

# Environmental Dust Assessment Report (December 2022)

**Tweed Valley Hospital Project, Cudgen NSW**

Prepared for: Lendlease Building Pty Ltd

A101021.0286.00 | EDM41.Rev0 | Date: 7/02/2023



**ADE**  
CONSULTING  
GROUP

# Document Information

**Report Title:** Environmental Dust Assessment Report  
**Prepared for:** Lendlease Building Pty Ltd  
**Project Address:** 771 Cudgen Road, Cudgen NSW  
**File Reference:** A101021.0286.00  
**Report Reference:** EDM41.Rev0  
**Date:** 7/02/2023

# Document Control

Version	Date	Author	Revision description	Reviewer
RevA	18/01/2023	[REDACTED]	Draft for internal review	[REDACTED]
Rev0	7/02/2023	[REDACTED]	Final for issue	[REDACTED]

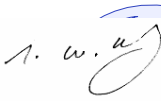
For and on behalf of  
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# Executive Summary

ADE Consulting Group Pty Ltd (ADE) was commissioned by Lendlease Building (Lendlease) to measure the levels of dust at the Tweed Valley Hospital Project, located at 771 Cudgen Road, Cudgen NSW hereafter referred to as 'the Site'. At the time of the dust monitoring, Lendlease is continuing superstructure works on the Site which includes the construction of columns and suspended slabs. CD Civil has been engaged for other civil works on the project and has begun works on Cudgen Road which includes construction of permanent footpaths, road construction and widening. All three (3) dust monitors have been relocated to the southern side of Cudgen Road to assess the road constructions works against the requirements presented in the Tweed Valley Hospital Management Plan – Air Quality.

The Dust Assessment consisted of real time data observation and discussion to achieve the following:

- Compliance with Tweed Valley Hospital Management Plan – Air Quality;
- Avoidance of excessive dust generation through site planning and the adoption of appropriate work methods and practices; and
- Prevention or minimisation to the greatest extent, the impact of construction dust on neighbours and to establish and maintain positive relationships with project stakeholders.

The outcome of the dust assessment did not identify exposures presenting an unacceptable risk to human health or the environment. The report details the outcome of the real time dust assessment conducted by ADE throughout the month of **December 2022**.

Results from dust monitoring undertaken during the monitoring period of **December 2022** showed no exceedances of limits. Specifically, results, were **less than**  $0.5 \text{ mg/m}^3$  which is below both the Action Limit of  $2.5 \text{ mg/m}^3$  and exposure limit of  $5 \text{ mg/m}^3$ .

Works were understood only to be conducted between 6am and 6pm, Monday to Friday during the month of **December 2022**.

# 1 Introduction

## 1.1 Background

ADE was commissioned by Lendlease to measure the levels of dust at Tweed Valley Hospital Project, located at 771 Cudgen Road, Cudgen NSW (the Site). At the time of the dust monitoring, Lendlease is continuing superstructure works on site which includes the construction of columns and suspended slabs. CD Civil has also been engaged to undertake civil works on the project. CD Civil has begun works on Cudgen Road which includes construction of permanent footpaths, road construction and widening.

Real time dust monitoring was carried out to establish and quantify the levels of dust created during the days on which the contractors/employees are undertaking construction works. Three monitors have been employed to measure dust concentration. All three (3) monitors have been relocated to the southern side of Cudgen Road to assess the road constructions works against the requirements of the Tweed Valley Hospital Management Plan – Air Quality.

**Table 1.** Summary of Site Information.

Site Details	
<b>Client Name:</b>	Lendlease
<b>ADE Project Number:</b>	A101021.0286.00
<b>Site Address:</b>	771 Cudgen Road, Cudgen NSW
<b>Monitoring Time and Dates:</b>	December 2022 (continuous): <ul style="list-style-type: none"> <li>▪ Day shift from 6.00am to 5.59pm</li> <li>▪ Night Shift from 6.00pm to 5.59am</li> </ul>
<b>Date of Report:</b>	7/02/2023
<b>Monitoring Parameters:</b>	<ul style="list-style-type: none"> <li>▪ Particulate Matter &lt;10 micrometres (PM10); and</li> <li>▪ Data recording frequency: 1 minute.</li> </ul>
<b>Exposure Standard:</b>	Australian Institute of Occupational Hygienists (AIOH) recommendation for PM10 Dust <b>5 mg/m<sup>3</sup></b> (expressed as 8-hour time weighted average) <sup>A</sup>

Note:

<sup>A</sup>: 2.5 mg/m<sup>3</sup> has been set as an Action Level to trigger consideration of controls to minimise the potential exceedance of the exposure standard.

## 1.2 Scope of Work

The scope of work involved the following:

- Completion of a Safety, Health & Environment Work Method Statement prior to undertaking any works;
- Real time continuous monitoring of PM10 in three (3) locations along the Southern boundary of Cudgen Road; and

- Preparation of an Environmental Dust Assessment Report outlining the site data, conclusions and recommendations.

## 1.3 Whole Report

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No one section or part of a section, of this report should be taken as giving an overall idea of this report. Each section must be read in conjunction with the whole of this report, including its appendices and attachments.

## 1.4 Previous Report

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Refer to the previous report (A101021.0286.00 / EDM40 / Rev0) for details from earlier monitoring periods.

## 1.5 Monitoring Locations

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The Site is located at 771 Cudgen Road, bounded by Tweed Coast Road to the West, Turnock Street to the East and Cudgen Road to the South at Cudgen, NSW.

The monitors were relocated due to scheduled road upgrade works, being undertaken by CD Civil along Cudgen Road. The monitoring locations were moved to the boundary of the nearest sensitive receivers to ensure the roadworks are compliant with the Tweed Valley Hospital Management Plan – Air Quality. Dust levels are recorded at these locations to establish the dust levels at the Southern boundary of the project during the construction phase. This is to establish dust concentrations that maybe exposed to nearby sensitive receivers listed in the Tweed Valley Hospital Management Plan – Air Quality.

Dust monitors at locations 005, 006 and 007 remain operational 24 hours a day. Existing monitors had been relocated on 17 November 2022 due to scheduled road upgrade works being undertaken by CD Civil along Cudgen Road.

Aerial imaging and monitoring location overview is presented in *Appendix I – Aerial Photograph* and *Appendix II – Monitoring Location*. ADE site visits are summarised in *Appendix III – ADE Site Visit Summary*.

## 1.6 Exposure Limits

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ADE has adopted the recommended exposure standard for PM<sub>10</sub> as 5 mg/m<sup>3</sup> (8-hour time weighted average) as per the recommendation of the Australian Institute of Occupational Hygienists (AIOH) for works on-site. If this standard is exceeded works are to cease immediately. A review of controls and relevant practices will be undertaken as listed in the Tweed Valley Hospital Management Plan – Air Quality. An Action Limit of 2.5 mg/m<sup>3</sup> (8-hour time weighted average) has been implemented to trigger an alert to assess control and minimise the likelihood of an exceedance.

## **1.7 Missing Data**

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### **1.7.1 Monitoring Location 005**

Dust monitor 005 was noted to be offline during the daily checks on 7 December 2022. ADE attended site on 8 December 2022 to check connections and solar panels. The monitor came back online on 9 December 2022. The monitor was noted to be offline during the daily checks on 13 December 2022. The monitor came back online on 14 December 2022.

### **1.7.2 Monitoring Location 006**

Dust monitor 006 was noted to be offline during the daily checks on 24 November 2022. ADE attended site on 01 December 2022 to check connections and reposition solar panels. The monitor was removed from site for repair on 08 December 2022. Following diagnostics and repair, the monitor was reinstalled on site on 14 December 2022. The monitor went offline again on 25 December 2022 and came back online 01 January 2023.

### **1.7.3 Monitoring Location 007**

All data from dust monitor 007 were correctly collected.

## 1.8 Bureau of Meteorology (BOM) Climate Data

A summary of climate data from the Coolangatta weather station has been included in **Table 2** below.

**Table 2.** Summary of December 2022 Climate Data at Coolangatta, QLD.

Date	Wind Direction	Highest Wind Gusts (Km/H)	Time of Maximum Wind Gust	Minimum Temperature (°C)	Maximum Temperature (°C)	Rain (Mm)
1	S	69	12:57	15.7	19.6	13.0
2	SSE	69	13:01	16.1	24.2	20.6
3	SSE	57	13:10	16.3	25.3	7.2
4	SE	46	11:04	16.4	24.8	16.2
5	ESE	35	14:19	18.2	29.3	3.0
6	N	41	13:30	20.4	34.1	0.2
7	SSW	35	00:18	18.6	28.6	0
8	SSE	54	22:02	22.8	28.6	0
9	S	46	00:08	20.1	25.5	0.2
10	ENE	31	18:46	18.2	26.0	0.8
11	N	39	16:09	21.1	28.0	0.6
12	N	59	16:27	21.1	29.2	0
13	SE	43	09:18	23.4	26.4	0
14	NE	28	13:18	18.9	27.5	0
15	ESE	41	14:34	19.8	27.5	0
16	S	37	23:48	18.0	26.0	47.6
17	SE	46	13:07	17.5	26.1	1.0
18	S	44	10:02	17.4	25.3	0.2
19	SE	57	14:15	17.5	26.2	0
20	SE	61	13:19	16.4	25.8	0.6
21	SE	46	15:03	16.9	25.6	0
22	NE	30	13:39	17.0	26.5	0
23	NNE	39	11:04	20.2	28.2	0
24	N	26	11:58	20.3	26.8	3.4
25	E	33	11:24	18.9	28.5	2.6
26	E	43	13:25	19.4	27.6	2.8
27	ESE	44	08:46	20.2	28.0	0.2
28	ESE	39	09:37	20.0	27.4	1.8
29	SE	46	12:59	18.2	28.5	0
30	ESE	43	09:26	20.8	26.1	5.8
31	ESE	41	11:09	19.7	28.2	3.6

**Notes to Table 2**

ND – No Data provided by BOM.



## 2 Sampling Methodology

### 2.1 Air Monitoring Samples

The implementation of continuous dust monitoring using a light scattering instrument (Dust Trak™ DRX Aerosol Monitor) as a supplemented analysis technique for dust deposition and directional dust analysis techniques. This supplemental technique is used as a guide and first response to allow change to dust control measures to be implemented to avoid exceedances over the techniques employed for deposition and directional dust analysis.

A summary of the dust monitoring equipment is provided in **Table 3** below.

**Table 3** Dust equipment deployed

Make	Model	Location	Serial Number	Calibrated on	Calibration Due
DustTrak	8533	006	8533184203	10/02/2022	10/02/2023
DustTrak	8533	005	8533181801	31/01/2022	31/01/2023
DustTrak	8533	004 / 007	8533192607	21/04/2022	21/04/2023

### 2.2 Controls

As per Lendlease's Tweed Valley Hospital Management Plan – Air Quality:

*Works must be undertaken in accordance with the Lendlease GMRs, the Project EHS Plan, this Sub Plan and the Lendlease Building WDC. These documents detail Lendlease's approach and commitment to pro-active and responsible site management.*

*Site specific controls, monitoring, reporting and performance measures have been identified in this Sub Plan to prevent or minimise the impacts of construction related air emissions on the environment and community. These may include but are not limited to:*

- *Clear definition of trafficable and material storage areas to prevent unnecessary vehicle movement into other areas;*
- *Use of water cart to dampen work areas and exposed soils to prevent the emission of excessive dust;*
- *Installation of a wheel shaker grid and/or wash down facilities at the vehicle egress point;*
- *Ensuring trucks transporting materials to and from the site use covers to prevent windblown dust or spillage;*
- *Ensuring truck tailgate locking mechanisms are operational and in use;*
- *Periodic inspection of surrounding roads to ensure no construction contamination and initiation of road sweeping if required;*
- *Careful selection of materials for temporary road surfacing;*
- *Watercarts/water trucks will be in permanent use on site during excavation and civil works;*
- *Temporary stockpiles that are not required for imminent use will be stabilised with spray grass or appropriate fabric;*
- *Continuous monitoring of weather forecast to stop dust generating activities in case that high winds are expected;*
- *Before extended breaks (e.g., Easter, Christmas), areas will be treated with spray grass;*

- Only those areas where immediate structures are to be build will be stripped. Areas will be stripped at the latest possible date to comply with the program;
- Construction haul roads and temporary carparking will maximise the use of permanent infrastructure. These roads/carparks will have a sacrificial seal to minimise dust generation;
- Subcontractors to maintain equipment / machinery to ensure exhaust emissions comply with relevant legislation and guidelines;
- All waste material to be sorted, collected and removed from site (for recycling where possible);
- If rock crushing is assessed to be safe and feasible (i.e. cost effective and meets Noise restrictions) the following management provisions will be in place:
  - Rock crushers will have a water attachment for dust suppression at the source. The water is sprayed at the face of the crusher before, during and after the crushing;
  - Crushers will be located as far as practicable from Cudgen Road and immediate neighbours (i.e., on the north-west area of the site);
  - All crushed rock suitable for re-use will be recycled on site as fill, sediment control, pavements, hardstands, construction exits and pipe bedding materials;
  - Where possible, the oversize material from hard rock projects is also reused for vehicle entry shake downs and erosion control;
  - Air quality monitoring is required for dust only. Given all plant and equipment will be fitted with air filter caps, analytical air quality monitoring except for asbestos works is not required;
  - Dust screens and airlocks to be utilised with interior works;
  - Controlling dust close to its source by installing sprays and sprinkler systems to prevent off-site migration;
  - Maintaining the site access to prevent dust generation and tracking off-site; and
  - No blasting will be performed as part of the proposed construction works program.

*Demolition (e.g., existing inground services), excavation and construction stage dust, odour and emission management requirements must be included in relevant specifications, contract agreements, quality assurance documents, and subcontractor work method statements.*

*Site inspections, monitoring and reporting will be undertaken by Lendlease and subcontractors as detailed in the Project EHS Plan and the following implementation table to ensure controls remain effective overtime.*

Lendlease has established a daily check list on site to assess whether all monitors are operating in the field correctly, have adequate sunlight to power the units and that they are reporting consistently. It is understood that Lendlease will report issues immediately to ADE. Furthermore, ADE will conduct daily checks via telemetry to assess whether the monitors are operating and recording correctly. ADE are to advise Lendlease of issues immediately. Monitors will not be removed unless consultation with Lendlease, TSA Management and Health Infrastructure New South Wales has occurred and alternative locations are agreed upon.

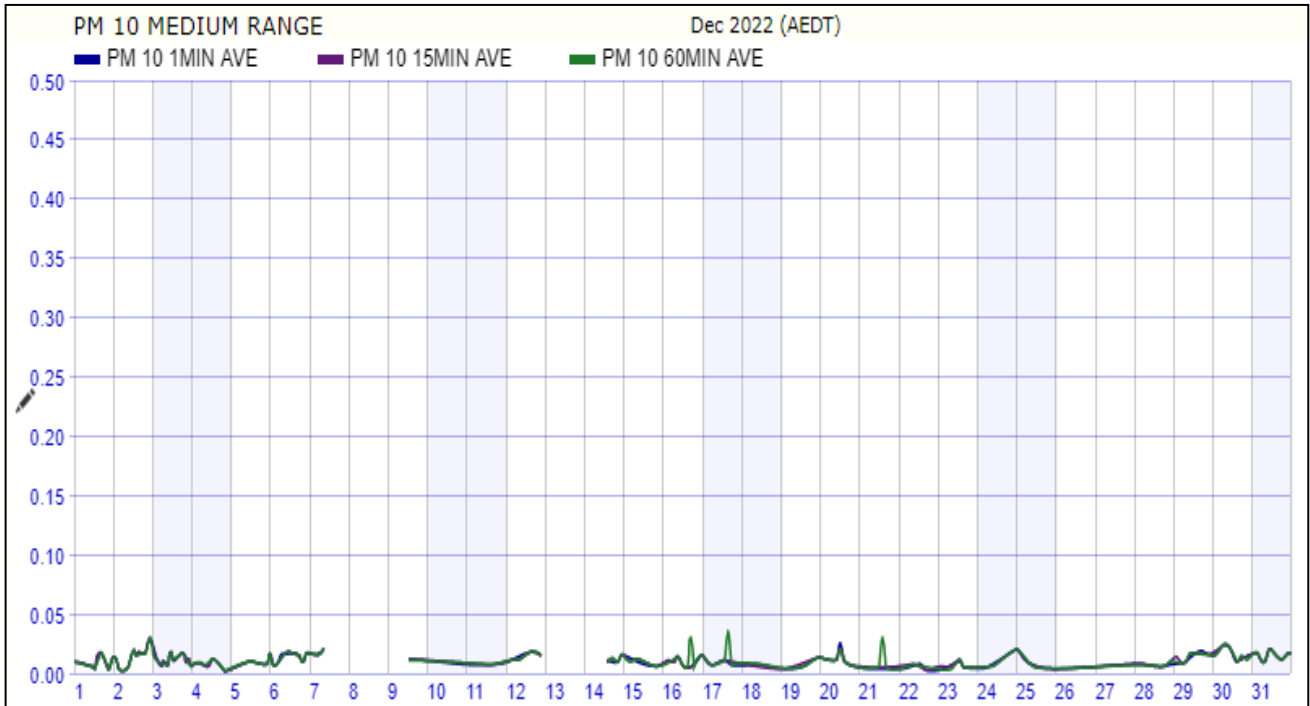
## 2.3 Data Gaps

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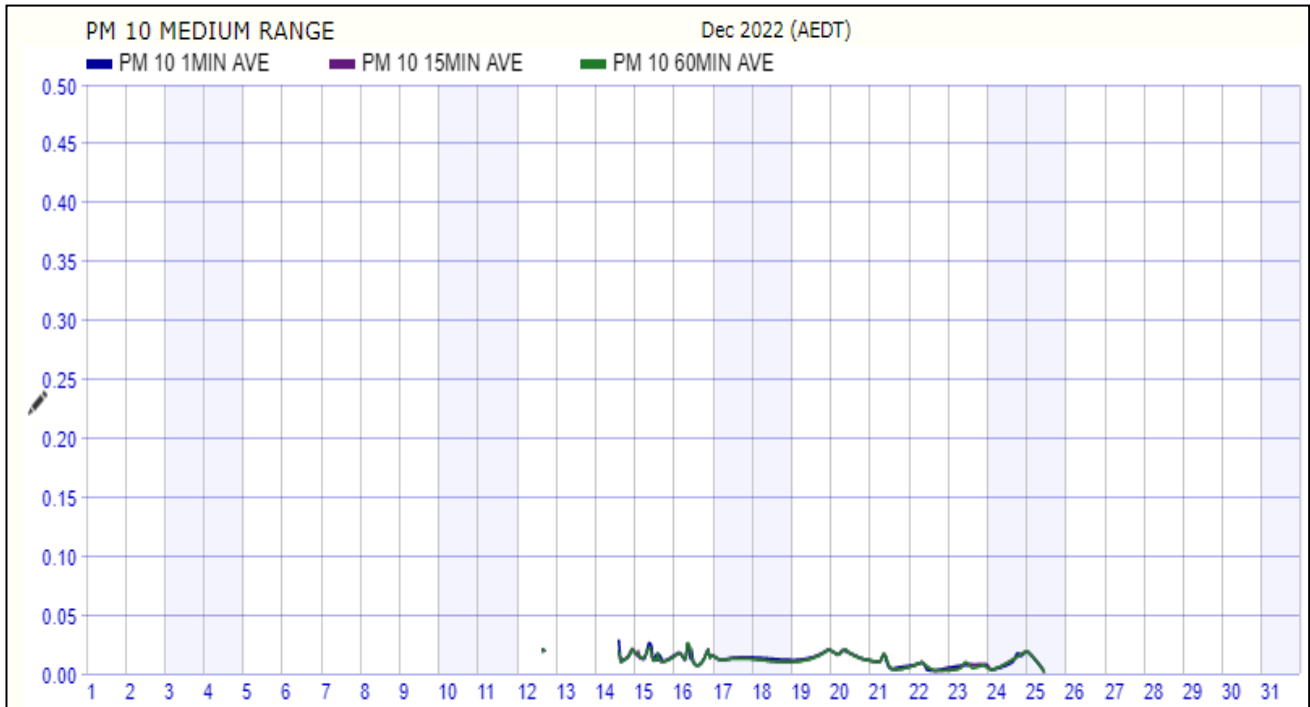
Data gaps were identified at monitoring location 006. Based on field observations and no residential dust complaints, ADE considers the potential for dust exceedances to be minor.

# 3 Data

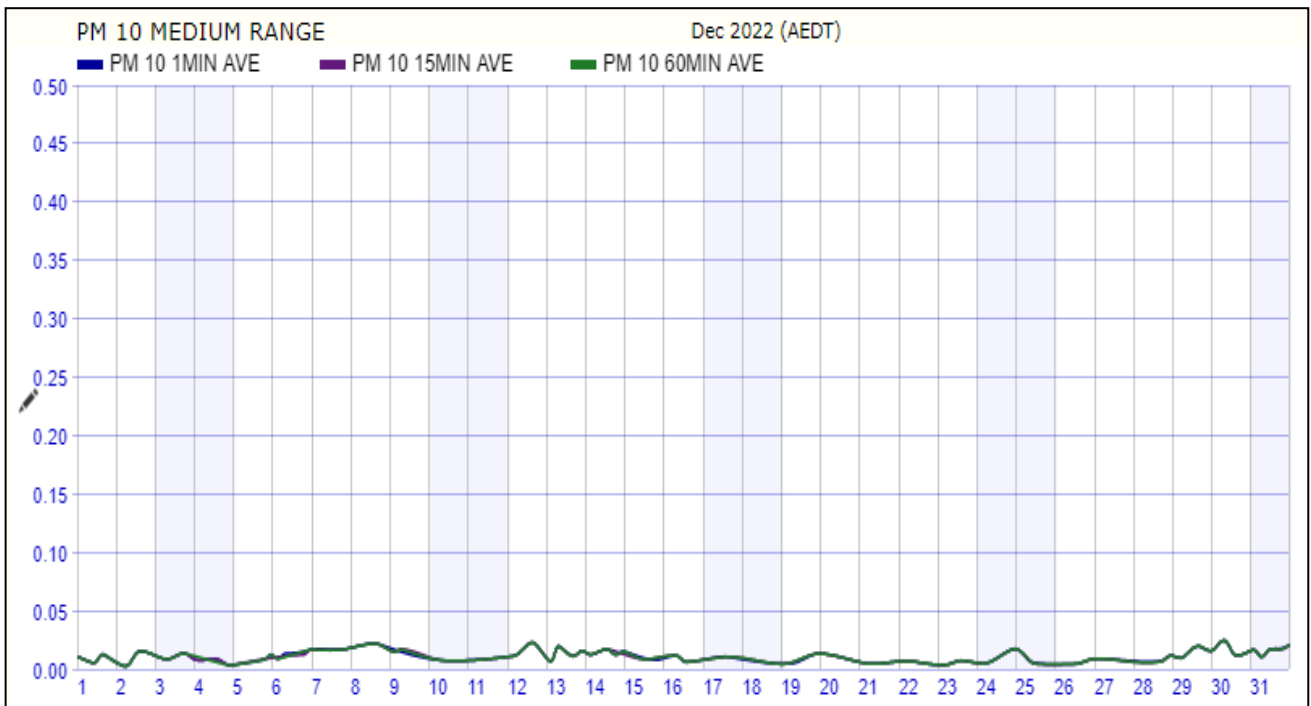
Figures below show monthly dust results for each of the three (3) monitoring locations. All graphs below express dust levels as an hourly average and values  $<0.001 \text{ mg/m}^3$  will be recorded as  $0 \text{ mg/m}^3$  and will not be graphed.



**Figure 1.** Summary of PM10 from the real time monitoring at location 005 – Solar Industry for the month of December 2022.



**Figure 2.** Summary of PM10 from the real time monitoring at location 006 – Mate and Matts for the month of December 2022.



**Figure 3.** Summary of PM10 from the real time monitoring at location 007 – Residential for the month of December 2022.

## 4 Conclusion & Recommendations

All dust levels remained below  $0.5 \text{ mg/m}^3$  during the month of December 2022 (*refer to Section 3*), below the Action limit of  $2.5 \text{ mg/m}^3$ . It should be noted that the DustTrak minimum concentration reading is  $0.001 \text{ mg/m}^3$  and values of lower concentration will be recorded as zero.

Consistent with previous reports, recommendations are to ensure adequate dust control measures continue to be implemented as per the Tweed Valley Hospital Management Plan – Air Quality and continue monitoring of PM10 for the duration of the project. If the action limit of  $2.5 \text{ mg/m}^3$  (8-hour time weighted average) is exceeded, works are to cease and appropriate dust prevention techniques are to be implemented. To reduce the likelihood of data gaps, daily on-site visual checks are to be undertaken by Lendlease accompanied by daily checks of the online telemetry by ADE. Rectification measures have been undertaken to improve the overall data collection at monitoring location 006.

## 5 Limitations

This report has been prepared for use by the client who has only commissioned the works in accordance with the project brief and the report contains information provided by the client. The advice herein relates only to this project and all results, conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, this report should not be used for any other purpose.

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ADE's professional opinions are based upon its professional judgment, experience, training and results from analytical data. In some cases, further testing and analysis may be required, thus producing different results and / or opinions. ADE has limited investigation to the scope agreed upon with its client.

ADE has used a degree of care and skill ordinarily exercised in similar investigations by a reputable member of the Environmental Industry within Australia. No other warranty, expressed or implied, is made or intended.

## 6 References

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- AIOH Position Paper, Dust not otherwise specified (Dust NOS) AND Occupational Health Issues, published by the Australian Institute of Occupational Hygienists (AIOH), May 2016.
- Australian Government, Bureau of Meteorology (BOM).
- Lendlease Building Pty Ltd Tweed Valley Hospital Management Plan – Air Quality.

# Appendix I – Aerial Photograph

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S:\5. Current Projects\2021\VA101023 0286.00 DBW\1 Lend Lease Building Tweed Valley Hospital, MS49\GIS\VA101023 0286.00 7th Environmental Monitoring.gpx



0 100 200m

Tweed Valley Hospital Development Project  
Environmental Noise, Vibration, and Dust Monitoring  
location Overview

Image: Nearmaps | Scale: 1:5000 | GOA 1994 Zone 56

Legend

- • Roads
- ◆ Loggets
- Cudgen Road Upgrade Works locations
- D Tweed Valley Hospital Development Project

## Appendix II – Monitoring Locations

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Photograph 1 Representative photograph of monitoring location 007 – Residential, as observed 08/12/2022

Photograph 2 Representative photograph of monitoring location 005 – Solar Industry, as observed 08/12/2022



Photograph 3 Representative photograph of monitoring location 006 – Mate and Matts, as observed 08/12/2022



## Appendix III – ADE Site Visit Summary

Date of site visit	Time of site visit	Observations/Actions
01/12/2022	1000 – 1400	<ul style="list-style-type: none"> <li>▪ Noise/Vibration firmware upgrades and monthly calibrations</li> </ul>
08/12/2022	1100 – 1700	<ul style="list-style-type: none"> <li>▪ Repositioning of solar panels;</li> <li>▪ Troubleshooting of dust monitor at location 006; and</li> <li>▪ Dust monitor at location 006 removed from site for diagnostics/repair</li> </ul>
14/12/2022	1230 – 1400	<ul style="list-style-type: none"> <li>▪ Re-installation of dust monitor at location 006</li> </ul>



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