Lloyd George Acoustics
PO Box 717
Hillarys WA 6923
T: 9401 7770
www.lgacoustics.com.au

# Compliance Noise Assessment - Neerabup Tyre Recycling Facility

## Lot 104/105, Altitude Drive, Neerabup, WA

Reference: 23017843-04

Prepared for:
CTS Tyre Recycling Pty Ltd

# Reference: 23017843-04


Lloyd George Acoustics Pty Ltd
ABN: 79 125 812 544

PO Box 717
Hillarys WA 6923
www.lgacoustics.com.au

| | |
|---|---|
| Contacts | [redacted] |
| E: | |
| P: | |
| Contacts | |
| E: | |
| P: | |




| Date | Rev | Description | Author | Verified |
|---|---|---|---|---|
| 28-May-25 | 0 | Issued to Client | [redacted] | - |
| | | | | |

# CONTENTS



## List of Tables



## List of Figures



## Appendices

# EXECUTIVE SUMMARY

Lloyd George Acoustics was engaged by CTS Tyre Recycling Pty Ltd to assess compliance for operational noise emissions at Lot 104/105, Altitude Drive, Neerabup, WA.

Attended noise monitoring was conducted 27 May 2025 at the nearest property boundaries located south and immediately east of the site.

The assessment has found that noise levels comply with the prescribed standards of the *Environmental Protection (Noise) Regulations 1997*, noting a solid eastern boundary wall is yet to be completed.

# 1. INTRODUCTION

Lloyd George Acoustics was engaged by CTS Tyre Recycling Pty Ltd to undertake an assessment of environmental noise emissions at Lot 104/105, Altitude Drive, Neerabup, WA - refer *Figure 1-1*.


***Figure 1-1: Subject Site Location***

Previous noise assessment examining initial operations (current), found mitigation was required to comply at the nearest Industrial Lot boundary(s). This works and corresponding findings were published in our report *Ref: 23017843-01_Rev2*, dated 21-Aug 2023.

Required mitigation included the construction of a solid noise wall running the length of the eastern boundary. At the time of measurements, the noise wall has only been partially constructed. Further noise reductions at the neighbouring premises (8 Parallax Way, NEERABUP) are anticipated upon completion of the noise wall.

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

# 2. CRITERIA

Environmental noise in Western Australia is governed by the *Environmental Protection Act 1986*, through the *Environmental Protection (Noise) Regulations 1997* (the Regulations) as follows:

***"7. Prescribed standard for noise emissions***

*(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 –*

*(i) tonality; and*

*(ii) impulsiveness; and*

*(iii) modulation,*

*when assessed under regulation 9.*

*(2) For the purposes of subregulation (1)(a), a noise emission is taken to significantly contribute to a level of noise if the noise emission … exceeds a value which is 5 dB below the assigned level at the point of reception."*

Tonality, impulsiveness and modulation are defined in regulation 9 (refer *Appendix B*). Under regulation 9(3), *"Noise is taken to be free of the characteristics of tonality, impulsiveness and modulation if -*

*(a) the characteristics cannot be reasonably and practicably removed by techniques other than attenuating the overall level of noise emission; and*

*(b) the noise emission complies with the standard prescribed under regulation 7(1)(a) after the adjustments in the table [Table 2-1] … are made to the noise emission as measured at the point of reception."*

***Table 2-1: Adjustments Where Characteristics Cannot Be Removed***

| Where Noise Emission is Not Music* | | | Where Noise Emission is Music | |
|---|---|---|---|---|
| Tonality | Modulation | Impulsiveness | No Impulsiveness | Impulsiveness |
| + 5 dB | + 5 dB | + 10 dB | + 10 dB | + 15 dB |

* These adjustments are cumulative to a maximum of 15 dB.

The assigned levels (prescribed standards) for all premises are specified in regulation 8(3) and are shown in *Table 2-2.* The $L_{A10}$ assigned level is applicable to noises present for more than 10% of a representative assessment period, generally applicable to "steady-state" noise sources. The $L_{A1}$ is for short-term noise sources present for less than 10% and more than 1% of the time. The $L_{Amax}$ assigned level is applicable for incidental noise sources, present for less than 1% of the time.

***Table 2-2: Baseline Assigned Levels***

| Premises Receiving Noise | Time Of Day | Assigned Level (dB) | | |
|---|---|---|---|---|
| | | $L_{A10}$ | $L_{A1}$ | $L_{Amax}$ |
| Noise sensitive premises: highly sensitive area[1] | 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 |
| Noise sensitive premises: any area other than highly sensitive area | All hours | 60 | 75 | 80 |
| Commercial Premises | All hours | 60 | 75 | 80 |
| Industrial and Utility Premises | All hours | 65 | 80 | 90 |

1. ***highly sensitive area*** means that area (if any) of noise sensitive premises comprising —
   (a) a building, or a part of a building, on the premises that is used for a noise sensitive purpose; and
   (b) any other part of the premises within 15 metres of that building or that part of the building.

*Table 2-3* shows the assigned levels taken from the previous assessment *Ref: 23017843-01_Rev2*, dated 21-Aug 2023.

As the nearest noise-sensitive (i.e. residential) receiver is located 992m south of the site, compliance for noise emissions therefore relates to adjacent Industrial Lots surrounding the site.

***Table 2-3 Assigned Levels***

| Premises Receiving Noise | Time Of Day | Assigned Level (dB) | | |
|---|---|---|---|---|
| | | $L_{A10}$ | $L_{A1}$ | $L_{Amax}$ |
| **+5 dB IF** Noise sensitive premises: highly sensitive area[1] | 0700 to 1900 hours Monday to Saturday (Day) | 50 | 60 | 70 |
| | 0900 to 1900 hours Sunday and public holidays (Sunday) | 45 | 55 | 70 |
| | 1900 to 2200 hours all days (Evening) | 45 | 55 | 60 |
| | 2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays (Night) | 40 | 50 | 60 |
| Industrial and Utility Premises | All hours | 65 | 80 | 90 |

The assigned levels are statistical levels and therefore the period over which they are determined is important. The Regulations define the Representative Assessment Period (RAP) as "*a period of time of not less than 15 minutes, and not exceeding 4 hours*, *determined by* an *inspector* or *authorised person to be appropriate for the assessment of a noise emission, having regard to the type and nature of the noise emission*".

# 3. METHODOLOGY

Under the Regulations, there are certain requirements that must be satisfied when undertaking measurements and are defined in *Regulations 19, 20, 22* and *23* and Schedule 4. In undertaking the measurements, these have been satisfied, specifically noting the following:

- The sound level meter used was a Bruel & Kjaer Type 2250 (S/N: 3011946).
- The meter has a current laboratory certificate of calibration that is available upon request. The meter was also field calibrated before and after and found to be within +/- 0.5 dB.
- The microphone was fitted with a standard wind screen.

Site measurements were undertaken on 27 May 2025 with site photographs shown in *Figure 3-1*.

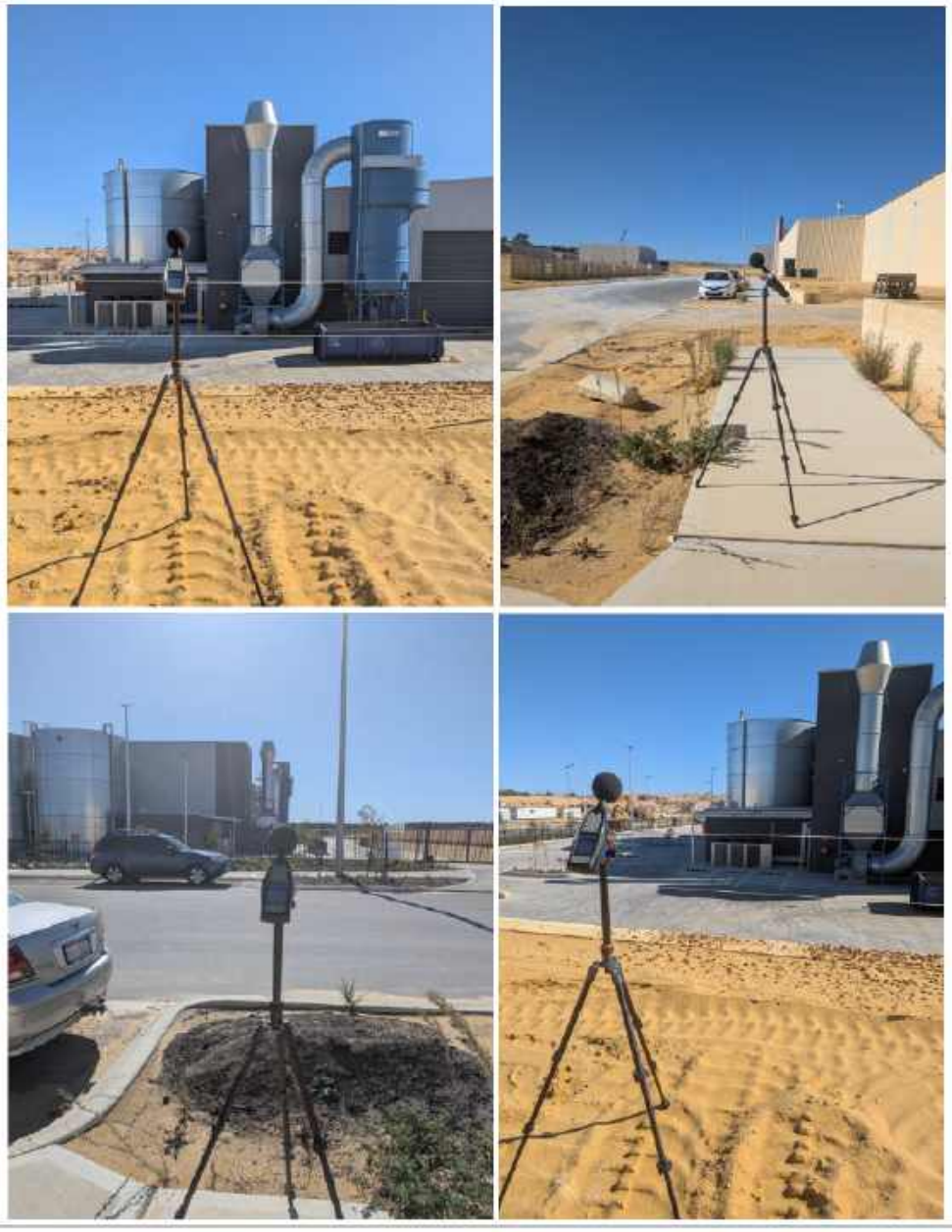


***Figure 3-1: Attended Noise Measurement***

Measurements were recorded on 27 May 2025 between 1.00 pm and 2.00 pm. Meteorological conditions at the time, recorded at the nearest Bureau of Meteorology weather station (PEARCE), were:

- Temperature 19°C
- Humidity 33%
- Wind Speed 6m/s
- Wind Direction North-East

Attended measurements were conducted at the locations shown in *Figure 3-2*.


***Figure 3-2 Measurements Locations***

It is noted the eastern boundary noise wall is only partially constructed. Inspection of the partially completed wall indicates suitable construction, with no gaps observed for the completed section – refer *Figure 3-3*.

***Figure 3-3 Partially Completed Noise Wall***

Further noise reduction at the neighbouring premises (8 Parallax Way, NEERABUP) is anticipated upon completion of the noise wall.

# 4. RESULTS & ASSESSMENT

Results from the attended noise monitoring are provided in *Table 4-1.* Recorded data has been processed to eliminate contributions from wind or extraneous noise. No tonality or modulating or impulsive noise characteristics were recorded.

The results include notes on noise contributions observed during the measurements.

***Table 4-1: Attended Noise Monitoring Summary, dB(A)***

| Location | Dur. | $L_{Aeq}$ dB | $L_{A1}$ dB | $L_{A10}$ dB | $L_{ASmax}$ dB | Notes |
|---|---|---|---|---|---|---|
| Southern boundary | 15min | 55 | 60 | 59 | 63 | site plant ~58 dB, $L_{AS}$<br>neighbouring exhaust fan ~53dB $L_{AS}$<br>vehicle pass-by ~63 dB, $L_{AS}$ |
| Eastern boundary | 15min | 65 | 66 | 65 | 66 | site plant ~65 dB, $L_{AS}$ |

Dominant noise source at all locations was observed to be the 70,000m$^3$/Hr primary baghouse filter located externally on the east warehouse façade wall.

The results of the measured $L_{A10}$ noise levels are assessed against the Assigned Levels in *Table 4-2*.

***Table 4-2: Measured Noise Levels and Assessment, dB $L_{A10}$***

| Location | Receiver | Type | Measured $L_{A10}$ dB | Assigned Level | Assessment |
|---|---|---|---|---|---|
| Southern boundary | 17 Parallax Way, NEERABUP | Industrial and Utility Premises | 58 | 65 | Complies |
| Eastern boundary | 8 Parallax Way, NEERABUP | Industrial and Utility Premises | 65 | 65 | Complies |

# 5. CONCLUSION

The assessment has found that operational noise levels at Lot 104/105, Altitude Drive, Neerabup, WA comply with the prescribed standards of the *Environmental Protection (Noise) Regulations 1997*, noting a solid eastern boundary wall is yet to be completed.

# Appendix A – Terminology

The following is an explanation of the terminology used throughout this report:

- **Decibel (dB)**

The decibel is the unit that describes the sound pressure levels of a noise source. It is a logarithmic scale referenced to the threshold of hearing.

- **A-Weighting**

An A-weighted noise level has been filtered in such a way as to represent the way in which the human ear perceives sound. This weighting reflects the fact that the human ear is not as sensitive to lower frequencies as it is to higher frequencies. An A-weighted sound level is described as $L_A$, dB.

- **Sound Power Level ($L_w$)**

Under normal conditions, a given sound source will radiate the same amount of energy, irrespective of its surroundings, being the sound power level. This is similar to a 1kW electric heater always radiating 1kW of heat. The sound power level of a noise source cannot be directly measured using a sound level meter but is calculated based on measured sound pressure level at known distances. Noise modelling incorporates source sound power levels as part of the input data.

- **Sound Pressure Level ($L_p$)**

The sound pressure level of a noise source is dependent upon its surroundings, being influenced by distance, ground absorption, topography, meteorological conditions etc. and is what the human ear actually hears. Using the electric heater analogy above, the heat will vary depending upon where the heater is located, just as the sound pressure level will vary depending on the surroundings. Noise modelling predicts the sound pressure level from the sound power levels taking into account ground absorption, barrier effects, distance etc.

- **$L_{ASlow}$**

This is the noise level in decibels, obtained using the A-frequency weighting and the S (slow) time weighting. Unless assessing modulation, all measurements use the slow time weighting characteristic.

- **$L_{AFast}$**

This is the noise level in decibels, obtained using the A-frequency weighting and the F (fast) time weighting. This is used when assessing the presence of modulation.

- **$L_{APeak}$**

This is the greatest absolute instantaneous sound pressure level in decibels using the A-frequency weighting.

- **$L_{Amax}$**

An $L_{Amax}$ level is the maximum A-weighted noise level during a particular measurement.

- **$L_{A1}$**

The $L_{A1}$ level is the A-weighted noise level exceeded for 1 percent of the measurement period and is considered to represent the average of the maximum noise levels measured.

- **$L_{A10}$**

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

- **$L_{A90}$**

The $L_{A90}$ level is the A-weighted noise level exceeded for 90 percent of the measurement period and is considered to represent the "background" noise level.

- **$L_{Aeq}$**

The equivalent steady state A-weighted sound level ("equal energy") in decibels which, in a specified time period, contains the same acoustic energy as the time-varying level during the same period. It is considered to represent the "average" noise level.

- **One-Third-Octave Band**

Means a band of frequencies spanning one-third of an octave and having a centre frequency between 25 Hz and 20000 Hz inclusive.

- **Representative Assessment Period**

Means a period of time not less than 15 minutes, and not exceeding four hours, determined by an inspector or authorised person to be appropriate for the assessment of a noise emission, having regard to the type and nature of the noise emission.

- **$L_{Amax}$ assigned level**

Means an assigned level, which, measured as a $L_{ASlow}$ value, is not to be exceeded at any time.

- **$L_{A1}$ assigned level**

Means an assigned level, which, measured as a $L_{ASlow}$ value, is not to be exceeded for more than 1 percent of the representative assessment period.

- **$L_{A10}$ assigned level**

Means an assigned level, which, measured as a $L_{ASlow}$ value, is not to be exceeded for more than 10 percent of the representative assessment period.

- **Tonal Noise**

A tonal noise source can be described as a source that has a distinctive noise emission in one or more frequencies. An example would be whining or 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.

This is relatively common in most noise sources.

- **Modulating Noise**

A modulating source is regular, cyclic and audible and is present for at least 10% of the measurement period. The quantitative definition of modulation is:

– a variation in the emission of noise that —

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

(b) is present for at least 10% of the representative assessment period; and

(c) is regular, cyclic and audible.

- **Impulsive Noise**

An impulsive noise source has a short-term banging, clunking or explosive sound. The quantitative definition of impulsiveness means:

– a variation in the emission of a noise where the difference between $L_{Apeak}$ and $L_{Amax}$ is more than 15 dB when determined for a single representative event.

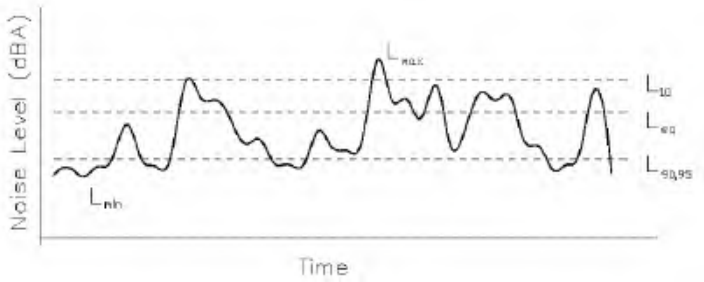
- **Major Road**

Is a road with an estimated average daily traffic count of more than 15,000 vehicles.

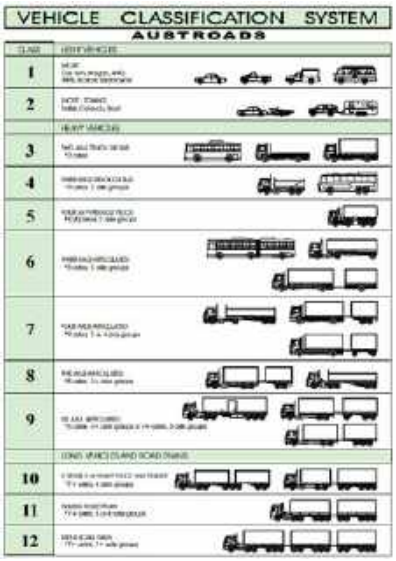
- **Secondary / Minor Road**

Is a road with an estimated average daily traffic count of between 6,000 and 15,000 vehicles.

- **Chart of Noise Level Descriptors**




- **Austroads Vehicle Class**




- **Typical Noise Levels**