

**PROPOSED SERVICE STATION
PART LOT 1 PEONY BOULEVARD
YANCHEP SHOPPING CENTRE**

ENVIRONMENTAL ACOUSTIC ASSESSMENT

APRIL 2024

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ENVIRONMENTAL ACOUSTIC ASSESSMENT
PROPOSED SERVICE STATION
YANCHEP

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FOR

FRP CAPITAL

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1. INTRODUCTION

Herring Storer Acoustics were commissioned by FRP Capital to undertake an acoustic assessment of noise emissions associated with the proposed service station to be located at Part Lot 1 Peony Boulevard, Yanchep, being within the Yanchep Shopping Centre.

From information received, we understand that the City of Wanneroo has requested an acoustic report for the noise associated with the AUTO carwash. Thus, this report only considers the noise received at the neighbouring residences (located across Marmion Avenue) from the AUTO carwash.

For reference, the concept plan for the proposed development is attached in Appendix A.

2. SUMMARY

As the service station and the AUTO carwash would be open 24 hours per day, noise received at the neighbouring noise sensitive premises from the AUTO carwash needs to comply with the appropriate assigned noise levels for the night period.

From the analysis undertaken, for noise received at the neighbouring residences from the AUTO carwash would comply with the requirements of the *Environmental Protection (Noise) regulations 1997* at all times, provided a door is installed on the entrance to the carwash.

We note that the door can be a “Rapid” type roller or similar door, commonly used with such car washes.

3. CRITERIA

The allowable noise level for noise sensitive premises in the vicinity of the proposed Facility site is prescribed by the *Environmental Protection (Noise) Regulations 1997*. Regulations 7 and 8 stipulate maximum allowable external noise levels or assigned noise levels that can be received at a premise from another premises. For residential premises, this noise level is determined by the calculation of an influencing factor, which is then added to the base levels shown below. The influencing factor is calculated for the usage of land within two circles, having radii of 100m and 450m from the premises of concern. The base noise levels for residential premises and the assigned noise levels for industrial premises are listed in Table 3.1.

TABLE 3.1 - BASELINE ASSIGNED OUTDOOR NOISE LEVEL

| Premises Receiving Noise | Time of Day | Assigned Level (dB) | | |
|---|--|---------------------|-----------------|-------------------|
| | | L _{A10} | L _{A1} | L _{Amax} |
| Noise sensitive premises: highly sensitive area | 0700 - 1900 hours Monday to Saturday (Day) | 45 + IF | 55 + IF | 65 + IF |
| | 0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day) | 40 + IF | 50 + IF | 65 + IF |
| | 1900 - 2200 hours all days (Evening) | 40 + IF | 50 + IF | 55 + IF |
| | 2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (Night) | 35 + IF | 45 + IF | 55 + IF |

Note: L_{A10} is the noise level exceeded for 10% of the time.
 L_{A1} is the noise level exceeded for 1% of the time.
 L_{Amax} is the maximum noise level.
 IF is the influencing factor.

It is a requirement that received noise be free of annoying characteristics (tonality, modulation and impulsiveness), defined below as per Regulation 9.

“impulsiveness” means a variation in the emission of a noise where the difference between L_{Apeak} and $L_{Amax(Slow)}$ is more than 15 dB when determined for a single representative event;

“modulation” means a variation in the emission of noise that –

- (a) is more than 3 dB L_{AFast} or is more than 3 dB L_{AFast} in any one-third octave band;
- (b) is present for more at least 10% of the representative assessment period; and
- (c) is regular, cyclic and audible;

“tonality” means 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_{ASlow} levels.

Where the noise emission is not music, if the above characteristics exist and cannot be practicably removed, then any measured level is adjusted according to Table 3.2 below.

TABLE 3.2 - ADJUSTMENTS TO MEASURED LEVELS

| Where tonality is present | Where modulation is present | Where impulsiveness is present |
|----------------------------------|------------------------------------|---------------------------------------|
| +5 dB(A) | +5 dB(A) | +10 dB(A) |

Note: These adjustments are cumulative to a maximum of 15 dB.

For this development, the closest residential premises of concern are located, as shown on Figure 3.1 below.



FIGURE 3.1 – NEIGHBOURING PREMISES

At the neighbouring residences, the Influencing Factor has been determined to be +8 dB. Thus, the assigned noise levels for the neighbouring residences would be as listed in Table 3.3.

TABLE 3.3 - ASSIGNED OUTDOOR NOISE LEVEL

| Premises Receiving Noise | Time of Day | Assigned Level (dB) | | |
|---|--|---------------------|------------------|--------------------|
| | | L _{A 10} | L _{A 1} | L _{A max} |
| Noise sensitive premises: Highly sensitive area | 0700 - 1900 hours Monday to Saturday | 53 | 63 | 73 |
| | 0900 - 1900 hours Sunday and Public Holidays | 48 | 58 | 73 |
| | 1900 - 2200 hours all days | 48 | 58 | 63 |
| | 2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays | 43 | 53 | 63 |

Note: L_{A10} is the noise level exceeded for 10% of the time.
 L_{A1} is the noise level exceeded for 1% of the time.
 L_{Amax} is the maximum noise level.

4. MODELLING

Modelling of the noise propagation from the proposed development was carried out using an environmental noise modelling computer program, "SoundPlan". Calculations were carried out using the EPA worst case weather conditions as stated in the Environmental Protection Authority's "Draft Guidance for Assessment of Environmental Factors No.8 - Environmental Noise".

The calculations were based in the sound power levels listed in Table 4.1.

TABLE 4.1 – GENERAL SOUND POWER LEVELS

| Item of Equipment | Sound Power Level, (dB(A)) |
|-------------------|----------------------------|
| Auto Carwash | 83* (Entry) 91 (Exit) |

*includes a rapid or similar door to the entry

We note that there is a gap in the boundary wall to Marmion Avenue at Gwalia Cove, and this gap in the wall provides a straight line of site between the entrance of the AUTO carwash and Residence R3 (ie 7 Gwalia Cove). Preliminary modelling showed that noise received at this residence from the entrance of the AUTO carwash would exceed the assigned noise level during the Night Period. Therefore, to achieve compliance with the assigned noise level at all times, noise mitigation, by way of a Rapid close or similar door has been included in the noise model.

5. RESULTS

Calculations were undertaken to all the residences noted on Figure 3.1. However, to simplify the assessment, only the noise received at the worst case location has been listed in Table 5.1.

TABLE 5.1 – WORST CASE CALCULATED NOISE LEVELS

| Location | Calculated Noise Levels (dB(A)) |
|----------|---------------------------------|
| R1 | 36 |
| R2 | 28 |
| R3 | 35 |

6. ASSESSMENT

Noise emissions from the AUTO carwash could occur for more than 10% of the time. Hence noise received from the mechanical services needs to comply with the assigned L_{A10} noise level.

Given the resultant noise level at the residences and likely background noise level associated noise from vehicles travelling along Marmion Avenue, we believe that it is unlikely that noise received at the neighbouring residences would be tonal. However, again to be conservative, a +5 dB(A) penalty has been applied to the calculated noise level associated with the combined noise from the mechanical services and voices. Table 6.1 lists the characteristics that should be included in the assessable noise level.

**TABLE 6.1 – APPLICABLE ADJUSTMENTS AND ASSESSABLE L_{A10} NOISE LEVELS, dB(A)
 MECHANICAL SERVICES**

| Location | Calculated Noise Level, dB(A) | Applicable Adjustments to Measured Noise Levels, dB(A) | | | Assessable Noise Level, dB(A) |
|----------|-------------------------------|--|------------|---------------|-------------------------------|
| | | Where Noise Emission is NOT music | | | |
| | | Tonality | Modulation | Impulsiveness | |
| R1 | 36 | +5 | - | - | 41 |
| R2 | 28 | +5 | - | - | 33 |
| R3 | 35 | +5 | - | - | 40 |

Table 6.2 shows the applicable Assigned Noise Levels, and assessable noise level emissions associated for the scenarios associated with the mechanical services.

**TABLE 6.2 – ASSESSMENT OF L_{A10} NIGHT PERIOD NOISE LEVEL EMISSIONS
 MECHANICAL SERVICES**

| Location | Assessable Noise Level, dB(A) | Applicable Times of Day | Applicable Assigned L _{A1} Noise Level (dB) | Exceedance to Assigned Noise Level (dB) |
|----------|-------------------------------|------------------------------------|--|---|
| R1 | 41 | Day Period | 53 | Complies |
| | | Sunday / Public Holiday Day Period | 48 | Complies |
| | | Evening Period | 48 | Complies |
| | | Night Period | 43 | Complies |
| R2 | 33 | Day Period | 53 | Complies |
| | | Sunday / Public Holiday Day Period | 48 | Complies |
| | | Evening Period | 48 | Complies |
| | | Night Period | 43 | Complies |
| R3 | 40 | Day Period | 53 | Complies |
| | | Sunday / Public Holiday Day Period | 48 | Complies |
| | | Evening Period | 48 | Complies |
| | | Night Period | 43 | Complies |

From the above assessments, it can be seen that noise received at the neighbouring residences, even using a conservative analysis, complies with the requirements of the *Environmental Protection (Noise) Regulations 1997* at all times, provided a Rapid close or similar door is installed on the entrance to the AUTO Carwash.

APPENDIX A

PLAN



proposed service station complex

service road

adjacent car park

adjacent shopping centre

Marimion Avenue

Peony Boulevard



LOCATION PLAN 1:500 AT A1

NEW SERVICE STATION COMPLEX

1 PEONY BOULEVARD YANCHEP SHOPPING CENTER WA 6035

0 5 10 25 50m
Scale 1:500 at A1



| areas | |
|---------------------|-----------------------|
| site | 5655sqm |
| control building | 282sqm |
| canopy | 269sqm |
| car wash | 160sqm |
| auto wash and plant | 92sqm |
| landscaping | 2188sqm 39% site area |

NEW SERVICE STATION COMPLEX

1 PEONY BOULEVARD YANCHEP SHOPPING CENTER WA 6035

PLANNING APPLICATION

04.04.24
JN1534 SK01b

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