

Shoalhaven Hospital Redevelopment

Dust Monitoring Report 7

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Attention To	John Holland Group Pty Ltd

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1 INTRODUCTION

This report presents the results of dust monitoring conducted by Acoustic Logic for the Shoalhaven Hospital Redevelopment project site. Details presented in this report include monitoring locations, relevant project objectives, measured levels over the monitoring period and discussion of results.

This report presents the results of vibration monitoring between 1/12/2023 and 31/12/2023. Monitoring has been ongoing since 29th May 2023.

This report should be read in conjunction with the Construction Noise, Dust and Vibration Management Sub Plan prepared by this office (ref: 20230220.1/0506A/R1/VF, dated 05/06/2023)

2 SITE DESCRIPTION

The project site is located at Shoalhaven Hospital Redevelopment. Bulk excavation works are currently being undertaken across the project site.

2.1.1 Surrounding Receivers

Based on site investigations, the following developments surround the site:

Table 1 – Sensitive Receivers

Receiver (Refer Figure 1)	Receiver Type	Comment
R1	Residential	Detached dwellings to south of North Street, and residences and St Michaels Catholic Church and school to the east.
R2	Residential	Detached dwellings to north east, opposite Shoalhaven Street with some health and commercial and recreational uses.
PS	School	Shoalhaven Community Pre-School (future relocated site).
CC	Hospital	Cancer Centre overnight accommodation (part of the greater hospital site).

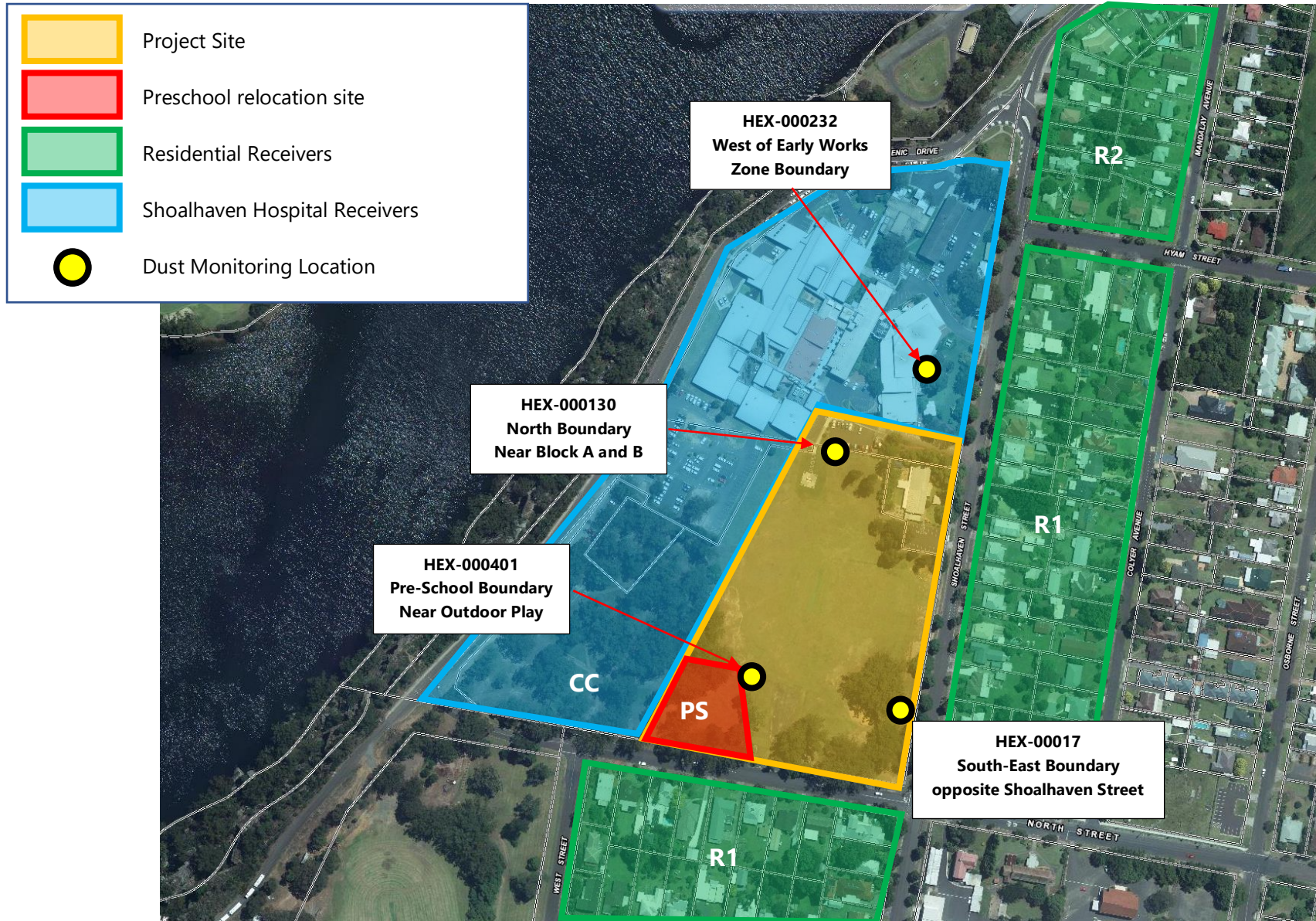


Figure 1 – Site Map. Monitoring Locations and Surrounding Receivers

3 MONITORING LOCATIONS AND DESCRIPTION

Refer to Figure 1 and photos below for monitoring locations.



Figure 2 – HEX000171 – South-East Boundary Opposite Shoalhaven Street (left) and HEX000131 – North Boundary Near Block A and B (right)



Figure 3 – HEX000232 – West of Early Works Zone Near Block A



Figure 4 – HEX000401 – Pre-School Boundary Fence Near Outdoor Play Area

3.1 MONITORING PERIOD

This report presents the results of monitoring between 1/12/2023 and 31/12/2023.

Monitoring has been ongoing since 29th May 2023.

3.2 MONITORING EQUIPMENT

Dust monitoring was conducted using SiteHive Hexanode monitors. Monitors are programmed to continuously store noise data over every 15-minute period

4 DUST MONITORING

4.1 PROJECT DOCUMENTATION

Construction impacts to nearby development have been determined in the Construction Noise, Dust and Vibration Management Sub Plan (ref: 20230220.1/0506A/R1/VF, dated 05/06/2023)

4.1.1 Dust Management Levels

Dust monitoring is conducted to measure mechanically generated respirable PM₁₀ dust particles (< 10µm) and PM_{2.5} dust particles (< 2.5µm), which are generally understood to be the main health concern in airborne dust. The air quality limits are based on the standards outlined in Department of the Environment's *National Environment Protection (Ambient Air Quality) Measure* and NSW EPA's air quality categories.

It should be noted that the dust monitoring results can be influenced by events such as fires, fogs and dust storms, thus the PM10 limit has an allowance of 5 days per year to account for the effects of these two effects. It is noted that site dust suppression systems using fine water sprays can affect the dust count of laser-based measurement systems and so too can pollen in Spring. The PM₁₀ and PM_{2.5} goals are summarised below.

Table 2 – PM₁₀ and PM_{2.5} Goals (24-Hour Average)

Pollutant	Averaging Time	Maximum Concentration
Particulate Matter PM ₁₀	24 hours	50 µg/m ³
Particulate Matter PM _{2.5}	24 hours	25 µg/m ³

The EPA has air quality categories based on particle concentration over a one-hour average. These levels may be used to control site dust emissions. Typically, a project alert trigger level is set on the 'Poor' category level. **However, the assessment level is based on the 24-hour average.**

Table 3 – PM₁₀ and PM_{2.5} Goals (1-Hour Average)

Pollutant	Air Quality Category (AQC)				
	Good	Fair	Poor	Very Poor	Extremely Poor
Particulate Matter PM ₁₀ (µg/m ³)	< 50	50-100	100-200	200-600	600 and above
Particulate Matter PM _{2.5} (µg/m ³)	< 25	25-50	50-100	100-300	300 and above

4.2 MONITORED DUST LEVELS

4.2.1 South-East Boundary Facing Shoalhaven Street (Monitor HEX-000171)

The daily average PM_{2.5} and PM₁₀ concentration levels are presented below:

Table 4 – South-East Boundary (HEX-000171) Daily Average PM₁₀ and PM_{2.5} Concentration

Date	24hr Average PM _{2.5} and PM ₁₀ Concentration					
	PM _{2.5} Level (µg/m ³)	PM _{2.5} Limit (µg/m ³)	Compliance	PM ₁₀ Level (µg/m ³)	PM ₁₀ Limit (µg/m ³)	Compliance
1/12/2023	4	25	Yes	15	50	Yes
2/12/2023	4		Yes	15		Yes
3/12/2023	4		Yes	19		Yes
4/12/2023	4		Yes	18		Yes
5/12/2023	9		Yes	35		Yes
6/12/2023	15		Yes	48		Yes
7/12/2023	19		Yes	57		No
8/12/2023	21		Yes	58		No
9/12/2023	23		Yes	54		No
10/12/2023	7		Yes	24		Yes
11/12/2023	12		Yes	44		Yes
12/12/2023	14		Yes	53		No
13/12/2023	11		Yes	35		Yes
14/12/2023	8		Yes	51		No
15/12/2023	13		Yes	46		Yes
16/12/2023	8		Yes	28		Yes
17/12/2023	13		Yes	42		Yes
18/12/2023	18		Yes	54		No
19/12/2023	23		Yes	63		No
20/12/2023	5		Yes	18		Yes
21/12/2023	14		Yes	39		Yes
22/12/2023	10		Yes	33		Yes
23/12/2023	8		Yes	27		Yes
24/12/2023	6		Yes	21		Yes
25/12/2023	13		Yes	45		Yes
26/12/2023	16		Yes	60		Yes*
27/12/2023	5		Yes	20		Yes
28/12/2023	4		Yes	21		Yes
29/12/2023	10		Yes	41		Yes
30/12/2023	8		Yes	26		Yes
31/12/2023	19		Yes	56		Yes*

4.2.2 North Boundary Facing Block A & B (Monitor HEX-000130)

The daily average PM_{2.5} and PM₁₀ concentration levels are presented below:

Table 5 – North Boundary (HEX-000130) Daily Average PM₁₀ and PM_{2.5} Concentration

Date	24hr Average PM _{2.5} and PM ₁₀ Concentration					
	PM _{2.5} Level (µg/m ³)	PM _{2.5} Limit (µg/m ³)	Compliance	PM ₁₀ Level (µg/m ³)	PM ₁₀ Limit (µg/m ³)	Compliance
1/12/2023	1	25	Yes	3	50	Yes
2/12/2023	1		Yes	2		Yes
3/12/2023	1		Yes	3		Yes
4/12/2023	1		Yes	3		Yes
5/12/2023	2		Yes	7		Yes
6/12/2023	4		Yes	10		Yes
7/12/2023	5		Yes	14		Yes
8/12/2023	5		Yes	13		Yes
9/12/2023	6		Yes	11		Yes
10/12/2023	2		Yes	4		Yes
11/12/2023	3		Yes	10		Yes
12/12/2023	4		Yes	13		Yes
13/12/2023	4		Yes	11		Yes
14/12/2023	2		Yes	5		Yes
15/12/2023	4		Yes	11		Yes
16/12/2023	2		Yes	5		Yes
17/12/2023	3		Yes	7		Yes
18/12/2023	5		Yes	14		Yes
19/12/2023	6		Yes	15		Yes
20/12/2023	1		Yes	3		Yes
21/12/2023	3		Yes	7		Yes
22/12/2023	2		Yes	6		Yes
23/12/2023	2		Yes	4		Yes
24/12/2023	1		Yes	3		Yes
25/12/2023	3		Yes	8		Yes
26/12/2023	3		Yes	9		Yes
27/12/2023	1		Yes	2		Yes
28/12/2023	1		Yes	2		Yes
29/12/2023	2		Yes	5		Yes
30/12/2023	2		Yes	4		Yes
31/12/2023	4		Yes	8		Yes

4.2.3 West of Early Works Zone (Monitor HEX-000232)

The daily average PM_{2.5} and PM₁₀ concentration levels are presented below:

Table 6 – West of Early Works (HEX-000232) Daily Average PM₁₀ and PM_{2.5} Concentration

Date	24hr Average PM _{2.5} and PM ₁₀ Concentration					
	PM _{2.5} Level (µg/m ³)	PM _{2.5} Limit (µg/m ³)	Compliance	PM ₁₀ Level (µg/m ³)	PM ₁₀ Limit (µg/m ³)	Compliance
1/12/2023	3	25	Yes	9	50	Yes
2/12/2023	3		Yes	10		Yes
3/12/2023	3		Yes	12		Yes
4/12/2023	3		Yes	12		Yes
5/12/2023	7		Yes	28		Yes
6/12/2023	11		Yes	33		Yes
7/12/2023	14		Yes	40		Yes
8/12/2023	14		Yes	40		Yes
9/12/2023	16		Yes	35		Yes
10/12/2023	5		Yes	15		Yes
11/12/2023	9		Yes	32		Yes
12/12/2023	11		Yes	38		Yes
13/12/2023	7		Yes	21		Yes
14/12/2023	5		Yes	21		Yes
15/12/2023	9		Yes	30		Yes
16/12/2023	6		Yes	20		Yes
17/12/2023	9		Yes	29		Yes
18/12/2023	13		Yes	36		Yes
19/12/2023	16		Yes	43		Yes
20/12/2023	3		Yes	9		Yes
21/12/2023	9		Yes	21		Yes
22/12/2023	7		Yes	21		Yes
23/12/2023	6		Yes	17		Yes
24/12/2023	5		Yes	14		Yes
25/12/2023	9		Yes	26		Yes
26/12/2023	12		Yes	40		Yes
27/12/2023	4		Yes	13		Yes
28/12/2023	3		Yes	13		Yes
29/12/2023	8		Yes	27		Yes
30/12/2023	5		Yes	16		Yes
31/12/2023	13		Yes	35		Yes

4.2.4 Pre-School Boundary (Monitor HEX-000401)

The daily average PM_{2.5} and PM₁₀ concentration levels are presented below:

Table 7 – Pre-School Boundary (HEX-000401) Daily Average PM₁₀ and PM_{2.5} Concentration

Date	24hr Average PM _{2.5} and PM ₁₀ Concentration					
	PM _{2.5} Level (µg/m ³)	PM _{2.5} Limit (µg/m ³)	Compliance	PM ₁₀ Level (µg/m ³)	PM ₁₀ Limit (µg/m ³)	Compliance
1/12/2023	2	25	Yes	9	50	Yes
2/12/2023	2		Yes	12		Yes
3/12/2023	2		Yes	11		Yes
4/12/2023	3		Yes	10		Yes
5/12/2023	5		Yes	21		Yes
6/12/2023	9		Yes	41		Yes
7/12/2023	11		Yes	47		Yes
8/12/2023	12		Yes	46		Yes
9/12/2023	13		Yes	34		Yes
10/12/2023	4		Yes	11		Yes
11/12/2023	8		Yes	44		Yes
12/12/2023	8		Yes	36		Yes
13/12/2023	8		Yes	55		No
14/12/2023	5		Yes	33		Yes
15/12/2023	9		Yes	58		No
16/12/2023	5		Yes	19		Yes
17/12/2023	7		Yes	23		Yes
18/12/2023	12		Yes	55		No
19/12/2023	13		Yes	61		No
20/12/2023	3		Yes	9		Yes
21/12/2023	8		Yes	21		Yes
22/12/2023	6		Yes	18		Yes
23/12/2023	5		Yes	15		Yes
24/12/2023	3		Yes	11		Yes
25/12/2023	7		Yes	25		Yes
26/12/2023	9		Yes	29		Yes
27/12/2023	3		Yes	12		Yes
28/12/2023	2		Yes	12		Yes
29/12/2023	6		Yes	23		Yes
30/12/2023	4		Yes	15		Yes
31/12/2023	10		Yes	29		Yes

4.3 DISCUSSION

4.3.1 East Boundary Opposite Shoalhaven Street Residences (HEX-000171)

- During the monitoring period, PM_{2.5} dust levels at the monitoring location were found to be within the maximum concentration permitted by Department of the Environment's *National Environment Protection (Ambient Air Quality) Measure*.
- During the monitoring period, PM₁₀ dust levels at the monitoring location were generally found to be within the maximum concentration permitted by Department of the Environment's *National Environment Protection (Ambient Air Quality) Measure*.
- An exceedance of the daily average occurred on the following dates and categories:
 - 7th December - PM₁₀
 - Large exceedances occurred outside of site hours on this date.
 - Average PM₁₀ levels between working hours were within the acceptable limits on this date.
 - We note the historical weather report indicates high humidity/rainfall on this date.
 - 8th December - PM₁₀
 - Large exceedances occurred outside of site hours on this date (12am-7am) largely due to rainfall.
 - Average PM₁₀ levels between working hours were within the acceptable limits on this date.
 - 9th December - PM₁₀
 - Average PM₁₀ levels between working hours were within the acceptable limits on this date.
 - We note the historical weather report indicates high humidity/fog on this date outside of site hours.
 - 12th December - PM₁₀
 - Average PM₁₀ levels between working hours were within the acceptable limits on this date.
 - We note the historical weather report indicates high humidity and wind speeds on this date exceeding 5m/s.
 - 14th December - PM₁₀
 - Average PM₁₀ levels between working hours were within the acceptable limits on this date.
 - We note the historical weather report indicates high wind speeds on this date exceeding 5m/s.
 - 18th December - PM₁₀
 - Average PM₁₀ levels between working hours were within the acceptable limits on this date.
 - We note the historical weather report indicates high humidity/wind speeds across this date.
 - 19th December - PM₁₀
 - Dust levels were generally in exceedance of the PM₁₀ level on this date, indicative of works carried out near to the monitors and centrally within the site. We note the historical weather report indicates high humidity/rainfall across this date.

4.3.2 North Boundary Near Block A and B (HEX-000130)

- During the monitoring period, PM_{2.5} dust levels at the monitoring location were found to be within the maximum concentration permitted by Department of the Environment's *National Environment Protection (Ambient Air Quality) Measure*.
- During the monitoring period, PM₁₀ dust levels at the monitoring location were found to be within the maximum concentration permitted by Department of the Environment's *National Environment Protection (Ambient Air Quality) Measure*.

4.3.3 West of Early Works Zone Near Block A (HEX-000232)

- During the monitoring period, PM_{2.5} dust levels at the monitoring location were found to be within the maximum concentration permitted by Department of the Environment's *National Environment Protection (Ambient Air Quality) Measure*.
- During the monitoring period, PM₁₀ dust levels at the monitoring location were found to be within the maximum concentration permitted by Department of the Environment's *National Environment Protection (Ambient Air Quality) Measure*.

4.3.4 Pre-School Boundary Near Outdoor Play Area (HEX-000401)

- During the monitoring period, PM_{2.5} dust levels at the monitoring location were found to be within the maximum concentration permitted by Department of the Environment's *National Environment Protection (Ambient Air Quality) Measure*.
- During the monitoring period, PM₁₀ dust levels at the monitoring location were generally found to be within the maximum concentration permitted by Department of the Environment's *National Environment Protection (Ambient Air Quality) Measure*.
- An exceedance of the daily average occurred on the following dates and categories:
 - 13th December - PM₁₀
 - Dust levels were generally in exceedance of the PM₁₀ level on this date, indicative of works carried out near to the monitors and centrally within the site.
 - 15th December - PM₁₀
 - Dust levels were generally in exceedance of the PM₁₀ level on this date, indicative of works carried out near to the monitors and centrally within the site.
 - We note the historical weather report on this date indicates high humidity/wind speeds exceeding 5m/s.
 - 18th December - PM₁₀
 - Dust levels were generally in exceedance of the PM₁₀ level on this date, indicative of works carried out near to the monitors and centrally within the site.
 - We note the historical weather report on this date indicates high humidity/wind speeds exceeding 5m/s.
 - 19th December - PM₁₀
 - Dust levels were generally in exceedance of the PM₁₀ level on this date, indicative of works carried out near to the monitors and centrally within the site.
 - We note the historical weather report indicates high humidity on this date.

4.3.5 General Notes:

- It should be noted that the measured dust levels will also be affected by meteorological events outside the project site, such as heavy rain and wind, high humidity, dust storms, bush fires, high pollen count and the like.
- We note an additional dust monitor was installed on the boundary of the site adjacent to the preschool over this monitoring periods – refer to Figure 1.

4.3.6 Response to Exceedances

The response procedures adopted by JH are as follows:

- The project team is notified via SMS alert messages when hourly average dust levels are exceeded
- Methodology and works across the project site and near to the specific monitoring location are recorded.
- Where monitoring locations are confirmed to be potentially impacted by the adjacent works (i.e., where exceedance notifications are received but no works are occurring near to the monitoring location – indicating alerts are as a result of external impacts – refer general notes in Section 4.3.4), work methodology was investigated and mistor(s) are deployed.

Acoustic Logic confirms JH has implemented best practices as well as reasonable and feasible mitigation measures in response to dust exceedances over the majority of this monitoring period.

A review of works on the days that led to exceedance of dust levels should be carried out and the following additional recommendations for ongoing dust management should be implemented:

- Loose soil and/or dusty stockpiles should be covered with tarpaulin outside of working hours
- Additional dust suppression methods such as directed water sprays directly onto excavation equipment and work areas should be implemented where alternative methodology cannot be found.

5 CONCLUSION

Dust monitoring has been conducted at different locations for the Shoalhaven Hospital Redevelopment between 1/12/2023 and 31/12/2023. For this monitoring period, we note the following:

- Hexanode HEX-000171 at the monitoring location $PM_{2.5}$ and PM_{10} dust levels were generally within the criteria during this monitoring period.
- Hexanode HEX-000130 at the monitoring location $PM_{2.5}$ and PM_{10} dust levels were generally within the criteria during this monitoring period.
- Hexanode HEX-000232 at the monitoring location $PM_{2.5}$ and PM_{10} dust levels were generally within the criteria during this monitoring period.
- Hexanode HEX-000401 at the monitoring location $PM_{2.5}$ and PM_{10} dust levels were generally within the criteria during this monitoring period.

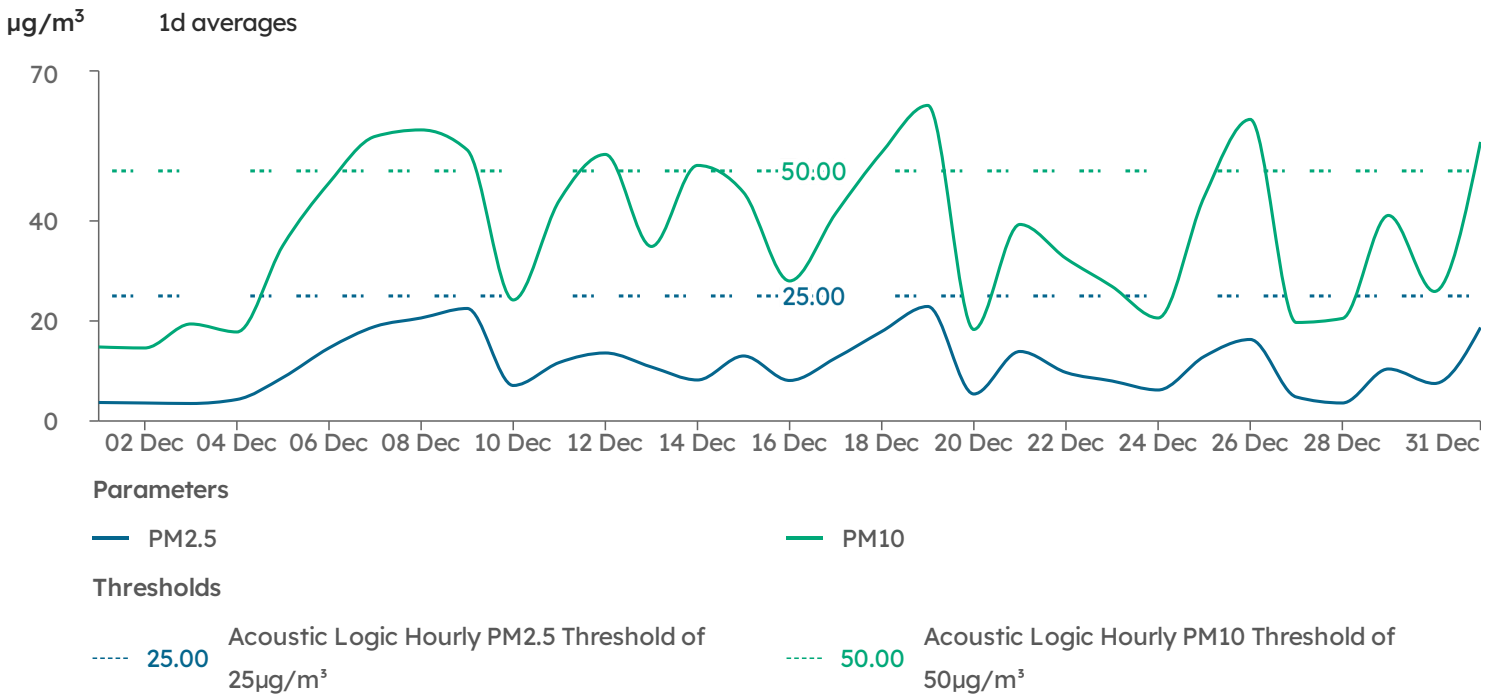
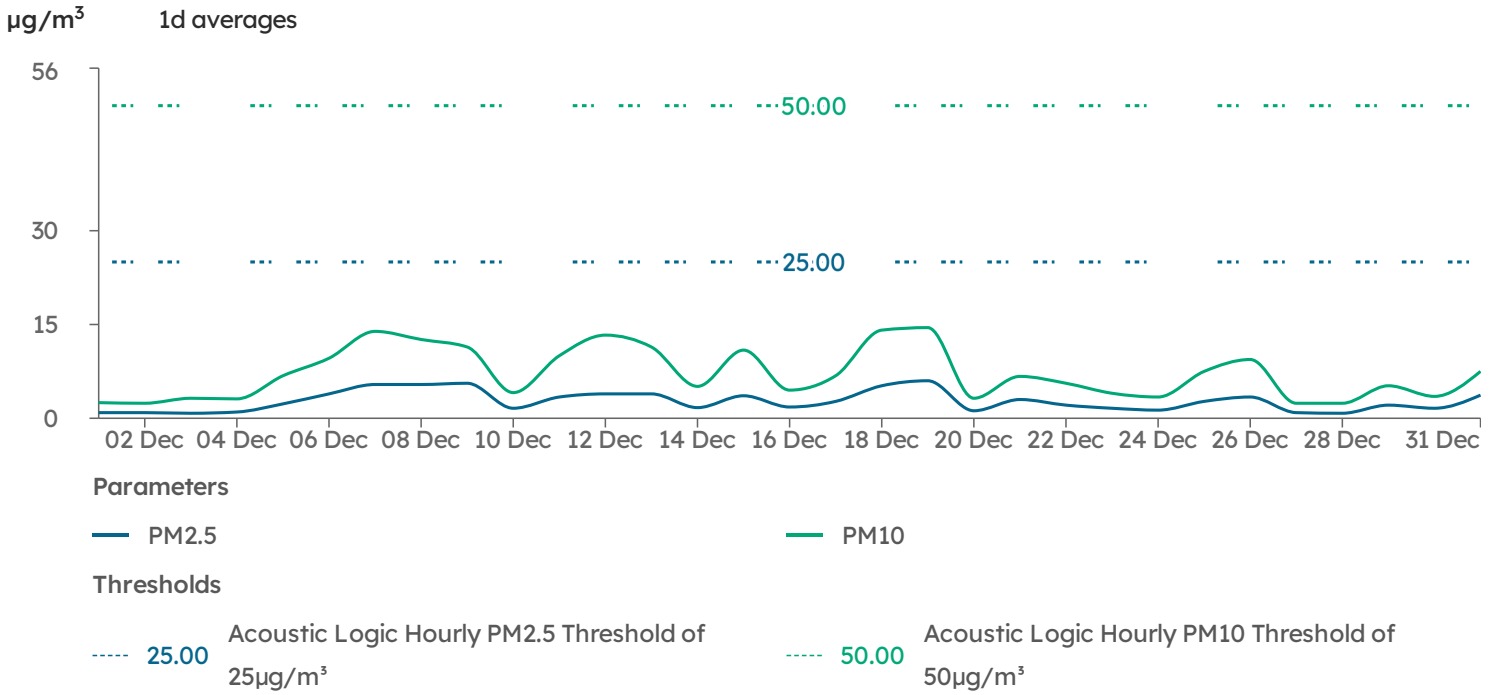
We trust this information is satisfactory. Please contact us should you have any further queries.

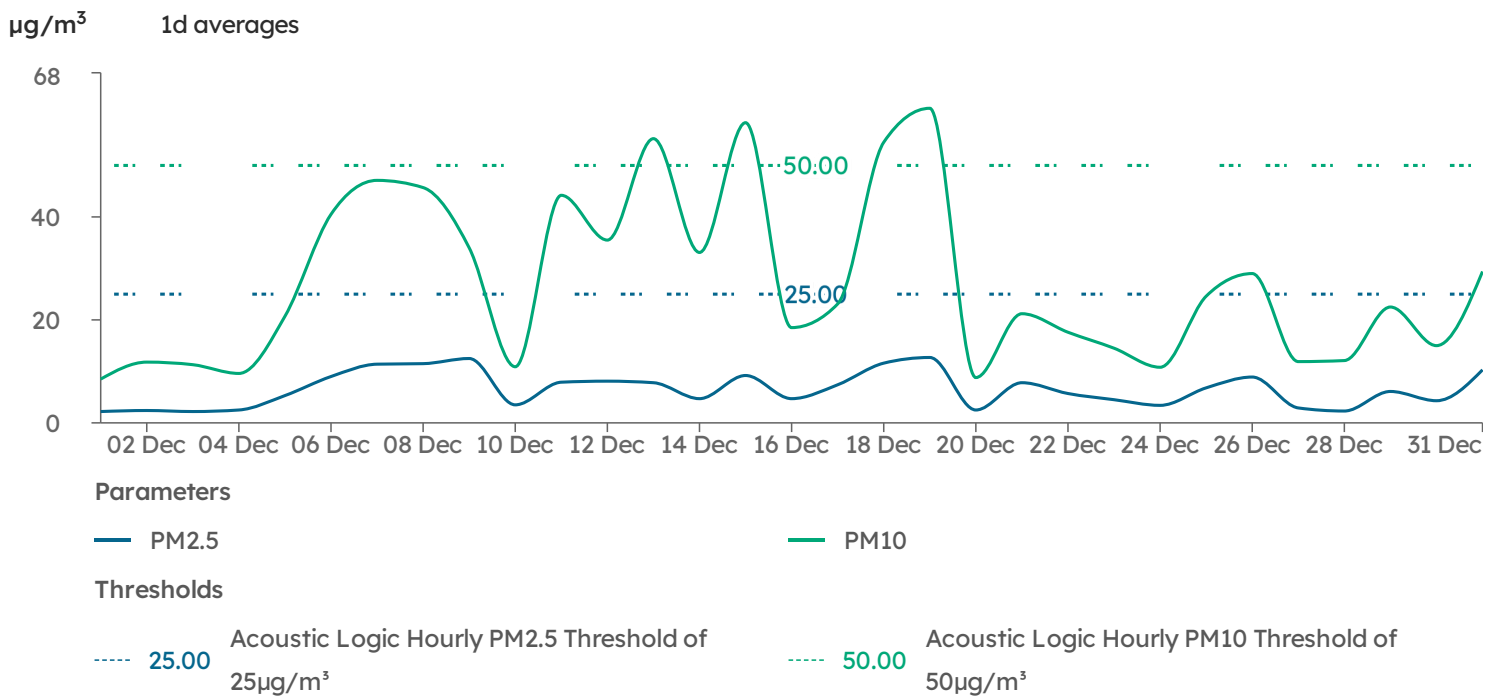
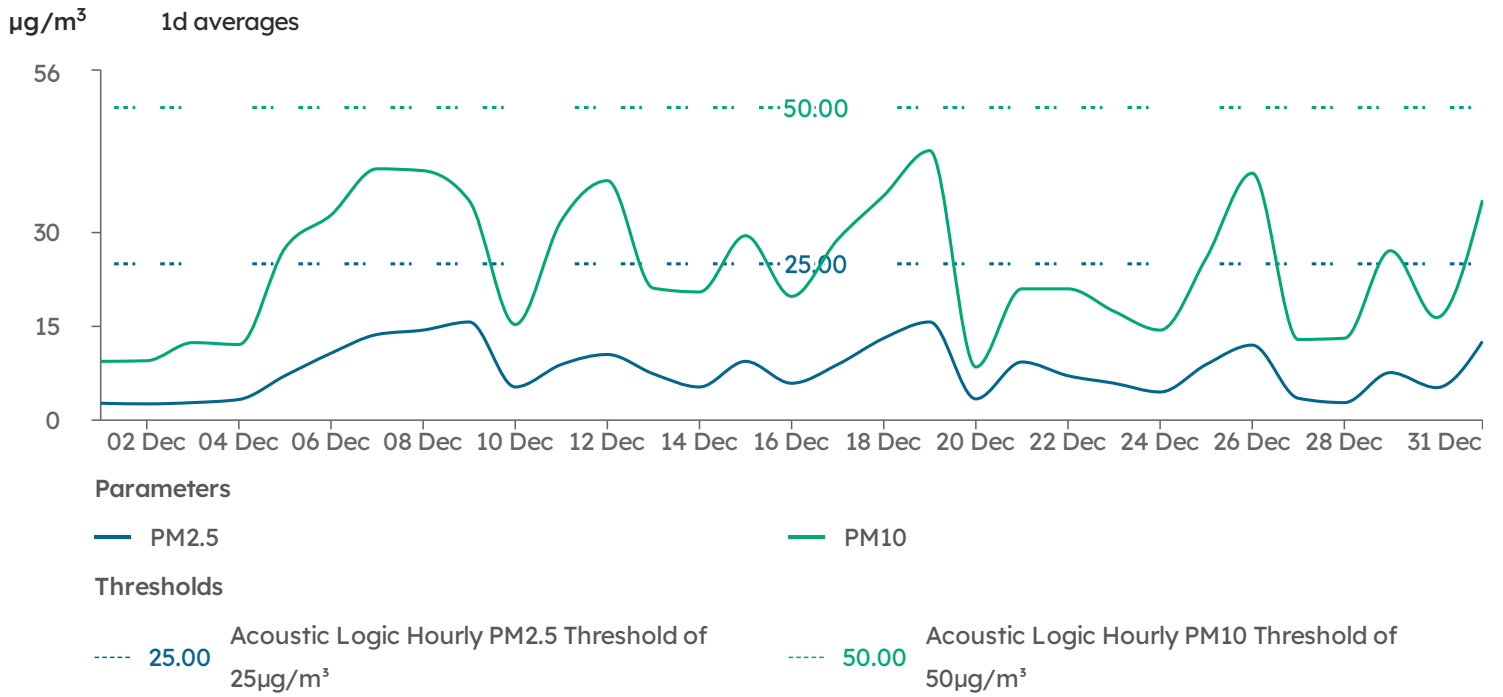
Yours faithfully,

A handwritten signature in black ink, appearing to be 'Hyde Deng', with a long horizontal line extending to the right.

Acoustic Logic Pty Ltd
Hyde Deng

APPENDIX A – DUST MONITORING GRAPHS





Device Details

Device Serial	Monitoring Points	Model	Calibration Date	Calibration Due
HEX-000171	East Boundary Near Shoalhaven Street	SiteHive Hexanode	03 Apr 2023	03 Apr 2025
HEX-000130	North Boundary Near Block A and B	SiteHive Hexanode	21 Apr 2023	21 Apr 2025
HEX-000232	West of Early Works Zone	SiteHive Hexanode	29 May 2023	29 May 2025
HEX-000401	Near Pre-School	SiteHive Hexanode	28 Aug 2023	28 Aug 2025