Environmental Dust Assessment Report (June 2020)

Tweed Valley Hospital Project, Kingscliff NSW

Prepared for: Delta Group

DLT-01-Q1013 / EDM11 / v1f
10th July 2020

ADE CONSULTING GROUP
SOLUTIONS THROUGH INNOVATION

Prepared for:

Delta Group

Environmental Dust Assessment Report

Tweed Valley Hospital Project

Version	Details	Date
v1f	Written by [redacted]	10th July 2020

Report No: DLT-01-Q1013 / EDM11 / v1f

Date: 10th July 2020

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BSc Hons. (Env. Sci.)
Project Manager

EXECUTIVE SUMMARY

ADE Consulting Pty Ltd (ADE) has been commissioned by the Delta Group to prepare an assessment of Dust levels during the construction phase for Tweed Valley Hospital Project located at 771 Cudgen Road, Kingscliff NSW. Kingscliff is located in the Northern Rivers region of New South Wales. The Site is bounded by the Tweed Coast Road to the West, Cudgen Road to the South and Turnock Street to the East.

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

- Compliance with Tweed Valley Hospital Management Plan – Air Quality (2020);
- Avoid excessive dust generation through site planning and the adoption of appropriate work methods and practices; and
- Prevent or minimize to the greatest extent, the impact of construction dust on neighbors and to establish and maintain positive relationships with project stakeholders.

Data gaps and errors were identified during the following period / monitoring location:

- Monitor 006, Thursday June 11th (approximately 06:45 – 09:00)
    - It was determined that this gap was caused by solar conditions (less sunlight and several overcast days in a row) combined with the position of Monitor 006 beneath a large stand of trees causing the solar panel to be in complete shade as early as 12:30 each day (refer to *Appendix I – Monitoring Locations*).
    - ADE attended site on Friday June 12th to install an additional solar panel to increase the rate of charge gained each morning. ADE requested approval from Lendlease to relocate the monitor no more than 10 m to a more suitable location.
    - ADE closely monitored the battery voltage via telemetry over the weekend and determined the additional solar panel had increased the rate of charge but would not be sufficient to prevent data gaps occurring on overcast days.
    - ADE's request to relocate Monitor 006 was approved by Lendlease on Monday June 15th. ADE mobilised immediately to move Monitor 006 and both solar panels 10 m east to a more suitable location (refer to *Appendix I – Monitoring Locations*).
    - The new location of Monitor 006 has rectified the battery shortage issue: it has since been running 24 hours a day.

- Monitor 003, Friday June 26th (approximately 17:00) to Monday June 29th (approximately 11:30)
    - The monitor was uploading to telemetry a constant value of 0.17mg/m^3.
    - The issue continued through the weekend.

- ADE attended site on Monday June 29th to identify and rectify the issue. It was determined that the issue was due to the Dust Monitor Auto-Zero Module failing to complete a scheduled auto-zero function.
- ADE disassembled and cleaned all internal components, replaced all filters, and re-calibrated the monitor and the Auto-Zero Module.
- Monitor 003 resumed normal operation and has since been running 24 hours a day.

- Monitor 004, Friday June 26th (approximately 16:00) to Monday June 29th (approximately 12:30)
  - The monitor was uploading to telemetry a constant value of 0.11mg/m^3.
  - The issue continued through the weekend.
  - ADE attended site on Monday June 29th to identify and rectify the issue. It was determined that the issue was due to the Dust Monitor Auto-Zero Module failing to complete a scheduled auto-zero function.
  - ADE disassembled and cleaned all internal components, replaced all filters, and re-calibrated the monitor and the Auto-Zero Module.
  - Monitor 004 resumed normal operation and has since been running 24 hours a day.

Outcome of the dust assessment did not identify any health exposures presenting an immediate danger to life, health or environment. The report details the outcome of the real time dust assessment conducted by ADE from 1st – 30th June 2020.

Results from dust monitoring undertaken during the monitoring period June 2020 were below 0.5 mg/m^3, as such dust concentrations across all monitoring location remained below the action limit of 2.5 mg/m^3. **No exceedances occurred throughout the month of June 2020.**

Works were only conducted between 7am and 6pm, Monday – Friday from the 1st – 30th June 2020 and only data within this range should be considered.

1 INTRODUCTION

1.1 General

ADE Consulting Group Pty Ltd (ADE) was commissioned by Delta Group (DLT) Pty Ltd to measure the levels of dust within the Tweed Valley Hospital Project, located at 771 Cudgen Road, Kingscliff NSW hereafter referred to as 'The Site'. At the time of the dust monitoring, Delta Group are continuing to conduct excavation works.

Real time dust monitoring was carried out to determine and quantify the levels of dust created during the days in which the contractors/employees are undertaking the earthworks.

Table 1. Summary of Site Information and Project Information.

Site and Project Details	
Client:	Delta Group
ADE Project No.:	DLT-01-Q1013
Site Location:	771 Cudgen Road, Kingscliff NSW
Monitoring Time and Dates:	Friday 1st June 2020 – Tuesday 30th June 2020 (continuous): - Day shift from 07:00 to 17:59 - Night Shift from 18:00 to 06:59
Date of Report:	10.07.2020
Monitoring Parameters:	Particulate Matter <10 micrometers (PM10); and Data recording frequency: 1 minute.
Exposure Standard:	Australian Institute of Occupational Hygienists (AIOH) recommendation for PM10 Dust **5 mg/m^3** (expressed as 8-hour time weighted average)

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 seven locations along the Eastern, Southern and Western boundaries of the site; and
- Preparation of an Environmental Dust Assessment Report outlining the site data, conclusions and recommendations.

1.3 Whole Report

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

Refer to the previous report (DLT-01-Q1013 / EDM10 / v1.3f) for details from earlier monitoring periods.

1.5 Monitoring Locations

The Site is located at 771 Cudgen Road, bounded by Tweed Coast Road to the West, Turncock Street to the East and Cudgen Road to the South at Kingscliff, NSW as per the Figure 1 on the following pages.

The DustTrak monitoring locations are indicated by the blue dots in Figure 1, all within the confines of the construction barriers in compliance with condition C29 of the consent.

Dust levels are recorded at these locations to determine the dust levels at the Western, Eastern and Southern boundaries of the project during the alterations on site, and ensure the nearby sensitive receivers listed in the Tweed Valley Hospital Management Plan – Air Quality (2020) remain undisturbed (refer to **Appendix I – Monitoring Locations**). Dust monitoring location 001 was installed on the 2nd of August 2019. Dust monitoring locations 002 & 003 were installed on the 31st of July 2019. Dust monitoring locations 004, 005, 006 & 007 were installed on the 16th of January 2020. All dust monitors have been operational 24 hours a day since their installation.

1.6 Exposure Limits

ADE has adopted the recommended exposure standard for PM10 to be 5 mg/m^3 (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, cease works immediately, and review controls and relevant practices listed in the Tweed Valley Hospital Management Plan – Air Quality (2020). An action limit of 2.5 mg/m^3 (8-hour time weighted average) has been implemented to minimize the likelihood of an exceedance.

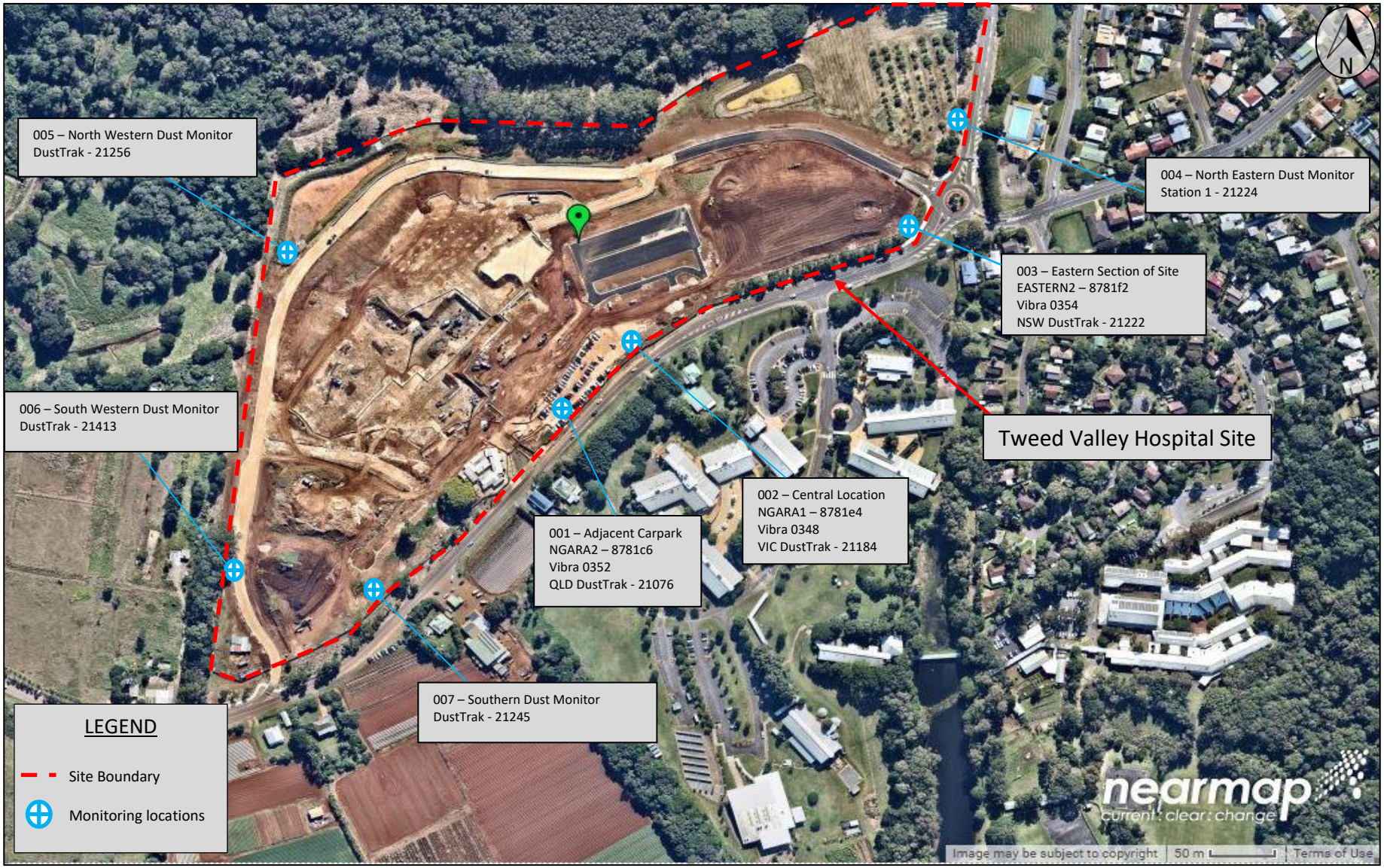
1.7 Bureau of Meteorology (BOM) Climate Data

Summary of climate data for Coolangatta has been included in Table 2 below.

Table 2. Summary of 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)
01/06/2020	N	41	15:22	11.5	24.1	0.4
02/06/2020	SW	31	11:56	9.9	20.6	0
03/06/2020	SE	31	16:07	4.3	20.3	0
04/06/2020	S	48	13:10	12.9	20.1	0
05/06/2020	S	35	12:02	14.3	21.8	0
06/06/2020	E	30	12:43	9.6	22.2	0
07/06/2020	E	28	15:06	11.2	21.8	0
08/06/2020	SSE	39	14:04	10.6	21	0.6
09/06/2020	SSE	41	11:48	14.5	21.6	0
10/06/2020	ENE	43	10:36	15.8	21.3	12.4
11/06/2020	ESE	26	14:28	14.9	24.1	31.4
12/06/2020	S	35	11:55	14.9	23	0.2
13/06/2020	ENE	20	14:36	13.9	23.6	0
14/06/2020	N	46	10:33	17	22.8	7.4
15/06/2020	S	31	12:59	13.8	24.1	6.6
16/06/2020	SE	33	12:16	17	23.7	0.2
17/06/2020	SSE	35	11:45	11.9	22.8	0.2
18/06/2020	SE	48	12:26	15.8	21.1	0
19/06/2020	S	31	11:47	13.8	19.9	11.4
20/06/2020	S	28	10:52	14.2	20	2.6
21/06/2020	N	35	16:54	11.3	21.5	0
22/06/2020	NNW	26	13:11	11.3	21.1	1.6
23/06/2020	W	26	15:27	4.8	19.9	0.2
24/06/2020	NE	20	13:47	4.6	18.6	0.2
25/06/2020	S	26	10:24	6.6	21.3	0
26/06/2020	SSW	33	10:23	9.2	20.5	0.2
27/06/2020	S	41	13:29	13.2	20.3	0
28/06/2020	SSW	31	3:26	14.4	16.7	0
29/06/2020	SSW	35	11:06	11.3	20.6	1.4
30/06/2020	S	26	8:41	11.6	21	0.2

Figure 1. Aerial Photograph of the DLT Works Area at Kingscliff



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 within deposition and directional dust analysis techniques.

2.2 Controls

As per Lendlease Tweed Valley Hospital Management Plan – Air Quality (2020):

"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 Nosie 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"

Delta and Lendlease have established a daily check list on site to ensure all monitors are operating in the field correctly, have adequate sunlight to power the units and that they are reporting consistently. Delta will report any issues immediately to ADE. Furthermore, ADE will conduct daily checks via telemetry to ensure the monitors are operating and recording correctly. ADE are to advise Delta of any issues immediately. Monitors will not be removed unless consultation with Delta/Lendlease, TSA and HI has occurred and alternative locations are agreed upon.

3. DATA

All graphs below express dust levels as an hourly average and values <0.01 will not be graphed. Figures below show monthly dust results for each of the seven (7) monitoring locations.

Figure 2. Summary of PM10 from the real time monitoring at location 001 – Adjacent the carpark.

Figure 3. Summary of PM10 from the real time monitoring at location 002 – Central location.

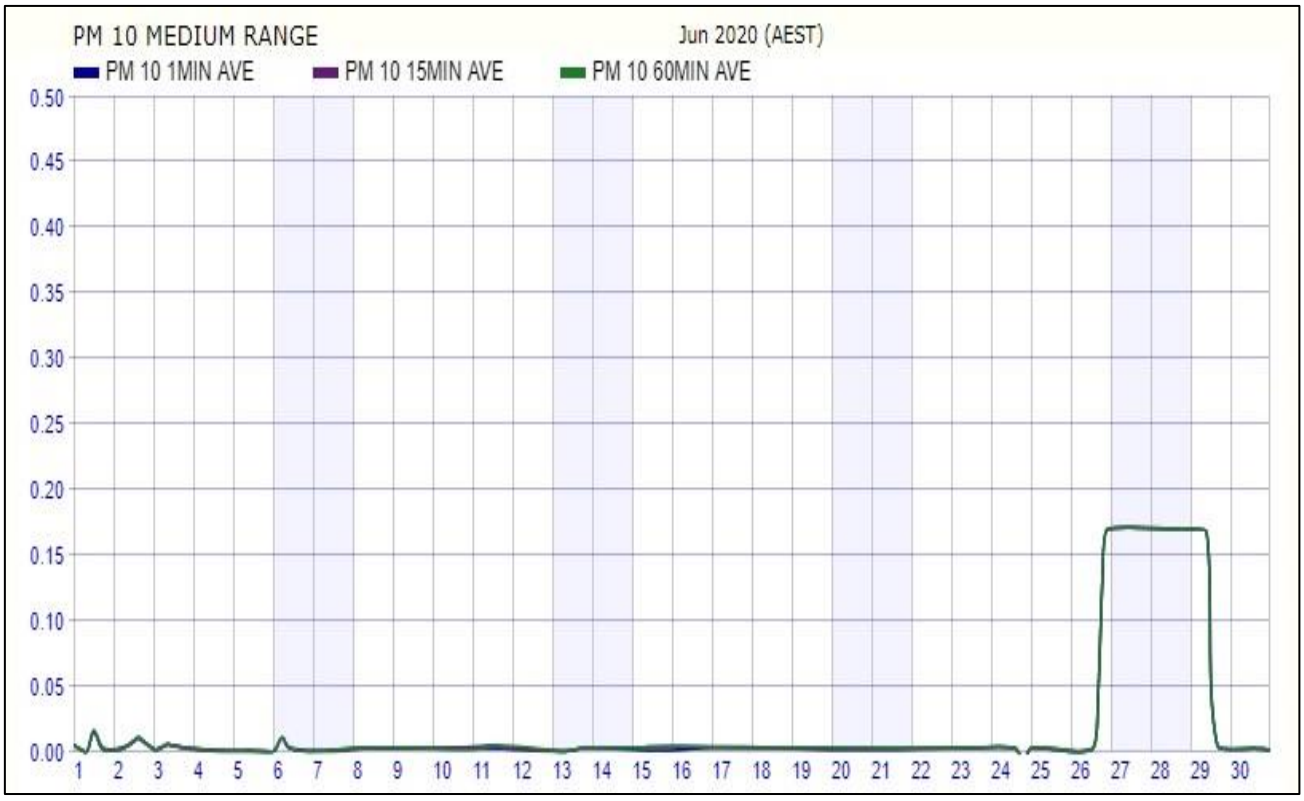


Figure 4. Summary of PM10 from the real time monitoring at location 003 – Eastern Section of site.

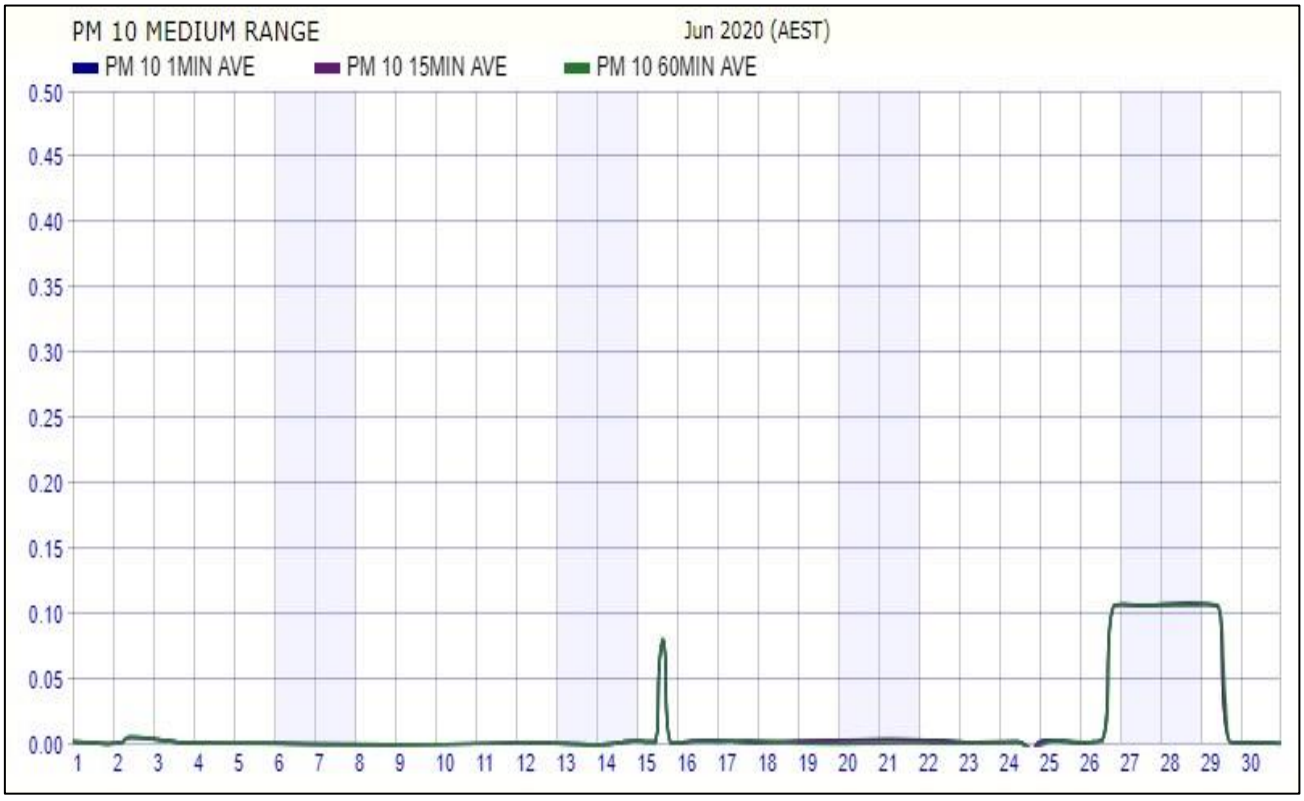


Figure 5. Summary of PM10 from the real time monitoring at location 004 – North Eastern Dust Monitor.

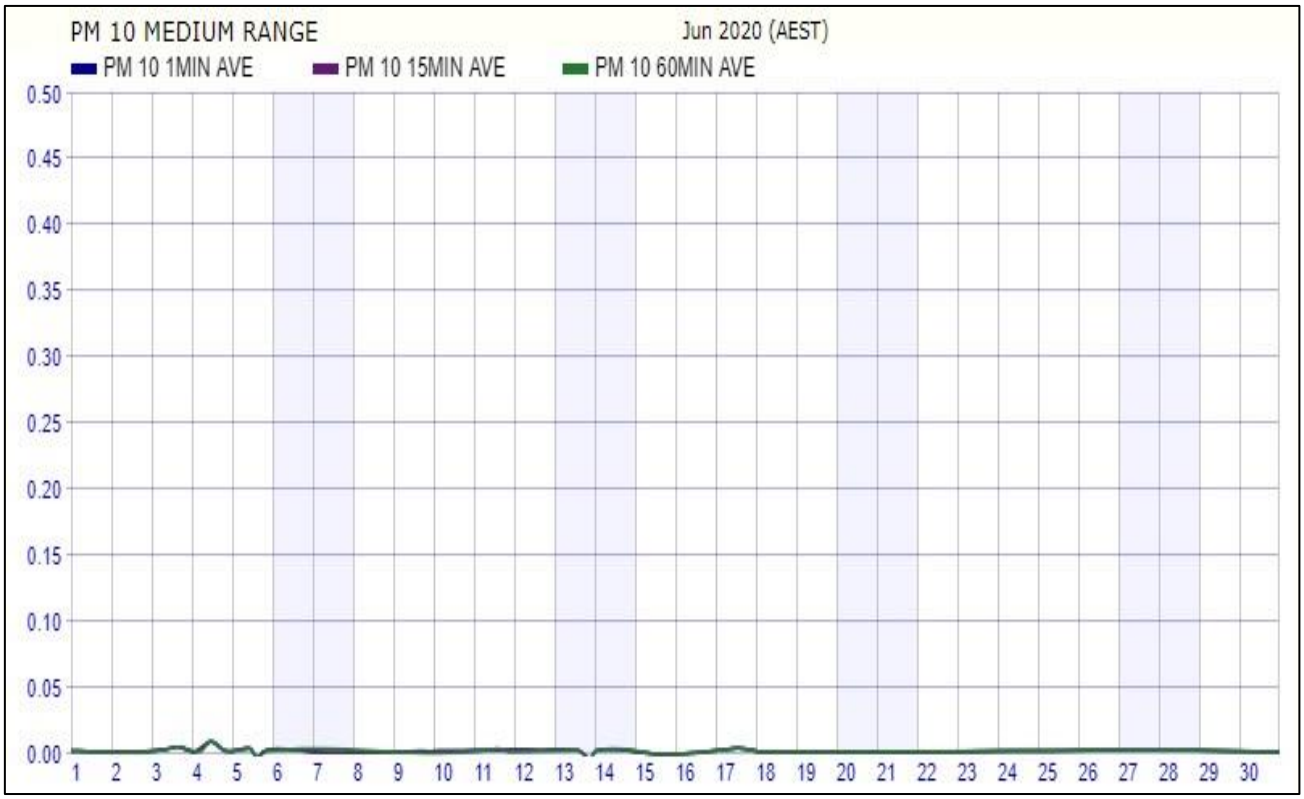


Figure 6. Summary of PM10 from the real time monitoring at location 005 – North Western Dust Monitor.

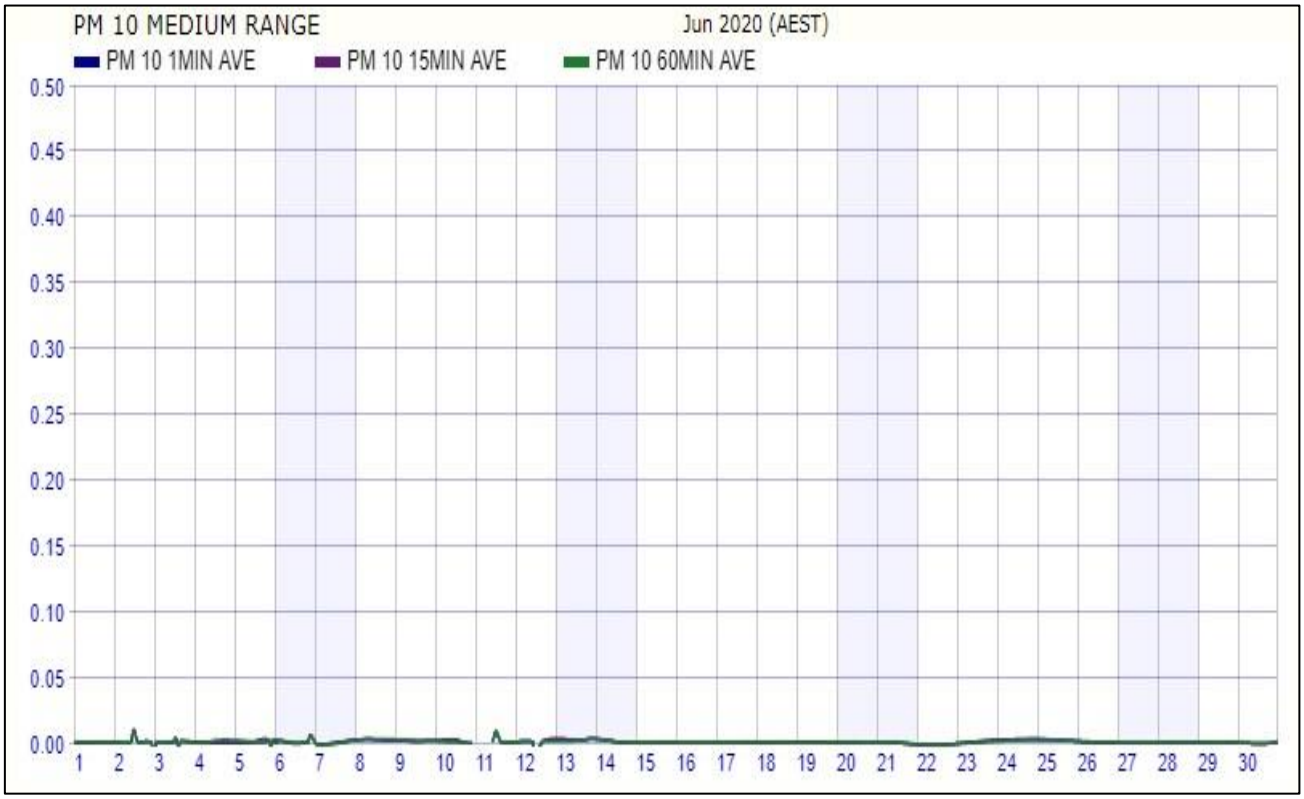


Figure 7. Summary of PM10 from the real time monitoring at location 006 – South Western Dust Monitor.

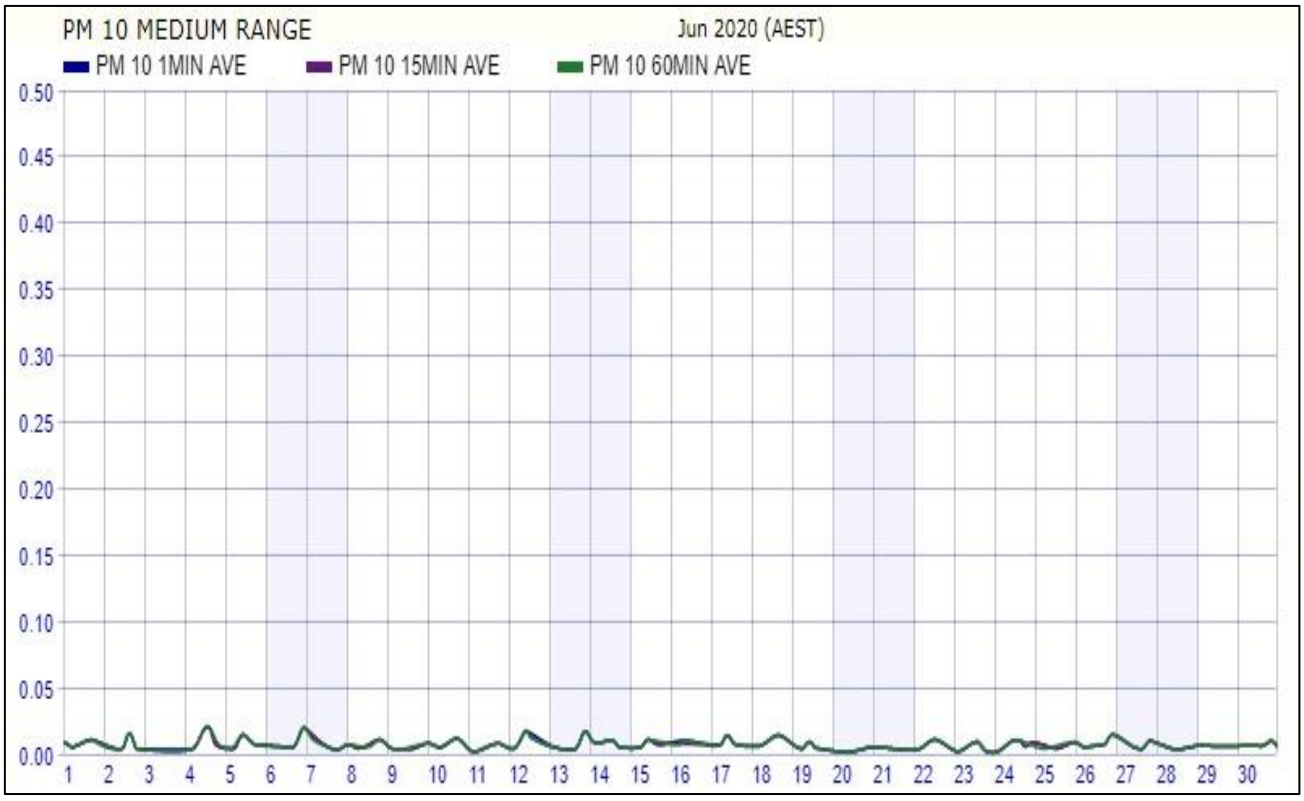


Figure 8. Summary of PM10 from the real time monitoring at location 007 – Southern Dust Monitor.

4. CONCLUSIONS

All dust levels remained below 0.5mg/m^3 during the month of June 2020 (*refer to **Section 3. Data**).*

It should be noted that the DustTrak minimum concentration reading is 0.001mg/m^3 and values of lower concentration will be recorded as zero.

Data gaps and errors were identified during the following period / monitoring location:

- Monitor 006, Thursday June 11th (approximately 06:45 – 09:00)
    - It was determined that this gap was caused by solar conditions (less sunlight and several overcast days in a row) combined with the position of Monitor 006 beneath a large stand of trees causing the solar panel to be in complete shade as early as 12:30 each day (refer to *Appendix I – Monitoring Locations*).
    - ADE attended site on Friday June 12th to install an additional solar panel to increase the rate of charge gained each morning. ADE requested approval from Lendlease to relocate the monitor no more than 10 m to a more suitable location.
    - ADE closely monitored the battery voltage via telemetry over the weekend and determined the additional solar panel had increased the rate of charge but would not be sufficient to prevent data gaps occurring on overcast days.
    - ADE's request to relocate Monitor 006 was approved by Lendlease on Monday June 15th. ADE mobilised immediately to move Monitor 006 and both solar panels 10 m east to a more suitable location (refer to *Appendix I – Monitoring Locations*).

- The new location of Monitor 006 has rectified the battery shortage issue: it has since been running 24 hours a day.

- Monitor 003, Friday June 26th (approximately 17:00) to Monday June 29th (approximately 11:30)
  - The monitor was uploading to telemetry a constant value of 0.17mg/m^3.
  - The issue continued through the weekend.
  - ADE attended site on Monday June 29th to identify and rectify the issue. It was determined that the issue was due to the Dust Monitor Auto-Zero Module failing to complete a scheduled auto-zero function.
  - ADE disassembled and cleaned all internal components, replaced all filters, and re-calibrated the monitor and the Auto-Zero Module.
  - Monitor 003 resumed normal operation and has since been running 24 hours a day.

- Monitor 004, Friday June 26th (approximately 16:00) to Monday June 29th (approximately 12:30)
  - The monitor was uploading to telemetry a constant value of 0.11mg/m^3.
  - The issue continued through the weekend.
  - ADE attended site on Monday June 29th to identify and rectify the issue. It was determined that the issue was due to the Dust Monitor Auto-Zero Module failing to complete a scheduled auto-zero function.
  - ADE disassembled and cleaned all internal components, replaced all filters, and re-calibrated the monitor and the Auto-Zero Module.
  - Monitor 004 resumed normal operation and has since been running 24 hours a day.

Dust concentrations across all monitoring location remained below the action limit of 2.5 mg/m^3 (refer to Section 3. Data).

5. RECOMMENDATIONS

Ensure adequate dust control measures are being implemented as per the Tweed Valley Hospital Management Plan – Air Quality (2020) and continued monitoring of PM10 for the duration of the project. If the action limit of 2.5 mg/m^3 (8-hour time weighted average) is exceeded, cease works and review and implement additional dust prevention techniques.

To reduce the likelihood of data gaps, daily on-site visual checks are undertaken by Delta accompanied by daily checks of the online telemetry by ADE.

6. LIMITATIONS

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only and has been based on 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, before being used for any other purpose. ADE Consulting Group Pty Ltd accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced or amended in any way without prior approval by the client or ADE and should not be relied upon by any other party, who should make their own independent enquiries.

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.

7. REFERENCES

- 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), 2020
- Lendlease Building Pty Ltd Tweed Valley Hospital Management Plan – Air Quality, dated 07/02/2020.

APPENDIX I

Monitoring Locations

Photograph 1. Representative photo of monitoring location 001 – Adjacent Carpark location, as observed as observed 18.06.2020.

Sydney Office:
ADE Consulting Group Pty Ltd
Unit 6 / 7 Millennium Court
Silverwater, NSW 2128

Melbourne Office:
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Brisbane Office:
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Photograph 2. Representative photo of monitoring location 002 – Central location, as observed as observed 18.06.2020.

Photograph 3. Representative photo of monitoring location 003 – Eastern Section of Site, as observed 18.06.2020.

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Photograph 4. Representative photo of monitoring location 004 – North Eastern Dust Monitor, as observed 18.06.2020.

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Photograph 5. Representative photo of monitoring location 005 – North Western Dust Monitor, as observed 18.06.2020.

Photograph 6. Representative photo of monitoring location 006 – South Western Dust Monitor, as observed 18.06.2020.

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Photograph 7. Representative photo of monitoring location 007 – Southern Dust Monitor, as observed 18.06.2020.

APPENDIX II

ADE Site Time Summary

Date of site visit	Time of site visit
01.06.2020	1030 to 1315
04.06.2020	1030 to 1400
10.06.2020	0830 to 1400
12.06.2020	1115 to 1445
15.06.2020	1000 to 1400
18.06.2020	1015 to 1300
29.06.2020	1045 to 1330