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QUARTERLY ENVIRONMENTAL MONITORING REPORT- JANUARY TO MARCH 2026

A2I | Albury to Illabo

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REVISION	REVISION DATE	AMENDMENT	DATE TO CLIENT
A	02/04/2026	Issued for review	02/04/2026
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GLOSSARY

Specific terms and acronyms used throughout this plan are listed and described in Table 1 below.

TABLE 1: DEFINITIONS

TERM	DEFINITION
A2I	Albury to Illabo
AA	Acoustic Advisor
ARTC	Australian Rail Track Corporation
BCS	Biodiversity, Conservation and Science Group
BoM	Bureau of Meteorology
CBMP	Construction Biodiversity Management Plan
CEMP	Construction Environmental Management Plan
CEMF	Construction Environmental Management Framework
CNVMP	Construction Noise and Vibration Management Plan
CNVMPr	Construction Noise and Vibration Monitoring Program
CNVIS	Construction Noise and Vibration Impact Statement
CoA	Condition of Approval
COD	Chemical Oxygen Demand
CMP	Construction Monitoring Program
CSWMP	Construction Surface Water Monitoring Program
DCCEEW	Department of Climate Change, Energy, the Environment and Water (NSW)
dB	Decibel
DO	Dissolved Oxygen
DPHI	Department of Planning, Housing and Infrastructure
DS	Downstream
EC	Electrical Conductivity
EIS	Environmental Impact Statement
EPL	Environment Protection Licence
EPA	Environment Protection Authority
ER	Environmental Representative

HBT	Hollow-Bearing Tree
ICNG	Interim Construction Noise Guideline
IRPL	Inland Rail Pty Ltd
ISO	International Organisation for Standardisation
J2I	Junee to Illabo enhancement site
LGA	Local Government Area
NML	Noise Management Level
NST	No Sample Taken
NOx	Oxidised Nitrogen
OOHW	Out-of-Hours Work
P2N	Parkes to Narromine

COMPLIANCE MATRIX

The below Table 2 outlines this reports compliance with Infrastructure Approval SSI-10055.

TABLE 2: COMPLIANCE MATRIX TO ARTC SPECIFICATION

<table>
<tr><th>CONDITION REFERENCE</th><th>CONDITION REQUIREMENT</th><th>REFERENCE</th></tr>
<tr><td>C26</td><td>Except as provided by Condition C16, the following Construction Monitoring Programs must be prepared and implemented in consultation with the relevant government agencies identified for each to compare actual performance of construction of the CSSI against the performance predicted in the documents listed in Condition A1 or in the CEMP:
<table>
<tr><th>Required Construction</th><th>Relevant Government Agencies</th></tr>
<tr><td>Traffic, transport and access</td><td>Relevant councils and Transport for NSW (TfNSW)</td></tr>
<tr><td>Noise and vibration</td><td>Relevant councils</td></tr>
<tr><td>Biodiversity</td><td>BCS (NSW DCCEEW)</td></tr>
<tr><td>Surface water</td><td>DCCEEW Water Group and relevant councils</td></tr>
</table>
</td><td>This report and associated submission to relevant agencies</td></tr>
<tr><td>C27</td><td>Each Construction Monitoring Program (CMP) must have consideration of SMART principles and provide:
a) details of baseline data available;
b) details of baseline data to be obtained and when;
c) details of all monitoring of the project to be undertaken;
d) the parameters of the project to be monitored;
e) the frequency of monitoring to be undertaken;
f) the location and justification of monitoring locations;
g) the reporting of monitoring results and analysis results against relevant criteria;
h) details of the methods that will be used to analyse the monitoring data;
i) procedures to identify and implement additional mitigation measures where the results of the monitoring indicate unacceptable project impacts; and
j) any consultation to be undertaken in relation to the monitoring programs.</td><td>The CMP's were endorsed as an appendix to their respective CEMP sub-plan and satisfy SMART principles:
Construction Biodiversity Management Plan - Stage B: Appendix G - Monitoring Program (Doc No: 6-0052-210-PES-00-PJ-0007)

Construction Soil and Water Management Plan (CSWMP) - Stage B: Appendix B - Construction Surface Water Quality Monitoring Program - Stage B (Doc No: 6-0052-210-PES-00-PJ-0005)

Construction Noise and Vibration Management Plan - Stage B: Appendix B - Construction Noise and Vibration Monitoring Program (Doc No: 6-0052-210-PMA-00-PL-0013)</td></tr>
</table>

C28	The Noise and Vibration Monitoring Program must be prepared in accordance with the requirements of Approved Methods for the Measurement and Analysis of Environmental Noise (EPA).	Construction Noise and Vibration Management Plan - Stage A: Appendix A - Construction Noise and Vibration Monitoring Program 6_0052-210-PES-00-PJ-0002 Construction Noise and Vibration Management Plan - Stage B: Appendix B - Construction Noise and Vibration Monitoring Program (Doc No: 6-0052-210-PMA-00-PL-0013)
C29	CMP(s) must be submitted to the Planning Secretary for approval except those permitted to be endorsed by others pursuant to a CEMF approved by the Planning Secretary under Condition C16.	The CMP's were submitted to the Planning Secretary and approved as an appendix to their respective CEMP sub-plan prior to the commencement of construction.
C30	Where a CMP requires Planning Secretary's approval, the CMP must be endorsed by the ER and then submitted to the Planning Secretary for approval no later than one (1) month before the commencement of construction, or where construction is staged, no later than one (1) month before the commencement of each stage.	As above
C31	CMP(s) not requiring the Planning Secretary's approval, but requiring ER endorsement, must be submitted to the ER no later than one (1) month before the commencement of construction or where construction is staged no later than one (1) month before the commencement of that stage. The CMP(s) must be endorsed by the ER as being consistent with the conditions of this approval and all undertakings made in the documents listed in Condition A1.	As above
C33	The CMP(s), as approved or endorsed (as relevant), including any minor amendments approved by the ER, must be implemented for the duration of construction and for any longer period set out in the monitoring program or specified by the Planning Secretary, whichever is the greater.	As above
C34	The results of the CMP(s) must be submitted to the Planning Secretary, and relevant regulatory agencies, for information in the form of a Construction Monitoring Report at the frequency identified in the relevant CMP.	This report

1 INTRODUCTION

1.1 Project Overview

Inland Rail is an approximate 1,600 kilometres (km) freight rail network that will connect Melbourne and Brisbane via regional Victoria, New South Wales (NSW) and Queensland. The Inland Rail route would involve using approximately 1,000 km of existing track (with enhancements and upgrades where necessary) and 600 km of new track, passing through 30 local government areas (LGAs). Inland Rail will accommodate double-stacked freight trains up to 1,800 metres (m) long and 6.5 m high.

The Australian Government has confirmed that Inland Rail is an important project to meet Australia's growing freight task, improve road safety and help decarbonise the economy. Inland Rail will enhance our national freight and supply chain capabilities, connecting existing freight routes through rail, roads and ports, and supporting Australian's growth. Inland Rail is being delivered by Australian Rail Track Corporation (ARTC) and Inland Rail Pty Ltd (IRPL).

Comprising 12 sections, a staged approach is being undertaken to deliver Inland Rail. Each of these projects can be delivered and operated independently with tie-in points to the existing railway. Work south of Parkes has been prioritised, which will enable Inland Rail to initially connect to existing rail networks between Melbourne, Sydney, Perth and Adelaide via Parkes and Narromine. The Parkes to Narromine (P2N) and Narrabri to North Star Phase 1 (N2NS P1) sections are complete.

The project will enable enhancement works to structures and sections of track along 185 km of the existing operational standard-gauge railway in the Albury to Illabo (A2I) section of the Inland Rail program (refer to Figure 1). Enhancement works are required to provide the increased vertical and horizontal clearances required for double-stacked freight trains. Works would include track realignment, lowering and/or modification within the existing rail corridor, modification, removal or replacement of bridge structures (rail, road and/or pedestrian bridges), raising or replacing signal gantries, level-crossing modifications and other associated works

1.2 Environmental Protection Licence and Reporting Requirements

Martinus Rail Pty Ltd obtained the Environment Protection Licence (EPL No. 21984) from the NSW Environment Protection Authority for the purpose of constructing the project. This licence authorises the carrying out of scheduled activities listed in the licence at premises located between Albury and Illabo. The following report details environmental monitoring undertaken during this reporting month conducted in accordance with the EPL.

The EPL can be found by following the link below to the EPA's website: Environment & Heritage | POEO Licences, Application and Notice Detail.

1.3 Submission Requirements and Distribution

In accordance with Condition **C34**, this Construction Monitoring Report (i.e. Quarterly Environmental Monitoring Report) will be submitted to the Planning secretary and following agencies for information at the frequency identified in the Construction Monitoring Program, which is on a quarterly basis and within 60 days of the period's conclusion:

- NSW Environment Protection Authority (EPA)
- Relevant Councils: Albury City Council, Wagga Wagga City Council, Junee Shire Council, Lockhart Shire Council, and Greater Hume Shire Council
- NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) – including the Water Group and Conservation Programs, Heritage and Regulation (CPHR) (formerly known as Biodiversity, Conservation and Science Group (BCS)).

The Advisor (AA) will review and endorse the report as required by Condition **A27(e)** prior to submission to the Planning Secretary, Department of Planning, Housing and Infrastructure (DPHI).

1.4 Reporting Period

This Quarterly Environmental Monitoring Report has been prepared to address the Condition of Approval (CoA) **C34** of the Planning Approval SSI-10055. The report presents monitoring data for the reporting period for all works undertaken on the Albury to Illabo (A2I) portion of Inland Rail from **01st January 2026 to 31st March 2026**, representing the fourth Quarterly report submitted under **C34**.

In accordance with each Construction Monitoring Program, this Quarterly Environmental Monitoring Report will be submitted to the Planning Secretary and to relevant regulatory agencies (i.e. the EPA) for information 60 days after the reporting period ends.

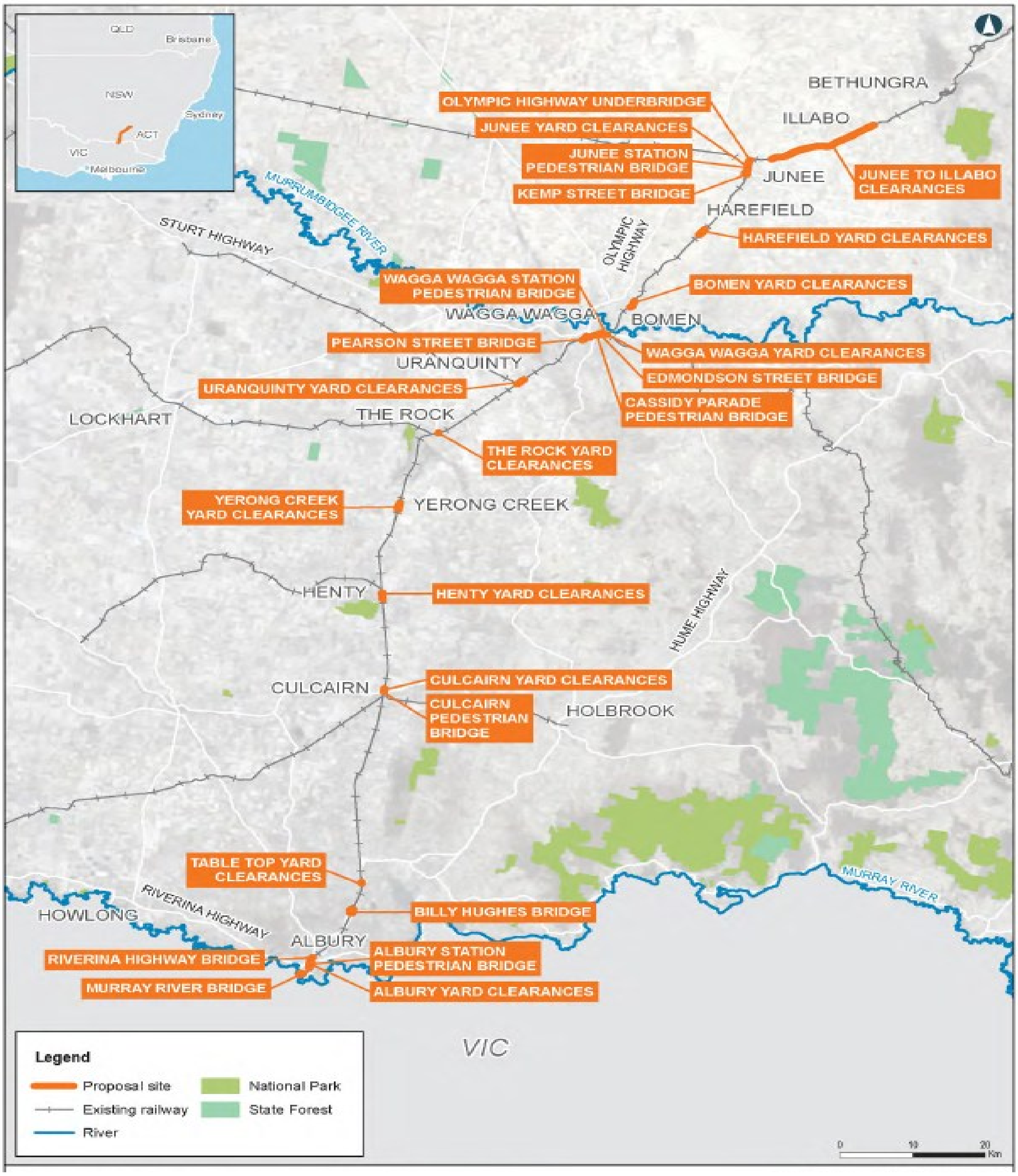

FIGURE 1: SITE OVERVIEW

2 METHODOLOGY

2.1 Noise and Vibration

2.1.1 Noise

Noise monitoring throughout the reporting period has been conducted in accordance with the procedures outlined in Appendix B of the Construction Noise and Vibration Management Plan (CNVMP); the Construction Noise and Vibration Monitoring Program (CNVMPr). Monitoring is conducted as required for out-of-hours work (OOHW), possessions, CNVIS validation, and complaint verification (if triggered), as well as ad hoc spot checks in response to potentially noise intensive plant or at the request of the Acoustic Advisor (AA). Monitoring activities were undertaken to generally satisfy the requirements of:

- Conditions of Approval (CoA): **C27**, **C28**, and **C34**
- Environment Protection Licence (EPL) No. 21984
- NSW EPA Approved Methods for the Measurement and Analysis of Environmental Noise (2022)
- Interim Construction Noise Guideline (ICNG, DECC 2009)

All monitoring was conducted by personnel deemed competent under Section 2.2 of the EPA Approved Methods, using equipment compliant with AS/NZS IEC 61672.1:2019 and AS 1055:2018. Monitoring locations were selected in accordance with the relevant site CNVIS, ICNG guidance, at the most noise-affected boundary within 30 metres of the residence, and at a height of 1.5 metres above ground level. Where access to private property was not granted, indicative monitoring was conducted at representative locations, with records of access requests maintained.

During this monitoring period, Martinus utilised the following noise monitoring devices:

TABLE 3: NOISE MONITORING EQUIPMENT

MANUFACTURER	MODEL	SERIAL NUMBER	CALIBRATION DATE	CALIBRATION DUE	LOCATION USED	DATE LOCATION MONITORING CEASED
RION	NL-42	00509260	03/09/2025	03/09/2026	South (Site 1 – Site 10)	-
RION	NL-43	00853458	10/09/2025	10/09/2026	South (Site 1 – Site 10)	-
RION	NL-43	00730663	07/05/2025	07/05/2026	North (Site 11 – Site 20)	-
RION	NL-43	00853459	01/11/2025	01/11/2026	North (Site 11 – Site 20)	-
SiteHive	-	HEX-001349	09/01/2026	09/01/2028	Edmondson Compound Cassidy Parade Wagga Yard Stockpiles	29/04/2025 – 24/02/2026 24/02/2026 – 16/03/2026 16/03/2026 – ongoing
SiteHive	-	HEX-000238	28/04/2025	28/04/2027	Illabo Compound South Wagga Public School	25/03/2025 – 20/01/2026 20/01/2025 - Ongoing
SiteHive	-	HEX-001335	09/01/2026	09/01/2028	Wrights Oval	05/12/2025 - 23/02/2026

					8 William St Junee	23/02/2026 - on going
SiteHive	-	HEX-001354	20/01/2026	20/01/2028	Kemp St Railway Parade	19/09/2025 - Ongoing
SiteHive	-	HEX-000600	15/08/2024	15/08/2026	Swift Street Compound / 530 Young St	14/12/2025 - Ongoing
Calibrator	NC-75	34556813	05/07/2025	05/07/2026	-	-

Calibration certificates are provided in **Appendix D**.

Table 4 details the specific noise monitoring activities undertaken during this quarter, aligning with the requirements set out in Table 13 of the CNVMPr.

TABLE 4: CNVMPr NOISE MONITORING PARAMETERS

MONITORING REQUIREMENT	FREQUENCY	EVIDENCE OF COMPLIANCE
Attended monitoring will be carried out at the commencement of activities for which a CNVIS has been prepared to confirm actual noise levels.	On the first occasion of activities for which a CNVIS has been prepared	Noise data register and attended monitoring field sheets
Attended monitoring where a complaint is received.	When a noise complaint is received and it is determined that the results of the process will assist in resolving the issue, or where this is identified as necessary to confirm mitigation measures are suitable	No noise complaints were received during this reporting period
Attended monitoring will be carried out at the request of AA or where predicted levels exceed the NML by: • >15dB for OOHWP1 • >5dB OOHWP2	At the request of AA, or (at a minimum) on the first occasion of activities for which a CNVIS has identified exceedances of the NML as listed	Noise data register and attended monitoring field sheets
Attended Validation monitoring	At least the first night of out of hours work where work is being undertaken in accordance with a community agreement	Noise data register and attended monitoring field sheets
Spot checks of noise intensive plant	At the commencement of noise intensive plant activities	Noise data register and attended field sheets
Where required for the purposes of refining construction methods or techniques to reduce noise levels	When trialling/refining construction methodologies or mitigation measures targeted at the reduction in sound power level of a specific noise source	Not applicable to this reporting period

2.1.2 Vibration

Vibration monitoring conducted during this reporting period was done generally in accordance with the CNVMPr. Monitoring was undertaken to generally satisfy the requirements of:

- Conditions of Approval (CoA) C26, C27, and C34,
- EPA's 'Assessing Vibration: a technical guideline' (DEC, 2006).

Vibration monitoring is conducted in response to activities that have the potential to generate vibration within the minimum working distances specified in Section 6.3 of the CNVMPr, and in proximity to heritage items, as required by CoA E80. Vibration monitoring was undertaken during the period for works conducted within minimum working distances of sensitive receivers (cosmetic damage and human comfort) and to validate the project vibration modelling and assumptions related to specific activities. A full summary of vibration monitoring activities can be found in Table 5.

Across the A2I project, Martinus utilise "SiteHive" Hexanode Vibration Monitoring to assess vibration impacts. The Hexanode device is calibrated in accordance with ISO/IEC 16063-21:2003 standards. Calibration certificates are provided in **Appendix D**.

TABLE 5: VIBRATION MONITORING EQUIPMENT

MANUFACTURER	SERIAL NUMBER	CALIBRATION DATE	CALIBRATION DUE	LOCATION USED	DATE USED
SiteHive	VIB-000279	05/09/2024	05/09/2026	111 Railway St (Gatehouse) 95 Railway St 22 Brookong St 80 Railway St	25/03/2026 - ongoing 27/02/2026 - 07/03/2026 11/02/2026 - 26/02/2026 15/01/2026 - 11/02/2026
SiteHive	VIB-000348	04/07/2025	04/07/2027	2 Kildare St Albury Station 111 Railway St (Gatehouse)	11/03/2026 - ongoing 02/03/2026 - 07/03/2026 27/02/2026 - 01/03/2026
SiteHive	VIB-000387	04/07/2025	04/07/2027	22 Brookong St 18 Junee Yard Signal Hut 14 Station Masters Residence	10/03/2026 - ongoing 28/02/2026 - 09/03/2026 19/01/2026- 27/02/2026
SiteHive	VIB-000047	04/07/2025	04/07/2027	S6 Culcairn Railway Station Turntable Albury Yard	28/02/2026 - 05/03/2026 03/02/2026 - 27/02/2026
SiteHive	VIB-000165	26/06/2025	26/06/2027	Albury Yard - Signalling Hut 1	01/01/2026 – ongoing
SiteHive	VIB-000512	24/02/2026	24/02/2028	Albury Station	07/03/2026 – ongoing

TABLE 6: CNVMPr VIBRATION MONITORING PARAMETERS

MONITORING PARAMETER	FREQUENCY	EVIDENCE OF COMPLIANCE
Vibratory works conducted within minimum working distances of sensitive receivers (cosmetic damage and human comfort)	At the commencement of vibratory works	Vibration monitoring data register
When a complaint is received in relation to human exposure to vibration levels and/or suspected property damage due to vibration impacts.	As required or when monitoring is considered an appropriate response	Vibration monitoring data register
For the purposes of refining construction methodology to reduce vibration levels	As required	Vibration monitoring data register
Vibration generating activities that have the potential to impact on heritage items in accordance with CoA E80	Any time vibration generating activities are occurring in proximity to heritage items.	Vibration monitoring data register

2.2 Surface Water

Surface water monitoring conducted throughout the monitoring period was undertaken in accordance with the Surface Water Monitoring Program. As per Section 3 of the program, nine points along the A2I alignment were monitored both monthly, as well in response to rain events that exceeded 25mm in 24hrs within the quarterly reporting period.

Surface water quality monitoring was performed at upstream (US) and downstream (DS) sites using a Horiba multiparameter for physio-chemical parameters, as well as the collection of water sample suits which were sent to a NATA accredited laboratory for analysis. The parameters analysed have been summarised below in Table 7.

During the monitoring period several sites could not be sampled due to the absence of any/running water. Typically, in the case of sampling locations that maintained ponded or stagnant water, no sample was taken as it would not have been reflective of the water body nor aligned with the intent of the Surface Water Monitoring Program.

Table 7 details the analytes that were monitored during the construction phase of the Project.

TABLE 7: SURFACE WATER QUALITY MONITORING PARAMETERS

CATEGORY	PARAMETERS
Physio-chemical parameters (field)	- Turbidity (NTU); - pH; - Dissolved oxygen (DO%); - Salinity/ Electrical Conductivity (EC); - Temperature (°C).
Laboratory analysis	- Chlorophyll-a; - Nutrients (total phosphorus and total nitrogen); - Total Suspended Solids (TSS); - Total metals (Aluminium, arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel and zinc); - Total Kjeldahl Nitrogen (TKN); - Nitrogen NOx (oxidised nitrogen); - Organic compounds (BTEX, naphthalene, and TRH); - Total Recoverable Hydrocarbons (TRH C6-C9, TRH C10-C36); - Chemical Oxygen Demand (COD);

	- Biochemical Oxygen Demand (BOD).

2.3 Biodiversity

Biodiversity monitoring conducted throughout the monitoring period was carried out in line with the project Construction Biodiversity Management Plan (CBMP). The monitoring aims to assess actual biodiversity impacts against predicted outcomes and ensure compliance with relevant CoA.

Monitoring activities outlined in this report were designed to:

- Validate predicted impacts to biodiversity.
- Ensure compliance with vegetation clearing limits.
- Assess effectiveness of mitigation measures.
- Inform biodiversity offset requirements (if required).

Biodiversity monitoring on A2I is conducted utilising several metrics. For the purpose of this report, specific reference will be made to the performance of outcomes as described in CoA **E20**.

3 RESULTS

3.1 Noise and vibration

3.1.1 Noise

3.1.1.1 Attended Noise Monitoring

Attended noise monitoring was undertaken throughout the reporting period as required for out-of-hours work (OOHW) and possessions, which were the periods of highest noise impact. Tailored monitoring programs were developed for each OOHW permit, aligned with the specific scope of works. Monitoring was carried out at sensitive receiver locations as per the site-specific CNVIS and relevant work periods.

Attended noise monitoring was undertaken for the following scopes:

- **Murray River Bridge:** February 2026 Possession OOHW – Top cord replacement
- **Billy Hughes Bridge:** OOHW verification for Sundays and public holidays, as well as February 2026 Possession OOHW associated with Shoulder recon works
- **Culcairn:** February 2026 Possession OOHW – Track works and slew.
- **Edmondson Street:** 66KV overhead wiring scope and February 2026 Possession OOHW – Bridge demolition
- **Wagga Wagga Yard:** OOH works associated with piling activities and February 2026 Possession OOHW – track work
- **Kemp Street/Junee:** February 2026 Possession OOHW – track works and driver platforms
- **Olympic Highway:** February 2026 Possession OOHW – track works
- **Junee to Illabo (J2I):** Sunday Day and Monday Nights OOHW – track works and February 2026 Possession OOHW – track works

All measured noise levels were found to be compliant with the relevant criteria. All monitoring results showed that the noise levels were compliant with the project requirements.

Detailed attended noise monitoring summary for attended noise monitoring events are provided in **Appendix A**.

3.1.1.2 Un-attended Noise Monitoring

Daily unattended noise monitoring was conducted using SiteHive Hexanodes, with monitors installed throughout the reporting period at Riverina Hwy as well as Edmondson, Wagga Yard, Cassidy Parade, Kemp Street, Wrights Oval and J2I site compounds when they were operational. These monitors continuously captured noise levels associated with daily site and construction activities. The primary purpose of the SiteHive Hexanodes is to enable the site team to make real-time decisions and proactively identify and manage noise risks. Outside of major possession periods, the acoustic environment was largely influenced by background sources such as local and highway traffic, natural elements (birds, insects, wind in vegetation) as well as intermittent train horns and shunting activities.

3.1.2 Vibration

3.1.2.1 Vibration Monitoring

Vibration monitoring was undertaken across A2I throughout the monitoring period across the alignment. SiteHive unattended vibration monitors provide live access to vibration data via the SiteHive Dashboard and sends text alerts for trigger level exceedances. This live feedback of data allows for prompt response to triggered events and the ability to amend construction methodology if required.

Throughout the monitoring period, vibration monitoring was undertaken at the following sites:

- **Albury Yard**: monitors were placed within the Albury Station and near the North Signalling Hut
- **Culcairn Yard**: monitor was placed just outside the Culcairn rail station
- **Wagga Yard:** monitor was placed for the piling operations on the northern piling pad to capture the use of a Soilmec SR-65 piling rig, as well as track works for the February 2026 Possession.
- **Cassidy Parade**: monitor was placed for the southern piling pad formation and piling works to capture the use of a vibratory roller and 110T piling rig
- **Edmondson Street**: a monitor was placed to capture the demolition of Edmondson Street bridge
- **Junee Yard:** a monitor was placed to during the February 2026 Possession to capture track work including the use of a vibratory roller, hydraulic hammer, piling rig and excavator with tamping head attachment

The Hexanode devices are calibrated in accordance with ISO/IEC 16063-21:2003 standards and set up as per the SiteHive guideline. All measured vibration levels are compliant with the relevant criteria. A few isolated events were recorded; however, upon review of the data these were determined to be short-term, not construction related and deemed compliant. The vibration monitoring summary is provided in **Appendix B**

3.2 Surface Water

3.2.1 Monthly Sample Events

Surface water monitoring conducted throughout the monitoring period identified elevated results in several water quality parameters. These results were observed across multiple sampling locations along the alignment, with downstream concentrations of some parameters exceeding upstream values by more than 20%, triggering the management response outlined in the Construction Surface Water Quality Monitoring Program (CSWMP). The management response for each month is as follows:

3.2.1.1 Monthly Management Response

January

January monitoring results indicate multiple exceedances of water quality parameters at both upstream and downstream locations across all sampled sites, highlighting potential environmental concerns. The parameters most frequently exceeding guideline values include chlorophyll-a, dissolved oxygen and aluminium. To assess whether these exceedances are linked to Martinus construction activities, a review of baseline data, recent rainfall records and recent activities including potential recorded erosion/sediment control incidents are required. These exceedances are consistent with the expectations of the EIS, noted in the CSWMP due to the highly disturbed nature of the waterways, likely the result of varying sources identified in the project EAD's, tied to historical and ongoing agricultural practices, urban development, and industrial runoff within the broader catchment.

Rainfall data for the month preceding the sampling (sampling completed on 21/01/2026) show approximately 6mm precipitation accumulatively recorded over 5 separate days, with the highest daily rainfall of 4.0mm recorded on the 22nd of December. Construction is actively occurring approximately 2km South-West of the SW01 and approximately 2km east of SW07. These exceedances have been consistent throughout all pre-existing monitoring event. There were no erosion/sediment incidents within this time. Given these conditions and the persistent nature of exceedances at upstream sites, it is highly unlikely that the observed water quality issues are attributable to recent construction activities by Martinus. Refer also to Table 9 which highlights that there were no parameters which showed downstream levels > 20% of upstream. Instead, the results point to long standing land use impacts and natural catchment characteristics as the primary contributors to water quality degradation.

February

February monitoring results indicate multiple exceedances of water quality parameters at both upstream and downstream locations across all sampled sites, highlighting potential environmental concerns. The parameters most frequently exceeding guideline values include chlorophyll-a, dissolved oxygen, aluminium, TSS and other metals. To assess whether these exceedances are linked to Martinus construction activities, a review of baseline data, recent rainfall records and recent activities including potential recorded erosion/sediment control incidents are required. These exceedances are consistent with the expectations of the EIS, noted in the CSWMP due to the highly disturbed nature of the waterways, likely the result of varying sources identified in the project EAD's, tied to historical and ongoing agricultural practices, urban development, and industrial runoff within the broader catchment.

Rainfall data for the month preceding the sampling (sampling completed on 16/02/2026) show approximately 15mm precipitation accumulatively recorded over 8 separate days, with the highest daily rainfall of 5.6mm recorded on the 9 th of February. Construction is actively occurring approximately 2km South-West of the SW01 and approximately 2km east of SW07 These exceedances have been consistent throughout all pre-existing monitoring event. There were no erosion/sediment incidents within this time. Given these conditions and the persistent nature of exceedances at upstream sites, it is highly unlikely that the observed water quality issues are attributable to recent construction activities by Martinus. Instead, the results point to long standing land use impacts and natural catchment characteristics as the primary contributors to water quality degradation.

March

March monitoring results indicate multiple exceedances of water quality parameters at both upstream and downstream locations across all sampled sites, highlighting potential environmental concerns. The parameters most frequently exceeding guideline values include chlorophyll-a, dissolved oxygen (DO) and aluminium
To assess whether these exceedances are linked to Martinus construction activities, a review of baseline data, recent

rainfall records and recent activities including potential recorded erosion/sediment control incidents are required. These exceedances are consistent with the expectations of the EIS, noted in the CSWMP due to the highly disturbed nature of the waterways, likely the result of varying sources identified in the project EAD's, tied to historical and ongoing agricultural practices, urban development, and industrial runoff within the broader catchment.

Rainfall data for the month preceding the sampling (sampling completed on 11/03/2026) show approximately 100mm precipitation accumulatively recorded over 6 separate days, with the highest daily rainfall of 55.2mm recorded in Albury on the 23rd of February. Construction is actively occurring approximately 2km South-West of the SW01 and approximately 2km east of SW07 These exceedances have been consistent throughout all pre-existing monitoring event. There were no erosion/sediment incidents within this time. Given these conditions and the persistent nature of exceedances at upstream sites, it is highly unlikely that the observed water quality issues are attributable to recent construction activities by Martinus.. Instead, the results point to long standing land use impacts and natural catchment characteristics as the primary contributors to water quality degradation.

3.2.2 Conclusion

As previously mentioned, several sites were consistently dry or stagnant, making them unable to be sampled or unrepresentative of the surface water quality in the waterway.

When compared against baseline data from the Environmental Impact Statement (EIS) for the A2I project—particularly Chapter 18: Hydrology, Flooding and Water Quality and Technical Paper 11—the observed exceedances aligned with historical trends and expectations for the region. The EIS identified many of the watercourses within the Murray and Murrumbidgee catchments as 'ephemeral systems', often subject to low flow conditions, poor ecological health, and naturally elevated concentrations of certain water quality indicators.

Given the absence of construction activities at the majority of sites, the previously obtained data from last quarter, and the consistency of results with pre-existing conditions documented in the EIS, it is reasonable to conclude that the observed deviations in water quality are not attributable to project-related impacts but rather reflect natural variability and legacy environmental conditions within the catchment.

A summary of this quarters surface water results can be found Table 8 and Table 9 below. A detailed monitoring reports and analyses are provided in **Appendix C.**

TABLE 8: SURFACE WATER SITES WHICH WERE NOT SAMPLED

MONITORING EVENT	SITES NOT SAMPLED	REASON
January	SW02, SW03, SW04, SW05, SW06, SW08, SW09	All dry or stagnant
February	SW02, SW03, SW04, SW05, SW06, SW08, SW09	All dry or stagnant
March	SW02, SW04, SW05, SW06, SW08, SW09	All dry or stagnant

TABLE 9: SURFACE WATER QUALITY EXCEEDANCE SUMMARY

MONITORING EVENT	SITE	PARAMETERS EXCEEDED	DOWNSTREAM > UPSTREAM (>20%)
January	SW01 - US	Dissolved Oxygen, Total Suspended Solids Aluminium, Chlorophyll-a	-
	SW01 - DS	Dissolved Oxygen, Aluminium	-

MONITORING EVENT	SITE	PARAMETERS EXCEEDED	DOWNSTREAM > UPSTREAM (>20%)
	SW07-US	NTU, Dissolved Oxygen, Total Suspended Solids, Aluminium, Cadmium, Chromium, Copper, Nickel, Zinc	-
	SW07-DS	Dissolved Oxygen, Aluminium, Cadmium, Chromium, Copper, Lead, Nickel, Zinc	-
February	SW01 - US	NTU Dissolved Oxygen, Total Suspended Solids, Aluminium, Cadmium, Chromium, Copper, Lead, Nickel, Zinc	-
	SW01 - DS	NTU, Dissolved Oxygen, Total Suspended Solids, Aluminium, Cadmium, Chromium, Lead, Nickel, Zinc	Dissolved Oxygen, Total Suspended Solids
	SW07-US	NTU, Dissolved Oxygen, Total Suspended Solids, Aluminium, Cadmium, Chromium, Copper, Lead.	-
	SW07-DS	Dissolved Oxygen, Total Suspended Solids, Aluminium, Cadmium, Chromium, Lead, Nickel	-
March	SW01 - US	Dissolved Oxygen, Electrical Conductivity, Aluminium	-
	SW01 - DS	pH, Dissolved Oxygen, Electrical Conductivity, Aluminium	-
	SW03-US	Dissolved Oxygen, Electrical Conductivity, Total Nitrogen, Total Phosphorus	-
	SW03-DS	Dissolved Oxygen, Aluminium, Total Nitrogen, Total Phosphorus	Dissolved Oxygen, Aluminium, Total Phosphorus
	SW07-US	NTU, Dissolved Oxygen, Aluminium, Chromium, Copper, Zinc, Total Nitrogen, Total Phosphorus	-
	SW07-DS	Dissolved Oxygen, Aluminium	Dissolved Oxygen

3.2.3 Wet Weather Monitoring

In accordance with the CSWMP, wet weather monitoring is required following rainfall exceeding 25 mm within a 24-hour period. When triggered, the parameters assessed include turbidity, pH, dissolved oxygen (DO), electrical conductivity (EC), and temperature. During the January–March quarter, Wet weather sampling was conducted at sampling sites SW01 – SW09 on the 3rd of March following 49mm in Albury and 32mm in wagga. Physio-chemical samples were taken at SW01, SW02, SW06 and SW07. Sampling locations at SW03, SW04, SW05, SW08 and SW09 were dry, and therefore no samples were taken. Results from this sampling event are displayed in Table 10.

TABLE 10: WET WEATHER SAMPLING RESULTS

Sample ID	Turbidity (NTU)	pH	Dissolved Oxygen (DO)	Electrical Conductivity (EC)	Temperature
SW01 - US	6.5	7.05	9.31	480	24.05
SW01 - DS	9	7.27	9.20	480	24.36
SW02 - US	96.8	6.61	4.59	730	21.46
SW02 - DS	181	6.37	6.92	770	21.69
SW03 - US	NST	NST	NST	NST	NST
SW03 - DS	NST	NST	NST	NST	NST
SW04 - US	NST	NST	NST	NST	NST
SW04 - DS	NST	NST	NST	NST	NST
SW05 - US	NST	NST	NST	NST	NST
SW05 - DS	NST	NST	NST	NST	NST
SW06 - US	2.5	6.47	9.19	340	21.85
SW06 - DS	2.8	7.01	6.16	440	21.68
SW07 - US	36.9	7.3	8.62	860	22.99
SW07 - DS	27.2	6.95	9.5	780	23.05
SW08 - US	NST	NST	NST	NST	NST
SW08 - DS	NST	NST	NST	NST	NST
SW09 - US	NST	NST	NST	NST	NST
SW09 - DS	NST	NST	NST	NST	NST

3.3 Biodiversity

3.3.1 Pre-Clearing/Post-Clearing Assessments

Pre-clearing assessments were conducted at enhancement sites in accordance with the CBMP. These assessments focused on verifying mapped vegetation, identifying habitat features, and evaluating connectivity for key threatened species, particularly the Squirrel Glider.

For enhancement sites where clearing had occurred a post clearing assessment was conducted.

Clearing occurred at the following enhancement sites during the reporting period.

TABLE 11: CLEARING EVENTS

SITE	DESCRIPTION
Junee to Illabo	Ongoing minor vegetation impacts resulting from shoulder reconditioning
Cassidy Footbridge	Tree clearing due to clashes with final design at Cassidy St bridge and trimming required for access
Olympic Highway	Minor trimming required for survey control, ongoing minor vegetation impacts resulting from shoulder reconditioning

Edmondson Street Bridge	Clearing to allow piling works and piling pad formation. Grubbing to allow hoarding installation
Bomen Yard	Grubbing works for compound and laydown establishment
Junee Driver Platforms	Grubbing to allow for construction and final design
Billy Hughes Bridge	Clearing and grubbing works to allow for construction footprint and stockpiling areas
Riverina	Grubbing to allow for signalling and track slew scope
Albury Yard	Clearing and grubbing to allow for the construction of Kenilworth St footbridge infrastructure

3.3.2 Plant Community Type Impacts

Vegetation clearing activities were monitored across all enhancement sites. Pre-clearing inspections confirmed mapped vegetation types and verified that no threatened ecological communities would be impacted as a result of any works associated with A2I.

All clearing was supervised by a suitably qualified ecologist.

TABLE 12: PLANT COMMUNITY TYPE

NAME OF PLANT COMMUNITY TYPE / ID	IDENTIFIED AREA AS PER THE COA (HA)	AREA CLEARED REPORTING PERIOD (HA)	TOTAL AREA CLEARED (HA)
277 – moderate – Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	0.5	Nil	0.0776
277 – poor – Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	1.44	Nil	0.1767
277 – derived – Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	2.3	Nil	0.787
277 – Native plantings – Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	0.26	Nil	Nil
277 – Non-native – Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	30.5	Nil	Nil
5 – River Red Gum herbaceous-grassy very tall open forest wetland on inner floodplains in the lower slopes sub-region of the NSW South Western Slopes Bioregion and the eastern Riverina Bioregion	0.04	Nil	Nil
Miscellaneous Ecosystems – 'Highly Disturbed areas with no or limited Native Vegetation'	N/A	0.565	10.39527
Miscellaneous Ecosystems – 'Ornamental Plantings'	N/A	Nil	0.607338

3.3.3 Threatened Species Habitat Impacts

Impacts to plant community types and threatened species habitat has not exceeded the impacts specified in CoA E20. No threated species were identified during the reported period.

TABLE 13: THREATENED FAUNA SPECIES HABITAT IMPACTS

FAUNA SPECIES	AREA AS PER THE COA (HA)	AREA IMPACTED (HA)	IDENTIFIED DURING REPORTING PERIOD	IDENTIFIED TO DATE
Lower Slopes IBRA Subregion				
Sloane's Froglet (Crinia sloanei)	0.03	Nil	No	Yes
Squirrel Glider (Petaurus norfolcensis)	0.16	Nil	No	Yes
Superb Parrot (Polytelis swainsonii)	0.16	Nil	No	No
Inland Slopes IBRA Subregion				
Sloane's Froglet (Crinia sloanei)	0.23	0.055	No	Yes
Key's Matchstick Grasshopper (Keyacris scurra)	0.21	Nil	No	No
Squirrel Glider (Petaurus norfolcensis)	1.82	0.2543	No	Yes
Superb Parrot (Polytelis swainsonii)	1.82	0.2543	No	No

3.3.4 Other Species Habitat Impacts

No other species habitat impacts were identified during this reporting period.

3.4 Weather Monitoring

In accordance with the requirements of the EPL, Condition **M3.1**, weather conditions are monitored daily using data sourced from the Bureau of Meteorology (BoM) weather stations along the A2I alignment.

Monitoring includes temperature, wind direction, wind velocity, and rainfall.

The BoM weather stations utilised include the below sites:

TABLE 14: WEATHER STATION SUMMARY

WEATHER STATION	SITE CAPTURED
Albury	- Murray River bridge - Albury Yard - Riverina Highway - Billy Hughes Bridge - Tabletop Yard
Lockhart	- Culcairn Yard - Henty Yard - Yerong Creek Yard - The Rock Yard

Wagga Wagga	- Uranquinty Yard - Pearson St bridge - Cassidy Footbridge - Edmondson St Bridge - Wagga Wagga Station - Bomen Yard - Harefield Yard - Kemp St Bridge - Junee Yard - Olympic Highway - Junee to Illabo

3.5 Water Discharge

No water was discharged from A2I premised sites during the reporting period.

APPENDICES

APPENDIX A

Attended Noise Monitoring Summary

Table 15: Attended Noise Monitoring

Date	Time (Hrs)	Duration (Min)	Location	Construction Activities	Audible Construction Activities	Period	NML	Predicted construction Noise Level (LAeq,15min) dB	LAeq 15 minute dB	LAmax dB	Determined Construction Noise Contribution (LAeq,15min) dB	Determined Construction Noise Contribution (LAmax) dB	Compliant (Y/N)	Comments
23/01/2026	8:30	15 min	2 Kildare St, Turvey Park	Tree Clearing	Tree clearing equipment such as mulcher	Standard	53	81	77.5	88.7	77	80	Y	Monitoring Capturing: Tree clearing at Cassidy Parade Equipment List: x1 mulcher, x1 truck, x1 EWP, x2 traffic control LVs. Distance from Works: Monitor was 50m from construction noise Distance from Receiver: Monitor was 10m from the receiver location Dominant Noise Source: Martinus/ tree mulcher was dominant noise source Estimated Construction dB: constant construction noise at 77 dB Estimated Background dB: Background noise was dominated by construction Nosie General Observations: NA
28/01/2026	8:02	15 min	2 Kildare St, Turvey Park	Tree Clearing	Tree clearing equipment such as mulcher	Standard	48	81	78.4	91.2	78.4	80	Y	Monitoring Capturing: Cassidy tree clearing Equipment List: x2 light vehicles, 1x EWP, x1 truck, 1x mulcher Distance from Works: Monitor was 50m from construction noise Distance from Receiver: Monitor was 10m from the receiver location Dominant Noise Source: the tree clearing activities were the dominant noise source throughout the monitoring period Estimated Construction dB: 78.4 Estimated Background dB: NA - Construction noise dominated General Observations: NA
1/02/2026	15:33	15 min	7 Tooheys Ln, Illabo	J2I Sunday & Monday Nights	Track work: material transport	Day OOH	46	66	60	76.2	54.2	57.4	Y	Monitoring Capturing: J2I Sunday & Monday Nights - Track Work Equipment List: x6 hydremas, x1 FEL Distance from Works: Monitor was 200m from construction noise Distance from Receiver: Monitor was 15m from the receiver location Dominant Noise Source: Construction noise was not dominant noise source, background ambient levels were 49dB and when construction related noise was observed DB was at 57.4. Loudest noise source was local traffic on at 76dB Estimated Construction dB: During ballast drops/compound operating dB levels were 54.2 Estimated Background dB: ambient noise dB was 49 however highway road traffic was 76dB General Observations:
7/01/2026	19:05	15 min	Kildare Catholic College	66KV Works	Cut over and Power Pole remova	Evening	51	63	57.3	71.1	57	60	Y	Attended monitoring captured brief Martinus mobilisation to Edmondson Bridge. Noise sources were primarily attributed to a mobile crane and EWP preparing the 66kv for cut over works being completed by EWP. All works fell below the predicted level.
7/01/2026	20:56	15 min	96 Railway Parade, Turvey Park	66KV Works	Cut over scope	Night	52	59	62.2	85	47.4	50	Y	Hume Highway traffic dominated noise monitoring event. A freight train passed through Wagga for approximately 1.5 minutes during the noise monitoring period. Martinus works were intermittently audible a between 48 and 50dB but were vastly quieter than local and Hume highway traffic, which was consistent throughout the monitoring event. Audible works fell below predicted levels and were therefore considered compliant.
7/01/2026	21:57	15 min	6 Little Best St, Turvey Park	66KV Works	Cut over scope	Night	42	77	59	68.9	59	68.9	Y	Martinus works were the dominant source of noise throughout the monitoring event. All audible works fell below predicted levels and were compliant with the OOHW permit. The Hume Highway was occasionally audible however traffic was light throughout the period.
12/01/2026	20:43	15 min	7 Tooheys Ln, Illabo	J2I Sundays & Monday Nights	Shoulder Recon and Compound operation	Night	46	66	52.3	72.2	51.4	61.3	Y	Monitoring in accordance with Shoulder Recon work scenario. 6xHi-rail hydrema, 1xplate compactor, LVs, lighting towers, 1xExcavator. Compound Operation of stockpile area was also occurring with a FEL operating during part of the measurement. Hydremas moved along track from stockpile area to shoulder recon area. Shoulder Recon work area approximately 150m north of monitor and stockpile area was 200m south. Monitor was 15m from receiver. Measurement was compliant with predicted level. When hydrema passing monitor and ballast drop in background measurement spiked to 61.3dB at 4:39 with no highway traffic. Measurement was 51.4dB at 13:47 with plate compactor operating and no highway traffic audible.
18/01/2026	15:22	15 min	36 Turland St, Illabo	J2I Sundays & Monday Nights	Track work: material transport	Day OOH	46	65	65.3	84.8	59	61	Y	Shoulder recon work area with 4x hi rail hydremas, 1 hi-rail excavator, LVs. Shoulder recon area was about 50m from monitor, and receiver was 30m further from the work area. Highway noise dominated the measurement therefore measured LAeq of 65.3dB is considered compliant with predicted level of 65dB. Excavator loading ballast into hydrema measuring about 61dB with no highway traffic audible. Highway traffic: Light vehicle and trailer spiked measurement to 77.6dB at 13:30
21/01/2026	18:46	15 min	14 Station Place, Wagga Wagga	Wagga Footbridge Pile cage removal	Pile cage removal	Evening	52	71	57.3	82.7	56	62	Y	Piling work area with equipment including excavator, oxycutter, hand tools, and power washer. Local traffic was audible throughout measurement and contributed equally alongside construction noise. Monitor was approximately 15m from work area and 30m from residence. Measurement was compliant with predicted level. 56dB when excavator operating and no non-construction noise audible. 62dB at 13:00 when power washer operating and no non-construction noise audible
3/02/2026	5:43	15 min	14 Station Place, Wagga Wagga	Piling works - Crane Demobilisation	Site Cleanup, Traffic Control, Crane Demobilisation	Night	44	55	58	78	50	52	Y	Local Garbage Truck Emptying Bins Approx 10m from monitor, 25m from receiver. Receiver 15m further from noise source then monitor. Garbage truck at least 10dB higher than MR related noise. The recorded 2dB exceedance of predicted value is not representative of MR noise and unlikely to have been received at that noise level the further 15m from noise source
9/02/2026	18:17	15 min	114 Main St, Junee	Olympic Hwy - Track Work	Stockile operation	Evening	47	67	60.2	77.7	60	65	Y	FEL, watercart, 3x hydrema, LV at Olympic Hwy Southern Stockpile area which was 15m from monitor, residence was a further 25m away. After 6 minutes FEL had loaded all 3 hydremas with capping and local traffic dominated noise measurement until 13 minutes when FEL began operating again. There was frequent traffic on Main Street throughout measurement. When vehicles pass monitor reading would reach about 66dB. Reading was about 60dB when FEL and hydrema were moving / operating when no local traffic was audible. Overall, traffic and construction contributed equally to measurement. Construction noise contribution LAeq estimated to be 60dB based on notes. Noise level was compliant with predicted level
9/02/2026	18:45	15 min	4 Waterworks Rd, Junee	Olympic Hwy - Track Work	Track work: material transport	Evening	47	77	62.9	86.5	62.9	65	Y	Hi-rail excavator, 4x hi-rail hydremas, hand tools, LVs at shoulder recon work area which was 25m from monitor with residence a further 10m away. There was occasional local traffic passing on Waterworks road. Reading spiked to 85.9dB when road train passed at 4:30. When plate compactor, hydremas, and excavator were all operating measurement was about 63dB from 7:10 to 9:30. Construction dominated the measurement and measured LAeq of 62.9dB is representative of construction noise contribution. Measurement was compliant with predicted level.
9/02/2026	19:16	15 min	4 Waterworks Rd, Junee	Olympic Hwy - Track Work	Track work: material transport	Evening	47	77	64	81.7	64	67	Y	6xhi-rail hydremas, 2xhi-rail excavators, LVs at shoulder recon work area which was approximately 25m from monitor and residence was a further 10m away. Hydremas were unloading ballast on shoulder and tracking by. One excavator was spreading ballast the other excavator just tracked by. There was occasional local traffic but construction noise dominated the measurement and measured LAeq of 64.0dB is representative of construction noise contribution. LAeq was compliant with predicted level.
9/02/2026	20:04	15 min	1-5 Hill St, Junee	Signalling	Cable work	Night	47	60	60.3	91.7	<27	NA	Y	Work was not audible over backgrounds noise for majority of measurement. Only equipment was hand tools, all LVs were parked and not idling. Work area was 30m from monitor and receiver was 15m from monitor. Local and highway traffic dominated the measurement. Determined construction contribution LAeq is estimated to be <LA90 of 37dB.
22/02/2026	18:44	15 min	3022 Byrnes Rd, Junee	Junee Driver Platforms	Driver platforms structures scope	Evening	47	73	63.8	93.4	46.4	62	Y	1x excavator, 3x LVs, 1xlight truck, 2xTC LVs Monitoring for driver platforms structures scope. Traffic on Byrnes Road dominated the measurement. Music from residence at 3024 Byrnes Road was also audible throughout measurement and overpowered the sound of the excavator operating. Monitor 100m from driver platform work area and 20m from residence. 72.2dB 1:03 local traffic on Byrnes road 61.8dB 6:18 LV pulling away in front of monitor 84.5dB 8:23 Road train passing on Byrnes road Based on observations estimated construction LAeq is <LA90 46.4dB and estimated construction LAmax is 62dB
22/02/2026	19:32	15 min	10 Waterworks Rd, Junee	Olympic Hwy - Track Work	Track work: material transport	Evening	47	75	56.7	80	56.7	74.9	Y	1x Hi rail truck, LV, 1x Hi rail excavator Monitoring track work at Olympic Highway, activities included ballast drops. Construction was active and audible for 13 minutes. Monitor was 12m from work area and 20m from residence noting the hi-rail truck and excavator were moving along the rail. Ballast dropping, measurement around 50-60dB depending on proximity of work to monitor. Measured LAeq is considered representative of construction activities, estimated construction contribution is 56.7dB. Estimated construction LAmax 74.9dB when excavator was scraping ballast out of truck at 6:00.
27/02/2026	8:50	15 min	12 Donnelly Ave, Wagga Wagga	February 2026 Possession	Geotechnical Investigations	Standard	58	58	61.1	78.9	57.6	60	Y	NDD Truck operating dominant at 57.6dB, Approx 80m from monitor, 90m from receiver Local traffic present 60% of noise recording and Approx 10-25dB louder than the NDD truck resulting in spikes and an increased LAeq.
28/02/2026	11:11	15 min	2 Donnelly Ave, Wagga Wagga	February 2026 Possession	Bridge Demolition, ERSED Install, Dust Suppression	Standard	58	94	68.3	86.4	68.3	72	Y	3x Excavators operating and hammering to remove bridge sections at 68.3dB, Tracking and separating concrete dominant throughout reading, Approx 40m from monitor, 50m from receiver. estimated construction contribution is 68.3dB. Estimated construction LAmax 79.8dB
28/02/2026	13:37	15 min	84 Main Street, Junee	February 2026 Possession	Ballast Regulator, Dust Suppression	Standard	47	72	61.3	78.5	70	74.3	Y	Ballast regulator at closest point to receiver 74.3dB, Approx 30m from monitor, 40m from receiver. Horn on road 79.5dB, Approx 100m from monitor, 110m from receiver. estimated construction contribution is 68.3dB. Estimated construction LAmax 74.3dB
18/01/2026	14:07	15 min	23-25 Sanctuary Lane, Albury	Signalling	Not audible	Day OOH	42	42	53.6	74.7	<32	NA	Y	Construction activity: Signalling works, CSR cabling installation - trenching with 5th excavator Construction noise was inaudible from nearest sensitive receiver. Primary noise sources captured included local traffic, echoing highway traffic, passing HV traffic and wildlife noises. LAeq compliant with Below NML permit.
28/02/2026	10:13	15 min	41 Pearson Street, Wagga Wagga	February 2026 Possession	Signalling scope	Standard	49	65	58.3	79	54	56	Y	CNVIS: W.009 Signalling Works Scope of work: NDD to expose cables for relocation NDD truck was audible throughout entire sample. This was the only construction noise heard throughout the sample. Other external noise sources included passing traffic over the level crossing, wind, and the residences gate shaking in the wind. Car passing at 3:20 raised LAmax to 73.3. Car passing at 4:40 raised LAmax to 74.5 Construction LAeq was observed as LAeq 56dB. Reading compliant.
28/02/2026	13:05	15 min	46 Melville Street, Culcairn	February 2026 Possession	Track Work. Replacing redundant sleepers	Standard	46	72	56.9	74.4	53	73.7	Y	CNVIS: W.004 Track Work Scope of work: changeout of old timber sleepers using a hi-rail crane, FEL and hand tools Car passing raised LAmax to 72.1 at 2:30. Between minutes 4-7, a HV pulled up at the otherwise of the road with a tonal beeper (LAeq between 50-53). Dominated sample for this period. Passing traffic was continuous throughout sample. When only non-tonal beeper could be heard, LAeq sat around 45dB. HV passing at 12:40 raised LAmax to 73.7 LAeq sat around 43dB when only construction noise could be heard. Reading compliant. MR Construction works observed as approximately LAeq 50-53dB. Measurement taken during standard construction hours.
28/02/2026	16:15	15 min	587 Abercorn St, South Albury	February 2026 Possession	Murray River rail bridge top cord removal and replacement	Standard	50	61	51.7	64.9	<51	51	Y	Hume Highway dominated entire noise monitoring event. MR Construction works observed as an LAeq of <51dB
28/02/2026	17:11	15 min	19 Sanctuary Ln, Ettamogah	February 2026 Possession	Not audible	Evening	42	50	53.4	74.7	<30.8	NA	Y	No MR works audible from this location, it can be therefore assumed that MR construction works maintained an LAeq of <31dB. Hume Highway dominated noise source. Noise profile did not change throughout monitoring period
1/03/2026	6:54	15 min	11 Erin Street, Turvey Park	Bridge Demolition, Dust Suppression, Traffic Control	Separating material	Evening	42	81	52.8	73.1	47.9	50	Y	0832 - 47.9 - Excavators separating material dominant, Approx 80-180m Monitor, 75-175m Receiver Birds present thought-out recording 70% of the time range of 49-62.1dBL26:O27
8/03/2026	17:17	15 min	92 Main Street, Junee	Soil stripping, Dust suppression, Track protection installation	Soil stripping operations	Day OOH	47	76	61.1	64.4	46.1	64.4	Y	1058 - 46.1 - Plant dominant no local traffic, Approx 50-80m from monitor 65-95m from receiver
15/03/2026	15:13	15 min	2-4 Turland St, Illabo	Geotechnical Investigations	Geotechnical Investigations	Day OOH	46	69	56	81	<58	58	Y	Monitoring during geotechnical investigations. 1xNDD truck at level crossing 40m away for half measurement and then moved to 30m away, hand tools in compound used approximately 100m away from monitor. Residence was an additional 10m away from work areas. Highway traffic was present throughout measurement. 80dB road train passing on highway 9:30. Construction noise dominated the measurement and measured LAeq is considered representative of construction noise contribution. 58dB LAmax construction from NDD truck movement.

Date	Time (Hrs)	Duration (Min)	Location	Construction Activities	Audible Construction Activities	Period	NML	Predicted construction Noise Level (LAeq,15min) dB	LAeq 15 minute dB	LAmax dB	Determined Construction Noise Contribution (LAeq,15min) dB	Determined Construction Noise Contribution (LAmax) dB	Compliant (Y/N)	Comments
18/03/2026	11:25	15 min	90 Railway Parade, Turvey Park	Wagga FB Pile break back	Footbridge pile breakback	Standard	58	75	74.3	82.5	75	82.5	Y	Pile break including 1xgenerator, 1xcompressor, 1xjackhammer 20m from monitor, residence is 5m from monitor. Construction noise dominated the measurement. 1xWatercart and 3xRigid truck also moving past monitor in corridor towards stockpile area for material load out intermittent during measurement. Hammering stopped at 11:20. Construction noise dominated the measurement and measured LAeq and LAmax are representative of construction noise contribution.
18/03/2026	15:10	15 min	2 Donnelly Ave, Wagga Wagga	Edmondson Bridge Works	Bridge demolition	Standard	58	94	61.8	83.3	61.8	66	Y	Bridge demolition works. North abutment - NDD truck, jackhammer old footings, hand tools, saw South abutment - excavator working on piling pad Jackhammer started at 5:50 stopped at 13:00. LAmax 66dB Local traffic passing monitor 61dB at 6:58 NDD stopped at 7:45 Construction noise dominated the measurement and the measured LAeq is considered representative of construction noise contribution.
18/03/2026	15:43	15 min	24-26 Brookong Ave, Wagga Wagga	Cassidy Parade Pile Break back	Footbridge pile breakback	Standard	58	82	64.6	73.5	64.6	73.5	Y	Monitoring Pedestrian Bridge Work Peak. Cassidy north work area 5m from monitor: pile break back - Concrete saw, generator + pressure washer, compressor Cassidy south work area 40m from monitor: piling pad construction - Excavator, rigid truck delivering material, 8T static roller Construction noise dominated the measurement and measured LAeq is considered representative of construction noise contribution.
19/03/2026	14:46	15 min	20 Brookong Ave, Wagga Wagga	Cassidy - Pile Breakback	Footbridge pile breakback	Standard	58	88	67.1	71.8	67.1	71.8	Y	Monitoring Pedestrian Bridge Work Peak adjacent to Telstra office building during pile break back at Cassidy north. 1x Generator, 1x jackhammer, 1x compressor at pile work area. Monitor was approximately 20m from pile works and the 10m from receiver. Construction dominated the measurement, measured LAeq and LAmax are representative of construction contribution.
19/03/2026	15:16	15 min	24-26 Brookong Ave, Wagga Wagga	Cassidy Pile Breakback	Footbridge pile breakback	Standard	58	82	69.2	76.1	69.2	76.1	Y	Cassidy North 5m from monitor concrete saw and 15m from monitor 1x LV, compressor, generator, Cassidy South 40m from monitor: 1xNDD 3xLVs, 1xexcavator Construction noise dominated the measurement, and measured LAeq is considered representative of construction noise contribution.
20/03/2026	12:17	15 min	19 Sanctuary Ln, Ettamogah	Excavation SW batter	Excavation SW batter	Standard	42	53	62.3	78.6	<35	NA	Y	Traffic on Wagga road both significant and consistent. MR Works were completely inaudible.

APPENDIX B

Vibration Monitoring Summary

Table 16: Vibration Monitoring - Human Comfort

Monitoring Location	Date	Works Being Carried Out	Attended or Continuous	Event Based Monitoring	SiteHive Data VDV Maximum (m/s^2)	VDV preferred values Criteria (m/s^2)	VDV Maximum values Criteria (m/s^2)	Compliant	Comments
Wagga Wagga - 80 Railway Street	Day - 15 Jan 2026	Community Complaint Monitoring - Piling pad construction from January 15 – 18th including the use of a vibratory roller approximately 37m from residence at the closest point of the piling pad.	Continuous	Yes	0.0358	0.20 - z	0.40 - z	Y	NA
	Night - 15 Jan 2026				0.0354	0.13 - z	0.26 - z	Y	NA
Wagga Wagga - 80 Railway Street	Day - 16 Jan 2026	Community Complaint Monitoring - Piling pad construction from January 15 – 18th including the use of a vibratory roller approximately 37m from residence at the closest point of the piling pad.	Continuous	Yes	0.0338	0.20 - z	0.40 - z	Y	NA
	Night - 16 Jan 2026				0.0324	0.13 - z	0.26 - z	Y	NA
Wagga Wagga - 80 Railway Street	Day - 17 Jan 2026	Community Complaint Monitoring - Piling pad construction from January 15 – 18th including the use of a vibratory roller approximately 37m from residence at the closest point of the piling pad.	Continuous	Yes	0.0165	0.20 - z	0.40 - z	Y	NA
	Night - 17 Jan 2026				0.0161	0.13 - z	0.26 - z	Y	NA
Wagga Wagga - 80 Railway Street	Day - 18 Jan 2026	Community Complaint Monitoring - Piling pad construction from January 15 – 18th including the use of a vibratory roller approximately 37m from residence at the closest point of the piling pad.	Continuous	Yes	0.0154	0.20 - z	0.40 - z	Y	NA
	Night - 18 Jan 2026				0.0151	0.13 - z	0.26 - z	Y	NA
Wagga Wagga - 80 Railway Street	Day - 21 Jan 2026	Wagga Wagga Yard - Piling operations on the northern piling pad, using a Soilmec SR-65 piling rig.	Continuous	Yes	0.0192	0.20 - z	0.40 - z	Y	NA
	Night - 21 Jan 2026				0.0180	0.13 - z	0.26 - z	Y	NA
Wagga Wagga - 14 Station Masters Residence	Day - 22 Jan 2026	Wagga Wagga Yard - Piling operations on the northern piling pad, using a Soilmec SR-65 piling rig.	Continuous	Yes	0.0584	0.20 - z	0.40 - z	Y	NA
	Night - 22 Jan 2026				0.0569	0.13 - z	0.26 - z	Y	NA
Wagga Wagga - 80 Railway Street	Day - 22 Jan 2026	Wagga Wagga Yard - Piling operations on the northern piling pad, using a Soilmec SR-65 piling rig.	Continuous	Yes	0.0233	0.20 - z	0.40 - z	Y	NA
	Night - 22 Jan 2026				0.0182	0.13 - z	0.26 - z	Y	NA
Wagga Wagga - 14 Station Masters Residence	Day - 23 Jan 2026	Wagga Wagga Yard - Piling operations on the northern piling pad, using a Soilmec SR-65 piling rig.	Continuous	Yes	0.0428	0.20 - z	0.40 - z	Y	NA
	Night - 23 Jan 2026				0.0405	0.13 - z	0.26 - z	Y	NA
Wagga Wagga - 80 Railway Street	Day - 23 Jan 2026	Wagga Wagga Yard - Piling operations on the northern piling pad, using a Soilmec SR-65 piling rig.	Continuous	Yes	0.0181	0.20 - z	0.40 - z	Y	NA
	Night - 23 Jan 2026				0.0163	0.13 - z	0.26 - z	Y	NA
Wagga Wagga - 14 Station Masters Residence	Day - 24 Jan 2026	Wagga Wagga Yard - Piling operations on the northern piling pad, using a Soilmec SR-65 piling rig.	Continuous	Yes	0.0330	0.20 - z	0.40 - z	Y	NA
	Night - 24 Jan 2026				0.0284	0.13 - z	0.26 - z	Y	NA
Wagga Wagga - 80 Railway Street	Day - 24 Jan 2026	Wagga Wagga Yard - Piling operations on the northern piling pad, using a Soilmec SR-65 piling rig.	Continuous	Yes	0.0200	0.20 - z	0.40 - z	Y	NA
	Night - 24 Jan 2026				0.0162	0.13 - z	0.26 - z	Y	NA
Wagga Wagga - 14 Station Masters Residence	Day - 25 Jan 2026	Wagga Wagga Yard - Piling operations on the northern piling pad, using a Soilmec SR-65 piling rig.	Continuous	Yes	0.0205	0.20 - z	0.40 - z	Y	NA
	Night - 25 Jan 2026				0.0196	0.13 - z	0.26 - z	Y	NA
Wagga Wagga - 80 Railway Street	Day - 25 Jan 2026	Wagga Wagga Yard - Piling operations on the northern piling pad, using a Soilmec SR-65 piling rig.	Continuous	Yes	0.0131	0.20 - z	0.40 - z	Y	NA
	Night - 25 Jan 2026				0.0118	0.13 - z	0.26 - z	Y	NA
Wagga Wagga - 14 Station Masters Residence	Day - 26 Jan 2026	Wagga Wagga Yard - Piling operations on the northern piling pad, using a Soilmec SR-65 piling rig.	Continuous	Yes	0.0172	0.20 - z	0.40 - z	Y	NA
	Night - 26 Jan 2026				0.0137	0.13 - z	0.26 - z	Y	NA
Wagga Wagga - 80 Railway Street	Day - 26 Jan 2026	Wagga Wagga Yard - Piling operations on the northern piling pad, using a Soilmec SR-65 piling rig.	Continuous	Yes	0.0124	0.20 - z	0.40 - z	Y	NA
	Night - 26 Jan 2026				0.0112	0.13 - z	0.26 - z	Y	NA
Wagga Wagga - 14 Station Masters Residence	Day - 27 Jan 2026	Wagga Wagga Yard - Piling operations on the northern piling pad, using a Soilmec SR-65 piling rig.	Continuous	Yes	0.0305	0.20 - z	0.40 - z	Y	NA
	Night - 27 Jan 2026				0.0302	0.13 - z	0.26 - z	Y	NA
Wagga Wagga - 80 Railway Street	Day - 27 Jan 2026	Wagga Wagga Yard - Piling operations on the northern piling pad, using a Soilmec SR-65 piling rig.	Continuous	Yes	0.0171	0.20 - z	0.40 - z	Y	NA
	Night - 27 Jan 2026				0.0125	0.13 - z	0.26 - z	Y	NA
Wagga Wagga - 14 Station Masters Residence	Day - 28 Jan 2026	Wagga Wagga Yard - Piling operations on the northern piling pad, using a Soilmec SR-65 piling rig.	Continuous	Yes	0.0468	0.20 - z	0.40 - z	Y	NA
	Night - 28 Jan 2026				0.0468	0.13 - z	0.26 - z	Y	NA
Wagga Wagga - 80 Railway Street	Day - 28 Jan 2026	Wagga Wagga Yard - Piling operations on the northern piling pad, using a Soilmec SR-65 piling rig.	Continuous	Yes	0.0180	0.20 - z	0.40 - z	Y	NA
	Night - 28 Jan 2026				0.0149	0.13 - z	0.26 - z	Y	NA

Monitoring Location	Date	Works Being Carried Out	Attended or Continuous	Event Based Monitoring	SiteHive Data VDV Maximum (m/s^2)	VDV preferred values Criteria (m/s^2)	VDV Maximum values Criteria (m/s^2)	Compliant	Comments
Wagga Wagga - 95 Railway Street	Day - 28 Feb 2026	Feburary 2026 Possession: demolition of Edmondson Street bridge and track works at Wagga Yard including the use of a large hydraulic hammer 1,600 kg (18–34t excavator), trench roller (vibratory), ballast tamper	Continuous	Yes	0.0362	0.20 - z	0.40 - z	Y	NA
	Night - 28 Feb 2026				0.0310	0.13 - z	0.26 - z	Y	NA
Wagga Wagga - 95 Railway Street	Day - 1 March 2026	Feburary 2026 Possession: demolition of Edmondson Street bridge and track works at Wagga Yard including the use of a large hydraulic hammer 1,600 kg (18–34t excavator), trench roller (vibratory), ballast tamper	Continuous	Yes	0.0698	0.20 - z	0.40 - z	Y	NA
	Night - 1 March 2026				0.0679	0.13 - z	0.26 - z	Y	NA
Cassidy Parade - 2 Kildare Street	Day - 11 March 2026	Cassidy piling pad formation including the use of a vibratory roller (<300kN (7-13t)	Continuous	Yes	0.0213	0.20 - z	0.40 - z	Y	NA
	Night - 11 March 2026				0.0166	0.13 - z	0.26 - z	Y	NA
Cassidy Parade - 24-26 Brookong	Day - 11 March 2026	Cassidy piling pad formation including the use of a vibratory roller (<300kN (7-13t)	Continuous	Yes	0.0237	0.20 - z	0.40 - z	Y	NA
	Night - 11 March 2026				0.0220	0.13 - z	0.26 - z	Y	NA
Cassidy Parade - 2 Kildare Street	Day - 12 March 2026	Cassidy piling pad formation including the use of a vibratory roller (<300kN (7-13t)	Continuous	Yes	0.0190	0.20 - z	0.40 - z	Y	NA
	Night - 12 March 2026				0.0171	0.13 - z	0.26 - z	Y	NA
Cassidy Parade - 24-26 Brookong	Day - 12 March 2026	Cassidy piling pad formation including the use of a vibratory roller (<300kN (7-13t)	Continuous	Yes	0.0218	0.20 - z	0.40 - z	Y	NA
	Night - 12 March 2026				0.0207	0.13 - z	0.26 - z	Y	NA
Cassidy Parade - 2 Kildare Street	Day - 13 March 2026	Cassidy piling pad formation including the use of a vibratory roller (<300kN (7-13t)	Continuous	Yes	0.0207	0.20 - z	0.40 - z	Y	NA
	Night - 13 March 2026				0.0177	0.13 - z	0.26 - z	Y	NA
Cassidy Parade - 24-26 Brookong	Day - 13 March 2026	Cassidy piling pad formation including the use of a vibratory roller (<300kN (7-13t)	Continuous	Yes	0.0211	0.20 - z	0.40 - z	Y	NA
	Night - 13 March 2026				0.0183	0.13 - z	0.26 - z	Y	NA
Cassidy Parade - 2 Kildare Street	Day - 14 March 2026	Cassidy piling pad formation including the use of a vibratory roller (<300kN (7-13t)	Continuous	Yes	0.0881	0.20 - z	0.40 - z	Y	NA
	Night - 14 March 2026				0.0881	0.13 - z	0.26 - z	Y	NA
Cassidy Parade - 24-26 Brookong	Day - 14 March 2026	Cassidy piling pad formation including the use of a vibratory roller (<300kN (7-13t)	Continuous	Yes	0.0241	0.20 - z	0.40 - z	Y	NA
	Night - 14 March 2026				0.0220	0.13 - z	0.26 - z	Y	NA

Table 17: Vibration Monitoring - Cosmetic Damage

Monitoring Location	Date	Works Being Carried Out	Attended or Continuous	Event Based Monitoring	Daily Measured PPV vSum (mm/s)	Cosmetic Damage Criteria (mm/s)	Compliant	Comments
Junee Yard - Signalling Hut	28-Feb-26	Feburary 2026 Possession: Track work at Junee yard including the use of a ballast tamper	Continuous	Yes	2.2	7.5	Y	Below criteria
Edmondson - 111 Railway St (Gatehouse)	28-Feb-26	Feburary 2026 Possession: demolition of Edmondson Street bridge and track works at Wagga Yard including the use of a large hydraulic hammer 1,600 kg (18–34t excavator), trench roller (vibratory), ballast tamper (excavator head attachment)	Continuous	Yes	2.6	7.5	Y	Below criteria
Junee Yard - Signalling Hut	01-Mar-26	Feburary 2026 Possession: Track work at Junee yard including the use of a ballast tamper	Continuous	Yes	6.336	7.5	Y	Tamping activities along the Up platform road adjacent to the Signalling hut lasted for approximately 10 minutes around 00:26 on 01/03/2026. During this activity and time period, a max vSum of 6.336mm/s was recorded.
Edmondson - 111 Railway St (Gatehouse)	01-Mar-26	Feburary 2026 Possession: demolition of Edmondson Street bridge and track works at Wagga Yard including the use of a large hydraulic hammer 1,600 kg (18–34t excavator), trench roller (vibratory), ballast tamper (excavator head attachment)	Continuous	Yes	1.05	7.5	Y	Below criteria
Albury Yard - Signalling Hut 1	02-Mar-26	Eastern Piling construction works utaliusing a vibratory roller (<300kN (7-13t)	Continuous	Yes	2.033	7.5	Y	Below criteria
S6 Culcairn Railway Station	02-Mar-26	Tamping works being conducted utalising a Ballast tamper	Continuous	Yes	14.495 (2.19*)	7.5	Y	Several peaks resulting from train passing. Tamping works did not result in tangible vibration data on this day *Tamping works resulted in approx 2.19mm/s
Albury Yard - Signalling Hut 1	03-Mar-26	Eastern Piling pad constrction utalising a Vibratory roller <300 kN (7-13 tonne) as well as the mobilisation of a Piling Rig – Bored ≤ 800mm	Continuous	Yes	273.707 (1-2*)	7.5	Y	Resulting from Martinus staff moving monitor to reflect works better. *Piling works resulted in approx 1-2mm/s
S6 Culcairn Railway Station	03-Mar-26	Tamping works being conducted utalising a Ballast tamper	Continuous	Yes	17.504 (3.56*)	7.5	Y	Several peaks resulting from train passing. Tamping works evident at approx 0.5 - 1.6mm *Tamping works resulted in approx 3.56mm/s
Albury Yard - Signalling Hut 1	04-Mar-26	Eastern Piling works	Continuous	Yes	232.394 (1-2*)	7.5	Y	Resulting from Martinus staff changing battery *Piling works resulted in approx 1-2mm/s
Albury Yard - Signalling Hut 1	05-Mar-26	Eastern Piling works	Continuous	Yes	1.827	7.5	Y	Below criteria
Albury Yard - Signalling Hut 1	06-Mar-26	Eastern Piling works	Continuous	Yes	1.198	7.5	Y	Below criteria
South Albury Station	07-Mar-26	Western piling pad construction	Continuous	Yes	1.696	7.5	Y	Below criteria
South Albury Station	08-Mar-26	Western piling pad construction	Continuous	Yes	0.382	7.5	Y	Below criteria
South Albury Station	09-Mar-26	Western piling pad construction	Continuous	Yes	1.358	7.5	Y	Below criteria
South Albury Station	10-Mar-26	Western piling pad construction	Continuous	Yes	2.918	7.5	Y	Below criteria
South Albury Station	11-Mar-26	Western piling pad construction	Continuous	Yes	1.531	7.5	Y	Below criteria
South Albury Station	12-Mar-26	Western piling pad construction	Continuous	Yes	0.518	7.5	Y	Below criteria
South Albury Station	13-Mar-26	Western piling pad construction	Continuous	Yes	2.004	7.5	Y	Below criteria
South Albury Station	14-Mar-26	Western piling pad construction	Continuous	Yes	0.878	7.5	Y	Below criteria
South Albury Station	15-Mar-26	Piling works	Continuous	Yes	0.365	7.5	Y	Below criteria
South Albury Station	16-Mar-26	Piling works	Continuous	Yes	1.641	7.5	Y	Below criteria
South Albury Station	17-Mar-26	Piling works	Continuous	Yes	1.076	7.5	Y	Below criteria
South Albury Station	18-Mar-26	Piling works	Continuous	Yes	0.968	7.5	Y	Below criteria
South Albury Station	19-Mar-26	Piling works	Continuous	Yes	0.451	7.5	Y	Below criteria
South Albury Station	20-Mar-26	Piling works	Continuous	Yes	0.392	7.5	Y	Below criteria
South Albury Station	21-Mar-26	Piling works	Continuous	Yes	0.488	7.5	Y	Below criteria
South Albury Station	22-Mar-26	Piling works	Continuous	Yes	0.416	7.5	Y	Below criteria
South Albury Station	23-Mar-26	Piling works	Continuous	Yes	1.419	7.5	Y	Below criteria
South Albury Station	24-Mar-26	Piling works	Continuous	Yes	1.084	7.5	Y	Below criteria
South Albury Station	25-Mar-26	Pile box out and break back	Continuous	Yes	1.553	7.5	Y	Below criteria
South Albury Station	26-Mar-26	Pile box out and break back	Continuous	Yes	0.516	7.5	Y	Below criteria
South Albury Station	27-Mar-26	Pile box out and break back	Continuous	Yes	0.482	7.5	Y	Below criteria
South Albury Station	28-Mar-26	Pile box out and break back	Continuous	Yes	1.014	7.5	Y	Below criteria
South Albury Station	29-Mar-26	Pile box out and break back	Continuous	Yes	0.448	7.5	Y	Below criteria
South Albury Station	30-Mar-26	Pile box out and break back	Continuous	Yes	0.102	7.5	Y	Below criteria

APPENDIX C

Surface Water Quality Monitoring Summary

January Surface Water Results

Sample ID	NTU	pH	DO	EC	Temp	TSS	Al	As	Cd	Cr	Cu	Pb	Mn	Ni	Zn	Fe	Hg	NOx	TKN	Total N	Total P	Chlorophyll-a	Chemical Oxygen Demand	Biological Oxygen Demand	Naphthalene	TRH C6-C9	TRH C10-C36	TRH C6-C10 minus BTE	TRH C16-C34 (F3)	TRH C34-C40 (F4)	TRH C10-C16 minus naphthale	Benzene	Toluene	Ethylbenzene	Xylenes
SW01 – US	9.1	7.02	7.83	490	21.79	<5	0.16	<0.001	<0.0001	<0.001	<0.001	<0.001	0.037	<0.001	<0.005	0.3	<0.0001	0.02	<0.1	<0.1	0.03	6	12	3	<5	<20	<50	<20	<100	<100	<100	<1	<2	<2	<2
SW01 – DS	8.5	6.99	8.86	470	21.81	8	0.16	<0.001	<0.0001	<0.001	<0.001	<0.001	0.04	<0.001	<0.005	0.32	<0.0001	0.03	<0.1	<0.1	0.02	4	13	2	<5	<20	<50	<20	<100	<100	<100	<1	<2	<2	<2
SW02 – US	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW02 – DS	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW03 – US	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW03 – DS	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW04 – US	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW04 – DS	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW05 – US	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW05 – DS	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW06 – US	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW06 – DS	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW07 – US	77.6	7.53	9.18	372	20.29	54	0.94	0.003	<0.0001	<0.001	<0.001	0.001	0.263	0.003	0.019	1.6	<0.0001	<0.01	0.6	0.6	0.08	11	<10	5	<5	<20	<50	<20	<100	<100	<100	<1	<2	<2	<2
SW07 – DS	20.5	7.51	4.93	389	20.01	14	0.53	0.002	<0.0001	<0.001	<0.001	<0.001	0.32	0.001	0.01	0.94	<0.0001	<0.01	0.7	0.7	0.08	6	<10	3	<5	<20	<50	<20	<100	<100	<100	<1	<2	<2	<2
SW08 – US	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW08 – DS	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW09 – US	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW09 – DS	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST

✓ – parameter does not exceed criteria
✗ – parameter exceeds criteria
NST – No Sample Taken

February Surface Water Results

Sample ID	NTU	pH	DO	EC	Temp	TSS	Al	As	Cd	Cr	Cu	Pb	Mn	Ni	Zn	Fe	Hg	NOx	TKN	Total N	Total P	Chlorophyll-a	Chemical Oxygen Demand	Biological Oxygen Demand	Naphthalene	TRH C6-C9	TRH C10-C36	TRH C6-C10 minus BTEX	TRH C16-C34 (F3)	TRH C34-C40 (F4)	TRH C10-C16 minus naphthalen	Benzene	Toluene	Ethylbenzene	Xylenes
SW01 – US	5	7.36	8.58	470	24.54	<5	0.1	0.001	<0.0001	<0.001	<0.001	<0.001	0.031	<0.001	<0.005	0.23	<0.0001	0.2	0.2	0.2	0.18	3	<10	<2	<5	<20	<50	<20	<100	<100	<100	<1	<2	<2	<2
SW01 – DS	5	7.68	11.59	810	24.65	<5	0.06	0.001	<0.0001	<0.001	0.002	<0.001	0.031	<0.001	<0.005	0.18	<0.0001	0.99	0.3	1.3	0.03	3	11	<2	<5	<20	<50	<20	<100	<100	<100	<1	<2	<2	<2
SW02 – US	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW02 – DS	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW03 – US	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW03 – DS	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW04 – US	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW04 – DS	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW05 – US	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW05 – DS	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW06 – US	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW06 – DS	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW07 – US	92	7.52	7.13	208	22.23	72	1.19	0.003	<0.0001	<0.001	<0.001	<0.001	0.655	0.002	0.009	0.86	<0.0001	<0.01	0.5	0.5	0.08	5	19	2	<5	<20	<50	<20	<100	<100	<100	<1	<2	<2	<2
SW07 – DS	16.5	8.23	13.94	259	23.53	178	0.31	0.001	0.001	<0.001	0.002	<0.001	0.033	<0.001	0.012	0.23	<0.0001	0.02	0.3	0.3	0.05	3	<10	-	<5	<20	<50	<20	<100	<100	<100	<1	<2	<2	<2
SW08 – US	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW08 – DS	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW09 – US	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW09 – DS	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST

✓ – parameter does not exceed criteria
✗ – parameter exceeds criteria
NST – No Sample Taken

March Surface Water Results

Sample ID	NTU	pH	DO	EC	Temp	TSS	Al	As	Cd	Cr	Cu	Pb	Mn	Ni	Zn	Fe	Hg	NOx	TKN	Total N	Total P	Chlorophyll-a	Chemical Oxygen Demand	Biological Oxygen Demand	Naphthalene	TRH C6-C9	TRH C10-C36	TRH C6-C10 minus BTEX	TRH C16-C34 (F3)	TRH C34-C40 (F4)	TRH C10-C16 minus naphthalen	Benzene	Toluene	Ethylbenzene	Xylenes
SW01 – US	9.8	6.51	4.74	44	22.78	<5	0.16	<0.001	<0.0001	<0.001	<0.001	<0.001	0.043	<0.001	<0.005	0.3	<0.0001	0.08	0.2	0.3	0.02	3	<10	3	<5	<20	<50	<20	<100	<100	<100	<1	<2	<2	<2
SW01 – DS	7.6	6.47	4.31	47	23.15	5	0.12	0.001	<0.0001	<0.001	<0.001	<0.001	0.042	<0.001	<0.005	0.26	<0.0001	0.16	0.3	0.5	0.04	5	12	3	<5	<20	<50	<20	<100	<100	<100	<1	<2	<2	<2
SW02 – US	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW02 – DS	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW03 – US	7.4	7.61	0.57	2310	25.13	6	0.04	0.006	<0.0001	<0.001	<0.001	0.001	1.24	0.002	<0.005	0.8	<0.0001	0.09	1	1.1	0.15	7	31	4	<5	<20	<50	<20	<100	<100	<100	<1	<2	<2	<2
SW03 – DS	34.3	7.72	3.92	2120	26.13	21	0.37	0.007	<0.0001	<0.001	<0.001	<0.001	1.42	0.001	<0.005	1.43	<0.0001	0.01	1.2	1.2	0.18	14	23	3	<5	<20	<50	<20	<100	<100	<100	<1	<2	<2	<2
SW04 – US	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW04 – DS	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW05 – US	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW05 – DS	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW06 – US	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW06 – DS	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW07 – US	73.1	7.12	4.59	441	21.34	72	2.07	0.003	<0.0001	0.002	0.003	0.002	0.447	0.003	0.024	2.55	<0.0001	0.02	1.1	1.1	0.19	17	<10	3	<5	<20	<50	<20	<100	<100	<100	<1	<2	<2	<2
SW07 – DS	25.3	7.64	6.88	616	21.22	26	0.24	0.002	<0.0001	<0.001	<0.001	<0.001	0.123	0.002	0.007	0.57	<0.0001	<0.01	0.4	0.4	0.04	2	<10	3	<5	<20	<50	<20	<100	<100	<100	<1	<2	<2	<2
SW08 – US	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW08 – DS	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW09 – US	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
SW09 – DS	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST

✓ – parameter does not exceed criteria
✗ – parameter exceeds criteria
NST – No Sample Taken

APPENDIX D

Calibration Certificates

HK Calibration Technologies Pty Ltd
ACN: 152 274 014 ABN: 84 152 274 014
Postal Address: PO Box 4489, North Rocks, 2151
NSW Australia

T: 1300 309 881 F: 1300 885 178
Email: info@hkcalibrations.com.au
Web: www.hkcalibrations.com.au

CALIBRATION CERTIFICATE

REPORT NO.: 191429-1

DATE OF CALIBRATION	:	03/09/2025	**LOCATION**	:	CALIBRATION LAB
RECOMMENDED DUE DATE	:	03/09/2026	**ENVIRONMENT**	:	TEMPERATURE: 23.0 ± 2°C HUMIDITY: 45% ± 10% RH

CUSTOMER	:	MARTINUS RAIL PTY LTD-SOUTH ALBURY
ADDRESS	:	INLAND RAIL: A2P LEVEL 1, 519 NURIGONG STR. SOUTH ALBURY NSW 2640

INSTRUMENT DETAIL	:	INSTRUMENT NAME	:	SOUND LEVEL METER
		MANUFACTURER	:	RION
		MODEL	:	NL-42
		SERIAL NUMBER	:	00509260
		ASSET NUMBER	:	NOT FOUND
		TYPE	:	DIGITAL
		RANGE	:	-

CALIBRATION PROCEDURE	:	HKC SOP 11-21-V3 (AS/NZS IEC 61672.2:2019)
REFERENCE NATA TRACEABLE CERTIFIED...	:	SOUND LEVEL CALIBRATOR, SOUND LEVEL METER MAKE : LUTRON, LUTRON MODEL: SC-942, SL-4001 ASSET: HKC016, HKC057 SERIAL NO: Q598203, Q449236 NATA REPORT NO: C53722

RESULT

Reading of Master	Reading of U.U.T.	Correction	Acceptance Criteria (±)	PASS/FAIL
dB@1KHZ	dB@1KHZ	dB@1KHZ	dB@1KHZ	PASS
94.0	94.0	0.00	1.5	PASS
114.0	114.0	0.00	1.5	PASS

CONCLUSION

THIS INSTRUMENT WAS FOUND PASS AND TO BE FUNCTIONING AS INDICATED BY OUR FINDINGS WITHIN THIS REPORT. NO ADJUSTMENTS AND REPAIRS WERE REQUIRED.

CX	CB	**03/09/2025**
SIGNATURE OF APPROVAL	**TEST BY CHINMAY**	**DATE OF ISSUE**

Note:The tests, calibrations, and measurements detailed in this document align with Australian/national standards. The reference standard used in the calibration is traceable to the Australian national standard via a NATA certified lab.

The applicable measurement uncertainties are calculated in accordance with the method described in the ISO Guide to the Expression of Uncertainty in Measurement, with confidence level of 95% using a coverage factor k=2.

Our calibration warranty extends for a period of 90 days. However, any damage resulting from customer mishandling or courier handling will void the warranty, unless there is evidence showing that the fault originated from calibration process as shown within this report.

This report is void of any erasures or corrections and may be reproduced solely in its complete form.

SYDNEY	MELBOURNE	BRISBANE	ADELAIDE	PERTH	HOBART
Unit 3 27 Daking Street North Parramatta NSW 2151	Suite 5 296 Bay Road Cheltenham VIC 3192	Unit 8 87 Kelliher Road Richlands QLD 4077	Unit 8 Levels 1 186 Pulteney Street Adelaide SA 5000	Unit 8 8 Aspiration Circuit Bibra Lake WA 6163	17A Main Rd Moonah TAS 7009

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Unit 36/14 Loyalty Rd
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www.acousticresearch.com.au

Sound Level Meter
IEC 61672-3:2013
Calibration Certificate

Calibration Number C25769-V1

Client Details	Martinus Unit 1, 80 Bomen Road Wagga Wagga NSW

Equipment Tested :	*Manufacturer*	*Model*	*Serial*
Instrument :	Rion	NL-43	00853458
Microphone :	Rion	UC-52	214090
Pre-amplifier :	Rion	NH-24	46390
Firmware Version :	01.03		

Pre-Test Atmospheric Conditions		**Post-Test Atmospheric Conditions**	
Ambient Temperature :	22.6 °C	**Ambient Temperature :**	22.8 °C
Relative Humidity :	48.1 %	**Relative Humidity :**	48.1 %
Barometric Pressure :	98.78 kPa	**Barometric Pressure :**	98.75 kPa

Calibration Technician :	Emanuel Eid	**Secondary Check:**	Matt Calleja
Calibration Date :	25-Nov-2025	**Report Issue Date :**	26-Nov-2025

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 2 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2013 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013 and because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in 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*	*±0.019 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 C25769-V1

Client Details Martinus
Unit 1, 80 Bomen Road
Wagga Wagga NSW

	Manufacturer	Model	Serial
Equipment Tested :			
Instrument Serial Number :	Rion	NL-43	00853458
Microphone Serial Number :	Rion	UC-52	214090
Pre-amplifier Serial Number :	Rion	NH-24	46390
Firmware Version :	01.03		

Pre-Test Atmospheric Conditions		**Post-Test Atmospheric Conditions**	
Ambient Temperature :	22.6 °C	**Ambient Temperature :**	22.8 °C
Relative Humidity :	48.1 %	**Relative Humidity :**	48.1 %
Barometric Pressure :	98.78 kPa	**Barometric Pressure :**	98.75 kPa

Calibration Technician : Emanuel Eid
Calibration Date : 25-Nov-2025
Secondary Check: Matt Calleja
Report Issue Date : 26-Nov-2025

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 2 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2013 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013 and because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in 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*	*±0.019 kPa*
Electrical Tests	*±0.13 dB*		

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

1. REVISION HISTORY

Revision	Date	Description
1	26-Nov-2025	Original Issue

2. OVERVIEW

This report presents the calibration test results of a NL-43 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.

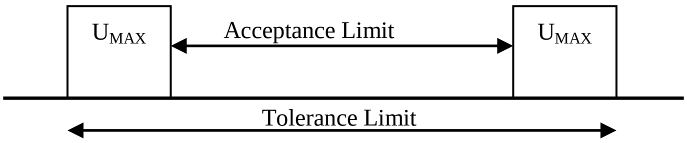
This report was generated using template version identifier of 69876974.

Where required, reference is made to manual version 66122 as provided by the manufacturer.

2.1 UNCERTAINTIES

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

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



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

The measured deviation from the design goal

Associated acceptance limits for the test

Maximum allowable uncertainty of measurement for the test

Actual expanded uncertainty for each measurement

2.2 DOCUMENT CONVENTIONS

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

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

3. GENERAL

3.1 DEVICE UNDER TEST

Equipment Tested :	*Manufacturer*	*Model*	*Serial*
Instrument :	Rion	NL-43	00853458
Microphone :	Rion	UC-52	214090
Pre-amplifier :	Rion	NH-24	46390

All results within this report correspond to Channel 1 of the device tested.

Instrument received in fair condition..

3.2 ENVIRONMENTAL CONDITIONS DURING TEST

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

3.3 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

3.4 TEST EQUIPMENT USED

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

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

3.4.1 Multi-function Acoustic Calibrator

A Bruel & Kjaer 4226 Multi-function calibrator (S/N – 3215300) was used for frequency response testing of the entire instrument (including microphone). This instrument was used as a reference calibrator and for frequency response verification.

The acoustic signal was applied by the 4226 Multi-function calibrator using a 1/2 inch microphone input.

3.4.2 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.

These signals were applied via the instrument's microphone input.

Where possible, a 19 pF capacitance dummy microphone was used during testing.

3.4.3 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.

3.4.4 Arbitrary Function Generator

A Keysight 33511B (S/N – MY62000827) was used to generate the required electrical signals.

3.4.5 Environmental Monitoring

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

4. CALIBRATION TEST RESULTS

4.1 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	93.90	94.10	94.00	94.02
C	93.90	94.10	94.00	94.02
Z	93.90	94.10	94.00	94.02

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

4.2 SELF GENERATED NOISE

4.2.1 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)

16.00	15.70	15.60	15.50	15.60
15.50	15.50	15.80	15.70	15.50

Acoustic Noise Floor : 15.6 dB(A)

4.2.2 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)

13.00	12.90	13.00	13.00	13.00
13.10	13.20	13.10	13.10	12.90

Random Readings dB(C)

17.60	18.20	18.50	18.10	17.90
17.70	17.90	17.70	17.90	18.20

Random Readings dB(Z)

21.9	22.2	23.8	22.3	21.9
24.9	21.8	23.0	23.8	23.6

	dB(A)	dB(C)	dB(Z)
Electric Noise Floor :	13.0	18.0	22.9

4.3 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	94.0	94.0	94.0	0.13
8 000	87.4	87.4	87.4	0.14

Actual Freq Hz	B&K 4226 Corrections	Corrected Response dB(C)		Uncertainty (dB)
		Actual	re 1kHz	
125.90	-0.02	94.08	0.16	0.13
1005.10	-0.08	93.92	0.00	0.13
7915.10	-0.02	87.38	-6.54	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	0.20	0.00	0.15	0.00	0.10
1005.10	0.10	0.20	0.10	0.15	-0.10	0.10
7915.10	3.20	0.30	0.00	0.35	-0.10	0.20

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	94.08	0.06	-0.2	±1.5	0.26	P	0.30	0.60
1005.10	94.02	0.00	0.0	±1.0	0.00	P	0.30	0.60
7915.10	90.48	-3.54	-3.0	±5.0	-0.54	P	0.52	0.70

4.4 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 93dB. 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	93.0	93.0	93.0	0.13
125	92.9	93.0	93.0	0.11
250	92.9	93.0	93.0	0.10
500	93.0	93.0	93.0	0.10
1 000	93.0	93.0	93.0	0.10
2 000	93.0	93.1	93.0	0.10
4 000	93.0	93.0	93.0	0.10
8 000	93.0	93.0	93.0	0.10
15 850	N/A	N/A	N/A	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	0.30	0.00	0.15	0.00	0.10
125	0.00	0.30	0.00	0.15	0.00	0.10
250	0.00	0.20	0.00	0.15	0.00	0.10
500	0.00	0.20	-0.10	0.15	-0.10	0.10
1 000	0.00	0.20	0.10	0.15	-0.10	0.10
2 000	-0.20	0.30	0.10	0.15	-0.40	0.15
4 000	-0.40	0.30	-0.10	0.15	-0.30	0.15
8 000	0.50	0.30	0.00	0.20	-0.10	0.20
15 850	0.00	0.00	0.00	0.00		

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	93.00	0.00	+1.0 / -2	P	0.38	0.60
125	92.90	-0.10	±1.5	P	0.37	0.60
250	92.90	-0.10	±1.5	P	0.29	0.60
500	92.80	-0.20	±1.5	P	0.29	0.60
1 000	93.00	0.00	±1.0	P	0.29	0.60
2 000	92.50	-0.50	±2.0	P	0.38	0.60
4 000	92.20	-0.80	±3.0	P	0.38	0.60
8 000	93.40	0.40	±5.0	P	0.43	0.70
15 850	N/A	N/A	+5.0 / –∞	N/A	####	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	93.00	0.00	+1.0 / -2	P	0.38	0.60
125	93.00	0.00	±1.5	P	0.37	0.60
250	93.00	0.00	±1.5	P	0.29	0.60
500	92.80	-0.20	±1.5	P	0.29	0.60
1 000	93.00	0.00	±1.0	P	0.29	0.60
2 000	92.60	-0.40	±2.0	P	0.38	0.60
4 000	92.20	-0.80	±3.0	P	0.38	0.60
8 000	93.40	0.40	±5.0	P	0.43	0.70
15 850	N/A	N/A	+5.0 / –∞	N/A	####	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	93.00	0.00	+1.0 / -2	P	0.38	0.60
125	93.00	0.00	±1.5	P	0.37	0.60
250	93.00	0.00	±1.5	P	0.29	0.60
500	92.80	-0.20	±1.5	P	0.29	0.60
1 000	93.00	0.00	±1.0	P	0.29	0.60
2 000	92.50	-0.50	±2.0	P	0.38	0.60
4 000	92.20	-0.80	±3.0	P	0.38	0.60
8 000	93.40	0.40	±5.0	P	0.43	0.70
15 850	N/A	N/A	+5.0 / –∞	N/A	####	1.00

4.5 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

4.6 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)
30.2	94	94.0	0.0	P	±0.3	0.10	0.10

4.7 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	±1.1	P	0.1	0.3
99.0	99.0	0.0	±1.1	P	0.1	0.3
104.0	104.0	0.0	±1.1	P	0.1	0.3
109.0	109.0	0.0	±1.1	P	0.1	0.3
114.0	114.0	0.0	±1.1	P	0.1	0.3
119.0	119.0	0.0	±1.1	P	0.1	0.3
124.0	124.0	0.0	±1.1	P	0.1	0.3
129.0	129.0	0.0	±1.1	P	0.1	0.3
131.0	131.0	0.0	±1.1	P	0.1	0.3
132.0	132.0	0.0	±1.1	P	0.1	0.3
133.0	133.0	0.0	±1.1	P	0.1	0.3
134.0	134.0	0.0	±1.1	P	0.1	0.3
135.0	135.0	0.0	±1.1	P	0.1	0.3
136.0	136.0	0.0	±1.1	P	0.1	0.3
137.0	137.0	0.0	±1.1	P	0.1	0.3

Overload indication at 138.0dB.

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	±1.1	P	0.1	0.3
89.0	89.0	0.0	±1.1	P	0.1	0.3
84.0	84.0	0.0	±1.1	P	0.1	0.3
79.0	79.0	0.0	±1.1	P	0.1	0.3
74.0	74.0	0.0	±1.1	P	0.1	0.3
69.0	69.0	0.0	±1.1	P	0.1	0.3
64.0	64.0	0.0	±1.1	P	0.1	0.3
59.0	59.0	0.0	±1.1	P	0.1	0.3
54.0	54.0	0.0	±1.1	P	0.1	0.3
49.0	49.0	0.0	±1.1	P	0.1	0.3
44.0	44.0	0.0	±1.1	P	0.1	0.3
39.0	39.0	0.0	±1.1	P	0.1	0.3
34.0	34.0	0.0	±1.1	P	0.1	0.3
30.0	30.0	0.0	±1.1	P	0.1	0.3
29.0	29.0	0.0	±1.1	P	0.1	0.3
28.0	28.0	0.0	±1.1	P	0.1	0.3
27.0	27.0	0.0	±1.1	P	0.1	0.3
26.0	25.9	-0.1	±1.1	P	0.1	0.3
25.0	24.9	-0.1	±1.1	P	0.1	0.3

No under range indicated.

4.8 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 135.0dB.

Table 14 - FAST Weighted Response

Burst Length	Response dB(A)	Deviation (dB)	Tolerance Limit (dB)	P/F	Uncertainty (dB)	Maximum Permitted Uncertainty (dB)
200ms	134.1	0.1	±1.0	P	0.1	0.3
2ms	117.0	0.0	+1.0 / -2.5	P	0.1	0.3
0.25ms	107.9	-0.1	+1.5 / -5	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	127.6	0.0	±1.0	P	0.1	0.3
2ms	108.0	0.0	+1.0 / -5	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	128.0	0.0	±1.0	P	0.1	0.3
2ms	108.0	0.0	+1.0 / -2.5	P	0.1	0.3
0.25ms	98.9	-0.1	+1.5 / -5	P	0.1	0.3

4.9 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 133.0dB(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)
136.1	-0.3	±3.0	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	134.9	-0.5	±2.0	P	0.1	0.35
Negative	134.9	-0.5	±2.0	P	0.1	0.35

No overload was noted during Peak C testing.

4.10 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 of137.0dB(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	135.3	0.0	±1.5	P	0.10	0.25
Negative	135.3					

Overload indication was verified.

Overload latch indication was verified.

4.11 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	137.0	137.0	0.0	±0.3	P	0.10	0.10
Slow	N/A	N/A	N/A	±0.3	N/A	0.10	0.10
Leq	137.0	137.0	0.0	±0.3	P	0.10	0.10

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Sound Level Meter
IEC 61672-3:2013
Calibration Certificate

Calibration Number C25411-V1

Client Details	Martinus Rail Pty Ltd 75 Miller Street North Sydney, NSW, 2060

Equipment Tested :	*Manufacturer*	*Model*	*Serial*
Instrument :	Rion	NL-43	00730663
Microphone :	Rion	UC-52	205540
Pre-amplifier :	Rion	NH-24	33620
Firmware Version :	v1.00		

Pre-Test Atmospheric Conditions		**Post-Test Atmospheric Conditions**	
Ambient Temperature :	22.3 °C	**Ambient Temperature :**	21.1 °C
Relative Humidity :	48.8 %	**Relative Humidity :**	47.2 %
Barometric Pressure :	99.88 kPa	**Barometric Pressure :**	99.8 kPa

Calibration Technician :	Peter Elters	**Secondary Check:**	Rhys Gravelle
Calibration Date :	01-Jul-2025	**Report Issue Date :**	01-Jul-2025

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 2 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2013 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013 and because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in 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*	*±0.11 kPa*
Electrical Tests	*±0.13 dB*		

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

NATA
WORLD RECOGNISED ACCREDITATION

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 C25411-V1

Client Details Martinus Rail Pty Ltd
75 Miller Street
North Sydney, NSW, 2060

	Manufacturer	Model	Serial
Equipment Tested :			
Instrument Serial Number :	Rion	NL-43	00730663
Microphone Serial Number :	Rion	UC-52	205540
Pre-amplifier Serial Number :	Rion	NH-24	33620
Firmware Version :	v1.00		

Pre-Test Atmospheric Conditions		Post-Test Atmospheric Conditions	
Ambient Temperature :	22.3 °C	**Ambient Temperature :**	21.1 °C
Relative Humidity :	48.8 %	**Relative Humidity :**	47.2 %
Barometric Pressure :	99.88 kPa	**Barometric Pressure :**	99.8 kPa

Calibration Technician : Peter Elters
Calibration Date : 01-Jul-2025
Secondary Check: Rhys Gravelle
Report Issue Date : 01-Jul-2025

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 2 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2013 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013 and because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in 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*	*±0.11 kPa*
Electrical Tests	*±0.13 dB*		

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

1. REVISION HISTORY

Revision	Date	Description
1	01-Jul-2025	Original Issue

2. OVERVIEW

This report presents the calibration test results of a NL-43 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.

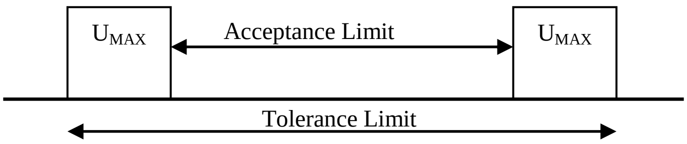
This report was generated using template version identifier of 64f64c78.

Where required, reference is made to manual version 66122 as provided by the manufacturer.

2.1 UNCERTAINTIES

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

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



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

The measured deviation from the design goal

Associated acceptance limits for the test

Maximum allowable uncertainty of measurement for the test

Actual expanded uncertainty for each measurement

2.2 DOCUMENT CONVENTIONS

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

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

3. GENERAL

3.1 DEVICE UNDER TEST

Equipment Tested :	*Manufacturer*	*Model*	*Serial*
Instrument :	Rion	NL-43	00730663
Microphone :	Rion	UC-52	205540
Pre-amplifier :	Rion	NH-24	33620

All results within this report correspond to Channel 1 of the device tested.

Instrument is brand new..

3.2 ENVIRONMENTAL CONDITIONS DURING TEST

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

3.3 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

3.4 TEST EQUIPMENT USED

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

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

3.4.1 Multi-function Acoustic Calibrator

A Bruel & Kjaer 4226 Multi-function calibrator (S/N – 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.

The acoustic signal was applied by the 4226 Multi-function calibrator using a 1/2 inch microphone input.

3.4.2 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.

These signals were applied via the instrument's microphone input.

Where possible, a 19 pF capacitance dummy microphone was used during testing.

3.4.3 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.

3.4.4 Arbitrary Function Generator

A Keysight 33511B (S/N – MY62000827) was used to generate the required electrical signals.

3.4.5 Environmental Monitoring

A MHB-382SD (S/N – AG44204) was used for measuring environmental conditions during device calibration. It is capable of providing temperature, relative humidity and pressure measurements.

4. CALIBRATION TEST RESULTS

4.1 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	93.90	94.10	94.00	94.02
C	93.90	94.10	94.00	94.02
Z	93.90	94.10	94.00	94.02

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

4.2 SELF GENERATED NOISE

4.2.1 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)

15.70	15.60	15.70	15.60	15.70
15.60	15.50	15.60	15.50	15.60

Acoustic Noise Floor : 15.6 dB(A)

4.2.2 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)

13.50	13.20	13.10	13.00	13.20
13.10	13.20	13.10	13.20	13.10

Random Readings dB(C)

18.30	18.00	17.80	19.60	18.40
17.60	17.90	18.70	18.50	17.90

Random Readings dB(Z)

22.4	23.8	26.2	24.9	22.2
25.1	22.7	24.3	26.2	22.9

	dB(A)	dB(C)	dB(Z)
Electric Noise Floor :	13.2	18.3	24.1

4.3 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	94.0	94.0	94.0	0.13
1 000	94.0	94.0	94.0	0.13
8 000	87.5	87.5	87.5	0.14

Actual Freq Hz	B&K 4226 Corrections	Corrected Response dB(C)		Uncertainty (dB)
		Actual	re 1kHz	
125.90	-0.06	93.94	0.02	0.13
1005.10	-0.08	93.92	0.00	0.13
7915.10	0.07	87.57	-6.35	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	0.20	0.00	0.15	0.00	0.10
1005.10	0.10	0.20	0.10	0.15	-0.10	0.10
7915.10	3.20	0.30	0.00	0.35	-0.10	0.20

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	93.94	-0.08	-0.2	±1.5	0.12	P	0.30	0.60
1005.10	94.02	0.00	0.0	±1.0	0.00	P	0.30	0.60
7915.10	90.67	-3.35	-3.0	±5.0	-0.35	P	0.52	0.70

4.4 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 93dB. 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	93.0	93.0	93.0	0.13
125	92.9	93.1	93.0	0.11
250	92.9	93.0	93.0	0.10
500	93.0	93.1	93.0	0.10
1 000	93.0	93.0	93.0	0.10
2 000	93.0	93.1	93.0	0.10
4 000	93.0	93.0	93.0	0.10
8 000	93.0	93.0	93.0	0.10
15 850	N/A	N/A	N/A	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	0.30	0.00	0.15	0.00	0.10
125	0.00	0.30	0.00	0.15	0.00	0.10
250	0.00	0.20	0.00	0.15	0.00	0.10
500	0.00	0.20	-0.10	0.15	-0.10	0.10
1 000	0.00	0.20	0.10	0.15	-0.10	0.10
2 000	-0.20	0.30	0.10	0.15	-0.40	0.15
4 000	-0.40	0.30	-0.10	0.20	-0.30	0.15
8 000	0.50	0.30	0.00	0.35	-0.10	0.20
15 850	N/A	N/A	N/A	N/A	N/A	N/A

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	93.00	0.00	+1.0 / -2	P	0.38	0.60
125	92.90	-0.10	±1.5	P	0.37	0.60
250	92.90	-0.10	±1.5	P	0.29	0.60
500	92.80	-0.20	±1.5	P	0.29	0.60
1 000	93.00	0.00	±1.0	P	0.29	0.60
2 000	92.50	-0.50	±2.0	P	0.38	0.60
4 000	92.20	-0.80	±3.0	P	0.41	0.60
8 000	93.40	0.40	±5.0	P	0.51	0.70
15 850	N/A	N/A	+5.0 / –∞	N/A	####	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	93.00	0.00	+1.0 / -2	P	0.38	0.60
125	93.10	0.10	±1.5	P	0.37	0.60
250	93.00	0.00	±1.5	P	0.29	0.60
500	92.90	-0.10	±1.5	P	0.29	0.60
1 000	93.00	0.00	±1.0	P	0.29	0.60
2 000	92.60	-0.40	±2.0	P	0.38	0.60
4 000	92.20	-0.80	±3.0	P	0.41	0.60
8 000	93.40	0.40	±5.0	P	0.51	0.70
15 850	N/A	N/A	+5.0 / –∞	N/A	####	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	93.00	0.00	+1.0 / -2	P	0.38	0.60
125	93.00	0.00	±1.5	P	0.37	0.60
250	93.00	0.00	±1.5	P	0.29	0.60
500	92.80	-0.20	±1.5	P	0.29	0.60
1 000	93.00	0.00	±1.0	P	0.29	0.60
2 000	92.50	-0.50	±2.0	P	0.38	0.60
4 000	92.20	-0.80	±3.0	P	0.41	0.60
8 000	93.40	0.40	±5.0	P	0.51	0.70
15 850	N/A	N/A	+5.0 / –∞	N/A	####	1.00

4.5 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

4.6 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)
31.3	94	94.0	0.0	P	±0.3	0.10	0.10

4.7 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	±1.1	P	0.1	0.3
99.0	99.0	0.0	±1.1	P	0.1	0.3
104.0	104.0	0.0	±1.1	P	0.1	0.3
109.0	109.0	0.0	±1.1	P	0.1	0.3
114.0	114.0	0.0	±1.1	P	0.1	0.3
119.0	119.0	0.0	±1.1	P	0.1	0.3
124.0	124.0	0.0	±1.1	P	0.1	0.3
129.0	129.0	0.0	±1.1	P	0.1	0.3
131.0	131.0	0.0	±1.1	P	0.1	0.3
132.0	132.0	0.0	±1.1	P	0.1	0.3
133.0	133.0	0.0	±1.1	P	0.1	0.3
134.0	134.0	0.0	±1.1	P	0.1	0.3
135.0	135.0	0.0	±1.1	P	0.1	0.3
136.0	136.0	0.0	±1.1	P	0.1	0.3
137.0	137.0	0.0	±1.1	P	0.1	0.3

Overload indication at 138.0dB.

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	±1.1	P	0.1	0.3
89.0	89.0	0.0	±1.1	P	0.1	0.3
84.0	84.0	0.0	±1.1	P	0.1	0.3
79.0	79.0	0.0	±1.1	P	0.1	0.3
74.0	74.0	0.0	±1.1	P	0.1	0.3
69.0	69.0	0.0	±1.1	P	0.1	0.3
64.0	64.0	0.0	±1.1	P	0.1	0.3
59.0	58.9	-0.1	±1.1	P	0.1	0.3
54.0	53.9	-0.1	±1.1	P	0.1	0.3
49.0	48.9	-0.1	±1.1	P	0.1	0.3
44.0	44.0	0.0	±1.1	P	0.1	0.3
39.0	38.9	-0.1	±1.1	P	0.1	0.3
34.0	34.0	0.0	±1.1	P	0.1	0.3
30.0	29.9	-0.1	±1.1	P	0.1	0.3
29.0	28.9	-0.1	±1.1	P	0.1	0.3
28.0	27.9	-0.1	±1.1	P	0.1	0.3
27.0	26.9	-0.1	±1.1	P	0.1	0.3
26.0	25.9	-0.1	±1.1	P	0.1	0.3
25.0	24.9	-0.1	±1.1	P	0.1	0.3

Under range indication at 24.0dB.

4.8 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 135.0dB.

Table 14 - FAST Weighted Response

Burst Length	Response dB(A)	Deviation (dB)	Tolerance Limit (dB)	P/F	Uncertainty (dB)	Maximum Permitted Uncertainty (dB)
200ms	134.0	0.0	±1.0	P	0.1	0.3
2ms	117.0	0.0	+1.0 / -2.5	P	0.1	0.3
0.25ms	107.9	-0.1	+1.5 / -5	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	127.6	0.0	±1.0	P	0.1	0.3
2ms	108.0	0.0	+1.0 / -5	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	128.0	0.0	±1.0	P	0.1	0.3
2ms	108.0	0.0	+1.0 / -2.5	P	0.1	0.3
0.25ms	98.9	-0.1	+1.5 / -5	P	0.1	0.3

4.9 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 133.0dB(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)
135.4	-1.0	±3.0	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	135.1	-0.3	±2.0	P	0.1	0.35
Negative	135.0	-0.4	±2.0	P	0.1	0.35

No overload was noted during Peak C testing.

4.10 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 of137.0dB(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	135.5	0.1	±1.5	P	0.10	0.25
Negative	135.4					

Overload indication was verified.

Overload latch indication was verified.

4.11 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	137.0	137.0	0.0	±0.3	P	0.10	0.10
Slow	N/A	N/A	N/A	±0.3	N/A	0.10	0.10
Leq	137.0	137.0	0.0	±0.3	P	0.10	0.10

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Sound Level Meter
IEC 61672-3:2013
Calibration Certificate

Calibration Number C25770-V1

Client Details Martinus
Unit 1, 80 Bomen Road
Wagga Wagga NSW

Equipment Tested :	*Manufacturer*	*Model*	*Serial*
Instrument :	Rion	NL-43	00853459
Microphone :	Rion	UC-52	214091
Pre-amplifier :	Rion	NH-24	46391
Firmware Version :	01.03		

Pre-Test Atmospheric Conditions		**Post-Test Atmospheric Conditions**	
Ambient Temperature :	22.9 °C	**Ambient Temperature :**	22.8 °C
Relative Humidity :	48.2 %	**Relative Humidity :**	46.1 %
Barometric Pressure :	98.74 kPa	**Barometric Pressure :**	98.7 kPa

Calibration Technician :	Emanuel Eid	**Secondary Check:**	Matt Calleja
Calibration Date :	25-Nov-2025	**Report Issue Date :**	26-Nov-2025

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 2 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2013 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013 and because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in 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*	*±0.019 kPa*
Electrical Tests	*±0.13 dB*		

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

NATA WORLD RECOGNISED ACCREDITATION

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, calibration and inspection reports.

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

Calibration Number C25770-V1

Client Details Martinus
Unit 1, 80 Bomen Road
Wagga Wagga NSW

Equipment Tested :	*Manufacturer*	*Model*	*Serial*
Instrument Serial Number :	Rion	NL-43	00853459
Microphone Serial Number :	Rion	UC-52	214091
Pre-amplifier Serial Number :	Rion	NH-24	46391
Firmware Version :	01.03		

Pre-Test Atmospheric Conditions		**Post-Test Atmospheric Conditions**	
Ambient Temperature :	22.9 °C	**Ambient Temperature :**	22.8 °C
Relative Humidity :	48.2 %	**Relative Humidity :**	46.1 %
Barometric Pressure :	98.74 kPa	**Barometric Pressure :**	98.7 kPa

Calibration Technician :	Emanuel Eid	**Secondary Check:**	Matt Calleja
Calibration Date :	25-Nov-2025	**Report Issue Date :**	26-Nov-2025

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 2 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2013 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013 and because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in 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*	*±0.019 kPa*
Electrical Tests	*±0.13 dB*		

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

1. REVISION HISTORY

Revision	Date	Description
1	26-Nov-2025	Original Issue

2. OVERVIEW

This report presents the calibration test results of a NL-43 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.

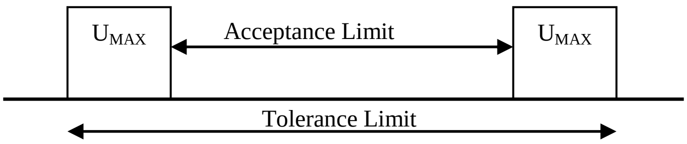
This report was generated using template version identifier of 69876974.

Where required, reference is made to manual version 66122 as provided by the manufacturer.

2.1 UNCERTAINTIES

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

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



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

The measured deviation from the design goal

Associated acceptance limits for the test

Maximum allowable uncertainty of measurement for the test

Actual expanded uncertainty for each measurement

2.2 DOCUMENT CONVENTIONS

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

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

3. GENERAL

3.1 DEVICE UNDER TEST

Equipment Tested :	*Manufacturer*	*Model*	*Serial*
Instrument :	Rion	NL-43	00853459
Microphone :	Rion	UC-52	214091
Pre-amplifier :	Rion	NH-24	46391

All results within this report correspond to Channel 1 of the device tested.

Instrument received in fair condition..

3.2 ENVIRONMENTAL CONDITIONS DURING TEST

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

3.3 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

3.4 TEST EQUIPMENT USED

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

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

3.4.1 Multi-function Acoustic Calibrator

A Bruel & Kjaer 4226 Multi-function calibrator (S/N – 3215300) was used for frequency response testing of the entire instrument (including microphone). This instrument was used as a reference calibrator and for frequency response verification.

The acoustic signal was applied by the 4226 Multi-function calibrator using a 1/2 inch microphone input.

3.4.2 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.

These signals were applied via the instrument's microphone input.

Where possible, a 19 pF capacitance dummy microphone was used during testing.

3.4.3 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.

3.4.4 Arbitrary Function Generator

A Keysight 33511B (S/N – MY62000827) was used to generate the required electrical signals.

3.4.5 Environmental Monitoring

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

4. CALIBRATION TEST RESULTS

4.1 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	94.10	94.10	94.00	94.02
C	94.10	94.10	94.00	94.02
Z	94.10	94.10	94.00	94.02

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

4.2 SELF GENERATED NOISE

4.2.1 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)

16.10	16.00	16.00	16.50	16.60
16.10	15.80	16.00	16.00	16.20

Acoustic Noise Floor : 16.1 dB(A)

4.2.2 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)

13.40	13.50	13.60	13.60	13.60
13.60	13.40	13.50	13.50	13.20

Random Readings dB(C)

17.00	18.00	18.10	19.40	17.30
18.40	18.50	18.50	18.40	17.90

Random Readings dB(Z)

22.1	23.7	24.6	23.7	24.0
22.8	22.9	23.5	23.8	22.2

	dB(A)	dB(C)	dB(Z)
Electric Noise Floor :	13.5	18.2	23.3

4.3 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	94.0	94.0	94.0	0.13
8 000	87.5	87.5	87.5	0.14

Actual Freq Hz	B&K 4226 Corrections	Corrected Response dB(C)		Uncertainty (dB)
		Actual	re 1kHz	
125.90	-0.02	94.08	0.16	0.13
1005.10	-0.08	93.92	0.00	0.13
7915.10	-0.02	87.48	-6.44	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	0.20	0.00	0.15	0.00	0.10
1005.10	0.10	0.20	0.10	0.15	-0.10	0.10
7915.10	3.20	0.30	0.00	0.35	-0.10	0.20

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	94.08	0.06	-0.2	±1.5	0.26	P	0.30	0.60
1005.10	94.02	0.00	0.0	±1.0	0.00	P	0.30	0.60
7915.10	90.58	-3.44	-3.0	±5.0	-0.44	P	0.52	0.70

4.4 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 93dB. 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	93.0	93.0	93.0	0.13
125	92.9	93.1	93.0	0.11
250	92.9	93.0	93.0	0.10
500	93.0	93.1	93.0	0.10
1 000	93.0	93.0	93.0	0.10
2 000	93.1	93.1	93.0	0.10
4 000	93.0	93.0	93.0	0.10
8 000	93.0	93.0	93.0	0.10
15 850	N/A	N/A	N/A	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	0.30	0.00	0.15	0.00	0.10
125	0.00	0.30	0.00	0.15	0.00	0.10
250	0.00	0.20	0.00	0.15	0.00	0.10
500	0.00	0.20	-0.10	0.15	-0.10	0.10
1 000	0.00	0.20	0.10	0.15	-0.10	0.10
2 000	-0.20	0.30	0.10	0.15	-0.40	0.15
4 000	-0.40	0.30	-0.10	0.20	-0.30	0.15
8 000	0.50	0.30	0.00	0.35	-0.10	0.20
15 850	0.00	0.00	0.00	0.00		

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	93.00	0.00	+1.0 / -2	P	0.38	0.60
125	92.90	-0.10	±1.5	P	0.37	0.60
250	92.90	-0.10	±1.5	P	0.29	0.60
500	92.80	-0.20	±1.5	P	0.29	0.60
1 000	93.00	0.00	±1.0	P	0.29	0.60
2 000	92.60	-0.40	±2.0	P	0.38	0.60
4 000	92.20	-0.80	±3.0	P	0.41	0.60
8 000	93.40	0.40	±5.0	P	0.51	0.70
15 850	N/A	N/A	+5.0 / –∞	N/A	####	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	93.00	0.00	+1.0 / -2	P	0.38	0.60
125	93.10	0.10	±1.5	P	0.37	0.60
250	93.00	0.00	±1.5	P	0.29	0.60
500	92.90	-0.10	±1.5	P	0.29	0.60
1 000	93.00	0.00	±1.0	P	0.29	0.60
2 000	92.60	-0.40	±2.0	P	0.38	0.60
4 000	92.20	-0.80	±3.0	P	0.41	0.60
8 000	93.40	0.40	±5.0	P	0.51	0.70
15 850	N/A	N/A	+5.0 / –∞	N/A	####	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	93.00	0.00	+1.0 / -2	P	0.38	0.60
125	93.00	0.00	±1.5	P	0.37	0.60
250	93.00	0.00	±1.5	P	0.29	0.60
500	92.80	-0.20	±1.5	P	0.29	0.60
1 000	93.00	0.00	±1.0	P	0.29	0.60
2 000	92.50	-0.50	±2.0	P	0.38	0.60
4 000	92.20	-0.80	±3.0	P	0.41	0.60
8 000	93.40	0.40	±5.0	P	0.51	0.70
15 850	N/A	N/A	+5.0 / –∞	N/A	####	1.00

4.5 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

4.6 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)
29.2	94	94.0	0.0	P	±0.3	0.10	0.10

4.7 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	±1.1	P	0.1	0.3
99.0	99.0	0.0	±1.1	P	0.1	0.3
104.0	104.0	0.0	±1.1	P	0.1	0.3
109.0	109.0	0.0	±1.1	P	0.1	0.3
114.0	114.0	0.0	±1.1	P	0.1	0.3
119.0	119.0	0.0	±1.1	P	0.1	0.3
124.0	124.0	0.0	±1.1	P	0.1	0.3
129.0	129.0	0.0	±1.1	P	0.1	0.3
131.0	131.0	0.0	±1.1	P	0.1	0.3
132.0	132.0	0.0	±1.1	P	0.1	0.3
133.0	133.0	0.0	±1.1	P	0.1	0.3
134.0	134.0	0.0	±1.1	P	0.1	0.3
135.0	135.0	0.0	±1.1	P	0.1	0.3
136.0	136.0	0.0	±1.1	P	0.1	0.3
137.0	137.0	0.0	±1.1	P	0.1	0.3

Overload indication at 138.0dB.

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	±1.1	P	0.1	0.3
89.0	89.0	0.0	±1.1	P	0.1	0.3
84.0	84.0	0.0	±1.1	P	0.1	0.3
79.0	79.0	0.0	±1.1	P	0.1	0.3
74.0	74.0	0.0	±1.1	P	0.1	0.3
69.0	69.0	0.0	±1.1	P	0.1	0.3
64.0	64.0	0.0	±1.1	P	0.1	0.3
59.0	59.0	0.0	±1.1	P	0.1	0.3
54.0	54.0	0.0	±1.1	P	0.1	0.3
49.0	49.0	0.0	±1.1	P	0.1	0.3
44.0	44.0	0.0	±1.1	P	0.1	0.3
39.0	39.0	0.0	±1.1	P	0.1	0.3
34.0	34.0	0.0	±1.1	P	0.1	0.3
30.0	30.0	0.0	±1.1	P	0.1	0.3
29.0	29.0	0.0	±1.1	P	0.1	0.3
28.0	27.9	-0.1	±1.1	P	0.1	0.3
27.0	26.9	-0.1	±1.1	P	0.1	0.3
26.0	25.9	-0.1	±1.1	P	0.1	0.3
25.0	24.9	-0.1	±1.1	P	0.1	0.3

No under range indicated.

4.8 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 135.0dB.

Table 14 - FAST Weighted Response

Burst Length	Response dB(A)	Deviation (dB)	Tolerance Limit (dB)	P/F	Uncertainty (dB)	Maximum Permitted Uncertainty (dB)
200ms	134.0	0.0	±1.0	P	0.1	0.3
2ms	117.0	0.0	+1.0 / -2.5	P	0.1	0.3
0.25ms	107.9	-0.1	+1.5 / -5	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	127.6	0.0	±1.0	P	0.1	0.3
2ms	108.0	0.0	+1.0 / -5	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	128.0	0.0	±1.0	P	0.1	0.3
2ms	108.0	0.0	+1.0 / -2.5	P	0.1	0.3
0.25ms	98.9	-0.1	+1.5 / -5	P	0.1	0.3

4.9 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 133.0dB(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)
136.1	-0.3	±3.0	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	135.0	-0.4	±2.0	P	0.1	0.35
Negative	135.0	-0.4	±2.0	P	0.1	0.35

No overload was noted during Peak C testing.

4.10 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 of137.0dB(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	135.3	0.0	±1.5	P	0.10	0.25
Negative	135.3					

Overload indication was verified.

Overload latch indication was verified.

4.11 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	137.0	137.0	0.0	±0.3	P	0.10	0.10
Slow	N/A	N/A	N/A	±0.3	N/A	0.10	0.10
Leq	137.0	137.0	0.0	±0.3	P	0.10	0.10

Hexanode Calibration Certificate

05 Feb 2026

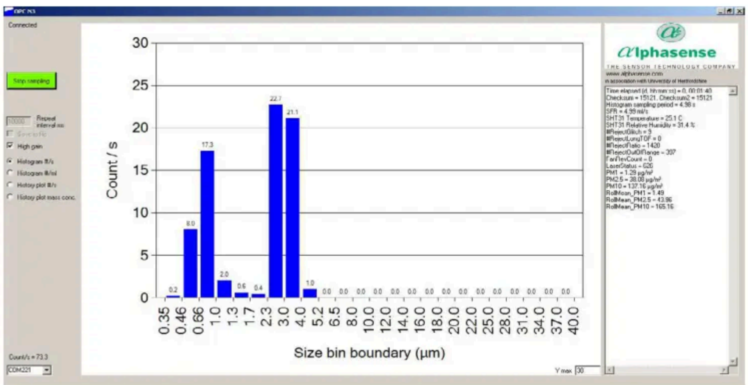
Dust

Thank you for choosing SiteHive for your realtime environmental management. This calibration certificate is valid for the device below.

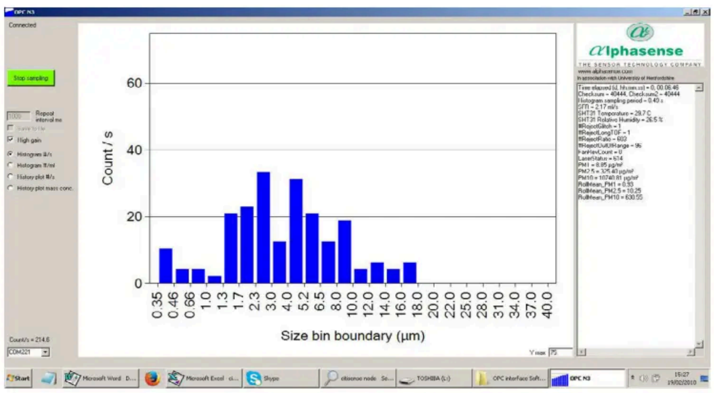
The Hexanode utilises the Alphasense N3 Optical Particle Sensor to provide real-time dust measurements. Whilst the N3 does not have any gravimetric sampling capabilities, measurements can be adjusted using a K-Factor if one is available. SiteHive software will also provide measurements from the nearest Government air quality station for reference. The full data sheet for the Alphasense N3 is available here.

Particle range	Particle range* µm spherical equivalent size (based on RI of 1.5)	0.35 to 40
Size categorisation	Number of software bins	24
Sampling interval	Histogram period (seconds)	1 to 30
Total flow rate (typical)	L/min	5.5
Sample flow rate (typical)	mL/min	280
Max particle count rate	Particles/second	10,000
Max coincidence probability	%concentration at 106 particles/L	0.84
Max coincidence probability	%concentration at 500 particles/L	0.24

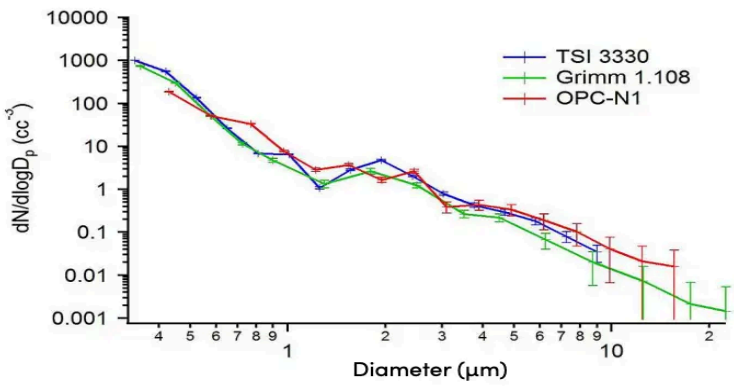
OPC-N3 response to 0.75 and 3 um PSL calibration standards



OPC-N3 response to a broad size range test dust



Particle Size Derivative Comparison



The OPC-N3 uses the same algorithms for 0.3 - 17µm as the OPC-N1.

Hexanode Calibration Certificate

05 Feb 2026

Noise

Thank you for choosing SiteHive for your realtime environmental management. This calibration certificate is valid for the device below.

The Hexanode sound level meter has been pressure calibrated by SiteHive using a NATA Certified (IEC 60942: Sound calibrators) Sound Level Calibrator, at 104 Commonwealth Street, Surry Hills, NSW, 2010.

NATA Certificates of Calibration that comply with the Class 2 performance requirements of IEC 61672.3 are available on request.

Serial Number	Noiseboard ID	Calibration Value	Calibration Date	Calibration Due
HEX-001349	4273865-009-1225000004	4.344251	09 Jan 2026	09 Jan 2028

Accuracy:	Complies with precision requirements of IEC 61672 for Class 2
Acoustic overload point:	135 dBSPL
Frequency Range:	20 Hz ~ 12.5 kHz
Frequency Rating:	Z, A and C weighting
Parameters (dB):	Frequency & time weighted integrations, statistical levels, and more
Direction of Arrival:	Device angle & cartesian angle (0°-360°) of dominant noise source
Reference Sound Level Calibrator:	Lutron SC-941
Calibration Reference Level:	94dB
Calibration Reference Frequency:	1 KHz
Environmental Conditions:	The environmental conditions remained within the acceptable limits as defined in IEC 61672.3

Hexanode Calibration Certificate

13 May 2025

Thank you for choosing SiteHive for your realtime environmental management. This calibration certificate is valid for the device below.

Noise

The Hexanode sound level meter has been pressure calibrated by SiteHive using a NATA Certified (IEC 60942: Sound calibrators) Sound Level Calibrator, at 104 Commonwealth Street, Surry Hills, NSW, 2010.

Serial Number	Calibration Value	Calibration Date	Calibration Due
HEX-000238	2.96282	28 Apr 2025	28 Apr 2027

Accuracy:	Complies with precision requirements of IEC 61672 for Class 2
Acoustic overload point:	135 dBSPL
Frequency Range:	20 Hz ~ 12.5 kHz
Frequency Rating:	Z, A and C weighting
Parameters (dB):	Frequency & time weighted integrations, statistical levels, and more
Direction of Arrival:	Device angle & cartesian angle (0°-360°) of dominant noise source

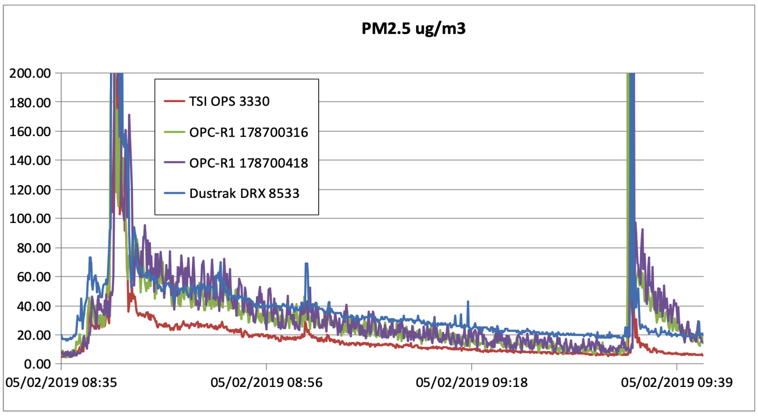
The SiteHive Hexanode uses innovative digital MEMS microphones, and as such cannot achieve full pattern approval in line with international standard IEC 61672, which is written for analogue condenser microphones. However, the SiteHive Hexanode sound level meter has been rigorously tested by the the National Measurement Institute (NMI), the division of the Australian Federal Government Department of Industry, Science, Energy & Resources responsible for providing world-class measurement services to support a fair, safe, healthy and competitive Australia. The National Measurement Institute's (NMI) acoustic, ultrasound and vibration measurement services are the most accurate in Australia, and include providing the certification for NATA (National Association of Testing Authorities) testing facilities, who provide class certification for noise meters. NMI undertook all of the possible tests outlined in IEC 61672-2, with the Hexanode passing all precision requirements within the criteria of a class 2 device.

Dust

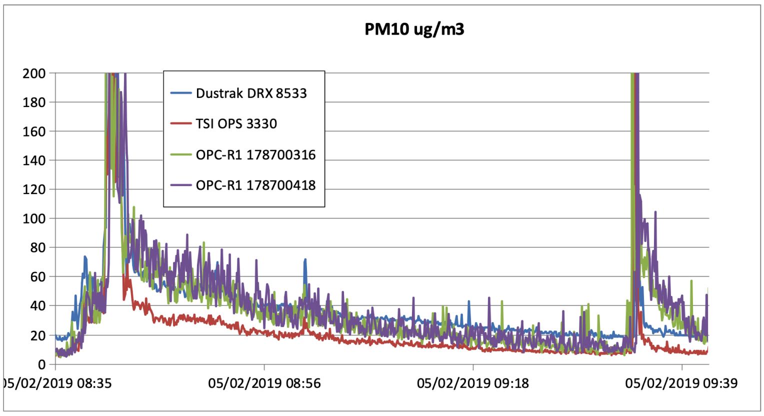
The Hexanode Multi device utilises the Alphasense OPC-R2 particle monitor to provide real-time dust measurements. These sensors are calibrated at manufacture by Alphasense. Whilst the R2 does not have any gravimetric sampling capabilities, measurements can be adjusted using a K-Factor if one is available. SiteHive software will also provide measurements from the nearest Government air quality station for reference. The full data sheet for the Alphasense R2 is available here.

Particle range	μm spherical equivalent size (based on RI of 1.5)	0.30 to 12.4
Size categorisation	Number of software bins	16
Sampling interval	Histogram period (seconds)	2 to 30
Total flow rate	L/min (typical)	0.24
Max particle count rate	particles/second	10,000
Max coincidence probability	% concentration at 10^6 particles/L	0.7

Prior to deployment, the R2 is tested against TSI Optical Particle Sizer 3330 and DustTrak instruments.



Comparison of PM2.5 monitoring by OPC-R2 sensor and TSI OPS 3330 and DustTrak instruments. All are set at 5s averaging and are sampling the ambient air of a workshop, the raw 3330 data has been used to calculate a PM figure.



Comparison of PM10 monitoring by OPC-R2 sensor and TSI OPS 3330 and DustTrak instruments. All are set at 5s averaging and are sampling the ambient air of a workshop, the raw 3330 data has been used to calculate a PM figure.

Hexanode Calibration Certificate

05 Feb 2026

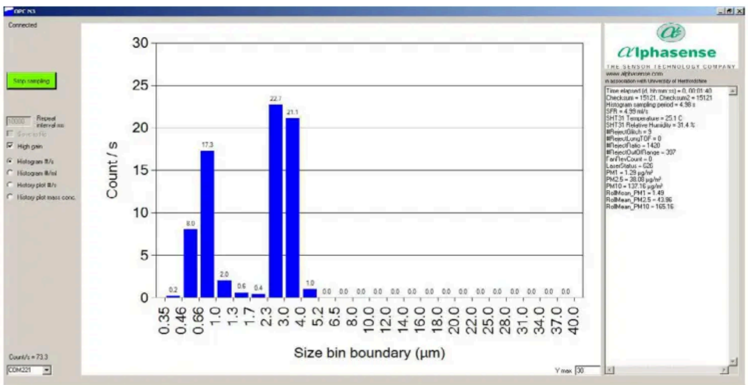
Dust

Thank you for choosing SiteHive for your realtime environmental management. This calibration certificate is valid for the device below.

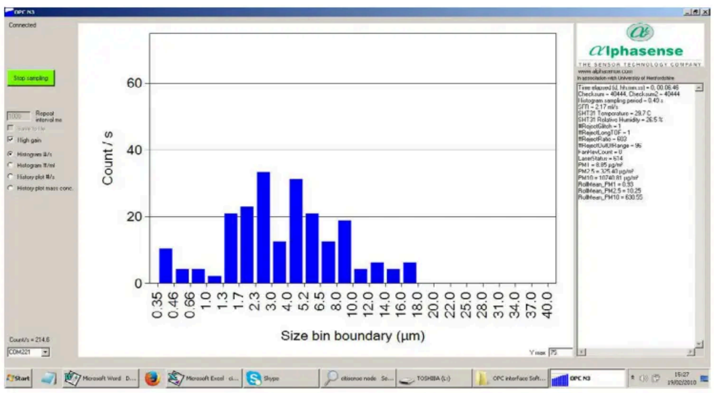
The Hexanode utilises the Alphasense N3 Optical Particle Sensor to provide real-time dust measurements. Whilst the N3 does not have any gravimetric sampling capabilities, measurements can be adjusted using a K-Factor if one is available. SiteHive software will also provide measurements from the nearest Government air quality station for reference. The full data sheet for the Alphasense N3 is available here.

Particle range	Particle range* µm spherical equivalent size (based on RI of 1.5)	0.35 to 40
Size categorisation	Number of software bins	24
Sampling interval	Histogram period (seconds)	1 to 30
Total flow rate (typical)	L/min	5.5
Sample flow rate (typical)	mL/min	280
Max particle count rate	Particles/second	10,000
Max coincidence probability	%concentration at 106 particles/L	0.84
Max coincidence probability	%concentration at 500 particles/L	0.24

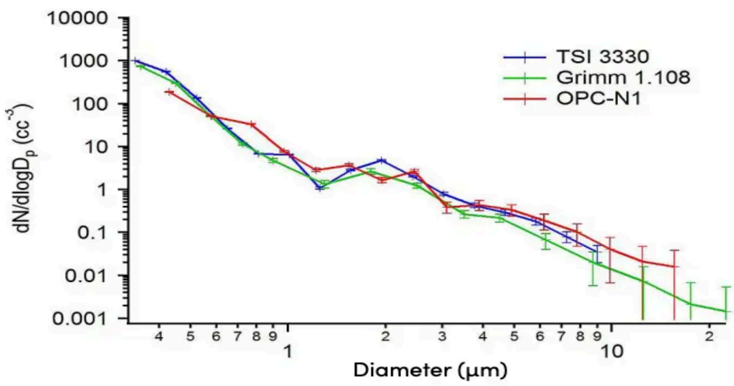
OPC-N3 response to 0.75 and 3 um PSL calibration standards



OPC-N3 response to a broad size range test dust



Particle Size Derivative Comparison



The OPC-N3 uses the same algorithms for 0.3 - 17µm as the OPC-N1.

Hexanode Calibration Certificate

05 Feb 2026

Noise

Thank you for choosing SiteHive for your realtime environmental management. This calibration certificate is valid for the device below.

The Hexanode sound level meter has been pressure calibrated by SiteHive using a NATA Certified (IEC 60942: Sound calibrators) Sound Level Calibrator, at 104 Commonwealth Street, Surry Hills, NSW, 2010.

NATA Certificates of Calibration that comply with the Class 2 performance requirements of IEC 61672.3 are available on request.

Serial Number	Noiseboard ID	Calibration Value	Calibration Date	Calibration Due
HEX-001335	4273865-009-1225000008	4.596377	09 Jan 2026	09 Jan 2028

Accuracy:	Complies with precision requirements of IEC 61672 for Class 2
Acoustic overload point:	135 dBSPL
Frequency Range:	20 Hz ~ 12.5 kHz
Frequency Rating:	Z, A and C weighting
Parameters (dB):	Frequency & time weighted integrations, statistical levels, and more
Direction of Arrival:	Device angle & cartesian angle (0°-360°) of dominant noise source
Reference Sound Level Calibrator:	Lutron SC-941
Calibration Reference Level:	94dB
Calibration Reference Frequency:	1 KHz
Environmental Conditions:	The environmental conditions remained within the acceptable limits as defined in IEC 61672.3

Hexanode Calibration Certificate

05 Feb 2026

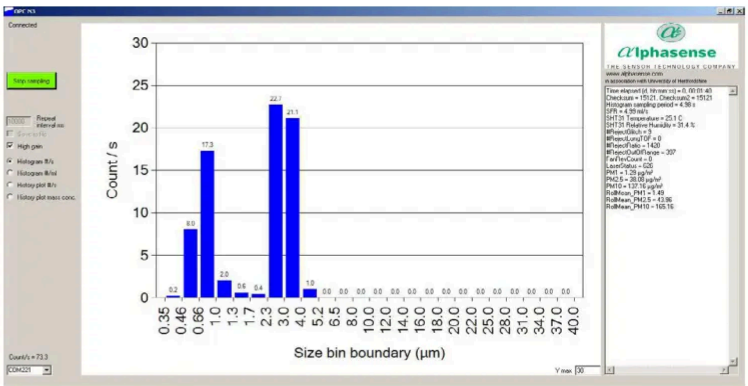
Dust

Thank you for choosing SiteHive for your realtime environmental management. This calibration certificate is valid for the device below.

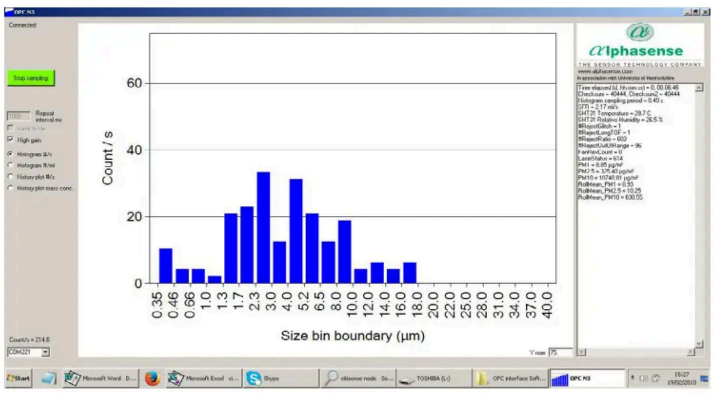
The Hexanode utilises the Alphasense N3 Optical Particle Sensor to provide real-time dust measurements. Whilst the N3 does not have any gravimetric sampling capabilities, measurements can be adjusted using a K-Factor if one is available. SiteHive software will also provide measurements from the nearest Government air quality station for reference. The full data sheet for the Alphasense N3 is available here.

Particle range	Particle range* µm spherical equivalent size (based on RI of 1.5)	0.35 to 40
Size categorisation	Number of software bins	24
Sampling interval	Histogram period (seconds)	1 to 30
Total flow rate (typical)	L/min	5.5
Sample flow rate (typical)	mL/min	280
Max particle count rate	Particles/second	10,000
Max coincidence probability	%concentration at 106 particles/L	0.84
Max coincidence probability	%concentration at 500 particles/L	0.24

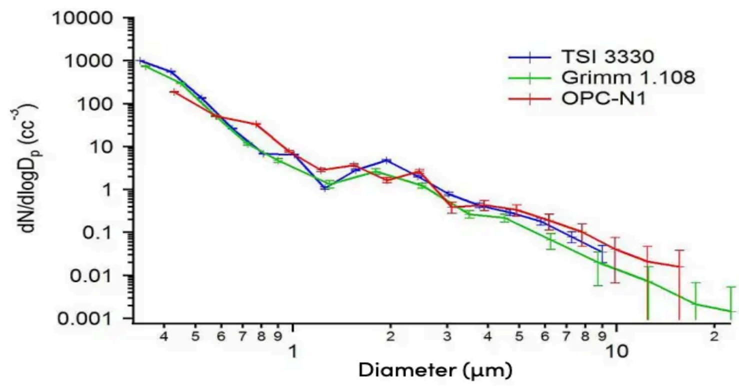
OPC-N3 response to 0.75 and 3 um PSL calibration standards



OPC-N3 response to a broad size range test dust



Particle Size Derivative Comparison



The OPC-N3 uses the same algorithms for 0.3 - 17µm as the OPC-N1.

Hexanode Calibration Certificate

05 Feb 2026

Noise

Thank you for choosing SiteHive for your realtime environmental management. This calibration certificate is valid for the device below.

The Hexanode sound level meter has been pressure calibrated by SiteHive using a NATA Certified (IEC 60942: Sound calibrators) Sound Level Calibrator, at 104 Commonwealth Street, Surry Hills, NSW, 2010.

NATA Certificates of Calibration that comply with the Class 2 performance requirements of IEC 61672.3 are available on request.

Serial Number	Noiseboard ID	Calibration Value	Calibration Date	Calibration Due
HEX-001354	4273865-009-1225000068	4.66895	20 Jan 2026	20 Jan 2028

Accuracy:	Complies with precision requirements of IEC 61672 for Class 2
Acoustic overload point:	135 dBSPL
Frequency Range:	20 Hz ~ 12.5 kHz
Frequency Rating:	Z, A and C weighting
Parameters (dB):	Frequency & time weighted integrations, statistical levels, and more
Direction of Arrival:	Device angle & cartesian angle (0°-360°) of dominant noise source
Reference Sound Level Calibrator:	Lutron SC-941
Calibration Reference Level:	94dB
Calibration Reference Frequency:	1 KHz
Environmental Conditions:	The environmental conditions remained within the acceptable limits as defined in IEC 61672.3

Hexanode Calibration Certificate

19 Nov 2024

Thank you for choosing SiteHive for your realtime environmental management. This calibration certificate is valid for the device below.

Noise

The Hexanode sound level meter has been pressure calibrated by SiteHive using a NATA Certified (IEC 60942: Sound calibrators) Sound Level Calibrator, at 104 Commonwealth Street, Surry Hills, NSW, 2010.

Serial Number	Calibration Date	Calibration Value
HEX-000600	15 Aug 2024	3.028699

Accuracy:	Complies with precision requirements of IEC 61672 for Class 2
Acoustic overload point:	135 dBSPL
Frequency Range:	20 Hz ~ 12.5 kHz
Frequency Rating:	Z, A and C weighting
Parameters (dB):	Frequency & time weighted integrations, statistical levels, and more
Direction of Arrival:	Device angle & cartesian angle (0°-360°) of dominant noise source

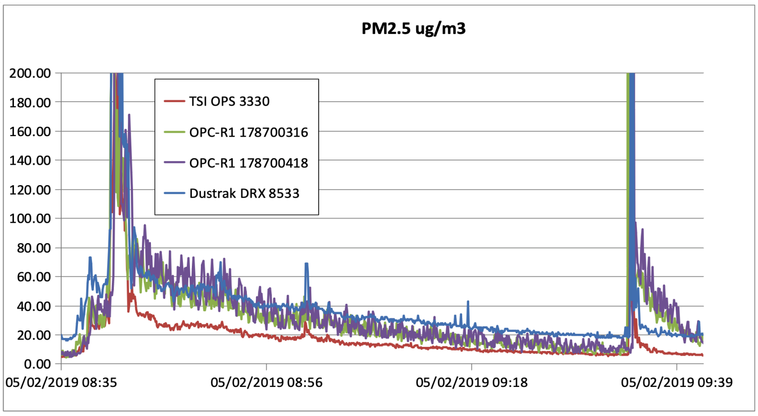
The SiteHive Hexanode uses innovative digital MEMS microphones, and as such cannot achieve full pattern approval in line with international standard IEC 61672, which is written for analogue condenser microphones. However, the SiteHive Hexanode sound level meter has been rigorously tested by the the National Measurement Institute (NMI), the division of the Australian Federal Government Department of Industry, Science, Energy & Resources responsible for providing world-class measurement services to support a fair, safe, healthy and competitive Australia. The National Measurement Institute's (NMI) acoustic, ultrasound and vibration measurement services are the most accurate in Australia, and include providing the certification for NATA (National Association of Testing Authorities) testing facilities, who provide class certification for noise meters. NMI undertook all of the possible tests outlined in IEC 61672-2, with the Hexanode passing all precision requirements within the criteria of a class 2 device.

Dust

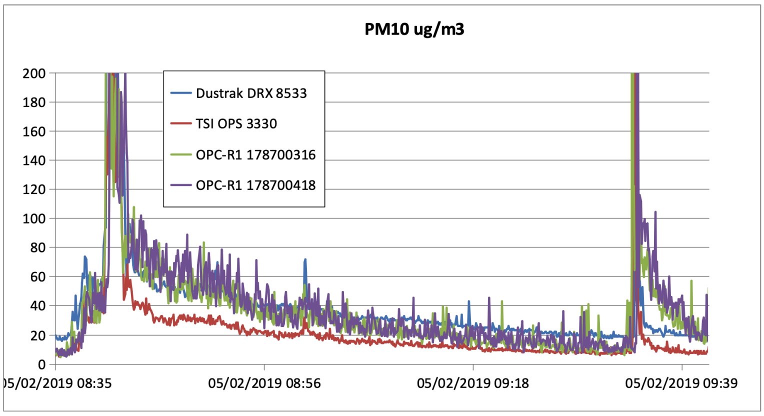
The Hexanode utilises the Alphasense R2 Optical Particle Sensor, to provide real-time dust measurements. Whilst the R2 does not have any gravimetric sampling capabilities, measurements can be adjusted using a K-Factor if one is available. SiteHive software will also provide measurements from the nearest Government air quality station for reference. The full data sheet for the Alphasense R2 is available here.

Particle range	µm spherical equivalent size (based on RI of 1.5)	0.30 to 12.4
Size categorisation	Number of software bins	16
Sampling interval	Histogram period (seconds)	2 to 30
Total flow rate	L/min (typical)	0.24
Max particle count rate	particles/second	10,000
Max coincidence probability	% concentration at 10^6 particles/L	0.7

Prior to deployment, the R2 is tested against TSI Optical Particle Sizer 3330 and DustTrak instruments.



Comparison of PM2.5 monitoring by OPC-R2 sensor and TSI OPS 3330 and DustTrak instruments. All are set at 5s averaging and are sampling the ambient air of a workshop, the raw 3330 data has been used to calculate a PM figure.



Comparison of PM10 monitoring by OPC-R2 sensor and TSI OPS 3330 and DustTrak instruments. All are set at 5s averaging and are sampling the ambient air of a workshop, the raw 3330 data has been used to calculate a PM figure.

Certificate No. D256934E

ilac-MRA IAJapan Accredited Calibration JCSS JCSS 0197

CALIBRATION CERTIFICATE

Product	:	SOUND CALIBRATOR
Model	:	NC-75
Serial number	:	34556813
Manufacturer	:	RION CO., LTD.
Calibration item	:	Sound pressure level (with reference standard microphone)
Calibration method	:	Measured by specified secondary standard microphone according to JCSS calibration procedure specified by RION.
Ambient conditions	:	Temperature 23.8 ℃, Relative humidity 36 %, Static pressure 99.7 kPa
Calibration date	:	7/5/2025 (D/M/YYYY)
Calibration location	:	3-20-41 Higashimotomachi, Kokubunji, Tokyo 185-8533, Japan RION CO., LTD. Calibration Room

We hereby certify that the results of this calibration were as follows.

Issue date : 15/5/2025 (D/M/YYYY)

Yoshio Maruyama
Manager
Quality Assurance Section,
Quality Assurance Department,
Production Division
RION CO., LTD.
3-20-41 Higashimotomachi, Kokubunji,
Tokyo 185-8533, Japan

CALIBRATION RESULT

Sound pressure level (with reference standard microphone)

Measured Value	Expanded Uncertainty *
93.98 dB	0.09 dB

Specified secondary standard microphone:

Model : 4160
Serial number : 1843696

Reference Sound pressure : 2×10^{-5} Pa

* Defines an interval estimated to have a level of confidence of approximately 95 %.
Coverage factor $k = 2$

Calibration result is the calibration value in ambient conditions during calibration.

BE OUT OF JCSS CALIBRATION

1. Frequency

Measured Value	Measurement uncertainty ($k = 2$)
1000.0 Hz	4.0×10^{-4} Hz

Working measurement standard universal counter:

Model : 53132A
Serial number : MY40005574
(JCSS Calibration Certificate No. 2408008578510)

2. Total distortion

Measured Value
0.4 %

Working measurement standard distortion meter:

Model : VA-2230A
Serial number : 11076061
(A2LA Calibration Certificate No. 1504-03541)

- closing -

Hexanode Calibration Certificate

29 Jul 2025

Vibration

Thank you for choosing SiteHive for your realtime environmental management. This calibration certificate is valid for the device below.

The vibration device is calibrated by SiteHive through comparison to a reference transducer, in line with testing protocols outlined in ISO 16063-21:2003.

Serial Number	Calibration Date	Calibration Due
VIB-000279	05 Sep 2024	05 Sep 2026

Result

Axis	Frequency (Hz)	Measured value (mm/s)	Reference value (mm/s)	Result (% difference to reference)
x	31.5	25.28	25.33	Pass (0)
y	31.5	25.59	25.63	Pass (0)
z	31.5	25.64	25.68	Pass (0)

Calibration conditions

Temperature	23 °C
Humidity	52 % RH
Mounting surface	Aluminium

Calibration equipment

Equipment	Model	Serial number	Calibration certificate
Reference Sensor 1	M-A352AD10	00005379	14 Jan 2024
Reference Sensor 2	M-A352AD10	00005090	14 Jan 2024
Shaker	AVM90-HF-10-0.5	AVM-34858	
Driver	AGD200-ET-2D02	AGD200-00122310916	
Reference Check			
Device Mount	8428544-001		

Hexanode Calibration Certificate

29 Jul 2025

Vibration

Thank you for choosing SiteHive for your realtime environmental management. This calibration certificate is valid for the device below.

The vibration device is calibrated by SiteHive through comparison to a reference transducer, in line with testing protocols outlined in ISO 16063-21:2003.

Serial Number	Calibration Date	Calibration Due
VIB-000348	04 Jul 2025	04 Jul 2027

Result

Axis	Frequency (Hz)	Measured value (mm/s)	Reference value (mm/s)	Result (% difference to reference)
x	31.5	25.13	25.18	Pass (0)
y	31.5	25.26	25.31	Pass (0)
z	31.5	25.43	25.47	Pass (0)

Calibration conditions

Temperature	23 °C
Humidity	52 % RH
Mounting surface	Aluminium

Calibration equipment

Equipment	Model	Serial number	Calibration certificate
Reference Sensor 1	M-A352AD10	00005379	23 Sep 2024
Reference Sensor 2	M-A352AD10	00005090	23 Sep 2024
Shaker	AVM90-HF-10-0.5	AVM-34858	
Driver	AGD200-ET-2D02	AGD200-00122310916	
Reference Check			
Device Mount	8428544-001		

Hexanode Calibration Certificate

SiteHive

29 Jul 2025

Vibration

Thank you for choosing SiteHive for your realtime environmental management. This calibration certificate is valid for the device below.

The vibration device is calibrated by SiteHive through comparison to a reference transducer, in line with testing protocols outlined in ISO 16063-21:2003.

Serial Number	Calibration Date	Calibration Due
VIB-000387	04 Jul 2025	04 Jul 2027

Result

Axis	Frequency (Hz)	Measured value (mm/s)	Reference value (mm/s)	Result (% difference to reference)
x	31.5	25.06	25.1	Pass (0)
y	31.5	25.42	25.46	Pass (0)
z	31.5	25.44	25.48	Pass (0)

Calibration conditions

Temperature	23 °C
Humidity	52 % RH
Mounting surface	Aluminium

Calibration equipment

Equipment	Model	Serial number	Calibration certificate
Reference Sensor 1	M-A352AD10	00005379	23 Sep 2024
Reference Sensor 2	M-A352AD10	00005090	23 Sep 2024
Shaker	AVM90-HF-10-0.5	AVM-34858	
Driver	AGD200-ET-2D02	AGD200-00122310916	
Reference Check			
Device Mount	8428544-001		

Hexanode Calibration Certificate

29 Jul 2025

Vibration

Thank you for choosing SiteHive for your realtime environmental management. This calibration certificate is valid for the device below.

The vibration device is calibrated by SiteHive through comparison to a reference transducer, in line with testing protocols outlined in ISO 16063-21:2003.

Serial Number	Calibration Date	Calibration Due
VIB-000047	04 Jul 2025	04 Jul 2027

Result

Axis	Frequency (Hz)	Measured value (mm/s)	Reference value (mm/s)	Result (% difference to reference)
x	31.5	25.1	25.14	Pass (0)
y	31.5	25.24	25.28	Pass (0)
z	31.5	25.66	25.7	Pass (0)

Calibration conditions

Temperature	23 °C
Humidity	52 % RH
Mounting surface	Aluminium

Calibration equipment

Equipment	Model	Serial number	Calibration certificate
Reference Sensor 1	M-A352AD10	00005379	23 Sep 2024
Reference Sensor 2	M-A352AD10	00005090	23 Sep 2024
Shaker	AVM90-HF-10-0.5	AVM-34858	
Driver	AGD200-ET-2D02	AGD200-00122310916	
Reference Check			
Device Mount	8428544-001		

Hexanode Calibration Certificate

01 Jan 2026

Vibration

Thank you for choosing SiteHive for your realtime environmental management. This calibration certificate is valid for the device below.

The vibration device is calibrated by SiteHive through comparison to a reference transducer, in line with testing protocols outlined in ISO 16063-21:2003.

Serial Number	Calibration Date	Calibration Due
VIB-000165	26 Jun 2025	26 Jun 2027

Result

Axis	Frequency (Hz)	Measured value (mm/s)	Reference value (mm/s)	Result (% difference to reference)
x	31.5	24.99	25.03	Pass (0)
y	31.5	25.14	25.19	Pass (0)
z	31.5	25.33	25.37	Pass (0)

Calibration conditions

Temperature	23 °C
Humidity	52 % RH
Mounting surface	Aluminium

Calibration equipment

Equipment	Model	Serial number	Calibration certificate
Reference Sensor 1	M-A352AD10	00005379	23 Sep 2024
Reference Sensor 2	M-A352AD10	00005090	23 Sep 2024
Shaker	AVM90-HF-10-0.5	AVM-34858	
Driver	AGD200-ET-2D02	AGD200-00122310916	
Reference Check			
Device Mount	8428544-001		

Hexanode Calibration Certificate

01 Mar 2026

Vibration

Thank you for choosing SiteHive for your realtime environmental management. This calibration certificate is valid for the device below.

The vibration device is calibrated by SiteHive through comparison to a reference transducer, in line with testing protocols outlined in ISO 16063-21:2003.

Serial Number	Calibration Date	Calibration Due
VIB-000512	24 Feb 2026	24 Feb 2028

Result

Axis	Frequency (Hz)	Measured value (mm/s)	Reference value (mm/s)	Result (% difference to reference)
x	31.5	24.86	24.9	Pass (0)
y	31.5	25.11	25.15	Pass (0)
z	31.5	25.24	25.28	Pass (0)

Calibration conditions

Temperature	23 °C
Humidity	52 % RH
Mounting surface	Aluminium

Calibration equipment

Equipment	Model	Serial number	Calibration certificate
Reference Sensor 1	M-A352AD10	00005379	23 Sep 2024
Reference Sensor 2	M-A352AD10	00005090	23 Sep 2024
Shaker	AVM90-HF-10-0.5	AVM-34858	
Driver	AGD200-ET-2D02	AGD200-00122310916	
Reference Check			
Device Mount	8428544-001		

SERVICE & CALIBRATION REPORT
Water Quality Meter

Customer Details:
Martinus Rail Pty Ltd
Attn Joseph Dusting ph: 0410 119 009
Inland Rail A2P Project
75 Miller Street
North Sydney, NSW 2060
Australia

Job Number
240937

Date
27/09/2024

Instrument Model:
HORIBA U-52/2m
Multi-parameter water quality meter

Instrument Serial Number:
F6GXX4FW JULY 24

PRE-DELIVERY CALIBRATION

Calibration:(in accordance with manufacturer's specifications)

Parameter - unit	Calibration value	After calibration	Comment
pH (pH)	7.01	7.01	Pass
pH (pH)	4.00	4.00	Pass
ORP (mV)	225	225	Pass
Conductivity (mS/cm)	0.000	0.000	Pass
Conductivity (mS/cm)	0.718	0.718	Pass
Conductivity (mS/cm)	6.67	6.67	Pass
Conductivity (mS/cm)	58.6	58.6	Pass
Turbidity (NTU)	0.0	0.0	N/A
Turbidity (NTU)	8.0	8.0	N/A
Turbidity (NTU)	80.0	80.0	N/A
Turbidity (NTU)	400	400	N/A
D.O. zero (mg/L)	0.00	0.00	Pass
D.O. span (mg/L)	9.42 mg/L @ 19.2°C	9.42 mg/L @ 19.2°C	Pass
Temperature (°C)	18.4°C	18.4°C	Pass

Senors:

pH Glass Electrode	pH Ref Electrode	ORP Electrode	DO Electrode
416020	UCUGXBU0	T00RG20V	A1S0SH8W

Comments:
MAKE SURE pH reference electrode is refilled with soln #330 regularly. If the #330 soln solidifies inside the pH reference electrode, remove the liquid junction cap (flat black rubber cap with wick in the middle) and rinse out the old soln with distilled water. Then refill with fresh HORIBA soln # 330 and refit the liquid junction cap. **Please read the notes on pH maintenance.**

Calibration carried out by:
Melanie Wheeler

AUSTRALIAN SCIENTIFIC PTY LTD
11 McDougall Street, Kotara NSW 2289
TEL: 1800 021 083
E-mail: sales@austscientific.com.au **www.austscientific.com.au**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