



HANRAHAN PLACE CARWASH

NOISE IMPACT ASSESSMENT

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PREPARED FOR

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GLOSSARY OF ACOUSTIC TERMS

Most environments are affected by environmental noise which continuously varies. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. The most common of these noise descriptors are defined below.

L_{Amax}	The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.
L_{A1}	The L_{A1} level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the L_{A1} level for 99% of the time.
L_{A10}	The L_{A10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{A10} level for 90% of the time.
L_{A90}	The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.
L_{Aeq}	The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This descriptor is a common measure of environmental noise.
ABL	The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day.
RBL	The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period – daytime, evening and night time.

1 INTRODUCTION

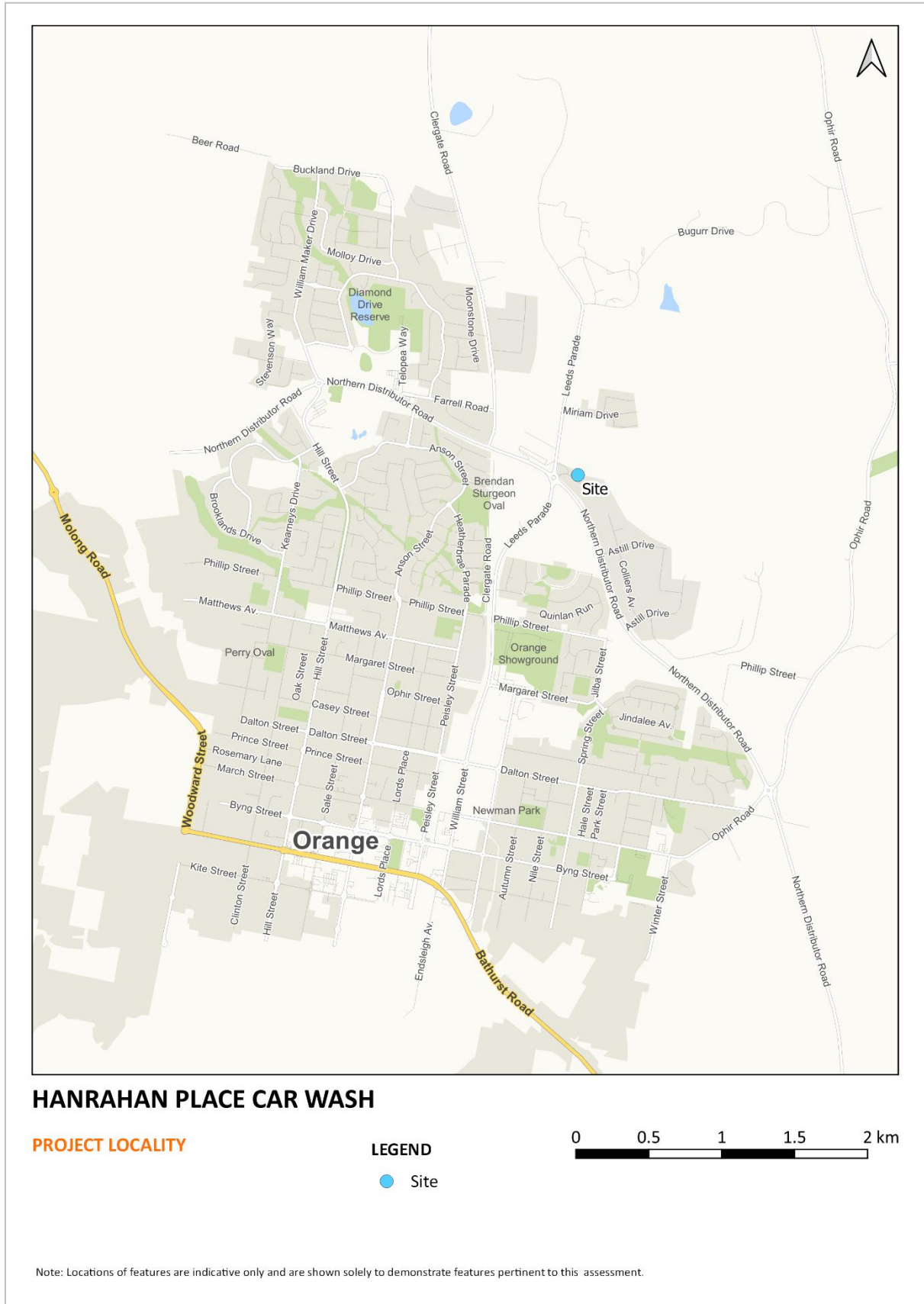
A Planning Proposal (hereafter referred to as “the Proposal”) is being submitted to Orange City Council (OCC) to amend Schedule 1 of the Orange Local Environmental Plan 2011 (LEP) to permit an Additional Permitted Use for a car wash facility at land described as Lot 87 DP 1167633, known as 2 Hanrahan Place, Orange. The site locality is shown in **Figure 1-1**.

SoundIN Pty Ltd (SoundIN) has been engaged to undertake a noise impact assessment of the Proposal.

The following report presents potential operational noise impacts associated with the Proposal at nearby existing and likely future residential receivers.

The assessment has been conducted in general accordance with the Noise Policy for Industry (NPfI).

Figure 1-1 Project Locality



2 THE PROPOSAL

2.1 Site Location

The site is located on Lot 87 DP 1167633, known as 2 Hanrahan Place, Orange. The site is located north of the Northern Distributor Road and east of Leeds Parade. The site location is shown in **Figure 2-1**.

2.2 Surrounding Land Uses and Sensitive Receivers

Land to the north of the site is zoned for business use (B7), while land to the east and west is zoned for industrial use (IN1). The nearest and most potentially affected residential receivers are two isolated dwellings to the north and south, denoted R1 and R2. Additionally, residential receivers are likely to exist in the future on land zoned for residential use to the north-east and to the south, denoted NCA1 and NCA2. The identified sensitive receivers are shown in **Figure 2-1**.

2.3 Proposal Description

Pursuant to DA 278/2014(1) the site, in conjunction with Lot 85 DP 1167633 on the opposite side of Hanrahan Place, has development consent for neighbourhood shops, take away food and drink premises and restaurant/café.

The Proposal seeks to amend Schedule 1 of the Orange LEP to permit an Additional Permitted Use (APU) for a car wash facility on the site. The car wash facility would include:

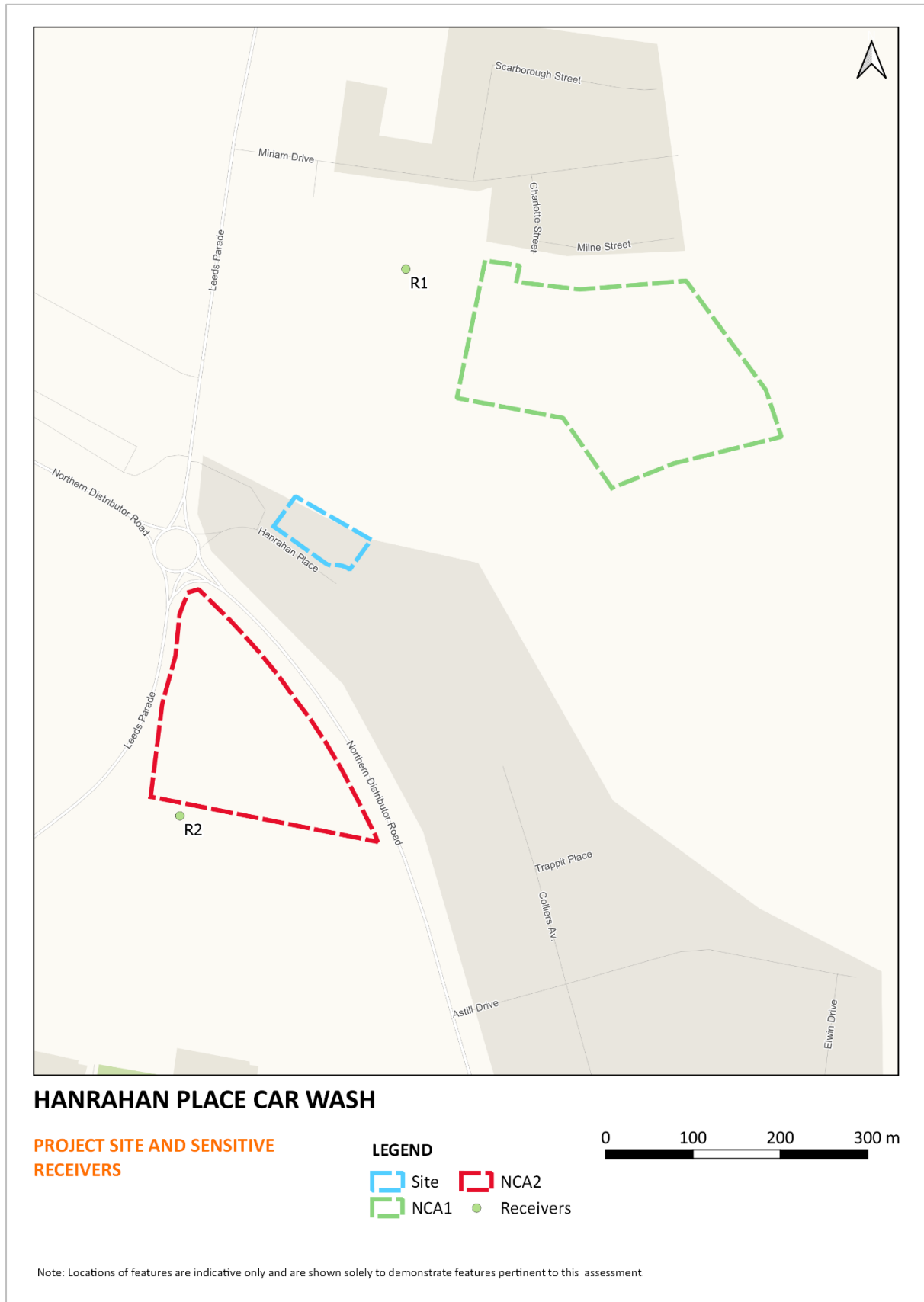
- 4 car wash bays (2 automatic and 2 manual).
- 4 vehicle vacuum bays.
- Double dog wash bay.

The proposed site layout is shown in **Figure 2-2**.

The car wash facilities would operate between the hours of 7am to 10pm.

In effect, the Proposal will retain the liquor outlet, remove the neighbourhood shops, and introduce a car wash facility within the subject land. In conjunction with the existing and approved developments within the Hanrahan Place precinct, the proposed APU will form a service/convenience precinct that will benefit travellers on the Northern Distributor Road as well as for the residents of the North Orange Urban Release Area, Narrambla industrial estate and Charles Sturt University.

Figure 2-1 Project Site and Sensitive Receivers



[illegible]

3 EXISTING NOISE ENVIRONMENT

Background noise levels in the area surrounding the Proposal were presented in the original noise assessment for the Hanrahan Place precinct (DA 278/2014(1)) and have been adopted for this assessment. This approach is considered conservative since background noise levels tend to increase over time, leading to less stringent noise criteria. The existing background noise levels are presented in **Table 3-1**.

Table 3-1 Rating Background Levels (RBL)

Represented receivers	Rating background level (dBA)		
	Day (7am – 6pm)	Evening (6pm – 10pm)	Night (10pm – 7am)
All nearby residences	41	39	33

4 NOISE CRITERIA

4.1 Operational Noise Trigger Levels

The *Noise Policy for Industry* (NPfI) (EPA, 2017) provides a framework for assessing environmental noise impacts from industrial premises and industrial development proposals in New South Wales.

The NPfI recommends the development of project noise trigger levels, which provide a benchmark for assessing a proposal or site. The project noise trigger levels should not be interpreted as mandatory noise criteria but, rather, as noise levels that, if exceeded, would indicate a potential noise impact on the community.

The project noise trigger level is the lower value of the project intrusiveness noise level and the project amenity noise level. The project intrusiveness noise level assesses the likelihood of noise being intrusive above the ambient noise level and is applied to residential receivers only. The project amenity noise level ensures the total industrial noise from all sources in the area does not rise above a maximum acceptable level.

The NPfI stipulates that project noise trigger levels are determined for the daytime (7am – 6pm), evening (6pm – 10pm) and night time (10pm – 7am) periods, as relevant. The determined trigger levels typically apply at the most affected point on or within the receiver property boundary.

4.1.1 Project Intrusiveness Noise Level

The intrusiveness noise level is the noise level 5 dBA above the background noise level for each time period (daytime, evening or night time) of interest at a residential receiver. The background noise level is derived from the measured L_{A90} noise levels.

The NPfI stipulates that project intrusiveness noise levels should not be set below 40 dBA during the daytime and 35 dBA in the evening and night time. Additionally, the NPfI recommends that the project intrusiveness noise level for evening is set at no greater than that for the daytime, and that the project intrusiveness level for night time is set at no greater than that for the evening and daytime.

Intrusiveness noise levels for the project, based on the RBLs presented in Section 3 are summarised in **Table 4-1**.

Table 4-1 Project Intrusiveness Noise Levels

Receiver	Time of day ¹	RBL (dBA)	Project intrusiveness noise level – $L_{Aeq,15min}$ (dBA)
All nearby residences	Day	41	46
	Evening	39	44
	Night	33	38

1. Day – 7am – 6pm; Evening = 6pm – 10pm; Night = 10pm – 7am.

4.1.2 Project Amenity Noise Levels

Project amenity noise levels aim to set a limit on continuing increases in noise levels from all industrial noise sources affecting a variety of receiver types; that is, the ambient noise level in an area from all industrial noise sources remains below recommended amenity noise levels.

The amenity assessment is based on noise criteria specific to land use and associated activities. The criteria relate only to industrial-type noise and do not include transportation noise (when on public transport corridors), noise from motor sport, construction noise, community noise, blasting, shooting ranges, occupational workplace noise, wind farms, amplified music/patron noise.

The amenity noise level aims to limit continuing increases in noise levels which may occur if the intrusiveness level alone is applied to successive development within an area.

The recommended amenity noise level represents the objective for total industrial noise at a receiver location. The project amenity noise level represents the objective for noise from a single industrial development at a receiver location.

To prevent increases in industrial noise due to the cumulative effect of several developments, the project amenity noise level for each new source of industrial noise is set at 5dBA below the recommended amenity noise level.

The following exceptions apply to determining the project amenity noise level:

- For high-traffic areas the amenity criterion for industrial noise becomes the $L_{Aeq,period(traffic)}$ minus 15dBA.
- In proposed developments in major industrial clusters.
- If the resulting project amenity noise level is at least 10dB lower than the existing industrial noise level, the project amenity noise level can be set at 10dB below existing industrial noise levels if it can be demonstrated that existing industrial noise levels are unlikely to reduce over time.
- Where cumulative industrial noise is not a consideration because no other industries are present in, or likely to be introduced into the area, the relevant amenity noise level is assigned as the project amenity noise level for the development.

Amenity noise levels are not used directly as regulatory limits. They are used in combination with the project intrusiveness noise level to assess the potential impact of noise, assess mitigation options and determine achievable noise requirements.

The project amenity noise levels are calculated from the recommended amenity noise levels presented in **Table 4-2**.

Table 4-2 Recommended Amenity Noise Levels

Receiver	Noise amenity area	Time of day ¹	Recommended amenity noise level – L _{Aeq,period} (dBA)
Residential	Rural	Day	50
		Evening	45
		Night	40
	Urban	Day	55
		Evening	45
		Night	40
	Suburban	Day	60
		Evening	50
		Night	45
Hotels, motels, caretakers' quarters, holiday accommodation, permanent resident caravan parks	See column 4	See column 4	5dBA above the recommended amenity noise level for a residence for the relevant noise amenity area and time of day.
School classroom-internal	All	Noisiest 1-hour period when in use	35
Hospital ward: internal external	All	Noisiest 1-hour	35
	All	Noisiest 1-hour	50
Place of worship-internal	All	When in use	40
Area specifically reserved for passive recreation (e.g.	All	When in use	50

Receiver	Noise amenity area	Time of day ¹	Recommended amenity noise level – $L_{Aeq,period}$ (dBA)
national park)			
Active recreation area (e.g. school playground, golf course)	All	When in use	55
Commercial premises	All	When in use	65
Industrial premises	All	When in use	65
Industrial interface (applicable only to residential noise amenity areas)	All	All	Add 5dBA to recommended noise amenity area

1. Day – 7am – 6pm; Evening = 6pm – 10pm; Night = 10pm – 7am.

Recommended amenity noise levels presented in Table 4-2 represent the objective for total industrial noise at a receiver location. In the case of a single new noise source being proposed, the project amenity noise level represents the objective for noise from a single industrial development at the receiver location. This is typically calculated as the recommended amenity noise level minus 5dBA.

Due to different averaging periods for the $L_{Aeq,15min}$ and $L_{Aeq,period}$ noise descriptors, the values of project intrusiveness and amenity noise levels cannot be compared directly when identifying noise trigger levels i.e. the most stringent values of each category. To make a comparison between descriptors, the NPfI assumes that the $L_{Aeq,15min}$ equivalent of an $L_{Aeq,period}$ noise level is equal to the $L_{Aeq,period}$ level plus 3dB.

Residential receivers near the Site are classified as being in a “suburban” noise amenity area. The project amenity noise levels for the Proposal are presented in **Table 4-3**.

Table 4-3 Project Amenity Noise Levels

Receiver	Time of day ¹	Recommended amenity noise level – $L_{Aeq,period}$ (dBA)	Project amenity noise level – $L_{Aeq,15min}$ (dBA)
Residential	Day	55	53
	Evening	45	43
	Night	40	38

1. Day – 7am – 6pm; Evening = 6pm – 10pm; Night = 10pm – 7am.

4.1.3 Project Noise Trigger Levels

Table 4-4 presents the project noise levels for sensitive receivers, with the project noise trigger levels shown in bold.

Table 4-4 Project noise trigger levels

Receiver	Time of day ¹	Project intrusiveness noise level – $L_{Aeq,15min}$ (dBA)	Project amenity noise level – $L_{Aeq,15min}$ (dBA)
Residential	Day	46	53
	Evening	44	43
	Night	38	38

1. Day – 7am – 6pm; Evening = 6pm – 10pm; Night = 10pm – 7am.

5 OPERATIONAL NOISE ASSESSMENT

5.1 Noise modelling methodology and assumptions

Operational noise emissions from the Proposal have been modelled using SoundPLAN v8.2. The selected noise calculation method is International Standard ISO 9613-2:1996 *Acoustics – Attenuation of sound during propagation outdoors – Part 2: General Method of Calculation* (ISO 9613-2).

Factors accounted for by ISO 9613-2 are:

- Noise source sound power and locations
- Shielding from ground topography and structures
- Noise attenuation due to geometric spreading
- Ground absorption
- Atmospheric absorption.

ISO 9613-2 is a “downwind” model, which conservatively assumes that each receiver is downwind from all noise sources.

It has been assumed that, in the event of residential dwellings being constructed in NCA2, a 1.8 metre high solid fence would be erected along the north-eastern boundary of NCA2.

5.2 Operational Noise Sources

The various car wash facilities are the dominant sources of operational noise emissions associated with the Proposal. During the operation of the car wash, noise emissions from vehicles would be small compared to the car wash facilities.

Final selection of plant and equipment for the car wash has not been conducted. For assessment purposes, typical sound power levels for the proposed equipment have been adopted based on SoundIN’s experience with such equipment. Equipment and continuous sound power levels adopted for this assessment are presented in **Table 5-1**. For assessment purposes, it is assumed that all equipment identified in **Table 5-2** is operating continuously. This is a conservative assumption.

Table 5-1 Operational Noise Sources and Sound Power Levels

Noise Source	Quantity	Sound Power Level per Item(dBA)
Automatic car wash	2	99
Manual car wash	2	91
Vacuum	2	75
Dog wash	2	83

5.3 Assessment of impacts

The predicted $L_{Aeq,15min}$ noise levels at sensitive receivers associated with the operation of the Proposal are presented in **Table 5-2** and assessed against the project noise trigger level for the evening assessment period, which is the most stringent trigger level for the operating hours of the Proposal.

Table 5-2 Predicted $L_{Aeq,15min}$ Noise Levels

Receiver	Predicted noise level (dBA)	Project noise trigger level (dBA)	Complies?
R1	39	43	Yes
R2	38	43	Yes
NCA1	42	43	Yes
NCA2	42	43	Yes

Review of **Table 5-2** indicates that the predicted noise levels comply with the project noise trigger level at all receivers.

6 CONCLUSION

A Planning Proposal is being submitted to Orange City Council (OCC) to amend Schedule 1 of the Orange Local Environmental Plan 2011 (LEP) to permit an Additional Permitted Use for a car wash facility at land described as Lot 87 DP 1167633, known as 2 Hanrahan Place, Orange.

SoundIN has conducted a noise impact assessment for the Proposal in general accordance with the Noise Policy for Industry (NPfI).

Background noise levels measured at locations representative of sensitive receivers for a previous noise study in the area have been used as the basis for establishing project noise trigger levels for the Proposal.

A computer noise model has been used to predict operational noise levels at existing and potential future sensitive receivers based on typical sound power levels for the plant and equipment anticipated to be installed at the car wash facility.

The predicted noise levels comply with the project noise trigger levels at all existing and potential future sensitive receivers.