Noise Monitoring Assessment

Northparkes Mines

Quarter 2, 2023

Prepared for: CMOC Mining Services Pty Ltd
June 2023
MAC190810RP17

Muller Acoustic Consulting

Document Information

Noise Monitoring Assessment

Northparkes Mines

Quarter 2, 2023

Prepared for: CMOC Mining Services Pty Limited

PO Box 995

Parkes NSW 2870

Prepared by: Muller Acoustic Consulting Pty Ltd
PO Box 678, Kotara NSW 2289
ABN: 36 602 225 132
P: +61 2 4920 1833
www.mulleracoustic.com

Document ID	Date	Prepared By	Signed	Reviewed By	Signed
MAC190810RP17	28 June 2023	Kristian Allen		Rod Linnett	

CONTENTS

This page has been intentionally left blank

1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by CMOC Mining Services Pty Limited (CMOC) to complete a Noise Monitoring Assessment (NMA) for Northparkes Mines (Northparkes), 27km Northwest of Parkes, NSW. The NMA has been completed to quantify operational noise emissions as per Conditions 1 to 5 of Schedule 3 of the Project Approval Conditions (PA11_110060) and the Northparkes Noise Management Plan (NMP, 2019).

The assessment has been conducted in accordance with the following documents:

- NSW Environment Protection Authority (EPA) 2017, Noise Policy for Industry (NPI);
- NSW Environment Protection Authority (EPA's), Approved methods for the measurement and analysis of environmental noise in NSW, 2022; and
- Australian Standard AS 1055:2018 - Acoustics - Description and measurement of environmental noise - General Procedures.

A glossary of terms, definitions and abbreviations used in this report is provided in **Appendix A.**

This page has been intentionally left blank

2 Noise Criteria

2.1 Operational Noise Criteria

This assessment has adopted criteria as per Conditions 1 to 5 of Schedule 3 of the Development Consent Conditions (PA11_110060) and the Northparkes Noise Management Plan (Northparkes, 2019) (see **Appendix B**) and is summarised below in **Table 1**.

Table 1 Noise Criteria

Location	Day	Evening	Night	
	dB $LA_{eq(15min)}$	dB $LA_{eq(15min)}$	dB $LA_{eq(15min)}$	dB $LA_{1(1min)}$
All privately-owned land	35	35	35	45

Additionally, the conditions state:

Operational Noise generated by the project will be measured in accordance with the relevant requirements of the NSW Industrial Noise Policy.

These limits apply under all meteorological conditions except the following:

- *during periods of rain or hail;*
- *average wind speeds at microphone height exceeds 5 m/s;*
- *wind speeds greater than 3 m/s at 10 metres above ground level; or*
- *temperature inversion conditions of up to 3 °C/100m or alternatively a stability class of G.*

Except for wind speed at the microphone height, the data to be used for determining meteorological conditions will be that recorded by the meteorological station located onsite. Operational noise generated by the project is to be measured in accordance with the relevant requirements of the NSW Industrial Noise Policy. Appendix 5 sets out the meteorological conditions under which these criteria apply, and the requirements for evaluating compliance with these criteria.

These limits do not apply if NPM have an agreement with the relevant owner/s of the residences or land to generate higher noise levels, and NPM has advised the Department in writing of the terms of the agreement.

This page has been intentionally left blank

3 Assessment Methodology

All attended noise monitoring surveys for this assessment were conducted in general accordance with the procedures described in Australian Standard AS 1055:2018, "Acoustics - Description and Measurement of Environmental Noise" and the NMP.

The acoustic instrumentation used carries appropriate and current NATA (or manufacturer) calibration certificates with records of all calibrations maintained by MAC as per Approved methods for the measurement and analysis of environmental noise in NSW (EPA, 2022) and complies with AS/NZS IEC 61672.1-2019-Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed ±0.5dBA.

3.1 Operational Noise Measurement Methodology

The locality surrounding the mine is primarily rural/residential. In accordance with the NMP, five representative receivers were selected for this assessment and are presented in **Table 2.**

Table 2 Noise Monitoring Locations

ID	Location	Coordinate Locations, MGA55	
		Easting (m)	Northing (m)
NM1	Hubberstone	600687	6360754
NM2	Lone Pine	593669	6358933
NM3	Milpose	594827	6352971
NM4	Hillview	602993	6353469
NM5	Adavale	593568	6356920

Note: NM5 is an additional monitoring initiative by NPM.

Monitoring locations with respect to the mine site are shown visually in **Figure 1**.

Measurements were carried out using a Svantek Type 1, 971 noise analyser from Tuesday 23 May 2023 to Wednesday 24 May 2023. The monitoring regime consisted of three 15-minute measurements during the daytime, evening and night-time periods at each monitoring location. Throughout each survey, the operator quantified the contribution of significant noise sources where possible.

FIGURE 1

Locality Plan

MAC190810

Northparkes Mine

KEY

Monitoring Locations

0 400 800 1200 1600 2000 m

N

MAC Muller Acoustic Consulting

4 Results

4.1 Operational Noise Results

The monitoring assessment results for each location are presented in **Table 3** to **Table 7**. Each table contains results for each of the three 15-minute measurements for daytime, evening and night-time periods for each location including wind direction, wind speed and atmospheric stability class.

Table 3 Operator-Attended Noise Survey Results – Location NM1, Hubberstone

Date/Time (hrs) Duration 15min	Noise Descriptor (dBA re 20 μPa)			Meteorology	Description and SPL, dBA
	L_{Amax}	L_{Aeq}	L_{A90}		
Day					
16:34 24/05/23	68	43	23	WD: SW WS: <0.5m/s Stab Class: E	Birds 20-68 Traffic 25-46 Insects 20-25 Livestock 25-38 Site Inaudible
16:49 24/05/23	57	34	23		
17:04 24/05/23	51	33	15		
Site $L_{Aeq(15min)}$ Contribution					<30
Evening					
20:08 23/05/23	41	22	20	WD: S WS: <0.1m/s Stab Class: F	Wildlife 25-34 Birds 25-38 MAC Operator Noise 41-53 NPM – Processing 20-25 (barely to just audible throughout)
20:23 23/05/23	34	22	20		
20:38 23/05/23	53	22	20		
Site $L_{Aeq(15min)}$ Contribution					<30
Night					
01:15 24/05/23	41	27	25	WD: S WS: 0.1m/s Stab Class: G	Dogs Barking 25-35 Livestock 25-42 NPM – Processing 23-29 (just audible throughout)
01:30 24/05/23	41	27	25		
01:45 24/05/23	42	26	24		
Site $L_{Aeq(15min)}$ Contribution					<30
Site $L_{A1(1min)}$ Contribution					<45

Note: NPM denotes Northparkes Mines.

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Table 4 Operator-Attended Noise Survey Results – Location NM2, Lone Pine					
Date/Time (hrs) Duration 15min	Noise Descriptor (dBA re 20 μPa)			Meteorology	Description and SPL, dBA
	L_{Amax}	L_{Aeq}	L_{A90}		
Day					
15:35 24/05/23	72	41	21	WD: SW WS: 0.5m/s Stab Class: D	Birds 20-72 Insects 20-28 Traffic 25-77 Residential Noise 30-44 Site Inaudible
15:50 24/05/23	77	51	24		
16:05 24/05/23	70	50	21		
Site $L_{Aeq(15min)}$ Contribution					<30
Evening					
21:09 23/05/23	41	17	13	WD: S WS: <0.1m/s Stab Class: E	Rural Hum <20 Birds 20-42 Dogs Barking 20-28 Site Inaudible
21:24 23/05/23	41	18	14		
21:39 23/05/23	42	18	13		
Site $L_{Aeq(15min)}$ Contribution					<30
Night					
22:00 23/05/23	35	18	15	WD: S WS: <0.1m/s Stab Class: G	Rural Hum <20 Wildlife 20-34 Dogs Barking 20-41 Site Inaudible
22:15 23/05/23	41	20	14		
22:30 23/05/23	40	18	13		
Site $L_{Aeq(15min)}$ Contribution					<30
Site $L_{A1(1min)}$ Contribution					<45

Note: NPM denotes Northparkes Mines.

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Table 5 Operator-Attended Noise Survey Results – Location NM3, Milpose					
Date/Time (hrs) Duration 15min	Noise Descriptor (dBA re 20 μPa)			Meteorology	Description and SPL, dBA
	L_{Amax}	L_{Aeq}	L_{A90}		
Day					
13:46 24/05/23	62	35	18	WD: SW WS: 1.0m/s Stab Class: A	Insects 20-34 Birds 20-62 Wind Gusts 30-55 Site Inaudible
14:01 24/05/23	48	27	18		
14:16 24/05/23	62	35	18		
Site $L_{Aeq(15min)}$ Contribution					<30
Evening					
20:19 24/05/23	39	23	21	WD: S WS: <0.5m/s Stab Class: G	Dogs Barking 25-38 MAC Operator 43 NPM - Site Hum 16-24 (barely to just audible throughout)
20:34 24/05/23	41	21	19		
20:49 24/05/23	43	23	19		
Site $L_{Aeq(15min)}$ Contribution					<30
Night					
00:01 24/05/23	47	23	18	WD: S WS: 0.1m/s Stab Class: G	Dogs Barking 20-36 Wildlife 20-35 Birds 20-39 MAC Operator 47 NPM - Site Hum 16-23 (barely to just audible throughout)
00:16 24/05/23	39	21	16		
00:31 24/05/23	41	18	13		
Site $L_{Aeq(15min)}$ Contribution					<30
Site $L_{A1(1min)}$ Contribution					<45

Note: NPM denotes Northparkes Mines.

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Table 6 Operator-Attended Noise Survey Results – Location NM4, Hillview					
Date/Time (hrs) Duration 15min	Noise Descriptor (dBA re 20 μPa)			Meteorology	Description and SPL, dBA
	LA_{max}	LA_{eq}	LA_{90}		
12:31 24/05/23	67	43	27	WD: W WS: 0.5m/s Stab Class: A	Residential Noise 25-67 Traffic 25=-56 Birds 25-48 Agricultural Noise 25-36 Site Inaudible
12:46 24/05/23	54	35	24		
13:01 24/05/23	51	36	27		
Site $LA_{eq(15min)}$ Contribution					<30
Evening					
18:00 24/05/23	69	49	24	WD: SW WS: <0.5m/s Stab Class: E	Traffic 20-69 Birds 20-42 Dogs Barking 20-29 Residential Noise 25-75 Site Inaudible
18:15 24/05/23	72	49	21		
18:30 24/05/23	75	49	22		
Site $LA_{eq(15min)}$ Contribution					<30
Night					
02:17 24/05/23	58	35	20	WD: SE WS: <0.5m/s Stab Class: G	Dogs Barking 25-34 Traffic 20-58 NPM - Site Hum 18-25 (just audible throughout)
02:32 24/05/23	35	23	20		
02:47 24/05/23	42	24	22		
Site $LA_{eq(15min)}$ Contribution					<30
Site $LA_{1(1min)}$ Contribution					<45

Note: NPM denotes Northparkes Mines.

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Table 7 Operator-Attended Noise Survey Results – Location NM5, Adavale					
Date/Time (hrs) Duration 15min	Noise Descriptor (dBA re 20 μPa)			Meteorology	Description and SPL, dBA
	LA_{max}	LA_{eq}	LA_{90}		
Day					
14:42 24/05/23	48	28	23	WD: SW WS: 0.5m/s Stab Class: A	Birds 20-62 Insects 20-25 Distant Traffic 20-26 Aircraft 25-34 Site Inaudible
14:57 24/05/23	51	29	22		
15:12 24/05/23	62	37	24		
Site $LA_{eq(15min)}$ Contribution					<30
Evening					
19:20 24/05/23	45	22	20	WD: S WS: <0.5m/s Stab Class: G	Birds 20-45 MAC Operator 47 NPM - Site Hum 15-23 (barely to just audible throughout)
19:35 24/05/23	47	22	18		
19:50 24/05/23	42	21	18		
Site $LA_{eq(15min)}$ Contribution					<30
Night					
22:57 23/05/23	48	26	20	WD: S WS: 0.1m/s Stab Class: G	Aircraft 20-41 Birds 20-33 MAC Operator 49 NPM - Site Hum 17-24 (barely to just audible throughout)
23:12 23/05/23	38	22	20		
23:27 23/05/23	49	23	20		
Site $LA_{eq(15min)}$ Contribution					<30
Site $LA_{1(1min)}$ Contribution					<45

Note: NPM denotes Northparkes Mines.

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.2 Road Noise Results

As an additional initiative to operational attended noise monitoring, Northparkes include two 1-hour attended noise monitoring measurements at the Hillview monitoring location (NM4) to quantify Northparkes road noise levels associated concentrate trucks movements (where present) and shift change traffic flows. **Table 8** presents the results of the road traffic noise measurements with a comparison against the road noise criteria outlined in the NMP which is consistent with the NSW Road Noise Policy (DECCW, 2011).

Table 8 Operator-Attended Road Noise Survey Results – Location NM4, Hillview

Date/Time (hrs) Duration 1 hour	Measured Noise Level dB $LA_{eq(1hr)}$	Meteorology	Criteria dB $LA_{eq(1hr)}$	Description and SPL dBA
12:31 24/05/23 (Day)	41	WD: W WS: 0.5m/s Stab Class: A	55	Residential Noise 25-67 Traffic 25=-56 Birds 25-48 Agricultural Noise 25-36 NPM Concentrate Truck (offsite) 30-54 (1 Pass) (Approx. 16 vehicles Enter/Exit NPM Site)
18:00 23/05/23 (Evening)	48	WD: SW WS: <0.5m/s Stab Class: E	55	Traffic 20-69 Birds 20-42 Dogs Barking 20-29 Residential Noise 25-75 NPM Concentrate Truck (offsite) 30-55 (2 Passes) (Approx. 84 vehicles Enter/Exit NPM Site)

Note: NPM denotes Northparkes Mines.

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Results of the road noise survey identify that the $LA_{eq(1hr)}$ noise contribution at NM4 is <50dBA for both measurements and hence, satisfy the relevant road noise criteria as outlined in the NMP and the RNP. Observations from MAC operator identified concentrate truck movements during the day and evening measurement periods, at a maximum of two movements per hour, which is in line with previous NPM quarterly measurements.

4.3 Unattended Noise Results

Unattended noise monitors are installed at four attended monitoring locations. Data from the unattended monitors provide a real time method for monitoring noise events, although it is noted that the results include all noise sources (ie project noise and extraneous noise sources). The results are used as a management tool for the project site.

Averaged results of the $LA_{eq(15min)}$ and $LA_{1(1min)}$ metrics from the seven-day monitoring period from Monday 22 May 2023 to Sunday 28 May 2023 for NM1 and NM3 are summarised in **Table 9**. **Appendix C** presents the unattended results in chart format. Metrics for NM2 and NM4 were unavailable due to technical issues.

Table 9 Unattended Noise Survey Results

Period[1]	Noise Descriptor (dBA re 20 μPa)	
	Weekly Average $LA_{eq(15min)}$	Weekly Average $LA_{1(1min)}$[2]
Location NM1, Hubberstone		
Day	49	-
Evening	33	-
Night	39	63
Location NM2, Lone Pine		
Day	N/A	-
Evening	N/A	-
Night	N/A	N/A
Location NM3, Milpose		
Day	52	-
Evening	35	-
Night	32	56
Location NM4, Hillview		
Day	N/A	-
Evening	N/A	-
Night	N/A	N/A

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note 2: Arithmetic average.

This page has been intentionally left blank

5 Discussion

5.1 Operational Noise Discussion

5.1.1 Discussion of Results – Location NM1, Hubberstone.

Attended measurement results for monitoring conducted at NM1, Hubberstone, for the quarter ending June 2023 noise survey, identified that NPM was inaudible during day measurements and generally just audible throughout evening, and night-time measurements.

Contributions from NPM were characterised as general processing hum. External noise sources including birds, traffic, livestock, wildlife, insects, dogs barking, and MAC operator noise, were audible during the monitoring period.

In summary, the noise contribution from NPM satisfied the relevant noise criteria for all monitored assessment periods at Location NM1.

5.1.2 Discussion of Results – Location NM2, Lone Pine.

Attended measurement results for monitoring conducted at NM2, Lone Pine, for the quarter ending June 2023 noise survey, identified that NPM was inaudible during day, evening, and night-time measurements.

External noise sources including, traffic, dogs barking, insects, birds, wildlife, residential noise, and general rural hum were all audible during the monitoring periods.

In summary, the noise contribution from NPM satisfied the relevant noise criteria for all monitored assessment periods at Location NM2.

5.1.3 Discussion of Results – Location NM3, Milpose.

Attended measurement results for monitoring conducted at NM3, Milpose, for the quarter ending June 2023 noise survey, identified that NPM was inaudible during the day measurements and generally just audible throughout evening, and night-time measurements.

Contributions from NPM were characterised as general site hum. External noise sources including birds, insects, dogs barking, wildlife, wind gusts and MAC operator noise were all audible during the monitoring periods.

In summary, the noise contribution from NPM satisfied the relevant noise criteria for all monitored assessment periods at Location NM3.

5.1.4 Discussion of Results – Location NM4, Hillview.

Attended measurement results for monitoring conducted at NM4, Hillview, for the quarter ending June 2023 noise survey, identified that NPM inaudible during day and evening measurements and generally just audible throughout night-time measurements.

Contributions from NPM were characterised as general site hum. External noise sources including traffic, birds, dogs barking, agricultural and residential noise were all audible during the monitoring period.

In summary, the noise contribution from NPM satisfied the relevant noise criteria for all monitored assessment periods at Location NM4.

5.1.5 Discussion of Results – Location NM5, Adavale.

Attended measurement results for additional monitoring conducted at NM5, Adavale, for the quarter ending June 2023 noise survey, indicated that NPM was inaudible during the day measurements and generally just audible during evening, and night-time measurements.

Contributions from NPM were characterised as general site hum. External noise sources including insects, birds, aircraft, and MAC operator noise were all audible during the monitoring period.

In summary, the noise contribution from NPM satisfied the relevant noise criteria for all monitored assessment periods at Location NM5.

6 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed a Noise Monitoring Assessment (NMA) on behalf of CMOC Mining Services Pty Limited (CMOC). The assessment was completed to quantify site noise emissions against relevant noise criteria pertaining to NPM operations in accordance with Conditions 1 to 5 of Schedule 3 of the Development Consent Conditions (PA11_110060) and the Northparkes, Noise Management Plan (NMP, 2019) for Quarter 2, ending June 2023.

Road noise monitoring identified that vehicle movements associated with shift change generated noise levels below the relevant road noise criteria specified in the RNP and NMP.

Attended monitoring has identified that operational emissions generated by NPM comply with relevant noise criteria at all monitoring locations for all assessment periods. Furthermore, project related noise emissions were generally just audible at four monitoring locations during evening and night periods. NPM noise sources such as general site hum were audible and extraneous non-mining sources such as wind in trees, traffic, birds, dogs barking, aircraft, insects, wildlife, and residential noise were audible during the monitoring period.

Appendix A – Glossary of Terms

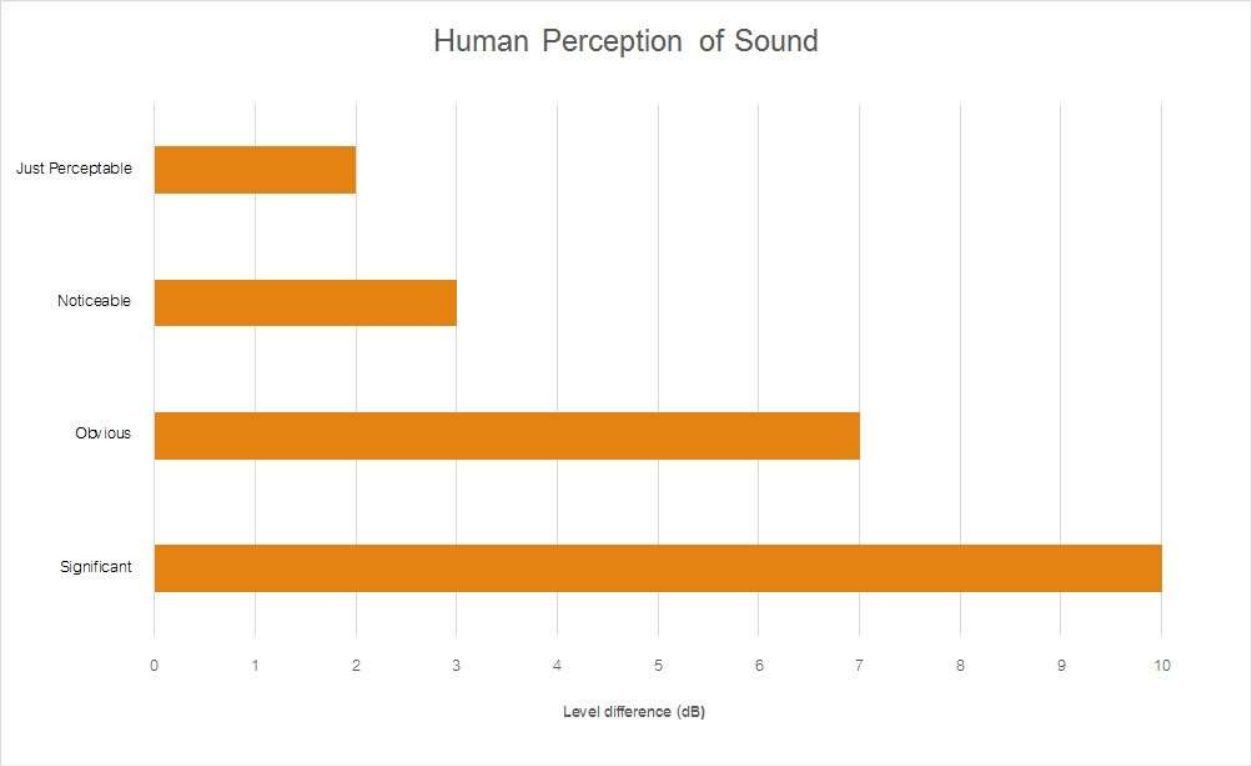
Table A1 provides a number of technical terms have been used in this report.

Table A1 Glossary of Terms	
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured LA90 statistical noise levels.
Adverse Weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient Noise	The noise associated with a given environment. Typically a composite of sounds from many sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z), dB(L)	Decibels Linear or decibels Z-weighted.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A noise level which is exceeded 10 % of the time. It is approximately equivalent to the average of maximum noise levels.
LA90	Commonly referred to as the background noise, this is the level exceeded 90 % of the time.
LAeq	The summation of noise over a selected period of time. It is the energy average noise from a source, and is the equivalent continuous sound pressure level over a given period.
LAmax	The maximum root mean squared (rms) sound pressure level received at the microphone during a measuring interval.
RBL	The Rating Background Level (RBL) is an overall single figure background level representing each assessment period over the whole monitoring period. The RBL is used to determine the intrusiveness criteria for noise assessment purposes and is the median of the ABL's.
Sound power level (LW)	This is a measure of the total power radiated by a source. The sound power of a source is a fundamental location of the source and is independent of the surrounding environment. Or a measure of the energy emitted from a source as sound and is given by : = 10.log10 (W/Wo) Where : W is the sound power in watts and Wo is the sound reference power at 10-12 watts.

Table A2 provides a list of common noise sources and their typical sound level.

Table A2 Common Noise Sources and Their Typical Sound Pressure Levels (SPL), dBA	
Source	Typical Sound Level
Threshold of pain	140
Jet engine	130
Hydraulic hammer	120
Chainsaw	110
Industrial workshop	100
Lawn-mower (operator position)	90
Heavy traffic (footpath)	80
Elevated speech	70
Typical conversation	60
Ambient suburban environment	40
Ambient rural environment	30
Bedroom (night with windows closed)	20
Threshold of hearing	0

Figure A1 – Human Perception of Sound



Appendix B – Regulatory Noise Limits

Table 1 NSW Development Consent Conditions – Schedule 3

<table>
<tr><th>Condition</th><th>Related Section in NMP</th></tr>
<tr><td colspan="2">Noise Criteria</td></tr>
<tr><td>1. The Proponent shall ensure that the noise generated by the project does not exceed the criteria in Table 1 at any residence on privately-owned land.

Table 2 Noise impact assessment criteria dB(A)
<table>
<tr><th rowspan="2">Property</th><th rowspan="2">Day
$L_{Aeq(15min)}$</th><th rowspan="2">Evening
$L_{Aeq(15min)}$</th><th colspan="2">Night</th></tr>
<tr><th>$L_{Aeq(15min)}$</th><th>$L_{A1(1min)}$</th></tr>
<tr><td>All privately-owned land</td><td>35</td><td>35</td><td>35</td><td>45</td></tr>
</table>
Note: To interpret the land referred to in Table 1, see the applicable figures in Appendix 4.

Operational noise generated by the project is to be measured in accordance with the relevant requirements of the NSW Industrial Noise Policy. Appendix 5 sets out the meteorological conditions under which these criteria apply, and the requirements for evaluating compliance with these criteria.</td><td>Section 5.4.1</td></tr>
<tr><td>2. The Proponent shall only carry out the construction works associated with the upgrade of McClintocks Lane, the construction of the McClintocks Lane access road and the upgrade of the intersection of McClintocks Lane and Bogan Road during the day.</td><td>Section 5.4.1</td></tr>
<tr><td>3. During construction of the works referred to in condition 2 of schedule 3, the noise criteria in Table 1 do not apply to the residences located in the vicinity of the works. The Proponent shall implement all reasonable and feasible measures to minimise construction noise impacts on the residences in the vicinity of these works.</td><td>Section 6</td></tr>
<tr><td>4. The Proponent shall:
a) implement best management practice to minimise the construction, operational and road noise of the project;
b) operate a comprehensive noise management system that uses a combination of predictive meteorological forecasting and real-time noise monitoring data to guide the day to day planning, and the implementation of both proactive and reactive noise mitigation measures to ensure compliance with the relevant conditions of this approval;
c) minimise the noise impacts of the project during meteorological conditions when the noise limits in this approval do not apply (see Appendix 5); and
d) carry out regular monitoring to determine whether the project is complying with the relevant conditions of this approval,
To the satisfaction of the Secretary.</td><td>Section 6 & Section 7</td></tr>
<tr><td>5. The Proponent shall prepare and implement a Noise Management Plan for the project to the satisfaction of the Secretary. This plan must:
a) be prepared in consultation with the EPA, and submitted to the Secretary prior to the commencement of construction;
b) describe the measures that would be implemented to ensure compliance with the noise criteria and operating conditions in this approval;
c) describe the proposed noise management system in detail; and
d) include a monitoring program that:
• evaluates and reports on:
– the effectiveness of the noise management system;
– compliance against the noise criteria in this approval; and
– compliance against the noise operating conditions;
• includes a program to calibrate and validate the real-time noise monitoring results with the attended monitoring results over time (so the real-time noise monitoring program can be used as a better indicator of compliance with the noise criteria in this approval and trigger for further attended monitoring); and
• defines what constitutes a noise incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any noise incidents</td><td>Section 6 & Section 7

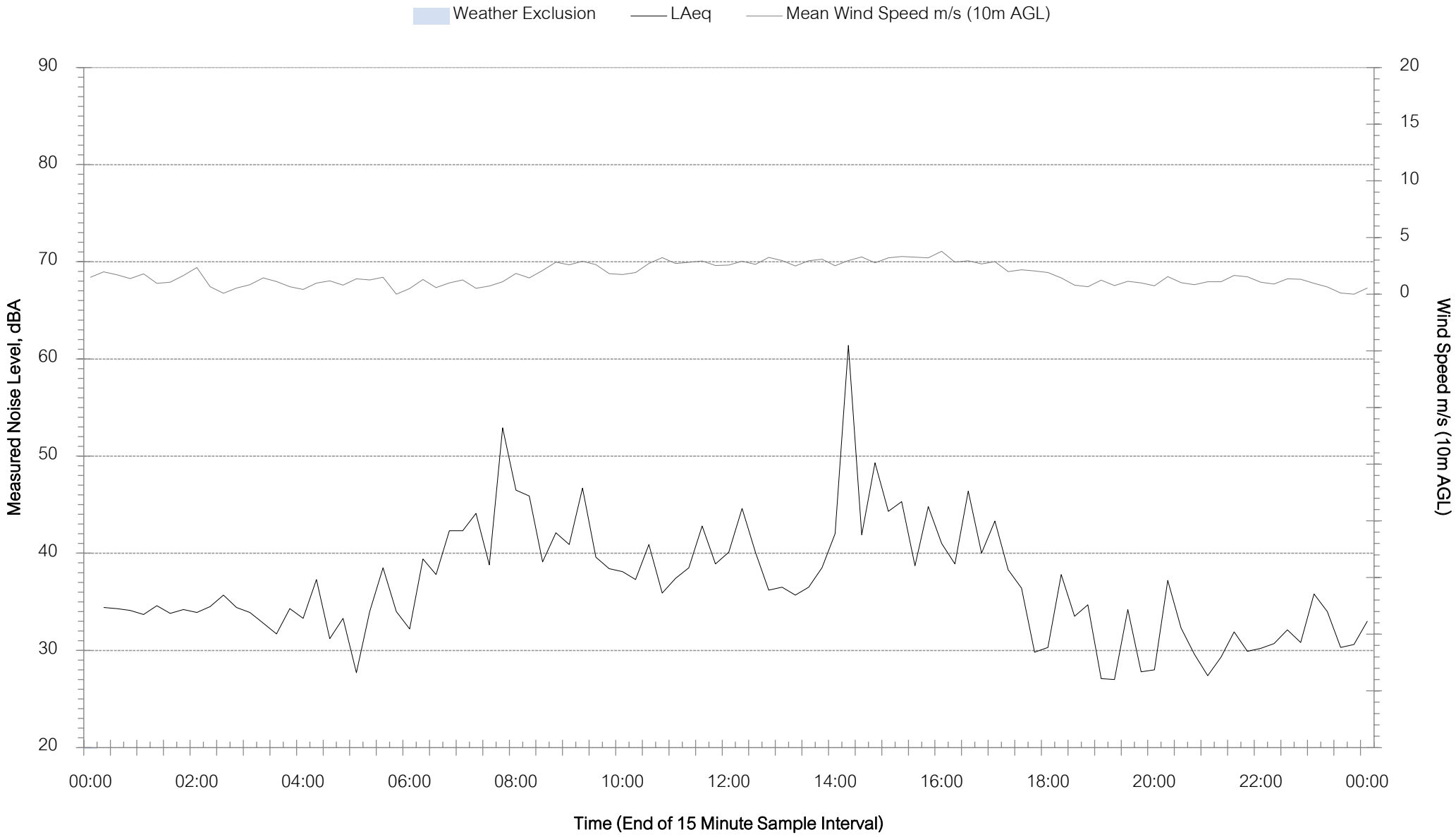
Section 7

Section 7.1</td></tr>
</table>

Appendix C – Unattended Monitoring Charts

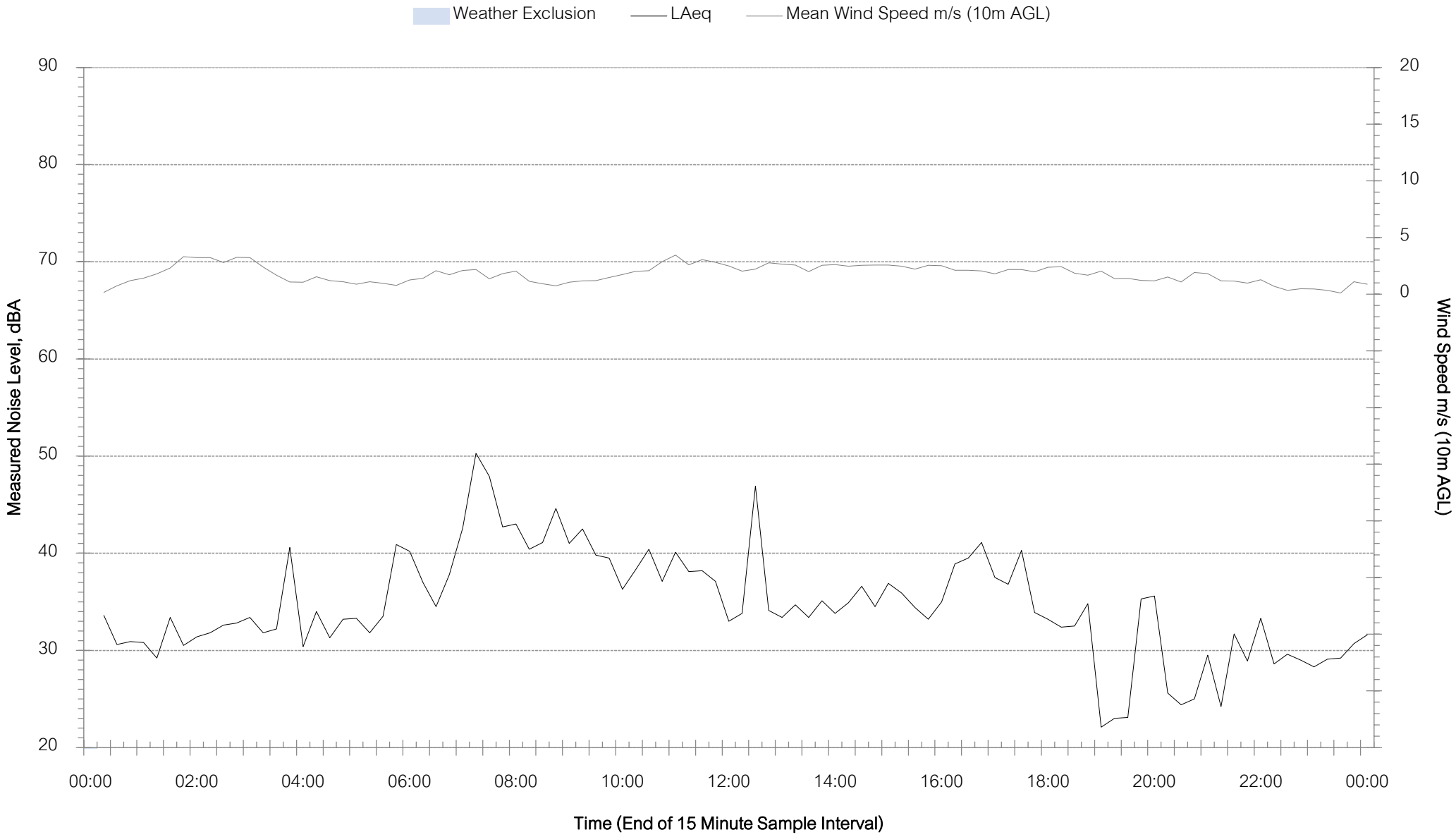
Background Noise Levels

NM1 Hubberstone - Monday 22 May 2023



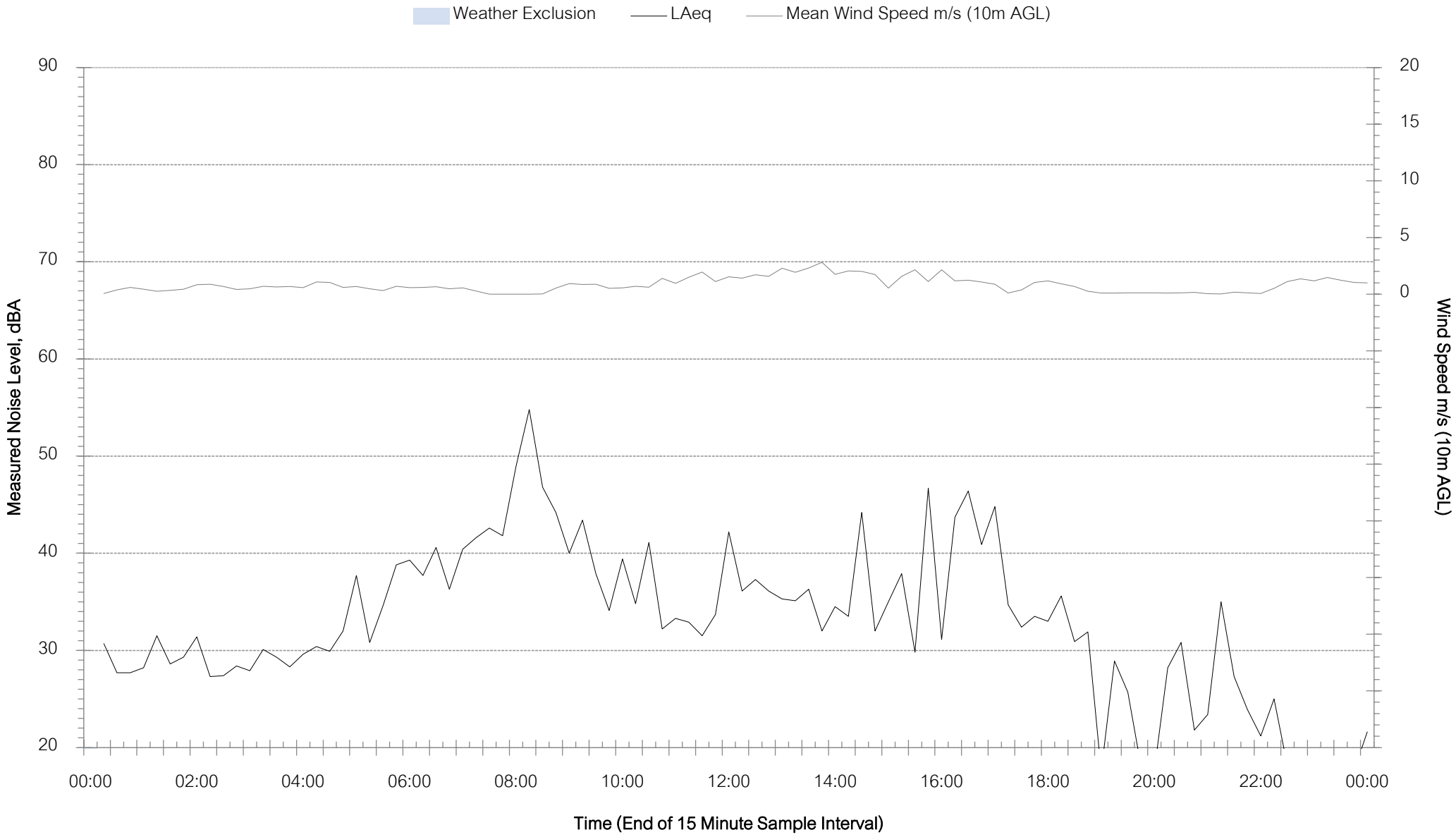
Background Noise Levels

NM1 Hubberstone - Tuesday 23 May 2023



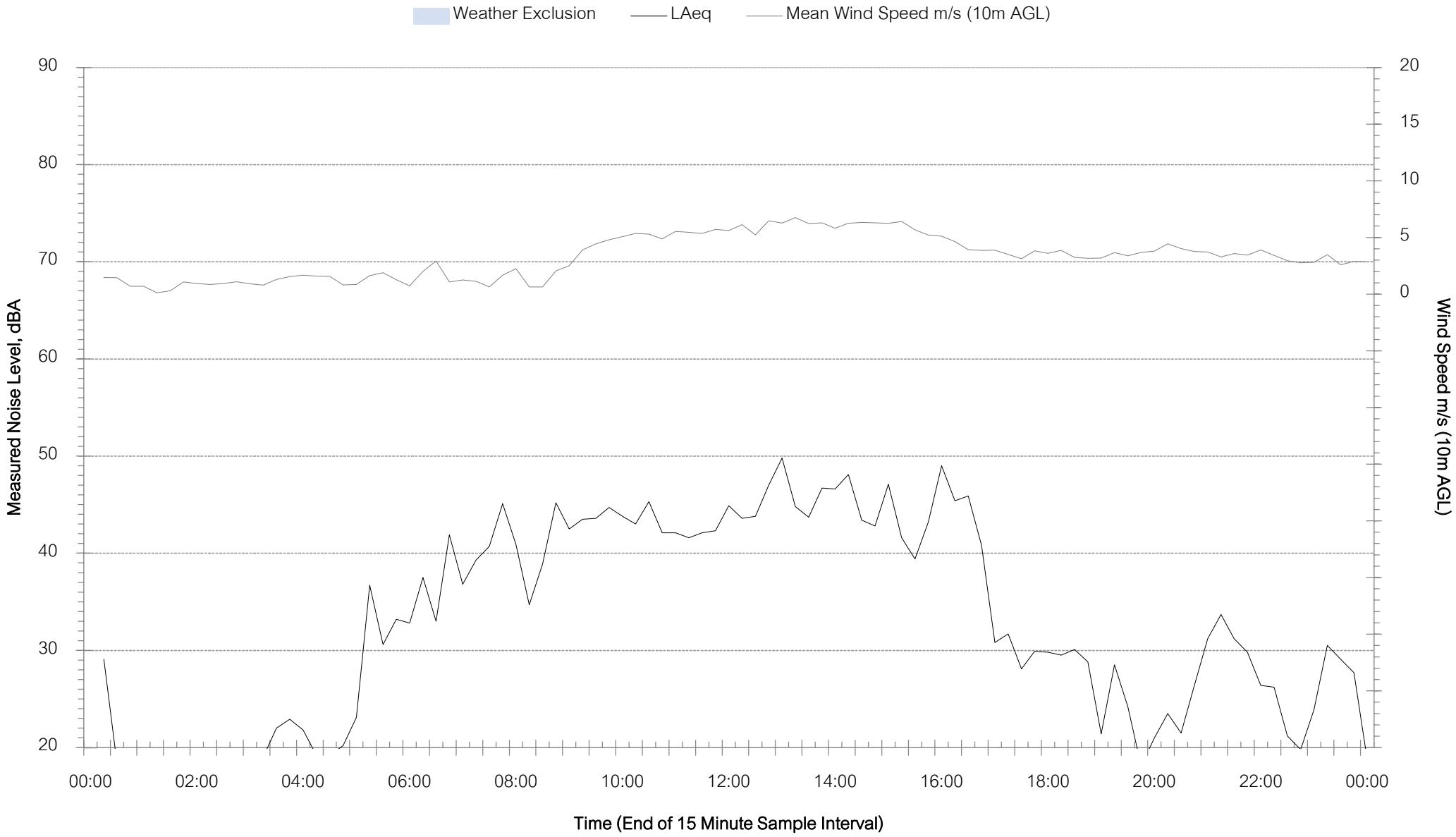
Background Noise Levels

NM1 Hubberstone - Wednesday 24 May 2023



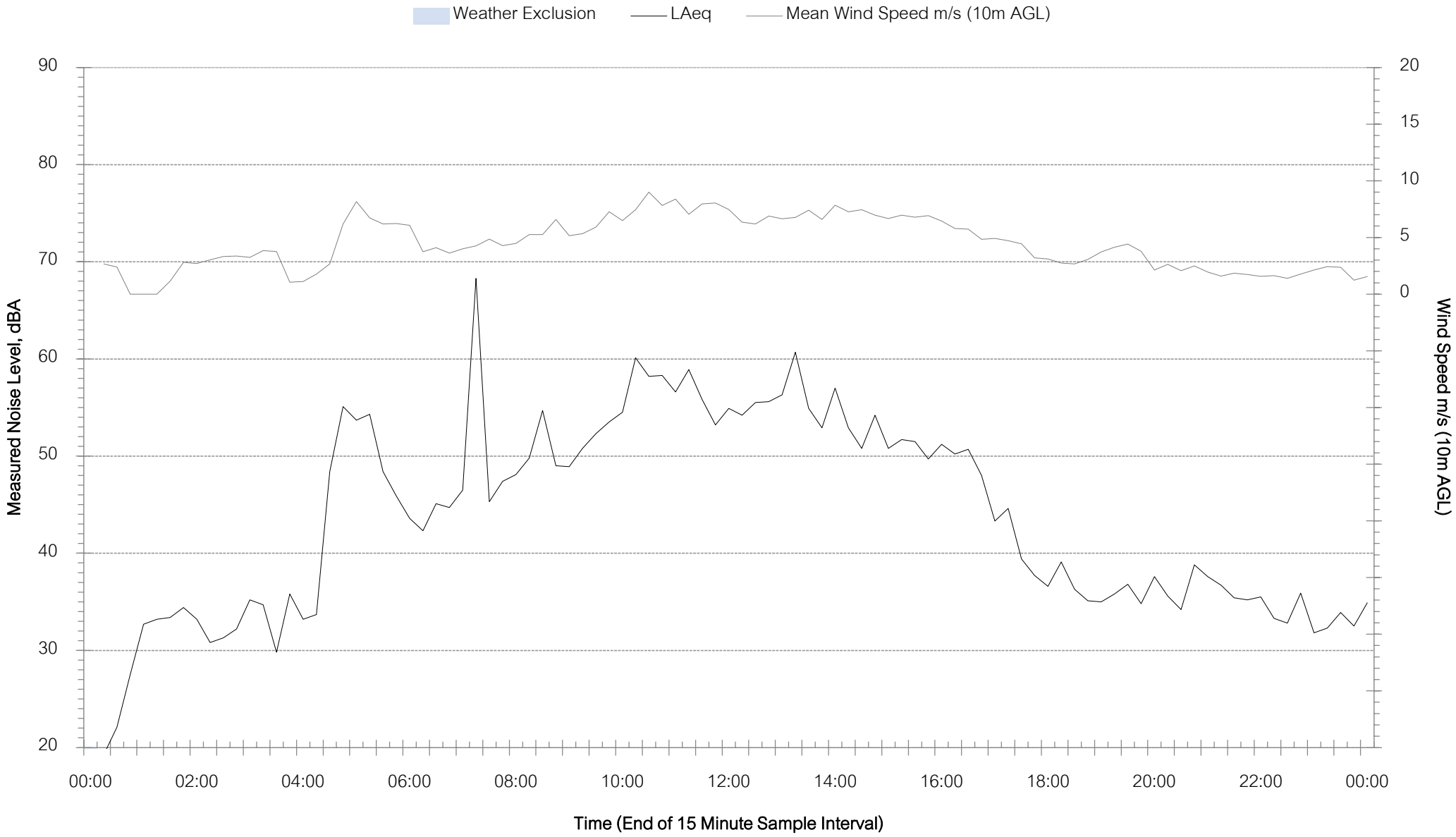
Background Noise Levels

NM1 Hubberstone - Thursday 25 May 2023



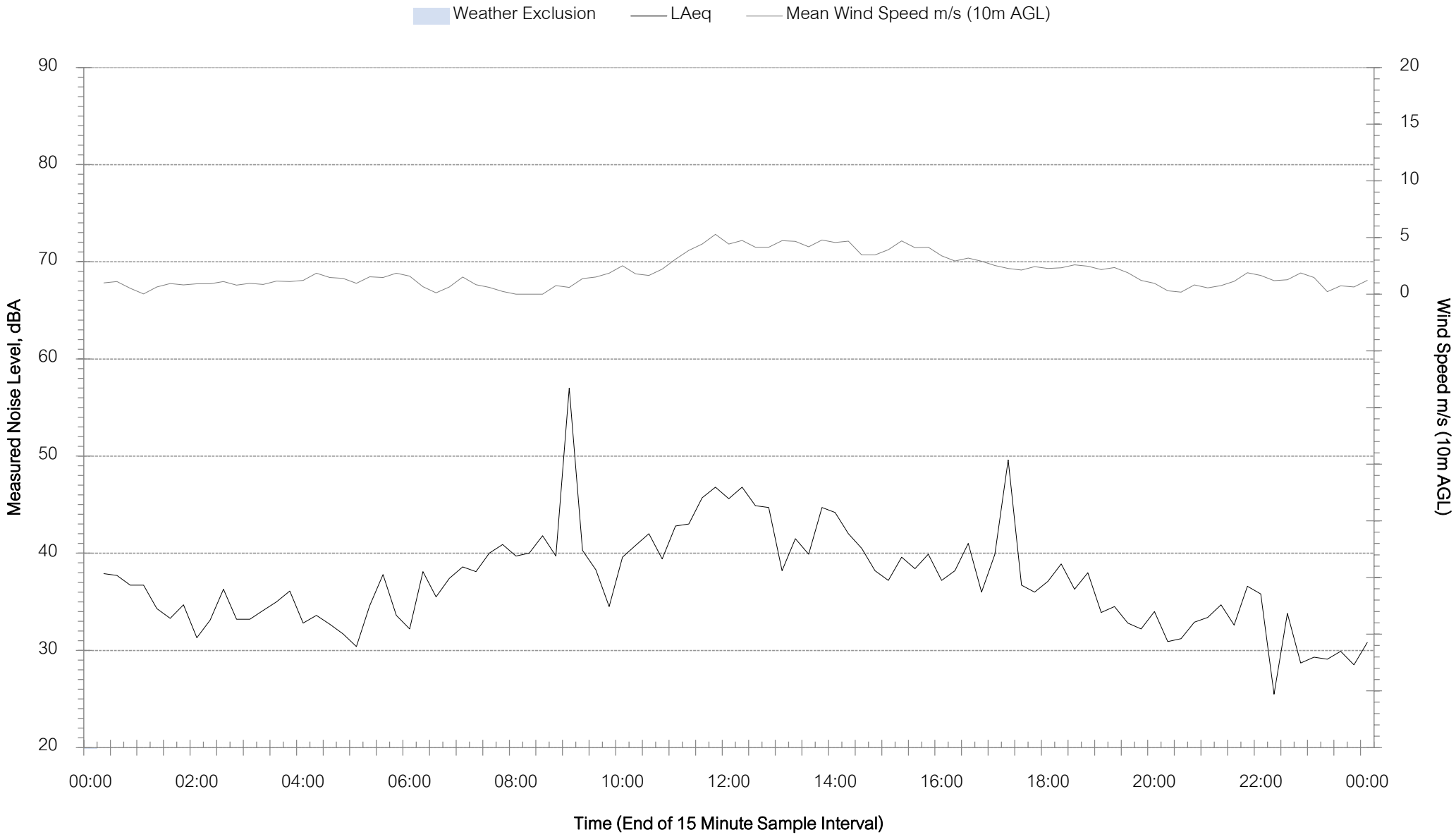
Background Noise Levels

NM1 Hubberstone - Friday 26 May 2023



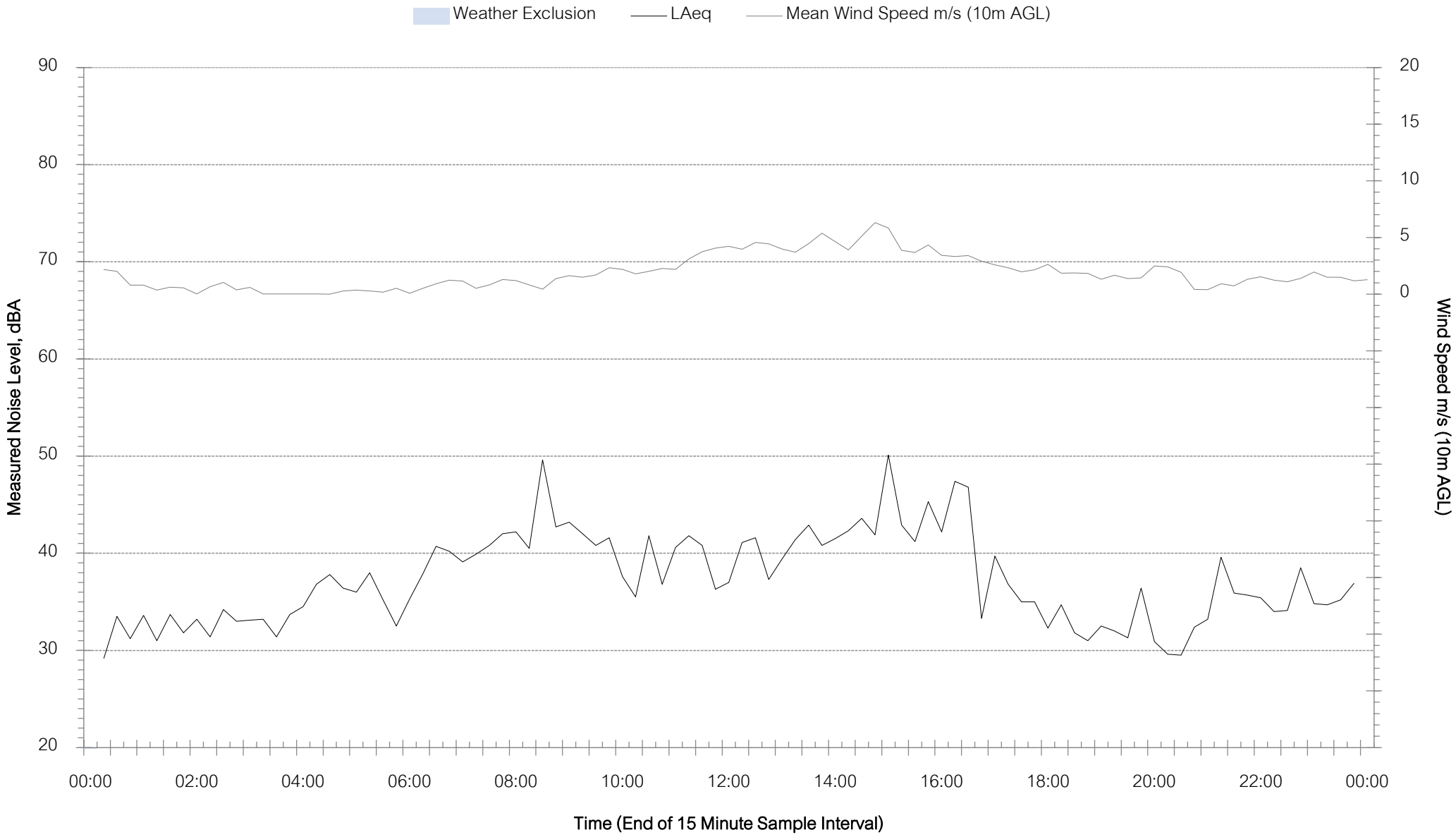
Background Noise Levels

NM1 Hubberstone - Saturday 27 May 2023



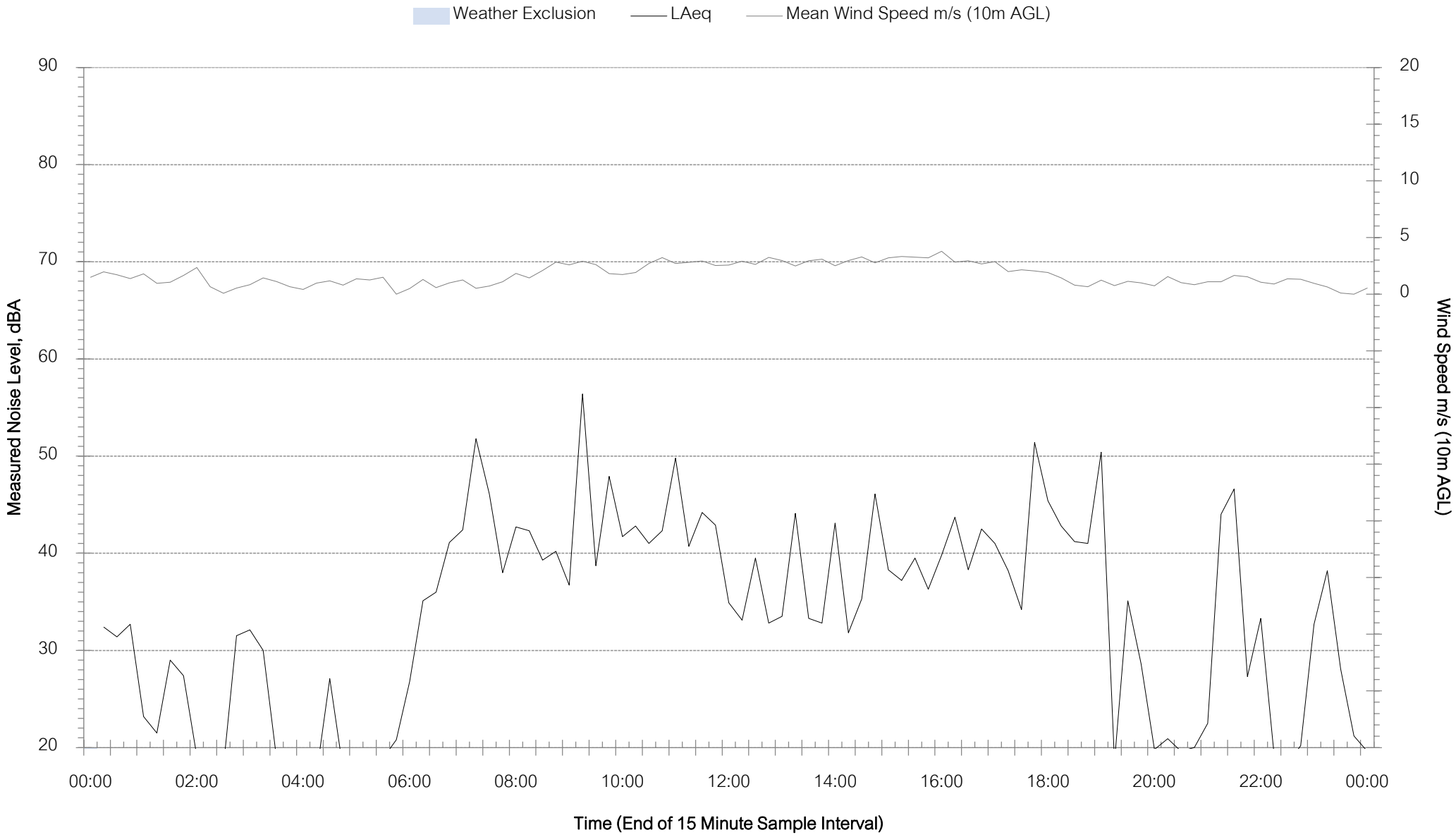
Background Noise Levels

NM1 Hubberstone - Sunday 28 May 2023



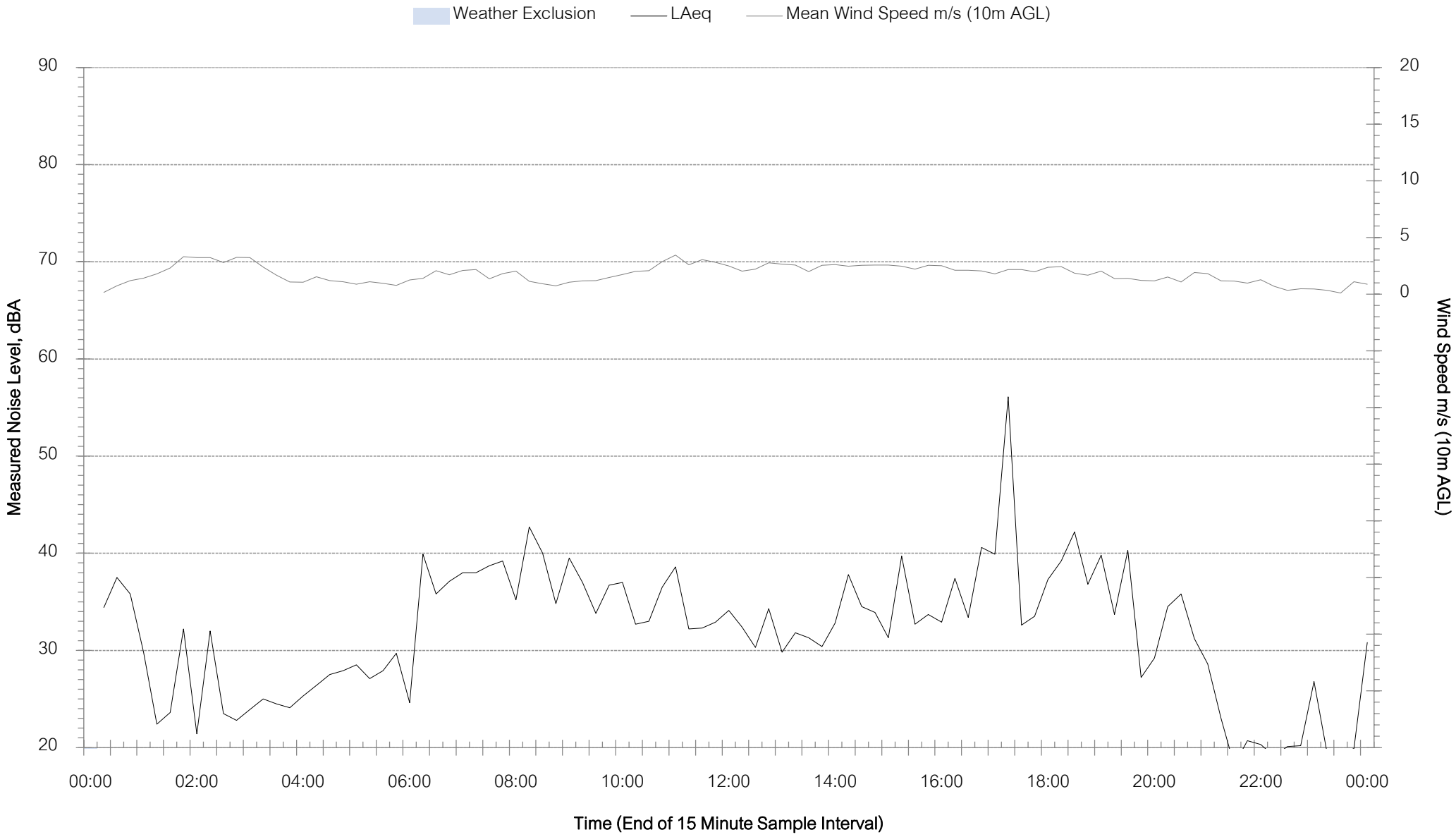
Background Noise Levels

NM3 Milpose - Monday 22 May 2023



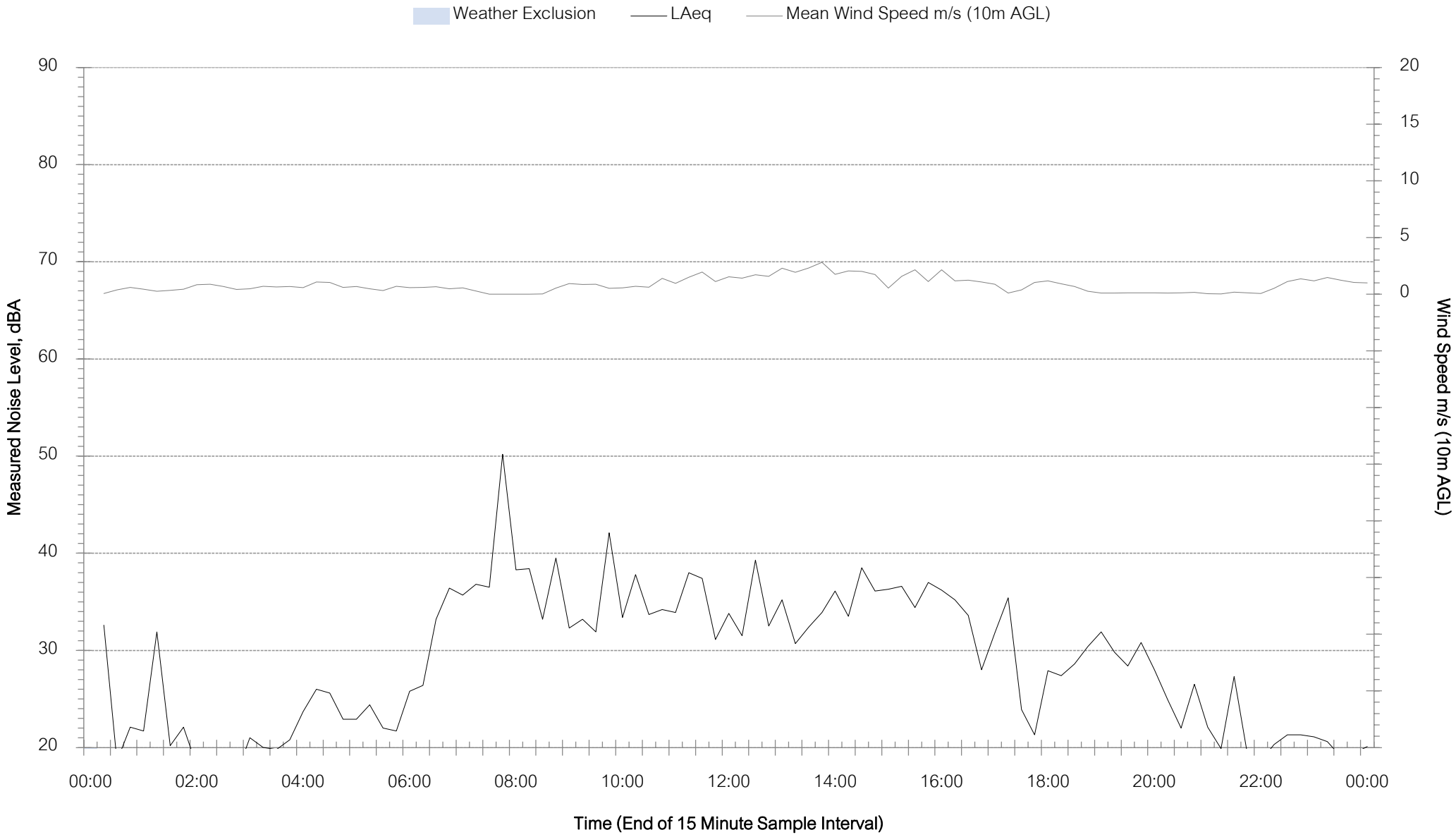
Background Noise Levels

NM3 Milpose - Tuesday 23 May 2023



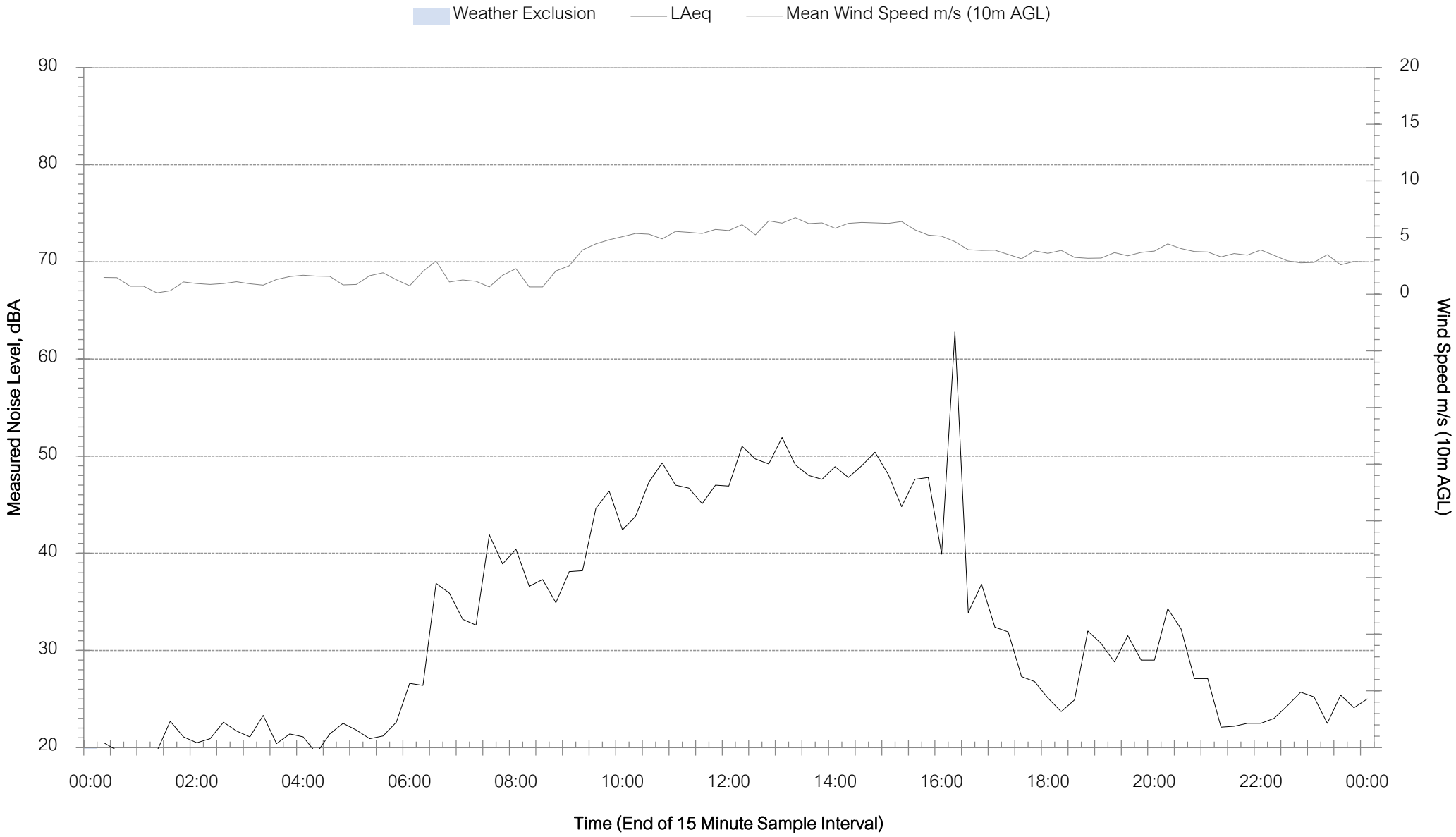
Background Noise Levels

NM3 Milpose - Wednesday 24 May 2023



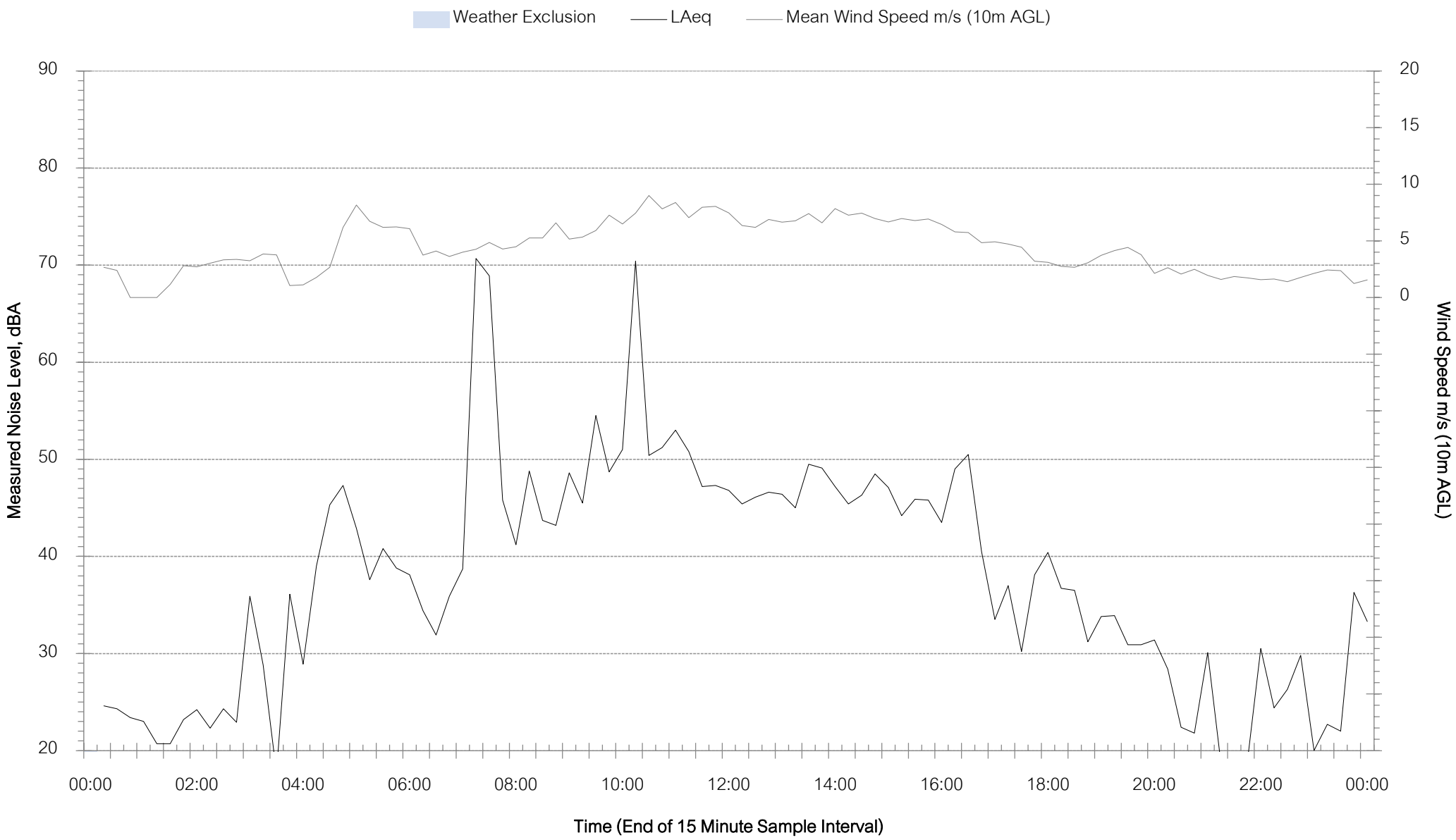
Background Noise Levels

NM3 Milpose - Thursday 25 May 2023



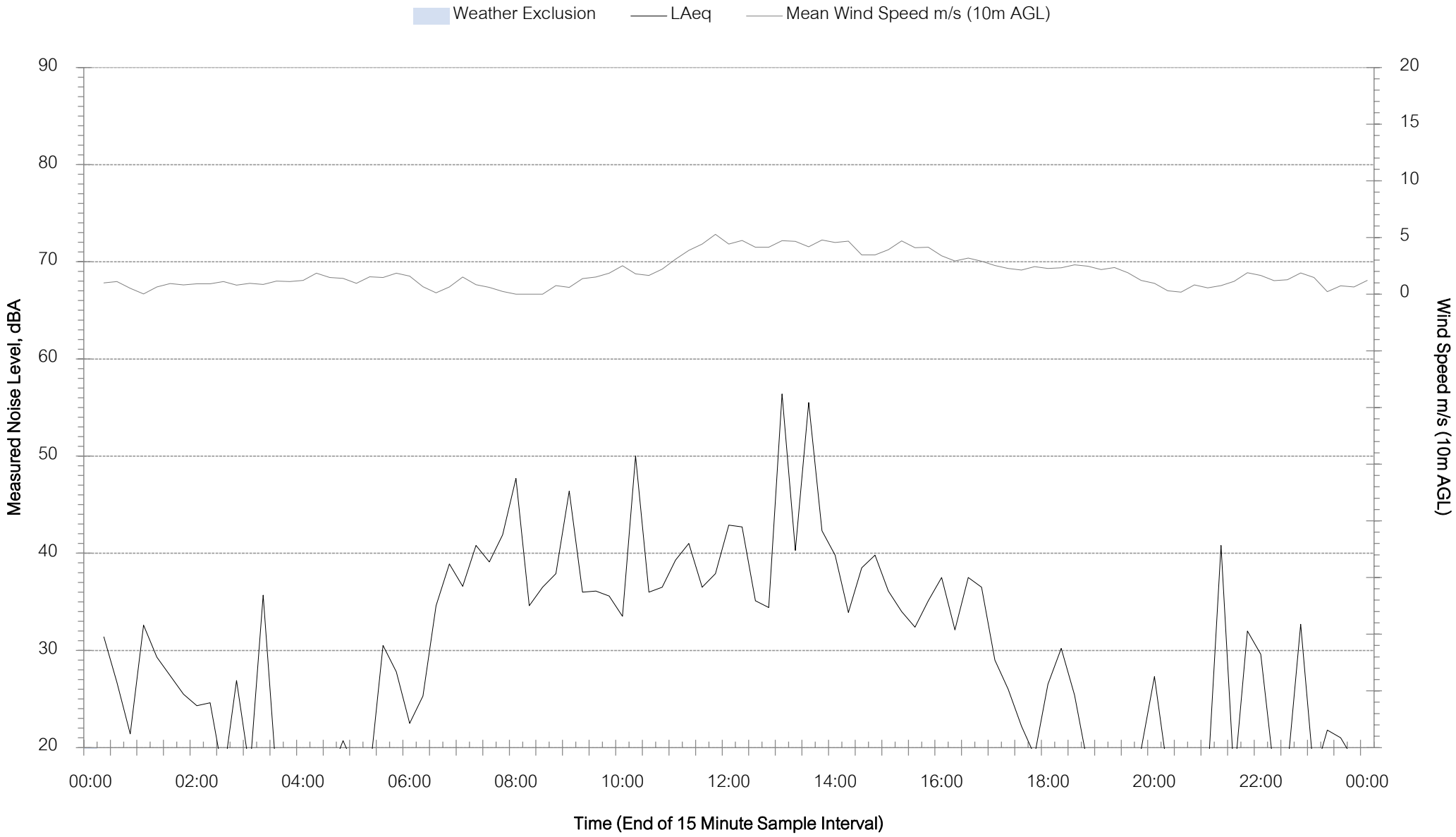
Background Noise Levels

NM3 Milpose - Friday 26 May 2023



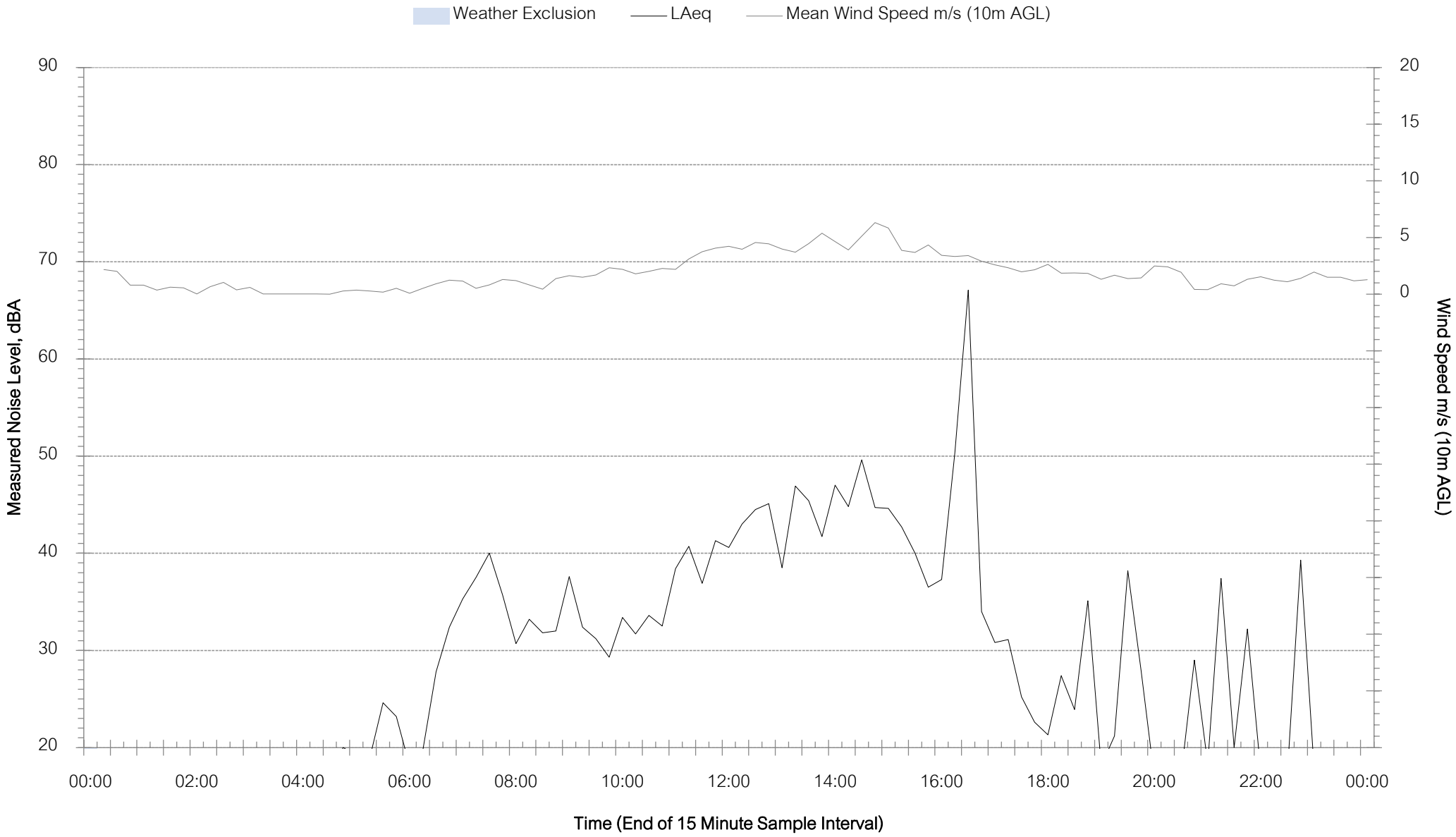
Background Noise Levels

NM3 Milpose - Saturday 27 May 2023



Background Noise Levels

NM3 Milpose - Sunday 28 May 2023



Muller Acoustic Consulting Pty Ltd

PO Box 678, Kotara NSW 2289

ABN: 36 602 225 132

Ph: +61 2 4920 1833

www.mulleracoustic.com

MAC
Muller Acoustic Consulting