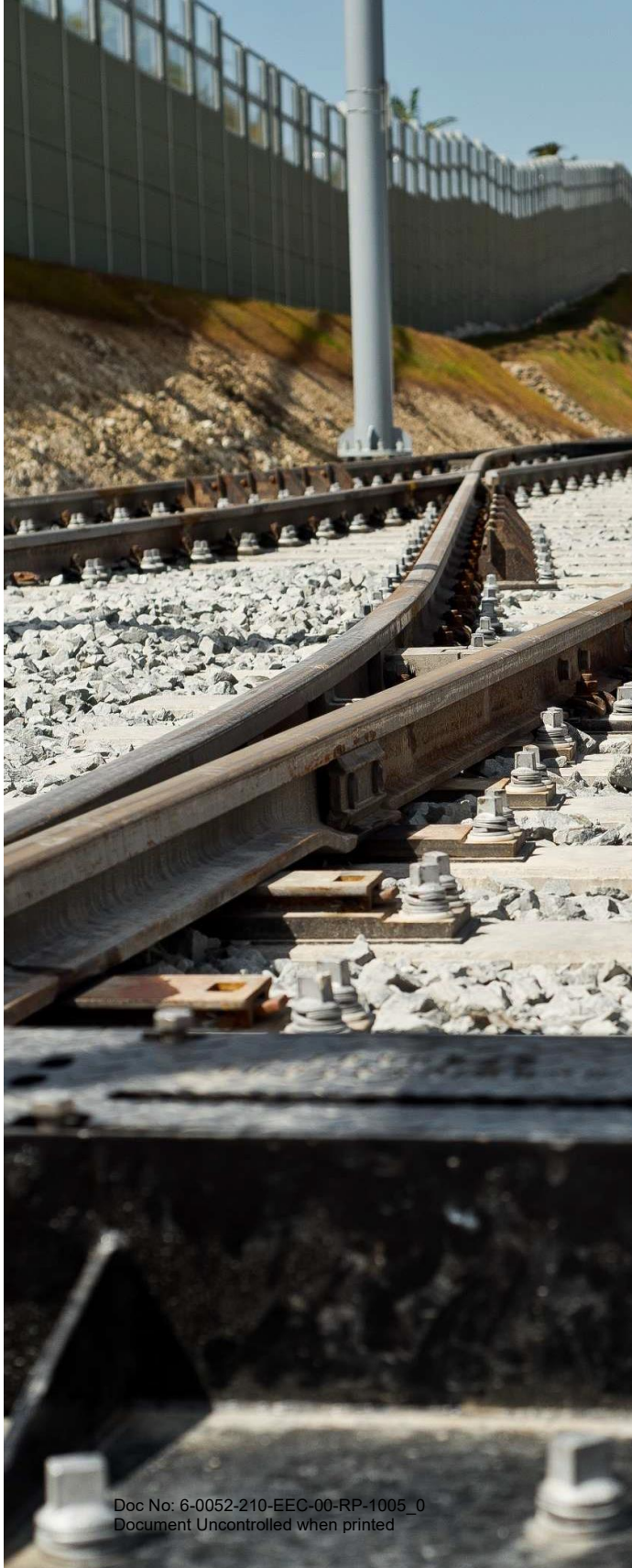




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## QUARTERLY ENVIRONMENTAL MONITORING REPORT- APRIL TO JUNE 2026

# A2I | Albury to Illabo

CONTRACT NUMBER: 0052

PROJECT DOCUMENT NUMBER:

6-0052-210-EEC-00-RP-1005

## Document Control

|                        |                                                                                   |               |                            |
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| <b>DOCUMENT TITLE:</b> | Quarterly Environmental Monitoring Report April to June 2026                      |               |                            |
| <b>DOCUMENT OWNER:</b> | Teiya Thornberry – Site Environmental Manager                                     |               |                            |
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## Approved by

| NAME             | TITLE                      | SIGNATURE                                                                         | DATE      |
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| Teiya Thornberry | Site Environmental Manager |  | 9/07/2026 |

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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                      |
| CNVMP <sub>r</sub> | 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**

| CONDITION REFERENCE           | CONDITION REQUIREMENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | REFERENCE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                              |                               |                                                 |                     |                   |              |                  |               |                                          |                                                                   |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------------------------------|-------------------------------------------------|---------------------|-------------------|--------------|------------------|---------------|------------------------------------------|-------------------------------------------------------------------|
| C26                           | <p>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:</p> <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>                                                                                                                                                                                               | Required Construction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Relevant Government Agencies | Traffic, transport and access | Relevant councils and Transport for NSW (TfNSW) | Noise and vibration | Relevant councils | Biodiversity | BCS (NSW DCCEEW) | Surface water | DCCEEW Water Group and relevant councils | <p>This report and associated submission to relevant agencies</p> |
| Required Construction         | Relevant Government Agencies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                              |                               |                                                 |                     |                   |              |                  |               |                                          |                                                                   |
| Traffic, transport and access | Relevant councils and Transport for NSW (TfNSW)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                              |                               |                                                 |                     |                   |              |                  |               |                                          |                                                                   |
| Noise and vibration           | Relevant councils                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                              |                               |                                                 |                     |                   |              |                  |               |                                          |                                                                   |
| Biodiversity                  | BCS (NSW DCCEEW)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                              |                               |                                                 |                     |                   |              |                  |               |                                          |                                                                   |
| Surface water                 | DCCEEW Water Group and relevant councils                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                              |                               |                                                 |                     |                   |              |                  |               |                                          |                                                                   |
| C27                           | <p>Each Construction Monitoring Program (CMP) must have consideration of SMART principles and provide:</p> <ul style="list-style-type: none"><li>a) details of baseline data available;</li><li>b) details of baseline data to be obtained and when;</li><li>c) details of all monitoring of the project to be undertaken;</li><li>d) the parameters of the project to be monitored;</li><li>e) the frequency of monitoring to be undertaken;</li><li>f) the location and justification of monitoring locations;</li><li>g) the reporting of monitoring results and analysis results against relevant criteria;</li><li>h) details of the methods that will be used to analyse the monitoring data;</li><li>i) procedures to identify and implement additional mitigation measures where the results of the monitoring indicate unacceptable project impacts; and</li><li>j) any consultation to be undertaken in relation to the monitoring programs.</li></ul> | <p>The CMP's were endorsed as an appendix to their respective CEMP sub-plan and satisfy SMART principles:</p> <p>Construction Biodiversity Management Plan - Stage B: Appendix G - Monitoring Program (Doc No: 6-0052-210-PES-00-PJ-0007)</p> <p>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)</p> <p>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)</p> |                              |                               |                                                 |                     |                   |              |                  |               |                                          |                                                                   |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                       |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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).                                                                                                                                                                                                                                                                         | <p>Construction Noise and Vibration Management Plan - Stage A: Appendix A - Construction Noise and Vibration Monitoring Program 6_0052-210-PES-00-PJ-0002</p> <p>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)</p> |
| 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 **01<sup>st</sup> April 2026 to 30<sup>th</sup> June 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 (CNVMP<sub>r</sub>). 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       | 03/09/2025      | South (Site 1 – Site 10)              | -                                               |
| RION         | NL-43 | 00853458      | 25/11/2025       | 25/11/2026      | South (Site 1 – Site 10)              | -                                               |
| RION         | NL-43 | 00730663      | 01/07/2025       | 01/07/2026*     | North (Site 11 – Site 20)             | -                                               |
| RION         | NL-43 | 00853459      | 25/11/2025       | 25/11/2026      | North (Site 11 – Site 20)             | -                                               |
| SiteHive     | -     | HEX-001349    | 09/01/2026       | 09/01/2028      | Wagga Yard Stockpiles                 | 18/03/2026 – ongoing                            |
| SiteHive     | -     | HEX-000238    | 28/04/2025       | 28/04/2027      | South Wagga Public School             | 18/06/2026 - ongoing                            |
| SiteHive     | -     | HEX-001335    | 09/01/2026       | 09/01/2028      | William St Junee Wagga Boarding House | 23/02/2026 – 14/04/2026<br>01/05/2026 – ongoing |
| SiteHive     | -     | HEX-001354    | 26/11/2025       | 26/11/2026      | Kemp St Railway Parade                | 18/002/2026 - Ongoing                           |

| MANUFACTURER | MODEL | SERIAL NUMBER | CALIBRATION DATE | CALIBRATION DUE | LOCATION USED                        | DATE LOCATION MONITORING CEASED |
|--------------|-------|---------------|------------------|-----------------|--------------------------------------|---------------------------------|
| SiteHive     | -     | HEX-000600    | 01/07/2025       | 01/07/2026*     | Swift Street Compound / 530 Young St | 01/01/2026 - Ongoing            |
| Calibrator   | NC-75 | 34556813      | 26/11/2025       | 26/11/2026      | -                                    | -                               |

\*Note calibration for this monitor is schedule in and will not be used until updated calibration is completed

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 CNVMP.

**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: <ul style="list-style-type: none"> <li>&gt;15dB for OOHWP1</li> <li>&gt;5dB OOHWP2</li> </ul> | 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      | Cheshire Street                   | 01/05/2026 – 23/05/2026                            |
| SiteHive     | VIB-000348    | 04/07/2025       | 04/07/2027      | Illabo Silos                      | 02/05/2026 – 05/05/2026                            |
| SiteHive     | VIB-000387    | 04/07/2025       | 04/07/2027      | Railway Street<br>Station Masters | 17/04/2026 – 20/04/2026<br>02/05/2026 – 04/05/2026 |
| SiteHive     | VIB-000047    | 04/07/2025       | 04/07/2027      | Railway Street                    | 02/05/2026 – 04/05/2026                            |
| SiteHive     | VIB-000165    | 26/06/2025       | 26/06/2027      | Scots School                      | 02/05/2026 – 19/05/2026                            |
| SiteHive     | VIB-000512    | 24/02/2026       | 24/02/2028      | Albury Station                    | 01/04/2026 – 08/04/2026                            |

**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 |

| MONITORING PARAMETER                                                                                           | FREQUENCY                                                                              | EVIDENCE OF COMPLIANCE             |
|----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|------------------------------------|
| 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) | <ul style="list-style-type: none"> <li>- Turbidity (NTU);</li> <li>- pH;</li> <li>- Dissolved oxygen (DO%);</li> <li>- Salinity/ Electrical Conductivity (EC);</li> <li>- Temperature (°C).</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                       |
| Laboratory analysis                | <ul style="list-style-type: none"> <li>- Chlorophyll-a;</li> <li>- Nutrients (total phosphorus and total nitrogen);</li> <li>- Total Suspended Solids (TSS);</li> <li>- Total metals (Aluminium, arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel and zinc);</li> <li>- Total Kjeldahl Nitrogen (TKN);</li> <li>- Nitrogen NOx (oxidised nitrogen);</li> <li>- Organic compounds (BTEX, naphthalene, and TRH);</li> <li>- Total Recoverable Hydrocarbons (TRH C6-C9, TRH C10-C36);</li> <li>- Chemical Oxygen Demand (COD);</li> <li>- Biochemical Oxygen Demand (BOD).</li> </ul> |

## 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:

- 📍 **Billy Hughes Bridge:** Shoring works
- 📍 **Cassidy Parade:** Piling activities
- 📍 **Pearson Street:** May 2026 Possession
- 📍 **Edmondson Street/Wagga Wagga Yard:** Piling activities, Oversized Deliveries, May 2026 Possession
- 📍 **Kemp Street/Junee:** Piling activities and May 2026 Possession
- 📍 **Olympic Highway:** Track work and May 2026 Possession
- 📍 **Junee to Illabo (J2I):** Sunday Day and Monday Nights OOHW and May 2026 Possession All

measured noise levels were found to be compliant with the relevant criteria.

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. Monitors were installed throughout the reporting period along the alignment at multiple sites 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.

SiteHive Hexanodes were relocated during the reporting period to align with the active works and monitoring requirements. Monitoring locations included:

- **Site 02-** Swift Street
- **Site 12-** 20 Brookong Avenue
- **Site 13-** South Wagga Wagga Public School
- **Site 17-** Kemps Railway Parade
- **Site 17-** 1 Edgar Street

#### 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:

- **Site 02- Albury Yard:** monitors were placed within the Albury Station.
- **Site 03- Riverina Yard:** monitor was placed to capture track work and temporary drainage works.
- **Site 11- Pearson Street:** monitor was placed near Cheshire Street to capture piling activities.
- **Site 13-14- Wagga Yard/Edmondson Street:** monitor was placed during piling activities throughout April and for the May 2026 Possession and to capture track works.
- **Site 20 Junee to Illabo:** monitor was placed for the May 2026 Possession track works.

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. One isolated vibration spike was recorded at 111 Railway Street (Gatehouse) on 27 April 2026 at approximately 2:30 am. Following review, the event occurred outside construction hours and during a period when no construction activities were being undertaken; therefore, the elevated result was considered as not attributed to construction. 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

##### April

April monitoring identified a number of water quality parameters above the adopted guideline values at both upstream and downstream locations across the sampled sites. The parameters most commonly elevated were Chlorophyll-a, Total Phosphorus, Total Nitrogen and Aluminium.

The results have been considered in the context of baseline monitoring, recent rainfall, surrounding land uses and construction activities, including a review of any recorded erosion and sediment control incidents that may have influenced water quality during the monitoring period.

The pattern of exceedances is generally consistent with the existing condition of these highly modified waterways, as identified in the EIS and acknowledged in the CSWMP. A range of established catchment influences identified in the Project Environmental Assessment Documentation (EAD), including historical and ongoing agricultural activities, urban development and industrial runoff, are likely to contribute to the observed water quality conditions. On this basis, the exceedances are considered more indicative of broader catchment conditions than of a discrete Project-related source.

Rainfall data for the month preceding the monitoring event identified a maximum daily rainfall total of 33.8 mm at Albury on 3 March. At SW01 (Murray River Bridge), no works had been undertaken at this site or within the vicinity of the waterway during the month of April. At SW02 (Billy Hughes Bridge, Albury), construction activities were occurring approximately 70 m south of the monitoring location. The downstream SW02 sampling point is also located downstream of the steel foundry, with runoff from the foundry catchment discharging to Eight Mile Creek between the upstream and downstream monitoring locations. As such, this external catchment source has the potential to influence the downstream SW02 results but would not be expected to affect the upstream monitoring location.

A further review of the SW07 monitoring arrangement at Pearson Street, Wagga Wagga, identified that the upstream and downstream sampling locations had been incorrectly designated in previous monitoring records, with the location previously identified as downstream actually situated upstream, and vice versa. Sampling at SW07 is undertaken within an urban stormwater drain that is typically dry, and this configuration error had not previously been apparent.

The monitoring records will be corrected going forward to reflect the confirmed upstream and downstream locations at SW07. Based on the corrected configuration, interpretation of the results for this quarter does not indicate a water quality issue associated with the Project.

Similar water quality exceedances have been recorded consistently across previous monitoring events, including prior to the commencement of the current construction activities, and no erosion or sediment control incidents were recorded during the monitoring period. Considering the absence of earthworks at SW01, the presence of external catchment influences at SW02, the corrected monitoring configuration at SW07, and the persistent nature of the exceedances, the results are considered unlikely to be attributable to recent Martinus construction activities. Rather, they are more consistent with existing catchment conditions and the range of background influences identified in the Project Environmental Assessment Documentation, including historical and ongoing agricultural activities, urban development and industrial runoff.

##### May

May monitoring identified a number of water quality parameters above the adopted guideline values at both upstream and downstream locations across the sampled sites. The parameters most commonly elevated were Chlorophyll-a, Total Phosphorus, Total Nitrogen and Aluminium.

The results have been considered in the context of baseline monitoring, recent rainfall, surrounding land uses and construction activities, including a review of any recorded erosion and sediment control incidents that may have influenced water quality during the monitoring period.

The pattern of exceedances is generally consistent with the existing condition of these highly modified waterways, as identified in the EIS and acknowledged in the CSWMP. A range of established catchment influences identified in the Project Environmental Assessment Documentation (EAD), including historical and ongoing agricultural activities, urban development and industrial runoff, are likely to contribute to the observed water quality conditions. On this basis, the exceedances are considered more indicative of broader catchment conditions than of a discrete Project-related source.

Rainfall data for the month preceding the monitoring event identified a maximum daily rainfall total of 14.4 mm at Wagga Wagga on 10 April. At SW01 (Murray River Bridge), works during the monitoring period were limited to activities associated with the existing bridge structure, with no earthworks or other ground-disturbing activities undertaken in the vicinity of the waterway. At SW02 (Billy Hughes Bridge, Albury), construction activities were occurring approximately 70 m south of the monitoring location. The downstream SW02 sampling point is also located downstream of the steel foundry, with runoff from the foundry catchment discharging to Eight Mile Creek between the upstream and downstream monitoring locations. This external catchment source therefore has the potential to influence the downstream SW02 results without affecting the upstream monitoring location.

At SW03 (Billabong Creek, Culcairn), an exceedance was also recorded during the May monitoring event. No construction activities have been undertaken at the Culcairn worksite since September 2025, and the monitoring location is approximately 850 m from the construction area. Given the separation distance and the absence of recent construction activity, the exceedance is considered unlikely to be associated with Project activities and is more consistent with existing conditions within the Billabong Creek catchment.

At SW07 (Pearson Street, Wagga Wagga), the corrected upstream and downstream sampling locations have been adopted following the review undertaken during the previous monitoring period. Sampling is undertaken within an urban stormwater drain that is typically dry, and interpretation of the May results has been based on the corrected flow direction and monitoring configuration.

Similar water quality exceedances have been recorded consistently across previous monitoring events, including prior to the commencement of the current construction activities, and no erosion or sediment control incidents were recorded during the monitoring period. Considering the absence of earthworks at SW01, the external catchment influences at SW02, the absence of construction activity at SW03 since September 2025, the corrected monitoring configuration at SW07, and the persistent nature of the exceedances, the May results are considered unlikely to be attributable to recent Martinus construction activities. Rather, they are more consistent with existing catchment conditions and the range of background influences identified in the Project Environmental Assessment Documentation.

## June

June monitoring identified a number of water quality parameters above the adopted guideline values at both upstream and downstream locations across the sampled sites. The parameters most commonly elevated were Chlorophyll-a, Aluminium, Chromium, Copper and Zinc.

The results have been considered in the context of baseline monitoring, recent rainfall, surrounding land uses and construction activities, including a review of any recorded erosion and sediment control incidents that may have influenced water quality during the monitoring period.

The pattern of exceedances is generally consistent with the existing condition of these highly modified waterways, as identified in the EIS and acknowledged in the CSWMP. A range of established catchment influences identified in the Project Environmental Assessment Documentation (EAD), including historical and ongoing agricultural activities, urban development and industrial runoff, are likely to contribute to the observed water quality conditions. On this basis, the exceedances are considered more indicative of broader catchment conditions than of a discrete Project-related source.

Rainfall data for the month preceding the monitoring event identified maximum daily rainfall totals of 29.2 mm at Albury and 14.4 mm at Wagga Wagga on 4 May. At SW01 (Murray River Bridge), no works had been undertaken at this site or within the vicinity of the waterway during the month of June. At SW02 (Billy Hughes Bridge, Albury), construction activities were occurring approximately 70 m south of the monitoring location. The downstream SW02 sampling point is also located downstream of the steel foundry, with runoff from the foundry catchment discharging to Eight Mile Creek between the upstream and downstream monitoring locations. This external catchment source therefore has the potential to influence the downstream SW02 results without affecting the upstream monitoring location.

At SW07 (Pearson Street, Wagga Wagga), the corrected upstream and downstream sampling locations have been adopted following the review undertaken during the previous monitoring period. Sampling is undertaken within an urban stormwater drain that is typically dry, and interpretation of the June results has been based on the corrected flow direction and monitoring configuration.

Similar water quality exceedances have been recorded consistently across previous monitoring events, including prior to the commencement of the current construction activities, and no erosion or sediment control incidents were recorded during the monitoring period. Considering the absence of earthworks at SW01, the presence of external catchment influences at SW02, the corrected monitoring configuration at SW07, and the persistent nature of the exceedances, the June results are considered unlikely to be attributable to recent Martinus construction activities. Rather, they are more consistent with existing catchment conditions and the range of background influences identified in the Project Environmental Assessment Documentation, including historical and ongoing agricultural activities, urban development and industrial runoff.

### 3.2.2 Conclusion

Several monitoring locations were dry or contained only stagnant water during the quarter, limiting the ability to obtain representative surface water samples at those sites.

Comparison with the baseline information presented in the A2I Environmental Impact Statement (EIS), including Chapter 18 – Hydrology, Flooding and Water Quality and Technical Paper 11, indicates that the observed exceedances are generally consistent with previously documented water quality conditions. The EIS identifies a number of waterways within the Murray and Murrumbidgee catchments as ephemeral systems that are subject to low-flow conditions, variable water quality and naturally elevated concentrations of some parameters.

The quarterly results have also been considered in the context of construction activities and surrounding catchment influences. At SW01, works were limited to activities associated with the existing bridge structure, with no earthworks undertaken in the vicinity of the waterway. At SW02, the downstream monitoring location is subject to additional external catchment influence from the steel foundry, with runoff entering Eight Mile Creek between the upstream and downstream sampling locations. At SW03 (Billabong Creek, Culcairn), no construction activities have occurred since September 2025 and the monitoring location is approximately 850 m from the construction area. At SW07, interpretation has been updated to reflect the corrected upstream and downstream monitoring configuration.

Considering these site-specific circumstances, the absence of recorded erosion or sediment control incidents during the quarter, the persistence of similar exceedances across previous monitoring events, and the consistency of the results with baseline conditions documented in the EIS, the observed water quality variations are considered more representative of existing catchment conditions and natural variability than of a discrete Project-related influence.

A summary of the quarterly surface water monitoring results is provided in Tables 8 and 9. Detailed monitoring results and supporting analysis are provided in Appendix C.

TABLE 8: SURFACE WATER SITES WHICH WERE NOT SAMPLED

| MONITORING EVENT | SITES NOT SAMPLED                  | REASON              |
|------------------|------------------------------------|---------------------|
| April            | SW02, SW04, SW05, SW06, SW08, SW09 | All dry or stagnant |
| May              | SW04, SW05, SW06, SW08, SW09       | All dry or stagnant |
| June             | SW04, SW05, SW06, SW08, SW09       | All dry or stagnant |

TABLE 9: SURFACE WATER QUALITY EXCEEDANCE SUMMARY

| MONITORING EVENT | SITE      | PARAMETERS EXCEEDED                         | DOWNSTREAM > UPSTREAM (>20%) |
|------------------|-----------|---------------------------------------------|------------------------------|
| April            | SW01 - US | Total Phosphorus, Total Nitrogen,           | -                            |
|                  | SW01 - DS | Total Phosphorus, Total Nitrogen, Aluminium | Chlorophyll-a, Aluminium     |

| MONITORING EVENT | SITE      | PARAMETERS EXCEEDED                                                      | DOWNSTREAM > UPSTREAM (>20%)                                                                                                                                                |
|------------------|-----------|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | SW03 - US | Aluminium                                                                | -                                                                                                                                                                           |
|                  | SW03 - DS | Aluminium                                                                | -                                                                                                                                                                           |
|                  | SW07 - US | Chlorophyll-a, Total Phosphorus, Total Nitrogen, Aluminium, Zinc         | -                                                                                                                                                                           |
|                  | SW07 - DS | Chlorophyll-a, Total Phosphorus, Total Nitrogen, Aluminium               | -                                                                                                                                                                           |
| May              | SW01 - US | Total Phosphorus, Total Nitrogen, Aluminium                              | -                                                                                                                                                                           |
|                  | SW01 - DS | Total Phosphorus, Total Nitrogen, Aluminium                              | -                                                                                                                                                                           |
|                  | SW02 - US | Chlorophyll-a, Aluminium, Chromium, Copper, Lead, Zinc                   | -                                                                                                                                                                           |
|                  | SW02 - DS | Chlorophyll-a, Total Phosphorus, Aluminium, Chromium, Copper, Lead, Zinc | Total Nitrogen, Arsenic, Copper, Zinc, Nitrite + Nitrate as N, Biological Oxygen Demand                                                                                     |
|                  | SW03 - US | Aluminium, Copper, Zinc,                                                 | -                                                                                                                                                                           |
|                  | SW03 - DS | Aluminium, Zinc                                                          | Chlorophyll-a, Total Phosphorus, Total Nitrogen, Total Suspended Solids (TSS), Aluminium, Arsenic, Iron, Manganese, Total Kjeldahl Nitrogen (TKN), Biological Oxygen Demand |
|                  | SW07 - US | Total Phosphorus, Aluminium, Mercury, Zinc,                              | -                                                                                                                                                                           |
|                  | SW07 - DS | Total Phosphorus, Aluminium, Mercury, Zinc                               | -                                                                                                                                                                           |
| June             | SW01 - US | Chlorophyll-a, Total Phosphorus, Aluminium                               | -                                                                                                                                                                           |
|                  | SW01 - DS | Chlorophyll-a, Total Phosphorus, Total Nitrogen, Aluminium               | -                                                                                                                                                                           |
|                  | SW02 - US | Chlorophyll-a, Aluminium, Chromium, Copper, Lead, Zinc                   | -                                                                                                                                                                           |
|                  | SW02 - DS | Chlorophyll-a, Aluminium, Chromium, Copper, Iron, Lead, Zinc             | Aluminium, Iron Nickel, Zinc                                                                                                                                                |
|                  | SW03 - US | Chlorophyll-a, Aluminium                                                 | -                                                                                                                                                                           |
|                  | SW03 - DS | Chlorophyll-a, Total Phosphorus, Aluminium                               | Total Suspended Solids (TSS), Aluminium, Biological Oxygen Demand                                                                                                           |
|                  | SW07 - US | Chlorophyll-a, Aluminium, Chromium, Copper, Zinc                         | Total Nitrogen, Arsenic, Lead, Total Kjeldahl Nitrogen (TKN), Biological Oxygen Demand                                                                                      |

| MONITORING EVENT | SITE      | PARAMETERS EXCEEDED                              | DOWNSTREAM > UPSTREAM (>20%) |
|------------------|-----------|--------------------------------------------------|------------------------------|
|                  | SW07 - DS | Chlorophyll-a, Aluminium, Chromium, Copper, Zinc |                              |

### 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 April to June reporting period, wet weather sampling was undertaken concurrently with the May monthly monitoring event. On 4<sup>th</sup> May 2026, 29 mm of rainfall was recorded in both Albury and Wagga Wagga, triggering the wet weather sampling requirements. Accordingly, the wet weather sampling results are included within the May monitoring data.

## 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.

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 10: CLEARING EVENTS**

| SITE                | DESCRIPTION                                                                                                                 |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Junee to Illabo     | Ongoing minor vegetation impacts resulting from shoulder reconditioning                                                     |
| Cassidy Footbridge  | Minor trimming of vegetation and trees within the rail corridor to enable construction of the temporary footbridge pathways |
| Pearson Street      | Minor vegetation impact for Pearson Street compound establishment and future piling works.                                  |
| Henty               | Grubbing works and vegetation disturbance at Henty Yard for signalling scope and initial site establishment.                |
| Olympic Highway     | Ongoing minor vegetation impacts resulting from shoulder reconditioning                                                     |
| Wagga Wagga Yard    | Minor removal of trees for shoulder widening                                                                                |
| Billy Hughes Bridge | Vegetation impact linked to North-East and South-West batter works                                                          |

### 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 A21.

Based on the total area cleared to date, sufficient approved vegetation remains available to facilitate the remaining construction activities. Future vegetation clearing requirements will be determined as construction progresses. No additional vegetation clearing approvals are anticipated to be required at this stage of the Project.

All clearing was supervised by a suitably qualified ecologist.

TABLE 11: 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                                | 0.21                               | 0.3867                  |
| 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                                 | 2.424728                           | 10.39527                |
| Miscellaneous Ecosystems – 'Ornamental Plantings'                                                                                                                                                  | N/A                                 | 0.0514                             | 0.607338                |

### 3.3.3 Threatened Species Habitat Impacts

All habitat impacts recorded to date have occurred within the approved impact limits specified under CoA E20. Future habitat disturbance will be undertaken in accordance with the approved construction footprint and environmental approvals. The final extent of habitat disturbance will depend on the construction program and cannot be confirmed at this stage. Impacts to plant community types and threatened species habitat has not exceeded the impacts specified in CoA E20. No threatened species were identified during the reported period.

TABLE 12: THREATENED FAUNA SPECIES HABITAT IMPACTS

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

|                                                  |      |        |    |     |
|--------------------------------------------------|------|--------|----|-----|
| Squirrel Glider ( <i>Petaurus norfolcensis</i> ) | 1.82 | 0.4643 | No | Yes |
| Superb Parrot ( <i>Polytelis swainsonii</i> )    | 1.82 | 0.4643 | 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 13: WEATHER STATION SUMMARY**

| WEATHER STATION | SITE CAPTURED                                                                                                                                                                                                                                                                                                                                      |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Albury          | <ul style="list-style-type: none"> <li>- Murray River bridge</li> <li>- Albury Yard</li> <li>- Riverina Highway</li> <li>- Billy Hughes Bridge</li> <li>- Tabletop Yard</li> </ul>                                                                                                                                                                 |
| Lockhart        | <ul style="list-style-type: none"> <li>- Culcairn Yard</li> <li>- Henty Yard</li> <li>- Yerong Creek Yard</li> <li>- The Rock Yard</li> </ul>                                                                                                                                                                                                      |
| Wagga Wagga     | <ul style="list-style-type: none"> <li>- Uranquinty Yard</li> <li>- Pearson St bridge</li> <li>- Cassidy Footbridge</li> <li>- Edmondson St Bridge</li> <li>- Wagga Wagga Station</li> <li>- Bomen Yard</li> <li>- Harefield Yard</li> <li>- Kemp St Bridge</li> <li>- Junee Yard</li> <li>- Olympic Highway</li> <li>- Junee to Illabo</li> </ul> |

## 3.5 Water Discharge

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



# APPENDICES

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# APPENDIX A

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## Attended Noise Monitoring Summary

Table 18: 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 | LAmix dB | Determined Construction Noise Contribution (LAeq,15min) dB | Determined Construction Noise Contribution (LAmix) dB | Compliant (Y/N) | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------|------------|----------------|--------------------------------|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----|----------------------------------------------------|-------------------|----------|------------------------------------------------------------|-------------------------------------------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 01/04/2026 | 08:25      | 15 min         | 2 Kildare St, Turvey Park      | Cassidy Footbridge Piling                     | Piling and earthworks                                                                                                                                                                                                                             | Standard | 58  | 81                                                 | 66.3              | 91.4     | 66                                                         | 84.1                                                  | Y               | Monitoring during Peak piling activities at Cassidy Parade Footbridge during standard hours. 1x30T Excavator, 1x 110T Piling Rig. LVs were observed operating during the monitoring. Construction noise was audible throughout measurement. Local traffic was present throughout measurement.12:07-69.7- Passing Truck on Public Road 12:16: 84.1- Rotating Rig                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 06/04/2026 | 12:12      | 15 min         | 19 Sanctuary Ln, Ettamogah     | Shoring of excavations for drainage works     | Lay drainage pipe. Excavate and backfill. Tipper carting 20mm screenings and stockpile for backfill. Preparation of SW batter for second layer of soil nails. 2 x 13t Excavators and Tipper Truck operating at time of attended noise monitoring. | Standard | 42  | 53                                                 | 52.8              | 66.5     | <36                                                        | N/A                                                   | Y               | No construction noise was audible throughout 15 minute attended noise monitoring. Conservative estimate of construction noise contribution is <LA90 (45.9 dB). Martinus construction activities did not dominate noise measurements. Between 11:30 and 12:30 highway noise and Wagga Road dominated measurements with consistent dB greater than 49. Did not hear any plant from Billy Hughes construction activities. Highest noise measurement was 66.5 dB - V8 Landcruiser towing caravan on Wagga Road. Noise levels caused by Highway and Wagga Rd potentially impacted by wet roads due to showers earlier in morning.                                                                                                                                                                                                                                                                                                                 |
| 14/04/2026 | 08:27      | 15 min         | 1 Edgar St, Junee              | Kemp St Bridge demolition                     | Monitoring demolition of brick face on abutment A                                                                                                                                                                                                 | Standard | 52  | 87                                                 | 82.1              | 94.4     | 82.1                                                       | 83                                                    | Y               | Monitoring demolition of brick face on abutment A approximately 13m from residence at 1 Edgar and noise monitor. 1 x water cart supplying water to mist cannon, 20T excavator + hammer, generator, LVs. Hammering was relatively continuous throughout 15 minute measurement, stopped for a bit over a minute around 9:50 and 13:45. Construction noise dominated the measurement. Measured LAeq and LAmix are considered representative of construction noise contribution. Due to the high impact level of the works, subcontractor was reminded of requirement to follow maximum 3 hours continuous work with 1 hour respite.                                                                                                                                                                                                                                                                                                             |
| 17/04/2026 | 22:19      | 15 min         | 2 Donnelly Ave, Wagga Wagga    | Edmondson Street Bridge- Oversized Deliveries | Oversized Deliveries                                                                                                                                                                                                                              | Night    | 42  | 65                                                 | 59.3              | 79.9     | 59                                                         | 61.6                                                  | Y               | Monitoring during Peak Oversized Deliveries to Edmondson Street Bridge site during Out of Hours. 1x Flatbed Semi Trailer truck, 1x Crawler Crane, 1xLV were observed operating during the monitoring. Construction noise was audible and consistent throughout measurement. Local traffic and noise from passing train was present throughout measurement. . 10:24-61.6-Noise from Crawler crane 12:24: 77.9-Noise from train                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 26/04/2026 | 16:19      | 15 min         | 731 Ballengoarrah Ln, Wantiool | J21 OOHW - 477.000 Drainage work              | removal of material and track shoulder work                                                                                                                                                                                                       | Day OOH  | 46  | 60                                                 | 62.7              | 80       | 58                                                         | 59                                                    | Y               | Sunday day OOHW, monitoring drainage work at the 477.000 bridge including removal of contaminated material and track shoulder work. 1xNDD truck, 1x plate compactor, 2xHirail excavator, 1x light truck, 10T excavator, 3xLVs. Traffic on Olympic Highway was audible in the background and contributed the LAmix, although construction noise dominated the measurement. The monitoring location was approximately 15 m from the work area and approximately 215 m from the nearest residential receiver. A distance correction of approximately 23 dB was calculated and applied to estimate noise levels at the residential receiver. Based on the determined construction noise contribution at the monitoring location, the estimated construction noise level at the receiver was approximately 35 dB(A) LAeq,15min and 36 dB(A) LAmix. This is below the predicted construction noise level of 60 dB(A) and below the applicable NML. |
| 26/04/2026 | 17:21      | 15 min         | 96 Main St, Junee              | OOHW Olympic Hwy - Compound Operation         | material transport from Olympic Highway stockpile area                                                                                                                                                                                            | Day OOH  | 47  | 67                                                 | 59.8              | 75.2     | 57.1                                                       | 59                                                    | Y               | Sunday day OOHW material transport from Olympic Highway stockpile area. 1x FEL, 1xExcavator, 2xLVs, 4xhiral hydremas present. Monitor was 30m from work area and 15m from receiver. FEL loads all hydremas then they move together up the rail. Local traffic and background noise was present throughout measurement. No construction noise audible from 6:00 - 12:30. LAeq was compliant with predicted level. Based on notes, construction noise contribution is estimated to be 57.1dB.                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 27/04/2026 | 17:49      | 15 min         | 21 Illabo Rd, Junee            | OOHW Olympic Hwy - Material transport         | material transport from Olympic Highway stockpile area                                                                                                                                                                                            | Day OOH  | 47  | 69                                                 | 68.2              | 86.1     | 68                                                         | 70                                                    | Y               | Monitoring during material transport at Olympic Highway site on public holiday (day OOHW), 1xExcavator, 1xLV, 2xHydrema. Construction noise during ballast transport and drops dominated the measurement. Local traffic on Olympic Highway and background noise were also audible. LAeq compliant with predicted noise level and based on observations, reading is considered representative of construction noise contribution.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 30/04/2026 | 11:10      | 15 min         | 1 Pretoria Ave, Junee          | Kemp St - Bridge Works Piling                 | Bridge Work Peak piling activities                                                                                                                                                                                                                | Standard | 52  | 80                                                 | 60.1              | 74.5     | 57.1                                                       | 63.8                                                  | Y               | Monitoring during Bridge Work Peak piling activities at Kemp Street during standard hours. 1x concrete agitator, hand tools (hydraulic), 3x LVs, NDD truck, EWP, crane, piling rig, concrete pump truck. Construction noise was audible throughout measurement. Hand tools used intermittently. Concrete agitator and NDD operational for majority of measurement. Local traffic and community noise (leaf blower) also present throughout measurement. Construction noise and non-construction noise contributed equally to the readings. Based on observations, construction noise contribution LAeq is estimated to be 57.1dB. 05:18 mins: NDD truck entering site (63.8dB) - construction LAmix. 12:00 mins: Leaf blower 15m from monitor at Endeavour Park (71.7dB)                                                                                                                                                                     |
| 30/04/2026 | 11:48      | 15 min         | 1 Pretoria Ave, Junee          | Kemp St - Bridge Works Piling                 | Bridge Work Peak piling activities                                                                                                                                                                                                                | Standard | 52  | 80                                                 | 59.8              | 74       | 57.1                                                       | 71.6                                                  | Y               | Monitoring during Bridge Work Peak piling activities at Kemp Street during standard hours. 1x concrete agitator, hand tools (hydraulic), 3x LVs, NDD truck, EWP, crane, piling rig, concrete pump truck. Construction noise was audible throughout measurement. Train idling audible constantly throughout measurement. Hand tools used intermittently. Concrete agitator and NDD operational for majority of measurement. Local traffic and community noise (schoolchildren's voices) also present throughout measurement. Construction noise and non-construction noise contributed equally to the readings. Based on observations, construction noise contribution LAeq is estimated to be 57.1dB. Measurement is compliant with predicted level. 03:55mins - Truck passing (71.6dB) - non-construction noise.                                                                                                                            |
| 02/05/2026 | 03:44      | 15 min         | 731 Ballengoarrah Ln, Wantiool | May Possession 2026                           | 477.000 Bridge Rail Unclipping                                                                                                                                                                                                                    | Night    | 42  | 60                                                 | 48.5              | 66.3     | 48                                                         | 55                                                    | Y               | 1xHirail excavator, 2x crew trucks, 5x LV's, hand tools. The work area was approximately 100 m from the monitor, with the nearest receiver approximately 500 m from the monitoring location. A conservative distance correction was calculated and applied to estimate construction noise levels at the receiver. The calculated correction was approximately 14 dB. Based on the determined construction noise contribution at the monitor, the estimated receiver level was approximately 34 dB(A) LAeq and 41 dB(A) LAmix, which is below the predicted noise levels for the conducted activity. 04:25 - 05:35 mins: period of no construction works, measurement of LAeq 39.1dB observed.                                                                                                                                                                                                                                                |
| 02/05/2026 | 04:50      | 15 min         | 60 Main St, Junee              | May Possession 2026                           | Rail declipping and cutting                                                                                                                                                                                                                       | Night    | 40  | 76                                                 | 64.7              | 81.4     | 64.7                                                       | 80                                                    | Y               | 1xlight tower, hand tools, 1x rail saw. Work area 40m from monitor and monitor 15m from receiver. When rail cutting occurred it was dominant. Once unclipping started it was constant.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 02/05/2026 | 09:17      | 15 min         | 88 Peacock Drive, Turvey Park  | May Possession 2026                           | Piling works                                                                                                                                                                                                                                      | Standard | 50  | 76                                                 | 52.5              | 73.3     | 49.5                                                       | 73.3                                                  | Y               | Monitoring during May 2026 Possession Peak piling activities at Pearson Street during standard hours. 1x Rubber Duck, 1x20T Excavator, 1xWatercart, 1x Piling Rig were observed operating during the monitoring. Construction noise was audible throughout measurement. Rubber Duck and Excavator were operational majority of measurement. Local traffic, wildlife noise (birds) and community noise (resident at 10 Peacock Drive) also present throughout measurement. Construction noise and non-construction noise contributed equally to the readings. Based on observations and two equal construction and non-construction contributions, construction noise contribution was estimated to be 49.5 dB(A) LAeq and 73.3 LAmix. Measurement is compliant with predicted level. 06:27-62.7-Motorcycle passing - non-construction noise.                                                                                                 |
| 02/05/2026 | 09:52      | 15 min         | 11 Erin St, Turvey Park        | May Possession 2026                           | Piling works                                                                                                                                                                                                                                      | Standard | 42  | 79                                                 | 57.7              | 72.8     | 56                                                         | 72                                                    | Y               | Monitoring during May 2026 Possession Peak piling activities and material movement at Edmondson Street Bridge work site during standard hours. 1x Truck (tipper), 1x20T Excavator, 1x Watercart, 1x Piling Rig, 1x Crawler Crane were observed operating during the monitoring. Construction noise was audible throughout measurement. Piling Rig and Excavator were operational for majority of measurement. It was noted that overall noise results were influenced by moderate traffic on Erin Street. Construction noise and non-construction noise contributed equally to the readings. 09:53:72.0-10-wheeler truck leaving site-construction noise 09:58: 69.1- Vehicle passing the monitoring location- non-construction noise                                                                                                                                                                                                        |
| 02/05/2026 | 10:22      | 15 min         | 731 Ballengoarrah Ln, Wantiool | May Possession 2026                           | 477.000 Drainage work                                                                                                                                                                                                                             | Standard | 51  | 60                                                 | 76.2              | 86.8     | 58.5                                                       | 83                                                    | Y               | Monitoring hammering out of concrete pier at the 477.000 culvert (drainage works). 1x crane, 1x watercart, 1x excavator + garner, 3xLV, 1xHirail excavator (inactive), 1x flatbed truck at work area. The work area is 30m from monitor and the receiver is an additional 200m away. Sound level at receiver was calculated to be approximately 58.5dB based on distance from work area. Therefore, reading is compliant with predicted level. 83dB concrete hammering LAmix observed.                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 02/05/2026 | 10:37      | 15 min         | 2 Donnelly Ave, Wagga Wagga    | May Possession 2026                           | Piling works                                                                                                                                                                                                                                      | Standard | 42  | 79                                                 | 66.4              | 84.4     | 58                                                         | 60                                                    | Y               | Monitoring during May 2026 Possession Peak piling activities at Edmondson Street Bridge during standard construction hours. 1x Piling Rig, 1x 20T Excavator, 1x Watercart, 1xCrawler Crane were observed operating during the monitoring. Construction noise was audible throughout measurement. Piling Rig and Excavator were operational for majority of measurement. It was noted that non-construction noise (Tree mulching machine, saw, leaf blower) at Wagga Boarding House was as dominant as construction noise at the time when monitoring was conducted. Based on observations and two equal construction and non-construction contributions, construction noise contribution was estimated to be 55 dB(A) LAeq and 60dB(A) LAmix. Measurement is compliant with predicted level. 10:49:75.5-Tree Mulcher- non-construction noise.                                                                                                |
| 02/05/2026 | 14:29      | 15 min         | 60 Main St, Junee              | May Possession 2026                           | Track Work                                                                                                                                                                                                                                        | Standard | 52  | 75                                                 | 64.8              | 91.4     | 63                                                         | 84.3                                                  | Y               | Monitoring track work on underbridge abutments during possession works at Olympic Highway. 2x hi rail excavators digging out approaches to under bridge on north and south, hydremas carting out material (2 on north, 1 on south). LVs. Hydremas tracking to and from stockpile areas and excavation areas. Local traffic was on Main St was present throughout reading. Pauses in excavation on South approach for survey pick up - 2:20-4:00, 6:15-7:25, and 12:30-13:55. Loading Hydrema: LAmix 84.3dB at 4:50. Local car drove past monitor on Main St at 7:55 LAF 91.4dB. Construction noise contribution LAeq estimated to be 63dB based on notes.                                                                                                                                                                                                                                                                                    |
| 02/05/2026 | 15:18      | 15 min         | 587 Abercorn St, South Albury  | May Possession 2026                           | Static Cord Installation, Mesh Layout                                                                                                                                                                                                             | Standard | 55  | 62                                                 | 52.6              | 68.7     | 52.6                                                       | 54.7                                                  | Y               | Birds and Highway noise louder than construction, Highway traffic present approximately 75% of the reading at similar levels to construction. Estimated construction contribution 52.6dB, Estimated construction LAmix 54.7dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 02/05/2026 | 15:46      | 15 min         | 14 Station Place, Wagga Wagga  | May Possession 2026                           | Trackworks                                                                                                                                                                                                                                        | Standard | 53  | 81                                                 | 51                | 67.3     | 50                                                         | 52                                                    | Y               | Monitoring during May 2026Possession Track works at Wagga Yard during standard hours. 1x Hydrema, 1xRubber Duck were observed operating during the monitoring. Construction noise was audible throughout measurement. Rubber Duck and Hydrema were transporting and unloading ballast on railways for majority of measurement. Local traffic, wildlife noise (birds) was also present throughout measurement. Construction noise and non-construction noise contributed equally to the readings. Measurement is compliant with predicted level. 15:48:62.2-Noise from wildlife (birds)- non-construction noise                                                                                                                                                                                                                                                                                                                               |
| 02/05/2026 | 20:57      | 15 min         | 371 Wilson St, East Albury     | May Possession 2026                           | Compound operation and track work                                                                                                                                                                                                                 | Evening  | 45  | 52                                                 | 48.1              | 60.7     | >48.1                                                      | N/A                                                   | Y               | Hume Highway and local traffic dominated the noise source throughout the reading. Martinus works were not audible. It is therefore confirmed that MR noise profile fell below the construction RBL of LAeq <36dB, for the location. Save file: 0023 Martinus works 10dB below RBL; at least 10dB below measured LAeq                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 02/05/2026 | 21:31      | 15 min         | 19 Sanctuary Ln, Ettamogah     | May Possession 2026                           | Compound operation, earthworks and track work                                                                                                                                                                                                     | Evening  | 42  | 55                                                 | 50.5              | 66.2     | 42                                                         | 43                                                    | Y               | Hume Highway Traffic dominant and louder than construction activities when present. Estimated construction contribution 42dB. Estimated construction LAmix 43dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 02/05/2026 | 21:32      | 15 min         | 46 Main St, Junee              | May Possession 2026                           | Excavation of abutment                                                                                                                                                                                                                            | Evening  | 40  | 76                                                 | 56.8              | 81.6     | 56.8                                                       | 80                                                    | Y               | Work area 40m from monitor and monitor 15m from receiver. 4x hydremas and 3x excavators (20T). Excavator noise was audible throughout (low noise from engine humming was constant as well as occasional tracking movement and bucket clanging). Hydrema noise was audible throughout (low noise from engine humming was constant, as well as occasional tracking movement, material being dropped into bucket, non-tonal reverse alarm and hydraulic noise from dump bucket raising)                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 02/05/2026 | 23:05      | 15 min         | 32 George St, Junee            | May Possession 2026                           | Track work                                                                                                                                                                                                                                        | Night    | 40  | 80                                                 | 45.8              | 68.8     | >45                                                        | 50                                                    | Y               | Community complaint received at 21:50, with noise monitoring commencing at 23:05 at approximately 5 m from the receiver at 32 George Street. Minimal construction noise was faintly audible during the measurement. The predominant noise sources were local traffic, constant cricket/insect noise and intermittent dog barking. An LAmix of 68.8 dB(A) was observed when a car passed along George Street at 23:11, close to the noise monitor. Based on attended observations, construction noise was not dominant and the construction noise contribution was considered to be below the measured LAeq                                                                                                                                                                                                                                                                                                                                   |

| Date       | Time (Hrs) | Duration (Min) | Location                       | Construction Activities                       | Audible Construction Activities                  | Period   | NML | Predicted construction Noise Level (LAeq,15min) dB | LAeq 15 minute dB | LAmaz dB | Determined Construction Noise Contribution (LAeq,15min) dB | Determined Construction Noise Contribution (LAmaz) dB | Compliant (Y/N) | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------|------------|----------------|--------------------------------|-----------------------------------------------|--------------------------------------------------|----------|-----|----------------------------------------------------|-------------------|----------|------------------------------------------------------------|-------------------------------------------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 03/05/2026 | 01:45      | 15 min         | 11 Railway Pde, Junee          | May Possession 2026                           | Piling and Excavation                            | Night    | 40  | 73                                                 | 63.1              | 82.9     | 63.1                                                       | 82                                                    | Y               | Construction noise was predominant noise source and was near constant. Excavator was intermittent (bucket banging), jack hammering was near constant, piling was intermittent and noise from plant idling/engines running was low and constant. 1x Piling rig, 1x 15t excavator, 2x jack hammer. As construction noise dominated the measurement, the measured LAeq of 63.1 dB(A) and LAmaz of 82 dB(A) are considered representative of the construction noise contribution. The monitoring location was approximately 10 m from the receiver and approximately 70 m from the closest construction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 03/05/2026 | 06:26      | 15 min         | 20 Plantation Lane, Ettamogah  | Earthworks, Machine Prestarts                 | Earthworks, Machine Prestarts                    | Night    | 42  | 49                                                 | 57.1              | 77.3     | 32.8                                                       | 42                                                    | Y               | Highway traffic present 80% of the measurement, Construction inaudible when highway traffic present. Construction noise dominant reading 32.8dB. Estimated construction contribution 32.8dB, Estimated construction LAmaz 42dB.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 03/05/2026 | 07:14      | 15 min         | 530 Young Street, Albury       | Compound Operations                           | Compound Operations                              | Day OOH  | 41  | 70                                                 | 64.5              | 83.3     | 51                                                         | 52                                                    | Y               | Birds and Traffic noise dominant and present throughout approximately 80% of the measurement. Hand tools dominant 50m from monitor, 40m from receiver 51dB. Estimated construction contribution 51dB, Estimated construction LAmaz 52.0dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 03/05/2026 | 08:28      | 15 min         | 2 Donnelly Ave, Wagga Wagga    | May Possession 2026                           | Piling Activities                                | Day OOH  | 42  | 76                                                 | 63.7              | 87.9     | 62                                                         | 84.2                                                  | Y               | Monitoring during May 2026 Possession Peak piling activities at Edmondson Street Bridge during OOH Weekend hours. 1x Piling Rig, 1x 20TExcavator, 1x Crawler Crane were observed operating during the monitoring. Construction noise was audible and dominant throughout the measurement. Background noise included car passing the monitoring location and noise from wildlife. Piling Rig was operational for majority of measurement. Noise from construction activity was dominant at monitoring location. Measurement is compliant with predicted level. 08:38: 84.2- Noise from Piling Rig shaking off the material-construction noise.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 03/05/2026 | 09:32      | 15 min         | 36 Turland St, Illabo          | May Possession 2026                           | Track Tamping                                    | Day OOH  | 46  | 69                                                 | 69.6              | 83.8     | 68                                                         | 81.4                                                  | Y               | 1 x Regulator, 1 x hi rail water cart, LVs, 1 x light truck (tools). Regulator working on up main with hi-rail water cart in front for dust suppression. Regulator passed monitor/receiver moving south towards Illabo level crossing, reversed back passed the monitor north, and then once again worked passed monitor. Traffic on highway was present throughout measurement and dominated the reading when the tamper was not operating in proximity to the monitor. Reading would reach 70-80dB with passing of traffic on highway. Based on observations construction noise contribution LAeq estimated to be approximately 68dB. Reading compliant with predicted level. 4:38 - Noise reading from regulator passing 75dB 9:01 - Noise reading from regulator passing 81.4dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 03/05/2026 | 09:59      | 15 min         | 88 Peacock Drive, Turvey Park  | May Possession 2026                           | Piling Activities                                | Day OOH  | 50  | 76                                                 | 55.3              | 72.1     | 55                                                         | 67                                                    | Y               | Monitoring during May 2026Possession Peak piling activities at Pearson Street during OOH Weekend hours. 1x Hydrema, 2x Excavator, 1xWatercart, 1x Piling Rig, 1x Agi were observed operating during the monitoring. Construction noise was audible and dominant throughout measurement. Wildlife noise (birds)and wind noise was also present throughout the measurement. Measurement is compliant with predicted level. 10:05:58.0-Truck with trailer on Urana street- construction noise.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 03/05/2026 | 12:27      | 15 min         | 52 Railway Street, Turvey Park | May Possession 2026                           | Trackworks                                       | Day OOH  | 53  | 75                                                 | 64.3              | 78.8     | 63                                                         | 76                                                    | Y               | Monitoring during May 2026Possession works at Wagga Yard during standard hours. 1x hand tools, 1x Truck (tipper), 1x Hi-rail excavator, 1x Rubber Duck with tamping head, 1x8T Excavator were observed operating during the monitoring. Construction noise was audible and dominant throughout the measurement. Operating plants were delivering materials and cutting the rail tracks. Local traffic on Railway Street, and noise from resident's activity was also present throughout measurement. Construction noise and non-construction noise contributed equally to the readings. Measurement is compliant with predicted level. 12:39:71.7- Traffic on Railway Street- non-construction noise.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 03/05/2026 | 15:04      | 15 min         | 1-5 Hill St, Junee             | May Possession 2026                           | Bridge works                                     | Day OOH  | 47  | 78                                                 | 61                | 79       | 61                                                         | 78                                                    | Y               | Pier 1 - piling rig, crane, concrete agitator, generator, excavator, NDD truck, polymer tank, hand tools. Pier 2 - Excavator, jackhammers, light truck, LVs. Pier 1 work area for pile was approximately 16-40m away and excavator 80m away from monitor. Pier 2 work area was approximately 70m away from monitor. Receiver was 20m from monitor. Construction noise dominated the measurement, therefore, measured LAeq considered representative of construction noise contribution. Reading compliant with predicted noise level. Pressure washer 64.3dB at 11:46 Pile cage shaking 68dB at 12:58 Pile tracking 75dB at 14:50 (closest to monitor)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 04/05/2026 | 09:03      | 15 min         | 5 Erin Street, Turvey Park     | Attended Noise Monitoring                     | Piling Activities                                | Standard | 42  | 70                                                 | 59.9              | 86.1     | 58                                                         | 64.3                                                  | Y               | Monitoring during May 2026Possession Peak piling activities and material movement at Edmondson Street Bridge work site during standard hours. 1x Excavator, 1x Piling Rig, 1x Crawler Crane were observed operating during the monitoring. Construction noise was audible throughout measurement. Piling Rig and Excavator were operational for majority of measurement. It was noted that overall noise results were influenced by traffic on Erin Street. Construction noise and non-construction noise contributed equally to the readings. Measurement is compliant with predicted level. 09:06:64.3-Piling Rig shaking off the material- construction noise 09:10:82.2- Traffic on Erin Street- non-construction noise                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 04/05/2026 | 21:20      | 15 min         | 1 Marquis Street, Junee        | May Possession 2026                           | Rail reclipping                                  | Evening  | 47  | 70                                                 | 58                | 80.2     | 58                                                         | 78                                                    | Y               | 1x excavator, 1x lighting tower, 1x Hydrema, hand tools. Noise monitor was set up approximately 10m from receiver (1 Marquis Street) and 100m from construction area. Predominant noise sources were: -Constant plant low humming noise (possibly from light tower) -Declogging noise from hand tools (occasional and not very loud) -Workers voices (occasional and not very loud) Non-construction related noise sources included local traffic (responsible for LAmaz reading at 07:50mins) and dogs barking.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 04/05/2026 | 23:01      | 15 min         | 19 Sanctuary Ln, Ettamogah     | May Possession 2026                           | Compound operation, earthworks and track work    | Night    | 42  | 52                                                 | 49                | 68       | 42                                                         | 55                                                    | Y               | Hume Highway dominated noise profile. MR construction contribution estimated at LAeq,15min 42dB. Very brief shower passed for approximately 2 minutes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 05/05/2026 | 02:43      | 15 min         | 19 Sanctuary Ln, Ettamogah     | May Possession 2026                           | Compound operation, track tamping and track work | Night    | 42  | 52                                                 | 48.7              | 63.5     | 43                                                         | 44                                                    | Y               | MR works occasionally audible at 44dB. Hume Highway dominated the noise source                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 05/05/2026 | 08:42      |                | 62 Main St, Junee              | May Possession 2026                           | Tamping                                          | Standard | 52  | 74                                                 | 76.6              | 85.3     | 73                                                         | 85                                                    | Y               | Monitoring during tamping of approaches to underbridge (approximately 30m either side of underbridge). 0:00 Tamper started on DN main approximately 70m from the monitor moving south towards underbridge. The monitor was 15m from the receiver. At 3:33 the tamper was the closest point to the monitor (30m away) and the reading reached a maximum of 85dB. At 7:56 the tamper stopped tamping and non-construction noise dominated the measurement. Local traffic including large buses were passing on Main st and the underbridge throughout reading, with noise levels reaching up to 72 dB when passing once tamping stopped. Non-project construction noise on corner of Marquis St and Illabo Rd was also audible once tamping stopped. Based on observations, construction noise contribution LAeq estimated to be approximately 73dB. Measurement compliant with predicted level.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 05/05/2026 | 10:00      | 15 min         | 19 Sanctuary Ln, Ettamogah     | May Possession 2026                           | Ballast Tamping, Dust Suppression and Trackwork  | Standard | 47  | 52                                                 | 35.2              | 58.2     | 35.2                                                       | 58.2                                                  | Y               | Tamper operating dominant noise source approximately 150m from monitor and 130m receiver (280m in total) receiver noise will be less than calculated, however calculated levels are acceptable - 36.2dB. Birds and Traffic dominant and louder than construction activities when present 70% of the time. estimated construction contribution 35.2dB, Estimated construction LAmaz 58.2dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 30/05/2026 | 08:07      | 15 min         | 62 Railway Street, Turvey Park | Saturday Works- Vac-truck                     | Vac-truck                                        | Standard | 58  | 67                                                 | 66.3              | 82.1     | 63.1                                                       | 66                                                    | Y               | Background noise included wildlife (birds) and traffic on Railway Street. Attended monitoring demonstrated that construction noise was audible and present with consistent and audible noise from wildlife (birds) and traffic on Railway Street. It was noted that construction contribution level was 63.1 dB, while predicted noise level for 62 Railway Street was 67 dB. Note: 08:15- Measurement stopped due to resident from 62 Railway street started chatting to Martinus personnel. 08:16- Monitoring resumed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 31/05/2026 | 15:06      | 15 min         | 7 Tooheys Ln, Illabo           | J21 Sunday & Monday Nights Track Work         | Trackwork                                        | Day OOH  | 38  | 66                                                 | 63.5              | 85.4     | 47.1                                                       | 57                                                    | Y               | Attended monitoring demonstrated that construction noise was audible and present with consistent and audible noise coming from traffic on Olympic Highway. It was noted that construction contribution level was 47.1 dB, while predicted noise level for 7 Tooheys Lane was 66 dB.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 16/06/2026 | 08:41      | 15 min         | 11 Erin St, Turvey Park        | Edmondson Street Bridge- Pile Breaking        | Pile breaking                                    | Standard | 58  | 68                                                 | 60.1              | 78.5     | 55                                                         | 77                                                    | Y               | Attended monitoring was conducted to assess the generated noise from pile breaking with jackhammer at Edmondson Abutment A. The works were carried out during standard construction hours. 1x Jackhammer, 1x Air compressor were observed operating during the monitoring. Monitoring revealed that construction noise was audible and consistent at monitoring location, however, dominant noise was coming from traffic on Erin Street. Noise levels averaged 55 dB when construction noise was audible and present, increasing to 77 dB when traffic on Erin Street was increasing. In addition to attended monitoring results, the continuous sound level (LAeq,15min) contributed by construction activity was calculated and estimated to be 55.4 dB, while predicted noise level for 11 Erin Street was 68 dB.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 16/06/2026 | 10:10      | 15 min         | 2 Kildare St, Turvey Park      | Cassidy Parade Footbridge- Pile Breaking      | Pile breaking                                    | Standard | 58  | 82                                                 | 63.3              | 71.4     | 63                                                         | 70                                                    | Y               | Attended monitoring was conducted to assess the generated noise from concrete saw cutting at Cassidy Parade Footbridge site. The works were carried out during standard construction hours. 1x Concrete saw, 1x Air compressor were observed operating during the monitoring. Monitoring revealed that construction noise was dominant and consistent at monitoring location. Almost no non-construction noise was audible at monitoring location.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 21/06/2026 | 15:34      | 15 min         | 7 Tooheys Ln, Illabo           | J21 Sunday & Monday Nights                    | track works                                      | Day OOH  | 46  | 66                                                 | 64.5              | 87.5     | 62                                                         | 87.5                                                  | Y               | The noise monitor was set up approximately 130m from work area (where Hydrema was getting loaded up with Ballast by the Loader) and approximately 25m from the residential receiver (7 Tooheys, Lane). When the Hydrema passed along the rail track to get loaded up/to unload the closest distance it was to the noise monitor was approximately 30m. The noise monitoring began at 15:34, as the Hydrema was approaching to get loaded up with ballast. At 04:11mins the Hydrema was passing at the closest point to the monitor (30m) and the reading reaching a maximum of 87.5dB, however cars and a truck were also passing along Olympic Highway at the same time which would have contributed to the noise levels. When ballast was being dropped into the Hydrema by the Loader, levels were observed to reach LAeq 63-68dBdB. When Hydrema passed to get loaded the second time, at approximately 13:32mins, the LAeq was observed to range between 52-79, averaging mostly in mid 60's. No traffic passed along with the Hydrema this time. Traffic passing intermittently but often along Olympic Highway was the predominant noise source, even when construction noise was audible. When traffic passed LAeq levels were observed to be between 68db - 76dB and when there was no traffic LAeq levels were observed to be approximately 37dB, with near constant birdsong audible. Based on observations, construction noise contribution LAeq is estimated to be approximately 65dB. Measurement was compliant with predicted avel. |
| 27/06/2026 | 06:03      | 15 min         | 19 Sanctuary Ln, Ettamogah     | Destressing rail, cutting/welding/decclipping | Destressing rail, cutting/welding/decclipping    | Evening  | 42  | 48                                                 | 57                | 72.9     | <57                                                        | NA                                                    | Y               | Construction noise was not noticeable to attended monitoring team, recording was dominated by surrounding wildlife noises (crickets and frogs) along with traffic from Wagga Road and Hume highway.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 28/06/2026 | 13:42      | 15 min         | 19 Sanctuary Ln, Ettamogah     | De-Stressing rail, rail cutting.              | De-Stressing rail, rail cutting.                 | Day OOH  | 42  | 48                                                 | 51.7              | 69.5     | <51.7                                                      | NA                                                    | Y               | Highway noise, birds, no audible noise from construction. Birds, traffic from the highway and Wagga road are audible. Slight breeze.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |



# APPENDIX B

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## 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 <sup>2</sup> ) | VDV preferred values Criteria (m/s <sup>2</sup> ) | VDV Maximum values Criteria (m/s <sup>2</sup> ) | Compliant | Comments |
|-----------------------------------------|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|------------------------|-----------------------------------------------|---------------------------------------------------|-------------------------------------------------|-----------|----------|
| Pearson - 14 Cheshire Street            | Day - 1 May 2026    | Piling activites including the use of a piling rig, 12t roller and plate compactor                                                                  | Continuous             | Yes                    | 0.0276                                        | 0.20 - z                                          | 0.40 - z                                        | Y         | NA       |
|                                         | Night - 1 May 2026  |                                                                                                                                                     |                        |                        | 0.0182                                        | 0.13 - z                                          | 0.26 - z                                        | Y         | NA       |
| Pearson - 14 Cheshire Street            | Day - 2 May 2026    | Piling activites including the use of a piling rig, 12t roller and plate compactor                                                                  | Continuous             | Yes                    | 0.0347                                        | 0.20 - z                                          | 0.40 - z                                        | Y         | NA       |
|                                         | Night - 2 May 2026  |                                                                                                                                                     |                        |                        | 0.0122                                        | 0.13 - z                                          | 0.26 - z                                        | Y         | NA       |
| Pearson - 14 Cheshire Street            | Day - 3 May 2026    | Piling activites including the use of a piling rig, 12t roller and plate compactor                                                                  | Continuous             | Yes                    | 0.0333                                        | 0.20 - z                                          | 0.40 - z                                        | Y         | NA       |
|                                         | Night - 3 May 2026  |                                                                                                                                                     |                        |                        | 0.0188                                        | 0.13 - z                                          | 0.26 - z                                        | Y         | NA       |
| Pearson - 14 Cheshire Street            | Day - 4 May 2026    | Piling activites including the use of a piling rig, 12t roller and plate compactor                                                                  | Continuous             | Yes                    | 0.027                                         | 0.20 - z                                          | 0.40 - z                                        | Y         | NA       |
|                                         | Night - 4 May 2026  |                                                                                                                                                     |                        |                        | 0.0269                                        | 0.13 - z                                          | 0.26 - z                                        | Y         | NA       |
| Pearson - 14 Cheshire Street            | Day - 5 May 2026    | Piling activites including the use of a piling rig, 12t roller and plate compactor                                                                  | Continuous             | Yes                    | 0.045                                         | 0.20 - z                                          | 0.40 - z                                        | Y         | NA       |
|                                         | Night - 5 May 2026  |                                                                                                                                                     |                        |                        | 0.0108                                        | 0.13 - z                                          | 0.26 - z                                        | Y         | NA       |
| Pearson - 14 Cheshire Street            | Day - 6 May 2026    | Piling activites including the use of a piling rig, 12t roller and plate compactor                                                                  | Continuous             | Yes                    | 0.0562                                        | 0.20 - z                                          | 0.40 - z                                        | Y         | NA       |
|                                         | Night - 6 May 2026  |                                                                                                                                                     |                        |                        | 0.0412                                        | 0.13 - z                                          | 0.26 - z                                        | Y         | NA       |
| Pearson - 14 Cheshire Street            | Day - 7 May 2026    | Piling activites including the use of a piling rig, 12t roller and plate compactor                                                                  | Continuous             | Yes                    | 0.0509                                        | 0.20 - z                                          | 0.40 - z                                        | Y         | NA       |
|                                         | Night - 7 May 2026  |                                                                                                                                                     |                        |                        | 0.0495                                        | 0.13 - z                                          | 0.26 - z                                        | Y         | NA       |
| Wagga Wagga - Station Masters Residence | Day - 2 May 2026    | May 2026 Possession: capturing track work activities, involving the use of a 12T vibratory roller and tamping head atachments for hi-rail excavator | Continuous             | Yes                    | 0.0158                                        | 0.20 - z                                          | 0.40 - z                                        | Y         | NA       |
|                                         | Night - 2 May 2026  |                                                                                                                                                     |                        |                        | 0.0111                                        | 0.13 - z                                          | 0.26 - z                                        | Y         | NA       |
| Wagga Wagga - Station Masters Residence | Day - 3 May 2026    | May 2026 Possession: capturing track work activities, involving the use of a 12T vibratory roller and tamping head atachments for hi-rail excavator | Continuous             | Yes                    | 0.0193                                        | 0.20 - z                                          | 0.40 - z                                        | Y         | NA       |
|                                         | Night - 3 May 2026  |                                                                                                                                                     |                        |                        | 0.0106                                        | 0.13 - z                                          | 0.26 - z                                        | Y         | NA       |
| Wagga Wagga - Station Masters Residence | Day - 4 May 2026    | May 2026 Possession: capturing track work activities, involving the use of a 12T vibratory roller and tamping head atachments for hi-rail excavator | Continuous             | Yes                    | 0.0115                                        | 0.20 - z                                          | 0.40 - z                                        | Y         | NA       |
|                                         | Night - 4 May 2026  |                                                                                                                                                     |                        |                        | 0.0103                                        | 0.13 - z                                          | 0.26 - z                                        | Y         | NA       |
| Pearson - 14 Cheshire Street            | Day - 08 May 2026   | Piling activites incuding the use of a piling rig                                                                                                   | Continuous             | Yes                    | 0.0517                                        | 0.20 - z                                          | 0.40 - z                                        | Y         | NA       |
|                                         | Night - 08 May 2026 |                                                                                                                                                     |                        |                        | 0.0413                                        | 0.13 - z                                          | 0.26 - z                                        | Y         | NA       |
| Pearson - 14 Cheshire Street            | Day - 09 May 2026   | Piling activites incuding the use of a piling rig                                                                                                   | Continuous             | Yes                    | 0.0447                                        | 0.20 - z                                          | 0.40 - z                                        | Y         | NA       |
|                                         | Night - 09 May 2026 |                                                                                                                                                     |                        |                        | 0.0373                                        | 0.13 - z                                          | 0.26 - z                                        | Y         | NA       |
| Pearson - 14 Cheshire Street            | Day - 10 May 2026   | NA - no works this day                                                                                                                              | Continuous             | Yes                    | 0.0512                                        | 0.20 - z                                          | 0.40 - z                                        | Y         | NA       |
|                                         | Night - 10 May 2026 |                                                                                                                                                     |                        |                        | 0.0495                                        | 0.13 - z                                          | 0.26 - z                                        | Y         | NA       |
| Pearson - 14 Cheshire Street            | Day - 11 May 2026   | Piling activites incuding the use of a piling rig                                                                                                   | Continuous             | Yes                    | 0.0435                                        | 0.20 - z                                          | 0.40 - z                                        | Y         | NA       |
|                                         | Night - 11 May 2026 |                                                                                                                                                     |                        |                        | 0.0302                                        | 0.13 - z                                          | 0.26 - z                                        | Y         | NA       |
| Pearson - 14 Cheshire Street            | Day - 12 May 2026   | Piling activites incuding the use of a piling rig                                                                                                   | Continuous             | Yes                    | 0.0699                                        | 0.20 - z                                          | 0.40 - z                                        | Y         | NA       |
|                                         | Night - 12 May 2026 |                                                                                                                                                     |                        |                        | 0.046                                         | 0.13 - z                                          | 0.26 - z                                        | Y         | NA       |
| Pearson - 14 Cheshire Street            | Day - 13 May 2026   | Piling activites incuding the use of a piling rig                                                                                                   | Continuous             | Yes                    | 0.0571                                        | 0.20 - z                                          | 0.40 - z                                        | Y         | NA       |
|                                         | Night - 13 May 2026 |                                                                                                                                                     |                        |                        | 0.0528                                        | 0.13 - z                                          | 0.26 - z                                        | Y         | NA       |
| Pearson - 14 Cheshire Street            | Day - 14 May 2026   | Piling activites incuding the use of a piling rig                                                                                                   | Continuous             | Yes                    | 0.0549                                        | 0.20 - z                                          | 0.40 - z                                        | Y         | NA       |
|                                         | Night - 14 May 2026 |                                                                                                                                                     |                        |                        | 0.0414                                        | 0.13 - z                                          | 0.26 - z                                        | Y         | NA       |
| Pearson - 14 Cheshire Street            | Day - 15 May 2026   | Piling activites incuding the use of a piling rig                                                                                                   | Continuous             | Yes                    | 0.0541                                        | 0.20 - z                                          | 0.40 - z                                        | Y         | NA       |
|                                         | Night - 15 May 2026 |                                                                                                                                                     |                        |                        | 0.0458                                        | 0.13 - z                                          | 0.26 - z                                        | Y         | NA       |
| Pearson - 14 Cheshire Street            | Day - 16 May 2026   | Piling activites incuding the use of a piling rig                                                                                                   | Continuous             | Yes                    | 0.0402                                        | 0.20 - z                                          | 0.40 - z                                        | Y         | NA       |
|                                         | Night - 16 May 2026 |                                                                                                                                                     |                        |                        | 0.0363                                        | 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 <sup>2</sup> ) | VDV preferred values Criteria (m/s <sup>2</sup> ) | VDV Maximum values Criteria (m/s <sup>2</sup> ) | Compliant | Comments |
|------------------------------|---------------------|---------------------------------------------------|------------------------|------------------------|-----------------------------------------------|---------------------------------------------------|-------------------------------------------------|-----------|----------|
| Pearson - 14 Cheshire Street | Day - 17 May 2026   | NA - no works this day                            | Continuous             | Yes                    | 0.0472                                        | 0.20 - z                                          | 0.40 - z                                        | Y         | NA       |
|                              | Night - 17 May 2026 |                                                   |                        |                        | 0.0424                                        | 0.13 - z                                          | 0.26 - z                                        | Y         | NA       |
| Pearson - 14 Cheshire Street | Day - 18 May 2026   | Piling activites incuding the use of a piling rig | Continuous             | Yes                    | 0.0365                                        | 0.20 - z                                          | 0.40 - z                                        | Y         | NA       |
|                              | Night - 18 May 2026 |                                                   |                        |                        | 0.0272                                        | 0.13 - z                                          | 0.26 - z                                        | Y         | NA       |
| Pearson - 14 Cheshire Street | Day - 19 May 2026   | Piling activites incuding the use of a piling rig | Continuous             | Yes                    | 0.0296                                        | 0.20 - z                                          | 0.40 - z                                        | Y         | NA       |
|                              | Night - 19 May 2026 |                                                   |                        |                        | 0.0296                                        | 0.13 - z                                          | 0.26 - z                                        | Y         | NA       |
| Pearson - 14 Cheshire Street | Day - 20 May 2026   | Piling activites incuding the use of a piling rig | Continuous             | Yes                    | 0.0299                                        | 0.20 - z                                          | 0.40 - z                                        | Y         | NA       |
|                              | Night - 20 May 2026 |                                                   |                        |                        | 0.023                                         | 0.13 - z                                          | 0.26 - z                                        | Y         | NA       |
| Pearson - 14 Cheshire Street | Day - 21 May 2026   | Piling activites incuding the use of a piling rig | Continuous             | Yes                    | 0.0377                                        | 0.20 - z                                          | 0.40 - z                                        | Y         | NA       |
|                              | Night - 21 May 2026 |                                                   |                        |                        | 0.0317                                        | 0.13 - z                                          | 0.26 - z                                        | Y         | NA       |
| Pearson - 14 Cheshire Street | Day - 22 May 2026   | Piling activites incuding the use of a piling rig | Continuous             | Yes                    | 0.0506                                        | 0.20 - z                                          | 0.40 - z                                        | Y         | NA       |
|                              | Night - 22 May 2026 |                                                   |                        |                        | 0.0482                                        | 0.13 - z                                          | 0.26 - z                                        | Y         | NA       |
| Pearson - 14 Cheshire Street | Day - 23 May 2026   | Piling activites incuding the use of a piling rig | Continuous             | Yes                    | 0.0416                                        | 0.20 - z                                          | 0.40 - z                                        | Y         | NA       |
|                              | Night - 23 May 2026 |                                                   |                        |                        | 0.0266                                        | 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       |
|----------------------------------------------|-----------|-----------------------------------------------------------------------------------------------------------------------|------------------------|------------------------|--------------------------------|---------------------------------|-----------|----------------|
| Albury Station                               | 01-Apr-26 | Piling activities                                                                                                     | Continuous             | Yes                    | 0.743                          | 7.5                             | Y         | Below criteria |
| Albury Station                               | 02-Apr-26 | Piling activities                                                                                                     | Continuous             | Yes                    | 0.468                          | 7.5                             | Y         | Below criteria |
| Albury Station                               | 03-Apr-26 | Piling activities                                                                                                     | Continuous             | Yes                    | 0.44                           | 7.5                             | Y         | Below criteria |
| Albury Station                               | 04-Apr-26 | Piling activities                                                                                                     | Continuous             | Yes                    | 0.413                          | 7.5                             | Y         | Below criteria |
| Albury Station                               | 05-Apr-26 | Piling activities                                                                                                     | Continuous             | Yes                    | 0.391                          | 7.5                             | Y         | Below criteria |
| Albury Station                               | 06-Apr-26 | Piling activities                                                                                                     | Continuous             | Yes                    | 0.419                          | 7.5                             | Y         | Below criteria |
| Albury Station                               | 07-Apr-26 | Piling activities                                                                                                     | Continuous             | Yes                    | 0.459                          | 7.5                             | Y         | Below criteria |
| Albury Station                               | 08-Apr-26 | Piling activities                                                                                                     | Continuous             | Yes                    | 1.22                           | 7.5                             | Y         | Below criteria |
| Wagga Wagga - 111 Railway Street (Gatehouse) | 17-Apr-26 | Piliing activities for abutment B capturing the use of a piling rig as well as the UC post installation on abutment A | Continuous             | Yes                    | 1.299                          | 7.5                             | Y         | Below criteria |
| Wagga Wagga - 111 Railway Street (Gatehouse) | 18-Apr-26 | Piling activities capturing piling pad construction, including the use of a drum roller as well as abutment B works   | Continuous             | Yes                    | 4.183                          | 7.5                             | Y         | Below criteria |
| Wagga Wagga - 111 Railway Street (Gatehouse) | 19-Apr-26 | Piling activities capturing piling pad construction, including the use of a drum roller as well as abutment B works   | Continuous             | Yes                    | 1.302                          | 7.5                             | Y         | Below criteria |
| Wagga Wagga - 111 Railway Street (Gatehouse) | 20-Apr-26 | Piling activities capturing piling pad construction, including the use of a drum roller as well as abutment B works   | Continuous             | Yes                    | 1.383                          | 7.5                             | Y         | Below criteria |
| Wagga Wagga - 111 Railway Street (Gatehouse) | 21-Apr-26 | Piliing activities for abutment B capturing the use of a piling rig as well as the UC post installation on abutment A | Continuous             | Yes                    | 1.874                          | 7.5                             | Y         | Below criteria |
| Wagga Wagga - 111 Railway Street (Gatehouse) | 22-Apr-26 | Piliing activities for abutment B capturing the use of a piling rig as well as the UC post installation on abutment A | Continuous             | Yes                    | 1.341                          | 7.5                             | Y         | Below criteria |
| Wagga Wagga - 111 Railway Street (Gatehouse) | 23-Apr-26 | Piliing activities for abutment B capturing the use of a piling rig as well as the UC post installation on abutment A | Continuous             | Yes                    | 1.517                          | 7.5                             | Y         | Below criteria |
| Wagga Wagga - 111 Railway Street (Gatehouse) | 24-Apr-26 | Piliing activities for abutment B capturing the use of a piling rig as well as the UC post installation on abutment A | Continuous             | Yes                    | 1.566                          | 7.5                             | Y         | Below criteria |
| Wagga Wagga - 111 Railway Street (Gatehouse) | 25-Apr-26 | Piliing activities for abutment B capturing the use of a piling rig as well as the UC post installation on abutment A | Continuous             | Yes                    | 1.042                          | 7.5                             | Y         | Below criteria |
| Wagga Wagga - 111 Railway Street (Gatehouse) | 26-Apr-26 | Piliing activities for abutment B capturing the use of a piling rig                                                   | Continuous             | Yes                    | 1.38                           | 7.5                             | Y         | Below criteria |

| 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                                                          |
|----------------------------------------------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|------------------------|--------------------------------|---------------------------------|-----------|-------------------------------------------------------------------|
| Wagga Wagga - 111 Railway Street (Gatehouse) | 27-Apr-26 | Piling activities for abutment B capturing the use of a piling rig                                                                                   | Continuous             | Yes                    | 59.477                         | 7.5                             | Y         | Spike occurred at 2:30AM and not attributed to construction works |
| Wagga Wagga - 111 Railway Street (Gatehouse) | 28-Apr-26 | Piling activities for abutment B capturing the use of a piling rig                                                                                   | Continuous             | Yes                    | 1.34                           | 7.5                             | Y         | Below criteria                                                    |
| Wagga Wagga - 111 Railway Street (Gatehouse) | 29-Apr-26 | Piling activities for abutment B capturing the use of a piling rig                                                                                   | Continuous             | Yes                    | 1.29                           | 7.5                             | Y         | Below criteria                                                    |
| Wagga Wagga - 111 Railway Street (Gatehouse) | 30-Apr-26 | Piling activities for abutment B capturing the use of a piling rig                                                                                   | Continuous             | Yes                    | 1.42                           | 7.5                             | Y         | Below criteria                                                    |
| Wagga Wagga - 95 Railway Street              | 02-May-26 | May 2026 Possession: capturing track work activities, involving the use of a 12T vibratory roller and tamping head attachments for hi-rail excavator | Continuous             | Yes                    | 0.431                          | 7.5                             | Y         | Below criteria                                                    |
| Wagga Wagga - Station Masters Residence      | 02-May-26 | May 2026 Possession: capturing track work activities, involving the use of a 12T vibratory roller and tamping head attachments for hi-rail excavator | Continuous             | Yes                    | 0.431                          | 7.5                             | Y         | Below criteria                                                    |
| Junee to Illabo - Illabo Silos               | 02-May-26 | May 2026 Possession: capturing tamping activities including the use of a ballast tamper and regualator                                               | Continuous             | Yes                    | 0.141                          | 7.5                             | Y         | Below criteria                                                    |
| Riverina - Scotts School                     | 02-May-26 | Temporary drainage works including the use of a 8T roller and plate compactor                                                                        | Continuous             | Yes                    | 0.524                          | 7.5                             | Y         | Below criteria                                                    |
| Wagga Wagga - 95 Railway Street              | 03-May-26 | May 2026 Possession: capturing track work activities, involving the use of a 12T vibratory roller and tamping head attachments for hi-rail excavator | Continuous             | Yes                    | 0.455                          | 7.5                             | Y         | Below criteria                                                    |
| Wagga Wagga - Station Masters Residence      | 03-May-26 | May 2026 Possession: capturing track work activities, involving the use of a 12T vibratory roller and tamping head attachments for hi-rail excavator | Continuous             | Yes                    | 0.455                          | 7.5                             | Y         | Below criteria                                                    |
| Junee to Illabo - Illabo Silos               | 03-May-26 | May 2026 Possession: capturing tamping activities including the use of a ballast tamper and regualator                                               | Continuous             | Yes                    | 2.892                          | 7.5                             | Y         | Below criteria                                                    |
| Riverina - Scotts School                     | 03-May-26 | Temporary drainage works including the use of a 8T roller and plate compactor                                                                        | Continuous             | Yes                    | 2.995                          | 7.5                             | Y         | Below criteria                                                    |
| Wagga Wagga - 95 Railway Street              | 04-May-26 | May 2026 Possession: capturing track work activities, involving the use of a 12T vibratory roller and tamping head attachments for hi-rail excavator | Continuous             | Yes                    | 0.526                          | 7.5                             | Y         | Below criteria                                                    |
| Wagga Wagga - Station Masters Residence      | 04-May-26 | May 2026 Possession: capturing track work activities, involving the use of a 12T vibratory roller and tamping head attachments for hi-rail excavator | Continuous             | Yes                    | 0.526                          | 7.5                             | Y         | Below criteria                                                    |
| Junee to Illabo - Illabo Silos               | 04-May-26 | May 2026 Possession: capturing tamping activities including the use of a ballast tamper and regualator                                               | Continuous             | Yes                    | 1.863                          | 7.5                             | Y         | Below criteria                                                    |
| Riverina - Scotts School                     | 04-May-26 | Temporary drainage works including the use of a 8T roller and plate compactor                                                                        | Continuous             | Yes                    | 0.373                          | 7.5                             | Y         | Below criteria                                                    |
| Junee to Illabo - Illabo Silos               | 05-May-26 | May 2026 Possession: capturing tamping activities including the use of a ballast tamper and regualator                                               | Continuous             | Yes                    | 1.014                          | 7.5                             | Y         | Below criteria                                                    |
| Riverina - Scotts School                     | 05-May-26 | Temporary drainage works including the use of a 8T roller and plate compactor                                                                        | Continuous             | Yes                    | 0.722                          | 7.5                             | Y         | Below criteria                                                    |
| Riverina - Scotts School                     | 06-May-26 | Trackwork for loop line diversion including the use of a trench roller and plate compactor                                                           | Continuous             | Yes                    | 0.51                           | 7.5                             | Y         | Below criteria                                                    |

| 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       |
|--------------------------|-----------|--------------------------------------------------------------------------------------------|------------------------|------------------------|--------------------------------|---------------------------------|-----------|----------------|
| Riverina - Scotts School | 07-May-26 | Trackwork for loop line diversion including the use of a trench roller and plate compactor | Continuous             | Yes                    | 0.584                          | 7.5                             | Y         | Below criteria |
| Riverina - Scotts School | 08-May-26 | Trackwork for loop line diversion including the use of a trench roller and plate compactor | Continuous             | Yes                    | 0.542                          | 7.5                             | Y         | Below criteria |
| Riverina - Scotts School | 09-May-26 | Trackwork for loop line diversion including the use of a trench roller and plate compactor | Continuous             | Yes                    | 0.595                          | 7.5                             | Y         | Below criteria |
| Riverina - Scotts School | 10-May-26 | Trackwork for loop line diversion including the use of a trench roller and plate compactor | Continuous             | Yes                    | 0.687                          | 7.5                             | Y         | Below criteria |
| Riverina - Scotts School | 11-May-26 | Trackwork for loop line diversion including the use of a trench roller and plate compactor | Continuous             | Yes                    | 0.569                          | 7.5                             | Y         | Below criteria |
| Riverina - Scotts School | 12-May-26 | Trackwork for loop line diversion including the use of a trench roller and plate compactor | Continuous             | Yes                    | 0.52                           | 7.5                             | Y         | Below criteria |
| Riverina - Scotts School | 13-May-26 | Trackwork for loop line diversion including the use of a trench roller and plate compactor | Continuous             | Yes                    | 0.877                          | 7.5                             | Y         | Below criteria |
| Riverina - Scotts School | 14-May-26 | Trackwork for loop line diversion including the use of a trench roller and plate compactor | Continuous             | Yes                    | 0.693                          | 7.5                             | Y         | Below criteria |
| Riverina - Scotts School | 15-May-26 | Trackwork for loop line diversion including the use of a trench roller and plate compactor | Continuous             | Yes                    | 0.436                          | 7.5                             | Y         | Below criteria |
| Riverina - Scotts School | 16-May-26 | Trackwork for loop line diversion including the use of a trench roller and plate compactor | Continuous             | Yes                    | 0.512                          | 7.5                             | Y         | Below criteria |
| Riverina - Scotts School | 17-May-26 | Trackwork for loop line diversion including the use of a trench roller and plate compactor | Continuous             | Yes                    | 0.442                          | 7.5                             | Y         | Below criteria |
| Riverina - Scotts School | 18-May-26 | Trackwork for loop line diversion including the use of a trench roller and plate compactor | Continuous             | Yes                    | 0.61                           | 7.5                             | Y         | Below criteria |
| Riverina - Scotts School | 19-May-26 | Trackwork for loop line diversion including the use of a trench roller and plate compactor | Continuous             | Yes                    | 0.488                          | 7.5                             | Y         | Below criteria |



# APPENDIX C

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## Surface Water Quality Monitoring Summary

## April Surface Water Results

| Sample ID | NTU  | pH   | DO    | EC  | Temp  | TSS | Al   | As     | Cd     | Cr     | Cu     | Pb     | Mn    | Ni     | Zn     | Fe   | Hg     | NOx    | TRN | Total N | Total P | Chlorophyll-a | Chemical Oxygen | 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 naphthal | Benzene | Toluene | Ethylbenzene | Xylenes |
|-----------|------|------|-------|-----|-------|-----|------|--------|--------|--------|--------|--------|-------|--------|--------|------|--------|--------|-----|---------|---------|---------------|-----------------|--------------------------|-------------|-----------|-------------|----------------------|------------------|------------------|----------------------------|---------|---------|--------------|---------|
| SW01-US   | 12.8 | 6.33 | 7.52  | 43  | 17.47 | 6   | 0.05 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.32  | <0.001 | <0.005 | 0.15 | <0.001 | 0.08   | 0.2 | 0.3     | <0.01   | 7             | 14              | 2                        | <5          | <20       | <50         | <20                  | <100             | <100             | <100                       | <1      | <2      | <2           | <2      |
| SW01-DS   | 10.1 | 5.41 | 7.35  | 43  | 17.54 | <5  | 0.07 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.03  | <0.001 | <0.005 | 0.15 | <0.001 | 0.08   | 0.2 | 0.3     | 0.02    | 9             | <10             | 2                        | <5          | <20       | <50         | <20                  | <100             | <100             | <100                       | <1      | <2      | <2           | <2      |
| SW02-US   | NS   | NS   | NS    | NS  | NS    | NS  | NS   | NS     | NS     | NS     | NS     | NS     | NS    | NS     | NS     | NS   | NS     | NS     | NS  | NS      | NS      | NS            | NS              | NS                       | NS          | NS        | NS          | NS                   | NS               | NS               | NS                         | NS      | NS      | NS           | NS      |
| SW02-DS   | NS   | NS   | NS    | NS  | NS    | NS  | NS   | NS     | NS     | NS     | NS     | NS     | NS    | NS     | NS     | NS   | NS     | NS     | NS  | NS      | NS      | NS            | NS              | NS                       | NS          | NS        | NS          | NS                   | NS               | NS               | NS                         | NS      | NS      | NS           | NS      |
| SW03-US   | 55.6 | 7.48 | 9.34  | 187 | 13.79 | 25  | 0.25 | 0.003  | <0.001 | <0.001 | <0.001 | 0.001  | 0.268 | <0.001 | <0.005 | 0.77 | <0.001 | <0.001 | 1.1 | 1.1     | 0.12    | 44            | 18              | 4                        | <5          | <20       | <50         | <20                  | <100             | <100             | <100                       | <1      | <2      | <2           | <2      |
| SW03-DS   | 84.3 | 7.39 | 8.89  | 190 | 15.89 | 27  | 0.27 | 0.003  | <0.001 | <0.001 | <0.001 | <0.001 | 0.238 | 0.001  | <0.005 | 0.79 | <0.001 | <0.001 | 1.2 | 1.2     | 0.11    | 44            | 12              | 4                        | <5          | <20       | <50         | <20                  | <100             | <100             | <100                       | <1      | <2      | <2           | <2      |
| SW04-US   | NS   | NS   | NS    | NS  | NS    | NS  | NS   | NS     | NS     | NS     | NS     | NS     | NS    | NS     | NS     | NS   | NS     | NS     | NS  | NS      | NS      | NS            | NS              | NS                       | NS          | NS        | NS          | NS                   | NS               | NS               | NS                         | NS      | NS      | NS           | NS      |
| SW04-DS   | NS   | NS   | NS    | NS  | NS    | NS  | NS   | NS     | NS     | NS     | NS     | NS     | NS    | NS     | NS     | NS   | NS     | NS     | NS  | NS      | NS      | NS            | NS              | NS                       | NS          | NS        | NS          | NS                   | NS               | NS               | NS                         | NS      | NS      | NS           | NS      |
| SW05-US   | NS   | NS   | NS    | NS  | NS    | NS  | NS   | NS     | NS     | NS     | NS     | NS     | NS    | NS     | NS     | NS   | NS     | NS     | NS  | NS      | NS      | NS            | NS              | NS                       | NS          | NS        | NS          | NS                   | NS               | NS               | NS                         | NS      | NS      | NS           | NS      |
| SW05-DS   | NS   | NS   | NS    | NS  | NS    | NS  | NS   | NS     | NS     | NS     | NS     | NS     | NS    | NS     | NS     | NS   | NS     | NS     | NS  | NS      | NS      | NS            | NS              | NS                       | NS          | NS        | NS          | NS                   | NS               | NS               | NS                         | NS      | NS      | NS           | NS      |
| SW06-US   | NS   | NS   | NS    | NS  | NS    | NS  | NS   | NS     | NS     | NS     | NS     | NS     | NS    | NS     | NS     | NS   | NS     | NS     | NS  | NS      | NS      | NS            | NS              | NS                       | NS          | NS        | NS          | NS                   | NS               | NS               | NS                         | NS      | NS      | NS           | NS      |
| SW06-DS   | NS   | NS   | NS    | NS  | NS    | NS  | NS   | NS     | NS     | NS     | NS     | NS     | NS    | NS     | NS     | NS   | NS     | NS     | NS  | NS      | NS      | NS            | NS              | NS                       | NS          | NS        | NS          | NS                   | NS               | NS               | NS                         | NS      | NS      | NS           | NS      |
| SW07-US   | 47.8 | 7.48 | 12.7  | 730 | 16.67 | 34  | 0.23 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.057 | 0.001  | 0.001  | 0.5  | <0.001 | 0.03   | 0.4 | 0.4     | 0.02    | 1             | <10             | 2                        | <5          | <20       | <50         | <20                  | <100             | <100             | <100                       | <1      | <2      | <2           | <2      |
| SW07-DS   | 10.5 | 8.08 | 13.72 | 817 | 20.65 | <5  | 0.23 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.025 | 0.001  | 0.007  | 0.26 | <0.001 | <0.001 | 0.2 | 0.2     | <0.01   | <1            | >10             | 2                        | <5          | <20       | <50         | <20                  | <100             | <100             | <100                       | <1      | <2      | <2           | <2      |
| SW08-US   | NS   | NS   | NS    | NS  | NS    | NS  | NS   | NS     | NS     | NS     | NS     | NS     | NS    | NS     | NS     | NS   | NS     | NS     | NS  | NS      | NS      | NS            | NS              | NS                       | NS          | NS        | NS          | NS                   | NS               | NS               | NS                         | NS      | NS      | NS           | NS      |
| SW08-DS   | NS   | NS   | NS    | NS  | NS    | NS  | NS   | NS     | NS     | NS     | NS     | NS     | NS    | NS     | NS     | NS   | NS     | NS     | NS  | NS      | NS      | NS            | NS              | NS                       | NS          | NS        | NS          | NS                   | NS               | NS               | NS                         | NS      | NS      | NS           | NS      |
| SW09-US   | NS   | NS   | NS    | NS  | NS    | NS  | NS   | NS     | NS     | NS     | NS     | NS     | NS    | NS     | NS     | NS   | NS     | NS     | NS  | NS      | NS      | NS            | NS              | NS                       | NS          | NS        | NS          | NS                   | NS               | NS               | NS                         | NS      | NS      | NS           | NS      |
| SW09-DS   | NS   | NS   | NS    | NS  | NS    | NS  | NS   | NS     | NS     | NS     | NS     | NS     | NS    | NS     | NS     | NS   | NS     | NS     | NS  | NS      | NS      | NS            | NS              | NS                       | NS          | NS        | NS          | NS                   | NS               | NS               | NS                         | NS      | NS      | NS           | NS      |

✓ – parameter does not exceed criteria

✗ – parameter exceeds criteria

NST – No Sample Taken

## May 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   | 7.6  | 7.02 | 7.61  | 48   | 17.10 | <5   | 0.12 | 0.001  | <0.001 | <0.001 | <0.001 | <0.001 | 0.026 | <0.001 | <0.005 | 0.21 | <0.001 | 0.05 | 0.4  | 0.4     | <0.01   | 8             | <10                    | 3                        | <5          | <20       | <50         | <20                   | <100             | <100             | <100                         | <1      | <2      | <2           | <2      |
| SW01-DS   | 8.7  | 6.93 | 6.89  | 56   | 17.29 | <5   | 0.12 | 0.001  | <0.001 | <0.001 | <0.001 | <0.001 | 0.026 | <0.001 | <0.005 | 0.21 | <0.001 | 0.05 | 0.4  | 0.4     | <0.01   | 8             | <10                    | 3                        | <5          | <20       | <50         | <20                   | <100             | <100             | <100                         | <1      | <2      | <2           | <2      |
| SW02-US   | 277  | 6.82 | 4.98  | 69   | 15.58 | <5   | 9.62 | 0.001  | <0.001 | 0.009  | 0.003  | 0.005  | 0.092 | 0.004  | 0.021  | 7.49 | <0.001 | 0.11 | 0.6  | 0.7     | 0.06    | <1            | 65                     | 3                        | <5          | <20       | <50         | <20                   | <100             | <100             | <100                         | <1      | <2      | <2           | <2      |
| SW02-DS   | 281  | 6.62 | 3.22  | 56   | 15.83 | 120  | 9.15 | 0.002  | <0.001 | 0.009  | 0.004  | 0.005  | 0.084 | 0.003  | 0.037  | 7.31 | <0.001 | 0.17 | 0.7  | 0.9     | 0.02    | 2             | 56                     | 5                        | <5          | <20       | <50         | <20                   | <100             | <100             | <100                         | <1      | <2      | <2           | <2      |
| SW03-US   | 73   | 7.63 | 2.77  | 753  | 16.66 | 34   | 1.02 | 0.002  | <0.001 | <0.001 | 0.035  | 0.003  | 0.203 | <0.001 | 0.016  | 1.3  | <0.001 | 0.12 | 0.6  | 0.7     | 0.08    | 24            | 50                     | 4                        | <5          | <20       | <50         | <20                   | <100             | <100             | <100                         | <1      | <2      | <2           | <2      |
| SW03-DS   | 118  | 7.63 | 4.25  | 885  | 17.27 | 58   | 1.37 | 0.003  | <0.001 | 0.001  | <0.001 | 0.002  | 0.275 | <0.001 | 0.014  | 1.81 | <0.001 | 0.13 | 0.9  | 1       | 0.1     | 39            | 56                     | 5                        | <5          | <20       | <50         | <20                   | <100             | <100             | <100                         | <1      | <2      | <2           | <2      |
| SW04-US   | NS T | NS T | NS T  | NS T | NS T  | NS T | NS T | NS T   | NS T   | NS T   | NS T   | NS T   | NS T  | NS T   | NS T   | NS T | NS T   | NS T | NS T | NS T    | NS T    | NS T          | NS T                   | NS T                     | NS T        | NS T      | NS T        | NS T                  | NS T             | NS T             | NS T                         | NS T    | NS T    | NS T         | NS T    |
| SW04-DS   | NS T | NS T | NS T  | NS T | NS T  | NS T | NS T | NS T   | NS T   | NS T   | NS T   | NS T   | NS T  | NS T   | NS T   | NS T | NS T   | NS T | NS T | NS T    | NS T    | NS T          | NS T                   | NS T                     | NS T        | NS T      | NS T        | NS T                  | NS T             | NS T             | NS T                         | NS T    | NS T    | NS T         | NS T    |
| SW05-US   | NS T | NS T | NS T  | NS T | NS T  | NS T | NS T | NS T   | NS T   | NS T   | NS T   | NS T   | NS T  | NS T   | NS T   | NS T | NS T   | NS T | NS T | NS T    | NS T    | NS T          | NS T                   | NS T                     | NS T        | NS T      | NS T        | NS T                  | NS T             | NS T             | NS T                         | NS T    | NS T    | NS T         | NS T    |
| SW05-DS   | NS T | NS T | NS T  | NS T | NS T  | NS T | NS T | NS T   | NS T   | NS T   | NS T   | NS T   | NS T  | NS T   | NS T   | NS T | NS T   | NS T | NS T | NS T    | NS T    | NS T          | NS T                   | NS T                     | NS T        | NS T      | NS T        | NS T                  | NS T             | NS T             | NS T                         | NS T    | NS T    | NS T         | NS T    |
| SW06-US   | NS T | NS T | NS T  | NS T | NS T  | NS T | NS T | NS T   | NS T   | NS T   | NS T   | NS T   | NS T  | NS T   | NS T   | NS T | NS T   | NS T | NS T | NS T    | NS T    | NS T          | NS T                   | NS T                     | NS T        | NS T      | NS T        | NS T                  | NS T             | NS T             | NS T                         | NS T    | NS T    | NS T         | NS T    |
| SW06-DS   | NS T | NS T | NS T  | NS T | NS T  | NS T | NS T | NS T   | NS T   | NS T   | NS T   | NS T   | NS T  | NS T   | NS T   | NS T | NS T   | NS T | NS T | NS T    | NS T    | NS T          | NS T                   | NS T                     | NS T        | NS T      | NS T        | NS T                  | NS T             | NS T             | NS T                         | NS T    | NS T    | NS T         | NS T    |
| SW07-US   | 44.8 | 7.09 | 33.56 | 164  | 19.26 | 15   | 0.5  | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.022 | <0.001 | 0.02   | 0.48 | 0.02   | 0.15 | 0.5  | 0.6     | 0.04    | 8             | 13                     | 4                        | <5          | <20       | <50         | <20                   | <100             | <100             | <100                         | <1      | <2      | <2           | <2      |
| SW07-DS   | 46.5 | 6.68 | 5.69  | 148  | 18.62 | 15   | 0.5  | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.022 | <0.001 | 0.02   | 0.48 | 0.02   | 0.15 | 0.5  | 0.6     | 0.04    | 8             | 13                     | 4                        | <5          | <20       | <50         | <20                   | <100             | <100             | <100                         | <1      | <2      | <2           | <2      |
| SW08-US   | NS T | NS T | NS T  | NS T | NS T  | NS T | NS T | NS T   | NS T   | NS T   | NS T   | NS T   | NS T  | NS T   | NS T   | NS T | NS T   | NS T | NS T | NS T    | NS T    | NS T          | NS T                   | NS T                     | NS T        | NS T      | NS T        | NS T                  | NS T             | NS T             | NS T                         | NS T    | NS T    | NS T         | NS T    |
| SW08-DS   | NS T | NS T | NS T  | NS T | NS T  | NS T | NS T | NS T   | NS T   | NS T   | NS T   | NS T   | NS T  | NS T   | NS T   | NS T | NS T   | NS T | NS T | NS T    | NS T    | NS T          | NS T                   | NS T                     | NS T        | NS T      | NS T        | NS T                  | NS T             | NS T             | NS T                         | NS T    | NS T    | NS T         | NS T    |
| SW09-US   | NS T | NS T | NS T  | NS T | NS T  | NS T | NS T | NS T   | NS T   | NS T   | NS T   | NS T   | NS T  | NS T   | NS T   | NS T | NS T   | NS T | NS T | NS T    | NS T    | NS T          | NS T                   | NS T                     | NS T        | NS T      | NS T        | NS T                  | NS T             | NS T             | NS T                         | NS T    | NS T    | NS T         | NS T    |
| SW09-DS   | NS T | NS T | NS T  | NS T | NS T  | NS T | NS T | NS T   | NS T   | NS T   | NS T   | NS T   | NS T  | NS T   | NS T   | NS T | NS T   | NS T | NS T | NS T    | NS T    | NS T          | NS T                   | NS T                     | NS T        | NS T      | NS T        | NS T                  | NS T             | NS T             | NS T                         | NS T    | NS T    | NS T         | NS T    |

✓ – parameter does not exceed criteria

✗ – parameter exceeds criteria

NST – No Sample Taken

## June 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-C16 | TRH C6-C10 minus BTEX | TRH C16-C34 (F3) | TRH C34-C40 (F4) | TRH C10-C16 minus naphthalene | Benzene | Toluene | Ethylbenzene | Xylenes |
|-----------|------|------|------|-------|--------|------|------|--------|----------|---------|---------|---------|--------|---------|---------|------|----------|------|-----|---------|---------|---------------|------------------------|--------------------------|-------------|-----------|-------------|-----------------------|------------------|------------------|-------------------------------|---------|---------|--------------|---------|
| SW01 – US | 3.2  | 6.15 | 8    | 52    | 13.0 2 | 11   | 0.49 | 0.00 1 | <0.0 001 | <0.0 01 | <0.0 01 | <0.0 01 | 0.03 8 | <0.0 01 | <0.0 05 | 0.59 | <0.0 001 | 0.14 | 0.4 | 0.5     | 0.04    | 4             | <10                    | 2                        | <5          | <20       | <50         | <20                   | <10 0            | <10 0            | <10 0                         | <1      | <2      | <2           | <2      |
| SW01 – DS | 0    | 6.23 | 6.78 | 54    | 12.6 4 | 6    | 0.36 | 0.00 1 | <0.0 001 | <0.0 01 | <0.0 01 | <0.0 01 | 0.03 2 | <0.0 01 | <0.0 05 | 0.48 | <0.0 001 | 0.15 | 0.2 | 0.4     | 0.02    | 4             | <10                    | 2                        | <5          | <20       | <50         | <20                   | <10 0            | <10 0            | <10 0                         | <1      | <2      | <2           | <2      |
| SW02 – US | 275  | 6.32 | 4.56 | 68    | 11.7 2 | 170  | 7.91 | 0.00 2 | <0.0 001 | 0.01 4  | 0.00 6  | 0.00 5  | 0.11 5 | 0.00 4  | 0.02 1  | 6.38 | <0.0 001 | 1.64 | 1.2 | 2.8     | 0.12    | 1             | 73                     | 4                        | <5          | <20       | <50         | <20                   | <10 0            | <10 0            | <10 0                         | <1      | <2      | <2           | <2      |
| SW02 – DS | 321  | 6.1  | 4.24 | 63    | 11.8 2 | 153  | 13.5 | 0.00 2 | <0.0 001 | 0.01 4  | 0.00 7  | 0.00 6  | 0.09   | 0.00 7  | 0.03 9  | 10.2 | <0.0 001 | 0.17 | 1.3 | 1.5     | 0.09    | <2            | 53                     | 4                        | <5          | <20       | <50         | <20                   | <10 0            | <10 0            | <10 0                         | <1      | <2      | <2           | <2      |
| SW03 – US | 14.1 | 7.52 | 3.05 | 150 0 | 11.9   | 16   | 0.32 | 0.00 2 | <0.0 001 | <0.0 01 | <0.0 01 | <0.0 01 | 0.20 9 | <0.0 01 | <0.0 05 | 0.7  | <0.0 001 | 0.25 | 0.5 | 0.8     | 0.08    | 2             | <10                    | 3                        | <5          | <20       | <50         | <20                   | <10 0            | <10 0            | <10 0                         | <1      | <2      | <2           | <2      |
| SW03 – DS | 33.4 | 7.65 | 2.69 | 154 0 | 12     | 20   | 0.4  | 0.00 2 | <0.0 001 | <0.0 01 | <0.0 01 | 0.00 2  | 0.14 1 | <0.0 01 | 0.00 8  | 0.71 | <0.0 001 | 0.27 | 0.6 | 0.9     | 0.04    | 2             | <10                    | 4                        | <5          | <20       | <50         | <20                   | <10 0            | <10 0            | <10 0                         | <1      | <2      | <2           | <2      |
| SW04 – US | NS T | NST  | NST  | NST   | NST    | NS T | NST  | NST    | NST      | NST     | NS T    | NST     | NST    | NST     | NST     | NS T | NST      | NST  | NST | NST     | NS T    | NST           | NST                    | NST                      | NST         | NS T      | NST         | NST                   | NST              | NST              | NS T                          | NST     | NST     | NST          | NS T    |
| SW04 – DS | NS T | NST  | NST  | NST   | NST    | NS T | NST  | NST    | NST      | NST     | NS T    | NST     | NST    | NST     | NST     | NS T | NST      | NST  | NST | NST     | NS T    | NST           | NST                    | NST                      | NST         | NS T      | NST         | NST                   | NST              | NST              | NS T                          | NST     | NST     | NST          | NS T    |
| SW05 – US | NS T | NST  | NST  | NST   | NST    | NS T | NST  | NST    | NST      | NST     | NS T    | NST     | NST    | NST     | NST     | NS T | NST      | NST  | NST | NST     | NS T    | NST           | NST                    | NST                      | NST         | NS T      | NST         | NST                   | NST              | NST              | NS T                          | NST     | NST     | NST          | NS T    |
| SW05 – DS | NS T | NST  | NST  | NST   | NST    | NS T | NST  | NST    | NST      | NST     | NS T    | NST     | NST    | NST     | NST     | NS T | NST      | NST  | NST | NST     | NS T    | NST           | NST                    | NST                      | NST         | NS T      | NST         | NST                   | NST              | NST              | NS T                          | NST     | NST     | NST          | NS T    |
| SW06 – US | NS T | NST  | NST  | NST   | NST    | NS T | NST  | NST    | NST      | NST     | NS T    | NST     | NST    | NST     | NST     | NS T | NST      | NST  | NST | NST     | NS T    | NST           | NST                    | NST                      | NST         | NS T      | NST         | NST                   | NST              | NST              | NS T                          | NST     | NST     | NST          | NS T    |
| SW06 – DS | NS T | NST  | NST  | NST   | NST    | NS T | NST  | NST    | NST      | NST     | NS T    | NST     | NST    | NST     | NST     | NS T | NST      | NST  | NST | NST     | NS T    | NST           | NST                    | NST                      | NST         | NS T      | NST         | NST                   | NST              | NST              | NS T                          | NST     | NST     | NST          | NS T    |
| SW07 – US | 79.1 | 5.79 | 8.94 | 77    | 13.0 3 | 26   | 1.39 | 0.00 1 | <0.0 001 | 0.00 2  | 0.00 3  | 0.00 1  | 0.03   | 0.00 3  | 0.03 9  | 1.23 | <0.0 001 | 0.25 | 0.4 | 0.6     | 0.1     | 1             | <10                    | 3                        | <5          | <20       | <50         | <20                   | <10 0            | <10 0            | <10 0                         | <1      | <2      | <2           | <2      |
| SW07 – DS | 83.1 | 6.52 | 8.72 | 64    | 13.0 6 | 26   | 1.3  | 0.00 2 | <0.0 001 | 0.00 2  | 0.00 3  | 0.00 2  | 0.02 8 | 0.00 2  | 0.03 9  | 1.16 | <0.0 001 | 0.28 | 0.5 | 0.8     | 0.08    | 1             | <10                    | 4                        | <5          | <20       | <50         | <20                   | <10 0            | <10 0            | <10 0                         | <1      | <2      | <2           | <2      |
| SW08 – US | NS T | NST  | NST  | NST   | NST    | NS T | NST  | NST    | NST      | NST     | NS T    | NST     | NST    | NST     | NST     | NS T | NST      | NST  | NST | NST     | NS T    | NST           | NST                    | NST                      | NST         | NS T      | NST         | NST                   | NST              | NST              | NS T                          | NST     | NST     | NST          | NS T    |
| SW08 – DS | NS T | NST  | NST  | NST   | NST    | NS T | NST  | NST    | NST      | NST     | NS T    | NST     | NST    | NST     | NST     | NS T | NST      | NST  | NST | NST     | NS T    | NST           | NST                    | NST                      | NST         | NS T      | NST         | NST                   | NST              | NST              | NS T                          | NST     | NST     | NST          | NS T    |
| SW09 – US | NS T | NST  | NST  | NST   | NST    | NS T | NST  | NST    | NST      | NST     | NS T    | NST     | NST    | NST     | NST     | NS T | NST      | NST  | NST | NST     | NS T    | NST           | NST                    | NST                      | NST         | NS T      | NST         | NST                   | NST              | NST              | NS T                          | NST     | NST     | NST          | NS T    |
| SW09 – DS | NS T | NST  | NST  | NST   | NST    | NS T | NST  | NST    | NST      | NST     | NS T    | NST     | NST    | NST     | NST     | NS T | NST      | NST  | NST | NST     | NS T    | NST           | NST                    | NST                      | NST         | NS T      | NST         | NST                   | NST              | NST              | NS T                          | NST     | NST     | NST          | NS T    |

✓ – 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: 84152 274 014  
Postal Address: PO Box 4489, North Rocks, 2151  
NSW Australia

T: 1300 309 881 F: 1300 885 178  
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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<br>HUMIDIY: 45% ± 10% RH |
| CUSTOMER                                 | MARTINUS RAIL PIY 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                                                                                                                                                                 | NOTFOUND          |                                                  |
|                                          | IYPE                                                                                                                                                                         | DIGITAL           |                                                  |
|                                          | RANGE                                                                                                                                                                        |                   |                                                  |
| CALIBRATION PROCEDURE                    | HKC SOP 11-21-V3 (AS/NZS IEC 61672.2:2019)                                                                                                                                   |                   |                                                  |
| REFERENCE NATA<br>TRACEABLE CERTIFIED... | SOUND LEVEL CALIBRATOR, SOUND LEVEL MITTR<br>MAKE : LUTRON, LUTRON<br>MODEL: SC-942, SL-4001<br>ASSET:HKC016,HKC057<br>SERIAL NO: Q598203, Q449236<br>NATA REPORT NO: C53722 |                   |                                                  |

### RESULT

| Reading of Master | Reading of U.U.T. | Correction | Acceptance Criteria (±) | PASS/FAIL |
|-------------------|-------------------|------------|-------------------------|-----------|
| dB@IKHZ           | dB@IKHZ           | dB@IKHZ    | dB@IKHZ                 | 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.

SIGNATURE OF APPROVAL

TEST BY CHINMAY

03/09/2025

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 150 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 safely in its complete form.*

Page1

QR FORM 25-01-V5 (7/16)

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## Sound Level Meter

IEC 61672-3:2013

# Calibration Certificate

Calibration Number C25769-V1

|                                        |                     |                                                      |               |
|----------------------------------------|---------------------|------------------------------------------------------|---------------|
| <b>Client Details</b>                  |                     | Martinus<br>Unit 1, 80 Bomen Road<br>Wagga Wagga NSW |               |
| <b>Equipment Tested :</b>              | <i>Manufacturer</i> | <i>Model</i>                                         | <i>Serial</i> |
| <b>Instrument :</b>                    | Rion                | NL-43                                                | 00853458      |
| <b>Microphone :</b>                    | Rion                | UC-52                                                | 214090        |
| <b>Pre-amplifier :</b>                 | Rion                | NH-24                                                | 46390         |
| <b>Firmware Version :</b>              | 01.03               |                                                      |               |
| <b>Pre-Test Atmospheric Conditions</b> |                     | <b>Post-Test Atmospheric Conditions</b>              |               |
| <b>Ambient Temperature :</b>           | 22.6 °C             | <b>Ambient Temperature :</b>                         | 22.8 °C       |
| <b>Relative Humidity :</b>             | 48.1 %              | <b>Relative Humidity :</b>                           | 48.1 %        |
| <b>Barometric Pressure :</b>           | 98.78 kPa           | <b>Barometric Pressure :</b>                         | 98.75 kPa     |
| <b>Calibration Technician :</b>        | Emanuel Eid         | <b>Secondary Check:</b>                              | Matt Calleja  |
| <b>Calibration Date :</b>              | 25-Nov-2025         | <b>Report Issue Date :</b>                           | 26-Nov-2025   |
| <b>Approved Signatory :</b>            |                     | 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**

|                                        |                     |                                                      |               |
|----------------------------------------|---------------------|------------------------------------------------------|---------------|
| <b>Client Details</b>                  |                     | Martinus<br>Unit 1, 80 Bomen Road<br>Wagga Wagga NSW |               |
| <b>Equipment Tested :</b>              | <i>Manufacturer</i> | <i>Model</i>                                         | <i>Serial</i> |
| <b>Instrument Serial Number :</b>      | Rion                | NL-43                                                | 00853458      |
| <b>Microphone Serial Number :</b>      | Rion                | UC-52                                                | 214090        |
| <b>Pre-amplifier Serial Number :</b>   | Rion                | NH-24                                                | 46390         |
| <b>Firmware Version :</b>              | 01.03               |                                                      |               |
| <b>Pre-Test Atmospheric Conditions</b> |                     | <b>Post-Test Atmospheric Conditions</b>              |               |
| <b>Ambient Temperature :</b>           | 22.6 °C             | <b>Ambient Temperature :</b>                         | 22.8 °C       |
| <b>Relative Humidity :</b>             | 48.1 %              | <b>Relative Humidity :</b>                           | 48.1 %        |
| <b>Barometric Pressure :</b>           | 98.78 kPa           | <b>Barometric Pressure :</b>                         | 98.75 kPa     |
| <b>Calibration Technician :</b>        | Emanuel Eid         | <b>Secondary Check:</b>                              | Matt Calleja  |
| <b>Calibration Date :</b>              | 25-Nov-2025         | <b>Report Issue Date :</b>                           | 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 report applies only to the item tested and shall only be reproduced in full, unless approved in writing by Acoustic Research Labs.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.

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

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## 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.

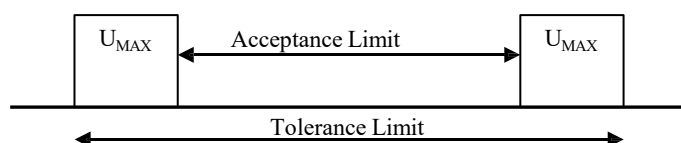
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Where required, reference is made to manual version 66122 as provided by the manufacturer.

### 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

| <b>Equipment Tested :</b> | <i>Manufacturer</i> | <i>Model</i> | <i>Serial</i> |
|---------------------------|---------------------|--------------|---------------|
| <b>Instrument :</b>       | Rion                | NL-43        | 00853458      |
| <b>Microphone :</b>       | Rion                | UC-52        | 214090        |
| <b>Pre-amplifier :</b>    | 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 |

Electric Noise Floor :

| dB(A) | dB(C) | dB(Z) |
|-------|-------|-------|
| 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<br>(Hz) | Response<br>(dB) |         | Tolerance<br>Limit<br>(dB) | P/F | Uncertainty<br>(dB) | Maximum<br>Permitted<br>Uncertainty<br>(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<br>(Hz) | Response<br>(dB) |         | Tolerance<br>Limit<br>(dB) | P/F | Uncertainty<br>(dB) | Maximum<br>Permitted<br>Uncertainty<br>(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<br>(Hz) | Response<br>(dB) |         | Tolerance<br>Limit<br>(dB) | P/F | Uncertainty<br>(dB) | Maximum<br>Permitted<br>Uncertainty<br>(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<br>Peak C | Deviation<br>(dB) | Tolerance<br>Limit<br>(dB) | P/F | Uncertainty<br>(dB) | Overload<br>Peak C | Maximum<br>Permitted<br>Uncertainty<br>(dB) |
|--------------------|-------------------|----------------------------|-----|---------------------|--------------------|---------------------------------------------|
| 136.1              | -0.3              | ±3.0                       | P   | 0.22                | N                  | 0.35                                        |

**Table 18 - Half Cycle Response**

| Signal<br>Orientation | Response<br>Peak C<br>(dB) | Deviation<br>(dB) | Tolerance<br>Limit<br>(dB) | P/F | Uncertainty<br>(dB) | Maximum<br>Permitted<br>Uncertainty<br>(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 of 137.0dB(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

|                                        |                     |                                                                      |               |
|----------------------------------------|---------------------|----------------------------------------------------------------------|---------------|
| <b>Client Details</b>                  |                     | Martinus Rail Pty Ltd<br>75 Miller Street<br>North Sydney, NSW, 2060 |               |
| <b>Equipment Tested :</b>              | <i>Manufacturer</i> | <i>Model</i>                                                         | <i>Serial</i> |
| <b>Instrument :</b>                    | Rion                | NL-43                                                                | 00730663      |
| <b>Microphone :</b>                    | Rion                | UC-52                                                                | 205540        |
| <b>Pre-amplifier :</b>                 | Rion                | NH-24                                                                | 33620         |
| <b>Firmware Version :</b>              | v1.00               |                                                                      |               |
| <b>Pre-Test Atmospheric Conditions</b> |                     | <b>Post-Test Atmospheric Conditions</b>                              |               |
| <b>Ambient Temperature :</b>           | 22.3 °C             | <b>Ambient Temperature :</b>                                         | 21.1 °C       |
| <b>Relative Humidity :</b>             | 48.8 %              | <b>Relative Humidity :</b>                                           | 47.2 %        |
| <b>Barometric Pressure :</b>           | 99.88 kPa           | <b>Barometric Pressure :</b>                                         | 99.8 kPa      |
| <b>Calibration Technician :</b>        | Peter Elters        | <b>Secondary Check:</b>                                              | Rhys Gravelle |
| <b>Calibration Date :</b>              | 01-Jul-2025         | <b>Report Issue Date :</b>                                           | 01-Jul-2025   |
| <b>Approved Signatory :</b>            |                     | 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.



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.



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

Calibration Number C25411-V1

|                                                                                            |                     |                                         |               |
|--------------------------------------------------------------------------------------------|---------------------|-----------------------------------------|---------------|
| <b>Client Details</b> Martinus Rail Pty Ltd<br>75 Miller Street<br>North Sydney, NSW, 2060 |                     |                                         |               |
| <b>Equipment Tested :</b>                                                                  | <i>Manufacturer</i> | <i>Model</i>                            | <i>Serial</i> |
| <b>Instrument Serial Number :</b>                                                          | Rion                | NL-43                                   | 00730663      |
| <b>Microphone Serial Number :</b>                                                          | Rion                | UC-52                                   | 205540        |
| <b>Pre-amplifier Serial Number :</b>                                                       | Rion                | NH-24                                   | 33620         |
| <b>Firmware Version :</b>                                                                  | v1.00               |                                         |               |
| <b>Pre-Test Atmospheric Conditions</b>                                                     |                     | <b>Post-Test Atmospheric Conditions</b> |               |
| <b>Ambient Temperature :</b>                                                               | 22.3 °C             | <b>Ambient Temperature :</b>            | 21.1 °C       |
| <b>Relative Humidity :</b>                                                                 | 48.8 %              | <b>Relative Humidity :</b>              | 47.2 %        |
| <b>Barometric Pressure :</b>                                                               | 99.88 kPa           | <b>Barometric Pressure :</b>            | 99.8 kPa      |
| <b>Calibration Technician :</b>                                                            | Peter Elters        | <b>Secondary Check:</b>                 | Rhys Gravelle |
| <b>Calibration Date :</b>                                                                  | 01-Jul-2025         | <b>Report Issue Date :</b>              | 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.*



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

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.

Accredited for compliance with ISO/IEC 17025 - Calibration.

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

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

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## 1. REVISION HISTORY

| Revision | Date        | Description    |
|----------|-------------|----------------|
| 1        | 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.

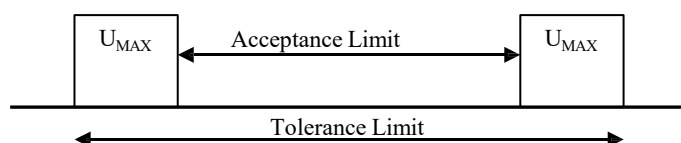
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Where required, reference is made to manual version 66122 as provided by the manufacturer.

### 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

| <b>Equipment Tested :</b> | <i>Manufacturer</i> | <i>Model</i> | <i>Serial</i> |
|---------------------------|---------------------|--------------|---------------|
| <b>Instrument :</b>       | Rion                | NL-43        | 00730663      |
| <b>Microphone :</b>       | Rion                | UC-52        | 205540        |
| <b>Pre-amplifier :</b>    | 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 |

Electric Noise Floor :

| dB(A) | dB(C) | dB(Z) |
|-------|-------|-------|
| 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<br>(Hz) | Response<br>(dB) |         | Tolerance<br>Limit<br>(dB) | P/F | Uncertainty<br>(dB) | Maximum<br>Permitted<br>Uncertainty<br>(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<br>(Hz) | Response<br>(dB) |         | Tolerance<br>Limit<br>(dB) | P/F | Uncertainty<br>(dB) | Maximum<br>Permitted<br>Uncertainty<br>(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<br>(Hz) | Response<br>(dB) |         | Tolerance<br>Limit<br>(dB) | P/F | Uncertainty<br>(dB) | Maximum<br>Permitted<br>Uncertainty<br>(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<br>Peak C | Deviation<br>(dB) | Tolerance<br>Limit<br>(dB) | P/F | Uncertainty<br>(dB) | Overload<br>Peak C | Maximum<br>Permitted<br>Uncertainty<br>(dB) |
|--------------------|-------------------|----------------------------|-----|---------------------|--------------------|---------------------------------------------|
| 135.4              | -1.0              | ±3.0                       | P   | 0.22                | N                  | 0.35                                        |

**Table 18 - Half Cycle Response**

| Signal<br>Orientation | Response<br>Peak C<br>(dB) | Deviation<br>(dB) | Tolerance<br>Limit<br>(dB) | P/F | Uncertainty<br>(dB) | Maximum<br>Permitted<br>Uncertainty<br>(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 of 137.0dB(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

|                                        |                     |                                                      |               |
|----------------------------------------|---------------------|------------------------------------------------------|---------------|
| <b>Client Details</b>                  |                     | Martinus<br>Unit 1, 80 Bomen Road<br>Wagga Wagga NSW |               |
| <b>Equipment Tested :</b>              | <i>Manufacturer</i> | <i>Model</i>                                         | <i>Serial</i> |
| <b>Instrument :</b>                    | Rion                | NL-43                                                | 00853459      |
| <b>Microphone :</b>                    | Rion                | UC-52                                                | 214091        |
| <b>Pre-amplifier :</b>                 | Rion                | NH-24                                                | 46391         |
| <b>Firmware Version :</b>              | 01.03               |                                                      |               |
| <b>Pre-Test Atmospheric Conditions</b> |                     | <b>Post-Test Atmospheric Conditions</b>              |               |
| <b>Ambient Temperature :</b>           | 22.9 °C             | <b>Ambient Temperature :</b>                         | 22.8 °C       |
| <b>Relative Humidity :</b>             | 48.2 %              | <b>Relative Humidity :</b>                           | 46.1 %        |
| <b>Barometric Pressure :</b>           | 98.74 kPa           | <b>Barometric Pressure :</b>                         | 98.7 kPa      |
| <b>Calibration Technician :</b>        | Emanuel Eid         | <b>Secondary Check:</b>                              | Matt Calleja  |
| <b>Calibration Date :</b>              | 25-Nov-2025         | <b>Report Issue Date :</b>                           | 26-Nov-2025   |
| <b>Approved Signatory :</b>            |                     | 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 **C25770-V1**

|                                        |                     |                                                      |               |
|----------------------------------------|---------------------|------------------------------------------------------|---------------|
| <b>Client Details</b>                  |                     | Martinus<br>Unit 1, 80 Bomen Road<br>Wagga Wagga NSW |               |
| <b>Equipment Tested :</b>              | <i>Manufacturer</i> | <i>Model</i>                                         | <i>Serial</i> |
| <b>Instrument Serial Number :</b>      | Rion                | NL-43                                                | 00853459      |
| <b>Microphone Serial Number :</b>      | Rion                | UC-52                                                | 214091        |
| <b>Pre-amplifier Serial Number :</b>   | Rion                | NH-24                                                | 46391         |
| <b>Firmware Version :</b>              | 01.03               |                                                      |               |
| <b>Pre-Test Atmospheric Conditions</b> |                     | <b>Post-Test Atmospheric Conditions</b>              |               |
| <b>Ambient Temperature :</b>           | 22.9 °C             | <b>Ambient Temperature :</b>                         | 22.8 °C       |
| <b>Relative Humidity :</b>             | 48.2 %              | <b>Relative Humidity :</b>                           | 46.1 %        |
| <b>Barometric Pressure :</b>           | 98.74 kPa           | <b>Barometric Pressure :</b>                         | 98.7 kPa      |
| <b>Calibration Technician :</b>        | Emanuel Eid         | <b>Secondary Check:</b>                              | Matt Calleja  |
| <b>Calibration Date :</b>              | 25-Nov-2025         | <b>Report Issue Date :</b>                           | 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 report applies only to the item tested and shall only be reproduced in full, unless approved in writing by Acoustic Research Labs.

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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.

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## 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.

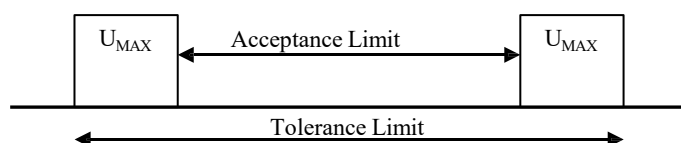
This report was generated using template version identifier of 69876974.

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

| <b>Equipment Tested :</b> | <i>Manufacturer</i> | <i>Model</i> | <i>Serial</i> |
|---------------------------|---------------------|--------------|---------------|
| <b>Instrument :</b>       | Rion                | NL-43        | 00853459      |
| <b>Microphone :</b>       | Rion                | UC-52        | 214091        |
| <b>Pre-amplifier :</b>    | 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 |

Electric Noise Floor :

| dB(A) | dB(C) | dB(Z) |
|-------|-------|-------|
| 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<br>(Hz) | Response<br>(dB) |         | Tolerance<br>Limit<br>(dB) | P/F | Uncertainty<br>(dB) | Maximum<br>Permitted<br>Uncertainty<br>(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<br>(Hz) | Response<br>(dB) |         | Tolerance<br>Limit<br>(dB) | P/F | Uncertainty<br>(dB) | Maximum<br>Permitted<br>Uncertainty<br>(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<br>(Hz) | Response<br>(dB) |         | Tolerance<br>Limit<br>(dB) | P/F | Uncertainty<br>(dB) | Maximum<br>Permitted<br>Uncertainty<br>(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<br>Peak C | Deviation<br>(dB) | Tolerance<br>Limit<br>(dB) | P/F | Uncertainty<br>(dB) | Overload<br>Peak C | Maximum<br>Permitted<br>Uncertainty<br>(dB) |
|--------------------|-------------------|----------------------------|-----|---------------------|--------------------|---------------------------------------------|
| 136.1              | -0.3              | ±3.0                       | P   | 0.22                | N                  | 0.35                                        |

**Table 18 - Half Cycle Response**

| Signal<br>Orientation | Response<br>Peak C<br>(dB) | Deviation<br>(dB) | Tolerance<br>Limit<br>(dB) | P/F | Uncertainty<br>(dB) | Maximum<br>Permitted<br>Uncertainty<br>(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 of 137.0dB(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

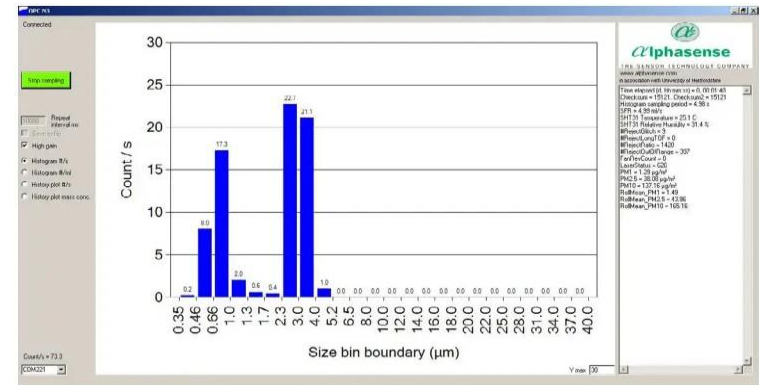
## Dust

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

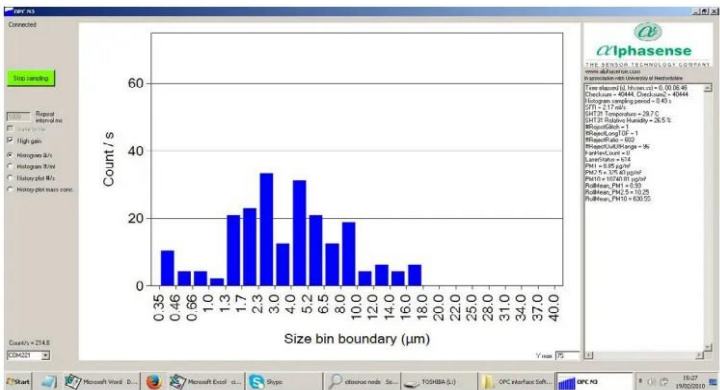
The Hexanode utilises the Alphasense N3 Optical Particle Sensor to provide real-time dust measurements. Whilst the N3 does not have any gravimetric sampling capabilities, measurements can be adjusted using a K-Factor if one is available. SiteHive software will also provide measurements from the nearest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

|                             |                                                                                 |            |
|-----------------------------|---------------------------------------------------------------------------------|------------|
| Particle range              | Particle range* $\mu\text{m}$ spherical equivalent size<br>(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       |

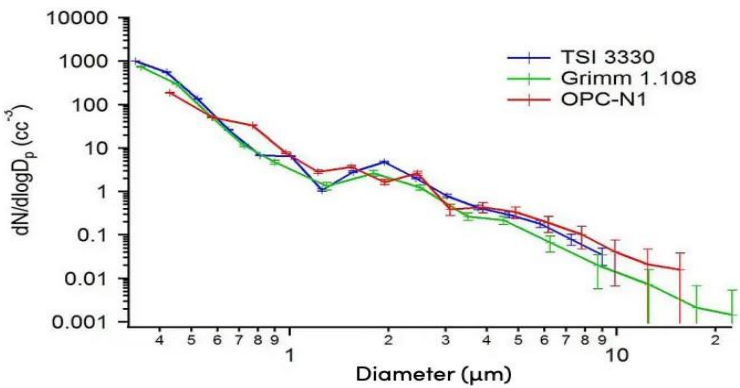
OPC-N3 response to 0.75 and 3  $\mu\text{m}$  PSL calibration standards



OPC-N3 response to a broad size range test dust



Particle Size Derivative Comparison



The OPC-N3 uses the same algorithms for 0.3 - 17 $\mu\text{m}$  as the OPC-N1.

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 |

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 dB SPL                                                           |
| 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    |

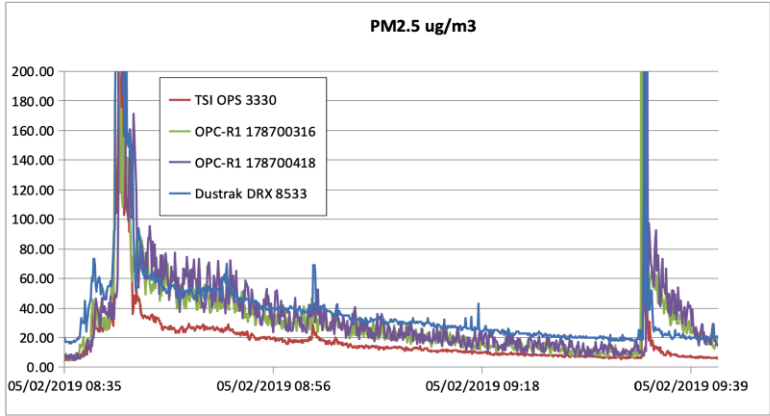
The SiteHive Hexanode uses innovative digital MEMS microphones, and as such cannot achieve full pattern approval in line with international standard IEC 61672, which is written for analogue condenser microphones. However, the SiteHive Hexanode sound level meter has been rigorously tested by the the National 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

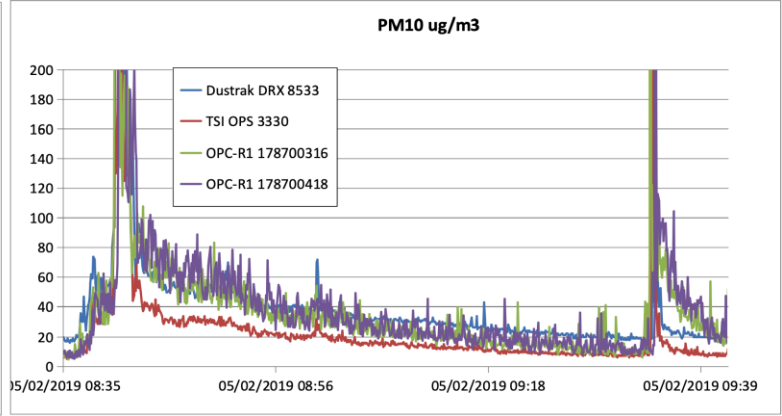
The Hexanode Multi device utilises the Alphasense OPC-R2 particle monitor to provide real-time dust measurements. These sensors are calibrated at manufacture by Alphasense. Whilst the R2 does not have any gravimetric sampling capabilities, measurements can be adjusted using a K-Factor if one is available. 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 <sup>6</sup> 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

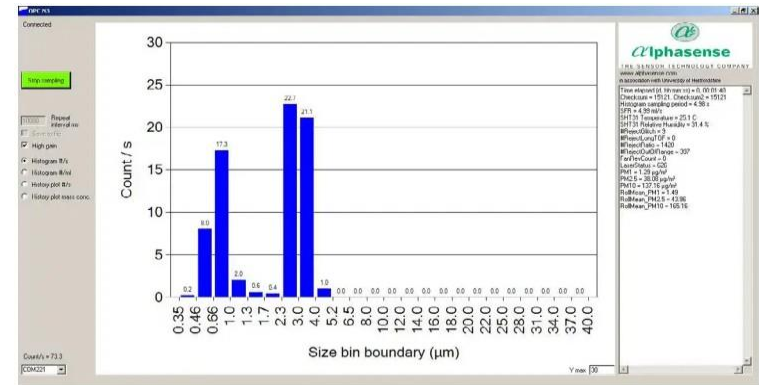
## Dust

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

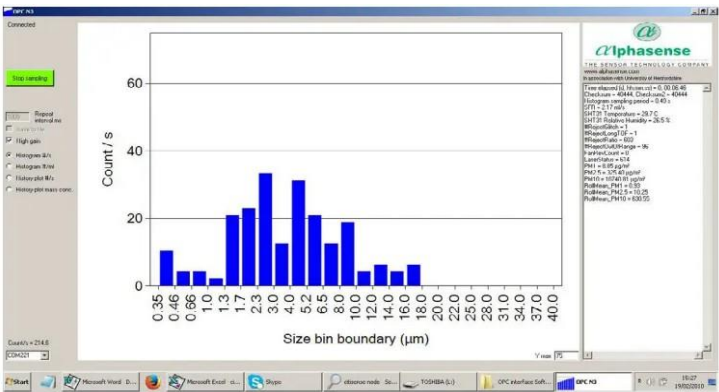
The Hexanode utilises the Alphasense N3 Optical Particle Sensor to provide real-time dust measurements. Whilst the N3 does not have any gravimetric sampling capabilities, measurements can be adjusted using a K-Factor if one is available. SiteHive software will also provide measurements from the nearest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

|                             |                                                                                 |            |
|-----------------------------|---------------------------------------------------------------------------------|------------|
| Particle range              | Particle range* $\mu\text{m}$ spherical equivalent size<br>(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       |

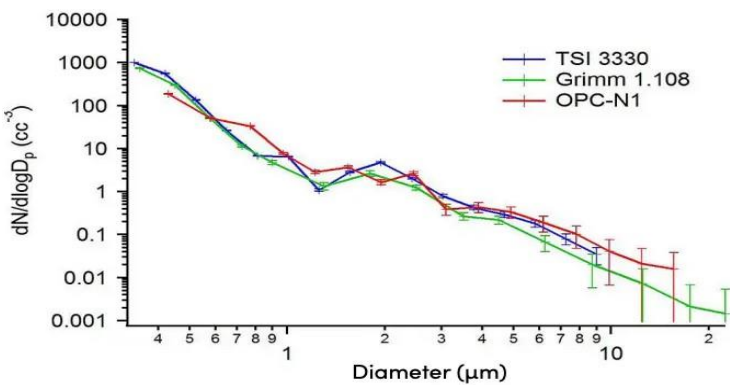
OPC-N3 response to 0.75 and 3  $\mu\text{m}$  PSL calibration standards



OPC-N3 response to a broad size range test dust



Particle Size Derivative Comparison



The OPC-N3 uses the same algorithms for 0.3 - 17 $\mu\text{m}$  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

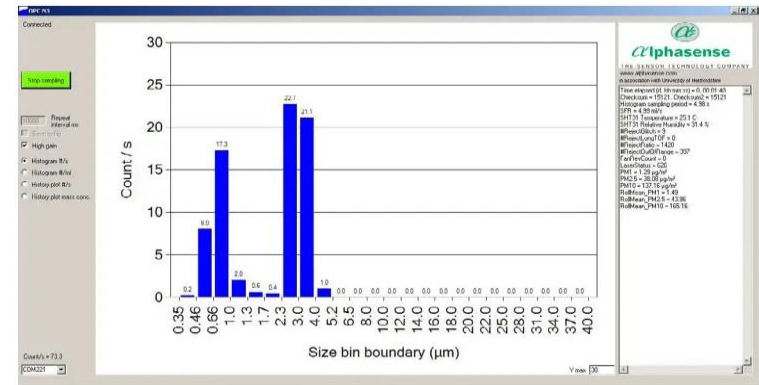
## Dust

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

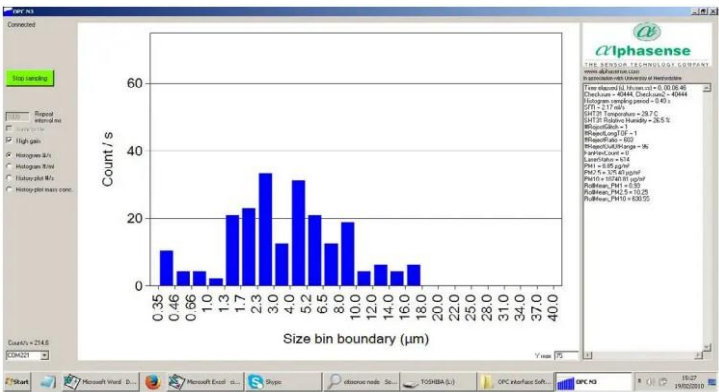
The Hexanode utilises the Alphasense N3 Optical Particle Sensor to provide real-time dust measurements. Whilst the N3 does not have any gravimetric sampling capabilities, measurements can be adjusted using a K-Factor if one is available. SiteHive software will also provide measurements from the nearest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

| Particle range              | Particle range* $\mu\text{m}$ spherical equivalent size<br>(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       |

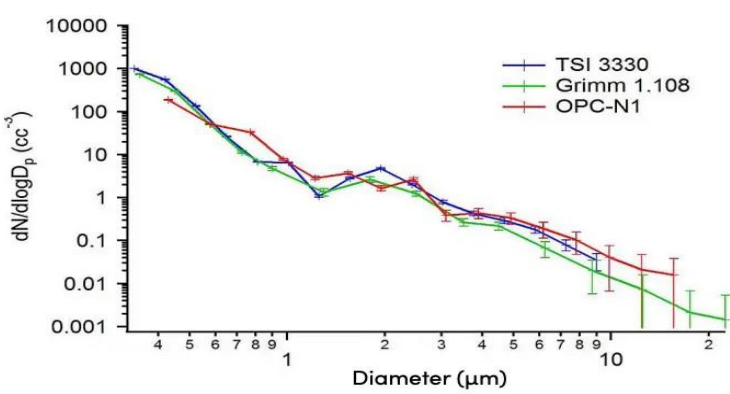
OPC-N3 response to 0.75 and 3  $\mu\text{m}$  PSL calibration standards



OPC-N3 response to a broad size range test dust



Particle Size Derivative Comparison



The OPC-N3 uses the same algorithms for 0.3 - 17 $\mu\text{m}$  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 |

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    |

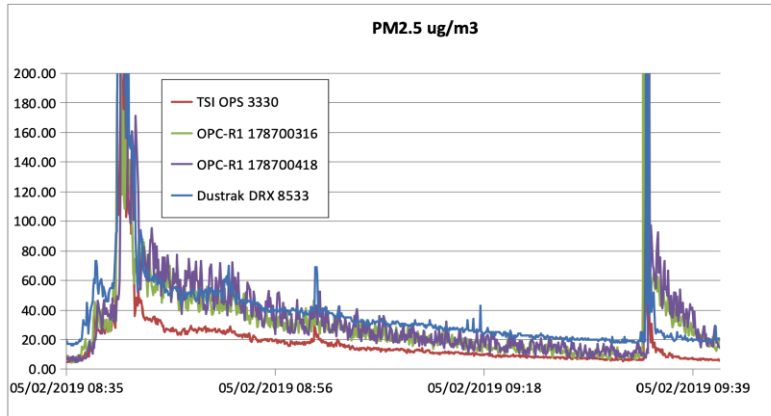
The SiteHive Hexanode uses innovative digital MEMS microphones, and as such cannot achieve full pattern approval in line with international standard IEC 61672, which is written for analogue condenser microphones. However, the SiteHive Hexanode sound level meter has been rigorously tested by the the National 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

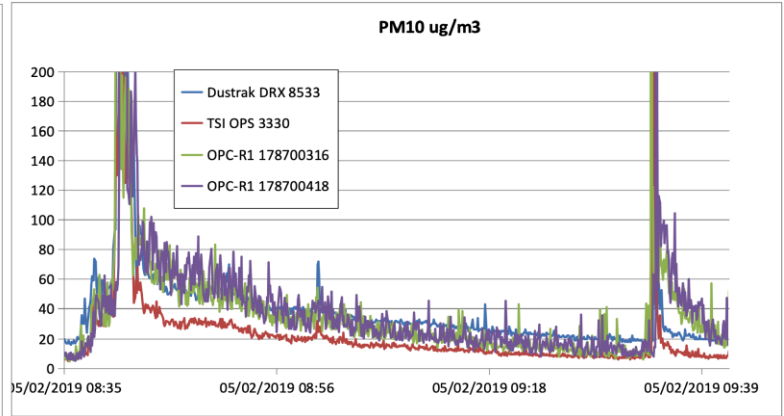
The Hexanode utilises the Alphasense R2 Optical Particle Sensor, to provide real-time dust measurements. Whilst the R2 does not have any gravimetric sampling capabilities, measurements can be adjusted using a K-Factor if one is available. SiteHive software will also provide measurements from the nearest 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 <sup>6</sup> 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.



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<br>according to JCSS calibration procedure specified by RION. |
| Ambient conditions   | : Temperature 23.8 °C, Relative humidity 36 %,<br>Static pressure 99.7 kPa                                          |
| Calibration date     | : 7/5/2025 (DIMJYYYY)                                                                                               |
| Calibration location | : 3-20-41 Higashimotomachi, Kokubunji, Tokyo 185-8533, Japan<br>RION CO., LTD. Calibration Room                     |

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

Issue date : 15/5/2025 (DIMJYYYY)

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



This certificate is based on article 144 of the Measurement Law and indicates the result of calibration in accordance with measurement standards traceable to Primary Measurement Standards (National Standards) which realizes the physical units of measurement according to the International System of Units (SI).  
The accreditation symbol is attestation of which the result of calibration is traceable to Primary Measurement Standards (National Standards).  
The certificate shall not be reproduced except in full, without the written approval of the issuing laboratory.  
The calibration laboratory who issued this calibration certificate conforms to ISO/IEC 17025:2017.  
This calibration certificate was issued by the calibration laboratory accredited by IA Japan who is a signatory to the Mutual Recognition Arrangement (MRA) of International Laboratory Accreditation Cooperation (ILAC) and Asia Pacific Accreditation Cooperation CAPAC). This (These) calibration result(s) may be accepted internationally through ILAC/APAC MRA.



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 X 10<sup>-5</sup> 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 X 10 <sup>-4</sup> 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·

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     |                    |                         |

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     |                    |                         |

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     |                    |                         |

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     |                    |                         |

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 Dusing 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**

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