

10/09/2026

Consolidated Power Projects Australia Pty Ltd
Dean Giannoulis
54-62 Ferndell Street, South Granville, NSW 2142
Via email: dgiannoulis@conpower.com.au

Our reference: 500-J00237-Noise Monitoring Letter Report_05.09.2026

Dear Mr Dean,

Re: Out of Hours noise monitoring conducted on 05 September 2026.

Introduction

An Out-of-Hours Work (OOHW) request was submitted to the NSW Department of Planning, Housing and Infrastructure (DPHI) seeking approval to extend construction hours for works at the Tamworth 330 kV Substation. DPHI granted approval on 17 July 2026, subject to conditions including attended noise monitoring during the approved OOHW activities.

Moss Environmental Pty Ltd was commissioned to undertake attended noise monitoring at three DPHI-approved sensitive receptor locations. The monitoring program includes a background monitoring session before the commencement of OOHW activities and fortnightly attended monitoring during the OOHW.

On 5 September 2026, Moss Environmental undertook background noise monitoring at the three DPHI-approved sensitive receptor locations, R2, R3 and R7, while no project-related construction activities were underway. The first round of OOHW noise monitoring was subsequently completed at the same locations while the approved construction activities were in progress.

This report presents the results of both the background monitoring and the first OOHW monitoring round. It documents the monitoring locations, measurement times and duration, LAeq,15min and LA90,15min noise levels, estimated site-only construction noise contribution, construction activities and equipment, acoustic observations and prevailing weather conditions, in accordance with clause 8 of the DPHI approval and Section 8.2 of the Interim Construction Noise Guideline (DECC, 2009).

It is noted in the OOHW approval that:

- the approval extends standard construction hours to include 7am – 8am and 1pm - 5pm on Saturdays, and 8am to 5pm on Sundays for approximately 5 months;
- work will only be undertaken during 'day' time periods and no work will be undertaken in the evening or nighttime periods;
- the noise impact assessment found elevated predicted noise levels at receivers within 500m of the site, with 6 of the 8 potentially noise affected by a minor exceedance (up to 6dBA); and

- to mitigate noise impacts, reasonable and feasible noise mitigation measures will be adopted.

DPHI Approval Requirements

The attended noise monitoring was undertaken in accordance with Condition 8 of the DPHI Out-of-Hours Work Approval. Table 1 below summarises the relevant approval requirements and identifies where each requirement is addressed in this report.

Table 1: Approval Compliance Summary

Condition No	Condition	Status	Description
<i>8. for all noise monitoring completed under the existing approval and this approval, reports are to be consistent with the requirements of Section 8.2 of the Interim Construction Noise Guideline (ICNG) and include:</i>			
a	details on each monitoring location, including receptor number, address and a figure showing the locations	Addressed	Receptor numbers, addresses, coordinates, monitoring photographs and a location figure are provided.
b	the date and start time of each noise monitoring event	Addressed	The date and start time are reported for each background and Round 1 monitoring event.
c	confirmation that each attended noise monitoring event was 15 minutes in duration	Addressed	Each event was monitored for 15 minutes. The R3 background duration is confirmed by the field record despite the instrument-export anomaly.
d	the parameters of the results, including total LAeq and LA90 levels for each monitoring event	Addressed	Total LAeq,15min and LA90,15min levels are reported for each monitoring event.
e	the estimated site-only noise contribution for each monitoring event reported as an LAeq(15minute). If construction noise is not audible during monitoring, this should be stated	Addressed	Conservative upper limits are provided for R2 and R7. Project noise was not audible at R3.
f	details of activities and equipment in use during the attended monitoring, including a figure showing the approximate location of equipment on site	Addressed	The construction activities and equipment observed during monitoring are described, and their approximate locations are shown on figure 2.
g	weather conditions including wind speed and wind direction during each monitoring event. This should be both local conditions and from the nominated site weather station	Addressed	Local field observations and Tamworth Airport AWS data are presented, including wind speed and direction.

Monitoring Location Selection

The monitoring locations comprised Receptors R2, R3 and R7, which were selected as representative sensitive receivers surrounding the Tamworth 330 kV Substation and subsequently approved by DPHI. The locations provide coverage of different orientations relative to the work area and were selected based on their proximity to the works, potential noise exposure, existing background noise environment, accessibility

and suitability for attended monitoring. Monitoring at R2 was conducted at the property boundary due to no approved access. The property boundary is 310m closer to the source than the dwelling. This was an alternative location selected because access to the dwelling was unavailable.

Monitoring was undertaken at representative outdoor locations within each property, where access was available. Figure 1 below shows the receptors surrounding the substation.



Figure 1: Closest sensitive receptors to the substation

Acoustic Team Qualifications and Experience

Table 2: Team qualification and experience

Shonelle Gleeson-Willey	Shonelle holds a Bachelor of Applied Science (Environmental Management and Tourism) and a Master of Environmental Management and is currently completing a Master of Environmental Law. She has completed the University of New South Wales General Principles of Acoustics short course (mod 1-4). She is also a Certified Environmental Practitioner (CEnvP-General) and has approximately 18 years of experience undertaking acoustic monitoring on construction projects, including noise monitoring and assessment associated with construction activities and out-of-hours works.
Elizabeth Ogunsote	Elizabeth Ogunsote holds a Master of Environmental Science and a Bachelor of Science in Microbiology. She has experience in environmental consulting and regulatory compliance, including environmental impact assessments, reviews of environmental factors and associated environmental investigations. Her experience also includes unattended noise monitoring, field data analysis and the preparation of acoustic assessment reports.

Background monitoring

As no project-related construction activities were underway during the monitoring, the measured noise levels are considered representative of the existing acoustic environment at each location before the commencement of the out-of-hours works for a duration of 15mins.

Across the three monitoring locations, the attended background monitoring recorded LAeq,15min levels ranging from 41.9 to 52.9 dBA and LA90,15min levels ranging from 37.2 to 38.5 dBA.

- Receptor 2 (R2) – 696 Burgmanns Lane, Kingswood, NSW 2340
- Receptor 3 (R3) – 57, Falcon Drive, Calala, NSW 2340
- Receptor 7 (R7) – 111 Burgess Lane, Calala, NSW 2340

Table 3: Background monitoring field notes

Receptor	Monitoring notes
R2	Start: 1:09pm, Finish:1:24pm, Duration 15mins Monitoring was undertaken at the property boundary as access was not granted. Conditions were overcast with light winds from the northwest at 2.41 m/s, a temperature of 27.1°C and no rainfall. Bird calls, including plovers and other small birds, were the dominant noise source. <i>Note: An excavator operated continuously during the measurement but was noted as not associated with the project. The recording is not considered representative of the typical background acoustic environment.</i>
R3	Start: 1:45pm, Finish: 2:00pm, Duration 15mins Monitoring was undertaken at the property boundary as access was not granted. Conditions were overcast, with north-westerly winds ranging from approximately 4.4 m/s, a temperature of 26.3°C and no

	rainfall. Lawn mowing at surrounding residential properties and bird calls were the dominant noise sources. <i>Note: The instrument export for R3 displayed a measurement duration of 00:00:00; however, the field record confirms a start time of 1:45 pm, a finish time of 2:00 pm and a total monitoring duration of 15 minutes. Accordingly, the measurement has been reported as a 15-minute monitoring event.</i>
R7	Start: 2:20pm, Finish: 2:35pm, Duration 15mins Monitoring was undertaken within the property with access granted by the owner. Conditions were overcast, with north-westerly winds at 3.65 m/s, a temperature of 25.9°C and no rainfall. Lawn mowing at surrounding properties and a tractor being driven within the monitored property were the dominant noise sources. <i>Note: Project-related construction activities were not audible during the measurement.</i>

The readings of the attended background noise monitoring are presented in table 4 below.

Table 4: Attended background noise monitoring results

Receptor	Date	Start time	Duration	L _{Aeq} , 15min (dBA)	L _{AF90} , 15min (dBA)
R2*	05 Sept 2026	13:09	15 minutes	52.9**	38.5
R3***	05 Sept 2026	13:45	15 minutes	43.4	38.1
R7***	05 Sept 2026	14:20	15 minutes	41.9	37.2

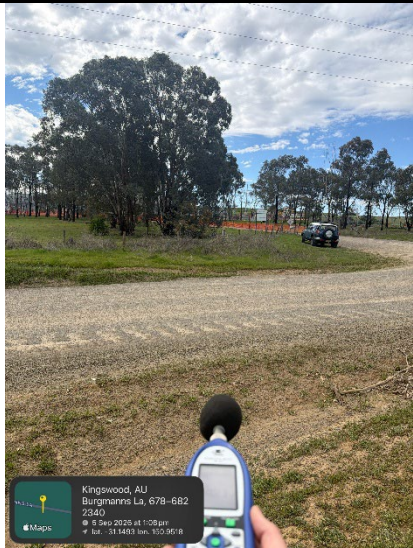
*The L_{Aeq} result at R2 was influenced by the continuous operation of an excavator not associated with the project and is therefore not considered representative of the typical background acoustic environment. Although, it has been retained as a part of this assessment. The background noise level during the monitoring period is represented by L_{AF90}, 15min. The minimum Rating Background daytime noise level is 35 L_{AF90} dB as determined by the project Environmental Impact Statement (Marshall Day Acoustics, 2023).

**An excavator associated with unrelated activities was observed operating during the measurement period. The substantial difference between the L_{Aeq}, 15min and L_{AF90}, 15min indicates intermittent elevated noise during the monitoring interval. The unrelated excavator is considered a likely contributor to the elevated L_{Aeq}, 15min result. The measurement should therefore be qualified and not treated as an entirely representative project-free L_{Aeq}.

*** qualified reference measurements due to lawn mowing and other local activities.

Table 5: Background Monitoring locations

Receptor	Address	Monitoring Location	Monitoring point coordinates	Microphone height	Distance to and type of reflective surface	Instrument positioning and windshield
R2	696 Burgmanns Lane, Kingswood, NSW 2340	Monitoring was undertaken at the property boundary as access was not granted. Burgess Lane is unsealed and located parallel to the property boundary. The residence is located approximately 310m to the South of the monitoring location.	Lat - 31.1493, Lon 150.9518	Between 1.2 and 1.5 m	None nearby	The sound level meter was handheld at approximately 1.2–1.5 m above ground level and at arm's length from the operator. A foam microphone windshield

						was fitted throughout the measurements.
R3	57, Falcon Drive, Calala, NSW 2340	Monitoring was undertaken at the property boundary as access was not granted. 	Lat - 31.1454, Lon 150.9551	Between 1.2 and 1.5 m	The nearest significant reflective surface was a metal shed located approximately 30 m from the monitoring position	The sound level meter was placed on a fence post, at approximately 1.2–1.5 m above ground level. A foam microphone windshield was fitted throughout the measurements.
R7	111 Burgess Lane, Calala, NSW 2340	Monitoring was undertaken within the property with access granted by the owner	Lat - 31.1458 Lon 150.9570	Between 1.2 and 1.5 m	The nearest significant reflective surface was the residential building, located approximately 8 m from the monitoring position.	The sound level meter was handheld at approximately 1.2–1.5 m above ground level and at arm's length from the operator. A foam microphone windshield

							was fitted throughout the measurements.
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First round of OOHW monitoring (Round 1)

The monitoring was undertaken to establish noise levels associated with OOHW at selected sensitive receptor locations. Out-of-hours construction activities were undertaken at the Tamworth substation during the monitoring period. The activities undertaken included conduit trench excavation and conduit installation. The plant and equipment used are:

- 5T excavator
- 14T excavator
- 10T tipper truck
- Tamping rammer

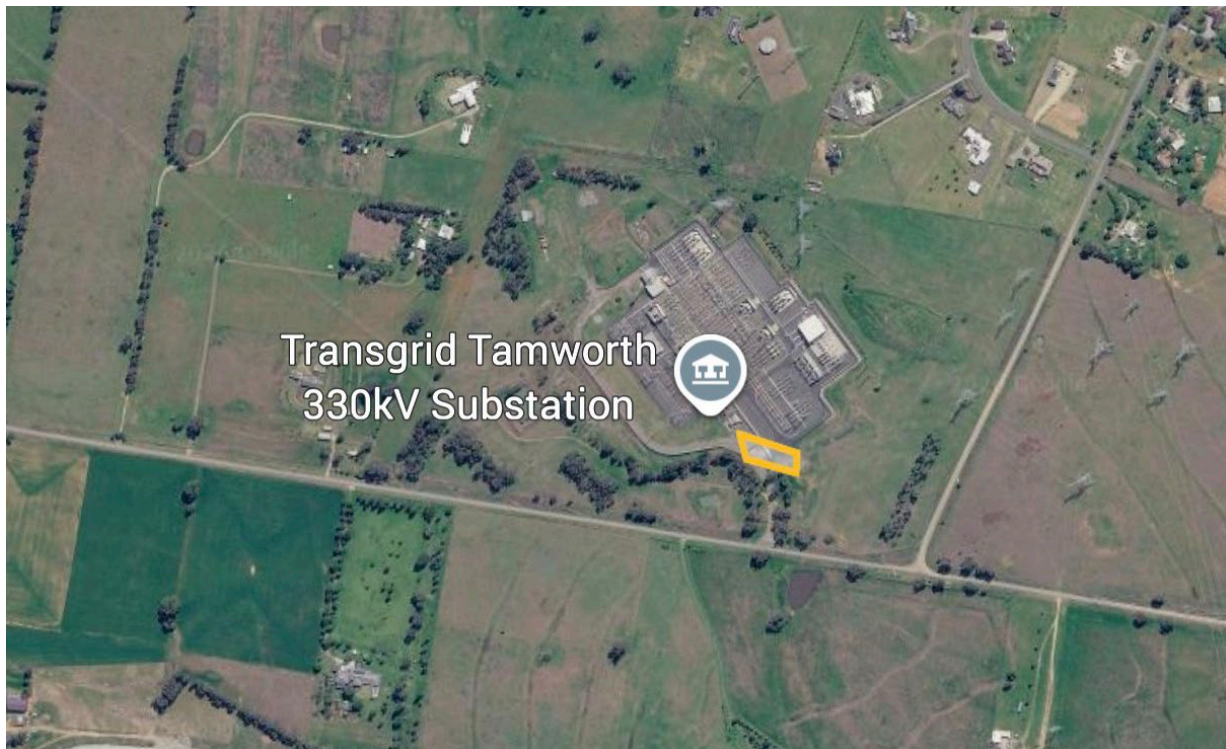


Figure 2: A figure showing the location of the truck and excavator working on site during the OOHW monitoring (in yellow outline)

Attended out-of-hours noise monitoring was conducted on 5th September 2026 at the following receptor locations:

- Receptor 2 (R2) – 696 Burgmanns Lane, Kingswood, NSW 2340
- Receptor 3 (R3) – 57, Falcon Drive, Calala, NSW 2340
- Receptor 7 (R7) – 111 Burgess Lane, Calala, NSW 2340

Table 6: Noise monitoring Round 1 field notes

Receptor	Monitoring notes
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R2	Start: 3:23pm, Finish: 3:39pm, Duration 15mins Monitoring was undertaken at the property boundary as access was not granted. Conditions were overcast, with north-westerly winds at 1.5 m/s, a temperature of 27.5°C and no rainfall. Project-related noise was audible and included two excavators digging with tooth and blade buckets, non-tonal reversing beepers and truck engine noise. Birds and occasional vehicles passing on the dirt road were also audible. <i>Note: Two monitoring rounds were completed, with the second measurement adopted because passing vehicles influenced the first measurement. The monitoring was done at the property boundary adjacent to a dirt road, hence, was susceptible to noise from traffic. As none of the observed traffic was related to the project, the second measurement, during which no vehicles were observed, was therefore considered more representative and was used in this assessment.</i>
R3	Start: 3:01pm, Finish: 3:16pm, Duration 15mins Monitoring was undertaken at the property boundary as access was not granted. Conditions were overcast, with north-westerly winds at 1.47 m/s, a temperature of 26°C and no rainfall. Vehicles travelling on the dirt road, lawn mowing at surrounding residential properties, children playing and bird calls were the dominant noise sources. Project-related construction activities were not audible during the measurement.
R7	Start: 2:39pm, Finish: 2:54pm, Duration 15mins Monitoring was undertaken within the property with access granted by the owner. Conditions were overcast, with north-westerly winds at 0.9 m/s, a temperature of 26.6°C and no rainfall. Vehicles travelling on the dirt road, lawn mowing at surrounding residential properties, bird calls and a rooster crowing approximately 11 minutes into the measurement were audible. Project-related construction noise was audible and described as a very faint grinding sound.

The readings of the attended Round 1 noise monitoring are presented in the table below.

Table 7: Attended Round 1 noise monitoring results

Receptor	Date	Start time	Duration	LAeq, 15min (dBA)	LA90, 15min (dBA)	LAFMAX	LAF10
R2*	05 Sept 2026	15:39	15 minutes	49.3	45.8	60.1	63.1
R3	05 Sept 2026	15:01	15 minutes	43.5	38.7	65.9	51.7
R7	05 Sept 2026	14:39	15 minutes	44.9	35.1	70.2	58.1

*Two 15-minute attended measurements were undertaken at R2. The first measurement, commencing at 15:22, recorded an LAeq,15min of 53.4 dBA and an LA90,15min of 43.7 dBA; however, it was influenced by vehicles passing on the adjacent dirt road. As this was an extraneous noise source unrelated to the project, a second measurement was undertaken at 15:39. The second measurement recorded an LAeq,15min of 49.3 dBA and an LA90,15min of 45.8 dBA and has been adopted as the representative result for comparison with the background measurement. The first measurement has been retained in the monitoring records but excluded from the primary assessment.

Table 8: Round 1 Monitoring locations

Receptor	Address	Monitoring Location	Monitoring point coordinates	Microphone height	Distance to and type of reflective surface	Notes
R2	696 Burgmanns Lane, Kingswood, NSW 2340	Monitoring was undertaken at the property boundary as access was not granted. 	Lat -31.1493, Lon 150.9518	Between 1.2 and 1.5 m	None nearby	Two excavators located at approximately 31°08'55.31"S 150°57'09.75"E and 31°08'54.02"S 150°57'07.54"E in operation throughout monitoring were the dominant noise source. The LAMAX was also controlled by an individual bird song several time throughout recording in proximity. Recording was paused for two cars on Burgmanns Lane (local traffic) due to proximity (3m) and resulting from cars being excluded from the background.
R3	57, Falcon Drive, Calala, NSW 2340	Monitoring was undertaken at the property boundary as access was not granted. 	Lat -31.1447, Lon 150.9560	Between 1.2 and 1.5 m	The nearest significant reflective surface was a metal shed located approximately 30 m from the monitoring position	The dominant noise source was lawn mowing from a residential property approximately 240m to the north-west. Children playing and bird song also contributed. Construction noise was not audible.
R7	111 Burgess Lane, Calala, NSW 2340	Monitoring was undertaken within the property with access granted by the owner	Lat -31.1458 Lon 150.9570	Between 1.2 and 1.5 m	The nearest significant reflective surface was the residential	The dominant noise source was lawn mowing at a residential premises

					building, located approximately 8 m from the monitoring position.	approximately 350m to the NW. The LA_{MAX} was controlled by local traffic on Burgess Lane. Burgess lane changes from sealed to unsealed in line with the property boundary causing additional tyre noise. This property houses chickens and ducks. A rooster crowed at the 11min mark and a fairy wren sung multiple times from 4min to 9min into the recording also controlling the LA_{MAX}.
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Monitoring Compliance

The monitoring methodology incorporated the applicable requirements of the NSW EPA’s Approved Methods for the Measurement and Analysis of Environmental Noise in NSW, as summarised in Table 9 below.

Table 9: Monitoring Methodology and Compliance with NSW EPA Approved Methods

Monitoring requirement	Compliance
Noise measurements must be undertaken using a Class 1 sound level meter compliant with AS/NZS IEC 61672.1.	Monitoring was undertaken using a Rion NL-52 Class 1 sound level meter. Instrument serial number: 99000. Acoustic calibrator: Pulsar Model 105
The sound level meter must hold a current laboratory calibration, with the applicable instrument standard identified.	The Rion NL-52 Class 1 sound level meter was calibrated on 17 Oct 2025 (see calibration certificate in Appendix A). The following relevant details were extracted from the calibration certificate: - Calibration number: C25684-V1 - Calibration date: 17 Oct 2025 - Report issue date: 29 April 2026 - IEC standard - calibrator: 60942:2017

Field calibration checks of the instrumentation must be carried out before and after measurements are made.	A field calibration of the sound level meter was undertaken at the commencement and completion of the monitoring program. The calibrator produced a measured sound level of 93.92 dB at approximately 1 kHz, consistent with its nominal output of 94 dB at 1 kHz on 17 October 2025. Post monitoring in field calibration was confirmed at 93.8dB. The calibration measurements did not differ by >1dB therefore all monitoring results are valid.
If meteorological conditions are likely to affect the measurements of noise, these must be considered and corrections applied (as appropriate), reported and justified. General advice on minimising the effects of meteorological conditions is described in section 6.3 of AS 1055:2018. Advice in relevant standards, policies and guidelines may also be appropriate, including fact sheet D of the Noise Policy for Industry. <u>Noise Policy for Industry</u> Do not take measurements when it is raining or when the average wind speed at microphone height exceeds 5 m/s.	No rainfall occurred during the monitoring. Local wind speed, wind direction and temperature were recorded using a handheld anemometer. Recorded wind speeds did not exceed 5 m/s. Weather observations are presented in Tables 3 and 6 for background and round 1 monitoring respectively.
Outdoor (free-field) measurements should be undertaken at least 3.5m from any reflecting structure (other than the ground) and at a height of 1.2–1.5m above ground level	The microphone was fitted with a windshield and held approximately 1.2–1.5 m above ground level during each measurement. Monitoring positions were selected to minimise the influence of significant reflecting surfaces, where practicable.
A measurement time interval of 15 minutes with a 'fast' (F) time weighting must be used for statistical descriptors, unless otherwise specified.	Each monitoring event was undertaken for 15 minutes using A-weighting and Fast time weighting. The recorded parameters included LAeq,15min and LA90,15min.

Assessment of Monitoring Results

Attended 15-minute noise measurements were undertaken on 5 September 2026 before and during the first out-of-hours work monitoring round at R2, R3 and R7. Unless otherwise stated, the measured levels represent total environmental noise at the monitoring locations, including project-related, non-project and other local noise sources.

The R2 background measurement, undertaken between 13:09 and 13:24, recorded an LAeq,15min of 52.9 dBA and an LAF90,15min of 38.5 dBA. An excavator unrelated to the project was reported to have operated continuously during the measurement. This is extraneous noise for the purpose of determining the project background level. Accordingly, the R2 measurement is not adopted for deriving the background level or rating background level. The LAF90,15min value of 38.5 dBA is not presented as a valid background level.

The R3 and R7 background measurements were also affected by local activities, including lawn mowing, a tractor and other local environmental sources. These results are retained as contemporaneous acoustic reference measurements, but are not incorporated as definitive background levels, because whilst a normal feature of the acoustic environment, they are of a known intermittent nature and influence on LAF90 results have not been determined.

At R2, two construction measurements were undertaken. The first measurement recorded an $L_{Aeq,15min}$ of 53.4 dBA and was affected by passing vehicles. The second measurement, undertaken at approximately 15:39, recorded an $L_{Aeq,15min}$ of 49.3 dBA and was adopted for comparison. Two excavators, a truck, reversing alarms and other construction-related sounds were audible during the adopted interval. The result was measured at the property boundary and not at the dwelling, which is approximately 310 m further from the nominal source.

At R3, the Round 1 $L_{Aeq,15min}$ was 43.5 dBA and the project was not audible. At R7, the Round 1 $L_{Aeq,15min}$ was 44.9 dBA. Very faint project-related grinding was audible at R7, but local sources, including lawn mowing, vehicles, birds and a rooster, also influenced the measurement.

Using the nominated 45 dBA $L_{Aeq,15min}$ noise management level, the total measured level at R2 was 4.3 dB above the NML, the R3 level was 1.5 dB below the NML and the R7 level was 0.1 dB below the NML. These comparisons apply to total measured noise at the monitoring locations and do not represent quantified project-only noise levels at the residences.

Table 10: Noise comparison table

Receptor	Background $L_{Aeq, 15min}$ (dBA)	Background $L_{A90, 15min}$ (dBA)	Round 1 $L_{Aeq, 15min}$ (dBA)	Round 1 $L_{A90, 15min}$ (dBA)	NML $L_{Aeq, 15min}$ (dBA)	Comparison
R2	52.9*	38.5*	49.3**	45.8**	45	4.3dB above NML at the alternative boundary location; not a source-specific result at the dwelling
R3	43.4	38.1	43.5	38.7	45	1.5dB below NML; project noise not audible
R7	41.9	37.2	44.9	35.1	45	0.1dB below unrounded; effectively at the NML when rounded

*The background measurement was influenced by a non-project excavator and is not considered representative of the typical background environment

**The adopted result was obtained from the second measurement. The first measurement was influenced by passing vehicles. Monitoring was located approximately.

Alternative R2 location and indicative distance screening

Access to the R2 dwelling was unavailable during monitoring. The R2 monitoring point was therefore used as an alternative location at the property boundary. The nominal source-to-monitoring-point distance was 108 m, and the dwelling was approximately 310 m further from the source. Assuming the source, monitoring point and dwelling are collinear:

For R2:

$$d_{S,R2} = 108 \text{ m}$$

$$d_{S,Rhouse} = 108 + 310 = 418 \text{ m}$$

The free-field point-source correction is:

$$\Delta L = 20 \log_{10} \left(\frac{d_{S,R2}}{d_{S,Rhouse}} \right)$$

$$\Delta L = 20 \log_{10} \left(\frac{108}{418} \right) = -11.8 \text{ dB}$$

Therefore:

$$L_{Rhouse} = L_{R2} - 11.8$$

Figure 3: Indicative source propagation equation

This is an indicative screening calculation only. It is not a Fact Sheet C correction and is not being presented as a measured or validated project-only level at the dwelling. The calculation assumes a fixed point source, free-field propagation, collinear geometry and no significant influence from terrain, ground effects, barriers, atmospheric absorption, source directivity or source movement. Because the R2 measurement included non-project noise and the excavators were mobile sources, a validated source-specific noise model or direct measurement at the dwelling is preferred for compliance assessment.

Discussion

The R2 background measurement was not suitable for determining the project background level because an unrelated excavator was operating during the entire measurement period. The large difference between the R2 LAeq,15min and LAF90,15min values indicates that the measurement interval was not acoustically stable and included a substantial elevated noise contribution. The two summary descriptors do not allow the excavator contribution to be identified or removed.

The R2 construction result of 49.3 dBA exceeded the nominated 45 dBA NML by 4.3 dB at the alternative property-boundary monitoring location. Construction noise from two excavators, a truck and reversing alarms was audible. However, the result also included non-project noise and was not measured at the dwelling. It therefore does not establish that project-only noise exceeded the NML at the residence.

The R3 construction result of 43.5 dBA was below the nominated NML and project noise was not audible. The similarity between the background reference LAeq and the Round 1 LAeq does not establish that the project contribution was zero; it indicates only that no identifiable project contribution could be quantified during the attended measurement.

The R7 construction result of 44.9 dBA was marginally below the nominated NML on an unrounded basis. Project-related grinding was faintly audible, but the measurement was also influenced by local sources. The project-only contribution could not be separated from the total measured level with sufficient confidence.

The indicative 11.8 dB distance reduction from the R2 monitoring point to the dwelling should not be used as a direct correction to the total measured LAeq. It may be retained as a clearly qualified screening calculation, utilising the reported assumptions and geometry. A validated project noise model, incorporating the actual source locations, terrain, ground effects, barriers and relevant meteorological conditions, should be used if a source-specific level at the dwelling is required.

Local wind speeds during the measurements were below 5 m/s and no rainfall was reported, which is generally suitable for attended environmental noise monitoring.

Overall, the monitoring identifies a potential management issue at the R2 alternative location but does not provide a defensible source-specific compliance determination at the R2 dwelling.

Conclusion

Attended noise monitoring was undertaken on 5 September 2026 at R2, R3 and R7 during the first out-of-hours construction monitoring round.

The R2 background measurement is excluded from formal background assessment because an unrelated excavator operated continuously during the measurement. The R3 and R7 background results are retained only as qualified contemporaneous reference measurements because local activities may have influenced those intervals.

At R2, the adopted total $L_{Aeq,15min}$ was 49.3 dBA, which was 4.3 dB above the nominated 45 dBA NML at the alternative property-boundary monitoring location. Project construction noise was audible; however, the result included non-project noise and was not measured at the dwelling. The result therefore does not confirm a project-only exceedance at the residence.

At R3, the total $L_{Aeq,15min}$ was 43.5 dBA, below the nominated NML, and project noise was not audible. At R7, the total $L_{Aeq,15min}$ was 44.9 dBA, marginally below the nominated NML on an unrounded basis, although faint project noise and other local sources were present.

The monitoring results do not demonstrate a project-only exceedance at a residence. They also do not provide a validated source-specific compliance result for R2 because the measurement was taken at an alternative location and the project contribution was not isolated. The R2 distance calculation should therefore be treated as indicative screening only.

Before the report is issued as a compliance record, the corrected instrument standards, calibration certificates, field sheets, photographs, source/receiver plan, weather records, measurement-time records and alternative-location justification should be included. Further monitoring at the dwelling or a validated source-specific noise model should be used to confirm the project contribution at R2.

Regards,

Elizabeth Ogunsoye
Senior Environmental Consultant
Author



Shonelle Gleeson-Willey
Principal Environmental Consultant
Field Scientist and QA check and Technical reviewer



Appendices

Appendix A - Sound level meter calibration certification



**Acoustic
Research
Labs Pty Ltd**

Unit 36/14 Loyalty Rd
North Rocks NSW AUSTRALIA 2151
Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
www.acousticresearch.com.au

Sound Calibrator

IEC 60942:2017

Calibration Certificate

Calibration Number C25684-V1

Client Details Acoustic Research Labs Pty Ltd
Unit 36, 14 Loyalty Road
North Rocks, NSW, 2151

Equipment Tested :	<i>Manufacturer</i>	<i>Model</i>	<i>Serial</i>
Instrument :	Pulsar	Model 105	99000

Atmospheric Conditions

Ambient Temperature : 22.5 °C
Relative Humidity : 38.6 %
Barometric Pressure : 100.1 kPa

Calibration Technician : Ken Williams
Calibration Date : 17-Oct-2025
Secondary Check: Rhys Gravelle
Report Issue Date : 29-Apr-2026

Approved Signatory :

Ken Williams

Characteristic Tested	Result
Generated Sound Pressure Level	Pass
Frequency Generated	Pass
Total Distortion	Pass

Nominal Level	Nominal Frequency	Measured Level	Measured Frequency
94	1000	93.92	1000.30

The sound calibrator has been shown to conform to the class 1 requirements for periodic testing, described in Annex B of IEC 60942:2017 for the sound pressure level(s) and frequency(ies) stated, for the environmental conditions under which the tests were performed..

Uncertainties of Measurement -

Specific Tests	Environmental Conditions
Generated SPL	Temperature
Frequency	Relative Humidity
Distortion	Barometric Pressure

±0.10 dB
±0.07 %
±0.20 %

±0.1 °C
±1.9 %
±0.019 kPa

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.



This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - Calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.



**Acoustic
Research
Labs Pty Ltd**

Unit 36/14 Loyalty Rd
North Rocks NSW AUSTRALIA 2151
Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
www.acousticresearch.com.au

Sound Calibrator

IEC 60942:2017

Calibration Test Report

Calibration Number C25684-V1

Client Details		Acoustic Research Labs Pty Ltd Unit 36, 14 Loyalty Road North Rocks, NSW, 2151		
Equipment Tested :	Manufacturer	Model	Serial	
Instrument :	Pulsar	Model 105	99000	
Atmospheric Conditions				
Ambient Temperature :	22.5 °C			
Relative Humidity :	38.6 %			
Barometric Pressure :	100.1 kPa			
Calibration Technician :	Ken Williams	Secondary Check:	Rhys Gravelle	
Calibration Date :	17-Oct-2025	Report Issue Date :	29-Apr-2026	
Approved Signatory :				Ken Williams

Characteristic Tested	Result
Generated Sound Pressure Level	Pass
Frequency Generated	Pass
Total Distortion	Pass

The sound calibrator has been shown to conform to the class 1 requirements for periodic testing, described in Annex B of IEC 60942:2017 for the sound pressure level(s) and frequency(ies) stated, for the environmental conditions under which the tests were performed..

Uncertainties of Measurement -			
Specific Tests	Environmental Conditions		
	Generated SPL	±0.10 dB	Temperature ±0.1 °C
	Frequency	±0.07 %	Relative Humidity ±1.9 %
	Distortion	±0.20 %	Barometric Pressure ±0.019 kPa

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.



This report applies only to the item tested and shall only be reproduced in full, unless approved in writing by Acoustic Research Labs.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - Calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

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1. REVISION HISTORY

Revision	Date	Description
1	29-Apr-2026	Original Issue

2. OVERVIEW

This report presents the calibration test results of a Model 105 Acoustic Calibrator, and associated equipment. Calibration is carried out in accordance with *IEC 60942-2017, Electroacoustics - Sound Calibrators*.

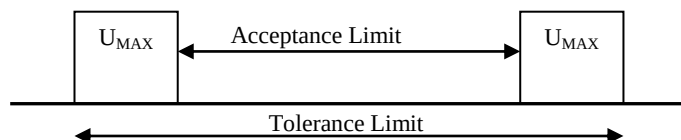
Relevant clauses from this standard have been used for periodic testing in conjunction with Acoustic Research Labs internal test methods described in Section 2 of the calibration work instruction manual.

This report was generated using template version identifier of 978e1342.

2.1 UNCERTAINTIES

For each test performed, the associated measurement uncertainties are derived at the 95% confidence level and are given with a coverage factor of 2.

The uncertainty applies at the time of measurement only, and takes no account of any drift or other effects that may apply afterwards. When estimating uncertainty at any later time, other relevant information should also be considered, including, where possible, the history of the performance of the instrument and the manufacturer's specifications.



Where deviations from the design goals are provided to determine conformance to performance specifications, each measurement is reported with:

- The measured deviation from the design goal
- Associated acceptance limits for the test
- Maximum allowable uncertainty of measurement for the test
- Actual expanded uncertainty for each measurement

2.2 DOCUMENT CONVENTIONS

Test results which highlight non-conformances relative to the standard, and the sound level meter type specified by the manufacturer have been marked with an **F** in the respective tests.

Any tests that are not required, due to sound level meter configuration, are marked N/A.

3. GENERAL

3.1 DEVICE UNDER TEST

Equipment Tested :	<i>Manufacturer</i>	<i>Model</i>	<i>Serial</i>
Instrument :	Pulsar	Model 105	99000

Instrument received in fair condition.

3.2 ENVIRONMENTAL CONDITIONS DURING TEST

No corrections have been applied to any results obtained to compensate for the environmental conditions.

All tolerance limits stated apply to measurements made at and around reference environmental conditions within the following ranges:

80 kPa to 105 kPa

20°C to 26°C

25% to 90% relative humidity

3.3 CALIBRATION TESTS

Where applicable the following tests were performed in accordance with the requirements of IEC 60942-2017 Annex B.

3.4 TEST EQUIPMENT USED

All test equipment used during periodic testing are calibrated every 12months by an accredited laboratory, traceable to SI units.

The performance of all equipment during these calibrations and the effects of instrument stability are used to determine the measurement uncertainty of each reported result.

3.4.1 Multi-function Acoustic Calibrator

A Bruel & Kjaer 4226 Multi-function calibrator (S/N – 3215300) was used as the reference for the sound pressure level and the signal frequency.

3.4.2 Sound Level Meter

ARL Ngara Class 1 (S/N – 878035). This device was used for converting acoustic signals into voltages which may be measured by the multimeter.

3.4.3 Audio Analyser

Abonet Audio Analyzer AVR-3710 (S/N – V859B9018). This device was used for measuring the AC voltage output of the reference Ngara unit. The AC level is proportional to the sound pressure level and frequency applied to the reference microphone.

3.4.4 Environmental Monitoring

A MHB-382SD (S/N – AH88227) was used for measuring environmental conditions during device calibration. It is capable of providing temperature, relative humidity and pressure measurements.

4. CALIBRATION TEST RESULTS

4.1 SOUND PRESSURE LEVEL

4.1.1 Generated Sound Pressure Level

The sound pressure level generated by the sound calibrator was measured three times as an average over 20 s of operation. During each measurement the sound calibrator was decoupled and rotated from the microphone to ensure any variations in operation were captured.

Table 1 – Generated Sound Pressure Level Results

Nominal Level (dB)	Nominal Frequency (Hz)	Measured Level (dB)	Deviation (dB)	Acceptance Limit (dB)	P/F	Uncertainty (dB)	Maximum Permitted Uncertainty (dB)
94	1000	93.92	0.08	±0.25	P	0.10	0.15

4.2 FREQUENCY OUTPUT

The frequency generated by the sound calibrator was measured as an average over 20s of operation. The deviation from expected values is calculated as the absolute value of the difference in per cent between the frequency of the sound generated by the sound calibrator and the corresponding specified frequency.

Table 2 – Frequency Output Results

Nominal Level (dB)	Nominal Frequency (Hz)	Measured Frequency (Hz)	Deviation (Hz)	Acceptance Limit (Hz)	P/F	Uncertainty (Hz)	Maximum Permitted Uncertainty (Hz)
94	1000	1000.30	0.30	±7.00	P	0.70	2.00

4.3 TOTAL HARMONIC DISTORTION AND NOISE

The total harmonic distortion and noise (THD+N), measured over the frequency range from 22,5 Hz to 20 kHz, was measured as an average over 20s of operation.

Table 3 – THD+N Results

Nominal Level (dB)	Nominal Frequency (Hz)	Distortion (%)	Acceptance Limit (%)	P/F	Uncertainty (%)	Maximum Permitted Uncertainty (%)
94	1000	0.78	±2.50	P	0.20	0.50

Appendix B – Field sheets and photos



Noise Monitoring Field Sheet

Project: Tamworth 330kV Substation

Field	Details
Receptor Number	R2 Baseline
Address	696 Burgmanns Lane, Calala
Date	5/9/2026
Start Time	1:14pm
Finish Time	
Monitoring Duration	15min

Weather Conditions

Parameter	Observation
Temperature	27.1
Wind Speed	2.41
Wind Direction	NW
Rainfall	☒ None ☐ Drizzle ☐ Light ☐ Moderate ☐ Heavy
General Conditions	Overcast, light wind

Noise Observations

Dominant noise sources observed:

Birds, plover,

Other / extraneous noise sources:

Birds, plover,

Construction/project activities audible:

☐ No☒ Yes



If yes, describe:

One excavator not associated with this project. Monitoring paused when audible. Reversing beeper and horn audible. Two cars and one plane, music faintly heard throughout. Car 1@ 6min car 2@9 min, car 3@12 min, car 4@12:33min, car 5@ 13min,, motorbike@14min, car 6@ 14:39,

Field Notes

No access to property granted

Monitoring undertaken by: Shonelle Gleeson-Willey

Signature:

Noise Monitoring Field Sheet

Project: Tamworth 330kV Substation

Field	Details
Receptor Number	R3 Baseline
Address	57 Falcon Drive, Calala
Date	5/9/2026
Start Time	1:45pm
Finish Time	2:00pm
Monitoring Duration	15min

Weather Conditions

Parameter	Observation
Temperature	26.3
Wind Speed	4.4-2
Wind Direction	NW
Rainfall	☒ None ☐ Drizzle ☐ Light ☐ Moderate ☐ Heavy
General Conditions	Overcast

Noise Observations

Dominant noise sources observed:

Mowing, bird

Other / extraneous noise sources:

Mowing, bird Noises



If yes, describe:

Field Notes

No access to property granted

Monitoring undertaken by: Shonelle Gleeson-Willey

Signature:

Noise Monitoring Field Sheet

Project: Tamworth 330kV Substation

Field	Details
Receptor Number	R7 Baseline
Address	111, Burgess Lane Calala
Date	5/9/2026
Start Time	2:20pm
Finish Time	2:35pm
Monitoring Duration	15min

Weather Conditions

Parameter	Observation
Temperature	25.9
Wind Speed	3.65
Wind Direction	NW
Rainfall	☒ None ☐ Drizzle ☐ Light ☐ Moderate ☐ Heavy
General Conditions	Overcast

Noise Observations

Dominant noise sources observed:

Mowing, birds. Cars driving on dirt road, siren, chickens at 10min

Other / extraneous noise sources:

Construction/project activities audible:

☒ No ☐ Yes



Construction/project activities audible:

☒ No ☐ Yes

If yes, describe:

Field Notes

Access to property granted by owner.

Monitoring undertaken by: S.Gleeson-Willey

Signature: _____

Noise Monitoring Field Sheet

Project: Tamworth 330kV Substation

Field	Details
Receptor Number	R2
Address	696 Burgmanns Lane, Calala
Date	5/9/2026
Start Time	3:23pm
Finish Time	
Monitoring Duration	15min

Weather Conditions

Parameter	Observation
Temperature	27.5
Wind Speed	1.5
Wind Direction	NW
Rainfall	☒ None ☐ Drizzle ☐ Light ☐ Moderate ☐ Heavy
General Conditions	Overcast

Noise Observations

Dominant noise sources observed:

Construction	Machinery and birds, cars driving past on dirt road occasionally
--------------	--

Other / extraneous noise sources:

Construction	
--------------	--

Construction/project activities audible:

☐ No ☒ Yes



Construction/project activities audible:

☐ No ☒ Yes

If yes, describe:

Two excavators digging with tooth and blade buckets, reversing non tonal beeper, track noise

Field Notes

No access to property granted

Monitoring undertaken by: Shonelle Gleeson-Willey

Signature:

Noise Monitoring Field Sheet

Project: Tamworth 330kV Substation

Field	Details
Receptor Number	R3
Address	57 Falcon Drive, Calala
Date	5/9/2026
Start Time	3:01pm
Finish Time	3:16pm
Monitoring Duration	15min

Weather Conditions

Parameter	Observation
Temperature	26
Wind Speed	1.47
Wind Direction	NW
Rainfall	☒ None ☐ Drizzle ☐ Light ☐ Moderate ☐ Heavy
General Conditions	Overcast

Noise Observations

Dominant noise sources observed:

Cars on dirt Mowing, children playing, birds song

Other / extraneous noise sources:

Cars on dirt r

Construction/project activities audible:

☒ No ☐ Yes



Construction/project activities audible:

☒ No ☐ Yes

If yes, describe:

Field Notes

No Access to property granted

Monitoring undertaken by: Shonelle Gleeson-Willey

Signature:

Noise Monitoring Field Sheet

Project: Tamworth 330kV Substation

Field	Details
Receptor Number	R7
Address	111, Burgess Lane Calala
Date	5/9/2026
Start Time	2:39pm
Finish Time	2:54pm
Monitoring Duration	15min

Weather Conditions

Parameter	Observation
Temperature	26.6
Wind Speed	0.9
Wind Direction	NW
Rainfall	☒ None ☐ Drizzle ☐ Light ☐ Moderate ☐ Heavy
General Conditions	Overcast

Noise Observations

Dominant noise sources observed:

Cars on dirt Road. Rooster crowing at approx 11min

Other / extraneous noise sources:

Cars on dirt Road, mowing, birds

Construction/project activities audible:

☐ No ☒ Yes



If yes, describe:

Very faint grinding sound

Field Notes

Access granted by owner

Monitoring undertaken by: S.Gleeson-Willey

Signature:

Baseline calibration



Round 1 calibration



R2 Base recording screen



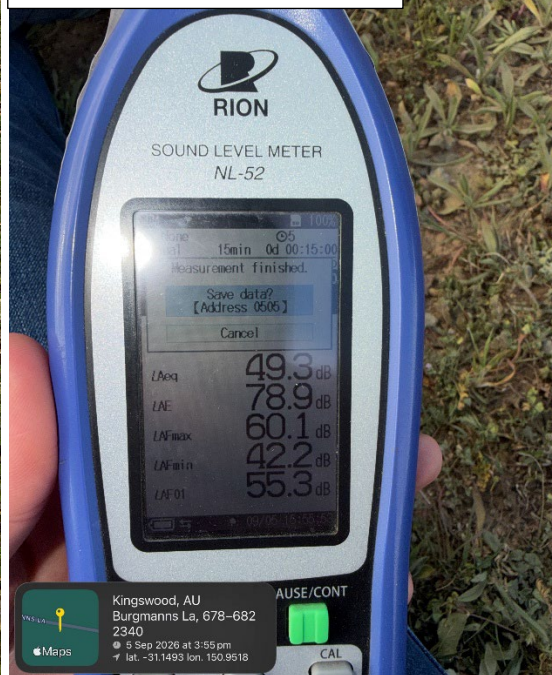
R3 Base recording screen



R7 Base recording screen



R2 Round 1 recording screen



R3 Round 1 recording screen



R7 Round 1 recording screen

