

DURALIE COAL MINE

Quarterly Compliance Monitoring
February 2021

Prepared for:
Duralie Coal Ltd

SLR Ref: 630.11772-R15
Version No: -v1.0
June 2021

SLR 

PREPARED BY

SLR Consulting Australia Pty Ltd
ABN 29 001 584 612
10 Kings Road
New Lambton NSW 2305 Australia
(PO Box 447 New Lambton NSW 2305)
T: +61 2 4037 3200
E: newcastleau@slrconsulting.com www.slrconsulting.com

BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Duralie Coal Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

DOCUMENT CONTROL

| Reference | Date | Prepared | Checked | Authorised |
|--------------------|--------------|----------------|----------------|----------------|
| 630.11772-R15-v1.0 | 11 June 2021 | Shannon Harvey | Timothy Trewin | Timothy Trewin |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

CONTENTS

| | | |
|----------|--|-----------|
| 1 | INTRODUCTION | 4 |
| 2 | DCM NOISE LIMITS | 4 |
| 2.1 | EPL Noise Limits | 4 |
| 2.2 | Project Approval Noise Limits..... | 5 |
| 2.3 | Low Frequency Noise..... | 6 |
| 3 | OPERATIONAL NOISE MONITORING METHODOLOGY | 6 |
| 3.1 | General Requirements..... | 6 |
| 3.2 | Methodology – Operator-attended Noise Monitoring Locations | 6 |
| 4 | RESULTS | 8 |
| 4.1 | Operator-attended Monitoring – DCM Operational Activity | 8 |
| 4.1.1 | Operator-attended Noise Survey Results | 8 |
| 5 | PERFORMANCE ASSESSMENT | 10 |
| 6 | SLEEP DISTURBANCE..... | 11 |
| 7 | CONCLUSION..... | 11 |

DOCUMENT REFERENCES

TABLES

| | | |
|---------|--|----|
| Table 1 | EPL Noise Limits for the Nominated Attended Noise Monitoring Locations | 4 |
| Table 2 | DCM Operational Noise Monitoring Locations | 6 |
| Table 3 | Daytime Operator Attended Noise Survey Results | 9 |
| Table 4 | Performance Assessment – Operations | 10 |
| Table 5 | Performance Assessment – Sleep Disturbance..... | 11 |

FIGURES

| | | |
|----------|---|---|
| Figure 1 | Duralie Coal Mine Attended Monitoring Locations | 7 |
|----------|---|---|

APPENDICES

| | |
|------------|---------------------------------------|
| Appendix A | Acoustic Terminology |
| Appendix B | Operator Attended Noise Survey Charts |

1 Introduction

Duralie Coal Pty Limited (DCPL), a wholly owned subsidiary of Yancoal Australia Limited (Yancoal), has commissioned SLR Consulting Australia Pty Ltd (SLR) to conduct quarterly noise monitoring for the Duralie Coal Mine (DCM) operations guided by the requirements of the *Duralie Coal Mine Noise Management Plan (NMP)*, Document No. NMP-R06-A, dated May 2018. This report presents the results and findings from operator-attended operational noise monitoring conducted Friday 26 February 2021. DCM has ceased mining operations and is currently undergoing rehabilitation works. Rehabilitation works are conducted during the daytime period only, as defined in the NSW *Industrial Noise Policy (INP)* (EPA 2000), and as such operator-attended monitoring was only conducted during the day-time period.

The objectives of the noise monitoring programme for this operating period were as follows:

- Conduct one round of external operator-attended noise measurements during operational periods at four nominated locations listed in Project Approval, representative of receivers located in the north, west and south directions from the DCM. The monitoring locations are NM1, NM4, NM5, and NM6.
- The three rounds comprise a single round within each of the day, evening and night-time periods as defined in the NSW *Industrial Noise Policy* (EPA 2000).
- Quantify all sources of noise within each of the attended noise surveys, including measured and/or estimated contribution and maximum level of individual noise sources.
- Assess the noise emissions from the DCM and determine compliance with respect to the limits contained in the NMP.

This report uses specialist acoustic terminology. An explanation of common terms is provided in **Appendix A**.

2 DCM Noise Limits

2.1 EPL Noise Limits

The site specific noise limits of sub-section L4.1 of Section L4 *Noise Limits* of the EPA’s Environment Protection Licence (EPL), EPL 11701 dated 8 November 2017, for the five nominated attended noise monitoring locations, are summarised in **Table 1**.

Table 1 EPL Noise Limits for the Nominated Attended Noise Monitoring Locations

| Locality | LAeq(15minute) | | | LA1(1minute) |
|----------------------------|----------------|---------|------------|--------------|
| | Daytime | Evening | Night-time | Night-time |
| NM1 Woodley | 35 | 35 | 35 | 45 |
| NM4 Fisher-Webster | 35 | 35 | 37 | 45 |
| NM5 Moylan | 35 | 35 | 35 | 45 |
| NM6 - Oleksiuk and Carmody | 35 | 35 | 39 | 45 |

Additional conditions relating to the noise monitoring location and applicable meteorological conditions are outlined in sub-sections L4.2 (a) and L4.8 of EPL 11701 and are summarised below.

L4.2 (a) with the L_{Aeq} (15-minute) noise limits in condition 4.1, the noise measurement equipment must be located:

Approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises; or

Within 30 metres of a dwelling façade, but not closer than 3 m, where any dwelling on the property is situated more than 30 metres from the boundary closest to the premises.

Noise from the premises is to be measured at a distance within 30 metres of the locations identified in L4.1 to determine compliance with this condition.

L4.8 The noise limits set out in condition in L4.1 apply under all meteorological conditions except for the following:

- a) wind speeds greater than 3 metres/second at 10 metres above ground level; or*
- b) Temperature Inversion conditions up to 3 degrees Celsius/100m and wind speeds greater than 2 metres/second at 10 metres above the ground level; or*
- c) Temperature inversion conditions greater than 3 degrees Celsius/100m.*

2.2 Project Approval Noise Limits

The Project approval conditions relating to the noise limits are as follows:

Noise Criteria

2. Except for the land referred to in Table 1, the Proponent shall ensure that the noise generated by the project does not exceed the criteria in Table 2 at any residence on privately-owned land or on more than 25 percent of any privately-owned land.

Table 2: Noise criteria dB(A)

| Location | Day | Evening | Night | |
|--------------------------------|-----------------------------|-----------------------------|-----------------------------|---------------------------|
| | $L_{Aeq(15\text{ minute})}$ | $L_{Aeq(15\text{ minute})}$ | $L_{Aeq(15\text{ minute})}$ | $L_{A1(1\text{ minute})}$ |
| 172 - Lyall | 35 | 39 | 40 | 45 |
| 126 – Hamann Pixalu PL | 35 | 35 | 39 | 45 |
| 123 – Oleksiuk & Carmody | | | | |
| 173 – Trigg & Holland | 35 | 36 | 37 | 45 |
| 116 - Weismantel | | | | |
| 127 – Fisher-Webster | 35 | 35 | 37 | 45 |
| 131(1) - Relton | | | | |
| 180 (1) - Thompson | 35 | 36 | 36 | 45 |
| 95 - Smith & Ransley | 35 | 35 | 36 | 45 |
| 144 - Wielgosinski | | | | |
| 169 - Williams | 35 | 36 | 35 | 45 |
| 177 - Thompson | | | | |
| All other privately-owned land | 35 | 35 | 35 | 45 |

Notes:

- Noise generated by the project is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy; and
- For this condition to apply, the exceedences of the criteria must be systemic.

2.3 Low Frequency Noise

The ‘Duralie Modification Noise and Blasting Assessment’ (prepared by SLR Consulting Australia dated 9 July 2014) included a low frequency analysis of C and A weighted intrusive noise levels in accordance with the NSW *Industrial Noise Policy* (INP) requirements. The assessment indicated that there is no dominant low-frequency content relating to noise emissions from the DCM.

At all locations DCM was either not audible or significantly below the relevant noise criteria and low frequency noise is therefore not addressed further in this report. The results of the operator attended noise measurements presented in **Section 3**.

3 Operational Noise Monitoring Methodology

3.1 General Requirements

All acoustic instrumentation employed throughout the monitoring programme has been designed to comply with the requirements of AS IEC 61672.1 – 2004 *Electroacoustics—Sound level meters – Specifications*, AS IEC 61672.2-2004, AS IEC 61672.3-2004 and carried current NATA or manufacturer calibration certificates. Instrument calibration was checked before and after each measurement survey, with the variation in calibrated levels not exceeding ± 0.5 dBA.

3.2 Methodology – Operator-attended Noise Monitoring Locations

Noise monitoring was conducted guided by the requirements of the NMP. Operator-attended noise measurements were conducted during the day period for a minimum of 15 minutes per period at each of the four nominated noise monitoring locations. An operator attended noise measurement was also conducted at one of the four nominated noise monitoring locations during the night-time period for a minimum of 15 minutes. The details of the operator-attended noise monitoring locations are contained within **Table 2** and shown in **Figure 1**. During the operator attended noise measurements, the character and relative contribution of ambient noise sources along with the mine contributions were noted.

Table 2 DCM Operational Noise Monitoring Locations

| Monitoring Location | Receiver Type | Resident / Owner | Monitoring Location - MGA Zone 56 | |
|---------------------|---------------|----------------------|-----------------------------------|--------------|
| | | | Easting (m) | Northing (m) |
| NM1 | Residence | Woodley ¹ | 400644 | 6421907 |
| NM4 | Residence | Fisher-Webster | 396790 | 6428961 |
| NM5 | Residence | Moylan | 396770 | 6428945 |
| NM6 | Residence | Oleksiuk and Carmody | 399661 | 6431862 |

Note 1: Woodley property has changed ownership but will retain the title of ‘Woodley’ until a License revision.

H:\Projects\SLR630-Sw\NTL\630-NTL\630:11772 Duralle Coal Quarterly Noise Monitoring\06 SLR Data\01 Drafting\Figures\CAD\CURRENT\Fig1_630:11772.00100_AttenNMLocations_V5.dwg



06.08.2018
630.11772.00100

**ATTENDED NOISE
MONITORING LOCATIONS**

FIGURE 1

The objective of the DCM operational operator-attended noise monitoring was to measure the maximum (L_{Amax}) and the $L_{Aeq(15minute)}$ noise level contributions at the nearest potentially affected receptors to determine the noise contribution of mining activities associated with Duralie Coal Mine operations over a 15 minute measurement period. In addition, the operator quantifies and characterises the overall levels of ambient noise in the area (i.e. L_{Amax} , $LA1$, $LA10$, $LA90$, and L_{Aeq}) over the 15 minute measurement interval. Operator-attended noise measurements were conducted using a one-third octave integrating Brüel & Kjær Type 2270 sound level meter (s/n 2697354).

4 Results

4.1 Operator-attended Monitoring – DCM Operational Activity

Operator-attended noise measurements were conducted during the day and night period on Friday 26 February 2021. Results of the operator-attended noise surveys at NM1, NM4, NM5, NM6 are provided in **Table 3**.

A summary of the results for the operator-attended noise monitoring are displayed graphically in **Appendix B**. Charts of the noise surveys show L_{Amax} , L_{Aeq} , and $L_{Aeq(\leq 1.25kHz)}$ in 1-second intervals throughout the monitoring survey.

Ambient noise levels presented include all noise sources such as transport (roads, rail and aircraft), fauna (insects, frogs, birds, and bats), farm animals, the natural environment (wind in trees), domestic noises, other industrial operations as well as Duralie Coal Mine noise emissions.

Weather data during the monitoring period has been obtained from the weather station located on the Duralie Coal Mine site. Where this data was not available meteorological conditions have been estimated based on observed conditions during the monitoring period.

The tables provide the following information:

- Date and start time, operator and equipment details.
- Monitoring location.
- Wind velocity (m/s) and temperature ($^{\circ}C$) at the measurement location.
- Typical maximum (L_{Amax}) and contributed $L_{Aeq(15minute)}$ noise levels.

4.1.1 Operator-attended Noise Survey Results

Results of the operator-attended noise surveys at all monitoring locations are provided in **Table 3**. Monitoring location NM1 represents residential receptors located to the south of the site. Due to access restrictions noise monitoring was conducted at the entrance to the property.

Table 3 Daytime Operator Attended Noise Survey Results

| Location | Date/Start Time/ Weather | Primary Noise Descriptor dBA (15 minute) | | | | | | Description of Noise Emissions and Typical Maximum Noise Levels (dBA) |
|-------------|--|--|-----------------|------------------|------------------|------------------|-----------------------------|---|
| | | L _{Amax} | L _{A1} | L _{A10} | L _{A90} | L _{Aeq} | L _{Aeq} (≤1.25kHz) | |
| NM1 | 26/02/2021 08:56 21°C 0.9 m/s SW | 78 | 56 | 45 | 36 | 50 | 49 | <i>Site related noise events:</i> DCM: Inaudible <i>Other noise events:</i> Road traffic 78 Insects 38-46 Birdsong 40-56 Distant traffic 25-33 |
| NM4 | 26/02/2021 07:57 19°C 1.3 m/s ESE | 61 | 52 | 42 | 39 | 42 | 36 | <i>Site related noise events:</i> DCM: Inaudible <i>Other noise events:</i> Road traffic 34-37 Insects 40-44 Birdsong 40-54 Livestock 55-61 |
| NM4 (Night) | 26/02/2021 06:40 17°C 0.4 m/s SE | 68 | 57 | 51 | 40 | 47 | 43 | <i>Site related noise events:</i> DCM: Barely Audible Haul trucks 25-31 L_{Aeq}(15minute) contribution <25 dBA L_{Amax} contribution 31 dBA <i>Other noise events:</i> Road traffic 34-37 Insects 40-52 Birdsong 40-54 Livestock 55-68 |
| NM5 | 26/02/2021 08:22 °C m/s | 68 | 59 | 48 | 40 | 47 | 45 | <i>Site related noise events:</i> DCM: Inaudible <i>Other noise events:</i> Road traffic 35-40 Insects 40-50 Birdsong 40-68 |
| NM6 | 26/02/2021 07:35 18°C 0.6 m/s ESE | 59 | 50 | 43 | 37 | 41 | 38 | <i>Site related noise events:</i> DCM: Barely Audible Engine noise <25 L_{Aeq}(15minute) contribution <25 dBA <i>Other noise events:</i> Aeroplane 41-45 Birdsong 40-55 Insects 37-43 Road traffic 35-43 |

NM1

- DCM operations were inaudible during the operator-attended survey at this location.
- The ambient noise environment at the monitoring location generally consisted of road traffic as well as natural sources such as insects and birdsong.

NM4 Day time

- DCM operations were inaudible during the day time operator-attended survey at this location.
- The ambient noise environment at the monitoring location generally consisted of natural sources such as insects, birdsong and livestock as well as road traffic noise.

NM4 Night-time

- DCM operations were barely audible during the night-time operator attended survey at this location. DCM operations generated an $L_{Aeq(15\text{minute})}$ noise contribution of <25dBA and an L_{Amax} noise levels of up to 31dBA at the monitoring location.
- The ambient noise environment at the monitoring location generally consisted of natural sources such as insects, birdsong and livestock as well as road traffic noise.

NM5

- DCM operations were inaudible during the operator-attended survey at this location.
- The ambient noise environment at the monitoring location generally consisted of natural sources such as insects and birdsong as well as road traffic noise.

NM6

- DCM operations were barely audible during the operator-attended survey at this location. DCM operations generated an $L_{Aeq(15\text{minute})}$ noise contribution of <25dBA at the monitoring location.
- The ambient noise environment at the monitoring location generally consisted of road traffic and aeroplane noise as well as natural sources such as birdsong.

5 Performance Assessment

Results of the operator-attended noise measurements compared with the relevant noise criteria contained in the Project Approval and EPL 11701 are given in **Table 4**.

Table 4 Performance Assessment – Operations

| Location | Estimated DCM $L_{Aeq(15\text{minute})}$ Contribution dBA | Noise Criteria $L_{Aeq(15\text{minute})}$ dBA | Compliance |
|------------------|---|---|------------|
| NM1 | I/A ¹ | 35 | Yes |
| NM4 (day time) | I/A | 35 | Yes |
| NM4 (night-time) | <25 | 37 | Yes |
| NM5 | I/A | 35 | Yes |
| NM6 | <25 | 35 | Yes |

1. I/A = Inaudible

6 Sleep Disturbance

Results of the night period sleep disturbance measurements compared with the relevant noise criteria contained in the Project Approval and EPL 11701 are given in **Table 5**.

Table 5 Performance Assessment – Sleep Disturbance

| Location | DCM LA1(1minute) Contribution | Noise Criteria LA1(1minute) | Compliance |
|----------|-------------------------------|-----------------------------|------------|
| NM4 | 31 | 45 | Yes |

Results presented in **Table 4** and **Table 5** indicate that compliance with the relevant criteria was achieved at all operator-attended monitoring locations.

7 Conclusion

SLR has conducted quarterly noise monitoring for the DCM guided by the requirements of the NMP.

Operator-attended operational noise monitoring was conducted at four locations on Friday 26 February 2021. The assessment of daytime and night-time operational noise emissions found DCM to be compliant with the relevant criteria contained within the DCM PA and EPL.

APPENDIX A

Acoustic Terminology

The following is a brief description of the acoustic terminology.

| Acoustic Terminology | Description |
|----------------------|---|
| 'A' Weighted | Frequency filter applied to measured noise levels to represent how humans hear sounds. |
| dBA | 'A' Weighted overall sound pressure level. |
| L90 , L10, L1 | A statistical measurement giving the sound pressure level which is exceeded for the given percentile of an observation period, i.e., L90 is the level which is exceeded for 90 percent of an observation period. L90 is commonly referred to as the background sound level. |
| LAm _{ax} | Highest value of the A-weighted sound pressure level with a specified time weighting that occurs during a given event. |

APPENDIX B

Operator-attended Noise Survey Charts

Figure B1 – Day Period – NM1 Operator Attended Noise Survey Results

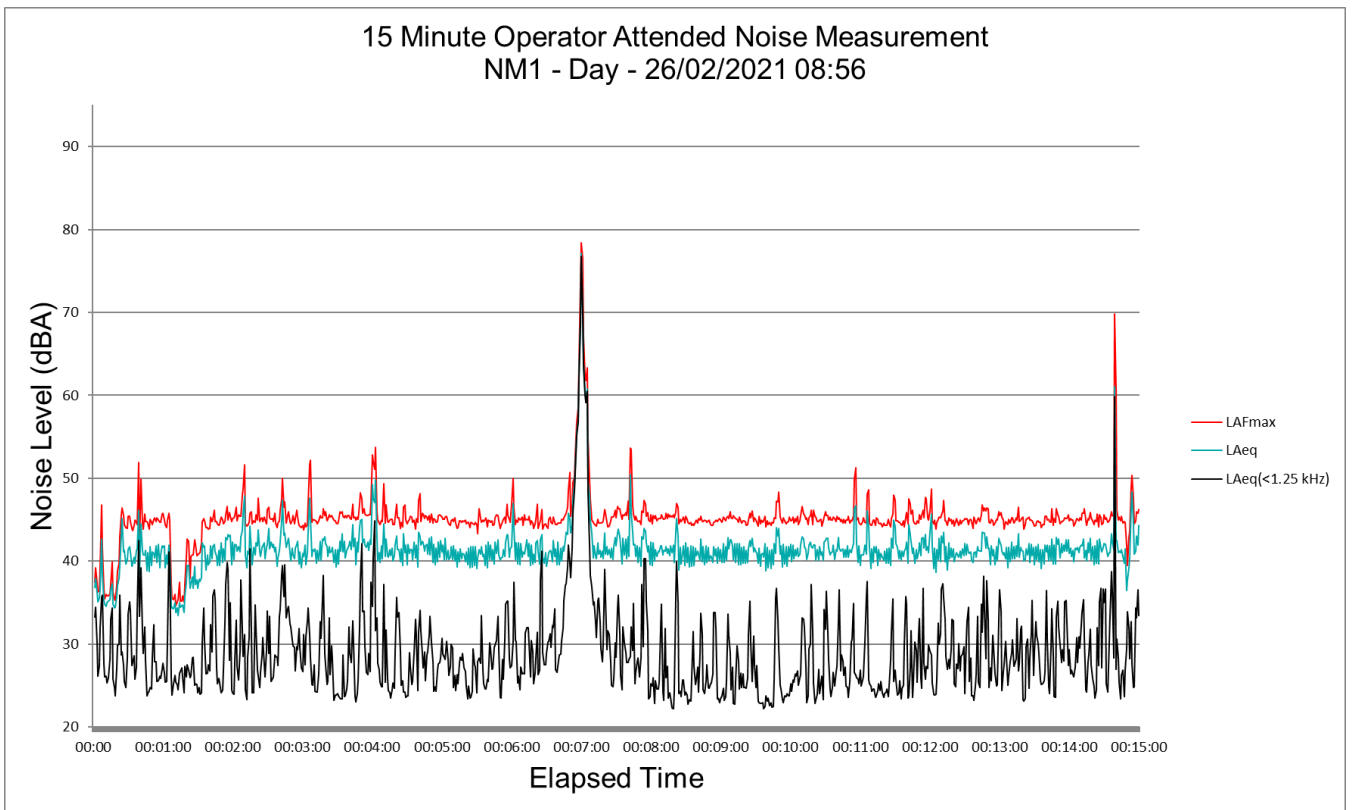


Figure B2 – Day Period – NM4 Operator Attended Noise Survey Results

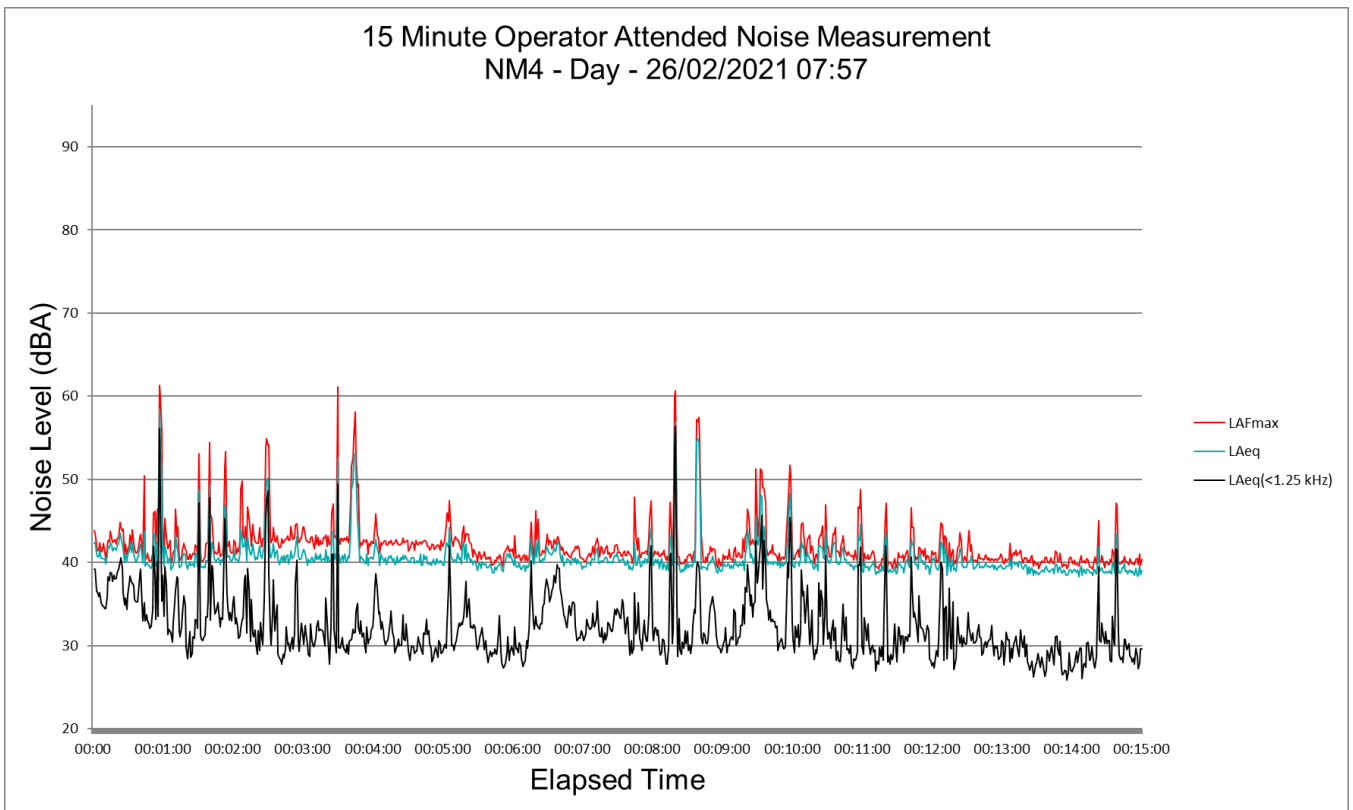


Figure B3 – Night Period – NM4 Operator Attended Noise Survey Results

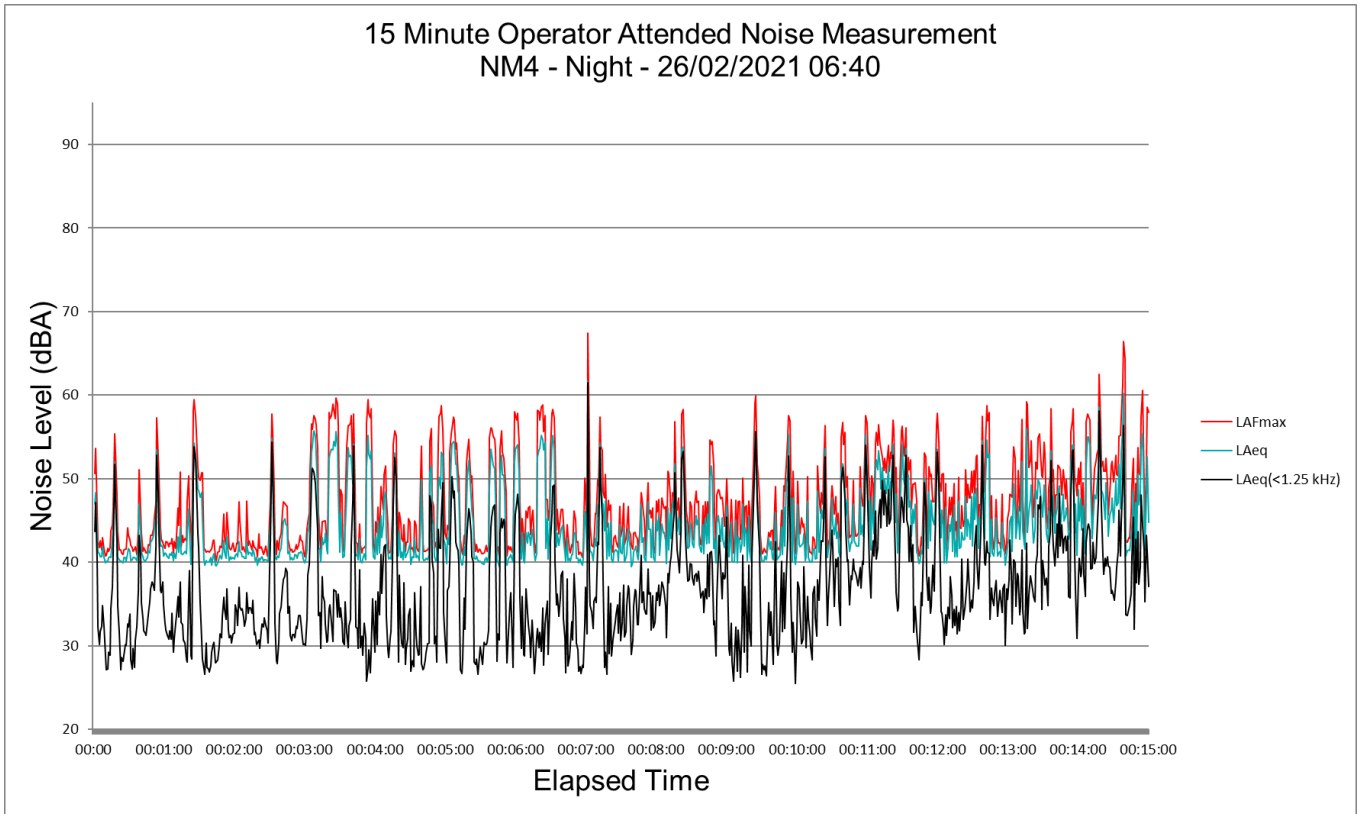


Figure B4 – Day Period – NM5 Operator Attended Noise Survey Results

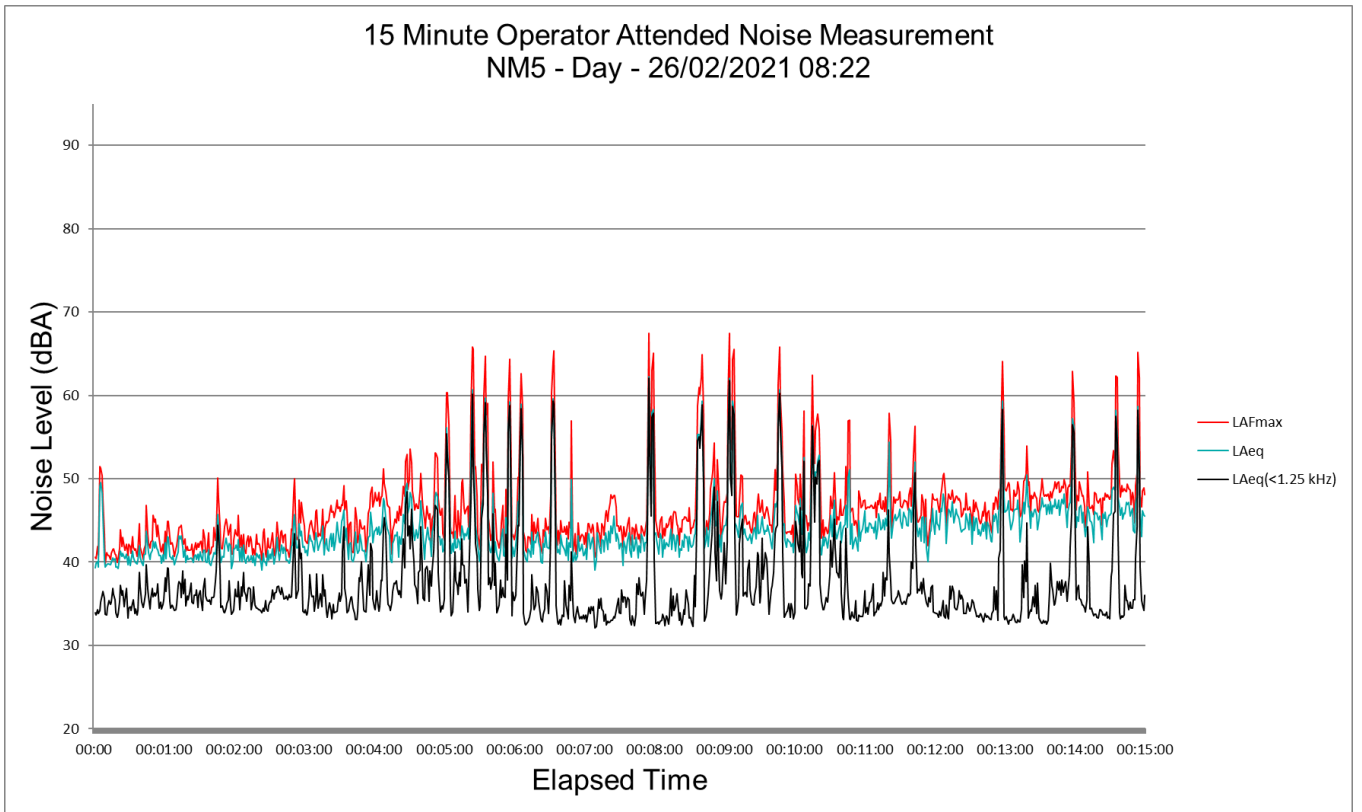
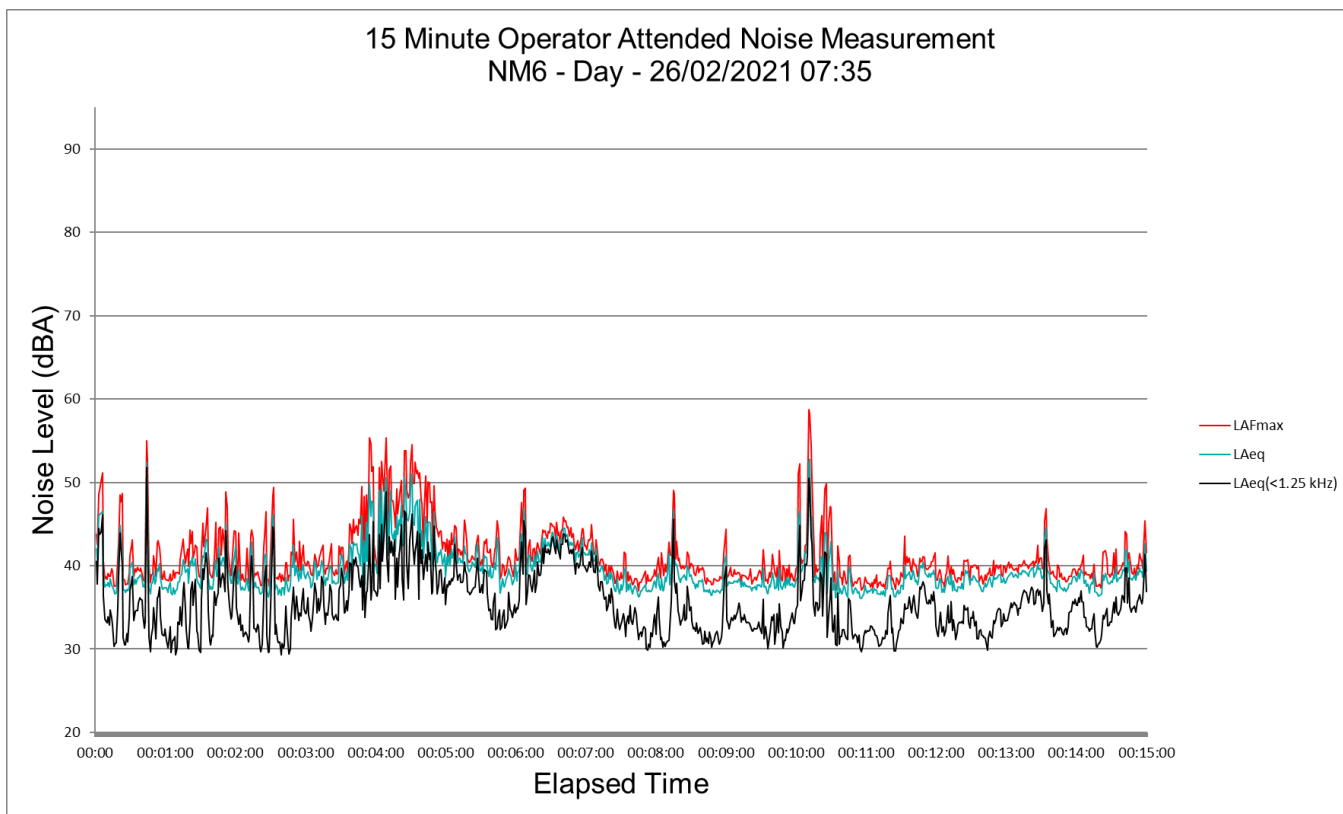


Figure B5 – Day Period – NM6 Operator Attended Noise Survey Results



ASIA PACIFIC OFFICES

BRISBANE

Level 2, 15 Astor Terrace
Spring Hill QLD 4000
Australia
T: +61 7 3858 4800
F: +61 7 3858 4801

CANBERRA

GPO 410
Canberra ACT 2600
Australia
T: +61 2 6287 0800
F: +61 2 9427 8200

DARWIN

Unit 5, 21 Parap Road
Parap NT 0820
Australia
T: +61 8 8998 0100
F: +61 8 9370 0101

GOLD COAST

Level 2, 194 Varsity Parade
Varsity Lakes QLD 4227
Australia
M: +61 438 763 516

MACKAY

21 River Street
Mackay QLD 4740
Australia
T: +61 7 3181 3300

MELBOURNE

Level 11, 176 Wellington Parade
East Melbourne VIC 3002
Australia
T: +61 3 9249 9400
F: +61 3 9249 9499

NEWCASTLE

10 Kings Road
New Lambton NSW 2305
Australia
T: +61 2 4037 3200
F: +61 2 4037 3201

PERTH

Ground Floor, 503 Murray Street
Perth WA 6000
Australia
T: +61 8 9422 5900
F: +61 8 9422 5901

SYDNEY

Tenancy 202 Submarine School
Sub Base Platypus
120 High Street
North Sydney NSW 2060
Australia
T: +61 2 9427 8100
F: +61 2 9427 8200

TOWNSVILLE

12 Cannan Street
South Townsville QLD 4810
Australia
T: +61 7 4722 8000
F: +61 7 4722 8001

WOLLONGONG

Level 1, The Central Building
UoW Innovation Campus
North Wollongong NSW 2500
Australia
T: +61 2 4249 1000

AUCKLAND

68 Beach Road
Auckland 1010
New Zealand
T: 0800 757 695

NELSON

6/A Cambridge Street
Richmond, Nelson 7020
New Zealand
T: +64 274 898 628