

NOISE MANAGEMENT PLAN

FOR

AMAROO RETREAT & SPA

20 December 2022

AES-890140-R01-1-20122022

DOCUMENT CONTROL

Noise Management Plan

Prepared for: Planning Outcomes WA
www.townplanningadvice.com.au

Contact: Matt Stuart
matt@townplanningadvice.com.au
0408 000 477

Prepared by: Dr Roy Ming
Acoustic Engineering Solutions
roy.ming@acousticengsolutions.com.au
0408 944 982

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1.0 INTRODUCTION

Amaroo Retreat & Spa (ARS) operates at 1200 Alison Street, Mt Helena. It offers the services of accommodation, day spa, restaurant and lounge bar.

Amaroo Retreat proposes to increase its capacity from 60 to 85 and include the west decking area as one of the two outdoor dining areas. An environmental noise assessment¹ demonstrates that the extended restaurant operations achieve full compliance with the Environmental Protection (Noise) Regulations 1997 (the Regulations).

The Shire of Mundaring requires a noise management plan (NMP) prepared to ensure the ARS operations achieve full compliance with the Regulations. Acoustic Engineering Solutions (AES) has been commissioned by Planning Outcomes WA (POWA) to prepare the NMP.

1.1 PURPOSE AND OBJECTIVES

This NMP has been developed to:

- Manage and minimise the ARS noise emissions;
- Maintain compliance with the Regulations;
- Provide a protocol for noise monitoring; and
- Outline complaint management procedure.

1.2 ROLE AND RESPONSIBILITY

The ARS Manager has the overall responsibility for this NMP implementation, and provides the necessary resources as required. The ARS Manager is responsible for disseminating NMP information to all employees, ensuring them to:

- Understand and meet the requirements of this NMP; and
- Be inducted and aware of their responsibilities and obligations.

And also responsible for:

- Responding to adverse site noise emissions, and adjusting works/activities as appropriate to minimise impacts on the neighbouring properties;
- Undertaking and assessing data from inspections, monitoring and reporting; and
- Liaising with relevant authorities as necessary.

All ARS employees are responsible for following mitigation measures, reporting noise hazards, and informing the ARS Manager of any noise management issues.

¹ Acoustic Report for Amaroo Retreat, Report NO: AES-890064-R01-2-20122022, 20 December 2022.

2.0 LEGISLATION AND REGULATIONS

2.1 RELEVANT LEGISLATION

Environmental noise management in Western Australia is implemented through:

- Environmental Protection Act 1986 (the Act); and
- Environmental Protection (Noise) Regulations 1997 (Regulations).

2.1.1 Noise Criteria

Regulation 8 sets the noise limits, which are the highest noise levels that can be received at noise-sensitive (residential), commercial and industrial premises. These noise limits are defined as 'assigned levels'.

Regulation 7 requires that "noise emitted from any premises or public place when received at other premises 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".

2.1.2 Corrections for Characteristics of Noise

Regulation 7 also requires that that "noise emitted from any premises or public place when received at other premises must be free of (i) tonality (ii) impulsiveness and (iii) modulation when assessed under Regulation 9".

If the noise exhibits intrusive or dominant characteristics, i.e. if the noise is impulsive, tonal, or modulating, noise levels at noise-sensitive premises must be adjusted. Regulation 9 sets out objective tests and the adjustments incurred for noise exhibiting dominant characteristics.

2.2 GUIDELINES AND STANDARDS

This NMP is prepared in accordance with following guidelines and standards:

- Draft Guideline on Environmental Noise for Prescribed Premises (the Draft Guideline), Department of Environment Regulation, Western Australia, May 2016.
- AS1055-1997 (AS1055) - Description and Measurement of Environmental Noise, Parts 1, 2 and 3, Standards Australia.

3.0 AMAROO RETREAT & SPA

ARS is located in a rural area, and surrounded by residential premises. Figure 1 in APPENDIX A presents an aerial view of the ARS site and surrounding area.

Figure 2 in APPENDIX A presents the site plan. The ARS site will have:

- 8 chalets and 12 Eco-tents;
- 4 SPA tents;
- GYM facility;
- Restaurant and lounge bar; and
- Multiple car parking areas.

3.1 HOURS OF OPERATIONS

3.1.1 Current Operations

ARS currently opens 3 days a week. The restaurant and lounge bar open between 8am and 10pm on Monday to Saturday and from 8am and 8pm for Sunday & public holidays.

The spa opens between 9am and 9pm on Wednesday and Thursday but 9am and 5pm for other days.

3.1.2 Future Operations

ARE plans to extend its service hours to 12am on Monday to Saturday.

3.2 SERVICES

ARS provides the services of 20 one-bedroom accommodations, 4 day spas, restaurant and lounge bar.

The day spa offers caring, indulgent spa treatments while the restaurant and bar take care of gourmet food and drink needs. The restaurant has a maximum capacity of 85 patrons.

3.3 MAJOR NOISE SOURCES

The major noise sources in the ARS site include:

- Restaurant kitchen extraction fan and coolroom compressor condenser.
- Toilet ventilation fans in the restaurant, chalets and eco-tents.
- Air-conditioning system in the restaurant, chalets and eco-tents.
- Indoor music speakers in the restaurant.
- Live music performance.
- TV with sound limiter in each unit of the 8 chalets and 12 eco-tents.
- Patron cars.

4.0 NEIGHBOURING PREMISES

The closest noise sensitive premises to ARS are the residences. Seven (7) neighbouring residences are selected for the detailed assessment of noise impact, as shown in Figure 1 in APPENDIX A.

4.1 ASSIGNED NOISE LEVELS

Table 4-1 presents the assigned noise levels for the selected receivers.

Table 4-1: Assigned noise levels in dB(A)

Closest Residents	Assigned Noise levels in dB(A)			
	Day ² Monday to Saturday	Day ³ Sunday and Public Holiday	Evening ⁴	Night ⁵
L_{A10}				
All	45	40	40	35
L_{A1}				
All	55	50	50	45
L_{AMax}				
All	65	65	55	55

² 0700 to 1900 hours for Monday to Saturday.

³ 0900 to 1900 hours for Sunday and public holidays.

⁴ 1900 to 2200 hours for all days.

⁵ 2200 hours on any day to 0700 hours Monday to Saturday or 0900 hours Sunday and public holidays.

5.0 NOISE ASSESSMENT

The dominant noise sources in the ARS site are associated with the operations of restaurant and lounge bar. The noise emissions from the 20 one-bedroom accommodations, 4 day spas and gym are insignificant compared with the noise emissions from the restaurant.

The noise emissions from the ARS restaurant has been assessed¹ and presented in the “Acoustic Report for Amaroo Retreat” (Report NO: AES-890064-R01-2-20122022) dated on 20 December 2022. The assessments have demonstrated that full compliance is achieved with the Regulations for the worst-case operations of the ARS restaurant.

5.1 PREDICTED NOISE LEVELS

5.1.1 Restaurant and Lounge Bar

Five operational scenarios are modelled to represent the worst-case operations of the restaurant and bar:

- Scenario 1: represents worst-case daily restaurant operation.
- Scenario 2: represents worst-case restaurant operation with an outdoor live music.
- Scenario 2A: represents worst-case restaurant operations with an indoor live music.
- Scenario 3: represents worst-case restaurant operation with a delivery.
- Scenario 4: represent car-door closing events.

Table 5-1 summarises the predicted worst-case noise levels in dB(A) for the above scenarios.

Table 5-1: Predicted worst-case noise levels in dB(A).

Receivers	Scenario 1		Scenario 2	Scenario 2A		Scenario 3	Scenario 4	
	Day	Night	Day	Day	Evening	Day	Day	Night
R1	17.1	17.0	33.0	25.6	25.6	18.0	22.1	22.1
R2	13.0	13.0	34.7	14.8	14.8	23.2	23.6	23.6
R3	28.7	28.6	32.7	29.2	29.1	37.3	38.3	38.3
R4	11.7	11.7	31.1	13.3	13.3	13.2	16.3	16.4
R5	10.9	10.9	14.1	11.4	11.4	20.2	17.2	17.3
R6	1.1	1.1	12.8	3.3	3.3	12.6	5.5	5.5
R7	21.2	21.1	23.6	30.2	30.2	30.4	22.0	22.0

5.1.2 Accommodations and Day-Spa

The noise sources for the accommodations and the day spa are mechanical plant:

- Air conditioning units;
- Toilet ventilation fans; and
- TVs with sound limiters.

For the worst-case operation, the following scenario is modelled:

Scenario 5: The air conditioning units, toilet ventilation fans and TVs of the 8 chalets, 12 Eco-tents and 4 day spas operate simultaneously.

Table 5-2 presents the predicted noise levels in dB(A) for the above scenario. It is shown that the predicted day and night-time noise levels are very similar.

Table 5-2: Predicted worst-case noise levels in dB(A).

Receivers	Scenario 5	
	Day	Night
R1	13.3	13.2
R2	14.0	13.9
R3	24.1	24.0
R4	7.7	7.7
R5	7.7	7.7
R6	3.5	3.4
R7	19.5	19.4

Table 5-1 and Table 5-2 shows:

- Outdoor live music radiates the highest noise emission.
- The mechanical plant of accommodations and day spas generates the lowest noises, which are far below the night-time assigned noise levels even with the tonality adjustment, at most of the neighbouring premises.
- The noises from the daily restaurant operation (scenario 1) and from the accommodations and day spas (scenario 5) are at similar levels and may not be audible at the neighbouring premises during the day and the evening when ambient noise is above 30 dB(A).

5.2 NOISE CONTOURS

Figure 3 to Figure 8 in APPENDIX B present the worst-case noise level contours at 1.5m above the ground. These noise contours represent the worst-case noise propagation envelopes, i.e., worst-case propagation in all directions simultaneously. Since the predicted day and night-time worst-case noise levels are at very similar levels, the noise contours represent day, evening and night-time noise emissions from the AES site.

6.0 MANAGEMENT OF NOISE

6.1 SITE ACCESS

Customers drive to ARS. To minimise vehicle noise impact, speed limit and “no honking” policy should be imposed on the ARS site roads. Signs of speed limit and “honking prohibited” are displayed in the site entrances and the car parking areas.

Site roads should be kept even, well graded, and designed to minimise the need for vehicles to reverse.

6.2 CAR PARK AREAS

Slamming a car door could generate high level noise. In the car park areas, the following information is displayed to remind customers to respect the neighbours when they arrive at and leave ARS:

- Close car door gently.
- Do not leave the car/truck engine idling.
- No Loud Conversations Allowed.
- Do not drag objects on the ground.

6.3 INDOOR SPEAKERS

The indoor speakers play low level background music to provide a pleasure and relaxed atmosphere to costumers. The requirement of an indoor speaker in the restaurant is that the average music level is $L_{Aeq,15minutes} = 60$ dB(A) at 1 metre over a 15 minute interval.

The control panel of PA system for operating the indoor speakers should be tested. The scale of PA system is set and marked on the PA system control panel. Restaurant employees are trained to operate the PA system. An information sheet is placed with the control panel to instruct how to operate the indoor speakers. Do not operate the PA system above the limit.

To ensure the background music does not affect costumer conversations (costumers do not need to raise voice against the background music), the background music is:

- Only slow soft music; and
- Played at low levels.

6.4 LIVE MUSIC

Live music is played:

- Outdoors during the day (700 to 1900) on Monday to Friday excluding public holidays.
- Indoors during the evenings (1900 to 2200) and for Sunday and public holidays.

The sound requirement for live music is the average music level measured at 1 metre from each live music speaker over a 15 minute interval is:

- $L_{Aeq,15minutes} \leq 91$ dB(A) if the live music has one speaker only; or
- $L_{Aeq,15minutes} \leq 88$ dB(A) if the live music has two speakers.

The above requirement should be maintained for any live music performance.

No live music is allowed during:

- 8am and 9am on Sunday and public holidays.
- After 10pm every day.

As indicated in section 5.1, outdoor live music generates the highest noise emission in the ARS site. Outdoor live music performance will be managed to minimise the noise emission. Mobile barriers can be used to reduce noise propagation towards specific directions if required.

6.5 INFORMATION GIVEN TO RESTAURANT GUESTS

On the restaurant tables, an information sheet is provided to remind customers:

- ARS does not tolerate any shouting and loud noise activities.
- Follow the site road rules of speed limit and "horning prohibited".
- Follow the rules of car park areas, stated in section 6.2.

6.6 NOISE MITIGATIONS

The following noise mitigation measures are recommended:

- The equipment operated on the site will be regularly maintained, and an equipment maintenance program will be developed to ensure all machines are operating as designed (the manufacturer's specifications).
- Take care to minimise noise from daily set up and pack down of furniture.
- Close the kitchen external door if feasible.
- Switch off indoor music immediately after the restaurant service hours.
- Do not drop glass bottle or metals to rubbish bins. Place them gently into rubbish bins.
- Close all external doors when using a vacuum cleaner or other noisy equipment outside the restaurant service hours.

6.7 DELIVERIES AND WASTE COLLECTIONS

Deliveries are generally restricted on Monday to Friday between 9am to 5pm. Delivery drivers are advised to:

- Switch their truck engine off immediately after it is parked.
- Close their truck doors gently.

A private waste collection service (J&J Richards) will be contracted to collect waste at the existing bin area in every second Wednesday morning after 7am. The waste truck drivers are advised to minimise noise emissions during the collections.

6.8 NEW EQUIPMENT PURCHASE AND INSTALLATION

When purchasing new tools or equipment, "Buy-Quiet" policy should be committed:

- Buy quietest equipment as available.
- Buy equipment that can achieve a similar outcome with less noise radiation.

The installation of new equipment including furniture should be restricted to the day-time period of Monday to Saturday (0700-1900). The contractor responsible for installations must provide evidence that the tools used for installation meets the noise emission limit, or that noise control with the tools is effective in reducing the noise level to the specified limit.

6.9 ACCOMMODATIONS

Guests staying at the accommodations are required to obey the ARS rules. On arrival, all guests will be provided with an information sheet to remind them:

- ARS does not tolerate any shouting and loud noise activities.
- No unauthorised music players or radios are permitted outdoors after 10pm.
- Do not talk loudly outdoors.
- Do not slam car/truck doors.
- Do not leave the car/truck engine idling.
- Do not drag objects on the ground.
- No unauthorised party is permitted.

6.10 TRAINING

All ARS employees will undertake a noise induction. The induction provides necessary awareness of noise management and the procedures and work practices to minimise noise generations. The induction includes but is not limited to the followings:

- Relevant licence and approval conditions;
- Assigned noise levels of different time periods;
- Locations of potential affected noise-sensitive premises;
- Scale setting for operating the indoor speakers;
- General noise mitigation measures; and
- Noise complaint procedures.

7.0 NOISE MONITORING

7.1 OVERVIEW

Operational noise monitoring will be conducted in accordance with the procedures outlines in the Regulations and AS 1055⁶.

Operational noise monitoring will be undertaken to:

- Quantify the ambient noise levels;
- Verify compliance with the Regulations during the operations;
- Assess the effectiveness of noise mitigation measure if it is implemented;
- Response to complaints where it is appropriate; and
- Evaluate noise emissions and impacts.

7.2 MONITORING LOCATION AND PERIOD

Noise monitoring is recommended to perform at the most affected residential premises (for example, R3) or the complainant premise or representative boundary locations.

At each location, noise monitoring should be undertaken for a minimum of 15 minutes during onsite worst-case operation or for a whole day period from 8am to 10pm or for a week depending on the requirements.

Monitoring locations and time periods are described in details in the measurement note including:

- Marks in an aerial photograph; and
- Photos showing the noise logger locations; and
- Geographic Information System (GIS) coordinates.

7.3 NOISE MONITORING PROCEDURE

7.3.1 Personnel

Noise monitoring should be conducted by a suitably qualified acoustic specialist.

7.3.2 Noise Monitoring Equipment

Noise monitoring equipment must comply with Schedule 4 of the Regulations.

Type 1 Sound Level Meter (SLM) is recommended and it should meet the requirements for Type 1 sound level meters as specified in AS 1259.2:1990⁷, and for octave band filters as

⁶ Australian Standard AS 1055 Acoustics – Description and measurement of environmental noise.

⁷ Australian Standard 1259.2-1990 Acoustics – Sound level meters, part 2: integrating averaging.

specified in IEC 1260 and AS/NZS 4476:1997⁸. The SLM should be able to record the 'Slow' time weighted and 'A' frequency-weighted noise levels of L_{A1} , L_{A10} , L_{A90} , L_{Amax} and L_{Aeq} .

The SLM microphone should be placed towards the site at 1.5m above the ground and at least 3 m away from any reflective objects.

The SLM should be calibrated immediately before and after the monitoring.

7.3.3 Meteorological Conditions

Noise monitoring should be undertaken during days of light winds (<5 m/s) and without rains. Wind speeds/directions and temperature should be recorded. Rain and heavy winds will produce false (high) noise readings.

7.3.4 Noise Environment

For attended noise monitoring, noise environment (activities and time) should be recorded/written in details, including:

- Any activities or audible noises from neighboring premises;
- Local traffic, especially motorcycles if monitoring location is close to roads;
- Train movement if monitoring location is close to a railway;
- Aircraft noise if present;
- Any mechanical plant operating nearby;
- Animal noises (Bird noise, Dog barks, etc);
- People walking and talking passing the noise logger;
- Any audible noise if present; and/or
- Any other activities, which make noises.

7.4 AMBIENT NOISE MONITORING

Before the operation of ARS, ambient noise monitoring is recommended to establish a baseline for the future assessments of operational noises.

7.5 OPERATIONAL NOISE MONITORING

To ensure operational noise compliance with the Regulations, attended noise monitoring is recommended during the worst-case activities in the first 4 weeks of the full operations. If monitored noise level consistently exceeds the assigned noise levels shown in Table 4-1, then investigation should be made to check if the exceedance results from the ARS operations, and if so to identify the culprit equipment/activities. If the exceedance results from the operation of restaurant, noise model should be updated, and noise control measures should be investigated, developed and implemented to achieve compliance with the Regulations.

⁸ Australian Standard 4476-1997 Acoustics – Octave-band and fraction-octave-band filters.

If a complaint is received, attended noise monitoring should be undertaken to:

- quantify the noise levels at complainant locations;
- correlate the noise levels between the sources and receivers; and
- identify potential noise sources and their relative contributions.

If a noise mitigation measure is implemented, attended noise monitoring should be undertaken to verify the effectiveness of noise mitigation measures.

If new equipment is purchased, noise measurements should be undertaken to qualify the sound power level and to assess its operational compliance.

7.6 REPORTING ON NOISE MONITORING

Following each noise monitoring, a report will be prepared to present monitoring results and findings. The following information must be included in the reports when applicable:

- Monitoring times/periods and dates.
- Noise monitoring location indicated in the site layout and/or by a photo.
- Sound measurement equipment including models and series numbers.
- Field calibration results (before and after measurements).
- Meteorological conditions during the measurements.
- Description of the site activities including number of customers and car/truck movement during the monitoring.
- Description of the noise environment including activities in the neighbouring premises during the monitoring.
- A table of monitoring results, which are the 15-minute L_{A1} , L_{A10} , L_{A90} , L_{Aeq} and L_{Amax} noise levels. The noise levels shall be taken to the nearest 0.1dB.
- Estimation of noise contributions from major noise sources if possible.
- A summary of any exceedance if present, and description of the machines or activities or (public) road traffic causing the exceedance.
- Details of any corrective & preventive actions taken and status of their implementation.

8.0 COMPLAINT MANAGEMENT

8.1 RESPONSIBILITIES

The Site Manager will ensure that all actions of this NMP are undertaken to a satisfactory standard. A dedicated site contact will be appointed to communicate with the community and deal with operational noise issues. The contact details will be published in the ARS website so that they are available to the public.

8.2 COMMUNITY CONSULTATION

The Site Manager will ensure that the local community is informed of the ARS operations. The following practices are recommended:

- The ARS website is used to notify the community. The content of notification includes:
 - Brief description of the ARS services and activities.
 - Opening hours and days.
 - How to lodge a complaint.
- Dedicated telephone complaint line or email address is established and made available to public especially the closest residents.

8.3 COMPLAINT MANAGEMENT

A complaint management procedure is established to response noise complaints.

In the event of a noise complaint from the community, the dedicated site contact will notify the Site Manager.

When a complaint is made, the dedicated site contact will complete a Noise Compliant Report Form (example in APPENDIX C), which includes:

- Date and time of the complaint.
- Compliant methods (telephone, email, in person).
- Location and contact details of the complainant.
- Nature of the complaint.
- Meteorological conditions at the time of the incident.
- The action taken in relation to the complaint:
 - If a verbal response is given, what is it and is the complainant satisfied.
 - If the site contact discusses with the complainant, what is resolved at this point.
- Name of staff who had taken the complaint.

The noise complaint report form will be kept for management purposes, and available to the Shire of Mundaring upon request.

After the complaint is received, actions will be taken as soon as practicable to determine the source of the issue, including:

- Investigation of noise source and activities that is the subject of complaint.
- Identification of related noise activities and locations that could have or are known to have contributed to the incident.
- Attended or unattended noise monitoring at the complainant location.
- Undertaking noise modelling of the activities which related to the complaint.
- Development and Implementation of noise control measures to reduce the noise emissions and to ensure the ARS operations complying with the Regulations.

Complaints will be managed on an individual basis. Corrective actions which do not adversely impact the operations will be implemented as a priority.



APPENDIX A SITE LAYOUTS

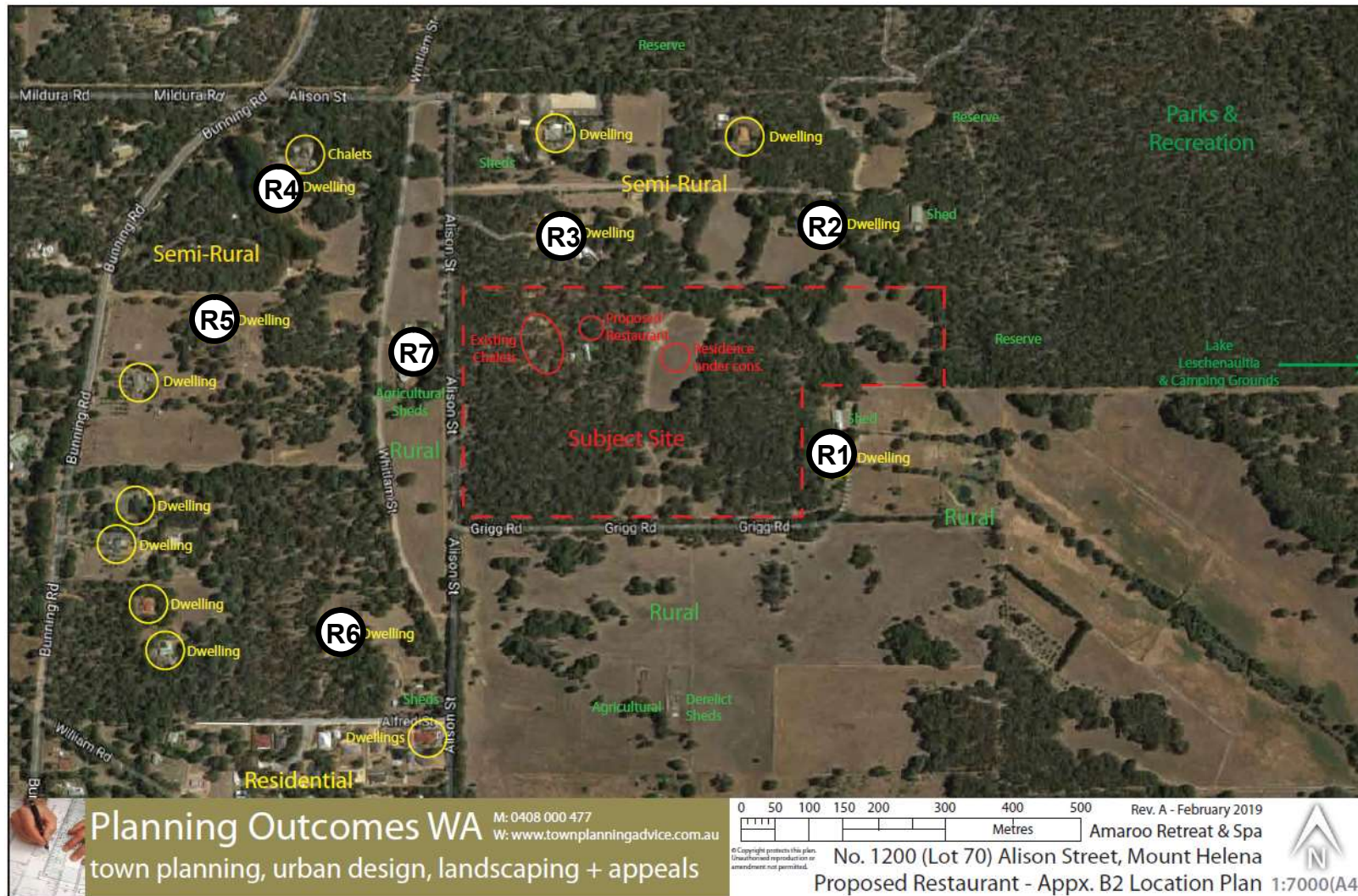


Figure 1: Aerial view of the Amaroo Retreat & Spa and its surrounding area.



Figure 2: Site Layout.

APPENDIX B NOISE CONTOURS

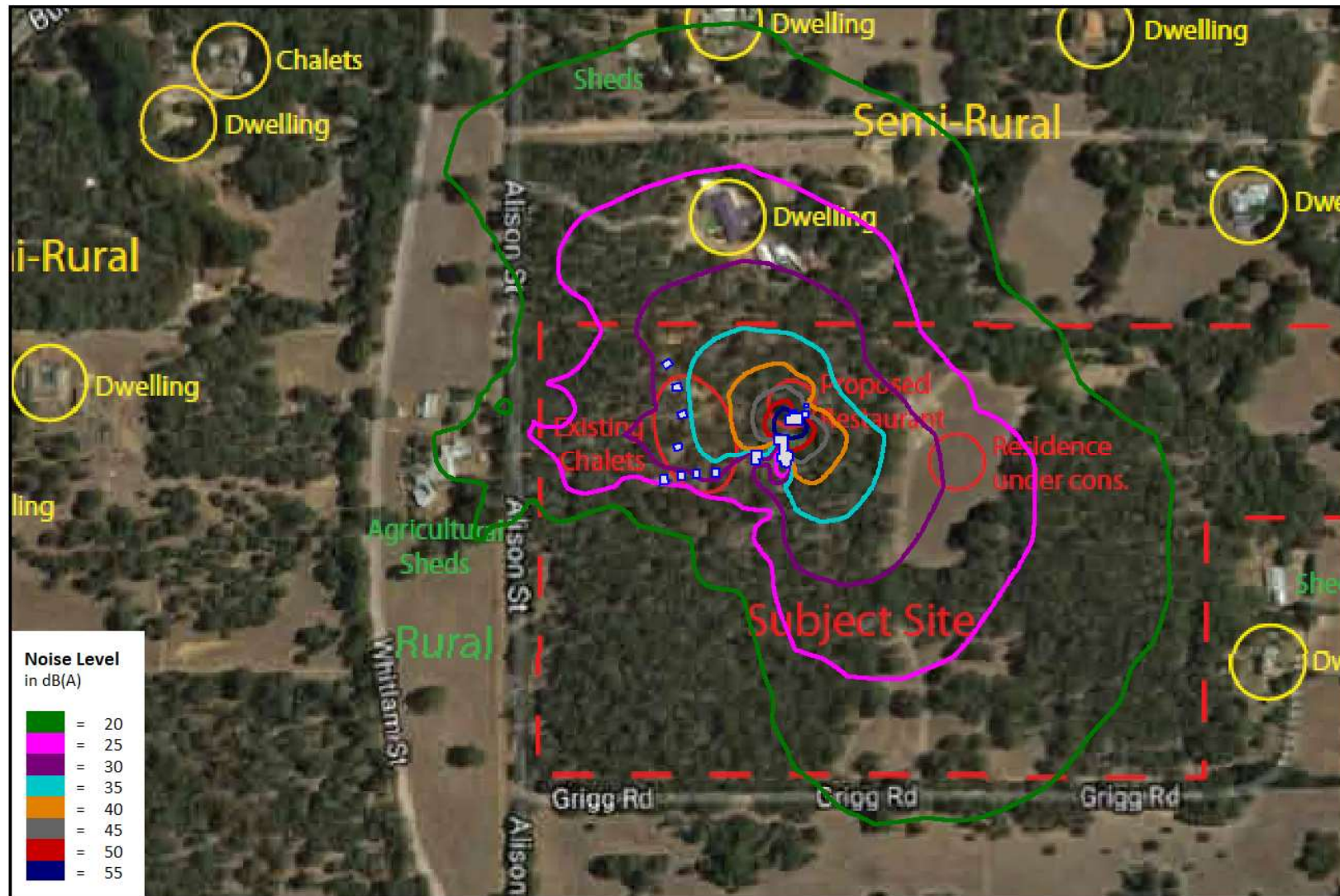


Figure 3: Worst-case noise level contours for scenario 1.

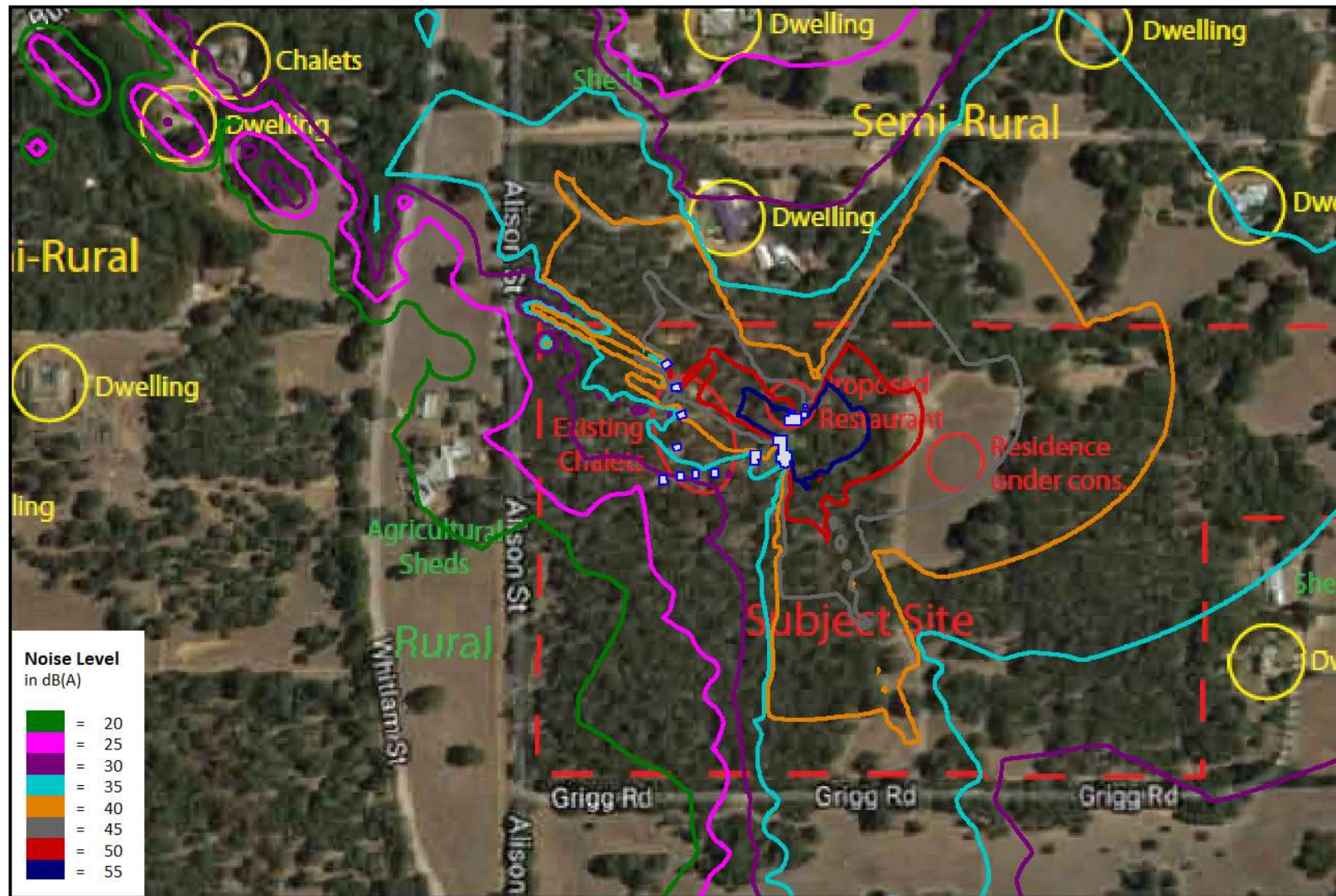


Figure 4: Worst-case noise level contours for scenario 2.



Figure 5: Worst-case noise level contours for scenario 2A.

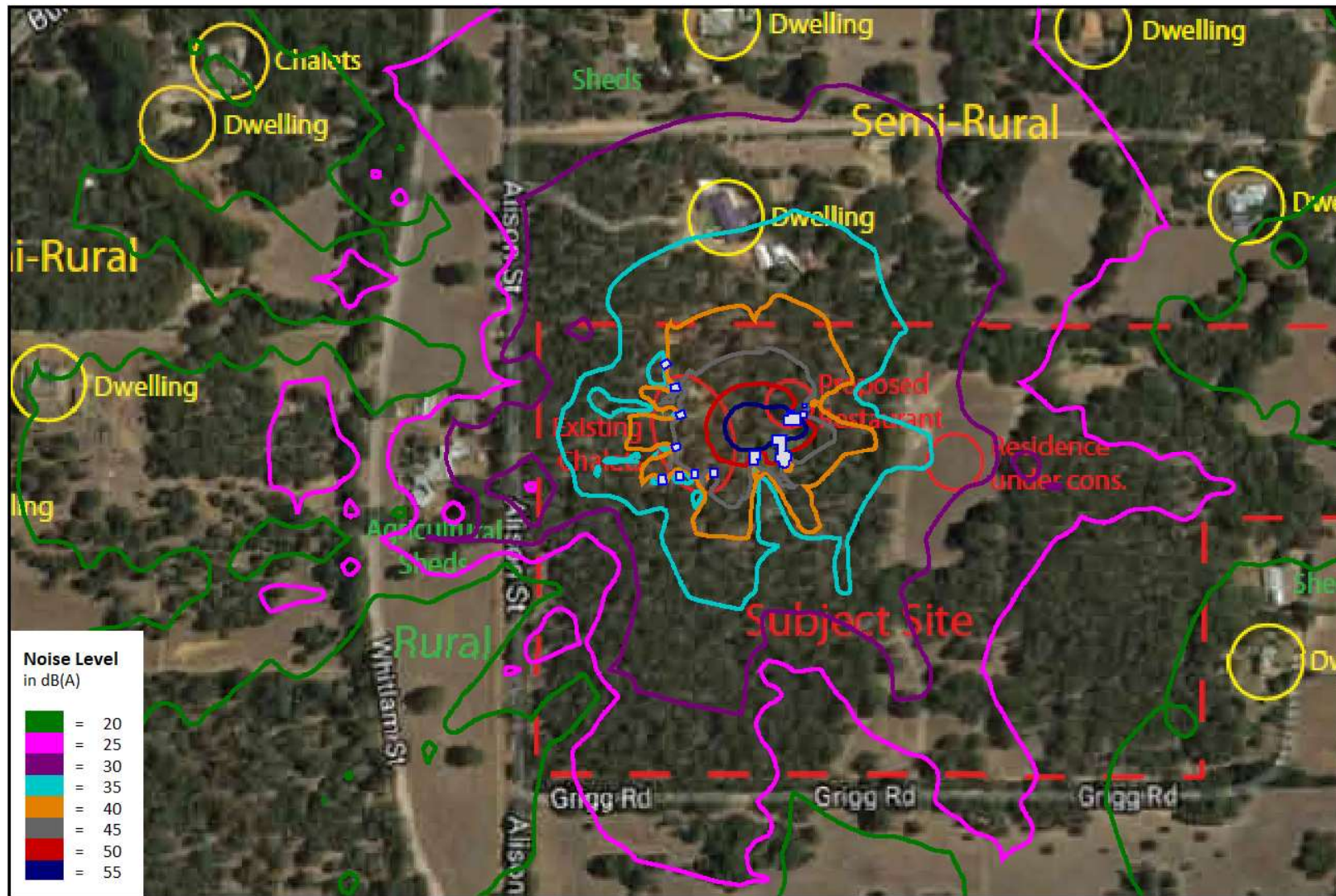


Figure 6: Worst-case noise level contours for scenario 3.

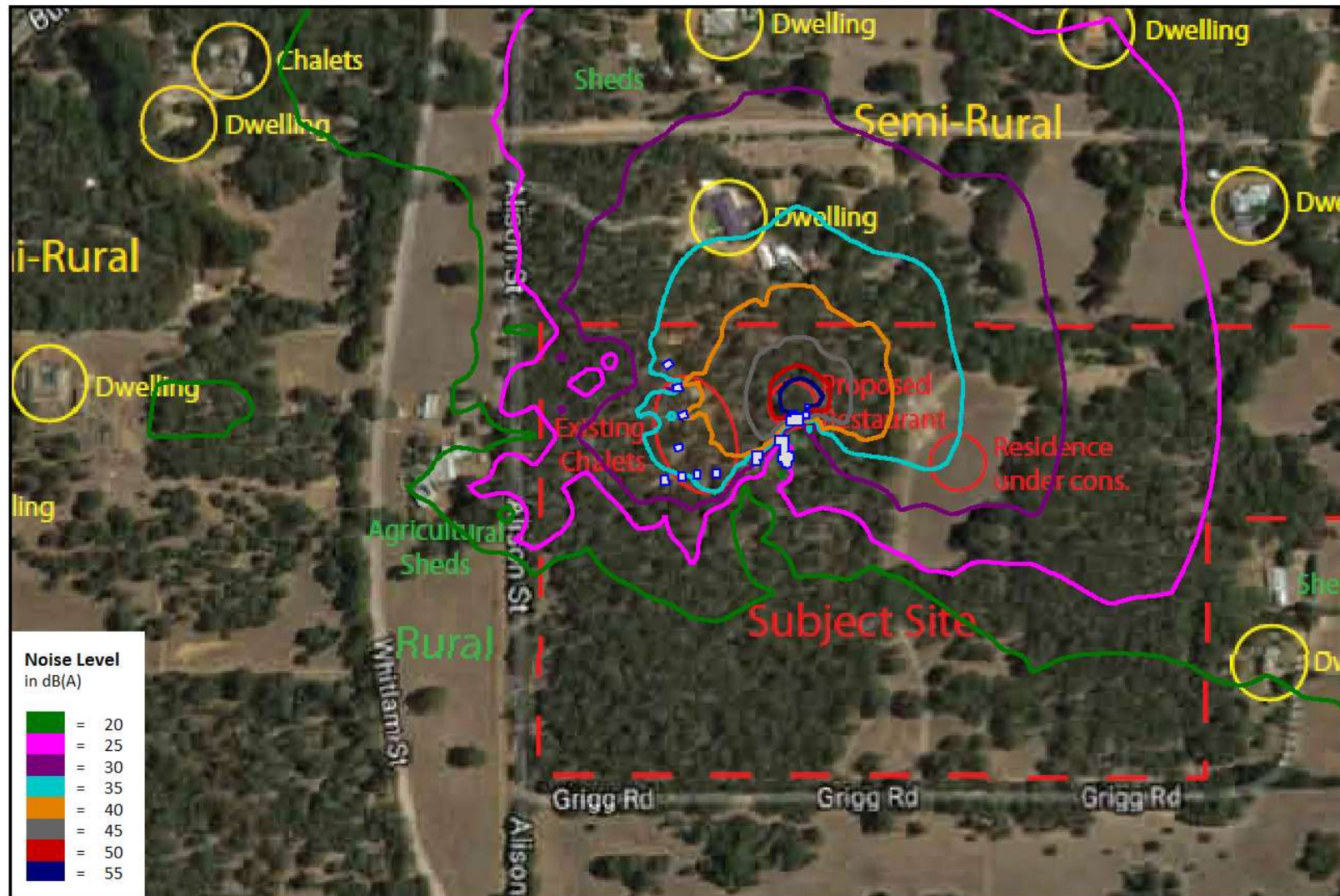


Figure 7: Worst-case noise level contours for scenario 4.

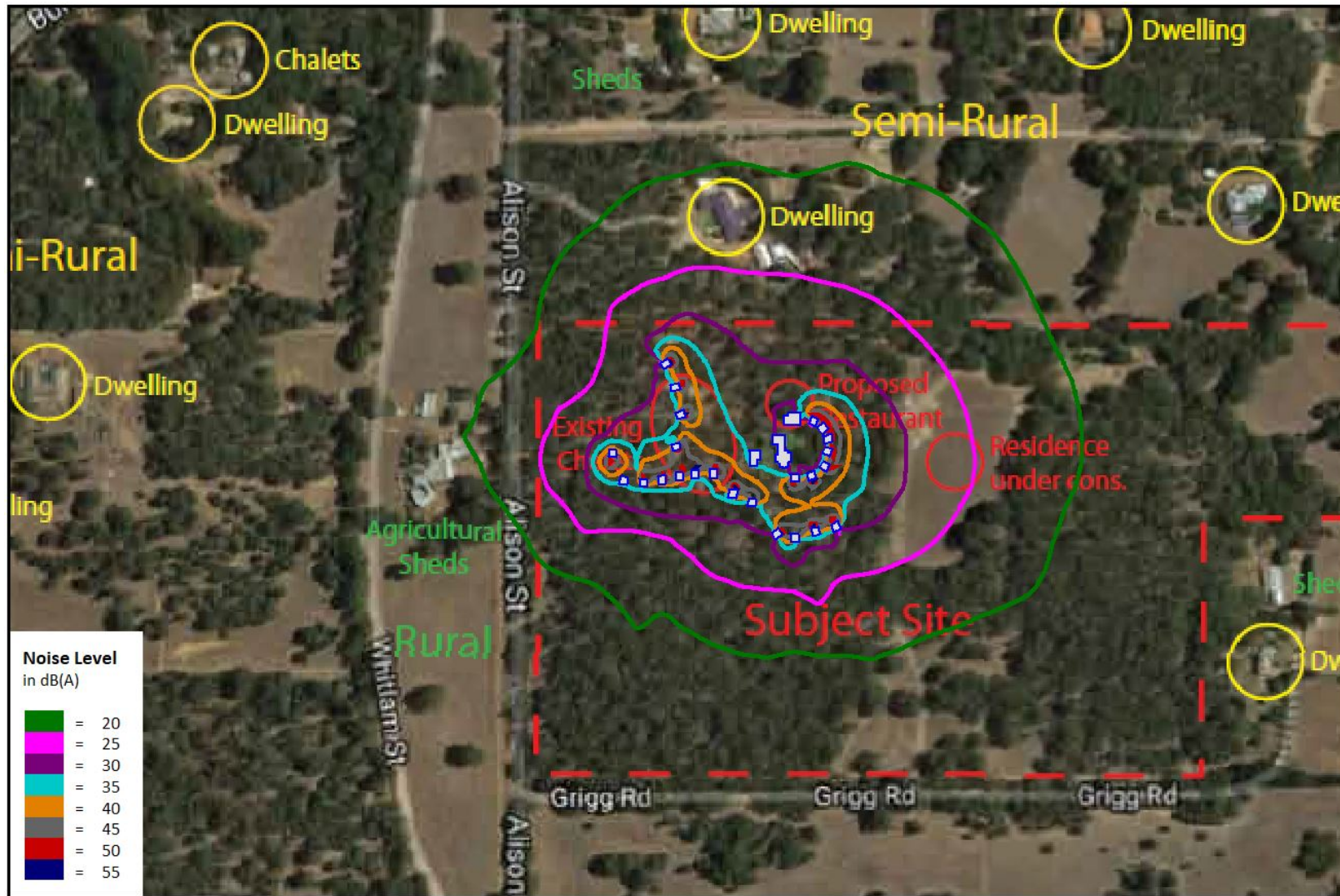


Figure 8: Worst-case noise level contours for scenario 5.

APPENDIX C COMPLAINT NOISE LOG

Noise Complaint Log – Amaroo Retreat & Spa

Date	Time	Method of complaint	Weather conditions and wind direction	Contact Details of complainant (Name and Phone)	Location of complainant	Nature of complaint	Response	Follow Up Action	Complaint Taken By
E.g. 18/03/20	7pm	Telephone	Light westerly	John Smith, 0400 XXX XXX	2 XX Street, Mt Helena	Music too loud	Verbal response. Problem solved	Scale down PA Controller	Staff name