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Bunyip North BESS

Noise Impact Assessment

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Bunyip North BESS

Noise Impact Assessment

0776507



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ACRONYMS AND ABBREVIATIONS

Term	Description
AS	Australian Standard
BPA	Bushfire Prone Area
BESS	Battery Energy Storage System
BNTS	Bunyip North Terminal Station
dB(A)	A-weighted decibels
EP Act	<i>Environment Protection Act 2017</i>
EPA	Environment Protection Authority (Vic)
ERM	Environmental Resources Management Australia Pty Ltd
FZ	Farming Zone
GED	General Environmental Duty
GWZ1	Green Wedge Zone – Schedule 1
GWAZ	Green Wedge A Zone
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
km	Kilometre(s)
LAeq	Equivalent continuous A-weighted sound pressure level
LA90	A-weighted sound pressure level exceeded for 90% of the measurement period
LDRZ	Low Density Residential Zone
LGA	Local Government Area
m	Metre(s)
MVA	Megavolt-ampere
MW	Megawatt(s)

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Term	Description
MWh	Megawatt-hour(s)
NATA	National Association of Testing Authorities (Australia)
NIA	Noise Impact Assessment
NML	Noise Monitoring Location
NSA	Noise Sensitive Area
RES	RES Australia Pty Ltd
TRZ2	Transport Zone 2 – Principal Road Network
WGS 84	World Geodetic System 1984

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EXECUTIVE SUMMARY

Environmental Resources Management Australia Pty Ltd (ERM) was engaged by RES Australia Pty Ltd (RES) to undertake a Noise Impact Assessment (NIA) of the proposed Bunyip North Battery Energy Storage System (BESS) (the Project) at Bunyip North, Victoria.

The purpose of this report is to identify noise limits for the Project in line with the Noise Protocol (EPA Victoria, September 2025), and to determine the extent of operational noise impacts (if any) at Noise Sensitive Areas (NSAs) in proximity to the Project.

Unattended noise monitoring was undertaken in accordance with the Noise Protocol to evaluate the existing background noise environment at NSAs and to derive project-specific operational noise limits.

Noise limits were developed for each of the identified NSAs around the site with consideration of land zoning, distance to the site, and collected representative background noise levels using the methodology prescribed in EPA Victoria *Publication 1826 Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises, and entertainment venues* (the Noise Protocol).

Wimpole Battery by AMPYR is a proposed BESS that is immediately adjacent to the east of the Project site. As such, cumulative noise impacts from both the Project and Wimpole Battery should be assessed at the NSAs. However, a NIA for Wimpole Battery was not available at the time of writing of this report to determine its noise contribution to the NSAs. Accordingly this assessment adopted *Publication 1997 Technical guidance: Measuring and analysing industry noise and music noise* (EPA Victoria, 2021), applying the alternative assessment criteria for multiple industrial premises, specifically those for proposed new industry or extension of existing premises in rural areas.

Two operational noise scenarios (day and evening/night) involving battery units, inverters and transformers were developed, and noise levels were predicted at the NSAs through noise modelling using the environmental noise modeling software, SoundPLAN v9.1.

Compliance with the Noise Protocol noise limits is predicted for the identified NSAs during the day, evening and night periods. In addition, no cumulative noise impacts with the proposed and adjacent BESS (Wimpole Battery) are predicted based on the Project's compliance with Publication 1997 noise limits. As such, no specific noise mitigation measures are required to be implemented.

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1. INTRODUCTION

Environmental Resources Management Australia Pty Ltd (ERM) was engaged by RES Australia Pty Ltd (RES) to undertake a Noise Impact Assessment (NIA) of the Bunyip North Battery Energy Storage System (BESS) (the Project).

The purpose of this report is to identify noise limits for the Project in line with applicable statutory requirements and assess operational noise impacts associated with the Project at its nearest noise sensitive areas.

A glossary of acoustics terms relevant to this report is provided in Appendix A.

2. PROJECT OVERVIEW

The Project is proposed to deliver a BESS for large scale electricity storage and dispatch capability, supporting Victoria's transition toward a more renewable and reliable energy network. The BESS is anticipated to have a storage capacity of up to 400 MW / 2,400 MWh, with a connection to the existing 220 kV transmission network via a new transmission terminal station, the Bunyip North Terminal Station (BNTS).

The Project (as shown in Figure 2-1) is wholly located within the Cardinia Shire local government area (LGA), approximately 80 kilometres (km) southeast of central Melbourne in Victoria's Gippsland region and approximately 2.5 km north of the Bunyip town centre.

The Project Area, being the land within which the Project may be developed, comprises approximately 27.6 hectares of private freehold land (the Site) and 3.2 hectares of public land to accommodate the proposed new access from the Princes Freeway.

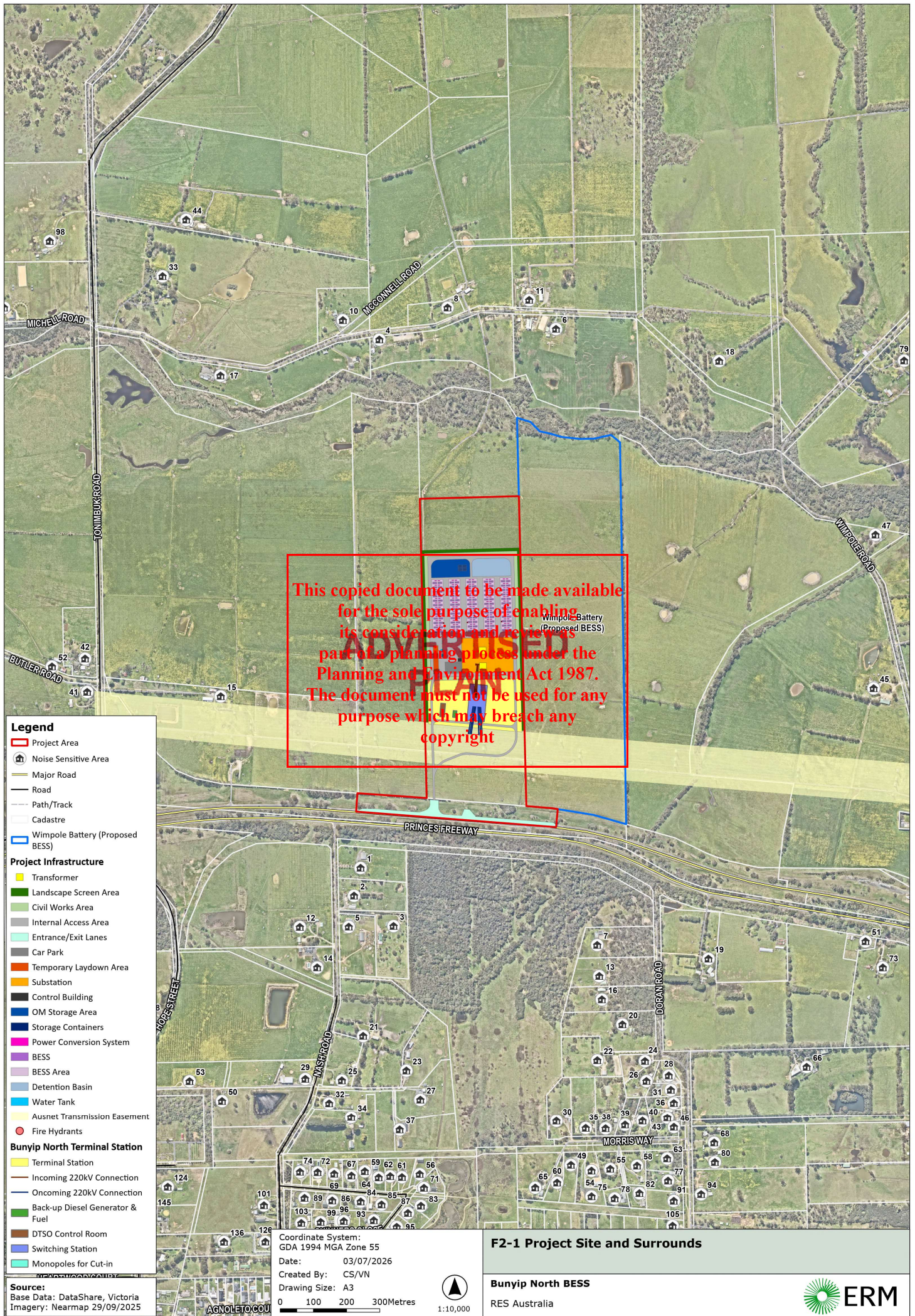
The Project Area sits within the Green Wedge Zone Schedule 1 (GWZ1), Environmental Significance Overlay (ESO1) and Bushfire Prone Area (BPA). The proposed accessway via the Princes Freeway to the south of the Site is within the Transport Zone (TRZ2 – Principal Road Network).

The Site is located on Lot 2 on Plan of Subdivision PS315155, at 30 Tonimbuk Road, Bunyip North, and comprises rural land currently used for grazing. The land is considered suitable to host the proposed BESS facility, BNTS, and associated ancillary infrastructure due to the following characteristics:

- Prominent high-voltage electricity infrastructure runs along the southern portion of the Site, supporting efficient grid connection for the BESS.
- The Project is directly bound to the south by the Princes Freeway (M1), a major arterial road zoned Transport Zone 2 (TRZ2).
- The surrounding area is characterised by open agricultural landscapes, scattered vegetation, and low-density rural development.

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2.1 NOISE SENSITIVE AREAS

The Noise Sensitive Areas (NSAs) included in this assessment are shown in Figure 2-1.

The NSAs are dwellings that have the potential to experience operational noise impacts associated with the Project. The NSA IDs are identified by their addresses and coordinates in Table 5-5.

2.2 EXISTING ACOUSTIC ENVIRONMENT

The noise environment in the vicinity of the Project receivers is best described as 'rural' or an area with an acoustic environment that is dominated by natural sounds, generally characterised by low background noise levels. However, receptors in the vicinity of the Princes Freeway (Route M1) intermittently experience elevated noise levels from road traffic, particularly during peak traffic periods.

A background noise monitoring exercise was undertaken in line with the Noise Protocol (EPA Victoria, September 2025) to evaluate typical noise levels at various locations around the Project site and aid with setting suitable noise limits. Section 4 outlines the background noise monitoring process and results.

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3. NOISE REGULATIONS FOR UTILITIES IN REGIONAL VICTORIA

3.1 ENVIRONMENT PROTECTION ACT 2017

The *Environment Protection Act 2017* (the Act) sets out the legislative framework for protecting human health and the environment from pollution and waste in Victoria. The version current at the time of writing is Version 021, effective 22 October 2025.

Part 7.6 Division 2 Clause 166 of the Act states the following:

A person must not, from a place or premises that are not residential premises—

(a) emit an unreasonable noise; or

(b) permit an unreasonable noise to be emitted.

3.2 ENVIRONMENT PROTECTION REGULATIONS 2021

The *Environment Protection Regulations 2021* (the Regulations) (Victorian Government, 2021) are given effect by the Act. Part 5.3 Division 1 Clause 113 states the following with respect to this NIA:

A person who conducts a prediction, measurement, assessment or analysis of noise within a noise sensitive area for the purposes of the Act or these Regulations, must conduct the prediction, measurement, assessment or analysis in accordance with the Noise Protocol.

3.3 NOISE PROTOCOL

EPA Victoria Publication 1826 Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues (the Noise Protocol) (EPA Victoria, September 2025) provides a protocol for determining noise limits for new and existing commercial, industrial and trade premises and entertainment venues. It also sets the methodology for assessing the effective noise level to determine unreasonable noise under the Regulations. At the time of writing, the applicable version of the Noise Protocol is Revision 1826.5, effective 01 September 2025. It should be noted that the Noise Protocol criteria are cumulative noise criteria which assess all noise-generating premises at the NSRs.

3.4 EPA PUBLICATION 1997

EPA Victoria *Publication 1997: Technical guidance - Measuring and analysing industry noise and music noise* (EPA Victoria, 2021) (Publication 1997) provides guidance on assessing industry noise from multiple premises and deriving noise limits applicable to cumulative noise from all industry premises.

Section 3.3 of Publication 1997 specifically states where two or more premises contribute, or will contribute, to the industry noise within the NSRs, both the cumulative noise and the contribution from each individual industry needs to be assessed separately.

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Cumulative noise impacts from both the Project and the proposed Wimpole Battery (Ref PA2604202) should be assessed at the NSAs. However, a NIA for Wimpole Battery was not available at the time of writing of this report to determine its noise contribution to the NSAs. Accordingly this assessment adopted *Publication 1997 Technical guidance: Measuring and analysing industry noise and music noise* (EPA Victoria, 2021), applying the alternative assessment criteria for multiple industrial premises, specifically those for proposed new industry or extension of existing premises in rural areas. These criteria enable the Project to be assessed individually while considering its cumulative noise impacts with Wimpole Battery.

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4. BACKGROUND NOISE MONITORING

In order to determine the existing background noise around the proposed Project Site and to develop noise limits, ERM deployed 3 noise loggers to conduct continuous unattended noise monitoring from Friday 12 August 2025 to Tuesday 16 August 2025 at the 3 locations presented in Section 4.2 below.

The background noise monitoring was conducted in accordance with Clauses 39 to 46 of Section 4.1 of the Noise Protocol and the Technical guide: Measuring and analysing industry noise and music noise (EPA Victoria, 2021).

Photographs of the in-situ noise loggers are included in Appendix B.

4.1 NOISE MONITORING EQUIPMENT

The equipment used in this assessment were ARL Ngara Class 1 noise logging systems.

The measurement instrumentation complied with the requirements of AS 61672.1 and AS/IEC 60942 with current NATA calibration certificates.

Instrument calibration was checked on site with a Pulsar 105 Class 1 calibrator before and after monitoring with no drift observed.

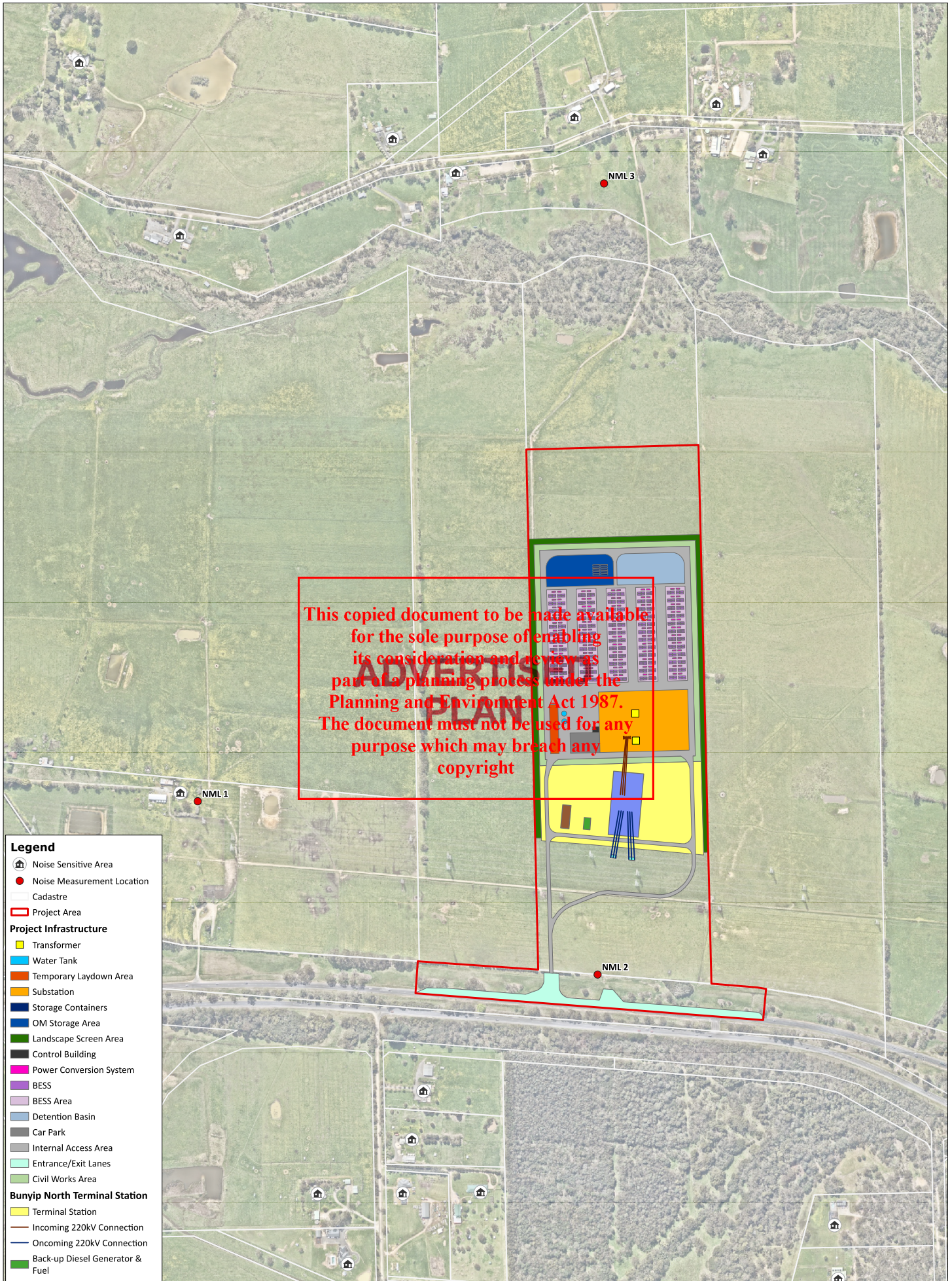
4.2 NOISE MEASUREMENT LOCATIONS

Noise monitoring locations were selected around the site at representative locations with the same noise environment as the NSAs.

The Noise Monitoring Locations are presented in Figure 4-1.

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Legend

Noise Sensitive Area

Noise Measurement Location

Cadastral

Project Area

Project Infrastructure

Transformer

Water Tank

Temporary Laydown Area

Substation

Storage Containers

OM Storage Area

Landscape Screen Area

Control Building

Power Conversion System

BESS

BESS Area

Detention Basin

Car Park

Internal Access Area

Entrance/Exit Lanes

Civil Works Area

Bunyip North Terminal Station

Terminal Station

Incoming 220kV Connection

Oncoming 220kV Connection

Back-up Diesel Generator & Fuel

DTSO Control Room

Switching Station

Monopoles for Cut-in

Source:
Base Data: DataShare, Victoria
Imagery: Nearmap 29/09/2025

Coordinate System:
GDA 1994 MGA Zone 55

Date:
03/07/2026

Created By:
CS/VN

Drawing Size:
A3

060120180Metres

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F4-1 Noise Monitoring Locations

Bunyip North BESS
RES Australia

4.3 METEOROLOGY

Half-hourly weather data was collected from the Bureau of Meteorology Automatic Weather Station 085313 at Nilma North during the noise monitoring period and was analysed to determine the exclusion of weather-affected measurements. Collected noise logger data with average wind speeds above 19 km/h (5 m/s) or rainfall were excluded as per EPA Victoria Publication 1997 (EPA Victoria, 2021).

4.4 MEASURED BACKGROUND NOISE LEVELS

Graphs of the 10-minute L_{Aeq} noise levels at each of the 3 Noise Monitoring Locations (NMLs) are provided in Appendix B. Data affected by rainfall or wind speeds above 5 m/s have been greyed out and excluded from the determination of background noise levels.

The determination of background noise levels satisfies Clause 46 of the Noise Protocol which states that L_{A90} must be measured continuously over each hour of the day, evening and night period that the commercial, industrial and trade premises under investigation normally operates (24 hours with respect to the Project).

The average of $L_{A90,1hr}$ background noise levels for each period is established as provided in Table 4-1.

TABLE 4-1 SUMMARY OF BACKGROUND NOISE LEVELS

Noise Measurement Location (NML)	Period of Day	Background Noise Level, dB $L_{A90,1hr}$
NML1	Day	50
	Evening	52
	Night	48
NML2	Day	59
	Evening	59
	Night	51
NML3	Day	39
	Evening	46
	Night	42

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5. OPERATIONAL NOISE ASSESSMENT

5.1 PROJECT NOISE LIMITS

The Project is defined as a Utility as per *EPA Publication 1997* (EPA Victoria, 2021). The Noise Protocol (EPA Victoria, September 2025) has a dedicated section (Section 2.6) detailing the process for assigning noise limits to Utilities in rural areas.

The Site (Generating Zone) is located in a Green Wedge Zone (GWZ). The Noise Sensitive Areas (NSAs) (Receiving Zones) are located in the Green Wedge Zone (GWZ), Green Wedge A Zone (GWZA), Farming Zone (FZ) and Low-Density Residential Zone (LDRZ). Table 5-1 lists the Zone Levels for each relevant Receiving Zone.

TABLE 5-1 ZONE LEVELS AS PER TABLE B.1 OF THE NOISE PROTOCOL

Receiving Zone	Zone Level, dB(A)		
	Day	Evening	Night
GWZ	46	41	36
GWAZ	45	38	33
FZ	46	41	36
LDRZ	45	40	35

Figure 5-1 shows the NML relevant to each NSA with respect to applicable background noise levels.

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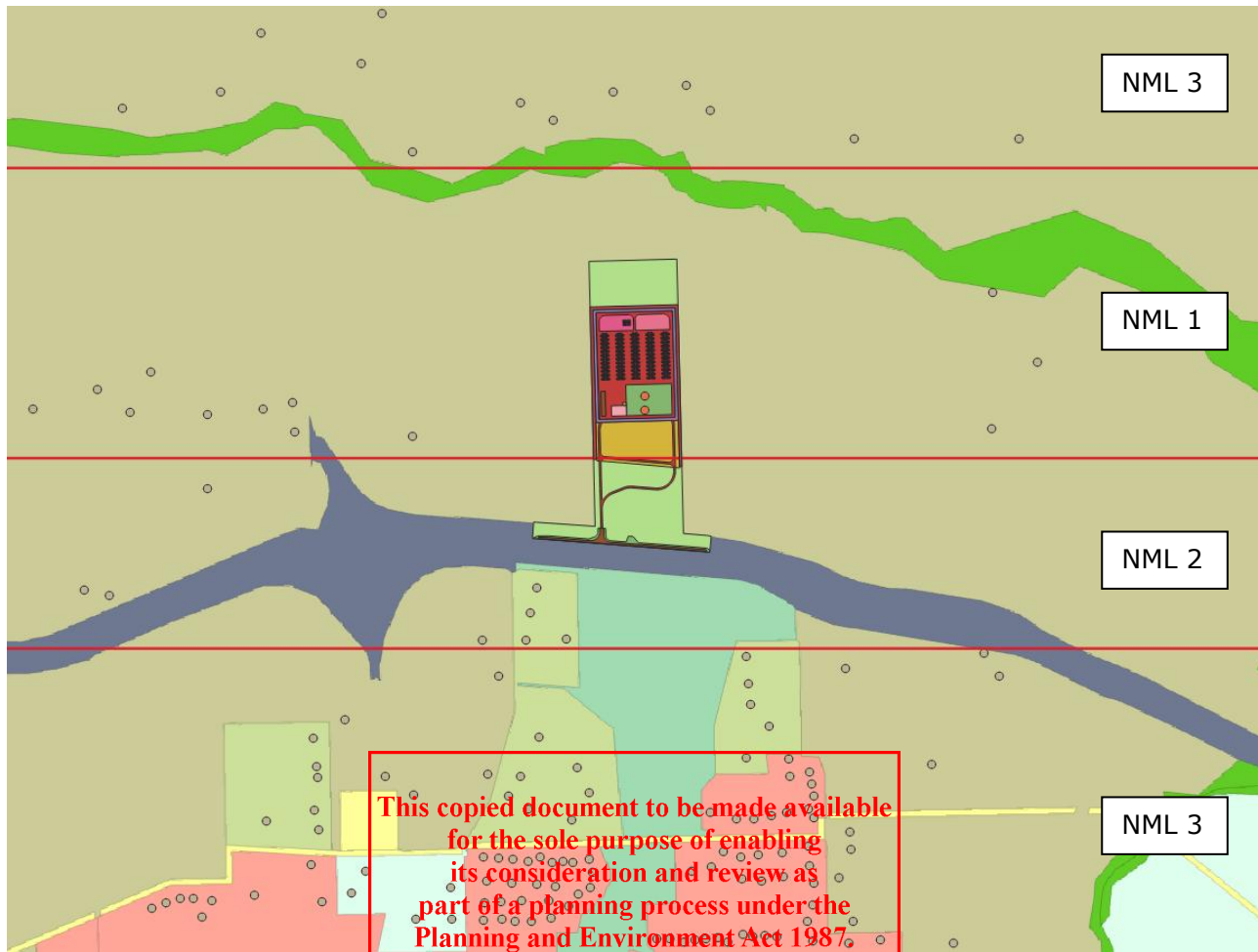


FIGURE 5-1 NOISE MEASUREMENT LOCATION CATCHMENT ZONES

Clause 20 of the Noise Protocol outlines the process for determining distance-adjusted noise levels. The distance adjustment made for each NSA is based on its proximity to the zone containing the Project.

The noise limit for each NSA was determined according to Clause 24 of the Noise Protocol based on the completed background noise monitoring.

NML1 and NML2 were identified as Background Relevant Areas affected by high traffic noise levels due to their proximity to Princes Freeway. For the noise limits at NSAs using NML1 and NML2 as background noise levels, adjustments were made in accordance with Section 2.5 of the Noise Protocol. The noise limit at each NSA was taken as the lesser of:

- the noise limit as per clause 24; and
- the reference value given by clause 26.

The Noise Protocol noise limits and their derivation for the NSRs are provided in Appendix C.

Publication 1997 Noise Limits

Wimpole Battery is a proposed BESS (submitted in January 2026 to DTP, Ref PA2604202) that is immediately adjacent to the west of the Project as shown in Figure 2-1. As such, cumulative noise impacts from both the Project and Wimpole Battery should be assessed. However, a NIA for Wimpole Battery was not available at the time of writing of this report to determine its noise contribution to the NSAs.

Publication 1997 Technical guidance: Measuring and analysing industry noise and music noise (EPA Victoria, 2021) provides guidance on assessing cumulative noise impacts. Section 3.3.1 of the publication provides assessment criteria for proposed new industry or extension of existing premises in rural areas.

In order to assess Bunyip North BESS cumulatively with Wimpole BESS in line with Publication 1997, the existing Noise Protocol noise limits for Bunyip North BESS individually are reduced by $10 \times \log(2) = 3$ dB.

The Publication 1997 criteria are provided in the assessment detailed in Table 5-5.

5.2 ASSESSMENT METHODOLOGY

Operational noise modelling has been undertaken using the environmental noise modelling software SoundPLAN 9.1, which has implemented the algorithms presented in ISO 9613 Acoustics – Attenuation of sound during propagation outdoors (ISO, 2024).

The noise modelling takes into consideration the sound power levels of the proposed equipment, and applies adjustments for attenuation from geometric spreading, acoustic shielding from intervening ground topography, ground effects, meteorological effects, and atmospheric absorption.

The ground absorption and meteorological parameters summarized in Table 5-2 were used and are deemed to be reasonable assumptions for this assessment.

TABLE 5-2 MODELLED GROUND AND METEOROLOGICAL CONDITIONS

Ground Factor	Relative humidity	Temperature	Receptor height
0.5	70%	10°C	1.5m

Note: Ground Factor is a measure of the acoustic absorptivity of the ground. 0 is used for hard and reflective surfaces, 1 for soft or porous surfaces

5.3 NOISE SOURCES

The expected significant noise-generating equipment were provided by RES and are listed in Table 5-3.

TABLE 5-3 EQUIPMENT SOUND POWER LEVELS

Equipment Item	Quantity	Sound Power Level per Plant Item, dB L _{Aeq}	Notes
Inverter	120	90.6 (day) 85.0 (evening/night)	- Height of 2.2m based on manufacturer specifications - Assumes 80% fan duty/ 40°C fan operation during the day - Assumes 60% fan duty/ 30°C fan operation during the evening and night periods - Noise spectrum is based on manufacturing data of 100% fan operation

Equipment Item	Quantity	Sound Power Level per Plant Item, dB L _{Aeq}	Notes
Substation Transformer	2	91.6	- Height is assumed to be 2.5m 250 MVA substation transformer(s)
Battery Unit	480	76.1 (day) 72.4 (evening/night)	- Assumes 35°C operation during the day - Assumes 25°C operation during the evening and night periods - Height of 2.6m based on 20ft container height

Figure 5-2 and Figure 5-3 display snapshots of the noise sources in the SoundPLAN noise model.

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FIGURE 5-2 NOISE MODEL - 3D VIEW

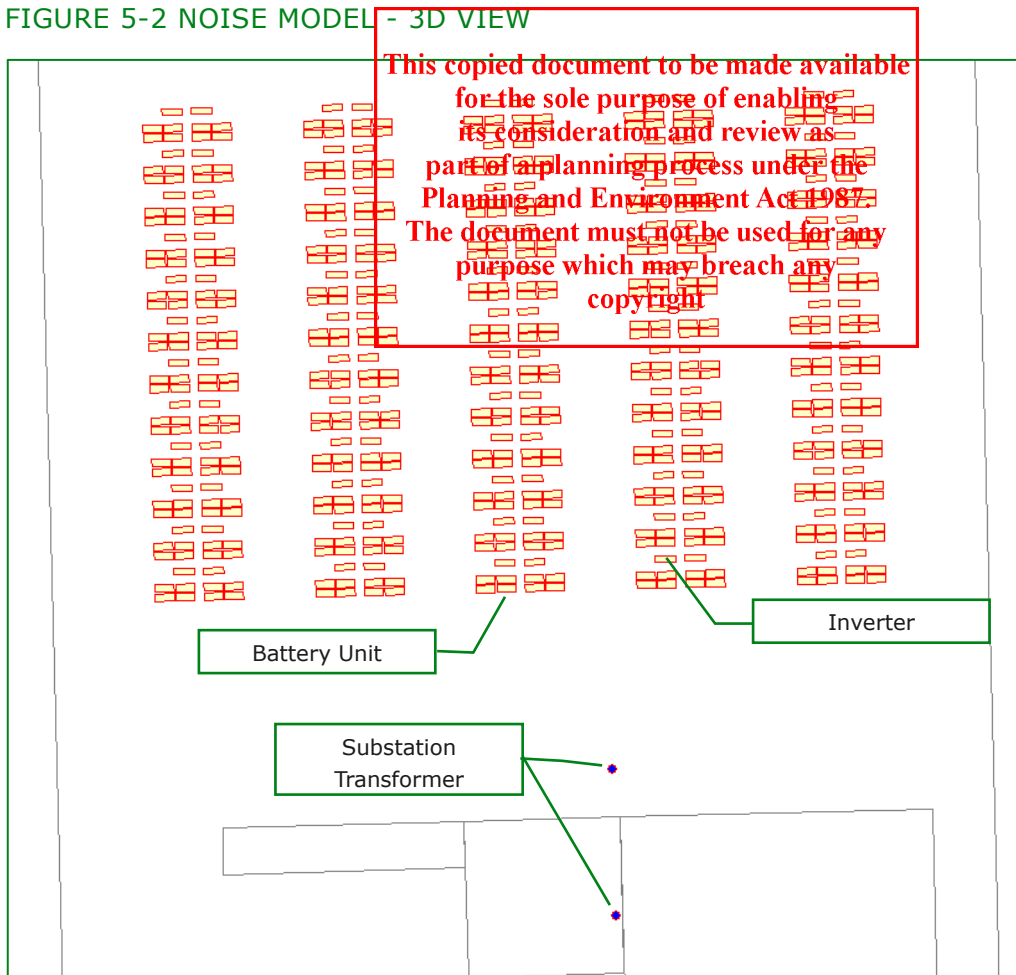


FIGURE 5-3 NOISE MODEL - NOISE SOURCES LAYOUT

Bunyip North Terminal Station (BNTS)

The proposed Terminal Station (identified in Figure 2-1) consists of the following components:

- Control room
- Diesel generator (standby/emergency only)
- Switching station, including:
 - 2x 220 kV busbar
 - 3x circuit breakers
 - 8x line earth switches / disconnectors
 - 3x 220 kV voltage transformers
 - 3x 220 kV current transformers
 - 3x 220 kV surge arrestors
 - 1x auxiliary transformer

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The key noise-generating components are discussed in Table 5-4.

TABLE 5-4 SWITCHING STATION NOISE SOURCES

Noise Source	Potential to Generate Noise Impacts
Passive and switching equipment (busbars, circuit breakers, line earth switches/disconnectors, surge arrestors and current and voltage transformers)	This equipment produces low levels of intermittent noise and will not contribute to the overall continuous site noise emissions generated by the BESS and substation.
Auxiliary transformer	This transformer is expected to have a low capacity of 0.315 MVA and based on <i>AS60076.10: 2009 Power Transformers – Part 10: Determination of Sound Levels</i> , its sound power level is estimated to be 59 dB(A). Its noise contribution to the nearest NSAs was calculated to be negligible in comparison with the noise contribution from the BESS and substation transformers.
HVAC for the Control Room	This equipment (typically outdoor condenser units) produce low levels of continuous noise and will not contribute to the overall continuous site noise emissions generated by the BESS and substation.
Diesel generator	This equipment is entirely for standby/emergency purposes only and it doesn't operate under normal conditions.

The 250 MVA transformers are not located within the BNTS, and have been included in the assessment as these are located in the Substation.

Based on Table 5-4, the noise generated by the BNTS is determined to be negligible at the NSAs in comparison with BESS and Substation noise emissions, and no further consideration of the BNTS is made in this assessment.

5.4 PREDICTED OPERATIONAL NOISE LEVELS AND COMPLIANCE ASSESSMENT

The predicted noise levels for each NSA have been provided in Table 5-5 below, and are shown as a noise contours in Figure 5-4 and Figure 5-5. The predictions are compared against the Noise Protocol and Publication 1997 noise limits.

The 1/3 octave band centre-frequency noise predictions at each NSA have been assessed for tonality according to Annex C of the Noise Protocol. Based on predicted tone-corrected levels at each receptor, a tonal adjustment of 2 dB has been applied to the predicted noise levels at Table 5-5 and the noise contours provided in Figure 5-4 and Figure 5-5.

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TABLE 5-5 COMPLIANCE ASSESSMENT

NSA ID	Address	Coordinates (WGS 84 Zone 55S)		Noise Protocol Noise Limits, dB(A)	Publication 1997 Noise Limits, dB(A)	Predicted Noise Contribution L _{Aeq} dB(A)	
		X m	Y m			Day	Evening/ Night
1	210 NASH ROAD BUNYIP 3815	388019	5784906	55 / 50 / 45	52 / 47 / 42	40	36
2	200 NASH ROAD BUNYIP 3815	387999	5784822	55 / 50 / 45	52 / 47 / 42	39	35
3	190 NASH ROAD BUNYIP 3815	388118	5784731	55 / 50 / 45	52 / 47 / 42	39	34
4	90 MCCONNELL ROAD BUNYIP NORTH 3815	388075	5786496	47 / 51 / 47	44 / 48 / 44	40	36
5	180 NASH ROAD BUNYIP 3815	387983	5784729	55 / 50 / 45	52 / 47 / 42	38	34
6	140 MCCONNELL ROAD BUNYIP NORTH 3815	388607	5786528	47 / 51 / 47	44 / 48 / 44	40	36
7	54 DORAN ROAD BUNYIP 3815	388731	5784674	47 / 51 / 47	44 / 48 / 44	38	33
8	105 MCCONNELL ROAD BUNYIP NORTH 3815	388281	5786592	47 / 51 / 47	44 / 48 / 44	40	35
10	75 MCCONNELL ROAD BUNYIP NORTH 3815	387966	5786555	47 / 51 / 47	44 / 48 / 44	39	35
11	135 MCCONNELL ROAD BUNYIP NORTH 3815	388527	5786615	47 / 51 / 47	44 / 48 / 44	39	35
12	195 NASH ROAD BUNYIP 3815	387836	5784728	55 / 50 / 45	52 / 47 / 42	37	33
13	50 DORAN ROAD BUNYIP 3815	388738	5784581	47 / 51 / 47	44 / 48 / 44	37	32
14	193 NASH ROAD BUNYIP 3815	387888	5784606	47 / 51 / 47	44 / 48 / 44	37	32
15	30 TONIMBUK ROAD BUNYIP NORTH 3815	387598	5785422	55 / 50 / 45	52 / 47 / 42	41	37
16	46 DORAN ROAD BUNYIP 3815	388746	5784510	47 / 51 / 47	44 / 48 / 44	36	32

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NSA ID	Address	Coordinates (WGS 84 Zone 55S)		Noise Protocol Noise Limits, dB(A)	Publication 1997 Noise Limits, dB(A)	Predicted Noise Contribution L _{Aeq} dB(A)	
		X m	Y m			Day	Evening/ Night
17	40 MCCONNELL ROAD BUNYIP NORTH 3815	387597	5786388	47 / 51 / 47	44 / 48 / 44	38	34
18	230 WIMPOLE ROAD BUNYIP NORTH 3815	389099	5786432	47 / 51 / 47	44 / 48 / 44	38	34
19	3430 PRINCES HIGHWAY BUNYIP 3815	389066	5784633	47 / 51 / 47	44 / 48 / 44	36	31
20	38 DORAN ROAD BUNYIP 3815	388807	5784435	47 / 51 / 47	44 / 48 / 44	35	31
21	170 NASH ROAD BUNYIP 3815	388027	5784400	47 / 51 / 47	44 / 48 / 44	35	31
22	36A DORAN ROAD BUNYIP 3815	388732	5784327	47 / 51 / 47	44 / 48 / 44	34	30
23	148C NASH ROAD BUNYIP 3815	388157	5784296	47 / 51 / 47	44 / 48 / 44	34	30
24	36 DORAN ROAD BUNYIP 3815	388875	5784325	47 / 51 / 47	44 / 48 / 44	34	30
25	2/154 NASH ROAD BUNYIP 3815	387963	5784266	47 / 51 / 47	44 / 48 / 44	34	30
26	34 DORAN ROAD BUNYIP 3815	388880	5784265	47 / 51 / 47	44 / 48 / 44	34	29
27	148B NASH ROAD BUNYIP 3815	388199	5784208	47 / 51 / 47	44 / 48 / 44	34	30
28	32 DORAN ROAD BUNYIP 3815	388947	5784281	47 / 51 / 47	44 / 48 / 44	34	29
29	159 NASH ROAD BUNYIP 3815	387853	5784271	47 / 51 / 47	44 / 48 / 44	34	30
30	10 MORRIS WAY BUNYIP 3815	388609	5784144	47 / 51 / 47	44 / 48 / 44	33	29
31	30 DORAN ROAD BUNYIP 3815	388953	5784238	47 / 51 / 47	44 / 48 / 44	33	29
32	146 NASH ROAD BUNYIP 3815	387924	5784197	47 / 51 / 47	44 / 48 / 44	33	29

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NSA ID	Address	Coordinates (WGS 84 Zone 55S)		Noise Protocol Noise Limits, dB(A)	Publication 1997 Noise Limits, dB(A)	Predicted Noise Contribution L _{Aeq} dB(A)	
		X m	Y m			Day	Evening/ Night
33	5 MCCONNELL ROAD BUNYIP NORTH 3815	387423	5786687	47 / 51 / 47	44 / 48 / 44	35	31
34	140 NASH ROAD BUNYIP 3815	387991	5784155	47 / 51 / 47	44 / 48 / 44	33	29
35	8 MORRIS WAY BUNYIP 3815	388697	5784122	47 / 51 / 47	44 / 48 / 44	33	29
36	28 DORAN ROAD BUNYIP 3815	388962	5784198	47 / 51 / 47	44 / 48 / 44	33	29
37	148A NASH ROAD BUNYIP 3815	388137	5784117	47 / 51 / 47	44 / 48 / 44	33	29
38	6 MORRIS WAY BUNYIP 3815	388757	5784121	47 / 51 / 47	44 / 48 / 44	33	29
39	4 MORRIS WAY BUNYIP 3815	388815	5784132	47 / 51 / 47	44 / 48 / 44	33	29
40	2 MORRIS WAY BUNYIP 3815	388868	5784144	47 / 51 / 47	44 / 48 / 44	33	29
41	35 TONIMBUK ROAD BUNYIP 3815	387196	5785536	55 / 50 / 45	52 / 47 / 42	37	32
42	45 TONIMBUK ROAD BUNYIP NORTH 3815	387190	5785536	55 / 50 / 45	52 / 47 / 42	37	32
43	26 DORAN ROAD BUNYIP 3815	388942	5784153	47 / 51 / 47	44 / 48 / 44	33	29
44	190 TONIMBUK ROAD BUNYIP NORTH 3815	387494	5786857	47 / 51 / 47	44 / 48 / 44	34	30
45	125 WIMPOLE ROAD BUNYIP NORTH 3815	389564	5785447	55 / 50 / 45	52 / 47 / 42	36	32
46	24 DORAN ROAD BUNYIP 3815	388962	5784125	47 / 51 / 47	44 / 48 / 44	32	28
47	140 WIMPOLE ROAD BUNYIP NORTH 3815	389569	5785909	55 / 50 / 45	52 / 47 / 42	36	32
48	106 HOPE STREET BUNYIP 3815	387369	5784458	47 / 51 / 47	44 / 48 / 44	33	29

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NSA ID	Address	Coordinates (WGS 84 Zone 55S)		Noise Protocol Noise Limits, dB(A)	Publication 1997 Noise Limits, dB(A)	Predicted Noise Contribution L _{Aeq} dB(A)	
		X m	Y m			Day	Evening/ Night
49	7 MORRIS WAY BUNYIP 3815	388652	5784010	47 / 51 / 47	44 / 48 / 44	32	28
50	145 NASH ROAD BUNYIP 3815	387602	5784204	47 / 51 / 47	44 / 48 / 44	32	28
51	3480 PRINCES HIGHWAY BUNYIP 3815	389539	5784685	47 / 51 / 47	44 / 48 / 44	33	29
52	30 BUTLER ROAD BUNYIP NORTH 3815	387090	5785512	55 / 50 / 45	52 / 47 / 42	36	31
53	108 HOPE STREET BUNYIP 3815	387504	5784264	47 / 51 / 47	44 / 48 / 44	33	28
54	5 MORRIS WAY BUNYIP 3815	388714	5783995	47 / 51 / 47	44 / 48 / 44	32	28
55	3A MORRIS WAY BUNYIP 3815	388771	5783998	47 / 51 / 47	44 / 48 / 44	32	28
56	17 SHINNERS CLOSE BUNYIP 3815	388197	5783983	47 / 51 / 47	44 / 48 / 44	32	28
58	1 MORRIS WAY BUNYIP 3815	388851	5784008	47 / 51 / 47	44 / 48 / 44	32	28
59	9 SHINNERS CLOSE BUNYIP 3815	388032	5783991	47 / 51 / 47	44 / 48 / 44	32	28
60	7A MORRIS WAY BUNYIP 3815	388611	5783957	47 / 51 / 47	44 / 48 / 44	32	28
61	15 SHINNERS CLOSE BUNYIP 3815	388144	5783974	47 / 51 / 47	44 / 48 / 44	32	28
62	13 SHINNERS CLOSE BUNYIP 3815	388108	5783976	47 / 51 / 47	44 / 48 / 44	32	28
63	22 DORAN ROAD BUNYIP 3815	388942	5784030	47 / 51 / 47	44 / 48 / 44	32	28
64	11 SHINNERS CLOSE BUNYIP 3815	388073	5783973	47 / 51 / 47	44 / 48 / 44	32	28
65	9 MORRIS WAY BUNYIP 3815	388545	5783942	47 / 51 / 47	44 / 48 / 44	32	28

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NSA ID	Address	Coordinates (WGS 84 Zone 55S)		Noise Protocol Noise Limits, dB(A)	Publication 1997 Noise Limits, dB(A)	Predicted Noise Contribution L _{Aeq} dB(A)	
		X m	Y m			Day	Evening/ Night
66	35 DORAN ROAD BUNYIP 3815	389362	5784307	47 / 51 / 47	44 / 48 / 44	31	28
67	7 SHINNERS CLOSE BUNYIP 3815	387992	5783978	47 / 51 / 47	44 / 48 / 44	32	28
68	27 DORAN ROAD BUNYIP 3815	389084	5784078	47 / 51 / 47	44 / 48 / 44	32	28
69	5 SHINNERS CLOSE BUNYIP 3815	387940	5783983	47 / 51 / 47	44 / 48 / 44	32	28
71	19 SHINNERS CLOSE BUNYIP 3815	388210	5783941	47 / 51 / 47	44 / 48 / 44	32	28
72	3 SHINNERS CLOSE BUNYIP 3815	387890	5783988	47 / 51 / 47	44 / 48 / 44	32	28
73	3500 PRINCES HIGHWAY BUNYIP 3815	389591	5784606	47 / 51 / 47	44 / 48 / 44	33	29
74	1 SHINNERS CLOSE BUNYIP 3815	387837	5783989	47 / 51 / 47	44 / 48 / 44	31	27
75	5A MORRIS WAY BUNYIP 3815	388714	5783916	47 / 51 / 47	44 / 48 / 44	31	27
76	104 HOPE STREET BUNYIP 3815	387261	5784394	47 / 51 / 47	44 / 48 / 44	32	28
77	20 DORAN ROAD BUNYIP 3815	388945	5783963	47 / 51 / 47	44 / 48 / 44	31	27
78	3 MORRIS WAY BUNYIP 3815	388784	5783910	47 / 51 / 47	44 / 48 / 44	31	27
79	230 WIMPOLE ROAD BUNYIP NORTH 3815	389656	5786433	47 / 51 / 47	44 / 48 / 44	34	30
80	27 DORAN ROAD BUNYIP 3815	389086	5784019	47 / 51 / 47	44 / 48 / 44	31	27
82	1A MORRIS WAY BUNYIP 3815	388859	5783925	47 / 51 / 47	44 / 48 / 44	31	27

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NSA ID	Address	Coordinates (WGS 84 Zone 55S)		Noise Protocol Noise Limits, dB(A)	Publication 1997 Noise Limits, dB(A)	Predicted Noise Contribution L _{Aeq} dB(A)	
		X m	Y m			Day	Evening/ Night
83	25 SHINNERS CLOSE BUNYIP 3815	388201	5783887	47 / 51 / 47	44 / 48 / 44	31	27
84	8 SHINNERS CLOSE BUNYIP 3815	388019	5783900	47 / 51 / 47	44 / 48 / 44	31	27
85	10 SHINNERS CLOSE BUNYIP 3815	388082	5783891	47 / 51 / 47	44 / 48 / 44	31	27
86	6 SHINNERS CLOSE BUNYIP 3815	387934	5783903	47 / 51 / 47	44 / 48 / 44	31	27
87	27 SHINNERS CLOSE BUNYIP 3815	388162	5783866	47 / 51 / 47	44 / 48 / 44	31	27
88	102 HOPE STREET BUNYIP 3815	387270	5784299	47 / 51 / 47	44 / 48 / 44	32	28
89	4 SHINNERS CLOSE BUNYIP 3815	387850	5783911	47 / 51 / 47	44 / 48 / 44	31	27
91	18 DORAN ROAD BUNYIP 3815	388962	5783902	47 / 51 / 47	44 / 48 / 44	31	27
92	100 HOPE STREET BUNYIP 3815	387274	5784262	47 / 51 / 47	44 / 48 / 44	32	28
93	30 SHINNERS CLOSE BUNYIP 3815	388059	5783843	47 / 51 / 47	44 / 48 / 44	31	27
94	25 DORAN ROAD BUNYIP 3815	389044	5783922	47 / 51 / 47	44 / 48 / 44	31	27
95	29 SHINNERS CLOSE BUNYIP 3815	388128	5783824	47 / 51 / 47	44 / 48 / 44	31	27
96	32 SHINNERS CLOSE BUNYIP 3815	387968	5783841	47 / 51 / 47	44 / 48 / 44	31	27

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NSA ID	Address	Coordinates (WGS 84 Zone 55S)		Noise Protocol Noise Limits, dB(A)	Publication 1997 Noise Limits, dB(A)	Predicted Noise Contribution L _{Aeq} dB(A)	
		X m	Y m			Day	Evening/ Night
98	TONIMBUK ROAD BUNYIP NORTH 3815	387083	5786793	47 / 51 / 47	44 / 48 / 44	32	28
99	34 SHINNERS CLOSE BUNYIP 3815	387899	5783838	47 / 51 / 47	44 / 48 / 44	31	27
100	3185 PRINCES HIGHWAY BUNYIP 3815	386900	5785245	55 / 50 / 45	52 / 47 / 42	34	29
101	105 NASH ROAD BUNYIP 3815	387728	5783889	47 / 51 / 47	44 / 48 / 44	31	27
102	35 BUTLER ROAD BUNYIP 3815	386902	5785496	55 / 50 / 45	52 / 47 / 42	34	30
103	36 SHINNERS CLOSE BUNYIP 3815	387841	5783835	47 / 51 / 47	44 / 48 / 44	31	27
104	35 SHINNERS CLOSE BUNYIP 3815	388069	5783785	47 / 51 / 47	44 / 48 / 44	31	27
105	16 DORAN ROAD BUNYIP 3815	388958	5783827	47 / 51 / 47	44 / 48 / 44	30	27
106	20 MICHELL ROAD BUNYIP NORTH 3815	386946	5786592	47 / 51 / 47	44 / 48 / 44	32	28
107	98 HOPE STREET BUNYIP 3815	387266	5784149	47 / 51 / 47	44 / 48 / 44	31	27
108	37 SHINNERS CLOSE BUNYIP 3815	388000	5783774	47 / 51 / 47	44 / 48 / 44	31	27
109	39 SHINNERS CLOSE BUNYIP 3815	387947	5783773	47 / 51 / 47	44 / 48 / 44	30	26
110	41 SHINNERS CLOSE BUNYIP 3815	387900	5783781	47 / 51 / 47	44 / 48 / 44	30	26
111	13 GREENHILL COURT BUNYIP 3815	388595	5783715	47 / 51 / 47	44 / 48 / 44	30	26

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NSA ID	Address	Coordinates (WGS 84 Zone 55S)		Noise Protocol Noise Limits, dB(A)	Publication 1997 Noise Limits, dB(A)	Predicted Noise Contribution L _{Aeq} dB(A)	
		X m	Y m			Day	Evening/ Night
112	19 GREENHILL COURT BUNYIP 3815	388718	5783727	47 / 51 / 47	44 / 48 / 44	30	26
113	7 GREENHILL COURT BUNYIP 3815	388473	5783713	47 / 51 / 47	44 / 48 / 44	30	26
114	15 GREENHILL COURT BUNYIP 3815	388636	5783716	47 / 51 / 47	44 / 48 / 44	30	26
115	5 GREENHILL COURT BUNYIP 3815	388426	5783714	47 / 51 / 47	44 / 48 / 44	30	26
116	11 GREENHILL COURT BUNYIP 3815	388555	5783710	47 / 51 / 47	44 / 48 / 44	30	26
117	14 DORAN ROAD BUNYIP 3815	388938	5783702	47 / 51 / 47	44 / 48 / 44	30	26
118	43 SHINNERS CLOSE BUNYIP 3815	387838	5783778	47 / 51 / 47	44 / 48 / 44	30	26
119	9 GREENHILL COURT BUNYIP 3815	388522	5783704	47 / 51 / 47	44 / 48 / 44	30	26
120	21 GREENHILL COURT BUNYIP 3815	388754	5783719	47 / 51 / 47	44 / 48 / 44	30	26
121	23 GREENHILL COURT BUNYIP 3815	388794	5783726	47 / 51 / 47	44 / 48 / 44	30	26
122	94 HOPE STREET BUNYIP 3815	387277	5784085	47 / 51 / 47	44 / 48 / 44	31	27
123	17 GREENHILL COURT BUNYIP 3815	388667	5783704	47 / 51 / 47	44 / 48 / 44	30	26
124	70 HOPE STREET BUNYIP 3815	387439	5783944	47 / 51 / 47	44 / 48 / 44	30	26
125	25 GREENHILL COURT BUNYIP 3815	388835	5783720	47 / 51 / 47	44 / 48 / 44	30	26

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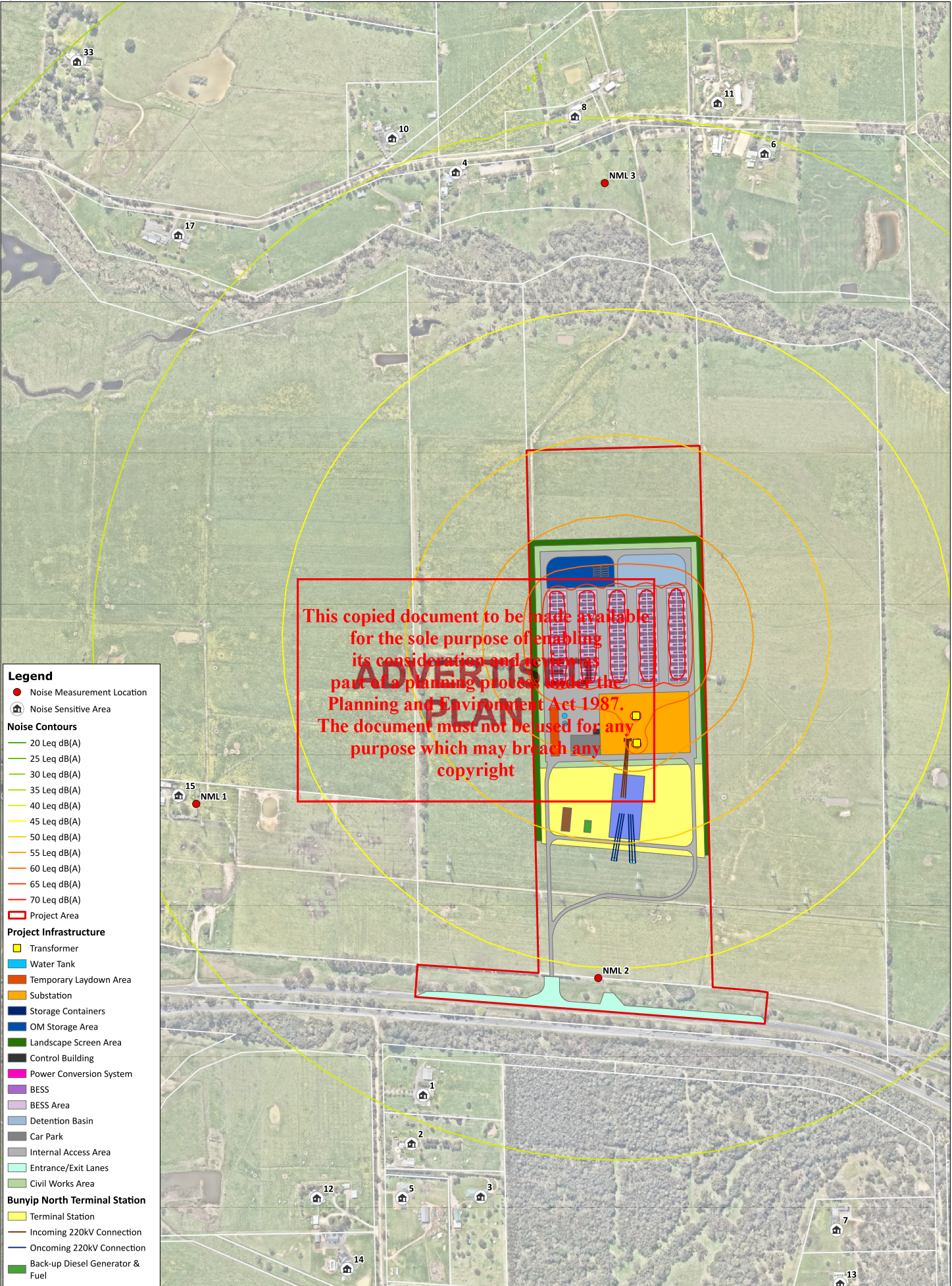
NSA ID	Address	Coordinates (WGS 84 Zone 55S)		Noise Protocol Noise Limits, dB(A)	Publication 1997 Noise Limits, dB(A)	Predicted Noise Contribution L _{Aeq} dB(A)	
		X m	Y m			Day	Evening/ Night
126	103 NASH ROAD BUNYIP 3815	387732	5783779	47 / 51 / 47	44 / 48 / 44	30	26
129	19 DORAN ROAD BUNYIP 3815	389092	5783774	47 / 51 / 47	44 / 48 / 44	30	26
130	12 DORAN ROAD BUNYIP 3815	388957	5783705	47 / 51 / 47	44 / 48 / 44	30	26
136	101 NASH ROAD BUNYIP 3815	387608	5783779	47 / 51 / 47	44 / 48 / 44	30	26
145	64 HOPE STREET BUNYIP 3815	387388	5783870	47 / 51 / 47	44 / 48 / 44	30	26
147	50 BUTLER ROAD BUNYIP NORTH 3815	386708	5785640	55 / 50 / 45	52 / 47 / 42	33	28
149	92 HOPE STREET BUNYIP 3815	387255	5783964	47 / 51 / 47	44 / 48 / 44	30	26
150	96 HOPE STREET BUNYIP 3815	387100	5784112	47 / 51 / 47	44 / 48 / 44	30	26
151	17 DORAN ROAD BUNYIP 3815	389080	5783698	47 / 51 / 47	44 / 48 / 44	29	26
157	17A DORAN ROAD BUNYIP 3815	389187	5783710	47 / 51 / 47	44 / 48 / 44	29	25
164	55 BUTLER ROAD BUNYIP 3815	386637	5785503	55 / 50 / 45	52 / 47 / 42	32	28
165	86 HOPE STREET BUNYIP 3815	387291	5783838	47 / 51 / 47	44 / 48 / 44	29	25
199	70 MICHELL ROAD BUNYIP NORTH 3815	386611	5786535	47 / 51 / 47	44 / 48 / 44	31	27
208	205 ABECKETT ROAD BUNYIP 3815	389435	5783700	47 / 51 / 47	44 / 48 / 44	29	25
212	3175 PRINCES HIGHWAY BUNYIP 3815	386567	5784882	55 / 50 / 45	52 / 47 / 42	30	26
216	70 BUTLER ROAD BUNYIP NORTH 3815	386529	5785579	55 / 50 / 45	52 / 47 / 42	31	27

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NSA ID	Address	Coordinates (WGS 84 Zone 55S)		Noise Protocol Noise Limits, dB(A)	Publication 1997 Noise Limits, dB(A)	Predicted Noise Contribution L _{Aeq} dB(A)	
		X m	Y m			Day	Evening/ Night
224	88 HOPE STREET BUNYIP 3815	387061	5783863	47 / 51 / 47	44 / 48 / 44	29	25
285	2 HAYNES CLOSE BUNYIP 3815	386916	5783843	47 / 51 / 47	44 / 48 / 44	28	24
297	4 HAYNES CLOSE BUNYIP 3815	386852	5783852	47 / 51 / 47	44 / 48 / 44	28	24
305	18 GWEN MEREDITH DRIVE BUNYIP 3815	386884	5783787	47 / 51 / 47	44 / 48 / 44	28	24
311	6 HAYNES CLOSE BUNYIP 3815	386807	5783850	47 / 51 / 47	44 / 48 / 44	28	24
315	100 BUTLER ROAD BUNYIP NORTH 3815	386308	5785512	55 / 50 / 45	52 / 47 / 42	30	26
339	8 HAYNES CLOSE BUNYIP 3815	386761	5783834	47 / 51 / 47	44 / 48 / 44	28	24
378	10 HAYNES CLOSE BUNYIP 3815	386711	5783818	47 / 51 / 47	44 / 48 / 44	27	24
389	3165 PRINCES HIGHWAY BUNYIP 3815	386481	5784898	55 / 50 / 45	52 / 47 / 42	30	26
390	115 BUTLER ROAD BUNYIP 3815	386159	5784585	47 / 51 / 47	44 / 48 / 44	28	24

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Legend

- Noise Measurement Location
- Noise Sensitive Area

Noise Contours

- 20 Leq dB(A)
- 25 Leq dB(A)
- 30 Leq dB(A)
- 35 Leq dB(A)
- 40 Leq dB(A)
- 45 Leq dB(A)
- 50 Leq dB(A)
- 55 Leq dB(A)
- 60 Leq dB(A)
- 65 Leq dB(A)
- 70 Leq dB(A)

Project Area

- Project Area

Project Infrastructure

- Transformer
- Water Tank
- Temporary Laydown Area
- Substation
- Storage Containers
- OM Storage Area
- Landscape Screen Area
- Control Building
- Power Conversion System
- BESS
- BESS Area
- Detention Basin
- Car Park
- Internal Access Area
- Entrance/Exit Lanes
- Civil Works Area

Bunyip North Terminal Station

- Terminal Station
- Incoming 220kV Connection
- Oncoming 220kV Connection
- Back-up Diesel Generator & Fuel
- DTSO Control Room
- Switching Station
- Monopoles for Cut-in

Source:
Base Data: DataShare, Victoria
Imagery: Nearmap 29/09/2025

Coordinate System:
GDA 1994 MGA Zone 55
Date: 03/07/2026
Created By: CS/VN
Drawing Size: A3

0

60

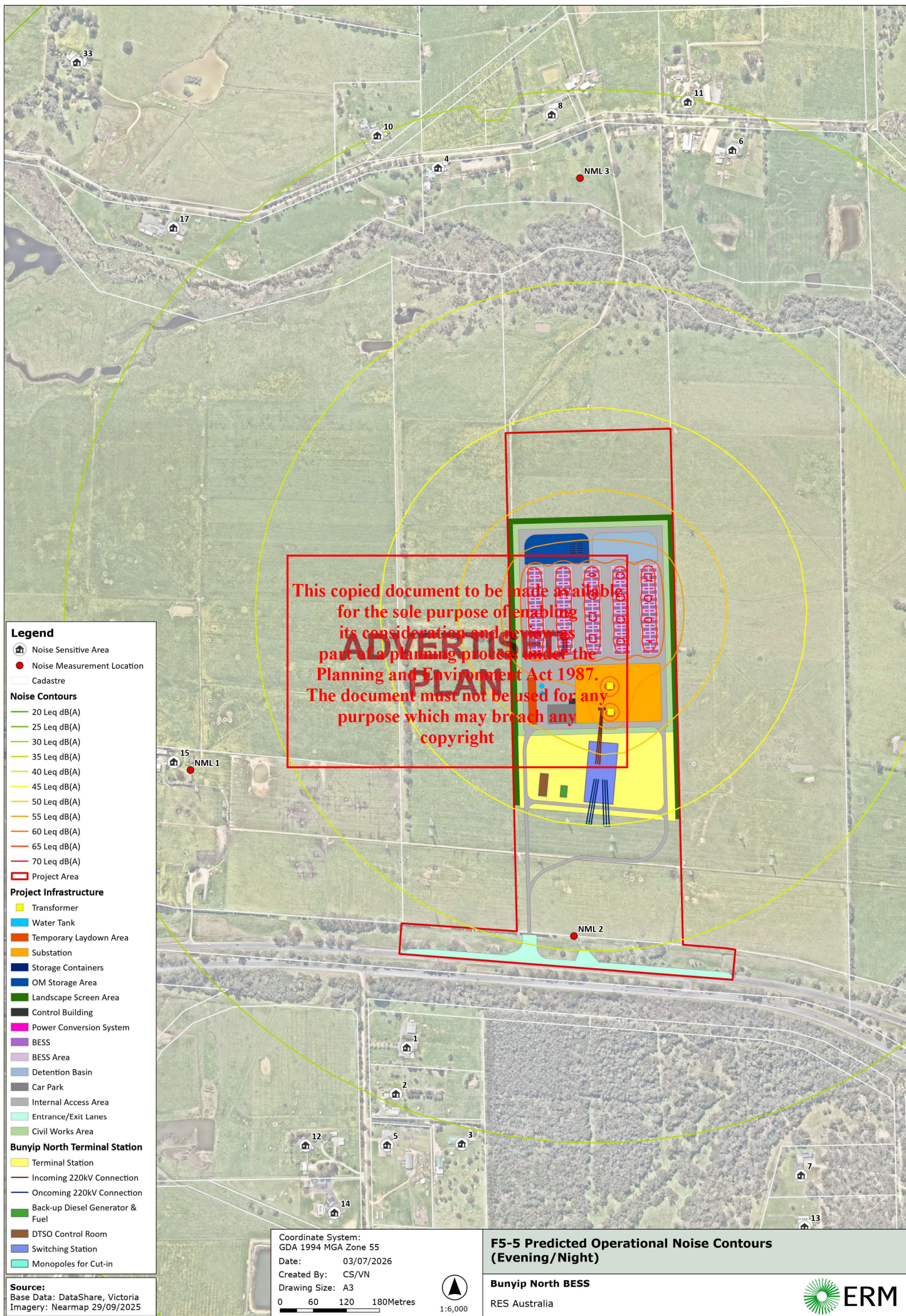
120

180Metres

1:6,000

F5-4 Predicted Operational Noise Contours (Day)

Bunyip North BESS
RES Australia



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Legend

- Noise Sensitive Area
- Noise Measurement Location
- Cadastre
- Noise Contours**
- 20 Leq dB(A)
- 25 Leq dB(A)
- 30 Leq dB(A)
- 35 Leq dB(A)
- 40 Leq dB(A)
- 45 Leq dB(A)
- 50 Leq dB(A)
- 55 Leq dB(A)
- 60 Leq dB(A)
- 65 Leq dB(A)
- 70 Leq dB(A)
- Project Area

Project Infrastructure

- Transformer
- Water Tank
- Temporary Laydown Area
- Substation
- Storage Containers
- OM Storage Area
- Landscape Screen Area
- Control Building
- Power Conversion System
- BESS
- BESS Area
- Detention Basin
- Car Park
- Internal Access Area
- Entrance/Exit Lanes
- Civil Works Area

Bunyip North Terminal Station

- Terminal Station
- Incoming 220kV Connection
- Oncoming 220kV Connection
- Back-up Diesel Generator & Fuel
- DTSO Control Room
- Switching Station
- Monopoles for Cut-in

Source:
Base Data: DataShare, Victoria
Imagery: Nearmap 29/09/2025

Coordinate System:
GDA 1994 MGA Zone 55
Date: 03/07/2026
Created By: CS/VN
Drawing Size: A3
0 60 120 180Metres



**F5-5 Predicted Operational Noise Contours
(Evening/Night)**

Bunyip North BESS
RES Australia



6. DISCUSSION AND CONCLUSION

This report has assessed the operational noise impact of the Project on all Noise Sensitive Areas (NSAs) in proximity to the Project.

Unattended noise monitoring was undertaken in accordance with the Noise Protocol to evaluate the existing background noise environment at noise sensitive areas and to derive project-specific operational noise limits.

Noise limits were developed for each of the identified noise sensitive areas around the site using land zoning, distance to the site, and collected representative background noise levels using the methodology prescribed in the Noise Protocol.

Two operational noise scenarios (day and evening/night) involving battery units, inverters and transformers were developed, and noise levels were predicted at the NSAs through noise modelling using the environmental noise modeling software, SoundPLAN v9.1.

As shown in Table 5-5, Figure 5-4 and Figure 5-5, compliance with the Noise Protocol noise limits is predicted at all NSAs for the day, evening and night periods. In addition, no cumulative noise impacts with due to the proposed Wimpole Battery are predicted for all periods based on the Project's compliance with Publication 1997 noise limits. As such, no specific noise mitigation measures are required to be implemented.

The cornerstone of the EP Act is General Environmental Duty (GED). Part 3.2 Clause 25 of the EP Act states the following:

A person who is engaging in an activity that may give rise to risks of harm to human health or the environment from pollution or waste must minimise those risks, so far as reasonably practicable.

This assessment has considered GED with respect to the selection of quieter equipment. As a result, margins of compliance of 8 dB and 5 dB are achieved at the worst-affected NSR against the Noise Protocol and Publication 1997 noise limits respectively.

This assessment is based on the equipment noise data and equipment locations detailed in this report and should be revised if there are any significant changes.

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APPENDIX A GLOSSARY OF ACOUSTIC TERMS

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GLOSSARY – ACOUSTICAL CONCEPTS AND TERMINOLOGY

SOUND AND NOISE

Sound is the perception of compressions and rarefactions in the air above and below normal atmospheric pressure. Noise is generally defined as sound that is loud, unpleasant, that causes disturbance or is simply unwanted.

WHAT FACTORS CONTRIBUTE TO ENVIRONMENTAL NOISE?

The noise from an activity at any location can be affected by a number of factors, the most significant being:

- how loud the activity is;
- how far away the noise source is from the receptor;
- the type of ground between the noise source and the receptor;
- ground topography between the noise source and the receptor (e.g. flat, hilly, mountainous);
- Other obstacles that block the line of sight between the source and the receptor (e.g. buildings, berms, purpose built noise walls).

HOW TO MEASURE AND DESCRIBE NOISE?

Noise is measured using a specially designed “sound level meter” which must meet internationally recognised performance standards. Audible sound pressure levels vary across a large range – from the threshold of hearing at around 20 micro-Pascals to the threshold of pain at around 120 Pascals. Scientists have adopted a statistically-determined scale in deci-Bels (dB) to describe noise more manageably.

To demonstrate how this scale works, the following points give an indication of how an average person perceives the noise levels and differences.

0 dB - represents the threshold of human hearing (for a young person with ears in good condition).

50 dB – represents average conversation.

70 dB – represents average street noise, local traffic etc.

90 dB – represents the noise inside an industrial premises or factory.

135 dB - represents the threshold of pain – the point at which permanent hearing damage may occur.

Unless otherwise stated in this report, all sound pressure levels (predicted or measured noise levels at a location or point) are expressed in decibels (dB, re: 20×10^{-6} Pa) and adopting the relevant acoustical or statistical noise level parameter e.g., L_{eq} , 10min, L_{90} , 1hr or L_{90} , period.

All sound power levels (source noise emission values) are expressed in decibels (dB, re: 10^{-12} Watts (W)) with the “A-weighting” curve applied (represents human hearing) and adopting the relevant acoustical or statistical noise level parameter.

HUMAN RESPONSE TO CHANGES IN NOISE LEVELS

The following concepts offer qualitative guidance in respect of the average response to changes in noise levels:

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Differences in noise levels of less than approximately 2 dB(A) are generally imperceptible in practice, an increase of 2 dB(A) is hardly perceivable.

Differences in noise levels of around 5 dB(A) are considered to be significant.

Differences in noise levels of around 10 dB(A) are generally perceived to be a doubling (or halving) of the perceived loudness of the noise. An increase of 10 dB(A) is perceived as twice as loud. Therefore, an increase of 20 dB(A) is four times as loud and an increase of 30 dB(A) is eight times as loud etc.

The addition of two identical noise levels will increase the dB(A) level by about 3 dB(A). For example: for two substation transformers operating next to each other, and each operating at 40 dB(A), the total substation noise level will be about 43 dB(A).

The addition of a second noise level of similar character which is at least 10 dB(A) lower than the existing noise level will not add significantly to the overall dB(A) level.

A doubling of the distance between a noise source and a receptor results approximately in a 3 dB(A) decrease for a line source (for example, vehicles travelling on a road) and a 6 dB(A) decrease for a point source (for example, the idling car discussed above).

A doubling of traffic volume for a line source results approximately in a 3 dB(A) increase in noise, halving the traffic volume for a line source results approximately in a 3 dB(A) decrease in noise.

TERMS TO DESCRIBE THE PERCEPTIBILITY OF NOISE

The following terms offer quantitative and qualitative guidance in respect of the audibility of a noise source:

Inaudible / Not Audible - the noise source and/or event could not be heard by the receptor, most likely masked by extraneous noise sources not associated with the source. This is quantified as the noise being less than the measured LA_{90} background noise level potentially by 10 dB or greater.

Barely Audible – the noise source and/or event are difficult to identify by the receptor, typically masked by extraneous noise sources not associated with the source. If a source is 'barely audible' its noise level may be quantified as being 5 - 7 dB below the measured LA_{90} or LA_{eq} noise level, depending on the nature of the source e.g., constant or intermittent.

Just Audible – the noise source and/or event may be defined by the receptor. However, there are a number of extraneous noise sources contributing to the measurement. The noise level should be quantified based on instantaneous noise level contributions.

Audible – the noise source and/or event may be easily defined by the receptor. There may be a number of extraneous noise sources contributing to the measurement. The noise level should be quantified based on instantaneous noise level contributions.

Dominant – the noise source and/or event may be identified to be significantly 'louder' than all other noise sources. The noise level should be quantified based on instantaneous noise level contributions.

The following terms offer qualitative guidance in respect of acoustic terms used to describe the frequency of occurrence of a noise source during an operator attended environmental noise measurements:

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Constant – a noise source which is constantly audible for the duration of a noise measurement (e.g. an air-conditioner that runs constantly during the measurement).

Intermittent – a noise source which, stops and starts in frequent intervals for the duration of a noise measurement (e.g. cars passing by).

Infrequent – a noise source which is audible, but occurs irregularly or at large intervals for the duration of a noise measurement (e.g. a small number of aircraft are noted during the measurement).

ACOUSTIC TERMINOLOGY & STATISTICAL NOISE DESCRIPTORS

Environmental noise levels such as noise generated by industry, construction and road traffic are commonly expressed in dB(A). The A-weighting scale follows the average human hearing response and enables comparison of the intensity of noise with different frequency characteristics. Time-varying noise sources are often described in terms of statistical noise descriptors. The following descriptors are commonly used when assessing noise and are referred to throughout this acoustic assessment:

Background noise level – the underlying level of noise present in the existing environment, excluding the noise source under investigation, when extraneous noise is removed. This is described using the L_{A90} descriptor and is determined using Clause I:A:4. of the noise protocol.

Decibel (dB) – A measure of sound level. The decibel is a logarithmic way of describing a ratio. The ratio may be power, sound pressure, voltage, intensity or other parameters. In the case of sound pressure, it is equivalent to 10 times the logarithm (to base 10) of the ratio of a given sound pressure squared to a reference sound pressure squared.

dB(A) – Unit of measure for 'A-weighted' sound pressure levels. A-weighting is an adjustment made to sound-level measurement to approximate the response of the human ear under normal conditions.

dB(C) – unit used to measure 'C-weighted' sound pressure levels. C-weighting is an adjustment made to sound-level measurement to approximate the response of the human ear to high sound pressure levels.

dB(Z) or dB(L) – unit used to measure 'Z-weighted' sound pressure levels with no weighting applied (linear).

Hertz (Hz) – the measure of frequency of sound wave oscillations per second. 1 oscillation per second equals 1 hertz.

Octave – a division of the frequency range into bands, with each octave representing a doubling of frequency (Hz) when compared to the band below.

1/3 Octave – single octave bands divided into three parts. Using 1/3 octave bands is useful for increased granularity of assessment, and is required to assess tonality (discussed below).

L_{eq} – the noise level representing the equivalent, or average, noise energy measured across a given measurement period. The $L_{eq, 15min}$ noise descriptor, for example, refers to the energy-average noise level calculated over a 15-minute period.

$L_{Aeq, T}$ – The time-averaged sound pressure level. The value of the A-weighted sound pressure level of a continuous steady sound that, with a measurement time interval T, has the

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same mean square sound pressure level as a sound under consideration with a level that varies with time (AS1055.1-1997).

L_{90} – the noise level exceeded for 90 per cent of the time and is approximately the average of the minimum noise levels. The L_{90} level is often referred to as the “background” noise level and is commonly used as a basis for determining noise criteria for assessment purposes.

$L_{A90, T}$ – the A-weighted sound pressure level measured that is exceeded for 90% of the time over a given assessment period (T). This is a measure of background noise.

$L_{A90, \text{period}}$ (day/evening/night) – The A-weighted sound pressure level that is equal to or exceeded for 90% of the day, evening or night periods.

Low frequency – Noise containing major components in the low-frequency range (10 Hz to 160 Hz) of the frequency spectrum. Sometimes described as rumbly or bass-heavy.

Masking – The phenomenon of one sound interfering with the perception of another sound. For example, the interference of traffic noise with use of a public telephone on a busy street (Bies and Hansen, 1996).

Sound Power Level (L_W) – this is a measure of the total power radiated by a source. The Sound Power of a source is a fundamental property of the source and is independent of the surrounding environment.

Sound Pressure Level (L_P) – the level of sound pressure as measured at a distance by a standard sound level meter with a microphone. This differs from L_W in that this is the received sound as opposed to the sound ‘intensity’ at the source.

Spectral characteristics – with a noise being considered across the spectrum of frequencies, this term is used to characterise the noise (e.g. dominated by low-frequencies, or mostly uniform).

Tonal noise (tonality) – noise containing a prominent frequency and characterised by a definite pitch, or tone.

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APPENDIX B

NOISE MONITORING LOCATIONS AND BACKGROUND NOISE LEVELS

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NOISE MEASUREMENT LOCATION 1

WEST FACING VIEW



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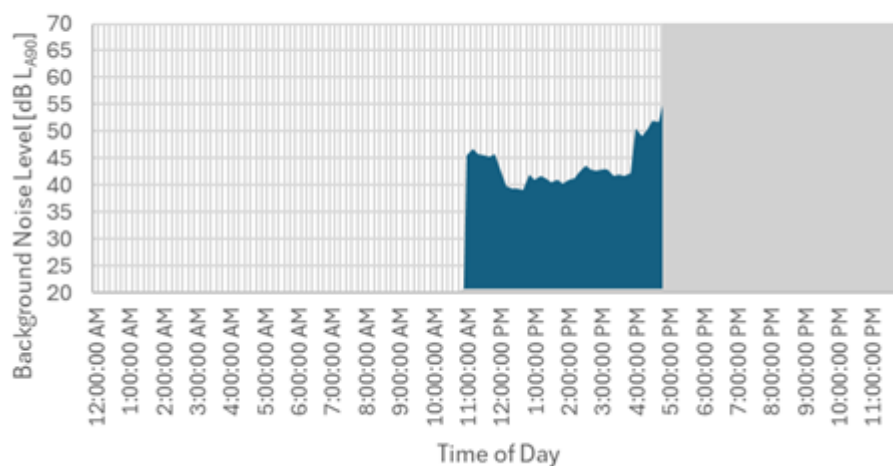
SOUTH FACING VIEW



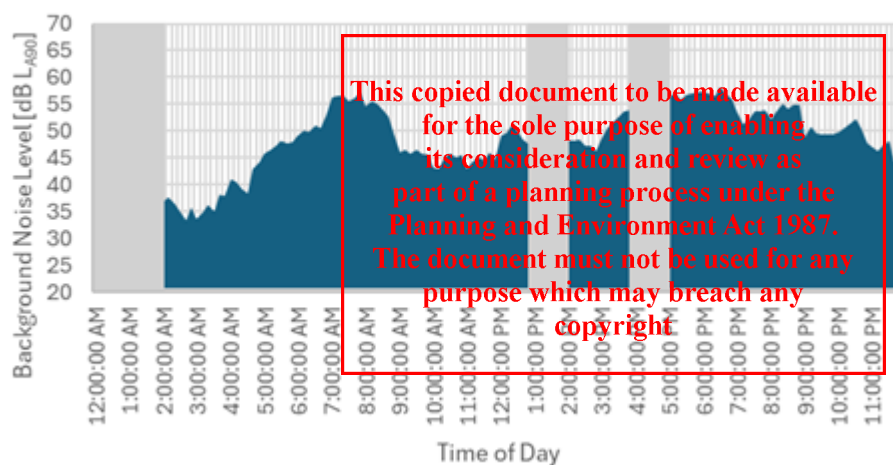
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NOISE LOGGING GRAPHS

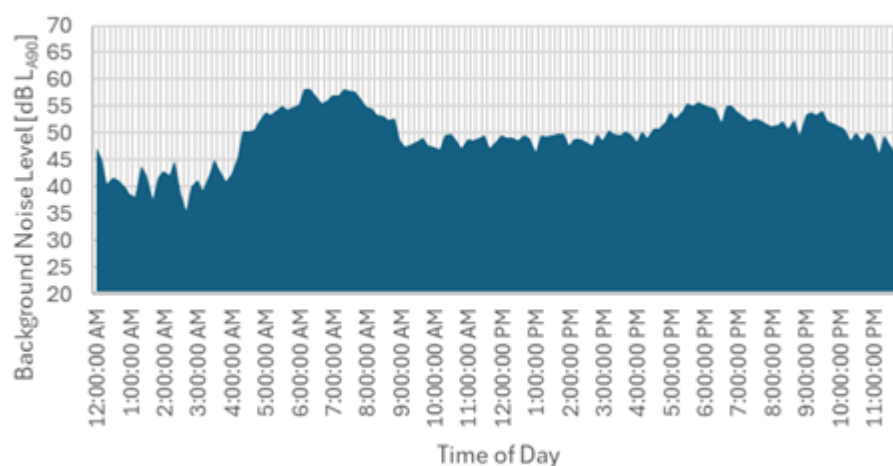
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Background noise logging - NML 1 - 13/08/2025

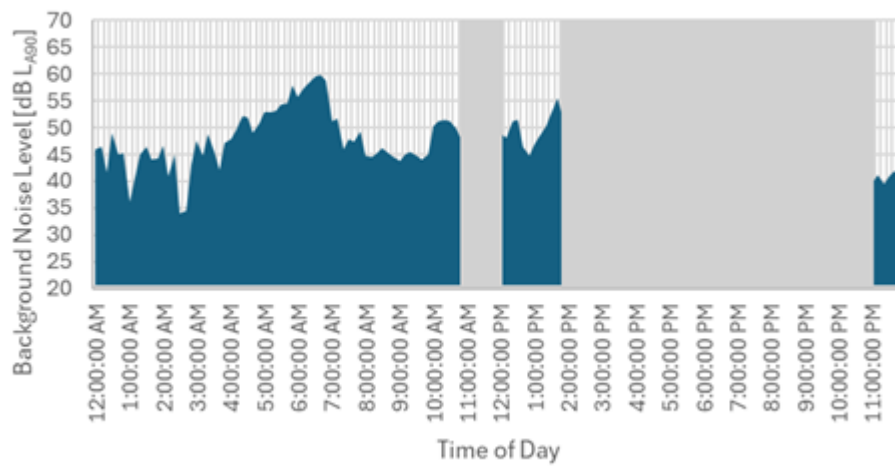


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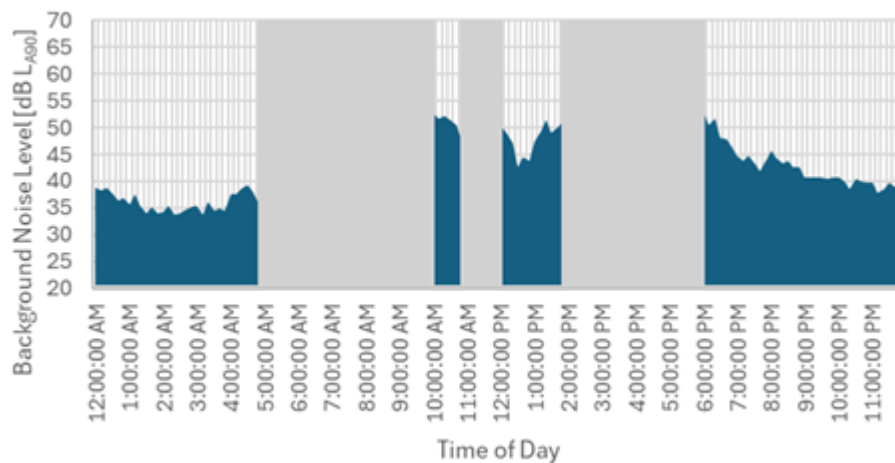


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Background noise logging - NML 1 - 15/08/2025



Background noise logging - NML 1 - 16/08/2025



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NOISE MEASUREMENT LOCATION 2

NORTH FACING VIEW



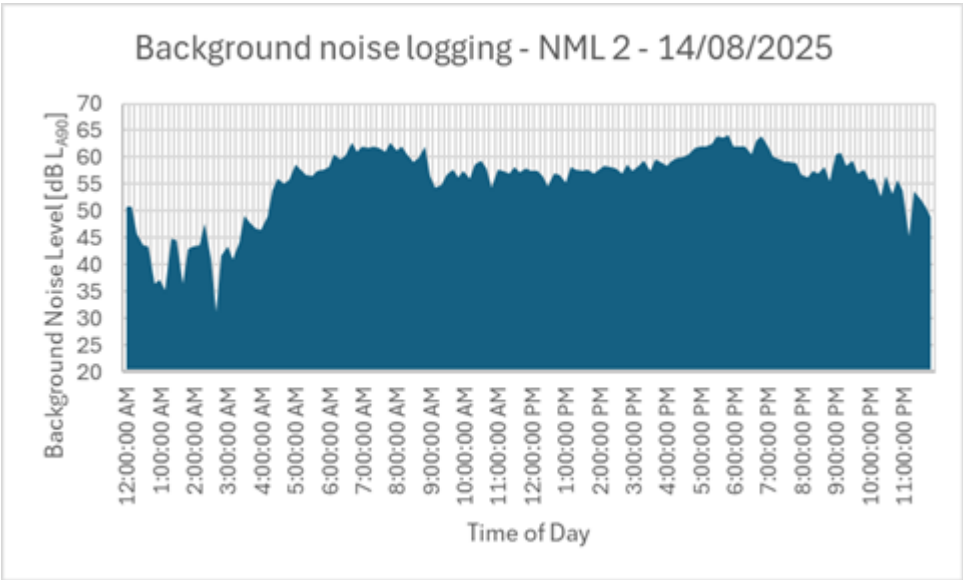
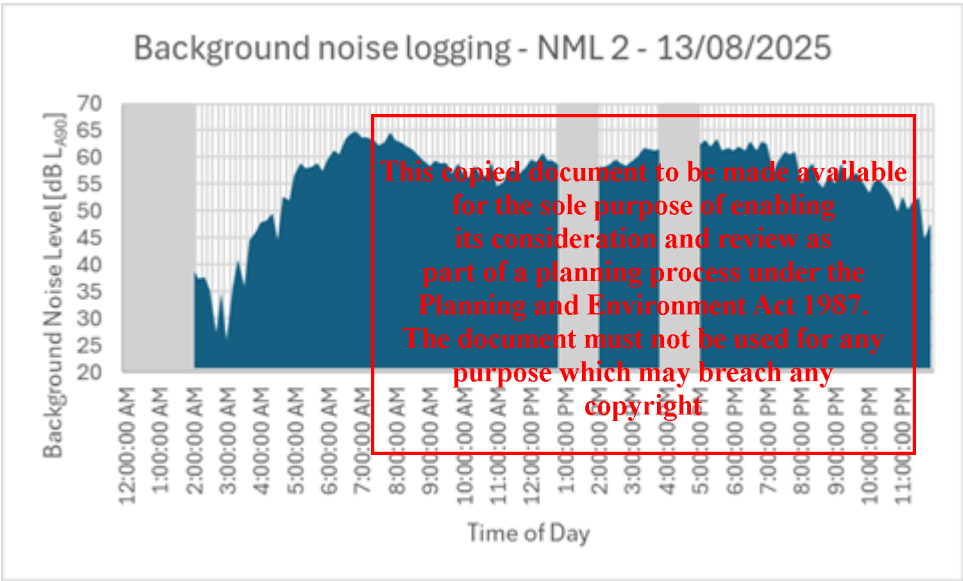
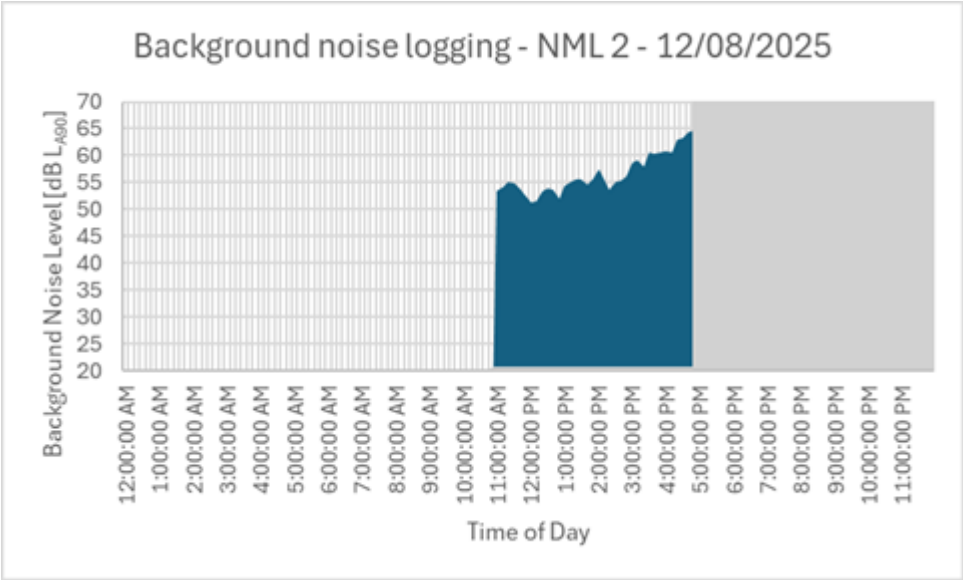
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SOUTH FACING VIEW



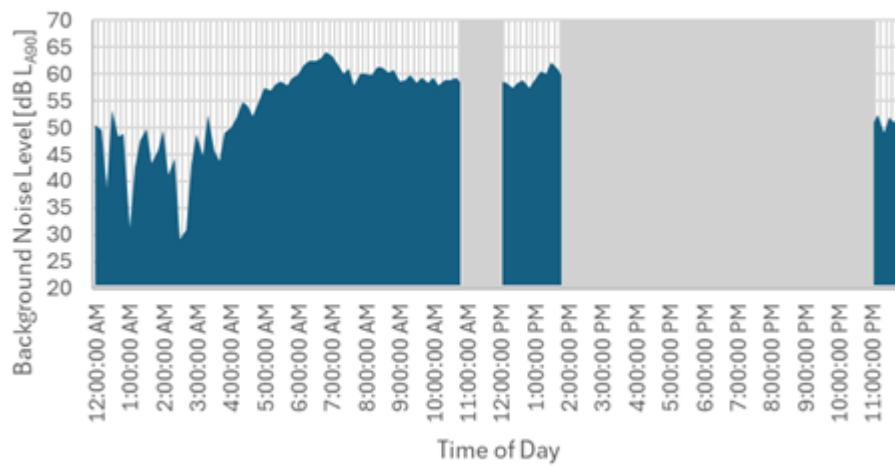
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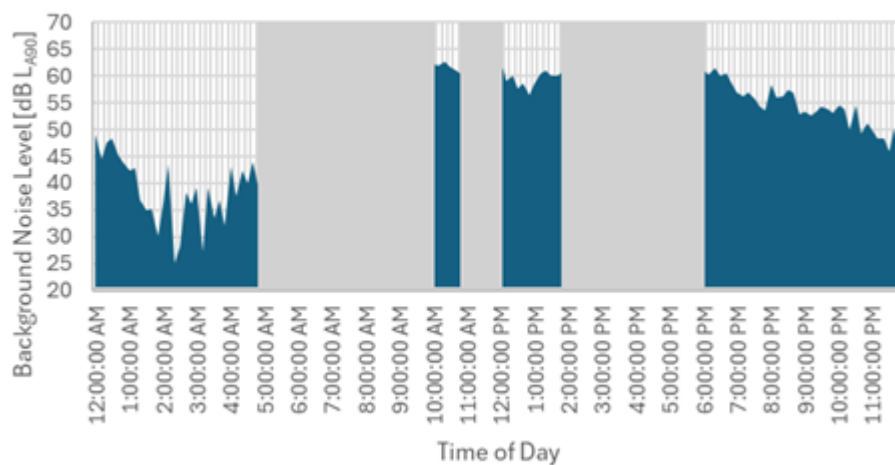


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Background noise logging - NML 2 - 16/08/2025



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NOISE MEASUREMENT LOCATION 3

NORTH FACING VIEW



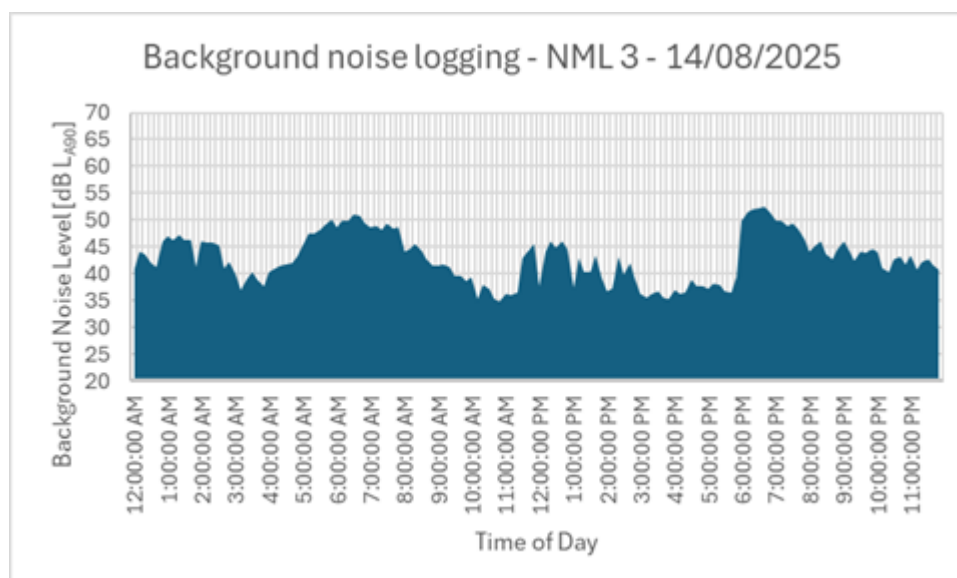
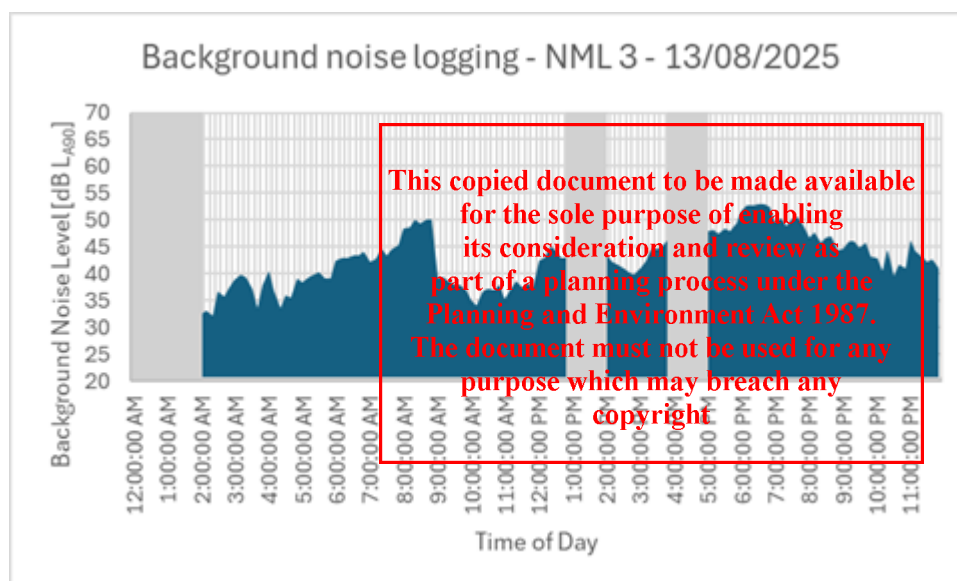
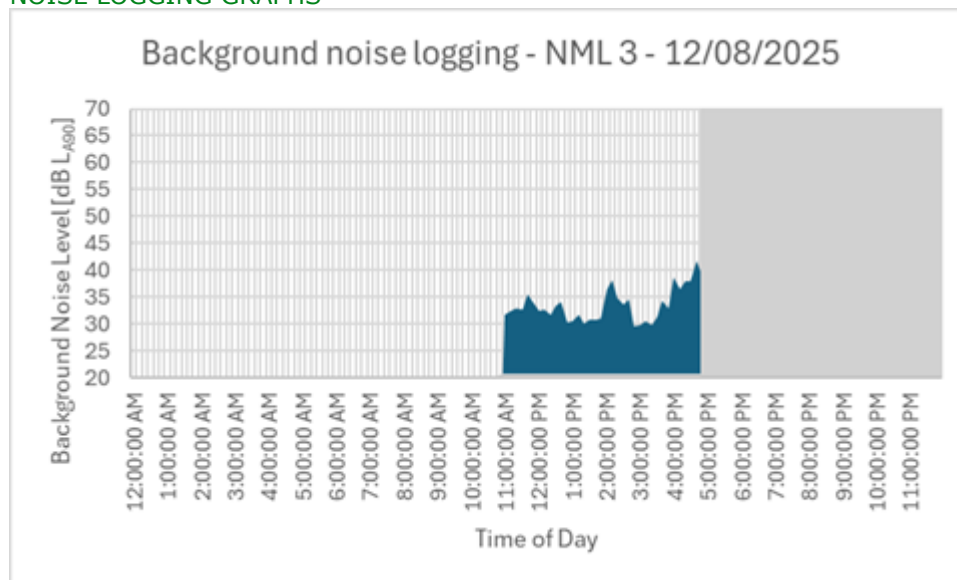
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SOUTH FACING VIEW



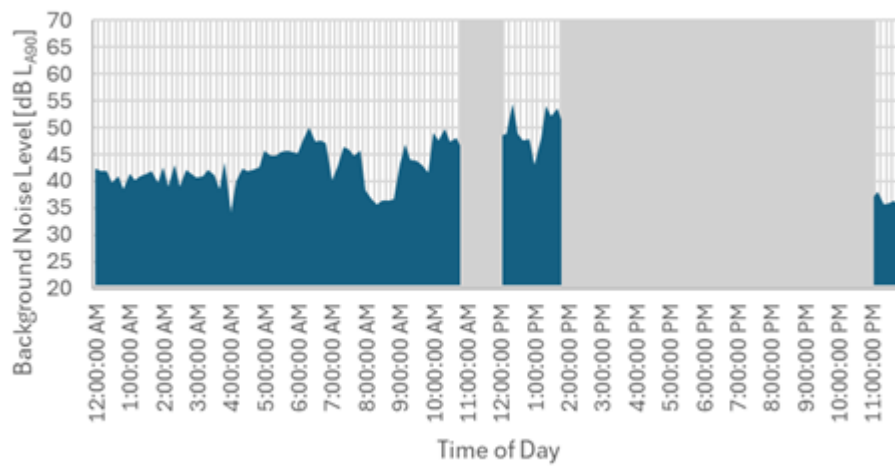
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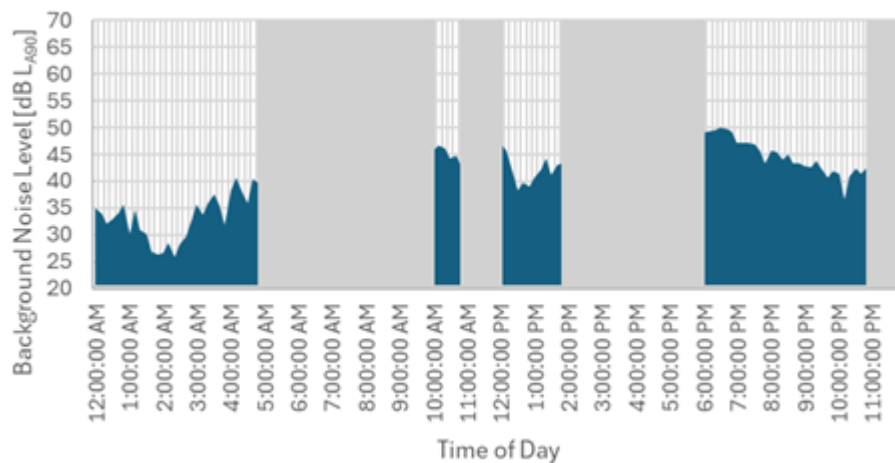


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APPENDIX C NOISE PROTOCOL NOISE LIMITS

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NSA ID	Description	Applicable Noise Monitoring Location (NML)	Average Background Noise Level, L _{A90} , dB(A)			Noise Protocol Clause 24 Noise Limits, dB(A)			Final Traffic-affected Noise Protocol Noise Limits dB(A)		
			Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
1	210 NASH ROAD BUNYIP 3815	2	59	59	51	67	64	55	55	50	45
2	200 NASH ROAD BUNYIP 3815	2	59	59	51	67	64	55	55	50	45
3	190 NASH ROAD BUNYIP 3815	2	59	59	51	67	64	55	55	50	45
4	90 MCCONNELL ROAD BUNYIP NORTH 3815	3	39	46	42	47	51	47	47	51	47
5	180 NASH ROAD BUNYIP 3815	2	59	59	51	67	64	55	55	50	45
6	140 MCCONNELL ROAD BUNYIP NORTH 3815	3	39	46	42	47	51	47	47	51	47
7	54 DORAN ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
8	105 MCCONNELL ROAD BUNYIP NORTH 3815	3	39	46	42	47	51	47	47	51	47
10	75 MCCONNELL ROAD BUNYIP NORTH 3815	3	39	46	42	47	51	47	47	51	47
11	135 MCCONNELL ROAD BUNYIP NORTH 3815	3	39	46	42	47	51	47	47	51	47
12	195 NASH ROAD BUNYIP 3815	2	59	59	51	67	64	55	55	50	45
13	50 DORAN ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
14	193 NASH ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47

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NSA ID	Description	Applicable Noise Monitoring Location (NML)	Average Background Noise Level, L _{A90} , dB(A)			Noise Protocol Clause 24 Noise Limits, dB(A)			Final Traffic-affected Noise Protocol Noise Limits dB(A)		
			Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
15	30 TONIMBUK ROAD BUNYIP NORTH 3815	1	50	52	48	58	57	53	55	50	45
16	46 DORAN ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
17	40 MCCONNELL ROAD BUNYIP NORTH 3815	3	39	46	42	47	51	47	47	51	47
18	230 WIMPOLE ROAD BUNYIP NORTH 3815	3	39	46	42	47	51	47	47	51	47
19	3430 PRINCES HIGHWAY BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
20	38 DORAN ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
21	170 NASH ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
22	36A DORAN ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
23	148C NASH ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
24	36 DORAN ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
25	2/154 NASH ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
26	34 DORAN ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
27	148B NASH ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47

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NSA ID	Description	Applicable Noise Monitoring Location (NML)	Average Background Noise Level, L _{A90} , dB(A)			Noise Protocol Clause 24 Noise Limits, dB(A)			Final Traffic-affected Noise Protocol Noise Limits dB(A)		
			Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
28	32 DORAN ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
29	159 NASH ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
30	10 MORRIS WAY BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
31	30 DORAN ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
32	146 NASH ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
33	5 MCCONNELL ROAD BUNYIP NORTH 3815	3	39	46	42	47	51	47	47	51	47
34	140 NASH ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
35	8 MORRIS WAY BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
36	28 DORAN ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
37	148A NASH ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
38	6 MORRIS WAY BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
39	4 MORRIS WAY BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
40	2 MORRIS WAY BUNYIP 3815	3	39	46	42	47	51	47	47	51	47

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NSA ID	Description	Applicable Noise Monitoring Location (NML)	Average Background Noise Level, L _{A90} , dB(A)			Noise Protocol Clause 24 Noise Limits, dB(A)			Final Traffic-affected Noise Protocol Noise Limits dB(A)		
			Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
41	35 TONIMBUK ROAD BUNYIP 3815	1	50	52	48	58	57	53	55	50	45
42	45 TONIMBUK ROAD BUNYIP NORTH 3815	1	50	52	48	58	57	53	55	50	45
43	26 DORAN ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
44	190 TONIMBUK ROAD BUNYIP NORTH 3815	3	39	46	42	47	51	47	47	51	47
45	125 WIMPOLE ROAD BUNYIP NORTH 3815	1	50	52	48	58	57	53	55	50	45
46	24 DORAN ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
47	140 WIMPOLE ROAD BUNYIP NORTH 3815	1	50	52	48	58	57	53	55	50	45
48	106 HOPE STREET BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
49	7 MORRIS WAY BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
50	145 NASH ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
51	3480 PRINCES HIGHWAY BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
52	30 BUTLER ROAD BUNYIP NORTH 3815	1	50	52	48	58	57	53	55	50	45
53	108 HOPE STREET BUNYIP 3815	3	39	46	42	47	51	47	47	51	47

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NSA ID	Description	Applicable Noise Monitoring Location (NML)	Average Background Noise Level, L _{A90} , dB(A)			Noise Protocol Clause 24 Noise Limits, dB(A)			Final Traffic-affected Noise Protocol Noise Limits dB(A)		
			Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
54	5 MORRIS WAY BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
55	3A MORRIS WAY BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
56	17 SHINNERS CLOSE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
58	1 MORRIS WAY BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
59	9 SHINNERS CLOSE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
60	7A MORRIS WAY BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
61	15 SHINNERS CLOSE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
62	13 SHINNERS CLOSE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
63	22 DORAN ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
64	11 SHINNERS CLOSE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
65	9 MORRIS WAY BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
66	35 DORAN ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
67	7 SHINNERS CLOSE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47

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			Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
68	27 DORAN ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
69	5 SHINNERS CLOSE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
71	19 SHINNERS CLOSE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
72	3 SHINNERS CLOSE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
73	3500 PRINCES HIGHWAY BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
74	1 SHINNERS CLOSE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
75	5A MORRIS WAY BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
76	104 HOPE STREET BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
77	20 DORAN ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
78	3 MORRIS WAY BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
79	230 WIMPOLE ROAD BUNYIP NORTH 3815	3	39	46	42	47	51	47	47	51	47
80	27 DORAN ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
82	1A MORRIS WAY BUNYIP 3815	3	39	46	42	47	51	47	47	51	47

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NSA ID	Description	Applicable Noise Monitoring Location (NML)	Average Background Noise Level, L _{A90} , dB(A)			Noise Protocol Clause 24 Noise Limits, dB(A)			Final Traffic-affected Noise Protocol Noise Limits dB(A)		
			Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
83	25 SHINNERS CLOSE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
84	8 SHINNERS CLOSE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
85	10 SHINNERS CLOSE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
86	6 SHINNERS CLOSE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
87	27 SHINNERS CLOSE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
88	102 HOPE STREET BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
89	4 SHINNERS CLOSE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
91	18 DORAN ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
92	100 HOPE STREET BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
93	30 SHINNERS CLOSE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
94	25 DORAN ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
95	29 SHINNERS CLOSE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
96	32 SHINNERS CLOSE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47

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NSA ID	Description	Applicable Noise Monitoring Location (NML)	Average Background Noise Level, L _{A90} , dB(A)			Noise Protocol Clause 24 Noise Limits, dB(A)			Final Traffic-affected Noise Protocol Noise Limits dB(A)		
			Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
98	TONIMBUK ROAD BUNYIP NORTH 3815	3	39	46	42	47	51	47	47	51	47
99	34 SHINNERS CLOSE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
100	3185 PRINCES HIGHWAY BUNYIP 3815	2	59	59	51	67	64	55	55	50	45
101	105 NASH ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
102	35 BUTLER ROAD BUNYIP 3815	1	50	52	48	58	57	53	55	50	45
103	36 SHINNERS CLOSE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
104	35 SHINNERS CLOSE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
105	16 DORAN ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
106	20 MICHELL ROAD BUNYIP NORTH 3815	3	39	46	42	47	51	47	47	51	47
107	98 HOPE STREET BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
108	37 SHINNERS CLOSE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
109	39 SHINNERS CLOSE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
110	41 SHINNERS CLOSE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47

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NSA ID	Description	Applicable Noise Monitoring Location (NML)	Average Background Noise Level, L _{A90} , dB(A)			Noise Protocol Clause 24 Noise Limits, dB(A)			Final Traffic-affected Noise Protocol Noise Limits dB(A)		
			Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
111	13 GREENHILL COURT BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
112	19 GREENHILL COURT BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
113	7 GREENHILL COURT BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
114	15 GREENHILL COURT BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
115	5 GREENHILL COURT BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
116	11 GREENHILL COURT BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
117	14 DORAN ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
118	43 SHINNERS CLOSE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
119	9 GREENHILL COURT BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
120	21 GREENHILL COURT BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
121	23 GREENHILL COURT BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
122	94 HOPE STREET BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
123	17 GREENHILL COURT BUNYIP 3815	3	39	46	42	47	51	47	47	51	47

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NSA ID	Description	Applicable Noise Monitoring Location (NML)	Average Background Noise Level, L _{A90} , dB(A)			Noise Protocol Clause 24 Noise Limits, dB(A)			Final Traffic-affected Noise Protocol Noise Limits dB(A)		
			Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
124	70 HOPE STREET BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
125	25 GREENHILL COURT BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
126	103 NASH ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
129	19 DORAN ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
130	12 DORAN ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
136	101 NASH ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
145	64 HOPE STREET BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
147	50 BUTLER ROAD BUNYIP NORTH 3815	1	50	52	48	58	57	53	55	50	45
149	92 HOPE STREET BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
150	96 HOPE STREET BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
151	17 DORAN ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
157	17A DORAN ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
164	55 BUTLER ROAD BUNYIP 3815	1	50	52	48	58	57	53	55	50	45

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NSA ID	Description	Applicable Noise Monitoring Location (NML)	Average Background Noise Level, L _{A90} , dB(A)			Noise Protocol Clause 24 Noise Limits, dB(A)			Final Traffic-affected Noise Protocol Noise Limits dB(A)		
			Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
165	86 HOPE STREET BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
199	70 MICHELL ROAD BUNYIP NORTH 3815	3	39	46	42	47	51	47	47	51	47
208	205 ABECKETT ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
212	3175 PRINCES HIGHWAY BUNYIP 3815	2	59	59	51	67	64	55	55	50	45
216	70 BUTLER ROAD BUNYIP NORTH 3815	1	50	52	48	58	57	53	55	50	45
224	88 HOPE STREET BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
285	2 HAYNES CLOSE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
297	4 HAYNES CLOSE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
305	18 GWEN MEREDITH DRIVE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
311	6 HAYNES CLOSE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
315	100 BUTLER ROAD BUNYIP NORTH 3815	1	50	52	48	58	57	53	55	50	45
339	8 HAYNES CLOSE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47
378	10 HAYNES CLOSE BUNYIP 3815	3	39	46	42	47	51	47	47	51	47

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NSA ID	Description	Applicable Noise Monitoring Location (NML)	Average Background Noise Level, L _{A90} , dB(A)			Noise Protocol Clause 24 Noise Limits, dB(A)			Final Traffic-affected Noise Protocol Noise Limits dB(A)		
			Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
389	3165 PRINCES HIGHWAY BUNYIP 3815	2	59	59	51	67	64	55	55	50	45
390	115 BUTLER ROAD BUNYIP 3815	3	39	46	42	47	51	47	47	51	47

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APPENDIX D EQUIPMENT 1/3 OCTAVE BAND SOUND POWER LEVELS

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Name	Overall, dB L _{WA}	Sound Power Level at 1/3 Octave Band Centre Frequency, dB L _{WA}																							
		50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000
DAY																									
Inverter	90.6	53.1	60.6	62.3	67.2	71.8	71.0	73.4	83.0	83.5	72.8	74.6	75.3	77.2	77.8	78.7	77.8	76.4	76.1	74.7	78.6	77.3	75.5	76.0	74.4
BESS	76.1	43.0	49.3	54.4	60.8	58.2	58.9	63.2	59.8	60.2	61.1	62.4	66.2	67.8	64.8	63.9	64.1	64.1	63.5	62.6	62.7	61.9	60.2	56.8	57.2
Substation Transformer	91.6	44.0	51.0	54.7	78.1	61.1	59.8	82.3	70.6	83.6	87.4	83.0	80.3	74.4	75.2	74.8	69.2	67.4	66.5	63.4	60.2	60.7	62.1	59.1	57.7
NIGHT																									
Inverter	85	50.4	57.3	59.0	64.8	75.7	72.4	75.8	74.6	72.3	71.1	70.5	70.4	71.1	72.3	73.1	71.7	70.3	70.2	69.3	70.0	70.5	69.4	68.2	66.6
BESS	72.4	40.8	51.9	49.9	51.3	54.7	55.5	55.8	55.8	55.5	58.6	61.2	65.4	60.2	63.1	59.4	58.5	58.5	58.6	57.9	57.4	57.4	59.0	58.7	54.5
Substation Transformer	91.6	44.0	51.0	54.7	78.1	61.1	59.8	82.3	70.6	83.6	87.4	83.0	80.3	74.4	75.2	74.8	69.2	67.4	66.5	63.4	60.2	60.7	62.1	59.1	57.7

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