Benedict Recycling - Smeaton Grange

Verification noise monitoring

Prepared for Benedict Recycling Pty Ltd

April 2025

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Verification noise monitoring

Benedict Recycling Pty Ltd

E241087 RP#2

April 2025

Version	Date	Prepared by	Reviewed by	Comments
1	9 April 2025	Ingrid Smith	Robert Kirwan	Draft
2	10 April 2025	Ingrid Smith	Robert Kirwan	Final

Approved by

Robert Kirwan
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10 April 2025

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Tables

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1 Introduction

1.1 Background

EMM Consulting Pty Ltd (EMM) was engaged by Benedict Recycling Pty Ltd to conduct a verification noise survey of operations at Benedict Recycling Smeaton Grange (Benedict Recycling, the site) located at 52 Anderson Road, Smeaton Grange NSW. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified limits.

Attended environmental noise monitoring described in this report was done during the morning shoulder and day periods on Tuesday 8 April 2025 at two monitoring locations.

1.2 Attended monitoring locations

Site monitoring locations are detailed in Table 1.1 and shown on Figure 1.1. It should be noted that Figure 1.1 shows actual monitoring positions, not necessarily the location of residences.

Table 1.1 Attended noise monitoring locations

Location descriptor/ID	Description/address	Coordinates (GDA94 MGA Zone 56)	
		Easting	Northing
R9	Chapman Circuit, Currans Hill	293919	6231192
R22[1]	Turner Road, Gregory Hills	294119	6231518

Notes: 1. It is of note that the residence denoted by R22 (143 & 165 Turner Road, Gregory Hills) has since been demolished. Given this, an alternative noise monitoring location was used to represent the nearest private residence (170 Turner Road, Gregory Hills) to R22.

KEY

- Site boundary
- Assessment location
- Noise monitoring location

Existing environment

- Named watercourse
- Cadastral boundary

INSET KEY

- Major road
- NPWS reserve
- State forest

Source: EMM (2024); ABS (2021); DCSSS (2024); GA (2009); MetroMap (2024)

0 100 200 m

GDA2020 MGA Zone 56

N

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Noise monitoring locations and site boundary

Benedict Recycling - Smeaton Grange
Verification Noise Monitoring
Figure 1.1

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1.3 Terminology and abbreviations

Some definitions of terms and abbreviations which may be used in this report are provided in Table 1.2.

Table 1.2 Terminology and abbreviations

Term/descriptor	Definition
dB(A)	Noise level measurement units are decibels (dB). The "A" weighting scale is used to approximate how humans hear noise.
L_{Amax}	The maximum root mean squared A-weighted noise level over a time period.
L_{A1}	The A-weighted noise level which is exceeded for one per cent of the time.
$L_{A1,1minute}$	The A-weighted noise level which is exceeded for one per cent of the specified time period of one minute.
L_{A10}	The A-weighted noise level which is exceeded for 10 per cent of the time.
L_{Aeq}	The energy average A-weighted noise level.
L_{A50}	The A-weighted noise level which is exceeded for 50 per cent of the time, and is also the median noise level during a measurement period.
L_{A90}	The A-weighted noise level exceeded for 90 percent of the time, also referred to as the "background" noise level and commonly used to derive noise limits.
L_{Amin}	The minimum A-weighted noise level over a time period.
L_{Ceq}	The energy average C-weighted noise energy during a measurement period. The "C" weighting scale is used to take into account low-frequency components of noise within the audibility range of humans.
SPL	Sound pressure level. Fluctuations in pressure are measured as 10 times a logarithmic scale, with the reference pressure being 20 micropascals.
Hertz (Hz)	The frequency of fluctuations in pressure, measured in cycles per second. Most sounds are a combination of many frequencies together.
AWS	Automatic weather station used to collect meteorological data, typically at an altitude of 10 metres
VTG	The vertical temperature gradient in degrees Celsius per 100 metres altitude.
Sigma-theta	The standard deviation of the horizontal wind direction over a period of time.
IA	Inaudible. When site noise is noted as IA then there was no site noise at the monitoring location.
NM	Not Measurable. If site noise is noted as NM, this means some noise was audible but could not be quantified.
Day	Monday – Saturday: 7 am to 6 pm, on Sundays and Public Holidays: 8 am to 6 pm.
Evening	Monday – Saturday: 6 pm to 10 pm, on Sundays and Public Holidays: 6 pm to 10 pm.
Night	Monday – Saturday: 10 pm to 7 am, on Sundays and Public Holidays: 10 pm to 8 am.
Temperature inversion	A meteorological condition where the atmospheric temperature increases with altitude.

Appendix A provides further information that gives an indication as to how an average person perceives changes in noise level, and examples of common noise levels.

2 Noise limits

2.1 Development consent

Benedict Recycling noise limits are provided in Table 4, Condition B.5 of Schedule 2 Part B of the current development consent SSD 7424 (DC) dated 22 December 2017. Relevant sections of the DC are reproduced in Appendix B.1.

2.2 Environment protection licence

Benedict Recycling noise limits are provided in Condition L4.1 of the current EPL 21328 (EPL) dated 3 July 2024. Relevant sections of the EPL are reproduced in Appendix B.2.

2.3 Noise management plan

The approved current ONVMP (dated March 2018) adopts two attended noise monitoring locations that are representative of residences outlined in the DC and EPL. Relevant sections of the ONVMP are reproduced in Appendix B.3.

2.4 Noise limits

Noise limits based on the NMP and consistent with the DC and EPL are as shown in Table 2.1.

Table 2.1 Noise impact limits, dB

Location	Day $L_{Aeq,15minute}$	Evening $L_{Aeq,15minute}$	Night $L_{Aeq,15minute}$
All residential receivers	40	40	40

2.5 Meteorological conditions

The DC (which the NMP also references) states that:

> Noise generated by the Development is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy.

Meanwhile, the EPL states that:

> Noise generated by the Development is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the Noise Policy for Industry (NPfI) (2017).

Given the NPfI is the more recent policy document and supersedes the NSW Industrial Noise Policy, this assessment has measured noise generated by the development in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the NPfI.

2.6 Additional considerations

Monitoring and reporting have been done in accordance with the NSW EPA 'Noise Policy for Industry' (NPfI) issued in October 2017 and the 'Approved methods for the measurement and analysis of environmental noise in NSW' (Approved Methods) issued in January 2022.

2.7 Very noise-enhancing meteorological conditions

In accordance with the Approved Methods, noise monitoring for the site is scheduled to occur during forecasted meteorological conditions where noise limits in Table 2.1 will be applicable. However, in cases where actual meteorological conditions do not align with forecasts and noise limits are subsequently not directly applicable, it is the expectation of regulators that noise impact still be managed.

The NPfI states that:

> Noise limits derived for consents and licences will apply under the meteorological conditions used in the environmental assessment process, that is, standard or noise-enhancing meteorological conditions. For 'very noise-enhancing meteorological conditions' … a limit is set based on the limit derived under standard or noise-enhancing conditions (whichever is adopted in the assessment) plus 5 dB. In this way a development is subject to noise limits under all meteorological conditions.

Therefore, if noise monitoring occurs during meteorological conditions outside of those specified in Section 2.4, site limits are adjusted based on Table 2.1 plus 5 dB.

3 Methodology

3.1 Overview

Attended environmental noise monitoring was done in general accordance with Australian Standard AS1055:2018 'Acoustics, Description and Measurement of Environmental Noise' and relevant EPA requirements. Meteorological data was obtained from the Bureau of Meteorology's Campbelltown (Mount Annan) weather station (AWS) (Station ID 068257)which allowed the correlation of atmospheric parameters with measured noise levels.

3.2 Attended noise monitoring

Attended noise monitoring was done during the morning shoulder and day periods at each location. The duration of each measurement was 15 minutes. Atmospheric conditions were measured at each monitoring location.

Measured sound levels from various sources were noted during each measurement, and particular attention was paid to the extent of site contribution (if any) to measured levels. At each monitoring location, the site-only $L_{Aeq,15minute}$ and L_{Amax} were measured directly or determined by other methods detailed in Section 7.1 of the NPfI.

The terms 'Inaudible' (IA) or 'Not Measurable' (NM) may be used in this report. When site noise is noted as IA, it was inaudible at the monitoring location. When site noise is noted as NM, this means it was audible but could not be quantified. All results noted as IA or NM in this report were due to one or more of the following:

- Site noise levels were very low, typically more than 10 dB below the measured background (L_{A90}), and unlikely to be noticed.
- Site noise levels were masked by more dominant sources that are characteristic of the environment (such as breeze in foliage or continuous road traffic noise) that cannot be eliminated by monitoring at an alternate or intermediate location.
- It was not feasible or reasonable to employ methods, such as to move closer and back calculate. Cases may include rough terrain preventing closer measurement, addition/removal of significant source to receiver shielding caused by moving closer, and meteorological conditions where back calculation may not be accurate.

If exact noise levels from site could not be established due to masking by other noise sources in a similar frequency range but were determined to be at least 5 dB lower than relevant limits, then a maximum estimate may be provided. This is expressed as a 'less than' quantity, such as <20 dB or <30 dB.

For this assessment, the measured L_{Amax} has been used as a conservative estimate of $L_{A1,1minute}$. The EPA accepts sleep disturbance analysis based on either the $L_{A1,1minute}$ or L_{Amax} metrics, with the L_{Amax} representing a more conservative assessment of site noise emissions.

3.3 Meteorological data

This assessment determined stability categories throughout the attended monitoring period using the 'Pasquill-Gifford stability classification scheme' method from section D1.3.1 of Fact Sheet D of the Noise Policy for Industry (NSW EPA, 2017).

3.4 Modifying factors

All measurements were evaluated for potential modifying factors in accordance with the NPfI. If applicable, modifying factor penalties have been reported and added to the measured site only L_{Aeq} noise levels.

Low-frequency modifying factor penalties have only been applied to site-only L_{Aeq} if the site was the only contributing low-frequency noise source. Specific methodology for assessment of each modifying factor is outlined in Fact Sheet C of the NPfI.

3.5 Instrumentation and personnel

Attended noise monitoring was conducted by Ingrid Smith. Qualifications, experience, and/or demonstration of competence is in accordance with the EPA's Approved methods and supportive documentation is available upon request.

Equipment used to measure environmental noise levels is detailed in Table 3.1. Calibration certificates are provided in Appendix C.

Table 3.1 Attended noise monitoring equipment

Item	Serial number	Calibration due date	Relevant standard
Brüel & Kjær 2250 sound level meter	3008201	12/7/2025	IEC 61672-1:2013
Svantek SV-36 calibrator	154613	5/6/2025	IEC 60942:2017

4 Results

4.1 Total measured noise levels and atmospheric conditions

Overall (all sources) noise levels measured at each location during attended measurements are provided in Table 4.1. Discussion as to the sources responsible for measured levels is provided in Section 5 of this report.

Table 4.1 Total measured noise levels, dB – 8 April 2025[1]

Location	Start date	Time	L_{Amax}	L_{A1}	L_{A10}	L_{Aeq}	L_{A50}	L_{A90}	L_{Amin}
R22	08/04/2025	06:22	68	62	53	52	49	48	46
R9	08/04/2025	06:45	65	57	52	49	47	45	43
R9	08/04/2025	07:03	69	63	55	52	48	45	43
R22	08/04/2025	07:30	71	65	59	56	53	50	48

Notes: 1. Levels in this table are not necessarily the result of activity at the site.

Atmospheric condition data measured by the operator during each measurement using a hand-held weather meter is shown in Table 4.2. The wind speed, direction and temperature were measured at approximately 1.5 metres above ground. Attended noise monitoring is not done during rain, hail, or wind speeds above 5 m/s at microphone height.

Table 4.2 Atmospheric conditions measured at microphone height – 8 April 2025

Location	Date	Time	Temperature °C	Wind speed m/s	Wind direction °Magnetic north	Cloud cover 1/8s
R22	08/04/2025	06:22	17	<0.5	-	6
R9	08/04/2025	06:45	21	<0.5	-	5
R9	08/04/2025	07:03	19	<0.5	-	5
R22	08/04/2025	07:30	16	0.5	229	7

4.2 Site only noise levels

4.2.1 Modifying factors

There were no modifying factors, as defined in the NPfI, applicable during the survey.

4.2.2 Monitoring results

Table 4.3 provides site noise levels in the absence of other sources, where possible, and includes weather data from the AWS. Limits are applicable if weather conditions were within specified parameters during each measurement.

Table 4.3 Site noise levels and limits – 8 April 2025

Location	Start Date	Time	Wind		Stability Class	Very enhancing? [1]	Limit, dB	Site level, dB [2]	Exceedance, dB
			Speed m/s	Direction° [3]			$L_{Aeq,15minute}$	$L_{Aeq,15minute}$	$L_{Aeq,15minute}$
R22	08/04/2025	06:22	1.0	188	D	No	40	IA	Nil
R9	08/04/2025	06:45	0.0	-	D	No	40	31	Nil
R9	08/04/2025	07:03	1.5	225	D	No	40	39	Nil
R22	08/04/2025	07:30	1.5	224	D	No	40	38	Nil

Notes:
1. Noise emission limits are applicable if weather conditions were within parameters specified in Section 2.5.
2. Site-only $L_{Aeq,15minute}$, includes modifying factor penalties if applicable.
3. Degrees magnetic north, "-" indicates calm conditions.
4. IA in the site level column means that the site was deemed inaudible at that location.
5. Adjusted limits (+5 dB) due to 'very noise-enhancing' meteorological conditions in accordance with the EPL.

5 Discussion

5.1 Noted noise sources

During attended monitoring, the time variations (temporal characteristics) of noise sources are considered in each measurement via statistical descriptors. From these observations, summaries have been derived for the location and provided in this chapter. Statistical 1/3 octave-band analysis of environmental noise was undertaken, and the following figures display frequency ranges of various noise sources at each location for L_{A1}, L_{A10}, L_{Aeq}, L_{A50}, and L_{A90} descriptors. These figures also provide, graphically, statistical information for these noise levels.

An example is provided as Figure 5.1, where frogs and insects are seen to be generating noise at frequencies above 1000 Hz, while industrial noise is observed at frequencies less than 1000 Hz.

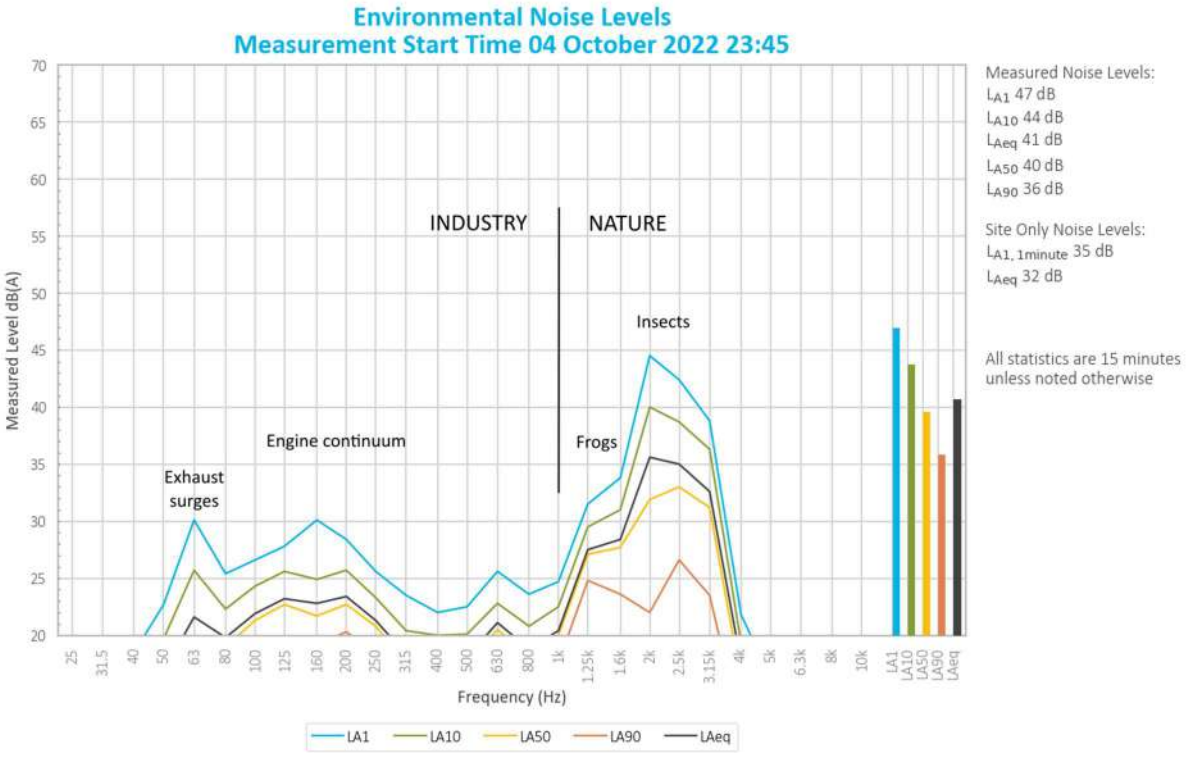

Figure 5.1 Example graph

5.2 R22 – Turner Road, Gregory Hills (Morning Shoulder)

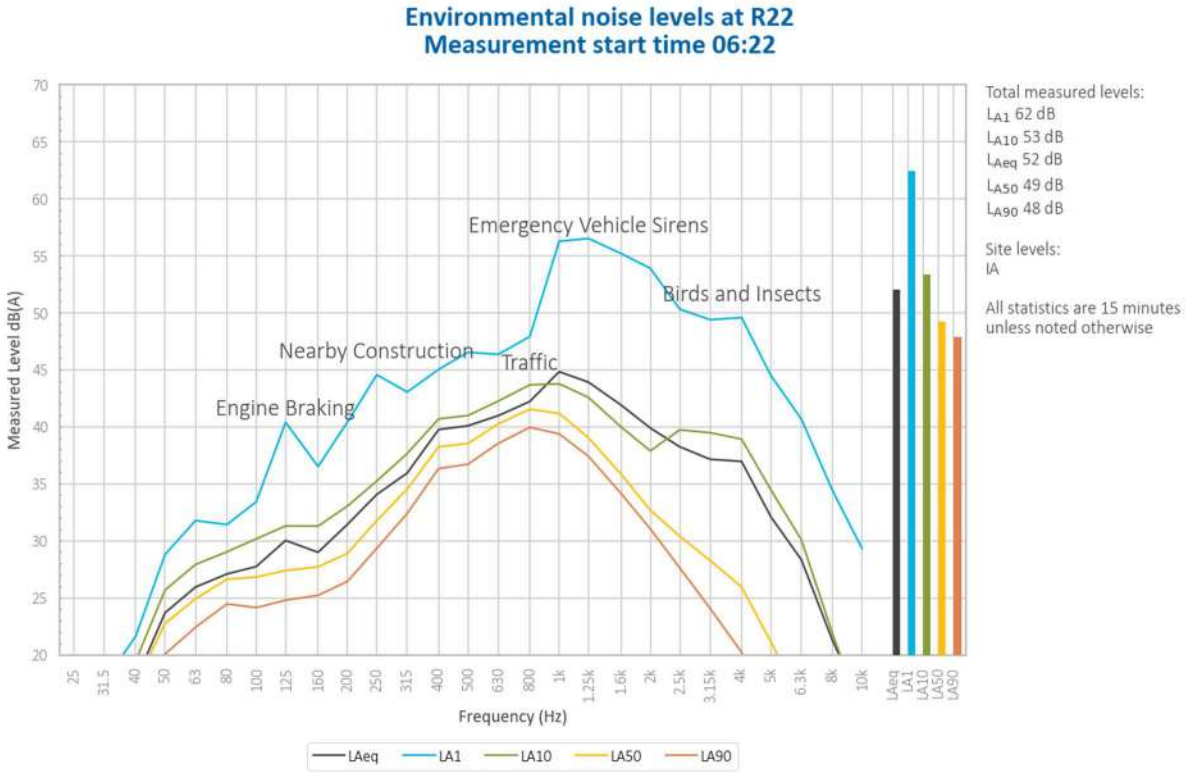

Figure 5.2 Environmental noise levels – R22, Turner Road, Gregory Hills (Morning Shoulder)

Benedict Smeaton Grange was inaudible throughout the measurement.

Nearby construction, emergency vehicle sirens, and trucks not associated with site were the main contributors to the measured levels.

Noise from local traffic and birds and insects was also noted.

5.3 R9 – Chapman Circuit, Currans Hill (Morning Shoulder)

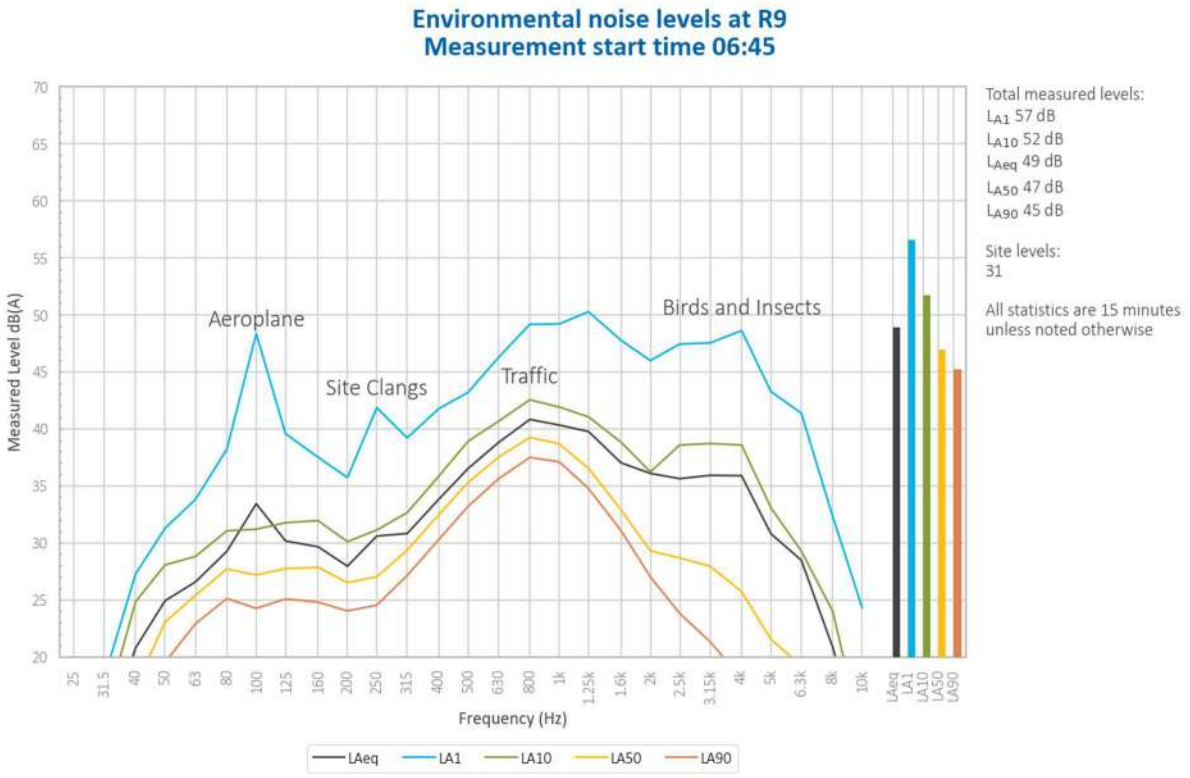

Figure 5.3 Environmental noise levels – R9, Chapman Circuit, Currans Hill (Morning Shoulder)

Benedict Smeaton Grange was occasionally audible throughout the measurement, including vehicle movements and site noise. This generated a site $L_{Aeq,15minute}$ of 31 dB.

Bird noise, aeroplanes, and road traffic noise generated the measured levels.

5.4 R9 – Chapman Circuit, Currans Hill (Day)

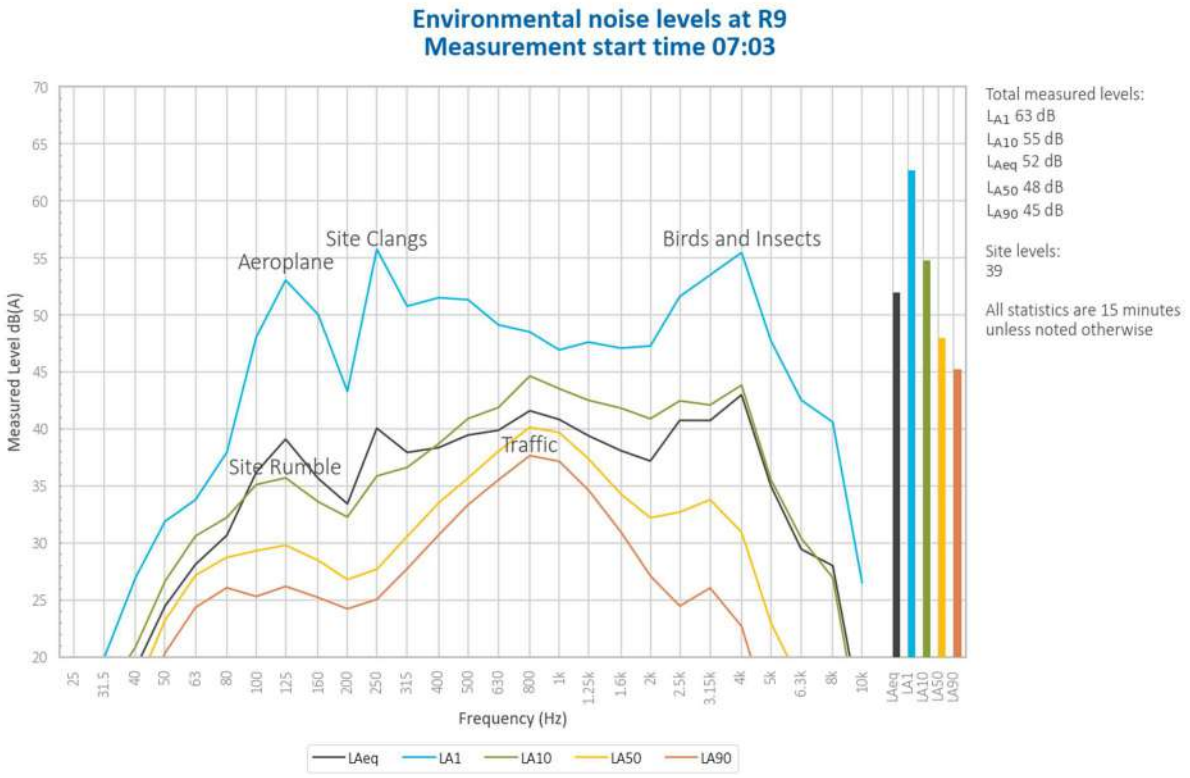

Figure 5.4 Environmental noise levels - R9, Chapman Circuit, Currans Hill (Day)

Benedict Smeaton Grange was occasionally audible throughout the measurement, including vehicle movements and site noise. This generated a site $L_{Aeq,15minute}$ of 39 dB.

Bird noise, road traffic noise and aeroplanes generated the measured levels.

5.5 R22 – Turner Road, Gregory Hills (Day)

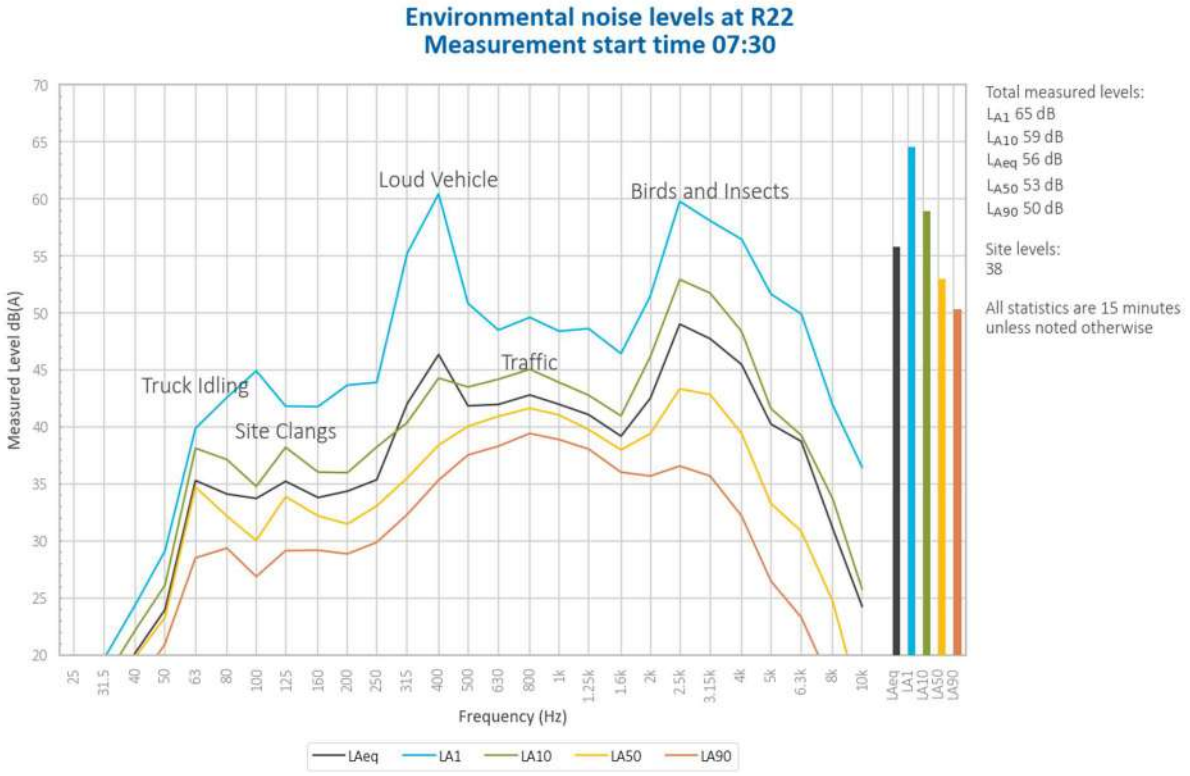

Figure 5.5 Environmental noise levels – R22, Turner Road, Gregory Hills (Day)

Benedict Smeaton Grange was occasionally audible throughout the measurement, including impact noise from site. This generated a site $L_{Aeq,15minute}$ of 38 dB.

Nearby construction vehicles, road traffic noise and birds and insects generated the measured levels.

6 Summary

EMM Consulting Pty Ltd (EMM) was engaged by Benedict Recycling Pty Ltd to conduct a verification noise survey of operations at Benedict Recycling. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified noise limits.

Attended environmental noise monitoring described in this report was done during the morning shoulder and day periods on Tuesday 8 April 2025 at two monitoring locations as per the approved NMP.

Noise from the site complied with relevant limits at all monitoring locations during this verification survey.

Appendix A
Noise perception and examples

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A.1 Noise levels

Table A.1 gives an indication as to how an average person perceives changes in noise level. Examples of common noise levels are provided in Figure A.1.

Table A.1 Perceived change in noise

Change in sound pressure level (dB)	Perceived change in noise
up to 2	Not perceptible
3	Just perceptible
5	Noticeable difference
10	Twice (or half) as loud
15	Large change
20	Four times (or a quarter) as loud

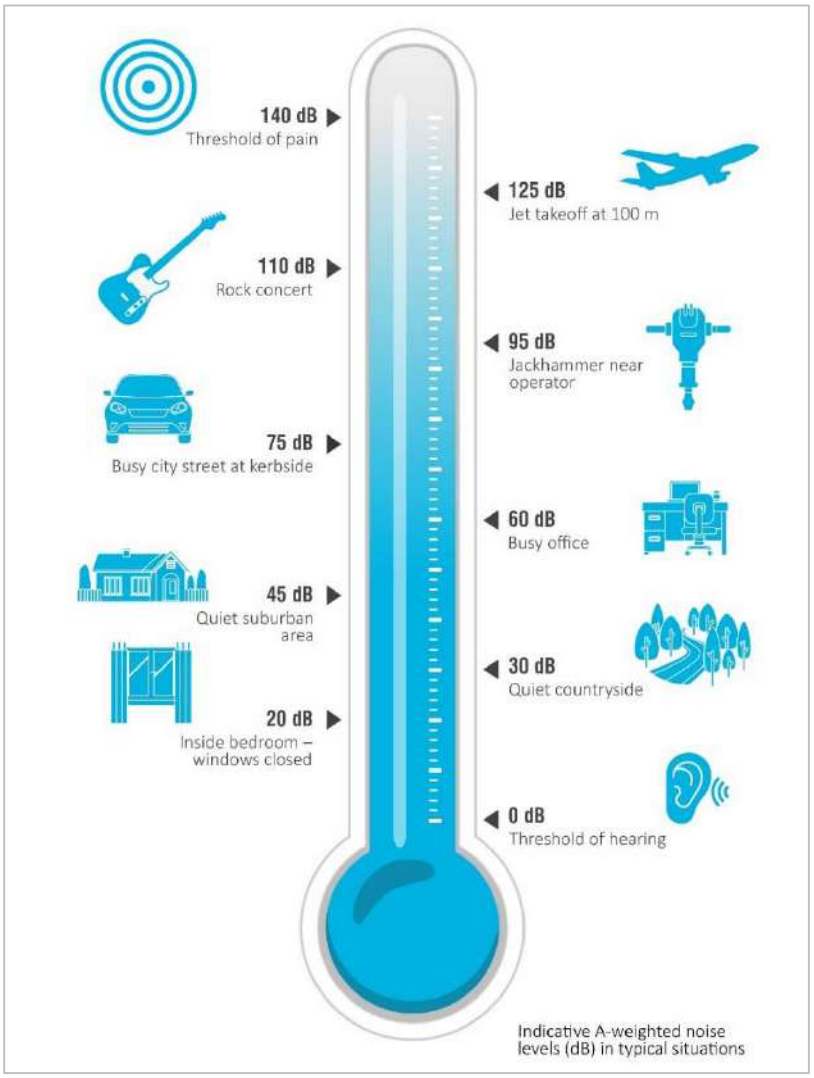

Figure A.1 Common noise levels

Appendix B
Regulator documents

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B.1 Development consent

PART B: ENVIRONMENTAL PERFORMANCE AND MANAGEMENT

NOISE

Hours of Work

B1. The Applicant must comply with the hours of work detailed in Table 3 unless otherwise agreed in writing by the Planning Secretary.

Table 3: Hours of Work

Activity	Day	Time
Accept waste deliveries and dispatch	Monday – Friday Saturday Sunday	6 am to 10 pm 6 am to 5 pm 8 am to 4 pm
Waste processing	Monday – Friday Saturday	7 am to 6 pm 7 am to 4 pm

B2. Works outside of the hours identified in Condition B1 may be undertaken in the following circumstances:

(a) for the delivery of materials required outside these hours by the NSW Police Force or other authorities for safety reasons; or

(b) where it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm.

Construction Noise Management Plan

B3. Prior to the commencement of construction, the Applicant must prepare a Construction Noise and Vibration Management Plan (CNVMP) for the development to manage high noise generating works to the satisfaction of the Planning Secretary. The CNVMP shall form part of the CEMP required by Condition C1 and must:

(a) be prepared by a suitably qualified and experienced noise expert;

(b) be approved by the Planning Secretary prior to the commencement of construction the Development;

(c) describe the management and mitigation measures and procedures for achieving the noise management levels in the EPA's *Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2009);

(d) identify high emission generating construction activities, including proposed times when these works will be carried out (including respite periods if required) and mitigation measures to minimise adverse impacts from these activities;

(e) include strategies that have been developed with the community for managing high noise generating works;

(f) describe the community consultation undertaken to develop the strategies in (e) above; and

(g) include a complaints management system that would be implemented for the duration of the Development.

B4. The Applicant must:

(a) not commence construction until the CNVMP required by Condition B3 is approved by the Planning Secretary; and

(b) The Applicant must ensure the CNVMP (as required and approved by the Planning Secretary from time to time) isimplemented during construction of the Development.

Operational Noise Criteria

B5. The Applicant must ensure that noise generated by operation of the Development does not exceed the noise criteria in Table 4.

Table 4: Noise Criteria dB(A)

Location	Day $L_{Aeq(15\ minute)}$	Evening $L_{Aeq(15\ minute)}$	Night $L_{Aeq(15\ minute)}$
All residential receivers	40	40	40

Note: Noise generated by the Development is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy. Refer to the plan inAppendix C for the location of residential receivers.

Acoustic Fencing

B6. The Applicant must construct the fencing shown in Appendix A prior to the commencement of construction of any part of the Development.

APPENDIX C

RESIDNETIAL RECEIVERS

Key issue	Management measure
	– dust generating activities will be generally undertaken within the main shed; and – no composting will be undertaken on the site.
Greenhouse gases	Management measures that will be implemented during construction and operations to minimise greenhouse gas emissions will include: • on-site equipment will be regularly maintained and serviced to maximise fuel efficiency; • vehicle kilometres travelled on site will be minimised; and • energy efficiency will be progressively reviewed and implemented throughout the life of the facility.
Noise	Management measures that will be implemented during operation to minimise noise impacts will include: • choosing quieter plant and equipment, including installing best-practice noise suppression equipment, based on the optimal power and size to most efficiently perform the required tasks; • plant with high noise emissions will generally be located inside the shed; • plant and equipment will be regularly maintained and serviced; low-frequency reversing alarms ("growlers") will be used rather than the standard high frequency beepers; • a site layout has been adopted that minimises the need for mobile plant to reverse; • plant and equipment will be switched off when not in use; • any vehicle queuing will be on site rather than on public roads; • material drop heights will be minimised and dragging materials along the ground will be minimised; • site contact details will be provided on a board at the front of the site; • any noise-related complaints will be handled promptly; and • a complaints register will be maintained. Benedict Recycling will commission noise verification monitoring at the closest residences to the south-east (R9) and to the north-east (R22) (or at equivalent locations) within 3, 6 and 12 months of the start of operations.
Transport	Signs will be erected at the facility requesting customers access the facility via Camden Valley Way viaAnderson Road. Signs will be erected at the facility regarding drivers' legal obligation to ensure that waste is covered during transport. Vehicles dispatching products or residue will be covered prior to leaving the site.
Visual	Management measures that will be implemented during construction and operations to minimise visual impacts will include: • this site will be colourbond fenced on the boundaries; and • the visual appearance of the site entrance on Anderson Road will be landscaped and kept tidy.

B.2 Environmental protection licence

Environment Protection Licence

		time		
NA	Cured concrete waste from a batch plant	As defined in Schedule 1 of the POEO Act, as in force from time to time	Resource recovery Waste storage	
NA	Synthetic fibre waste (from materials such as fibreglass, polyesters and other plastics) being waste that is packaged securely to prevent dust emissions, but excluding asbestos waste	As defined in Schedule 1 of the POEO Act, as in force from time to time	Resource recovery Waste storage	
NA	Wood waste	As defined in Schedule 1 of the POEO Act, as in force from time to time	Resource recovery Waste storage	
NA	Soils	General Solid Waste, as defined in Schedule 1 of the POEO Act, in force from time to time	Resource recovery Waste storage	Complies with CT1 maximum contaminant values shown in Table 1 of the NSW EPA Waste Classification.

L3.2 The authorised amount of waste permitted on the premises cannot exceed 3,000 tonnes at any one time.

L3.3 The maximum amount of waste permitted to be received at the premises is 140,000 tonnes in any 12 month period

L3.4 The licensee must ensure compliance with all specific and general resource recovery orders and exemptions applicable to the waste types received, stored and processed at the premises.

L3.5 VENM certificates must be retained at the premises and must be provided to any officer from the EPA that requests to inspect them, aside from VENM received from a licensed quarry.

L4 Noise limits

L4.1 Noise from the premises must not exceed the noise criteria in the table below.

Location	Day LAeq(15minutes)	Evening LAeq(15minutes)	Night LAeq(15minutes)
All residential receivers	40	40	40

Note: Noise generated by the Development is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the Noise Policy for Industry (2017).

B.3 Noise management plan

3 Noise criteria

Noise criteria for the facility are stipulated in Table 4 of development consent Condition B5. The noise criteria are specified for the day, evening and night periods and apply at all residential receivers which have the potential to be impacted by operational noise from the facility (refer to Figure 2.2 for the nearest residential receivers). The noise criteria for the facility are reproduced in Table 3.1.

Table 3.1 Noise criteria

Residential receiver	Assessment period	Noise level $L_{Aeq,15min}$, dB
All	Day[1]	40
	Evening[2]	40
	Night[3]	40

Notes: 1. Day period is between 7 am-6 pm Monday to Saturday and 8 am-6 pm Sundays and Public Holidays.

2. Evening period is the period between 6 pm-10 pm.

3. Night period is the remaining period.

Table note of Table 4 of the development consent states:

> Noise generated by the Development is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy. Refer to the plan in Appendix C for the location of residential receivers.

All compliance monitoring will adhere to the requirements of the EPA's policies and guidelines.

Further, the INP Application Notes state that Section 4 of the INP has been withdrawn and the modifying factor adjustments outlined in Fact Sheet C of the NPfI are to be used when assessing potential annoying characteristics of a noise source. Fact sheet C of the NPfI (EPA 2017) provides guidelines for applying corrections to account for annoying noise characteristics such as tonal noise and low frequency noise.

The INP and Fact Sheet C of the NPfI were adopted for the purpose of the ONVMP.

All acoustic instrumentation used for monitoring under the noise monitoring program will have current NATA or manufacturer calibration certificates as per the relevant Australian standards.

5.3 Noise monitoring program

The attended noise monitoring will be completed on a quarterly basis (as a minimum) to verify that noise emissions from the facility satisfy the relevant noise criteria at representative residential receivers. The attended noise monitoring program will be used to:

- estimate the site noise contribution from the measured noise levels;
- determine the individual noise sources contributing to the ambient noise environment wherever possible;
- determine whether a correction for annoying noise characteristics should be applied to the site noise level before comparison with the relevant noise criteria in accordance with the NPfI; and
- gain an understanding of the effects of meteorological conditions on the propagation of noise from site to surrounding residential receivers.

The development consent does not specify the assessment period in which the monitoring need to be completed. The attended noise monitoring which must include, as a minimum, one 15-minute measurement at each of the representative receivers will be completed during the morning shoulder (6 am-7 am) and day (7 am-6 pm) periods, to verify noise from the facility during the most critical morning shoulder period (deliveries and dispatch only) and typical daytime operations.

For each 15-minute attended noise monitoring measurement, the following information will be recorded:

- name of monitoring personnel;
- monitoring location;
- date(s) and time(s) at which the monitoring measurement started ended at each location;
- height of the microphone above the ground and, if relevant, distances to building facades or property boundaries (if monitoring cannot be completed within the property boundary);
- quantitative meteorological data such as wind speed (including the height above ground at which the measurement was taken), wind direction, temperature and humidity;
- qualitative meteorological information such as cloud cover, fog or rainfall;
- instrument type and in-field calibration details before and after the monitoring period;
- the $L_{Aeq,15min}$ noise level for the 15-minute period;

Appendix C
Calibration certificates

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CERTIFICATE OF CALIBRATION

CERTIFICATE NO: C50057

EQUIPMENT TESTED : Acoustic Calibrator

Manufacturer:	Svantek
Type No:	SV36 **Serial No:** 154613
Class:	1
Owner:	EMM Consulting Level 4, 20 Chandos Street St Leonards NSW 2065
Tests Performed:	Measured Output Pressure level, Frequency & Distortion
Comments:	See Details and Class Tolerance overleaf.

CONDITION OF TEST:

Ambient Pressure	1004	hPa ±1 hPa	**Date of Receipt :**	05/06/2024
Temperature	23	°C ±1° C	**Date of Calibration :**	05/06/2024
Relative Humidity	44	% ±5%	**Date of Issue :**	05/06/2024

Acu-Vib Test Procedure: AVP02 (Calibrators)
Test Method: AS IEC 60942 - 2017

CHECKED BY: .....

AUTHORISED SIGNATURE: .....

Hein Soe

Accredited for compliance with ISO/IEC 17025 - Calibration

Results of the tests, calibration and/or measurements included in this document are traceable to SI units through reference equipment that has been calibrated by the Australian National Measurement Institute or other NATA accredited laboratories demonstrating traceability.

This report applies only to the item identified in the report and may not be reproduced in part.

The uncertainties quoted are calculated in accordance with the methods of the ISO Guide to the Uncertainty of Measurement and quoted at a coverage factor of 2 with a confidence interval of approximately 95%.

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NATA
WORLD RECOGNISED ACCREDITATION
Accredited Laboratory No. 9262
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Sound Level Meter
IEC 61672-3:2013
Calibration Certificate

Calibration Number C23471

Client Details	EMM Consulting Ground Floor Suite 01, 20 Chandos Street
Equipment Tested/ Model Number :	Type 2250
Instrument Serial Number :	3008201
Microphone Serial Number :	2888134
Pre-amplifier Serial Number :	16037
Firmware Version :	N/A

Pre-Test Atmospheric Conditions		**Post-Test Atmospheric Conditions**	
Ambient Temperature :	23.1 °C	**Ambient Temperature :**	24.3 °C
Relative Humidity :	44 %	**Relative Humidity :**	44.1 %
Barometric Pressure :	101.6 kPa	**Barometric Pressure :**	101.3 kPa

Calibration Technician :	Max Moore	**Secondary Check:**	Rhys Gravelle
Calibration Date :	12 Jul 2023	**Report Issue Date :**	17 Jul 2023

Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	*Pass*	17: Level linearity incl. the level range control	*N/A*
13: Electrical Sig. tests of frequency weightings	*Pass*	18: Toneburst response	*Pass*
14: Frequency and time weightings at 1 kHz	*Pass*	19: C Weighted Peak Sound Level	*Pass*
15: Long Term Stability	*Pass*	20: Overload Indication	*Pass*
16: Level linearity on the reference level range	*Pass*	21: High Level Stability	*Pass*

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation test performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2013.

Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
125Hz	*±0.13 dB*	*Temperature*	*±0.1 °C*
1kHz	*±0.13 dB*	*Relative Humidity*	*±1.9 %*
8kHz	*±0.14 dB*	*Barometric Pressure*	*±0.014 kPa*
Electrical Tests	*±0.13 dB*		

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.

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Benedict Recycling - Smeaton Grange

Verification noise monitoring

Prepared for Benedict Recycling Pty Ltd

August 2025

Benedict Recycling - Smeaton Grange

Verification noise monitoring

Benedict Recycling Pty Ltd

E241087 RP#3

August 2025

Version	Date	Prepared by	Reviewed by	Comments
1	13 August 2025	Ingrid Smith	Robert Kirwan	Draft

Approved by

Robert Kirwan
Senior Associate Acoustics Consultant
13 August 2025

Level 10 201 Pacific Highway
St Leonards NSW 2065
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Appendices

Tables

Figures

1 Introduction

1.1 Background

EMM Consulting Pty Ltd (EMM) was engaged by Benedict Recycling Pty Ltd to conduct a verification noise survey of operations at Benedict Recycling Smeaton Grange (Benedict Recycling, the site) located at 52 Anderson Road, Smeaton Grange NSW. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified limits.

Attended environmental noise monitoring described in this report was done during the morning shoulder and day periods on Tuesday 29 July 2025 at two monitoring locations.

1.2 Attended monitoring locations

Site monitoring locations are detailed in Table 1.1 and shown on Figure 1.1. It should be noted that Figure 1.1 shows actual monitoring positions, not necessarily the location of residences.

Table 1.1 Attended noise monitoring locations

Location descriptor/ID	Description/address	Coordinates (GDA94 MGA Zone 56)	
		Easting	Northing
R9	Chapman Circuit, Currans Hill	293919	6231192
R22[1]	Turner Road, Gregory Hills	294119	6231518

Notes: 1. It is of note that the residence denoted by R22 (143 & 165 Turner Road, Gregory Hills) has since been demolished. Given this, an alternative noise monitoring location was used to represent the nearest private residence (170 Turner Road, Gregory Hills) to R22.

KEY

- Site boundary
- Assessment location
- Noise monitoring location

Existing environment

- Named watercourse
- Cadastral boundary

INSET KEY

- Major road
- NPWS reserve
- State forest

Source: EMM (2024); ABS (2021); DCSSS (2024); GA (2009); MetroMap (2024)

0 100 200 m

GDA2020 MGA Zone 56

N

\\emm.local\xdrive\2024\EF241087 - Benedict Smeaton Grange noise monitoring\GIS\02_Maps\N001_AssessmentLocations\N001_AssessmentLocations_20241122_01.aprx 22/11/2024

Noise monitoring locations and site boundary

Benedict Recycling - Smeaton Grange
Verification Noise Monitoring
Figure 1.1

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1.3 Terminology and abbreviations

Some definitions of terms and abbreviations which may be used in this report are provided in Table 1.2.

Table 1.2 Terminology and abbreviations

Term/descriptor	Definition
dB(A)	Noise level measurement units are decibels (dB). The "A" weighting scale is used to approximate how humans hear noise.
L_{Amax}	The maximum root mean squared A-weighted noise level over a time period.
L_{A1}	The A-weighted noise level which is exceeded for one per cent of the time.
$L_{A1,1minute}$	The A-weighted noise level which is exceeded for one per cent of the specified time period of one minute.
L_{A10}	The A-weighted noise level which is exceeded for 10 per cent of the time.
L_{Aeq}	The energy average A-weighted noise level.
L_{A50}	The A-weighted noise level which is exceeded for 50 per cent of the time, and is also the median noise level during a measurement period.
L_{A90}	The A-weighted noise level exceeded for 90 percent of the time, also referred to as the "background" noise level and commonly used to derive noise limits.
L_{Amin}	The minimum A-weighted noise level over a time period.
L_{Ceq}	The energy average C-weighted noise energy during a measurement period. The "C" weighting scale is used to take into account low-frequency components of noise within the audibility range of humans.
SPL	Sound pressure level. Fluctuations in pressure are measured as 10 times a logarithmic scale, with the reference pressure being 20 micropascals.
Hertz (Hz)	The frequency of fluctuations in pressure, measured in cycles per second. Most sounds are a combination of many frequencies together.
AWS	Automatic weather station used to collect meteorological data, typically at an altitude of 10 metres
VTG	The vertical temperature gradient in degrees Celsius per 100 metres altitude.
Sigma-theta	The standard deviation of the horizontal wind direction over a period of time.
IA	Inaudible. When site noise is noted as IA then there was no site noise at the monitoring location.
NM	Not Measurable. If site noise is noted as NM, this means some noise was audible but could not be quantified.
Day	Monday – Saturday: 7 am to 6 pm, on Sundays and Public Holidays: 8 am to 6 pm.
Evening	Monday – Saturday: 6 pm to 10 pm, on Sundays and Public Holidays: 6 pm to 10 pm.
Night	Monday – Saturday: 10 pm to 7 am, on Sundays and Public Holidays: 10 pm to 8 am.
Temperature inversion	A meteorological condition where the atmospheric temperature increases with altitude.

Appendix A provides further information that gives an indication as to how an average person perceives changes in noise level, and examples of common noise levels.

2 Noise limits

2.1 Development consent

Benedict Recycling noise limits are provided in Table 4, Condition B.5 of Schedule 2 Part B of the current development consent SSD 7424 (DC) dated 22 December 2017. Relevant sections of the DC are reproduced in Appendix B.1.

2.2 Environment protection licence

Benedict Recycling noise limits are provided in Condition L4.1 of the current EPL 21328 (EPL) dated 3 July 2024. Relevant sections of the EPL are reproduced in Appendix B.2.

2.3 Noise management plan

The approved current ONVMP (dated March 2018) adopts two attended noise monitoring locations that are representative of residences outlined in the DC and EPL. Relevant sections of the ONVMP are reproduced in Appendix B.3.

2.4 Noise limits

Noise limits based on the NMP and consistent with the DC and EPL are as shown in Table 2.1.

Table 2.1 Noise impact limits, dB

Location	Day $L_{Aeq,15minute}$	Evening $L_{Aeq,15minute}$	Night $L_{Aeq,15minute}$
All residential receivers	40	40	40

2.5 Meteorological conditions

The DC (which the NMP also references) states that:

> Noise generated by the Development is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy.

Meanwhile, the EPL states that:

> Noise generated by the Development is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the Noise Policy for Industry (NPfI) (2017).

Given the NPfI is the more recent policy document and supersedes the NSW Industrial Noise Policy, this assessment has measured noise generated by the development in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the NPfI.

2.6 Additional considerations

Monitoring and reporting have been done in accordance with the NSW EPA 'Noise Policy for Industry' (NPfI) issued in October 2017 and the 'Approved methods for the measurement and analysis of environmental noise in NSW' (Approved Methods) issued in January 2022.

2.7 Very noise-enhancing meteorological conditions

In accordance with the Approved Methods, noise monitoring for the site is scheduled to occur during forecasted meteorological conditions where noise limits in Table 2.1 will be applicable. However, in cases where actual meteorological conditions do not align with forecasts and noise limits are subsequently not directly applicable, it is the expectation of regulators that noise impact still be managed.

The NPfI states that:

> Noise limits derived for consents and licences will apply under the meteorological conditions used in the environmental assessment process, that is, standard or noise-enhancing meteorological conditions. For 'very noise-enhancing meteorological conditions' … a limit is set based on the limit derived under standard or noise-enhancing conditions (whichever is adopted in the assessment) plus 5 dB. In this way a development is subject to noise limits under all meteorological conditions.

Therefore, if noise monitoring occurs during meteorological conditions outside of those specified in Section 2.4, site limits are adjusted based on Table 2.1 plus 5 dB.

3 Methodology

3.1 Overview

Attended environmental noise monitoring was done in general accordance with Australian Standard AS1055:2018 'Acoustics, Description and Measurement of Environmental Noise' and relevant EPA requirements. Meteorological data was obtained from the Bureau of Meteorology's Campbelltown (Mount Annan) weather station (AWS) (Station ID 068257) which allowed the correlation of atmospheric parameters with measured noise levels.

3.2 Attended noise monitoring

Attended noise monitoring was done during the morning shoulder and day periods at each location. The duration of each measurement was 15 minutes. Atmospheric conditions were measured at each monitoring location.

Measured sound levels from various sources were noted during each measurement, and particular attention was paid to the extent of site contribution (if any) to measured levels. At each monitoring location, the site-only $L_{Aeq,15minute}$ and L_{Amax} were measured directly or determined by other methods detailed in Section 7.1 of the NPfI.

The terms 'Inaudible' (IA) or 'Not Measurable' (NM) may be used in this report. When site noise is noted as IA, it was inaudible at the monitoring location. When site noise is noted as NM, this means it was audible but could not be quantified. All results noted as IA or NM in this report were due to one or more of the following:

- Site noise levels were very low, typically more than 10 dB below the measured background (L_{A90}), and unlikely to be noticed.
- Site noise levels were masked by more dominant sources that are characteristic of the environment (such as breeze in foliage or continuous road traffic noise) that cannot be eliminated by monitoring at an alternate or intermediate location.
- It was not feasible or reasonable to employ methods, such as to move closer and back calculate. Cases may include rough terrain preventing closer measurement, addition/removal of significant source to receiver shielding caused by moving closer, and meteorological conditions where back calculation may not be accurate.

If exact noise levels from site could not be established due to masking by other noise sources in a similar frequency range but were determined to be at least 5 dB lower than relevant limits, then a maximum estimate may be provided. This is expressed as a 'less than' quantity, such as <20 dB or <30 dB.

For this assessment, the measured L_{Amax} has been used as a conservative estimate of $L_{A1,1minute}$. The EPA accepts sleep disturbance analysis based on either the $L_{A1,1minute}$ or L_{Amax} metrics, with the L_{Amax} representing a more conservative assessment of site noise emissions.

3.3 Meteorological data

This assessment determined stability categories throughout the attended monitoring period using the 'Pasquill-Gifford stability classification scheme' method from section D1.3.1 of Fact Sheet D of the Noise Policy for Industry (NSW EPA, 2017).

3.4 Modifying factors

All measurements were evaluated for potential modifying factors in accordance with the NPfI. If applicable, modifying factor penalties have been reported and added to the measured site only L_{Aeq} noise levels.

Low-frequency modifying factor penalties have only been applied to site-only L_{Aeq} if the site was the only contributing low-frequency noise source. Specific methodology for assessment of each modifying factor is outlined in Fact Sheet C of the NPfI.

3.5 Instrumentation and personnel

Attended noise monitoring was conducted by Ingrid Smith. Qualifications, experience, and/or demonstration of competence is in accordance with the EPA's Approved methods and supportive documentation is available upon request.

Equipment used to measure environmental noise levels is detailed in Table 3.1. Calibration certificates are provided in Appendix C.

Table 3.1 Attended noise monitoring equipment

Item	Serial number	Calibration due date	Relevant standard
Brüel & Kjær 2250 sound level meter	3008201	15/08/2025	IEC 61672-1:2013
Svantek SV-36 calibrator	154613	16/06/2026	IEC 60942:2017

4 Results

4.1 Total measured noise levels and atmospheric conditions

Overall (all sources) noise levels measured at each location during attended measurements are provided in Table 4.1. Discussion as to the sources responsible for measured levels is provided in Section 5 of this report.

Table 4.1 Total measured noise levels, dB – 29 July 2025[1]

Location	Start date	Time	L_{Amax}	L_{A1}	L_{A10}	L_{Aeq}	L_{A50}	L_{A90}	L_{Amin}
R22	29/07/2025	06:15	66	55	53	51	51	50	48
R9	29/07/2025	06:44	74	62	55	53	52	50	47
R9	29/07/2025	07:01	71	61	57	55	55	52	49
R22	29/07/2025	07:24	65	60	57	56	55	54	52

Notes: 1. Levels in this table are not necessarily the result of activity at the site.

Atmospheric condition data measured by the operator during each measurement using a hand-held weather meter is shown in Table 4.2. The wind speed, direction and temperature were measured at approximately 1.5 metres above ground. Attended noise monitoring is not done during rain, hail, or wind speeds above 5 metres per second (m/s) at microphone height.

Table 4.2 Atmospheric conditions measured at microphone height – 29 July 2025

Location	Date	Time	Temperature °C	Wind speed m/s	Wind direction °Magnetic north	Cloud cover 1/8s
R22	29/07/2025	06:15	12	4	251	8
R9	29/07/2025	06:44	10	-	-	4
R9	29/07/2025	07:01	11	-	-	4
R22	29/07/2025	07:24	11	1.3	216	5

4.2 Site only noise levels

4.2.1 Modifying factors

There were no modifying factors, as defined in the NPfI, applicable during the survey.

4.2.2 Monitoring results

Table 4.3 provides site noise levels in the absence of other sources, where possible, and includes weather data from the AWS. Limits are applicable if weather conditions were within specified parameters during each measurement. A 2 dB exceedance was measured at R22 during the day period. A 1 to 2 dB exceedance is considered negligible to a receiver and should not warrant further treatments or controls as per the NPfI.

Table 4.3 Site noise levels and limits – 29 July 2025

Location	Start date	Time	Wind		Stability class	Very enhancing? [1]	Limit, dB	Site level, dB [2]	Exceedance, dB
			Speed m/s	Direction° [3]			$L_{Aeq,15minute}$	$L_{Aeq,15minute}$	$L_{Aeq,15minute}$
R22	29/07/2025	06:15	3.4	290	E	Yes	45[5]	38	Nil
R9	29/07/2025	06:44	2.6	190	F	No	40	32	Nil
R9	29/07/2025	07:01	1.3	180	B	No	40	28	Nil
R22	29/07/2025	07:24	1.3	240	C	No	40	42	2

Notes:
1. Noise emission limits are applicable if weather conditions were within parameters specified in Section 2.5.
2. Site-only $L_{Aeq,15minute}$, includes modifying factor penalties if applicable.
3. Degrees magnetic north, "-" indicates calm conditions.
4. IA in the site level column means that the site was deemed inaudible at that location.
5. Adjusted limits (+5 dB) due to 'very noise-enhancing' meteorological conditions in accordance with the EPL.

5 Discussion

5.1 Noted noise sources

During attended monitoring, the time variations (temporal characteristics) of noise sources are considered in each measurement via statistical descriptors. From these observations, summaries have been derived for the location and provided in this chapter. Statistical 1/3 octave-band analysis of environmental noise was undertaken, and the following figures display frequency ranges of various noise sources at each location for L_{A1}, L_{A10}, L_{Aeq}, L_{A50}, and L_{A90} descriptors. These figures also provide, graphically, statistical information for these noise levels.

An example is provided as Figure 5.1, where frogs and insects are seen to be generating noise at frequencies above 1000 Hz, while industrial noise is observed at frequencies less than 1000 Hz.

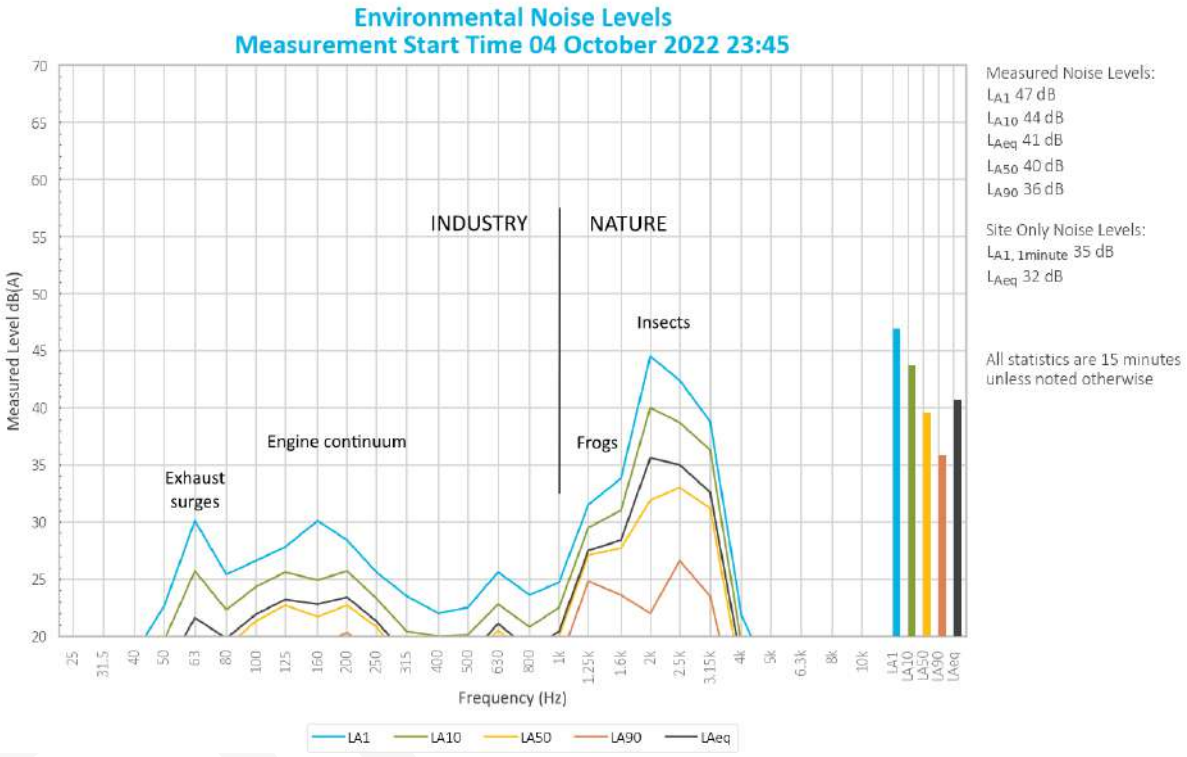

Figure 5.1 Example graph

5.2 R22 – Turner Road, Gregory Hills (Morning Shoulder)

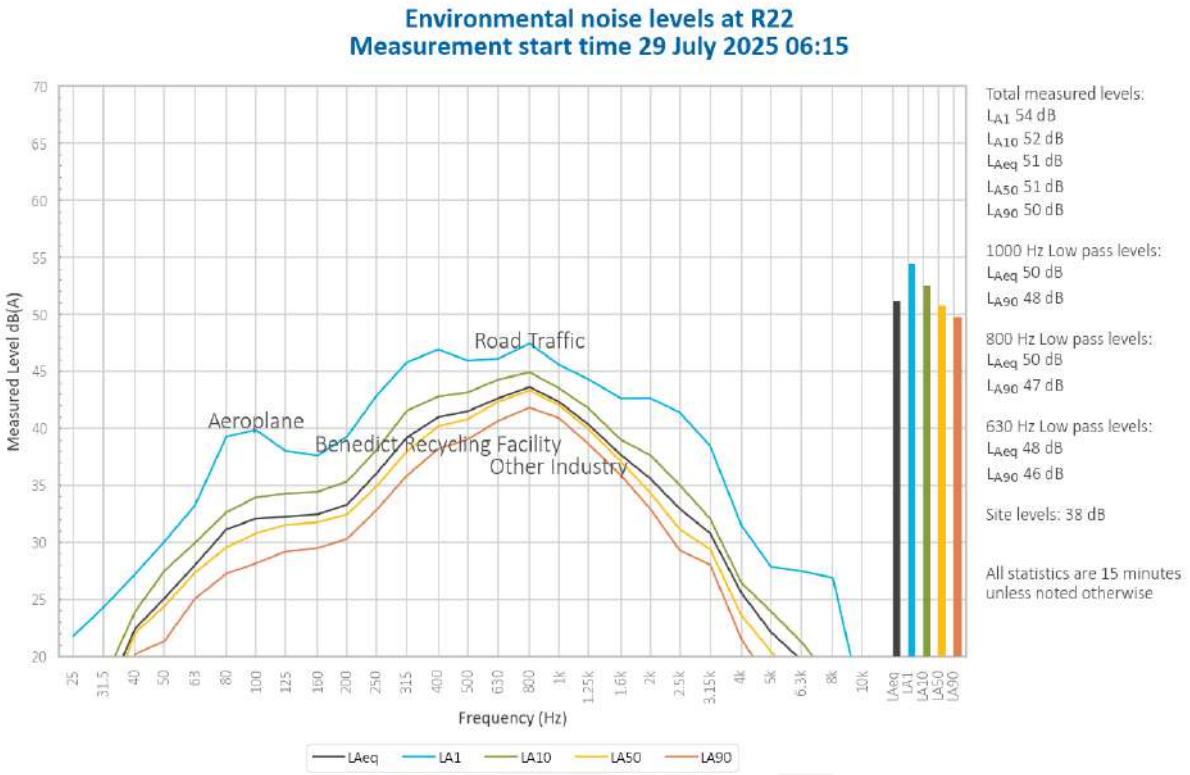

Figure 5.2 Environmental noise levels – R22, Turner Road, Gregory Hills (Morning Shoulder)

Benedict Smeaton Grange was intermittently audible throughout the measurement, including vehicle movements and site noise. This generated an $L_{Aeq, 15minute}$ of 38 dB.

Nearby road traffic and tyre noise, other industry and aeroplanes generated the measured levels

Noise from birds were also noted.

5.3 R9 – Chapman Circuit, Currans Hill (Morning Shoulder)

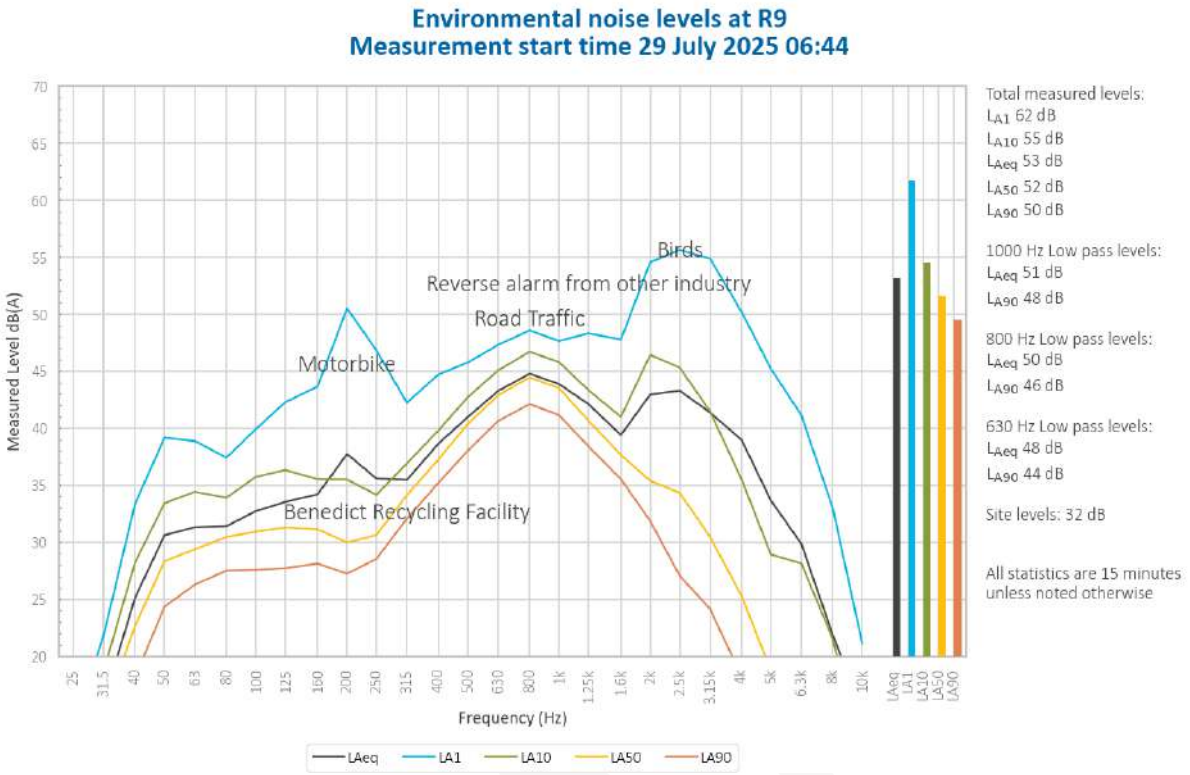

Figure 5.3 Environmental noise levels – R9, Chapman Circuit, Currans Hill (Morning Shoulder)

Benedict Smeaton Grange was occasionally audible throughout the measurement, including vehicle movements and site noise. This generated a site $L_{Aeq,15minute}$ of 32 dB.

Bird noise, road traffic noise, and other nearby industry all contributed to the measured levels.

5.4 R9 – Chapman Circuit, Currans Hill (Day)

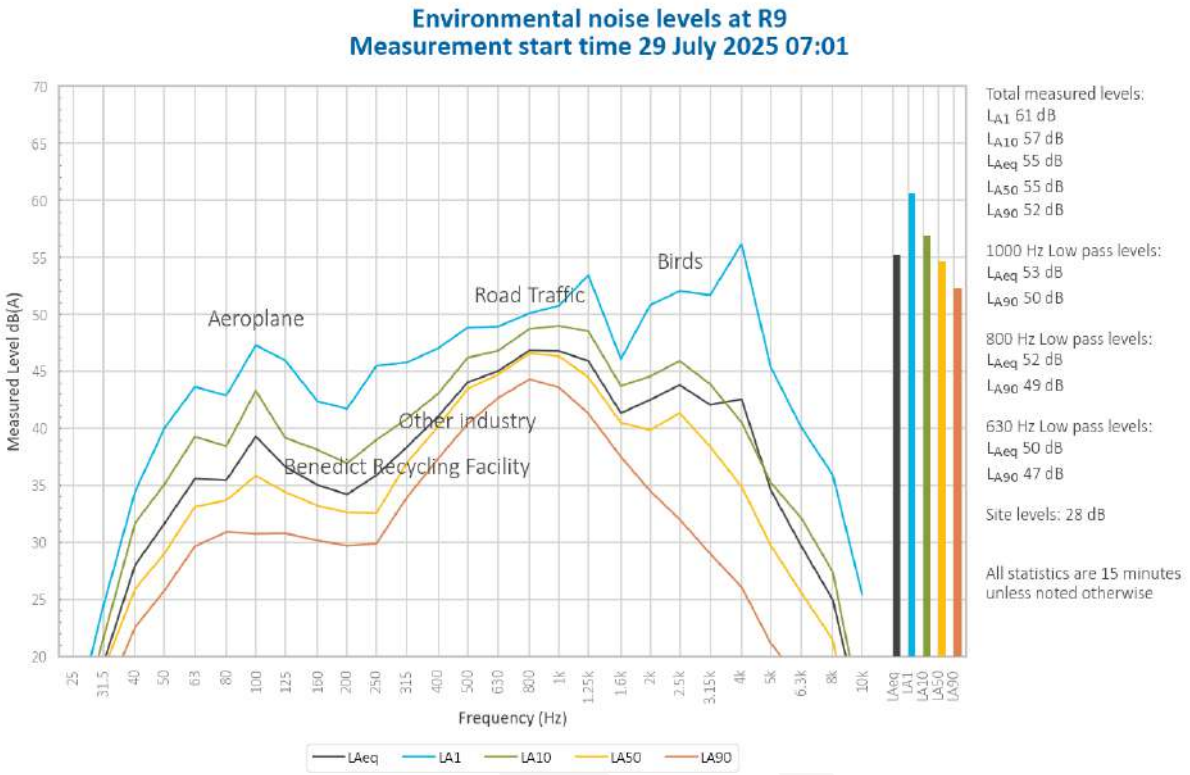

Figure 5.4 Environmental noise levels - R9, Chapman Circuit, Currans Hill (Day)

Benedict Smeaton Grange was occasionally audible throughout the measurement, including vehicle movements and site noise. This generated a site $L_{Aeq,15minute}$ of 28 dB.

Bird noise, road traffic noise, other industry and aeroplanes generated the measured levels.

5.5 R22 – Turner Road, Gregory Hills (Day)

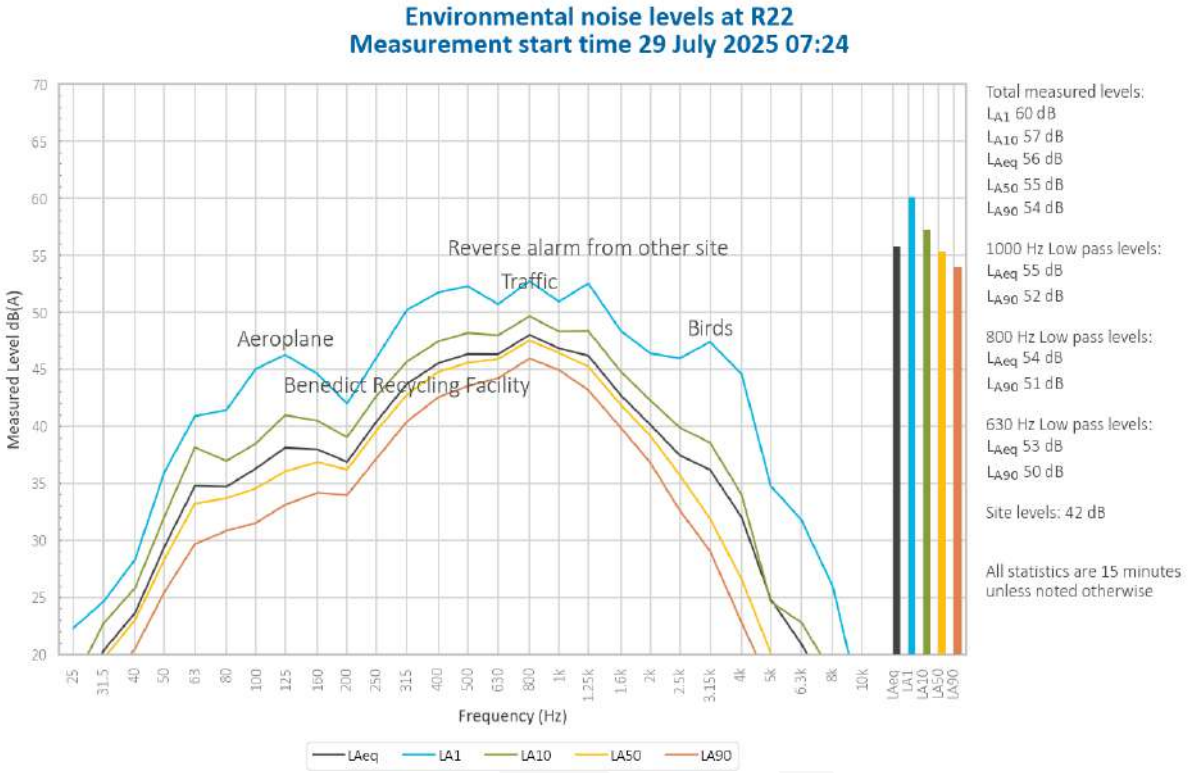

Figure 5.5 Environmental noise levels – R22, Turner Road, Gregory Hills (Day)

Benedict Smeaton Grange was audible throughout the measurement, including impact noise from site and vehicle movements. This generated a site $L_{Aeq,15minute}$ of 42 dB, which is an exceedance of 2 dB above the relevant noise criteria at R22.

A 2 dB exceedance is considered negligible in the Noise Policy for Industry (NSW EPA, 2017). It would not be discernible by the average listener and therefore would not warrant receiver-based treatments or controls.

Aeroplanes, birds, other industry, and road traffic noise all contributed to the measured levels.

6 Summary

EMM was engaged by Benedict Recycling Pty Ltd to conduct a verification noise survey of operations at Benedict Recycling Smeaton Grange. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified noise limits.

Attended environmental noise monitoring described in this report was done during the morning shoulder and day periods on Tuesday 29 July 2025 at two monitoring locations as per the approved NMP.

During the day period at R22, a 2 dB exceedance was measured. Benedict Smeaton Grange was audible throughout the measurement, including impact noise from site and vehicle movements.

A 2 dB exceedance is considered negligible in the Noise Policy for Industry (NSW EPA, 2017). It would not be discernible by the average listener and therefore would not warrant receiver-based treatments or controls.

All other measurements complied with relevant limits at all monitoring locations during this verification survey.

Appendix A
Noise perception and examples

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A.1 Noise levels

Table A.1 gives an indication as to how an average person perceives changes in noise level. Examples of common noise levels are provided in Figure A.1.

Table A.1 Perceived change in noise

Change in sound pressure level (dB)	Perceived change in noise
up to 2	Not perceptible
3	Just perceptible
5	Noticeable difference
10	Twice (or half) as loud
15	Large change
20	Four times (or a quarter) as loud

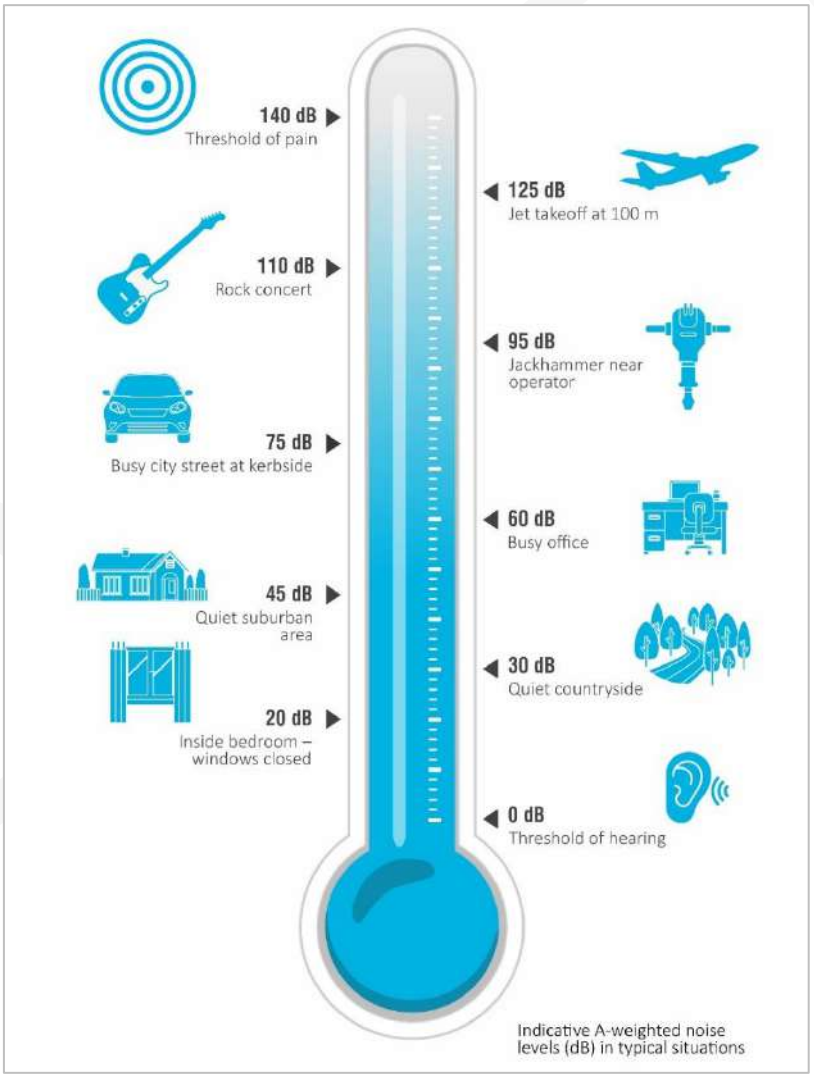

Figure A.1 Common noise levels

Appendix B
Regulator documents

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B.1 Development consent

PART B: ENVIRONMENTAL PERFORMANCE AND MANAGEMENT

NOISE

Hours of Work

B1. The Applicant must comply with the hours of work detailed in Table 3 unless otherwise agreed in writing by the Planning Secretary.

Table 3: Hours of Work

Activity	Day	Time
Accept waste deliveries and dispatch	Monday – Friday Saturday Sunday	6 am to 10 pm 6 am to 5 pm 8 am to 4 pm
Waste processing	Monday – Friday Saturday	7 am to 6 pm 7 am to 4 pm

B2. Works outside of the hours identified in Condition B1 may be undertaken in the following circumstances:

(a) for the delivery of materials required outside these hours by the NSW Police Force or other authorities for safety reasons; or

(b) where it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm.

Construction Noise Management Plan

B3. Prior to the commencement of construction, the Applicant must prepare a Construction Noise and Vibration Management Plan (CNVMP) for the development to manage high noise generating works to the satisfaction of the Planning Secretary. The CNVMP shall form part of the CEMP required by Condition C1 and must:

(a) be prepared by a suitably qualified and experienced noise expert;

(b) be approved by the Planning Secretary prior to the commencement of construction the Development;

(c) describe the management and mitigation measures and procedures for achieving the noise management levels in the EPA's *Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2009);

(d) identify high emission generating construction activities, including proposed times when these works will be carried out (including respite periods if required) and mitigation measures to minimise adverse impacts from these activities;

(e) include strategies that have been developed with the community for managing high noise generating works;

(f) describe the community consultation undertaken to develop the strategies in (e) above; and

(g) include a complaints management system that would be implemented for the duration of the Development.

B4. The Applicant must:

(a) not commence construction until the CNVMP required by Condition B3 is approved by the Planning Secretary; and

(b) The Applicant must ensure the CNVMP (as required and approved by the Planning Secretary from time to time) isimplemented during construction of the Development.

Operational Noise Criteria

B5. The Applicant must ensure that noise generated by operation of the Development does not exceed the noise criteria in Table 4.

Table 4: Noise Criteria dB(A)

Location	Day $L_{Aeq(15\ minute)}$	Evening $L_{Aeq(15\ minute)}$	Night $L_{Aeq(15\ minute)}$
All residential receivers	40	40	40

Note: Noise generated by the Development is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy. Refer to the plan inAppendix C for the location of residential receivers.

Acoustic Fencing

B6. The Applicant must construct the fencing shown in Appendix A prior to the commencement of construction of any part of the Development.

APPENDIX C

RESIDNETIAL RECEIVERS

Key issue	Management measure
	– dust generating activities will be generally undertaken within the main shed; and – no composting will be undertaken on the site.
Greenhouse gases	Management measures that will be implemented during construction and operations to minimise greenhouse gas emissions will include: • on-site equipment will be regularly maintained and serviced to maximise fuel efficiency; • vehicle kilometres travelled on site will be minimised; and • energy efficiency will be progressively reviewed and implemented throughout the life of the facility.
Noise	Management measures that will be implemented during operation to minimise noise impacts will include: • choosing quieter plant and equipment, including installing best-practice noise suppression equipment, based on the optimal power and size to most efficiently perform the required tasks; • plant with high noise emissions will generally be located inside the shed; • plant and equipment will be regularly maintained and serviced; low-frequency reversing alarms ("growlers") will be used rather than the standard high frequency beepers; • a site layout has been adopted that minimises the need for mobile plant to reverse; • plant and equipment will be switched off when not in use; • any vehicle queuing will be on site rather than on public roads; • material drop heights will be minimised and dragging materials along the ground will be minimised; • site contact details will be provided on a board at the front of the site; • any noise-related complaints will be handled promptly; and • a complaints register will be maintained. Benedict Recycling will commission noise verification monitoring at the closest residences to the south-east (R9) and to the north-east (R22) (or at equivalent locations) within 3, 6 and 12 months of the start of operations.
Transport	Signs will be erected at the facility requesting customers access the facility via Camden Valley Way viaAnderson Road. Signs will be erected at the facility regarding drivers' legal obligation to ensure that waste is covered during transport. Vehicles dispatching products or residue will be covered prior to leaving the site.
Visual	Management measures that will be implemented during construction and operations to minimise visual impacts will include: • this site will be colourbond fenced on the boundaries; and • the visual appearance of the site entrance on Anderson Road will be landscaped and kept tidy.

B.2 Environmental protection licence

Environment Protection Licence

		time		
NA	Cured concrete waste from a batch plant	As defined in Schedule 1 of the POEO Act, as in force from time to time	Resource recovery Waste storage	
NA	Synthetic fibre waste (from materials such as fibreglass, polyesters and other plastics) being waste that is packaged securely to prevent dust emissions, but excluding asbestos waste	As defined in Schedule 1 of the POEO Act, as in force from time to time	Resource recovery Waste storage	
NA	Wood waste	As defined in Schedule 1 of the POEO Act, as in force from time to time	Resource recovery Waste storage	
NA	Soils	General Solid Waste, as defined in Schedule 1 of the POEO Act, in force from time to time	Resource recovery Waste storage	Complies with CT1 maximum contaminant values shown in Table 1 of the NSW EPA Waste Classification.

L3.2 The authorised amount of waste permitted on the premises cannot exceed 3,000 tonnes at any one time.

L3.3 The maximum amount of waste permitted to be received at the premises is 140,000 tonnes in any 12 month period

L3.4 The licensee must ensure compliance with all specific and general resource recovery orders and exemptions applicable to the waste types received, stored and processed at the premises.

L3.5 VENM certificates must be retained at the premises and must be provided to any officer from the EPA that requests to inspect them, aside from VENM received from a licensed quarry.

L4 Noise limits

L4.1 Noise from the premises must not exceed the noise criteria in the table below.

Location	Day LAeq(15minutes)	Evening LAeq(15minutes)	Night LAeq(15minutes)
All residential receivers	40	40	40

Note: Noise generated by the Development is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the Noise Policy for Industry (2017).

B.3 Noise management plan

3 Noise criteria

Noise criteria for the facility are stipulated in Table 4 of development consent Condition B5. The noise criteria are specified for the day, evening and night periods and apply at all residential receivers which have the potential to be impacted by operational noise from the facility (refer to Figure 2.2 for the nearest residential receivers). The noise criteria for the facility are reproduced in Table 3.1.

Table 3.1 Noise criteria

Residential receiver	Assessment period	Noise level $L_{Aeq,15min}$, dB
All	Day[1]	40
	Evening[2]	40
	Night[3]	40

Notes: 1. Day period is between 7 am-6 pm Monday to Saturday and 8 am-6 pm Sundays and Public Holidays.

2. Evening period is the period between 6 pm-10 pm.

3. Night period is the remaining period.

Table note of Table 4 of the development consent states:

> Noise generated by the Development is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy. Refer to the plan in Appendix C for the location of residential receivers.

All compliance monitoring will adhere to the requirements of the EPA's policies and guidelines.

Further, the INP Application Notes state that Section 4 of the INP has been withdrawn and the modifying factor adjustments outlined in Fact Sheet C of the NPfI are to be used when assessing potential annoying characteristics of a noise source. Fact sheet C of the NPfI (EPA 2017) provides guidelines for applying corrections to account for annoying noise characteristics such as tonal noise and low frequency noise.

The INP and Fact Sheet C of the NPfI were adopted for the purpose of the ONVMP.

All acoustic instrumentation used for monitoring under the noise monitoring program will have current NATA or manufacturer calibration certificates as per the relevant Australian standards.

5.3 Noise monitoring program

The attended noise monitoring will be completed on a quarterly basis (as a minimum) to verify that noise emissions from the facility satisfy the relevant noise criteria at representative residential receivers. The attended noise monitoring program will be used to:

- estimate the site noise contribution from the measured noise levels;
- determine the individual noise sources contributing to the ambient noise environment wherever possible;
- determine whether a correction for annoying noise characteristics should be applied to the site noise level before comparison with the relevant noise criteria in accordance with the NPfI; and
- gain an understanding of the effects of meteorological conditions on the propagation of noise from site to surrounding residential receivers.

The development consent does not specify the assessment period in which the monitoring need to be completed. The attended noise monitoring which must include, as a minimum, one 15-minute measurement at each of the representative receivers will be completed during the morning shoulder (6 am-7 am) and day (7 am-6 pm) periods, to verify noise from the facility during the most critical morning shoulder period (deliveries and dispatch only) and typical daytime operations.

For each 15-minute attended noise monitoring measurement, the following information will be recorded:

- name of monitoring personnel;
- monitoring location;
- date(s) and time(s) at which the monitoring measurement started ended at each location;
- height of the microphone above the ground and, if relevant, distances to building facades or property boundaries (if monitoring cannot be completed within the property boundary);
- quantitative meteorological data such as wind speed (including the height above ground at which the measurement was taken), wind direction, temperature and humidity;
- qualitative meteorological information such as cloud cover, fog or rainfall;
- instrument type and in-field calibration details before and after the monitoring period;
- the $L_{Aeq,15min}$ noise level for the 15-minute period;

Appendix C
Calibration certificates

EMM
creating opportunities

Acoustic Research Labs Pty Ltd
Unit 36/14 Loyalty Rd
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Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
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Sound Level Meter
IEC 61672-3:2013
Calibration Certificate

Calibration Number C23471

Client Details	EMM Consulting Ground Floor Suite 01, 20 Chandos Street
Equipment Tested/ Model Number :	Type 2250
Instrument Serial Number :	3008201
Microphone Serial Number :	2888134
Pre-amplifier Serial Number :	16037
Firmware Version :	N/A

Pre-Test Atmospheric Conditions		**Post-Test Atmospheric Conditions**	
Ambient Temperature :	23.1 °C	**Ambient Temperature :**	24.3 °C
Relative Humidity :	44 %	**Relative Humidity :**	44.1 %
Barometric Pressure :	101.6 kPa	**Barometric Pressure :**	101.3 kPa

Calibration Technician :	Max Moore	**Secondary Check:**	Rhys Gravelle
Calibration Date :	12 Jul 2023	**Report Issue Date :**	17 Jul 2023

Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	*Pass*	17: Level linearity incl. the level range control	*N/A*
13: Electrical Sig. tests of frequency weightings	*Pass*	18: Toneburst response	*Pass*
14: Frequency and time weightings at 1 kHz	*Pass*	19: C Weighted Peak Sound Level	*Pass*
15: Long Term Stability	*Pass*	20: Overload Indication	*Pass*
16: Level linearity on the reference level range	*Pass*	21: High Level Stability	*Pass*

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation test performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2013.

Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
125Hz	*±0.13 dB*	*Temperature*	*±0.1 °C*
1kHz	*±0.13 dB*	*Relative Humidity*	*±1.9 %*
8kHz	*±0.14 dB*	*Barometric Pressure*	*±0.014 kPa*
Electrical Tests	*±0.13 dB*		

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.

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Sound Level Meter
IEC 61672-3:2013
Calibration Test Report

Calibration Number C23471

Client Details EMM Consulting
Ground Floor
Suite 01, 20 Chandos Street

Equipment Tested/ Model Number : Type 2250
Instrument Serial Number : 3008201
Microphone Serial Number : 2888134
Pre-amplifier Serial Number : 16037
Firmware Version : N/A

Pre-Test Atmospheric Conditions		Post-Test Atmospheric Conditions	
Ambient Temperature :	23.1 °C	**Ambient Temperature :**	24.3 °C
Relative Humidity :	44 %	**Relative Humidity :**	44.1 %
Barometric Pressure :	101.6 kPa	**Barometric Pressure :**	101.3 kPa

Calibration Technician : Max Moore
Calibration Date : 12 Jul 2023
Secondary Check: Rhys Gravelle
Report Issue Date : 17 Jul 2023

Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	*Pass*	17: Level linearity incl. the level range control	*N/A*
13: Electrical Sig. tests of frequency weightings	*Pass*	18: Toneburst response	*Pass*
14: Frequency and time weightings at 1 kHz	*Pass*	19: C Weighted Peak Sound Level	*Pass*
15: Long Term Stability	*Pass*	20: Overload Indication	*Pass*
16: Level linearity on the reference level range	*Pass*	21: High Level Stability	*Pass*

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation test performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2013.

Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
125Hz	*±0.13 dB*	*Temperature*	*±0.1 °C*
1kHz	*±0.13 dB*	*Relative Humidity*	*±1.9 %*
8kHz	*±0.14 dB*	*Barometric Pressure*	*±0.014 kPa*
Electrical Tests	*±0.13 dB*		

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

1. OVERVIEW

This report presents the calibration test results of a Type 2250 Sound Level Meter, and associated equipment. Calibration is carried out in accordance with *IEC 61672-3.2013, Electroacoustics - Sound Level Meters - Part 3: Periodic Tests*.

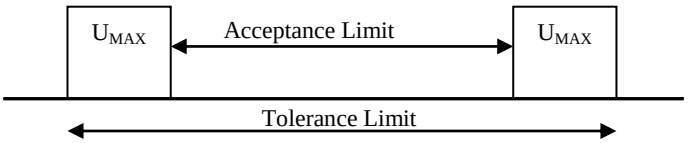
Relevant clauses from this standard have been used for periodic testing in conjunction with Acoustic Research Labs internal test methods described in Section 1 of the calibration work instruction manual.

Where required, reference is made to manual version 34 as provided by the manufacturer.

1.1 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

1.2 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.

2. GENERAL

2.1 ENVIRONMENTAL CONDITIONS DURING TEST

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

2.2 CALIBRATION TESTS

Where applicable the following tests were performed in accordance with the requirements of *IEC 61672-3.2013*. These clauses are used to define the periodic testing of Sound Level Meters.

Clause 10	Indication at the Calibration Check Frequency
Clause 11	Self Generated Noise
Clause 12	Acoustical Signal Tests of Frequency Weighting
Clause 13	Electrical Signal Tests of Frequency Weightings
Clause 14	Frequency and Time Weightings at 1kHz
Clause 15	Long Term Stability
Clause 16	Level Linearity on the Reference Level Range
Clause 17	Level Linearity including the level range control
Clause 18	Toneburst Response
Clause 19	Peak C Sound Level
Clause 20	Overload Indication
Clause 21	High Level Stability

2.3 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.

2.3.1 Multi-function Acoustic Calibrator

A Bruel & Kjaer 4226 Multi-function calibrator (S/N - 2985012) was used for frequency response testing of the entire instrument (including microphone). This instrument was used as a reference calibrator and for frequency response verification.

2.3.2 Microphone Electrical Equivalent Circuit

Calibration of most instrument parameters is carried out using electrical signals fed to the unit via a two-port electrical equivalent circuit of the microphone.

A 14pF capacitance dummy microphone was used during testing.

2.3.3 Adjustable Attenuator

A means for varying the attenuation of electrical signals via the dummy microphone was provided by a JFW Industries dual rotary attenuator (S/N - 792819 2132). The attenuator is switchable in 1dB steps between 0dB and 60dB.

2.3.4 Arbitrary Function Generator

A Keysight 33511B (S/N – MY58001621) was used to generate the required electrical signals.

2.3.5 Environmental Monitoring

A MHB-382SD (S/N – AG.44204) was used for measuring environmental conditions during device calibration. It is capable of providing temperature, relative humidity and pressure measurements.

3. CALIBRATION TEST RESULTS

3.1 INDICATION AT THE CALIBRATION CHECK FREQUENCY

The indication of the sound level meter at the calibration check frequency was checked by application of an acoustic signal at the reference sound pressure level and frequency.

Stated reference conditions as found in manual are

Reference Level : 94.0 dB

Reference Frequency : 1000.0 Hz

Indications before and after adjustments were recorded and are shown in Table 1 (all measurements in dB) -

Table 1 - Check Frequency Calibration Results

Frequency Weighting	Initial Response	B&K 4226 Corrected	FreeField Corrected	Final Corrected Response
A	93.80	94.10	94.02	94.02
C	93.80	94.10	94.02	94.02
Z	93.80	94.10	94.02	94.02

Free field adjustment data as provided by the manufacturer. Windscreen correction factors applied.

3.2 SELF GENERATED NOISE

3.2.1 Microphone Installed

Self generated noise was measured with the microphone installed on the sound level meter, in the configuration submitted for periodic testing. The sound level meter was set to the most-sensitive level range and with frequency weighting A selected.

Ten (10) time weighted observations were made over a period of 60 seconds.

Random Readings dB(A)

17.50	17.70	17.50	17.50	17.50
17.60	17.50	17.60	17.60	17.60

Acoustic Noise Floor : 17.6 dB(A)

3.2.2 Electrical Input Signal Device

With the microphone replaced by the electrical input signal device and terminated as specified, the sound level meter was set to the most-sensitive level range and with frequency weightings Z, C and A selected as provided.

Ten (10) time weighted observations were made over a period of 60 seconds.

Random Readings dB(A)

12.50	12.40	12.50	12.50	17.80
19.70	20.70	21.90	22.60	22.90

Random Readings dB(C)

11.00	11.10	11.10	15.00	11.00
11.00	11.00	11.00	11.00	11.10

Random Readings dB(Z)

15.4	15.2	15.2	15.1	15.2
15.1	15.2	15.1	15.3	15.2

	dB(A)	dB(C)	dB(Z)
Electric Noise Floor :	17.6	11.4	15.2

3.3 ACOUSTICAL SIGNAL TESTS OF A FREQUENCY WEIGHTING

The sound level meter was set to measure frequency weighting C with a FAST response. The test was carried out using a multi-function acoustic calibrator set to pressure mode.

Three (3) readings were made at each test frequency. The average of the readings was then corrected to the multi-function acoustic calibrator.

Table 2 - Frequency Weighting C Response

Freq Hz	Reading 1	Reading 2	Reading 3	Uncertainty (dB)
125	94.1	94.1	94.1	0.13
1 000	94.1	94.1	94.1	0.13
8 000	87.7	87.7	87.7	0.14

Actual Freq Hz	B&K 4226 Corrections	Corrected Response dB(C)		Uncertainty (dB)
		Actual	re 1kHz	
125.90	-0.06	94.04	0.02	0.13
1005.10	-0.08	94.02	0.00	0.13
7915.10	0.00	87.70	-6.32	0.14

Adjustments were then applied to correct for free field and sound level meter body effects with data supplied by the manufacturer as per Table 3. Windscreen correction factors applied.

Table 3 - Correction Data

Actual Freq (Hz)	Pressure to Freefield (dB)	Uncertainty (dB)	Body Effects (dB)	Uncertainty (dB)	WS Effects (dB)	Uncertainty (dB)
125.90	0.00	0.25	0.00	0.25	0.00	0.20
1005.10	0.80	0.25	-0.07	0.25	-0.18	0.20
7915.10	3.41	0.35	-0.08	0.35	0.41	0.30

Finally, the corrected responses are normalised to the response at 1kHz and compared to the tolerance limits stated in Table 2 of IEC 61672.1-2013.

Table 4 - Acoustic C Response

Actual Freq (Hz)	Corrected Response dB(C)		Expected Response dB(C)		Deviation (dB)	P/F	Uncertainty (dB)	Maximum Permitted Uncertainty (dB)
	Actual	re 1kHz	re 1kHz	Tolerance Limit				
125.90	94.04	-0.53	-0.2	±1.0	-0.33	P	0.43	0.60
1005.10	94.57	0.00	0.0	±0.7	0.00	P	0.43	0.60
7915.10	91.44	-3.13	-3.0	+1.5 / -2.5	-0.13	P	0.60	0.70

3.4 ELECTRICAL SIGNAL TESTS OF FREQUENCY WEIGHTINGS

Frequency weighting responses for Z, C and A were determined relative to the response at 1kHz using steady sinusoidal electrical input signals.

On the reference level range, and for each frequency weighting under test, the level of a 1kHz input signal was adjusted to yield 95dB. At test frequencies other than 1kHz, the input signal level was adjusted to compensate for the design goal attenuations as specified in Table 2 of IEC 61672.1-2013.

Table 5 - Measured Electrical Frequency Response

Freq (Hz)	A Weighting (dB)	C Weighting (dB)	Z Weighting (dB)	Uncertainty (dB)
63	95.1	95.0	95.1	0.13
125	95.0	95.1	95.0	0.11
250	95.0	95.0	95.0	0.10
500	95.0	95.1	95.0	0.10
1 000	95.0	95.0	95.0	0.10
2 000	95.0	95.1	95.0	0.10
4 000	95.0	95.0	95.0	0.10
8 000	95.0	95.0	95.0	0.10
15 850	94.1	94.1	94.2	0.13

Adjustments were then applied to correct for a uniform free field response and sound level meter body effects with data supplied by the manufacturer as per Table 6. Windscreen correction factors applied.

Table 6 - Correction Data

Freq (Hz)	Ufreq (dB)	Uncertainty (dB)	Body Effects (dB)	Uncertainty (dB)	WS Effects (dB)	Uncertainty (dB)
63	0.00	0.25	0.00	0.25	0.00	0.20
125	0.00	0.25	0.00	0.25	0.00	0.20
250	0.00	0.25	0.07	0.25	-0.01	0.20
500	0.00	0.25	0.22	0.25	-0.07	0.20
1 000	0.10	0.25	-0.07	0.25	-0.18	0.20
2 000	0.01	0.25	-0.09	0.25	-0.67	0.20
4 000	0.02	0.25	-0.09	0.25	-0.05	0.20
8 000	0.00	0.35	-0.08	0.35	0.41	0.30
15 850	-0.87	0.45	0.11	0.35	1.33	0.30

Finally, the corrected responses were referenced to the response at 1kHz and compared to the tolerance limits stated in Table 2 of IEC 61672.1-2013.

Table 7 - A Weighted Electrical Response

Freq (Hz)	Response (dB)		Tolerance Limit (dB)	P/F	Uncertainty (dB)	Maximum Permitted Uncertainty (dB)
	Corrected	re 1kHz				
63	95.10	0.25	±1.0	P	0.43	0.60
125	95.00	0.15	±1.0	P	0.42	0.60
250	95.06	0.21	±1.0	P	0.42	0.60
500	95.15	0.30	±1.0	P	0.42	0.60
1 000	94.85	0.00	±0.7	P	0.42	0.60
2 000	94.25	-0.60	±1.0	P	0.42	0.60
4 000	94.88	0.03	±1.0	P	0.42	0.60
8 000	95.33	0.48	+1.5 / -2.5	P	0.59	0.70
15 850	94.67	-0.18	+2.5 / −16	P	0.66	1.00

Table 8 - C Weighted Electrical Response

Freq (Hz)	Response (dB)		Tolerance Limit (dB)	P/F	Uncertainty (dB)	Maximum Permitted Uncertainty (dB)
	Corrected	re 1kHz				
63	95.00	0.15	±1.0	P	0.43	0.60
125	95.10	0.25	±1.0	P	0.42	0.60
250	95.06	0.21	±1.0	P	0.42	0.60
500	95.25	0.40	±1.0	P	0.42	0.60
1 000	94.85	0.00	±0.7	P	0.42	0.60
2 000	94.35	-0.50	±1.0	P	0.42	0.60
4 000	94.88	0.03	±1.0	P	0.42	0.60
8 000	95.33	0.48	+1.5 / -2.5	P	0.59	0.70
15 850	94.67	-0.18	+2.5 / −16	P	0.66	1.00

Table 9 - Z Weighted Electrical Response

Freq (Hz)	Response (dB)		Tolerance Limit (dB)	P/F	Uncertainty (dB)	Maximum Permitted Uncertainty (dB)
	Corrected	re 1kHz				
63	95.10	0.25	±1.0	P	0.43	0.60
125	95.00	0.15	±1.0	P	0.42	0.60
250	95.06	0.21	±1.0	P	0.42	0.60
500	95.15	0.30	±1.0	P	0.42	0.60
1 000	94.85	0.00	±0.7	P	0.42	0.60
2 000	94.25	-0.60	±1.0	P	0.42	0.60
4 000	94.88	0.03	±1.0	P	0.42	0.60
8 000	95.33	0.48	+1.5 / -2.5	P	0.59	0.70
15 850	94.77	-0.08	+2.5 / −16	P	0.66	1.00

3.5 FREQUENCY AND TIME WEIGHTINGS AT 1KHZ

A steady sinusoidal electrical input signal of 1kHz at the reference sound pressure level was applied to the reference level range.

The deviations of the indicated level of C and Z frequency weightings were recorded, along with the deviations of the indication of A weighted time averaged, and SLOW weighted response.

Table 10 - Frequency and Time Weighting Results

Frequency Weighting	Time Weighting	Response (dB)	Deviation (dB)	P/F	Tolerance Limit (dB)	Uncertainty (dB)	Maximum Permitted Uncertainty (dB)
A	Fast	94.0	0.0	P	±0.2	0.10	0.20
	Leq	94.0	0.0	P	±0.2	0.10	0.20
	Slow	94.0	0.0	P	±0.2	0.10	0.20
C	Fast	94.0	0.0	P	±0.2	0.10	0.20
Z	Fast	94.0	0.0	P	±0.2	0.10	0.20

3.6 LONG-TERM STABILITY

Long-term stability was tested by comparing a steady sinusoidal electrical signal applied at the start, and at the end of testing. The applied signal level was set to the reference level and frequency and was maintained constant. The difference between the indicated levels was recorded.

Table 11 - Frequency and Time Weighting Results

Signal Level (mV)	Initial Response (dB)	Final Response (dB)	Deviation (dB)	P/F	Tolerance Limit (dB)	Uncertainty (dB)	Maximum Permitted Uncertainty (dB)
71.8	94	94.0	0.0	P	±0.1	0.10	0.10

3.7 LEVEL LINEARITY ON THE REFERENCE LEVEL RANGE

Level linearity was tested with a steady sinusoidal electrical signal at a frequency of 8kHz, with the meter set to display frequency weighted A, FAST response.

The starting point for level linearity testing was set to 94.0dB as stated in the instruction manual.

Level linearity was measured in 5dB steps of increasing input signal level from the starting point up to within 5dB of the stated upper limit, then at 1dB steps up to (but not including) the first indication of overload.

Table 12 - Level Linearity - Increasing

Ideal (dB)	Response (dB)	Deviation (dB)	Tolerance Limit (dB)	P/F	Uncertainty (dB)	Maximum Permitted Uncertainty (dB)
94.0	94.0	0.0	±0.8	P	0.1	0.3
99.0	99.0	0.0	±0.8	P	0.1	0.3
104.0	104.0	0.0	±0.8	P	0.1	0.3
109.0	109.0	0.0	±0.8	P	0.1	0.3
114.0	114.0	0.0	±0.8	P	0.1	0.3
119.0	119.0	0.0	±0.8	P	0.1	0.3
124.0	124.0	0.0	±0.8	P	0.1	0.3
129.0	129.0	0.0	±0.8	P	0.1	0.3
134.0	134.0	0.0	±0.8	P	0.1	0.3
135.0	135.0	0.0	±0.8	P	0.1	0.3
136.0	136.0	0.0	±0.8	P	0.1	0.3
137.0	137.0	0.0	±0.8	P	0.1	0.3
138.0	138.0	0.0	±0.8	P	0.1	0.3
139.0	139.0	0.0	±0.8	P	0.1	0.3
140.0	140.0	0.0	±0.8	P	0.1	0.3

Overload indication at 140.9dB.

Level linearity test was the continued in 5dB steps of decreasing input signal level from the starting point up to within 5dB of the stated lower limit, then at 1dB steps up to (but not including) the first indication of under range.

Table 13 - Level Linearity - Decreasing

Ideal (dB)	Response (dB)	Deviation (dB)	Tolerance Limit (dB)	P/F	Uncertainty (dB)	Maximum Permitted Uncertainty (dB)
94.0	94.0	0.0	±0.8	P	0.1	0.3
89.0	89.0	0.0	±0.8	P	0.1	0.3
84.0	84.0	0.0	±0.8	P	0.1	0.3
79.0	79.0	0.0	±0.8	P	0.1	0.3
74.0	74.0	0.0	±0.8	P	0.1	0.3
69.0	69.0	0.0	±0.8	P	0.1	0.3
64.0	64.0	0.0	±0.8	P	0.1	0.3
59.0	59.0	0.0	±0.8	P	0.1	0.3
54.0	54.0	0.0	±0.8	P	0.1	0.3
49.0	49.0	0.0	±0.8	P	0.1	0.3
44.0	44.1	0.1	±0.8	P	0.1	0.3
39.0	39.1	0.1	±0.8	P	0.1	0.3
35.6	35.6	0.0	±0.8	P	0.1	0.3
34.6	34.7	0.1	±0.8	P	0.1	0.3
33.6	33.7	0.1	±0.8	P	0.1	0.3
32.6	32.7	0.1	±0.8	P	0.1	0.3
31.6	31.9	0.3	±0.8	P	0.1	0.3
30.6	30.9	0.3	±0.8	P	0.1	0.3
29.6	29.9	0.3	±0.8	P	0.1	0.3
28.6	28.0	-0.6	±0.8	P	0.1	0.3
27.6	28.1	0.5	±0.8	P	0.1	0.3
26.6	26.6	0.0	±0.8	P	0.1	0.3
25.6	25.8	0.2	±0.8	P	0.1	0.3

No under range indicated.

3.8 TONEBURST RESPONSE

The response of the sound level meter to short-duration signals was tested on the reference range with 4kHz tone bursts.

The tone bursts were generated from a steady sinusoidal signal at a level of 137.0dB.

Table 14 - FAST Weighted Response

Burst Length	Response dB(A)	Deviation (dB)	Tolerance Limit (dB)	P/F	Uncertainty (dB)	Maximum Permitted Uncertainty (dB)
200ms	136.0	0.0	±0.5	P	0.1	0.3
2ms	118.9	-0.1	+1.0 / -1.5	P	0.1	0.3
0.25ms	109.8	-0.2	+1.0 / -3	P	0.1	0.3

Table 15 - SLOW Weighted Response

Burst Length	Response dB(A)	Deviation (dB)	Tolerance Limit (dB)	P/F	Uncertainty (dB)	Maximum Permitted Uncertainty (dB)
200ms	129.5	-0.1	±0.5	P	0.1	0.3
2ms	109.9	-0.1	+1.0 / -3	P	0.1	0.3

Table 16 - Sound Exposure Level Response

Burst Length	Response dB(A)	Deviation (dB)	Tolerance Limit (dB)	P/F	Uncertainty (dB)	Maximum Permitted Uncertainty (dB)
200ms	129.9	-0.1	±0.5	P	0.1	0.3
2ms	109.9	-0.1	+1.0 / -1.5	P	0.1	0.3
0.25ms	100.8	-0.2	+1.0 / -3	P	0.1	0.3

3.9 PEAK C RESPONSE

Indication of Peak C sound level was tested on the least sensitive level range. Test signals used were -

- A single complete cycle of an 8kHz sinusoid, starting and stopping at zero crossings
- Positive and negative half cycles of a 500Hz sinusoid, starting and stopping at zero crossings.

The level of the steady 8kHz sinusoid was adjusted to display 132.0dB(C).

Table 17 - Single Cycle Response

Response Peak C	Deviation (dB)	Tolerance Limit (dB)	P/F	Uncertainty (dB)	Overload Peak C	Maximum Permitted Uncertainty (dB)
133.6	-1.8	±2.0	P	0.22	N	0.35

Table 18 - Half Cycle Response

Signal Orientation	Response Peak C (dB)	Deviation (dB)	Tolerance Limit (dB)	P/F	Uncertainty (dB)	Maximum Permitted Uncertainty (dB)
Positive	134.0	-0.4	±1.0	P	0.1	0.35
Negative	134.2	-0.2	±1.0	P	0.1	0.35

No overload was noted during Peak C testing.

3.10 OVERLOAD INDICATION

The overload indication was tested on the least sensitive level range, with the sound level meter set to display frequency weighted A, time averaged values.

Positive and negative half cycle sinusoidal electrical signals at 4kHz were used. The test began at an indicated time averaged level of139.0dB(A).

Using the positive half cycle signal, the signal level was increased in steps of 0.5dB up to, but not including, the first indication of overload. The level of the input signal was then increased in steps of 0.1dB until the first indication of overload. These steps were repeated using the negative half cycle signal.

Table 19 - Overload Indication

Signal Orientation	Overload Response (dB)	Difference (dB)	Tolerance Limit (dB)	P/F	Uncertainty (dB)	Maximum Permitted Uncertainty (dB)
Positive		N/A	±1.5	N/A	0.10	0.25
Negative						

Overload indication could not be verified due to insufficient output of the waveform generator.

Overload latch indication could not be verified due to insufficient output of the waveform generator.

3.11 HIGH LEVEL STABILITY

High level stability was tested by measuring the response of the meter to high signal levels. The result was evaluated as the difference between the A-Weighted indicated levels in response to a steady 1kHz signal applied over 5 minutes.

Table 20 - FAST Weighted Response

Time Weighting	Initial Response (dB)	Final Response (dB)	Deviation (dB)	Tolerance Limit (dB)	P/F	Uncertainty (dB)	Maximum Permitted Uncertainty (dB)
Fast	139.0	139.0	0.0	±0.1	P	0.10	0.10
Slow	N/A	N/A	N/A	±0.1	N/A	0.10	0.10
Leq	139.0	139.0	0.0	±0.1	P	0.10	0.10

CERTIFICATE OF CALIBRATION

CERTIFICATE NO: C54254

EQUIPMENT TESTED : Acoustic Calibrator

Make & Model:	Svantek SV 36	**Serial No:**	154613
Class:	1		
Owner:	EMM Consulting The Forum, Level 10/201 Pacific Hwy St Leonards NSW 2065		
Tests Performed:	Measured Output Pressure level, Frequency & Distortion		
Comments:	See Details and Class Tolerance overleaf.		

CONDITION OF TEST:

Ambient Pressure	1011	hPa ±1 hPa	**Date of Receipt :**	13/06/2025
Temperature	21	°C ±1° C	**Date of Calibration :**	16/06/2025
Relative Humidity	41	% ±5%	**Date of Issue :**	16/06/2025

Acu-Vib Test Procedure: AVP02 (Calibrators)
Test Method: AS IEC 60942 - 2017

CHECKED BY: A. Nowosadzka **AUTHORISED SIGNATURE:** H. Soe

Accredited for compliance with ISO/IEC 17025 - Calibration

Results of the tests, calibration and/or measurements included in this document are traceable to SI units through reference equipment that has been calibrated by the Australian National Measurement Institute or other NATA accredited laboratories demonstrating traceability.

This report applies only to the item identified in the report and may not be reproduced in part.

The uncertainties quoted are calculated in accordance with the methods of the ISO Guide to the Uncertainty of Measurement and quoted at a coverage factor of 2 with a confidence interval of approximately 95%.

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NATA
WORLD RECOGNISED
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No. 9262
Acoustic and Vibration
Measurements

CERTIFICATE NO: C54254

The Calibrator described in this report has been tested to the requirements of the standard IEC 60942-[Ed 4]:2017-11.
The tests described in Annex B of the standard (Periodic tests) were carried out under the environmental conditions listed above to the following clauses:

Clause	Test description
B4.6	Sound Pressure Level (By comparison with a reference calibrator).
B4.7	Frequency (By measurement with a calibrated frequency meter).
B4.8	Total distortion and noise. (By measurement with a calibrated Noise and Distortion meter).

Notes:

1. The calibrator was calibrated with the main axis vertical and facing down.
2. No corrections have been made for atmospheric pressure, temperature, or humidity.

Parameter	Pre-Adj	Adj Y/N	Output: **(dB re 20 µPa)**	Frequency **(Hz)**	THD&N **(%)**
Level1:	NA	N	94.02 dB	1000.00 Hz	0.40 %
Level2:	NA	N	114.01 dB	1000.00 Hz	0.25 %
Uncertainty			±0.11 dB	±0.05%	±0.40 %
Uncertainty (at 95% c.l.) k=2					

Parameter	Class 1		Class 2	
Nominal Frequency	250 Hz	1 kHz	250 Hz	1 kHz
Output dB SPL	0.25 dB	0.25 dB	0.40 dB	0.40 dB
Frequency Hz	0.7 % (1.75 Hz)	0.7 % (7 Hz)	1.7 % (4.25 Hz)	1.7 % (17 Hz)
THD&N	2.5 %	2.5 %	3.0 %	3.0 %

Tolerance limits from AS/IEC60942 (edition 4)

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The uncertainties quoted are calculated in accordance with the methods of the ISO Guide to the Uncertainty of Measurement and quoted at a coverage factor of 2 with a confidence interval of approximately 95%.

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