to the Regulatory noise levels.

Table 4.1: Noise from Dogs Barking

Location (ref *Figure 1.1*)	Predicted Noise Level, dB(A)		Adjusted level for Tonality/Impulsivity[1]		Assessment Against Regulatory Noise Levels	
	Dogs Barking Inside Building L_{A10} dB(A)	Dogs Barking Outside Building L_{Amax} dB(A)	Dogs Barking Inside Building +5dB L_{A10} dB(A)	Dogs Barking Outside Building +10dB L_{Amax} dB(A)	Complies with Assigned Noise Level of 54dB(A) L_{A10}	Complies with Assigned Noise Level 74dB(A) L_{Amax}
R1 Ground Floor	27	46	32	51	Complies	Complies
R2 Floor 1	32	49	37	54	Complies	Complies
R2 Floor 1 (ground floor commercial)	38	63	43	68	Complies	Complies
R2 Floor 2	38	64	43	69	Complies	Complies

1. +5 dB(A) or +10dB(A) adjustment may be required if the noise is considered Tonal or Impulsive respectively based on the ambient noise levels

The results presented in *Table 4.1* show that the predicted noise levels from dogs barking external to the front of the building , and also within the building comply with the regulatory levels at the closest noise sensitive receivers. All other residential premises are located further from the site and will similarly comply with the Regulations.

5 Recommendations and Discussion

The predicted noise levels comply with the Regulations at all nearby premises.

In addition to the assessment of noise levels in accordance with the regulations, to minimise the reverberation within the premises, it is understood that the following will be installed:

- Internal pens will have soft fall floors, such as rubber matting or the like;
- The building will include the installation of acoustically absorptive panelling on either the ceiling or walls. Such products could include:
    - Polyester or glasswool Batts;
    - perforated timber panelling internally lined with insulation;
    - Basotect (or similar) panels cut into shapes and direct fixed to the walls;
    - Autex ABC absorptive panels directly fixed to the walls/ceiling; or
    - Rigid wall insulation panels (black faced) cut into shapes and directly fixed to the walls.

6 Conclusion

The results of the noise predictions show that the proposed dog day care centre can comply with the assigned noise levels associated with the *Environmental Protection (Noise) Regulations 1997* at nearby residential receivers.

Appendix A

Terminology

Terminology

Ambient Noise

Ambient noise refers to the level of noise from all sources, including background noise as well as the source of interest.

A-Weighting

An A-weighted noise level is a noise level that has been filtered as to represent the way in which the human ear distinguishes sound. This weighting indicates the human ear is more sensitive to higher frequencies than lower frequencies. The A-weighted sound level is described as L_A dB.

Background Noise

Background noise is the noise level from sources other than the source of interest. Background may originate from such things as traffic noise, wind induced noise, industrial noise etc.

Decibel (dB)

The decibel is the unit that characterises the sound power levels and sound pressure of a noise source. It is a logarithmic scale with regard to the threshold of hearing.

Impulsive Noise

An impulsive noise source is a short-term impact noise which may originate from such things as banging, clunking or explosive sound.

Influencing factor

=1/10 (% Type A_{100} + % Type A_{450}) + 1/20(% Type B_{100} + % Type B_{450})

Where:

% Type A_{100} = The percentage of industrial land within a 100m radius of the premises receiving noise

% Type A_{450} = The percentage of industrial land within a 450m radius of the premises receiving noise

% Type B_{100} = The percentage of commercial land within a 100m radius of the premises receiving noise

% Type B_{450} = The percentage of commercial land within a 450m radius of the premises receiving noise

+ Traffic factor (maximum 6 dB)

= 2 for each secondary road within 100m

= 2 for each major road within 450m

= 6 for each major road within 450m

L_{A1}

An L_{A1} level is the A-weighted noise level which is overreached for one percent of a measurement period. It represents the average of the maximum noise levels measured.

L_{A1} assigned level

An assigned L_{A1} level which is not to be exceeded for more than 1% of a delegated assessment period.

L_{A10} assigned level

An assigned L_{A10} level which is not to be exceeded for more than 10% of a delegated assessment period.

L_{A10}

An L_{A10} level is the A-weighted noise level which is exceeded for 10 percent of the measurement period and is considered to represent the "*intrusive*" noise level.

L_{A90}

An L_{A90} level is the A-weighted noise level which is overreached for 90 percent of the measurement period. It is represents the "*background*" noise level.

L_{Aeq}

L_{Aeq} refers to the comparable steady state of an A-weighted sound which, over a specified time period, contains the same acoustic energy as the time-varying level during the specified time period. It represents the "*average*" noise level.

L_{AFast}

The noise level in decibels, obtained using the A frequency weighting and the F time weighting as specified in AS1259.1-1990. L_{AFast} is used when examining the presence of modulation.

L_{Amax}

The L_{AMax} level is the maximum A-weighted noise level throughout a specified measurement.

L_{Amax} assigned level

The L_{Amax} assigned level describes a level which is not to be exceeded at any time.

L_{APeak}

The L_{APeak} level is the maximum reading (measured in decibels) during a measurement period, using the A frequency weighting and P time weighting AS1259.1-1990.

L_{ASlow}

A L_{ASlow} level is the noise level (measured in decibels) obtained using the A frequency weighting and S time weighting as specified in AS1259.1-1990

Major Road

A Major road has an estimated average daily traffic count of more than 15,000 vehicles.

Maximum Design Sound Level

Maximum Design Sound Level is the level of noise beyond hearing range of most people occupying the space start, become dissatisfied with the level of noise.

Modulating Noise

A modulating source is an audible, cyclic and regular source. It is present for at least 10% of a measurement period. The quantitative definition of tonality is:

a fluctuation in the discharge of noise which;

a) is more than 3 dB $L_{A\ Fast}$ or is more than 3 dB $L_{A\ Fast}$ in any one-third octave band;

b) is present for at least 10% of the representative

One-Third-Octave Band

One-Third-Octave-Band are frequencies that span one-third of an octave which have a centre frequency between 25 Hz and 20 000 Hz inclusive.

Representative Assessment Period

Representative Assessment Period describes a period of time not less than 15 minutes, and not surpassing four hours. It is determined by an inspector or authorised person to be suitable for the assessment of noise emissions.

Reverberation Time

Reverberation time refers to an enclosure for a sound of a specified frequency or frequency band as well as the time that would be necessary for the reverberantly decaying sound pressure level in the enclosure to decrease by 60 decibels.

RMS

The root mean square level is used to represent the average level of a wave form such as vibration.

Satisfactory Design Sound Level

Satisfactory Design Sound Level refers to the level of noise that has been found to be acceptable for the environment in question, which is also to be non-intrusive.

Secondary / Minor Road

A Secondary / Minor road has an estimated average daily traffic count of between 6,000 and 15,000 vehicles.

Sound Pressure Level (L_p)

Sound Pressure Level refers to a noise source which is dependent upon surroundings, and is influenced by meteorological conditions, topography, ground absorption; distance etc. Sound Pressure Level is what the human ear actually hears. Noise modelling predicts the sound pressure level from the sound power levels whilst taking into account the effect of relevant factors (meteorological conditions, topography, ground absorption; distance etc).

Sound Power Level (L_w)

A sound power level of a noise source cannot be directly measured using a sound level meter. It is calculated based on measured sound pressure levels at recognised distances. Noise modelling includes source sound power levels as part of the input data.

Specific Noise

Specific Noise relates to the component of the ambient noise of interest. It can be specified as the noise of interest or the noise of concern.

Tonal Noise

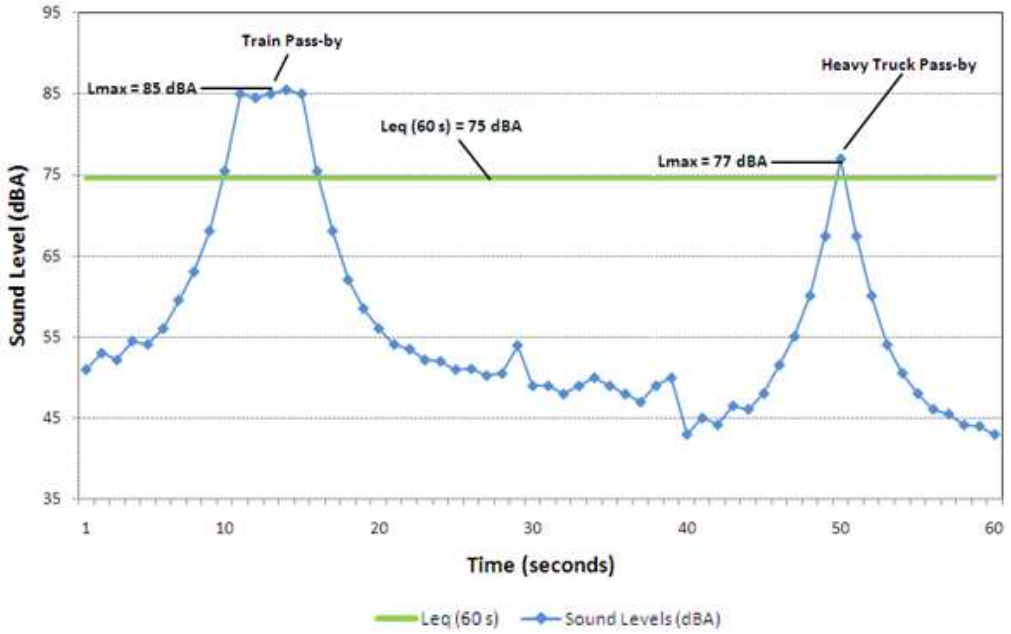
A tonal noise source can be designated as a source that has a specific noise emission over one or several frequencies, such as droning. The quantitative definition of tonality is:

the presence in the noise emission of tonal characteristics where the difference between —

a) the A-weighted sound pressure level in any one-third octave band; and

b) the arithmetic average of the A-weighted sound pressure levels in the 2 adjacent one-third octave bands, is greater than 3 dB when the sound pressure levels are determined as $L_{Aeq,T}$ levels where the time period T is greater than 10% of the representative assessment period, or greater than 8 dB at any time when the sound pressure levels are determined as $L_{A\ Slow}$ levels.

Chart of Noise Level Descriptors



Typical Noise Levels