Melrose Park, Stage 4, Lot AB

Traffic Noise Impact Assessment

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TABLE OF CONTENTS

1 INTRODUCTION

This report presents an acoustic assessment of a proposed mixed use development at Melrose Park, Stage 4, Lot AB4 Lot AB. The proposed Melrose Park VRS site is located at the address of 657-661 Victoria Road and 4-6 Wharf Road, Melrose Park.

In this report we will:

- Conduct an external noise impact assessment (primarily traffic noise) and recommend acoustic treatments to ensure that a reasonable level of amenity is achieved for future tenants.

ALC have utilised the following documents and regulations in the noise assessment of the development:

- *NSW Department of Planning and Environment's Document – 'Developments near Rail Corridors or Busy Roads – Interim Guideline';*
- Australian and New Zealand AS/NZS 2107:2016 *'Recommended design sound levels and reverberation times for building interiors'* and;

This assessment has been conducted using the Allen, Jack & Cottier architectural drawings, see details below.

Table 1 – Architectural Drawing List

Architect	Drawing Number	Revision	Date	Drawing Number	Revision	Date
Allen Jack and Cottier	DA4-000	A	20/06/2019	DA4-214	A	20/06/2019
	DA4-001	A	20/06/2019	DA4-215	A	20/06/2019
	DA4-100	A	20/06/2019	DA4-310	A	20/06/2019
	DA4-200	A	20/06/2019	DA4-311	A	20/06/2019
	DA4-201	A	20/06/2019	DA4-320	A	20/06/2019
	DA4-202	A	20/06/2019	DA4-321	A	20/06/2019
	DA4-203	A	20/06/2019	DA4-511	A	20/06/2019
	DA4-204	A	20/06/2019	DA4-960	A	20/06/2019
	DA4-205	A	20/06/2019	DA4-961	A	20/06/2019
	DA4-206	A	20/06/2019	DA4-962	A	20/06/2019
	DA4-207	A	20/06/2019	DA4-963	A	20/06/2019
	DA4-208	A	20/06/2019	DA4-964	A	20/06/2019
	DA4-209	A	20/06/2019	DA4-965	A	20/06/2019
	DA4-211	A	20/06/2019	DA4-966	A	20/06/2019
	DA4-211	A	20/06/2019	DA4-967	A	20/06/2019
	DA4-212	A	20/06/2019	DA4-968	A	20/06/2019
	DA4-213	A	20/06/2019	DA4-969	A	20/06/2019

2 SITE DESCRIPTION

The proposed Stage 4, Lot AB, Melrose Park development is to consist of blocks of multistorey residential buildings with ground floor supermarket, 1 level of ground floor car park and 3 levels of basement carparking.

Figure 1 details the site location, surrounding noise sources and measurement positions.

The Melrose Park VRS development site is located at 657-661 Victoria Road and 4-6 Wharf Road, Melrose Park in the block bound by Victoria Road and Wharf Road, these roads carrying respectively high and low volumes of traffic including bus traffic.

The nearest road way to the subject Stage 4 Lot AB site is Victoria Road to the immediate north which carries high volumes of traffic.

Refer to Figure 1 below, which is an aerial photo of the proposed development.

Figure 1 - Site and Measurement Locations

- Unattended noise monitoring – Suitable location previously obtained within the vicinity of the site.
- Attended noise measurement location.

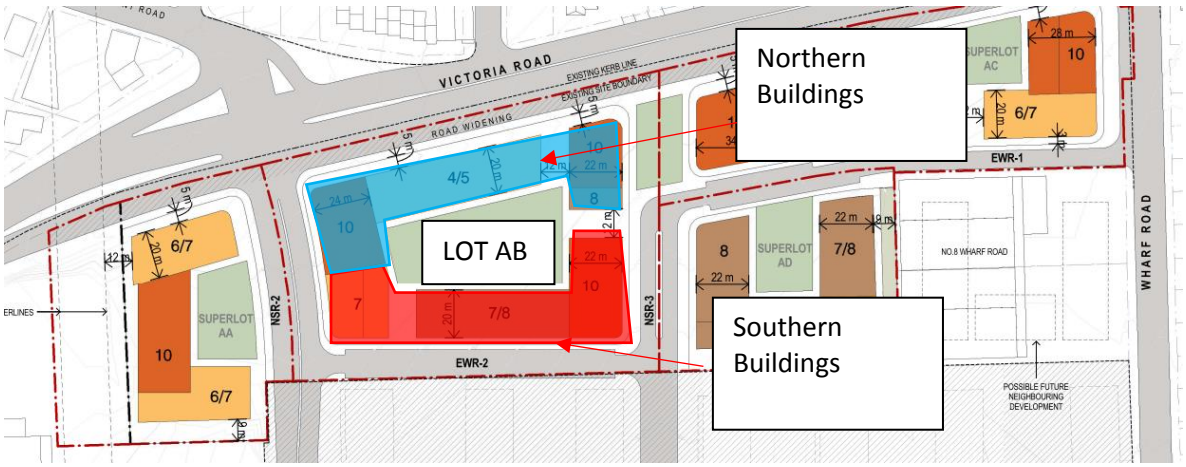


Figure 2 – Proposed Development and Northern and Southern Building Locations

3 NOISE DESCRIPTORS

Traffic noise constantly varies in level, due to fluctuations in speed, vehicle types, road conditions and traffic densities. Accordingly, it is not possible to accurately determine prevailing traffic noise conditions by measuring a single, instantaneous noise level. To accurately determine the effects of traffic noise a 15-20 minute measurement interval is utilised. Over this period, noise levels are monitored on a continuous basis and statistical and integrating techniques are used to determine noise description parameters. These parameters are used to measure how much annoyance would be caused by a particular noise source.

In the case of environmental noise three principle measurement parameters are used, namely L_{10}, L_{90} and L_{eq}.

The L_{10} and L_{90} measurement parameters are statistical levels that represent the average maximum and average minimum noise levels respectively, over the measurement intervals.

The L_{10} parameter is commonly used to measure noise produced by a particular intrusive noise source since it represents the average of the loudest noise levels produced at the source.

Conversely, the L_{90} level (which is commonly referred to as the background noise level) represents the noise level heard in the quieter periods during a measurement interval. The L_{90} parameter is used to set the allowable noise level for new, potentially intrusive noise sources since the disturbance caused by the new source will depend on how audible it is above the pre-existing noise environment, particularly during quiet periods, as represented by the L_{90} level.

The L_{eq} parameter represents the average noise energy during a measurement period. This parameter is derived by integrating the noise levels measured over the measurement period. L_{eq} is important in the assessment of traffic noise impact as it closely corresponds with human perception of a changing noise environment; such is the character of traffic noise.

Current practice favours the L_{eq} parameter as a means of measuring traffic noise, whereas the L_{10} parameter has been used in the past and is still incorporated in some codes. For the reasons outlined above, the L_{90} parameter is not used to assess traffic noise intrusion.

4 EXTERNAL NOISE INTRUSION ASSESSMENT

Investigation indicates that the primary external noise sources around site are as follows:

- Traffic noise impacts from Victoria Road.

4.1 NOISE INTRUSION CRITERIA

A traffic noise intrusion assessment has been conducted based off the requirements of the following acoustic noise criteria/standards;

- *NSW Department of Planning and Environment's Document – 'Developments near Rail Corridors or Busy Roads – Interim Guideline';*
- Australian and New Zealand AS/NZS 2107:2016 *'Recommended design sound levels and reverberation times for building interiors'*.

4.1.1 NSW Department of Planning and Environment's Document – *'Developments near Rail Corridors or Busy Roads – Interim Guideline'*

Section 3.5 of the NSW Department of Planning's 'Development near Rail Corridors and Busy Roads (Interim Guideline)' states:

"The following provides an overall summary of the assessment procedure to meet the requirements of clauses 87 and 102 of the Infrastructure SEPP. The procedure covers noise at developments for both Road and Rail.

- *If the development is for the purpose of a building for residential use, the consent authority must be satisfied that appropriate measures will be taken to ensure that the following L_{Aeq} levels are not exceeded:*
  - *in any bedroom in the building: 35dB(A) at any time 10pm-7am*
  - *anywhere else in the building (other than a garage, kitchen, bathroom or hallway): 40dB(A) at any time."*

4.1.2 Australian and New Zealand AS/NZS 2107:2016 *'Recommended design sound levels and reverberation times for building interiors'*

Australian Standard AS 2107-2016: Recommended design sound levels and reverberation times for building interiors specifies allowable internal noise levels for internal spaces within residential and commercial buildings. Table 1, in Section 5 of AS 2107-2016, gives the following maximum internal noise levels for commercial buildings and residential buildings near major roads.

Table 2 – Recommended Design Sound Level

Space /Activity Type	Recommended Maximum Design Sound Level dB(A)L_{eq}
Living Areas	40-45 dB(A)$L_{eq(24Hour)}$
Sleeping Areas	35 dB(A)$L_{eq(9Hour)}$
Bathrooms, Ensuites, Laundry	45 dB(A)L_{eq}
Retail	50 dB(A)L_{eq}

4.1.3 AAAC Guideline for Child Care 2013 Criteria

The AAAC Guideline for Child Care Assessment 2013 recommends the following to indoor play areas and sleeping areas for proposals that are located within 60 metres of an arterial road or railway line:

"The noise level LAEQ 1 hour from road, rail traffic or industry at any location within the indoor play or sleeping area areas of the Centre during the hours when the centre is operating shall not exceed 40 dB(A)"

4.1.4 Summary of Criteria

The governing project criteria is presented in the Table 3 below.

Table 3 – Summary of Internal Noise Level Criteria

Space	Internal Traffic Noise Criteria dB(A)L_{eq}
Bedroom	35dB(A)$L_{eq(9hour)}$
Living Space	40dB(A)$L_{eq(24hour)}$
Bathroom	45dB(A)$L_{eq(When\ in\ use)}$
Retail	50 dB(A)L_{eq}
Child Care internal	40 dB(A)$L_{eq\ (1\ hour)}$

4.2 EXTERNAL NOISE MEASUREMENTS

This section of the report details noise measurements conducted at the site to establish traffic surrounding environmental noise levels impacting the development.

4.2.1 Noise Measurements

4.2.2 Measurement Equipment

Attended short term measurements of traffic noise which were undertaken by this office, to supplement the unattended noise monitoring. Measurements were conducted using a Norsonic 140 Sound Analyser. The analyser was set to fast response and calibrated before and after the measurements using a Norsonic Sound Calibrator type 1251. No significant drift was noted.

Unattended noise monitoring was conducting using one Acoustic Research Laboratories Pty Ltd noise logger. The logger was programmed to store 15-minute statistical noise levels throughout the monitoring period. The equipment was calibrated at the beginning and the end of each measurement using a Rion NC-73 calibrator; no significant drift was detected. All measurements were taken on A-weighted fast response mode.

4.2.3 Measurement Locations

Attended Traffic Noise Noise Measurements: These were conducted along Victoria Road, See figure 1 for the measurement locations. Traffic noise measurements had a 180° view of the road and were 3m from the kerb.

An unattended noise monitor was installed along the northern boundary of the project site to determine the external noise levels from Victoria Road. For a detailed location refer to Figure 1. The noise monitor location had a full 180° view of Victoria Road and the logger was located approximately 6m from the kerb.

4.2.4 Measurement Period

Attended traffic noise measurements were undertaken between the hours of 4:00pm and 6:00pm on Thursday 2nd May 2019.

Unattended noise monitoring was conducted Tuesday 30th April 2019 to Wednesday 8th May, 2019

4.2.5 Measured Traffic Noise Measurements

Attended and unattended traffic noise measurements have been summarised below for each location.

4.2.5.1 Attended Traffic Noise Measurements

The following table presents the results of the attended traffic noise measurements.

Table 4 – Attended Traffic Noise Measurements

Location	Time of Measurement	Measured Noise Level dB(A)$L_{eq\ (15Mins)}$
Victoria Road (See Figure 1) 3m from kerb 180° view of the road	4:00 pm – 6:00pm Thursday 2nd May 2019	72 dB(A)

4.2.5.2 Unattended Noise Monitoring

The following table presents the results of the unattended noise monitoring.

Table 5 – Measured Existing Traffic Noise Levels

Location	Summary of Measured Existing Traffic Noise Level	
	Daytime (7am-10pm) dB(A) L_{Aeq}	Night time (10pm-7am) dB(A) L_{Aeq}
Victoria Road (Northern Boundary) approx. 6m from curb (See Figure 1)	70dB(A)$L_{eq(15hour)}$	67 dB(A)$L_{eq(9hour)}$

4.3 NOISE INTRUSION ANALYSIS

Traffic noise intrusion into the proposed development was assessed using the measured and predicted noise levels above.

Calculations were undertaken taking into account the orientation of windows, barrier effects *(where applicable)*, the total area of glazing, facade transmission loss and room sound absorption characteristics. In this way, the likely interior noise levels can be predicted.

4.4 RECOMMENDED CONSTRUCTIONS

4.4.1 Glazed Windows and Doors

The following constructions are recommended to comply with the project noise objectives. Aluminium framed/sliding glass doors and windows will be satisfactory provided they meet the following criteria. All external windows and doors listed are required to be fitted with Q-lon type acoustic seals. (**Mohair Seals are unacceptable**).

Thicker glazing may be required for structural, safety or other purposes. Where it is required to use thicker glazing than scheduled, this will also be acoustically acceptable.

The recommended constructions are listed in the table below. See Figure 2 for approximated locations of southern and northern buildings

Table 6 – Glazing Thickness Requirements – Northern Buildings

Buildings	Façade	Level	Unit	Space	Recommended Glazing	Acoustic Seals
Northern	All	All	-	Commercial Spaces	6.38mm laminated	Yes
	Northern (Facing Victoria Road)	All	All	Bedroom	10.38mm laminated/100mm airgap/6mm toughened	Yes
				Living Room	10.38mm laminated/100mm airgap/6mm toughened	Yes
				Studio	10.38mm laminated/100mm airgap/6mm toughened	Yes
	East and West Facing	Up to Level 8	All	Bedroom	12.38mm Laminated	Yes
				Living	12.38mm Laminated	Yes
				Studio (bed)	12.38mm Laminated	Yes

Note: Mohair seals and/or mohair/plastic fin combination seals are unacceptable.

Table 6 cont – Glazing Thickness Requirements

Buildings	Façade	Level	Unit	Space	Recommended Glazing	Acoustic Seals
Northern	East and West Facing	8 to 12	All	Bedroom	10.38mm Laminated	Yes
				Living	10.38mm Laminated	Yes
				Studio (bed)	10.38mm Laminated	Yes
	Internal Facing east and west	Up to level 8	All	Bedroom	6.38mm Laminated	Yes
				Living	6.38mm Laminated	Yes
				Studio (bed)	6.38mm Laminated	Yes
		Level 8 to 12	All	Bedroom	10.38mm Laminated	Yes
				Living	10.38mm Laminated	Yes
				Studio (bed)	10.38mm Laminated	Yes
	Remaining (Southern facing)	All	All	Bedroom	6.38mm Laminated	Yes
				Living	6.38mm Laminated	Yes
				Studio (bed)	6.38mm Laminated	Yes

Note: Mohair seals and/or mohair/plastic fin combination seals are unacceptable.

Table 7 – Glazing Thickness Requirements – Southern Buildings

Buildings	Façade	Level	Unit	Space	Recommended Glazing	Acoustic Seals
Southern	All	All	All	Bedroom	6.38mm Laminated	Yes
				Living	6.38mm Laminated	Yes
				Studio (bed)	6.38mm Laminated	Yes
	All	1	-	Retail	6mm toughened	Yes
	All	2	-	Child Care	6.38mm Laminated	Yes

Note: Mohair seals and/or mohair/plastic fin combination seals are unacceptable.

In addition to meeting the minimum glazing thickness requirements given, the design of the window mullions, perimeter seals and the installation of the windows/doors in the building openings shall not reduce the R_w rating of the glazing assembly below the values nominated in Table 8. Note that mohair type seals will not be acceptable for the windows requiring acoustic seals.

The glazing shall be selected to meet all requirements and may result in increased glass thicknesses over those specified in this report but shall in no cases fall below the minimum thicknesses and requirements set out in this report.

The proposed suppliers should provide evidence that the window systems proposed have been tested in a registered laboratory with the recommended glass thicknesses and comply with the minimum R_w requirements listed in Table 8.

All glazing must be either a single glazed or a double glazed sheeted glazing system as presented in the table below. We do not recommend the use of any louvred glazing system.

Table 8 - Minimum R_w of Glazing (with Acoustic Seals)

Glazing Assembly	Minimum R_w of Installed Window
6mm toughened	29
6.38mm Laminated	31
10.38mm Laminated	35
12.38mm Laminated	37
10.38mm laminated/100mm airgap/6mm toughened	44

4.4.2 External Walls

External walls composed of concrete or masonry elements will not require upgrading. There should not be vents on the internal skin of external walls. All penetrations in the internal skin of external walls should be acoustically sealed.

4.4.3 Roof/ Ceiling Constructions

Any external roof construction to be constructed from concrete will not require any further acoustic upgrading. In the event that any penetrations are required through the external skin, an acoustic sealant should be used to minimise all gaps.

5 CONCLUSION

This report presents an acoustic assessment of a proposed mixed use development at Melrose Park, Stage 4, Lot AB4 Lot AB. The proposed Melrose Park VRS site is located at the address of 657-661 Victoria Road and 4-6 Wharf Road, Melrose Park.

Provided the glazing construction as recommended in Section 4.3 are implemented, internal noise levels will comply with the internal noise criteria given in Section 4.1 of this report, and fully comply with project expectations, the SEPP 2007 and Australian Standard AS2107:2016.

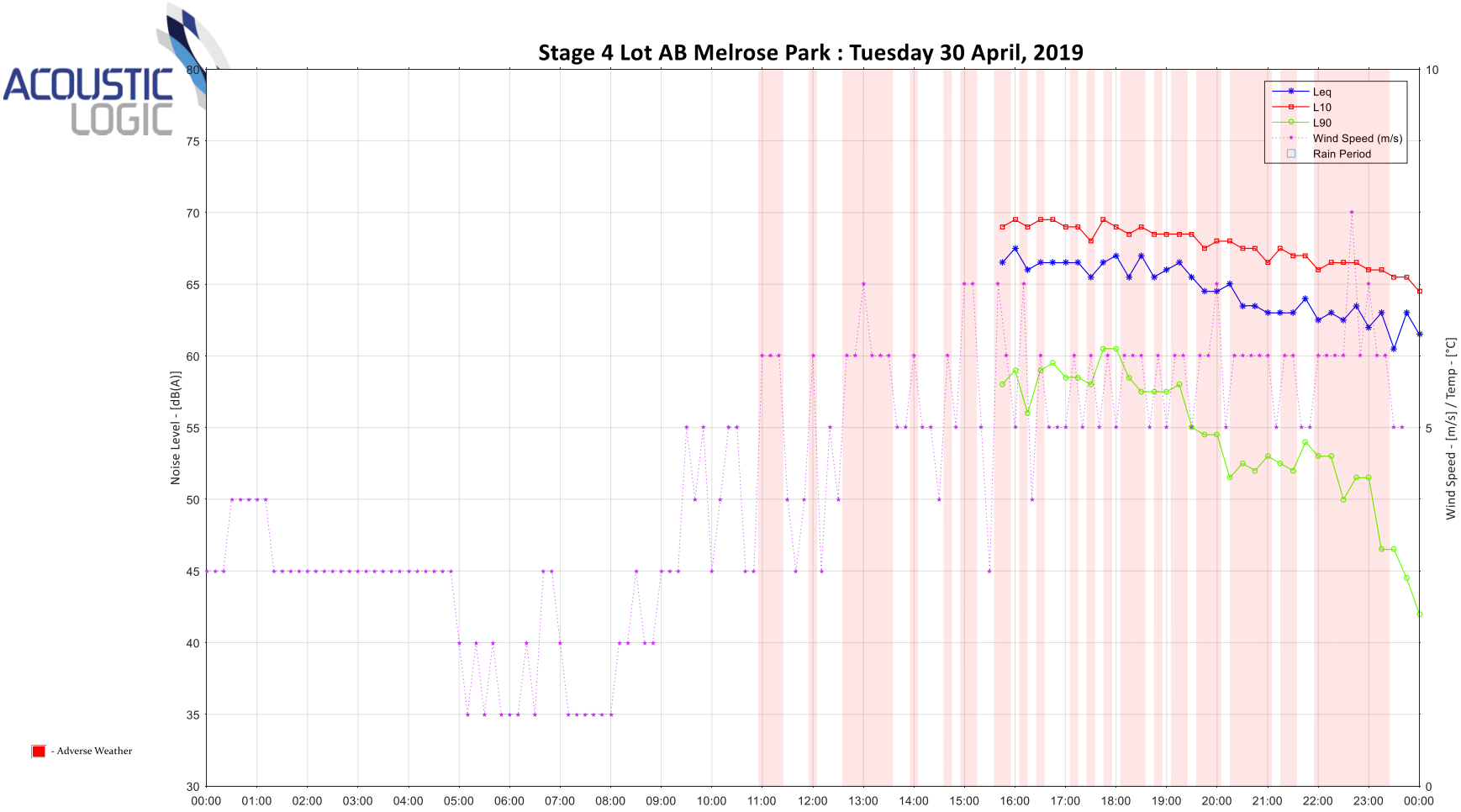
We trust this information is satisfactory. Please contact us should you have any further queries.

Yours faithfully,

Glen Campbell

APPENDIX 1

Unattended Noise Monitoring Data


Stage 4 Lot AB Melrose Park : Tuesday 30 April, 2019
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
80
75
70
65
60
55
50
45
40
35
30
10
5
0
00:00
01:00
02:00
03:00
04:00
05:00
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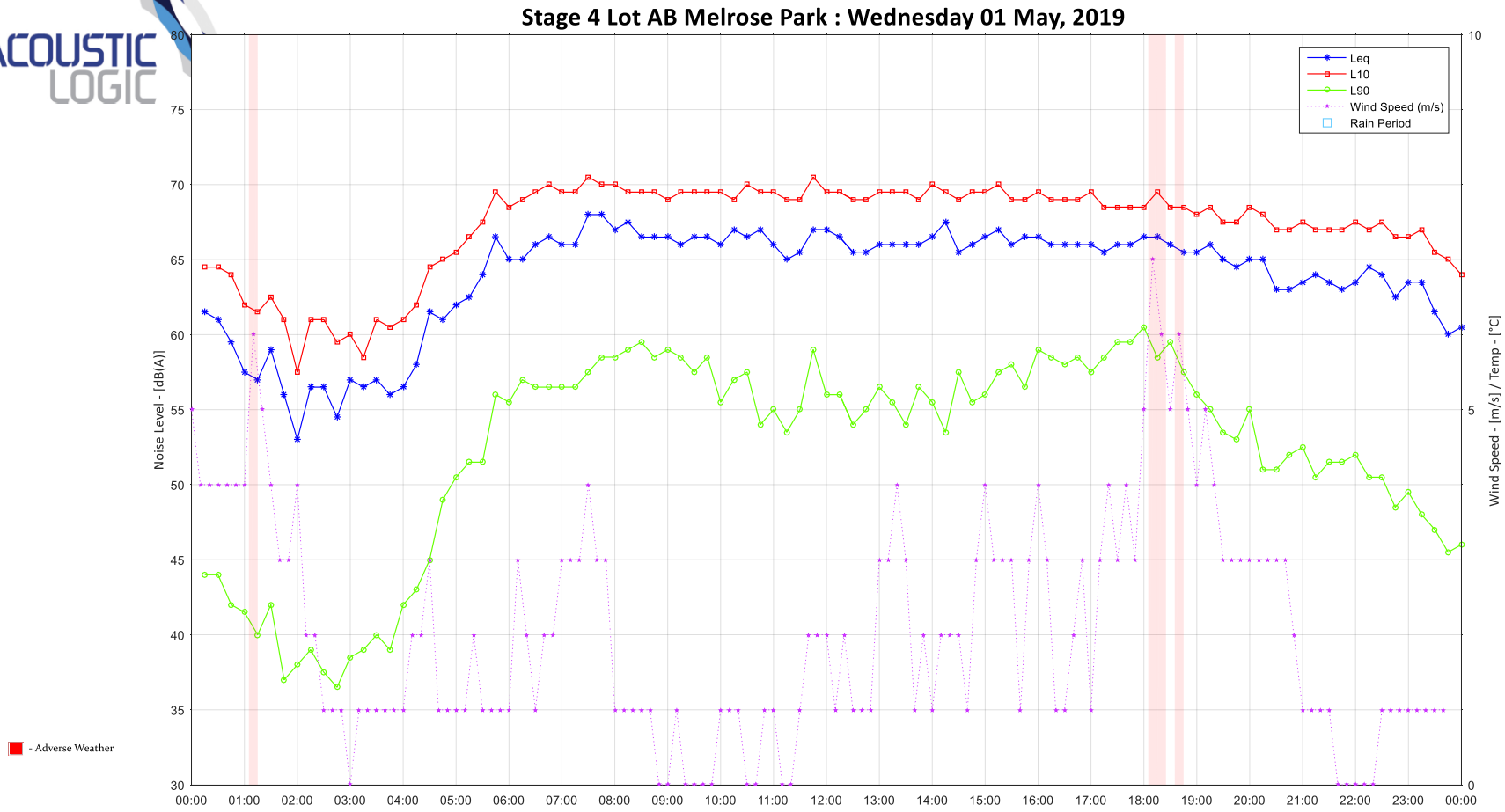
- Adverse Weather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Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
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75
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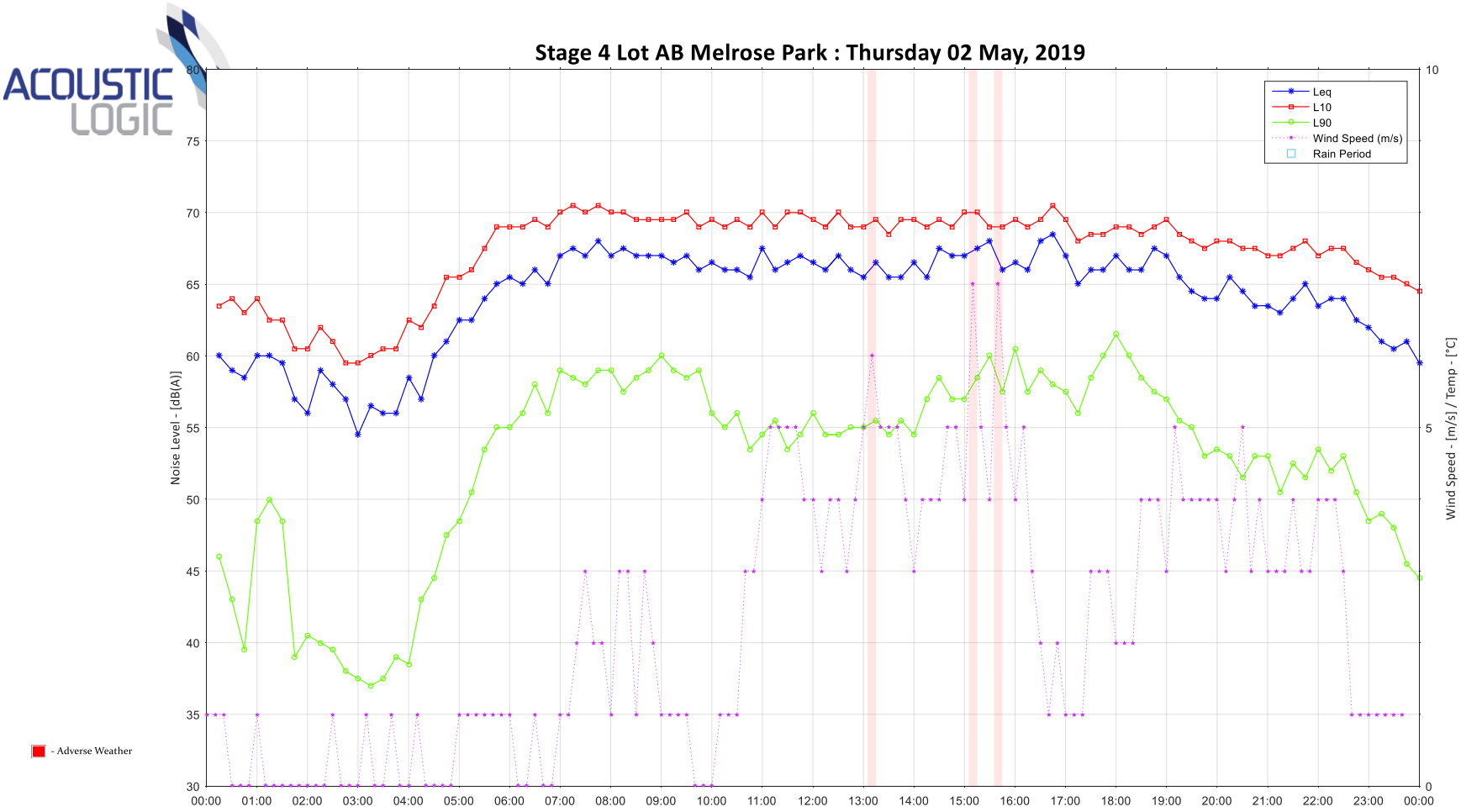
- Adverse Weather


Stage 4 Lot AB Melrose Park : Thursday 02 May, 2019
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
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75
70
65
60
55
50
45
40
35
30
10
5
0
00:00
01:00
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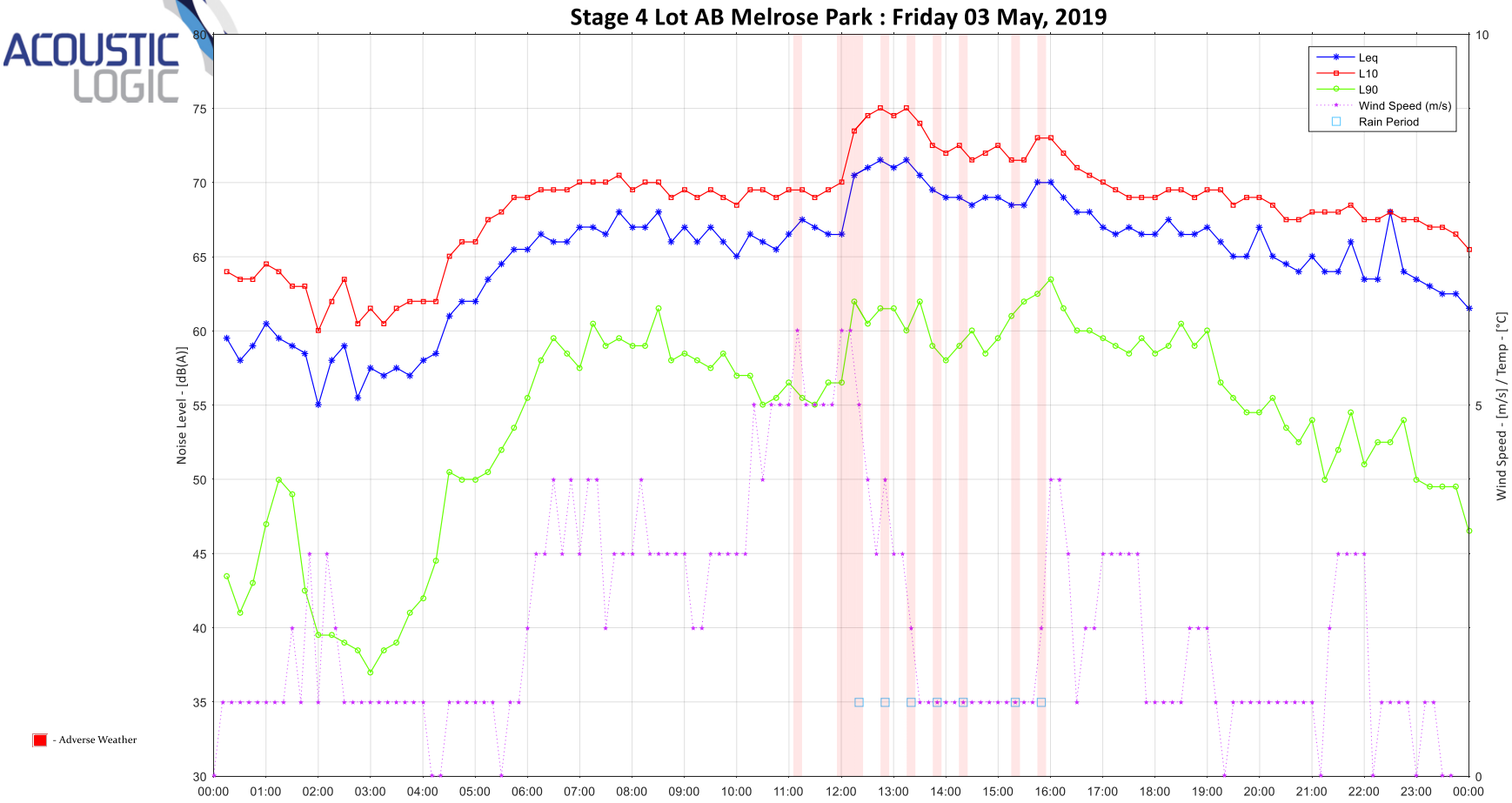
- Adverse Weather


Stage 4 Lot AB Melrose Park : Friday 03 May, 2019
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
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75
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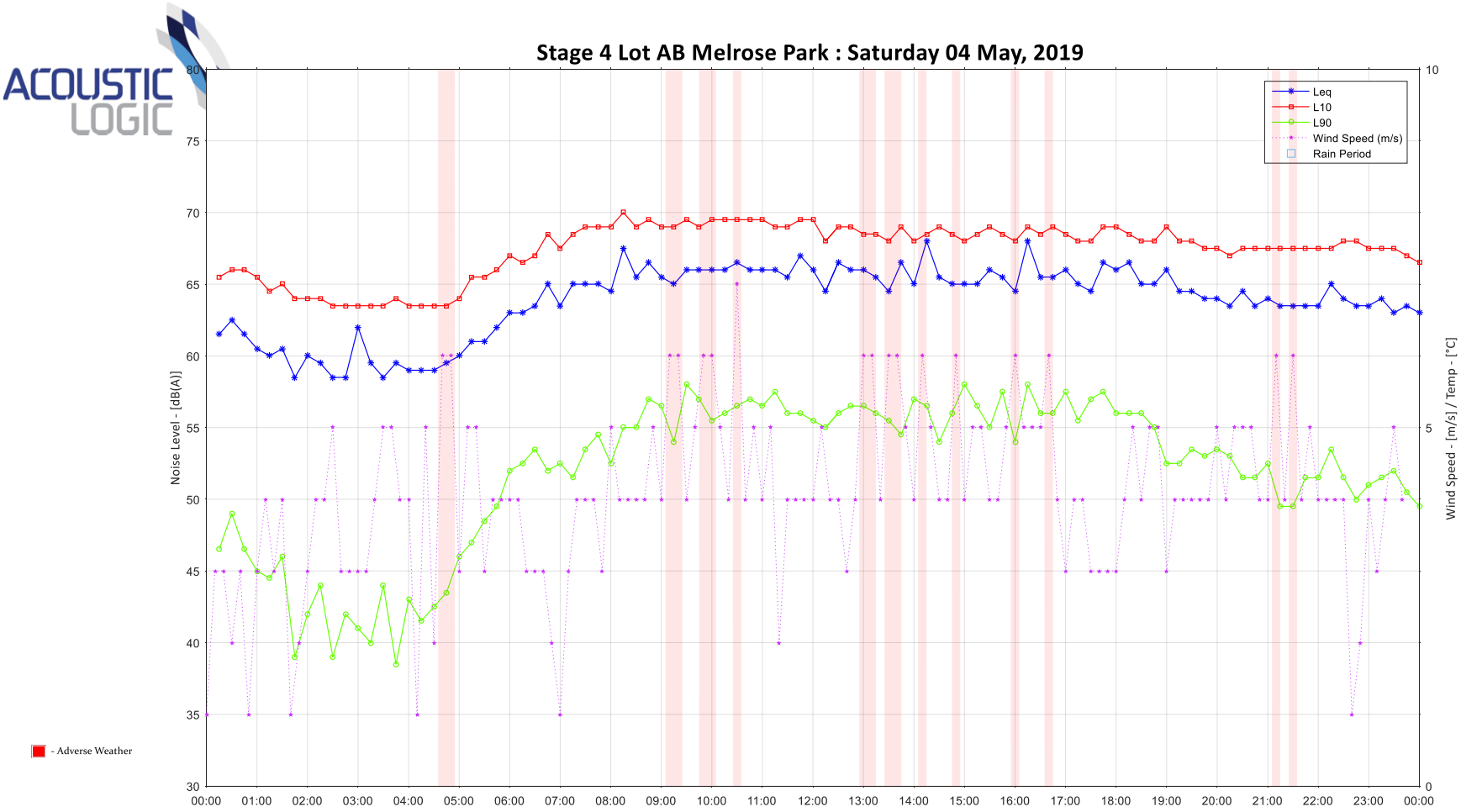
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L90
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Rain Period
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Wind Speed - [m/s] / Temp - [°C]
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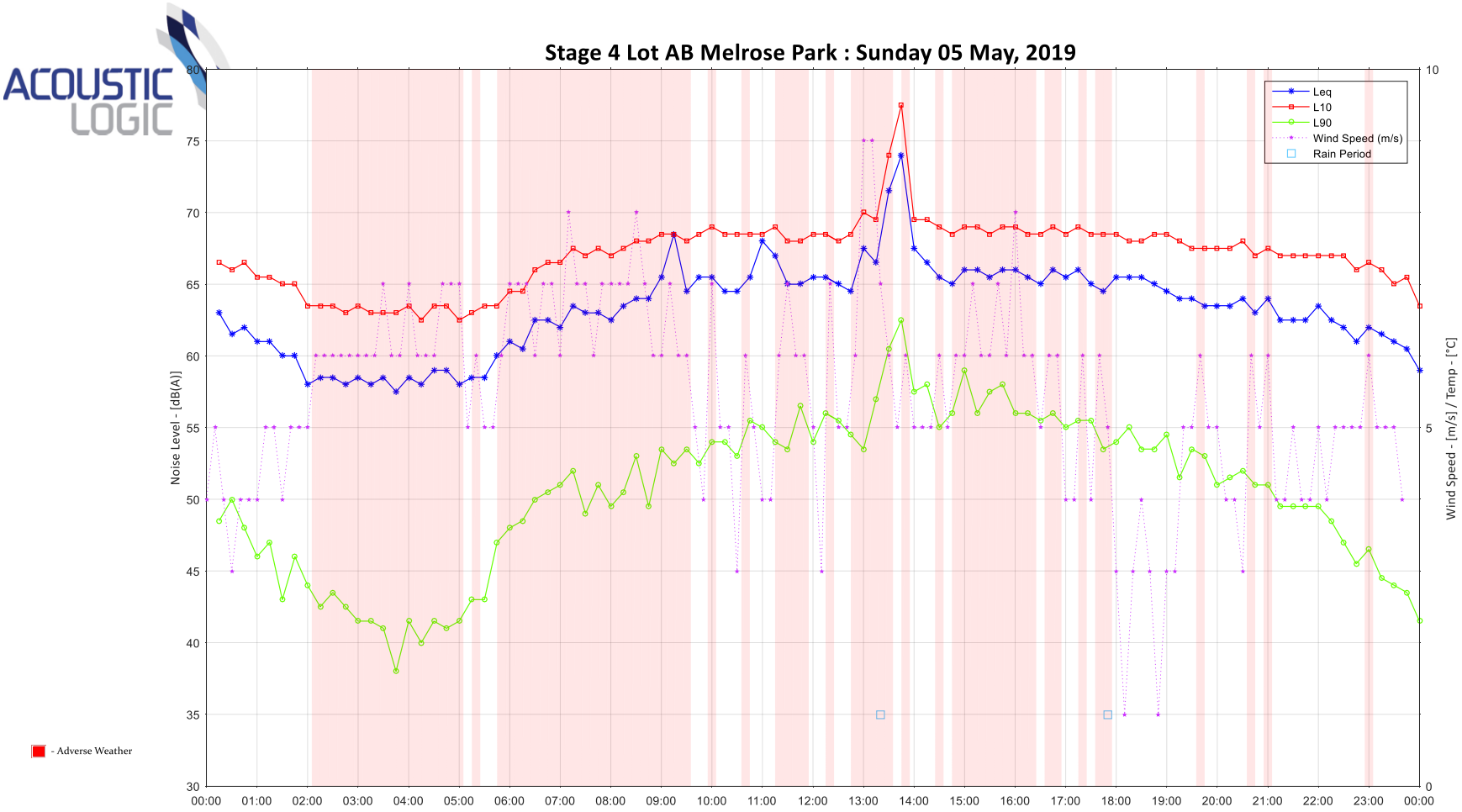
Stage 4 Lot AB Melrose Park : Sunday 05 May, 2019
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L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
- Adverse Weather
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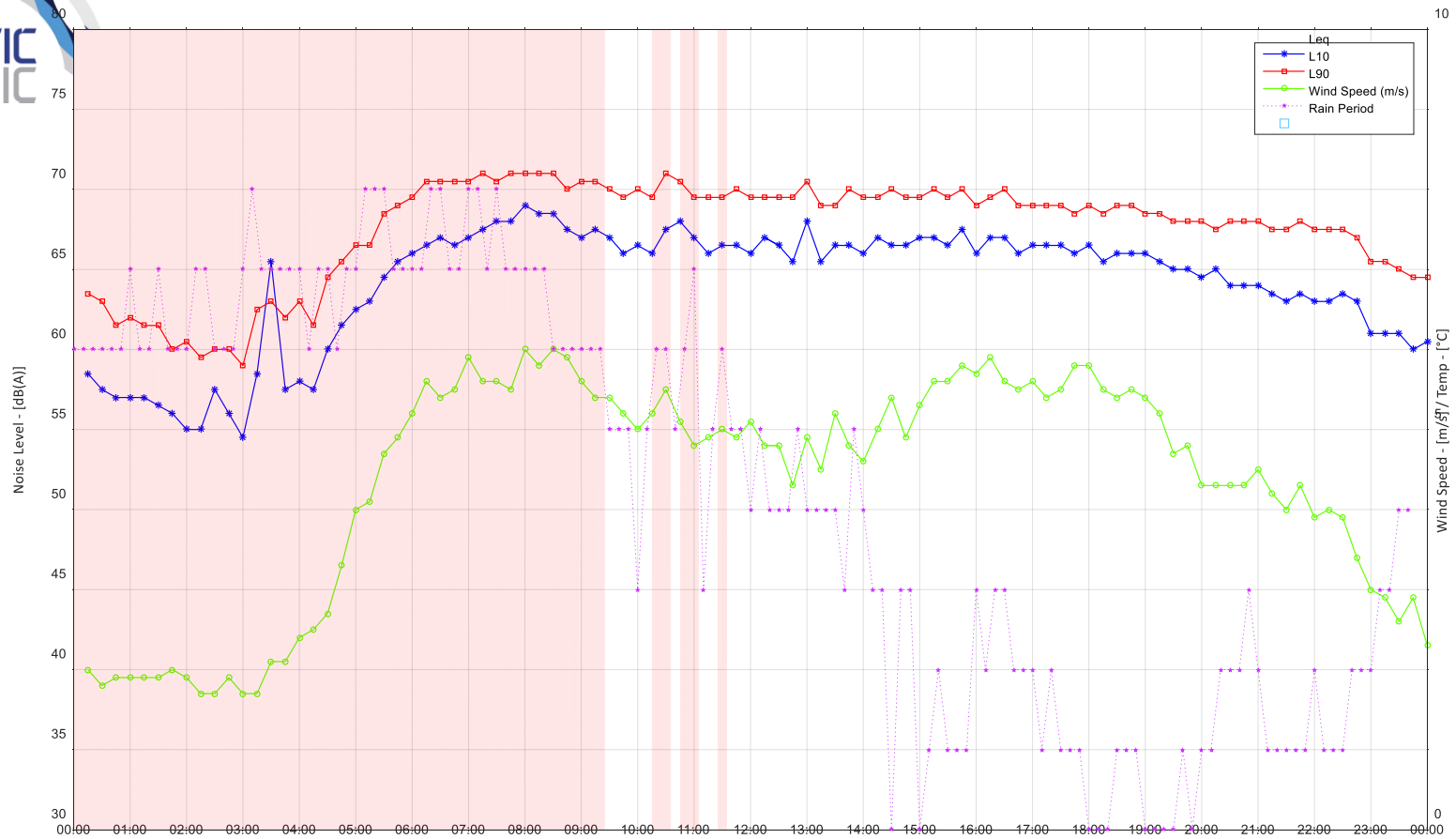
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L10
L90
Wind Speed (m/s)
Rain Period
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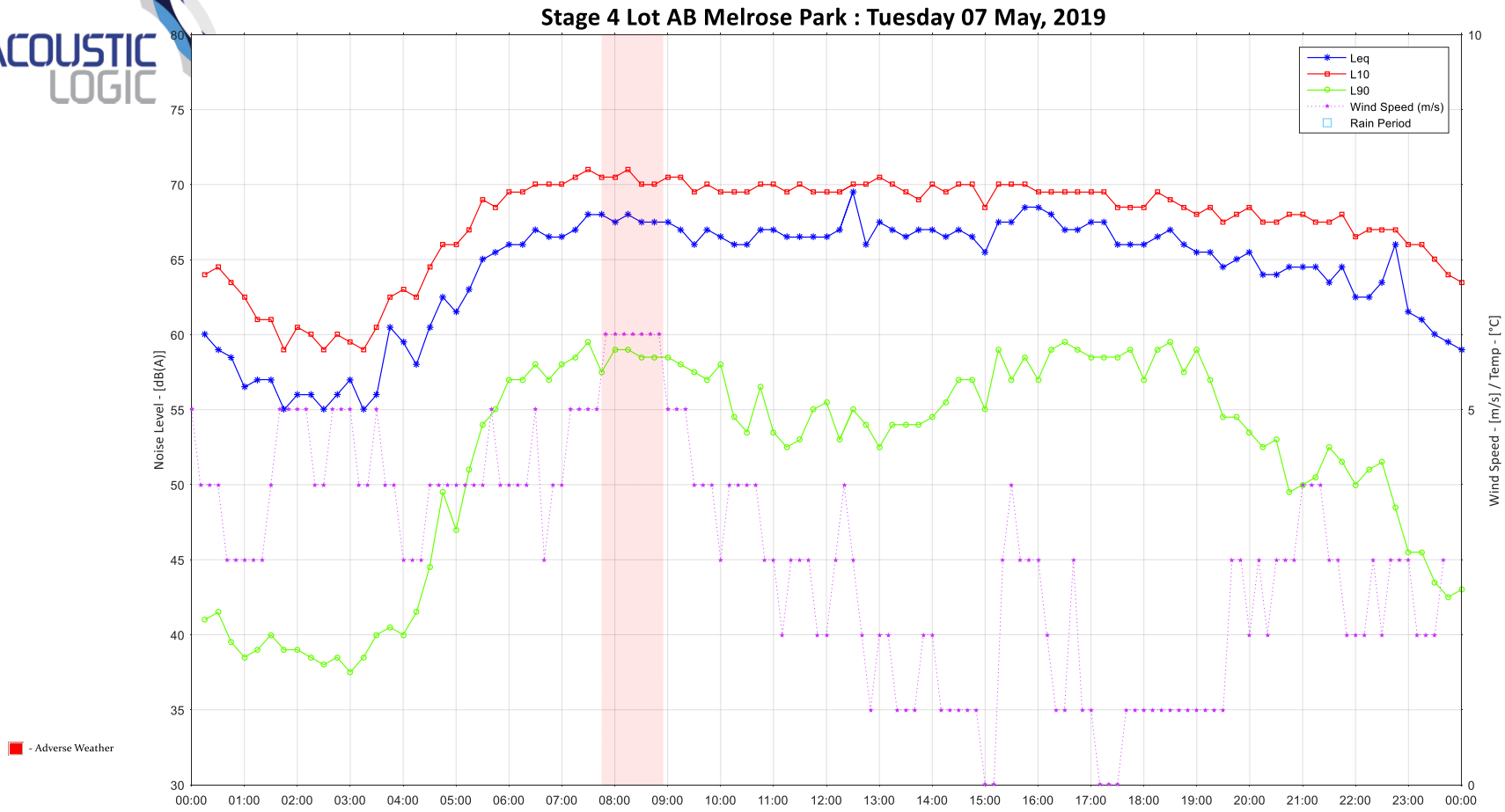
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Rain Period
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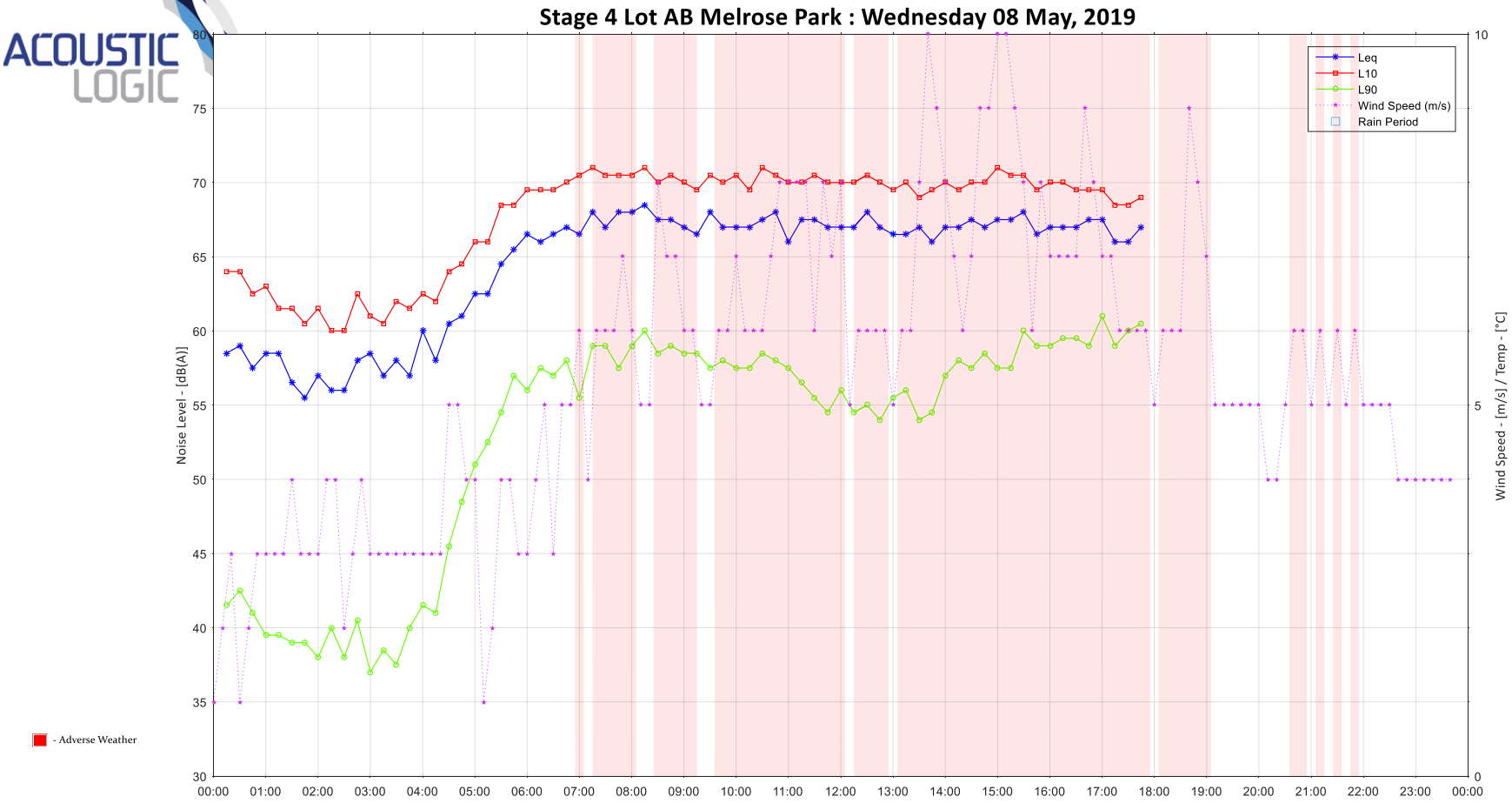
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Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
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L90
Wind Speed (m/s)
Rain Period
- Adverse Weather
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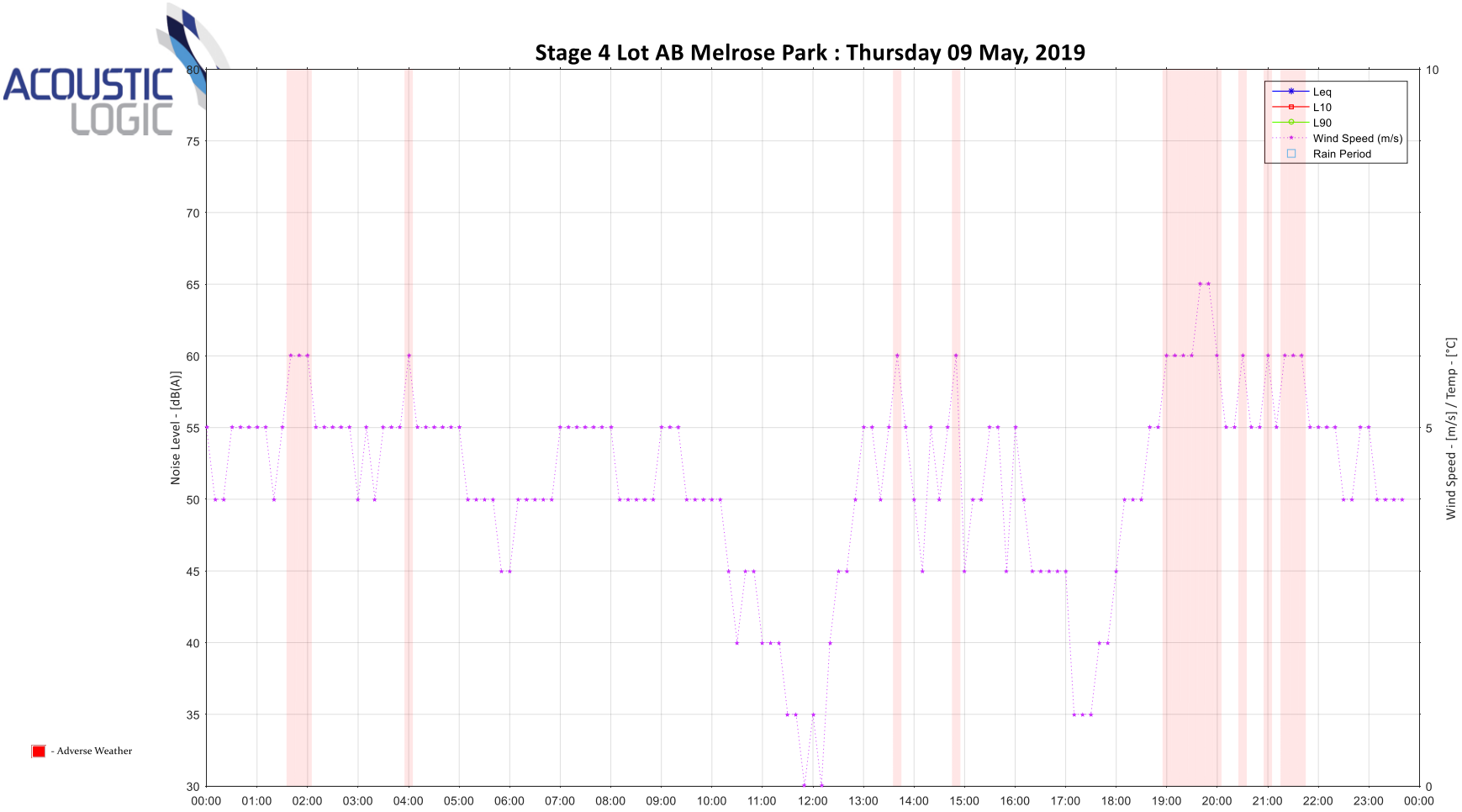
Stage 4 Lot AB Melrose Park : Thursday 09 May, 2019
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
Leq
L10
L90
Wind Speed (m/s)
Rain Period
- Adverse Weather
80
75
70
65
60
55
50
45
40
35
30
10
5
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
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