SUBURBAN RAIL LOOP

Air Quality Monthly Report

Early Works

Tunnels South

19 February – 18 March 2025

SUBURBAN RAIL LOOP AUTHORITY

VICTORIA'S BIG BUILD

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Introduction

This summary report presents the results of the monthly air quality monitoring data for the construction of SRL East. Laing O'Rourke (LOR) is delivering the Early Works (EW) as Managing Contractor (MC) and Suburban Connect is delivering the Tunnels South works as Principal Contractor (PC). The two delivery partners have individually prepared reports to comply with the Environmental Performance Requirement (EPR) for Air Quality.

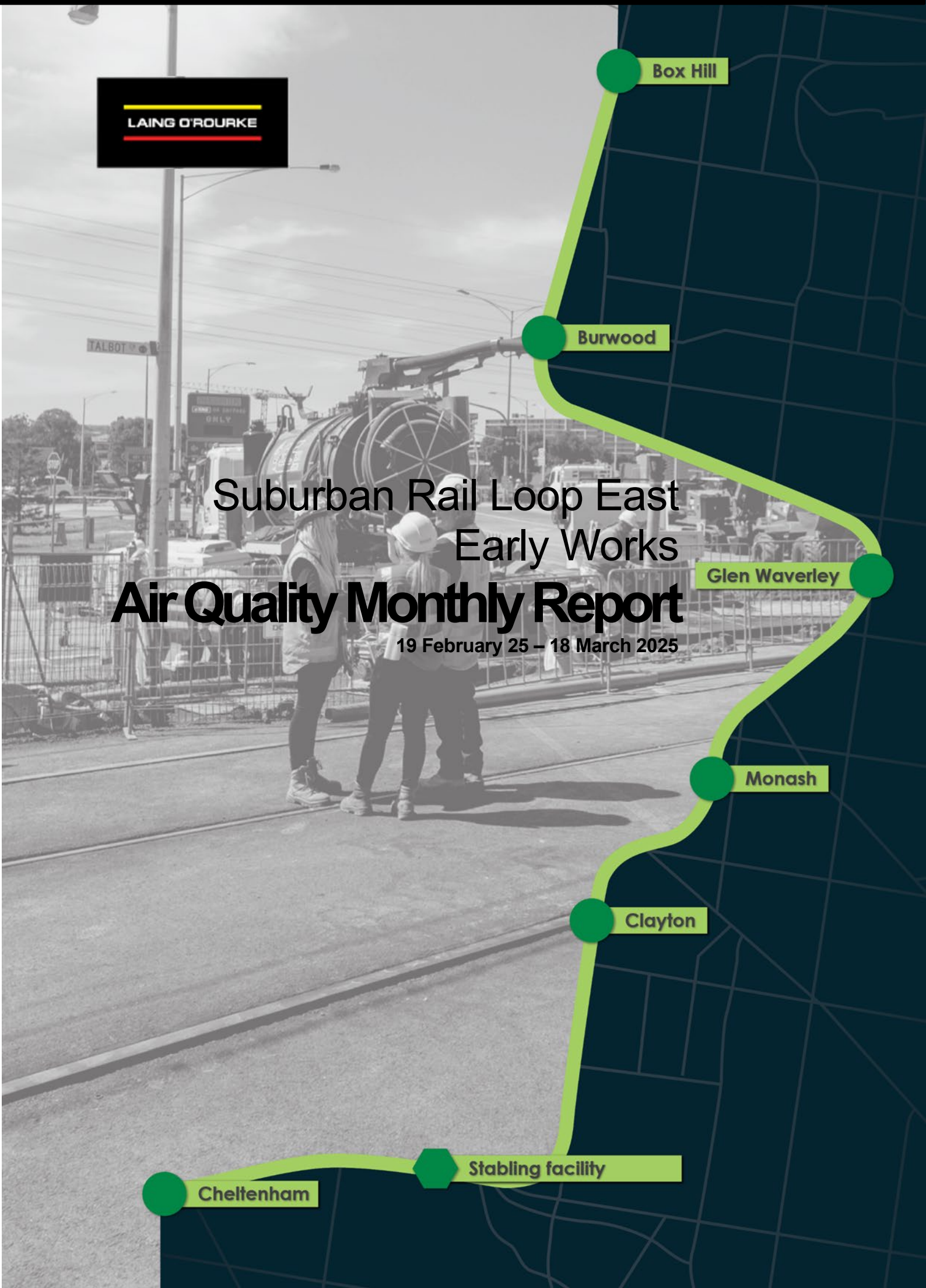
SRL East Early Works include road modifications, moving underground services, ground improvement works, tram terminus works, and site preparations for tunnel boring machines.

SRL East Tunnels South is a fully tunnelled metro corridor between Cheltenham and Glen Waverley. The delivery scope encompasses station boxes and twin segmentally lined bored tunnels with cross passages.

Appendices

Appendix 1 – Suburban Rail Loop East Early Works Air Quality Monthly Report

Appendix 2 – Suburban Rail Loop East Tunnels South Air Quality Monthly Report



Suburban Rail Loop East
Early Works
Air Quality Monthly Report

19 February 25 – 18 March 2025

Document Information

Document Details	
Issue Date	07/04/2025
Revision Number	C
Status	Issued for Review

Revision Control

Revision Number	Change Detail	Date	Comment
A	Draft issued to SRLA	20/03/2025	Issued for Review
B	Draft issued to SRLA	27/03/2025	Issued for Review
C	Draft issued to SRLA	07/04/2025	Issued for Review

Contents

Glossary

µg/m^3 – micrograms per cubic metre is a unit of measurement used to measure the mass of air pollutants (micrograms) per volume of air (cubic metre) as a concentration.

Environment Effects Statement (EES) – In Victoria, environment assessment of the potential environmental impacts or effects of a proposed development under the *Environment Effects Act 1978*.

Environmental Air Quality and Dust Management Plan (EAQDMP) – The EAQDMP is environmental management documentation prepared by the MC to manage and monitor air quality impacts during construction of SRL East. It includes the RMMP and TARP and is verified by the IEA.

Environmental Management Framework (EMF) – The purpose of the EMF is to provide a transparent and integrated framework to manage environmental effects of the SRL East Project during construction and operation to achieve acceptable environmental outcomes.

Environmental Performance Requirements (EPRs) – The EPRs define the environmental outcomes that must be achieved during the design, construction and operation of SRL East and are included within the EMF.

Environment Protection Authority (EPA) - Victorian regulator established under the *Environment Protection Act 2017* and which has the statutory objective to protect human health and the environment from the harmful effects of pollution and waste.

Environmental Reference Standard (ERS) – The ERS is a tool made under the *Environment Protection Act 2017* to identify and assess environmental values, including air quality, in Victoria.

Independent Environmental Auditor (IEA) – The IEA is appointed by the Victorian Government to undertake independent environmental reviews and audits of project activities including assessing compliance with the EMF and EPRs.

PM_{10} – Particulate matter with an aerodynamic diameter of 10 micrometres (µm) or less. PM_{10} particles are small enough to have a potential impact on human health.

Risk Management and Monitoring Program (RMMP) – this plan outlines the approach to air quality monitoring and includes instrumental, visual monitoring, TARP and public reporting processes. The RMMP forms part of the EAQDMP.

Trigger Action Response Protocol (TARP) – The TARP defines a series of adaptive management measures that are implemented to avoid or mitigate impacts from dust emissions for nearby sensitive receptors in response to the results from monitoring. The TARP forms part of the EAQDMP.

Executive Summary

Key Outcomes

Key outcomes arising from the monthly air quality monitoring program:

- In Box Hill, the TARP was implemented on eleven days during the reporting period. Dust levels were elevated with warm weather and northerly wind gusts. Water carts and hoses were used to proactively suppress fugitive dust generation during excavation works and material/spoil haulage. Trucks were required to cover loads prior to leaving the site to reduce dust generation.
- In Burwood, the TARP was implemented on two days during the reporting period. Water carts and hoses were used during material and spoil haulage, and dust was reduced by street sweeping and requiring trucks to cover loads prior to leaving the site.
- In Glen Waverley, the TARP was implemented on four days during the reporting period. Water carts and hoses were used during material and spoil haulage, and dust was reduced by street sweeping and requiring trucks to cover loads prior to leaving the site.
- In Monash, the TARP was implemented on eight days during the reporting period. Hoses were used proactively and reactively to suppress dust during demolition works.
- In Clayton, the TARP was implemented on six days during the reporting period. Water carts and hoses were used during spoil works and concreting activities. Hoses were used proactively and reactively to suppress dust.
- In Heatherton, the TARP was implemented on eight days during the reporting period. Water carts and hoses were used during excavation, and material and spoil haulage. Dust was reduced by street sweeping and requiring trucks to cover loads prior to leaving the site.
- In Cheltenham, the TARP was not implemented during the reporting period.

Further explanation is provided in Section 3 regarding these observations.

Purpose of the Report

This report presents the results of the monthly review of the air quality monitoring data for each Suburban Rail Loop (SRL) East Early Works construction site for the period between 19 February 2025 and 18 March 2025 in accordance with SRL East EMF and EPRs AQ1 and AQ2. Laing O'Rourke is delivering the Early Works as Managing Contractor (MC). Early Works for SRL East commenced at Burwood in May 2023, Box Hill in June 2023, Monash and Heatherton in October 2023, Clayton in December 2023, and Glen Waverley and Cheltenham in March 2024.

The MC implements an air quality monitoring program on each site that includes both visual observation and instrumental air quality monitoring. The purpose of the air quality monitors is to measure the concentration of small dust particles in the air near the construction site. These particles, known as PM_{10}, have the potential to impact human health. PM_{10} refers to particles with an aerodynamic diameter of 10 µm or less.

Measured PM_{10} concentrations may be compared to air quality objectives that are defined in the ERS which is a tool under the *Environment Protection Act 2017*. The ERS sets out the air quality objectives for PM_{10} which are measured over a 24-hour averaging period. The objectives are risk-based concentrations that are not intended to be compliance levels, but they assist the MC to understand the risk to human health. When the instrumental monitor and/or visual observations identify a change in site conditions this prompts the MC to implement mitigations on site to reduce dust impacts, and review measures applied.

Scope of Reporting

This report does not include works delivered as SRL Initial Works. The SRL Initial Works, which include investigative works, protective works, moving underground services, ground improvement works (such as at the Stabling Facility at Heatherton) and minor road modifications were subject to a separate approval process under Clause 52.30 of the Victoria Planning Provisions (VPP) and were approved by the Minister for Planning on 19 December 2021. These works are required to comply with Clause 52.30 of the VPP and are not subject to the EMF and EPRs.

This report does not include monitoring related to asbestos containing material removal, which is monitored and reported separately.

Results

The key findings are summarised in Table 1. An analysis of these findings is provided in Section 3.

Table 1: Summary of air quality monitoring results for reporting period.

Location	Parameter	Averaging Period	Max Concentration (µg/m^3)	Median Concentration (µg/m^3)	Days TARP Implemented in the Month
Representative Background[1]					
Alphington	PM_{10}	24-hour	42.3	22.7	-
Dandenong	PM_{10}	24-hour	45.2	23.5	-
Box Hill					
Site Office	PM_{10}	24-hour	56.6	26.6	11
East of Market Street	PM_{10}	24-hour	37.2	25.5	
Uniting AgeWell (UAW)	PM_{10}	24-hour	30.6	15.6	
Irving Avenue	PM_{10}	24-hour	42.5	20.5	
Burwood					
Corner of McComas Grove and Sinnott Street	PM_{10}	24-hour	31.7	16.4	2
16 McComas Grove	PM_{10}	24-hour	35.2	15.6	
Site 4 – East	PM_{10}	24-hour	24.8	13.4	
Site 4 – West	PM_{10}	24-hour	32.8	16.8	
Site 1 – South	PM_{10}	24-hour	60.1	28.8	
Glen Waverley					
Coleman Parade	PM_{10}	24-hour	44.9	22.0	4
Railway Parade	PM_{10}	24-hour	33.2	16.0	
Monash					
Normanby House – West	PM_{10}	24-hour	47.9	24.7	8
Normanby House – East	PM_{10}	24-hour	26.2	20.8	
Clayton					
Clayton Community Space – Site 1	PM_{10}	24-hour	34.0	27.2	6
Heatherton					
SSY - South	PM_{10}	24-hour	78.3	44.2	8
Site Office	PM_{10}	24-hour	51.6	25.1	
Cheltenham					
CTM Compound	PM_{10}	24-hour	30.5	15.1	0

[1] The EPA monitoring station at Dandenong is used as the representative control site for Heatherton. The EPA monitoring station at Alphington is used as the representative control site for Cheltenham, Clayton, Monash, Glen Waverley, Burwood and Box Hill.

https://www.epa.vic.gov.au/for-community/airwatch

1. Introduction

1.1. Suburban Rail Loop East

SRL will deliver a 90km rail line linking every major suburban line from the Frankston Line to the Werribee Line via Melbourne Airport, better connecting Victorians to jobs, retail, education, health services and each other. Construction of SRL East from Cheltenham to Box Hill is underway and will connect major employment, health, education and retail destinations in Melbourne's east and south-east. The new underground train line will reduce travel times, and connect people travelling on the Gippsland corridor. Construction of SRL East is creating up to 8000 direct local jobs, with trains to be running in 2035.

Early Works for SRL East commenced at Burwood in May 2023, Box Hill in June 2023, Monash and Heatherton in October 2023, Clayton in December 2023, Glen Waverley and Cheltenham in March 2024. Laing O'Rourke is delivering the Early Works as MC. Early Works include:

- Road modifications
- Moving underground services
- Ground improvement works
- Tram terminus works, and
- Site preparations for tunnel boring machines.

This report does not include works delivered as SRL Initial Works. The SRL Initial Works, which includes investigative works, protective works, utility relocations and installations, ground improvement works (such as at the Stabling Facility at Heatherton) and minor road modifications, were subject to a separate approval process under Clause 52.30 of the VPP and were approved by the Minister for Planning on 19 December 2021. These works are required to comply with Clause 52.30 of the VPP and are not subject to the EMF and EPRs.

1.2. Environmental Management Framework

The EMF for SRL East (the Project) provides a transparent and integrated framework to manage environmental effects of the Project and includes EPRs that define environmental outcomes that must be achieved during the design, construction, and operation phases the SRL East website at https://bigbuild.vic.gov.au/library/suburban-rail-loop/planning/srl-east-environmental-management-framework.

The development of the EMF has been informed by relevant legislation, policy and guidelines, and the specialist impact assessment studies completed for the SRL East EES and the Minister's Assessment, dated 5 August 2022.

The EMF requires the MC to develop and implement an EAQDMP. As part of implementing this plan, the MC is required to conduct monitoring of PM_{10} concentrations and measure wind speed and direction at each Early Works construction site and at a representative control site. The EAQDMP also includes a TARP which defines a set of triggers that prompt actions on site to reduce dust impacts, and review mitigation measures applied. The EMF, and therefore this report, is not applicable to SRL Initial Works activities.

The MC regularly reviews the monitoring data at each site, for the purpose of assessing the effectiveness of EAQDMP implementation. The verified results of the PM_{10} monitoring for the applicable monthly period are contained in this report, which will be available to the public, in accordance with the requirements of the EMF.

2. Air Quality Monitoring

2.1. Context

Maintaining air quality is important for public health, the liveability of our cities and our environment. Overall air quality conditions in Melbourne are good, however like all major cities, there are days where the background concentrations of air pollutants are very high on a regional basis. Sometimes these elevated concentrations are due to regional influences such as windblown continental dust, bushfires or hazard reduction burns. Emissions from traffic, home heating, and industrial emissions across Melbourne can also cause high background concentrations, especially when the weather is calm. EPA monitoring stations measure these background levels of pollution that already exist in the air within the surrounding area. The EPA monitoring station at Dandenong is used as the representative control site for Heatherton and Cheltenham, and the EPA monitoring station at Alphington is used as the representative control site for all other SRL work sites.

Without effective management, construction of the Project has the potential to contribute to these background concentrations which may impact public health. Comparison of SRL East monitoring results with publicly available EPA monitoring data is used by the MC to identify when construction-related activities are impacting local air quality, and conversely when the local air quality results may be influenced by background conditions outside of the influence of the construction site.

Meteorological conditions such as wind direction and speed can impact on the dispersion of particulates in the air and by monitoring these, the MC can respond when conditions on site change. Having records of wind conditions is also helpful for retrospectively identifying the activity that is causing any elevated dust concentrations.

2.2. Purpose

The purpose of the air quality monitors is to measure the concentration of small dust particles in the air near the construction site. These particles, known as PM_{10} have the potential to impact human health. PM_{10} refers to particles with an aerodynamic diameter of 10 µm or less.

The measured concentrations are compared to air quality objectives that are defined in the ERS which is a tool under the *Environment Protection Act 2017*. The air quality objectives defined in the ERS informed the objectives for air quality for the Project, noting that the ambient air ERS is not a compliance standard that one can pollute up to. The ERS does not provide an indicator or objective for nuisance dust.

The objectives are risk-based concentrations that are not intended to be compliance levels, but they assist the MC to understand the risk to human health. The ERS sets out the air quality objectives for PM_{10} which are measured over a 24-hour averaging period, as reproduced below in Table 2.

Table 2: Ambient air quality objectives for PM_{10}.

Indicator	Air Quality Objective (µg/m^3)	Averaging Period
Particles as PM_{10} (maximum concentration)	50	24-hour

The measured concentrations (which include both existing background concentrations and the Project's incremental contribution over a 24-hour period) are presented in Section 3. Monitoring is continuous, even when there are no construction-related activities occurring on the site. Periods of time where there are no site activities are classified as 'Out of Hours'. The potential for dust generation from the work sites is much lower when there are no site activities occurring, however dust can still be generated at the work site during "Out of Hours" periods due to wind erosion.

2.3. Monitoring Locations

Air quality monitors are located on or adjacent to the Early Works construction sites, to represent local air quality conditions, in positions that enable the MC to adequately measure potential impact of works on local sensitive receivers including residents. This does not include monitoring undertaken as part of the SRL Initial Works as outlined in Section 1.1.

The air quality monitors were installed on the following dates at each of the following locations. The location of these monitors is shown on maps in Section 3 of this Report.

Table 3: Air quality monitoring locations active during reporting period.

Monitoring Location	Date Commissioned	Coordinates	Monitoring Parameters	Representative Control Site
Box Hill – Site Office	07 Jul 2023	Latitude: -37.817863° Long 145.12187°	PM_{10}	Alphington EPA monitoring station
Box Hill – East of Market Street	13 Jul 2023	Latitude -37.818073° Longitude: 145.1232°	PM_{10}	Alphington EPA monitoring station
Box Hill – UAW	01 August 2024	Latitude -37.81479° Longitude: 145.12424°	PM_{10}	Alphington EPA monitoring station
Box Hill – Irving Avenue	01 August 2024	Latitude -37.815964° Longitude: 145.12355°	PM_{10}	Alphington EPA monitoring station
Burwood – 16 McComas Grove	18 May 2023	Latitude: -37.851494° Longitude: 145.1116°	PM_{10}	Alphington EPA monitoring station
Burwood – Site 4 – West	16 February 2024	Latitude: -37.850521° Longitude: 145.11009°	PM_{10}	Alphington EPA monitoring station
Burwood – Site 4 – East	20 February 2024	Latitude: -37.850586° Longitude: 145.11188	PM_{10}	Alphington EPA monitoring station
Burwood – Corner of McComas Grove and Sinnott Street	18 May 2023	Latitude: - 37.852413° Longitude: 145.11252°	PM_{10}	Alphington EPA monitoring station
Burwood – Site 1 South	08 May 2024	Latitude: -37.8549° Longitude: 145.10995°	PM_{10}	Alphington EPA monitoring station
Glen Waverley – Railway Parade	09 August 2024	Latitude: -37.878888° Longitude: 145.161078°	PM_{10}	Alphington EPA monitoring station
Glen Waverley – Coleman Parade	19 August 2024	Latitude: -37.880739° Longitude: 145.160738°	PM_{10}	Alphington EPA monitoring station
Monash – Normanby House – East	6 February 2025	Latitude: -37.90587° Longitude: 145.1376°	PM_{10}	Alphington EPA monitoring station
Monash – Normanby House – West	30 January 2025	Latitude: -37.90595° Longitude: 145.13969°	PM_{10}	Alphington EPA monitoring station
Clayton – Clayton Community Space Site 1	28 August 2024	Latitude: -37.92484° Longitude: 145.1207°	PM_{10}	Alphington EPA monitoring station
Heatherton – SSY – South	29 May 2023	Latitude: -37.955917° Longitude: 145.10239°	PM_{10}	Dandenong EPA monitoring station
Heatherton – SSY – Site Office	22 January 2024	Latitude: -37.95401° Longitude: 145.10062°	PM_{10}	Dandenong EPA monitoring station
CTM Compound	14 February 2025	Latitude: -37.9565° Longitude: 145.0506°	PM_{10}	Dandenong EPA monitoring station

2.4 Data Limitations and Verification

The following limitations apply to this data:

- Meteorological conditions on site can affect measurements made by monitoring devices. For instance, dust measurements can be impacted by rainfall, fog and/or humidity (with water droplets in the air being mistaken as dust particles). Displaying periods of inclement weather allows reviewers to identify measurements that may have been impacted.
- The monitors that measure dust concentrations and noise are located within the construction site close to the nearest homes. However, the measured levels at the nearest homes and beyond are usually less than what is measured by the monitor. This is due to the monitor being located closer to the source, due to the security requirements for the monitoring equipment.
- Monitors have been placed to record air quality and airborne noise at each site, however monitors may need to be moved as works progress. Air Quality monitoring devices are located in accordance with AS/NZS 3580.1.1-2016: Methods for sampling and analysis of ambient air (the Standard). This Standard specifies that locations must be representative of the location being monitored, which in this case is offsite receptors. Specifically, Section 7 of the Standard emphasises that locations should not be unduly influenced by immediate surroundings. Locating a monitoring device too close to the works results in increased readings as the space for air quality pollutants (i.e. dust) to dissipate is not representative of emissions at the offsite receptors. Therefore, depending on the location of the works on site and the monitoring device, the device may be moved to best represent impacts to offsite receptors, while also maintaining security and safe access.
- Breaks in data availability may occur due to sensor outages, instrument errors, technical issues, or removal of sensors during non-working periods to ensure the security of the equipment.

Data are provided in tabular and graphical form in Section 3 to visually present 24-hour averages of PM_{10} over the monthly period. The data included in this report have been verified by the MC and relevant subject matter experts.

3. Results

Data is provided in graphical form below to visually present 24-hour averages of PM_{10} dust concentration over the monthly period for each active construction site. Where the TARP has been implemented due to works occurring on the construction sites, an analysis is presented for discussion.

3.1. Box Hill

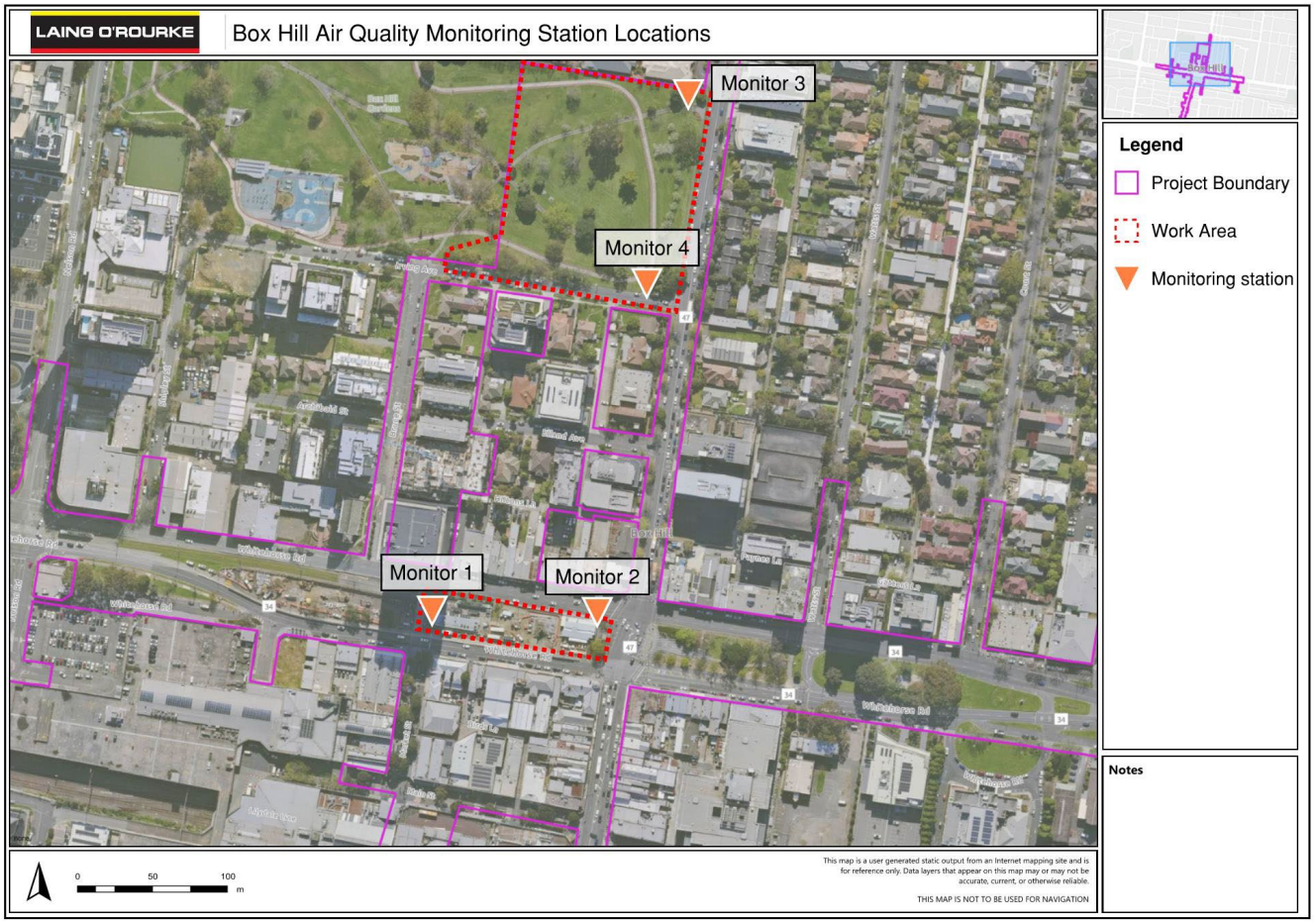


Figure 1: Box Hill air quality monitoring stations.

Table 4: Box Hill PM_{10} results.

Monitor Number	Monitoring Location	Max Daily PM_{10} Concentration (µg/m^3)	Median Daily PM_{10} Concentration (µg/m^3)	Days TARP Implemented in the Month
-	Representative Background - Alphington	42.3	22.7	-
1	Site Office	56.6	26.6	11
2	East of Market Street	37.2	25.5	
3	Uniting AgeWell	30.6	15.6	
4	Irving Avenue	42.5	20.5	

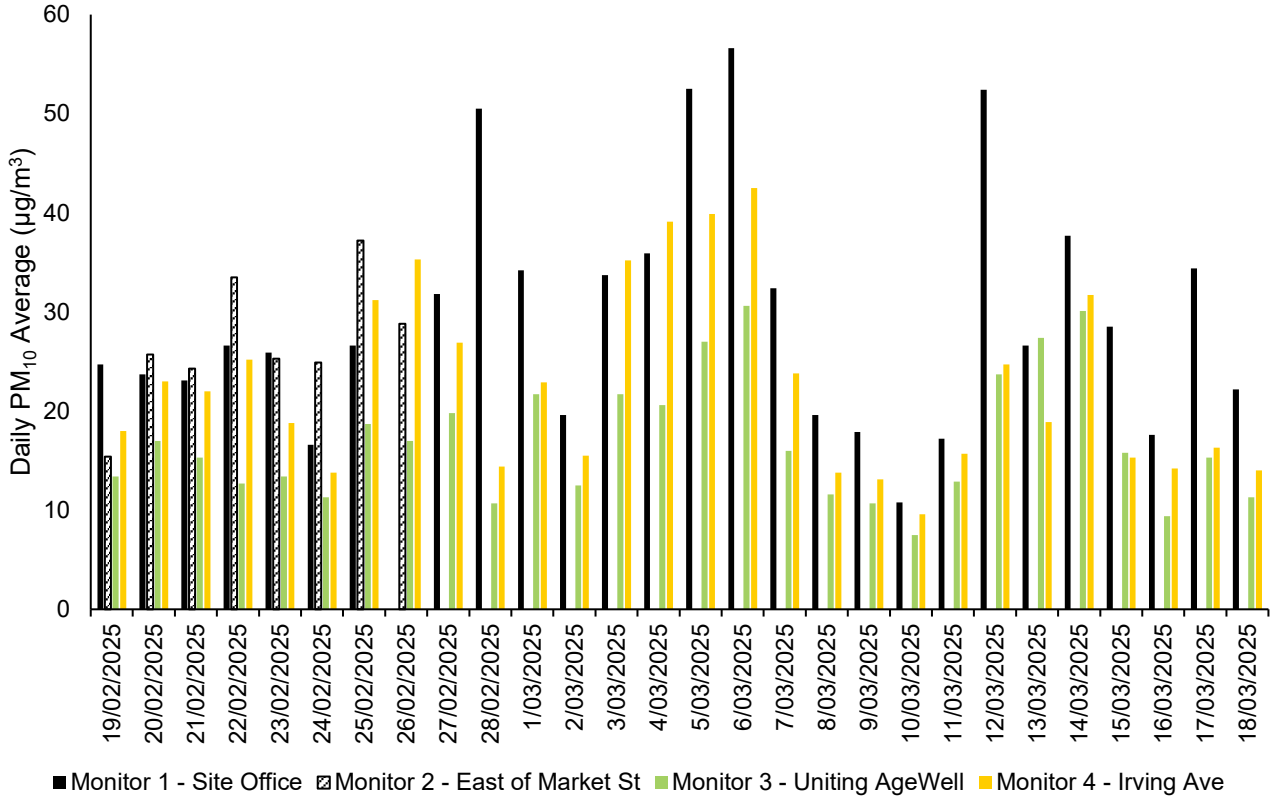


Figure 2: Box Hill PM_{10} daily averages.

3.1.1. Analysis

The maximum daily average PM_{10} concentrations were 56.6 µg/m^3 (n = 27), 37.2 µg/m^3 (n = 8), 30.6 µg/m^3 (n = 28), and 42.5 µg/m^3 (n = 28), at the monitoring stations located at the Site Office (Monitor 1), East of Market Street (Monitor 2), Uniting AgeWell (Monitor 3) and Irving Avenue (Monitor 4) respectively.

Exceedance of the EPA air quality objective (50 µg/m^3 over a 24-hour period) was recorded for the dates of 28 February, 5 March, 6 March and 12 March for the Site Office monitoring point. On these days, earthworks such as excavations and spoil haulage activities were undertaken within close proximity to the Site Office monitoring point resulting in elevated readings that are not representative of air quality levels experienced by receivers. Due to site constraints and works underway at the time, the Site Office monitoring point was positioned close to the extent of works.

On these dates, wind speeds were monitored and were generally moderate (max. gusts ranging between 30km/hr and 44 km/hr). Visible dust was not observed to pass the site boundaries indicating dust impacts were contained to the site. No community complaints were received regarding outdoor air quality related to the dates of exceedances.

The TARP was implemented on eleven days during the reporting period. Dust generated from excavation works and spoil transport activities was proactively suppressed using water carts and hoses. Further use of hoses on exposed surfaces and soil stockpiles was implemented to ensure dust levels were mitigated.

Other dust management on site included trucks covering loads prior to leaving site during spoil haulage. Stockpiles of soil and rock were maintained below the top of the site boundary fencing to minimise the risk of dust leaving the site.

3.2. Burwood

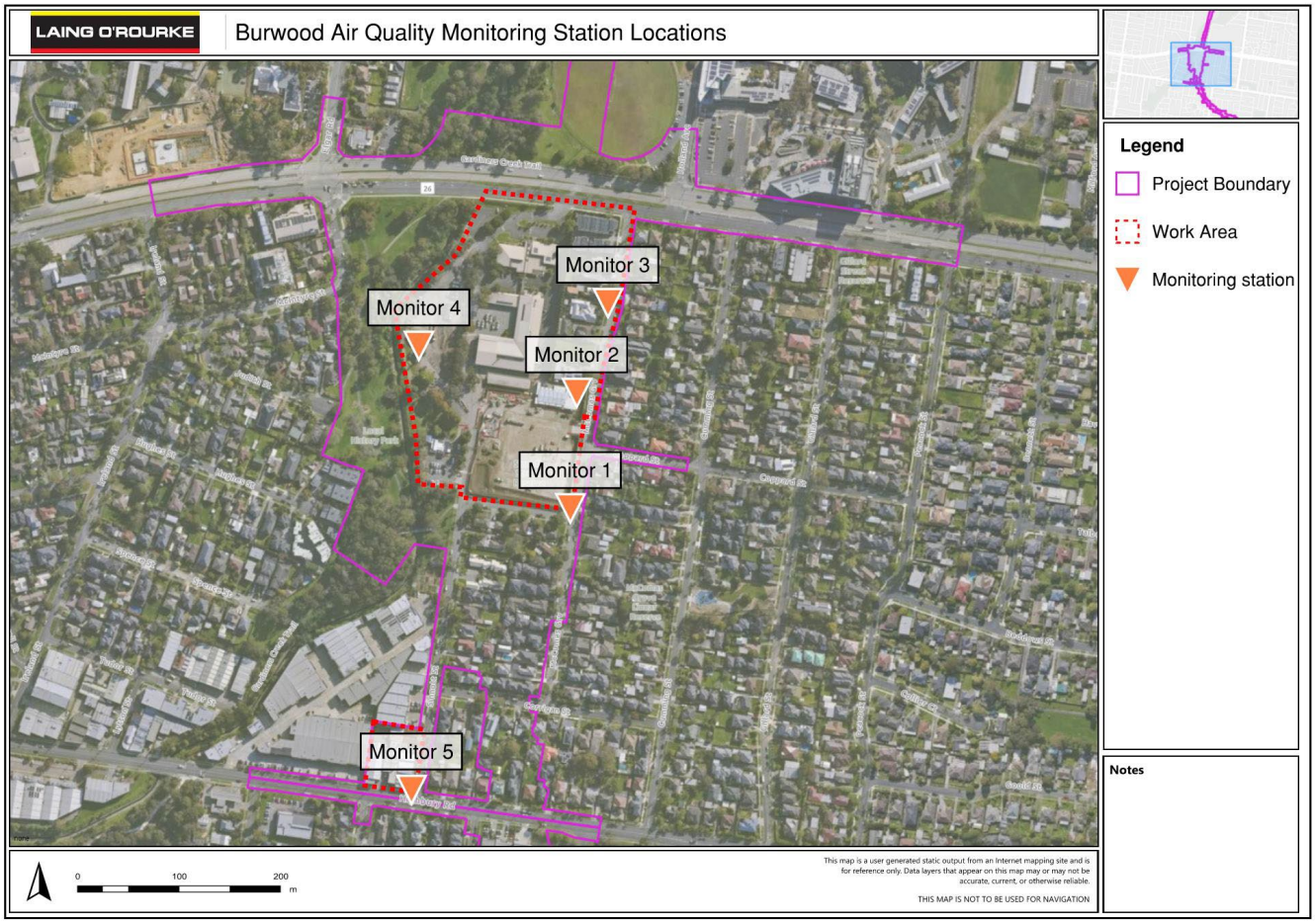


Figure 3: Burwood air quality monitoring stations.

Table 5: Burwood PM_{10} results.

Monitor Number	Monitoring Location	Max Daily PM_{10} Concentration (µg/m^3)	Median Daily PM_{10} Concentration (µg/m^3)	Days TARP Implemented in the Month
-	Representative Background - Alphington	42.3	22.7	-
1	Corner of McComas Grove and Sinnott Street	31.7	16.4	2
2	16 McComas Grove	35.2	15.6	
3	Site 4 - East	24.8	13.4	
4	Site 4 – West	32.8	16.8	
5	Site 1 – South	60.1	28.8	

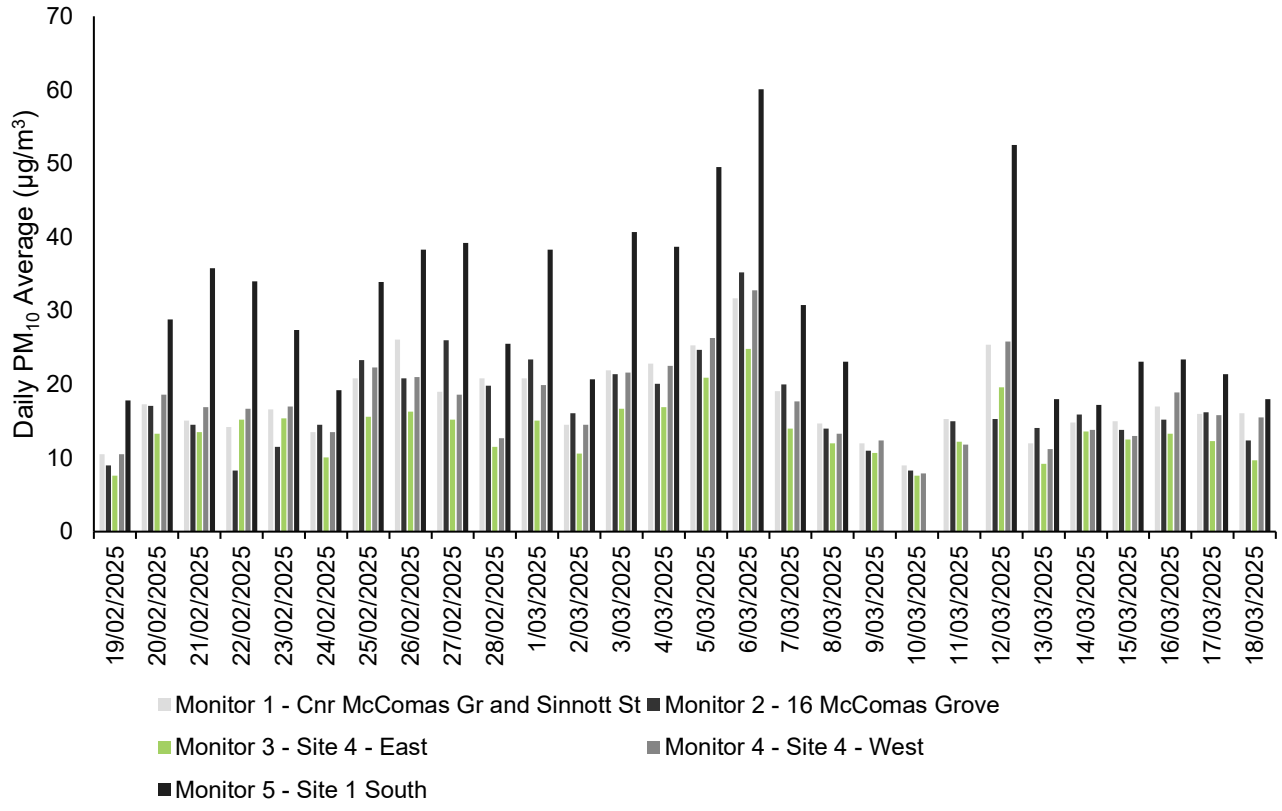


Figure 4: Burwood PM_{10} daily averages.

3.2.1. Analysis

The maximum daily average PM_{10} concentrations reported at the Burwood monitoring stations were 31.7 µg/m^3 (n = 28) at the corner of McComas Grove and Sinnott Street (Monitor 1), 35.2 µg/m^3 (n = 28) at 16 McComas Grove (Monitor 2), 24.8 µg/m^3 (n = 28) at Site 4 – East (Monitor 3), 32.8 µg/m^3 (n = 28) at Site 4 – West (Monitor 4), and 60.1 µg/m^3 (n = 28) at Site 1 South (Monitor 5).

The TARP was implemented on two days during the reporting period, on 6 March 2025 and 12 March 2025. Additional hoses were used to reduce dust generated from increased movement of materials. Water carts and hoses were also used proactively to manage dust.

Other dust management on site included trucks covering loads prior to leaving site during spoil haulage. Stockpiles of soil and rock were maintained below the top of the hoarding to minimise the risk of dust leaving the site. Additionally, stockpiles were routinely dampened during worktimes to prevent dust.

3.3. Glen Waverley

Figure 5: Glen Waverley air quality monitoring stations.

Table 6: Glen Waverley PM_{10} results.

Monitor Number	Monitoring Location	Max Daily PM_{10} Concentration (µg/m^3)	Median Daily PM_{10} Concentration (µg/m^3)	Days TARP Implemented in the Month
-	Representative Background - Alphington	42.3	22.7	-
1	Coleman Parade	44.9	22.0	4
2	Railway Parade	33.2	16.0	

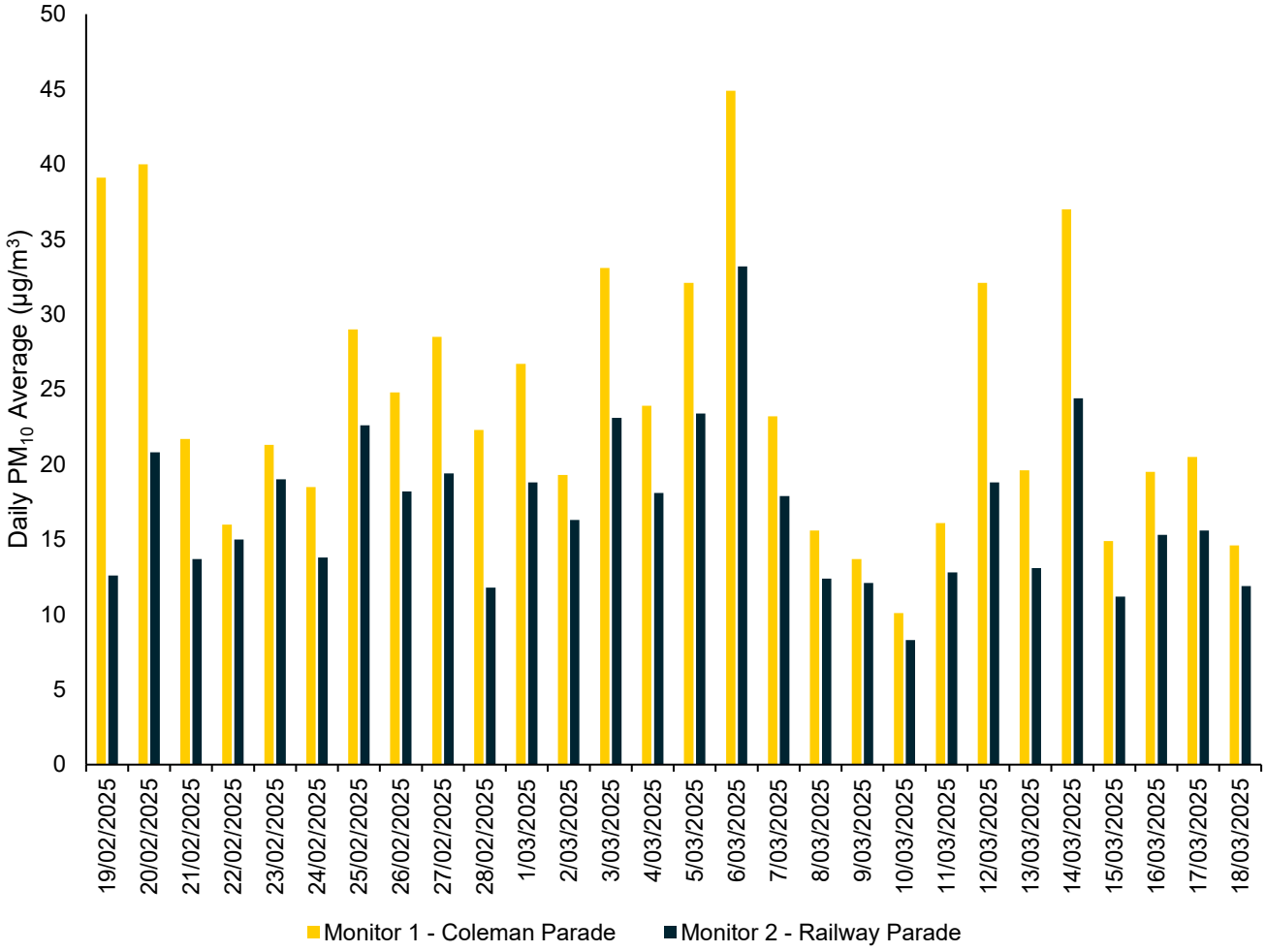


Figure 6: Glen Waverley PM_{10} daily averages.

3.3.1. Analysis

The maximum daily average PM_{10} concentrations were 44.9 µg/m^3 (n = 28), and 33.2 µg/m^3 (n = 28) at the monitoring locations at Coleman Parade (Monitor 1) and Railway Parade (Monitor 2), respectively.

The TARP was implemented on four days during this reporting period. Regular dust suppression activities, including the use of water carts and hoses, were utilised to maintain air quality levels. Dust generation from spoil haulage was reduced by requiring trucks to cover loads prior to leaving the site.

Stockpiles of soil and rock were maintained below the top of the hoarding to minimise the risk of dust leaving the site. Additionally, stockpiles were routinely dampened during worktimes to prevent dust.

3.4. Monash

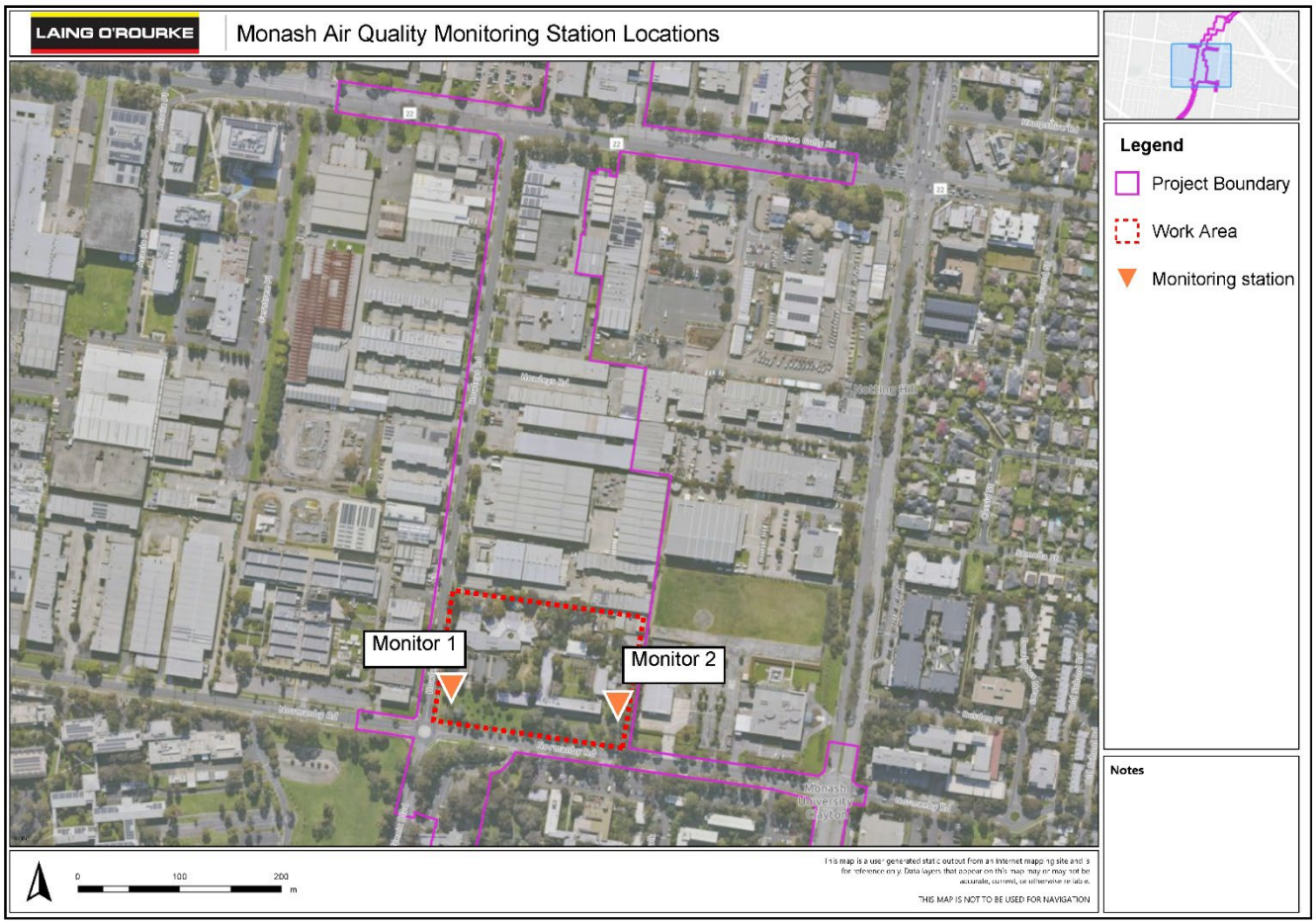


Figure 7: Monash air quality monitoring stations.

Table 7: Monash PM_{10} results.

Monitor Number	Monitoring Location	Max Daily PM_{10} Concentration ($\mu g/m^3$)	Median Daily PM_{10} Concentration ($\mu g/m^3$)	Days TARP Implemented in the Month
-	Representative Background - Alphington	42.3	22.7	-
1	Normanby House - West	47.9	24.7	8
2	Normanby House - East	26.2	20.8	

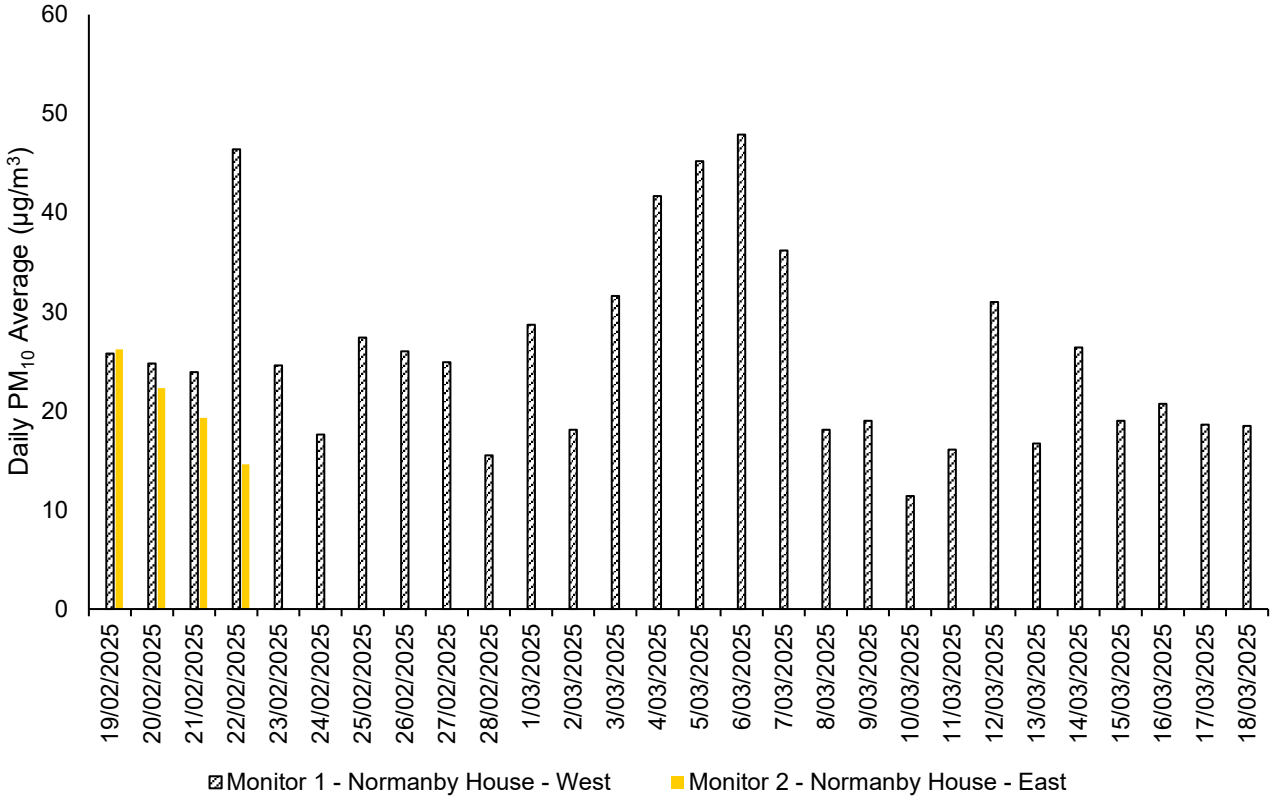


Figure 8: Monash PM_{10} daily averages.

3.4.1. Analysis

The maximum daily average PM_{10} concentrations was 47.9 µg/m3 (n = 28) at the Normanby House – West (Monitor 1), and 26.2 µg/m3 (n = 4) at the Normanby House – East (Monitor 2) monitoring locations, respectively.

The TARP was implemented eight times during the reporting period. Elevated PM_{10} concentrations within the reporting period were due to high wind speeds during demolition and site establishment activities. A hose was used proactively and reactively to suppress dust as required during these works.

3.5. Clayton

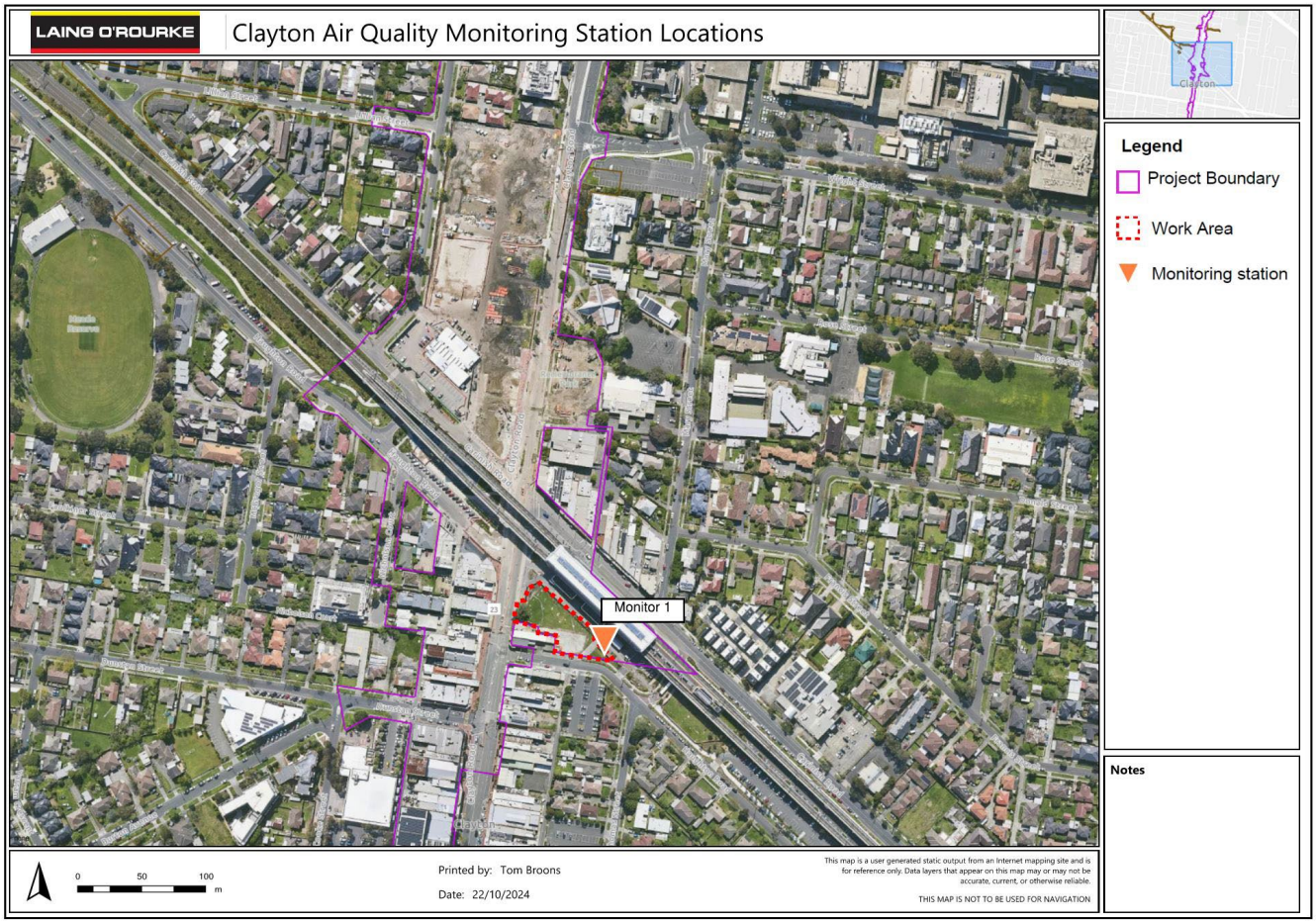


Figure 9: Clayton air quality monitoring stations.

Table 8: Clayton PM_{10} results.

Monitor Number	Monitoring Location	Max Daily PM_{10} Concentration (µg/m^3)	Median Daily PM_{10} Concentration (µg/m^3)	Days TARP Implemented in the Month
-	Representative Background - Alphington	42.3	22.7	-
1	Clayton Community Space - Site 1	34.0	27.2	6

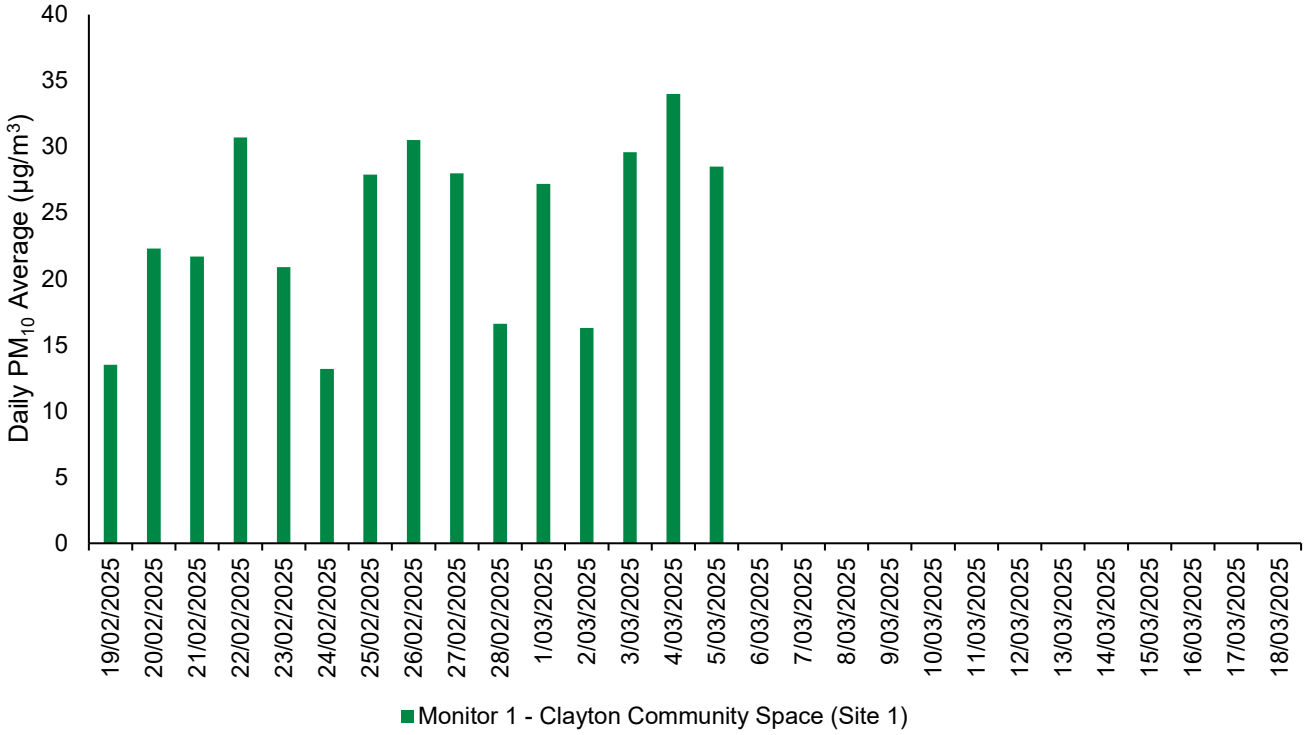


Figure 10: Clayton PM_{10} daily averages.

3.5.1. Analysis

The maximum daily average PM_{10} concentration was 34 µg/m^3 (n = 15) at the Clayton Community Space Site 1 (Monitor 1) monitoring locations.

The TARP was implemented on six days during the reporting period. Spoil movement, excavation and concreting activities contributed to dust on site. Proactive mitigation measures included using hoses and requiring trucks to cover loads prior to leaving the site.

3.6. Heatherton

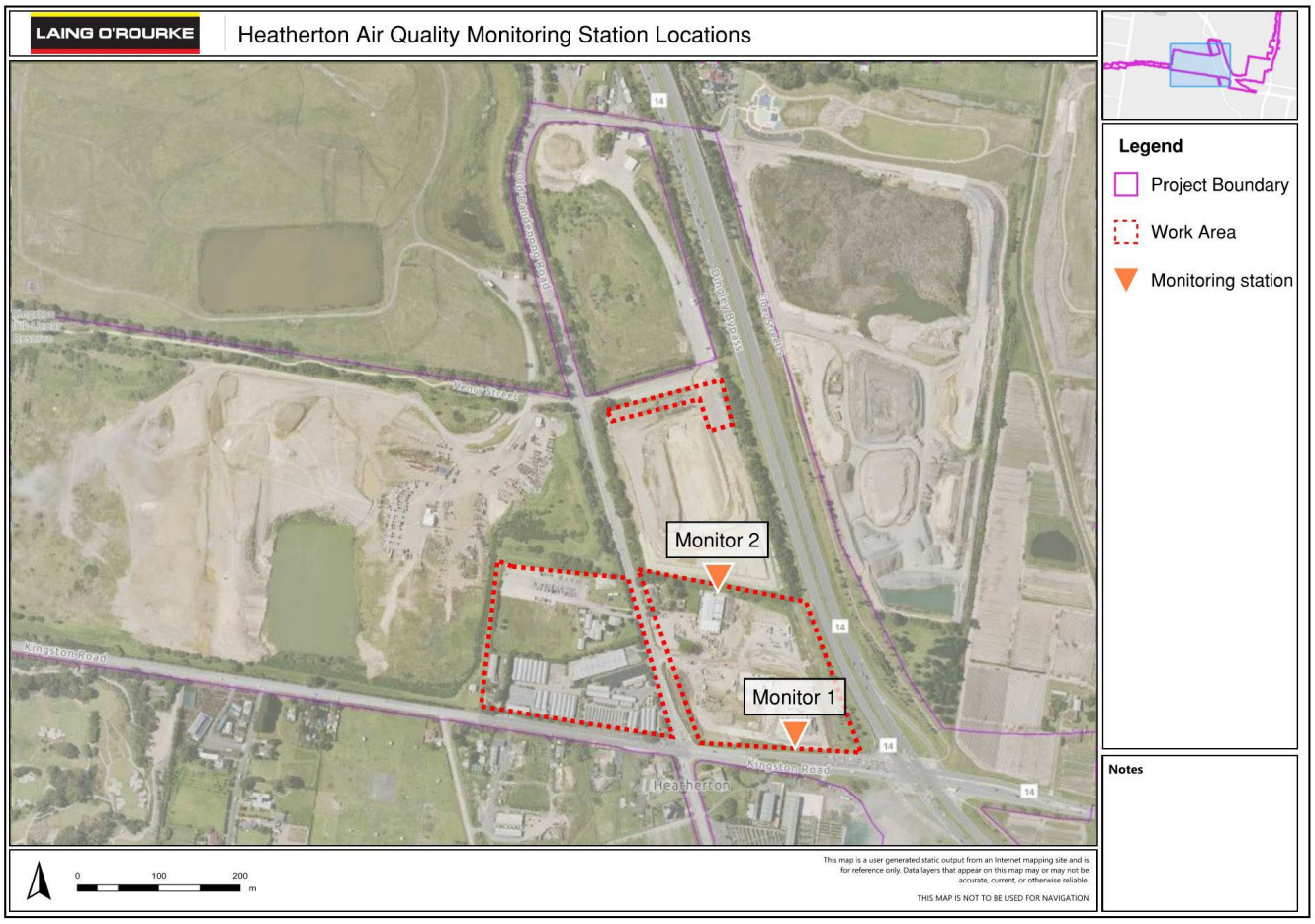


Figure 11: Heatherton air quality monitoring stations.

Table 9: Heatherton PM_{10} results.

Monitor Number	Monitoring Location	Max Daily PM_{10} Concentration (µg/m^3)	Median Daily PM_{10} Concentration (µg/m^3)	Days TARP Implemented in the Month
-	Representative Background - Dandenong	45.2	23.5	-
1	SSY - South	78.3	44.2	8
2	Site Office	51.6	25.1	

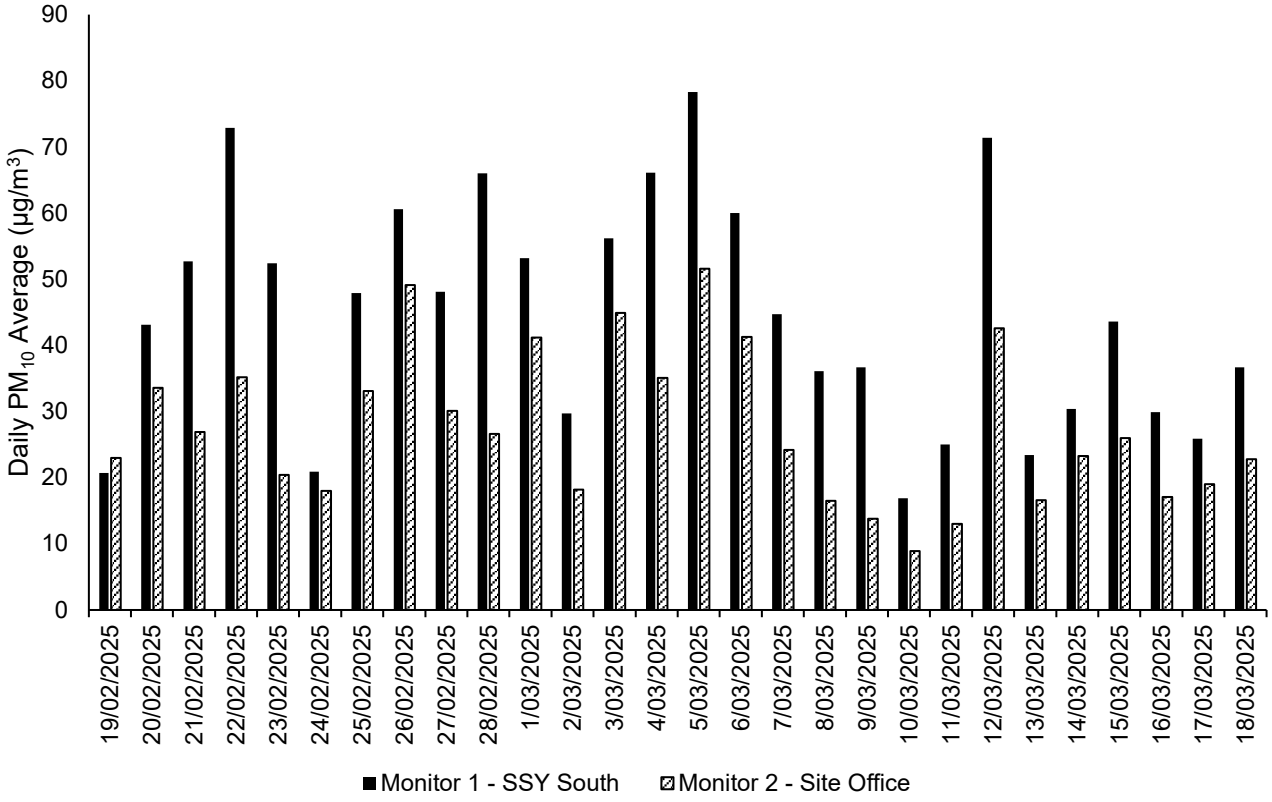


Figure 12: Heatherton PM_{10} daily averages.

3.6.1. Analysis

Both Initial Works and Early Works are being undertaken at Heatherton. Given the proximity of each of these works to each other, there is a strong possibility Initial Works are contributing to air quality conditions at the site. Initial Works are not subject to the EMF.

This report does not include monitoring related to asbestos removal, which is monitored and reported separately. Monitoring for asbestos particles in the air has consistently found levels are within a safe and allowable range.

Throughout this reporting period there were a range of works being undertaken at the site, some of which are not subject to the reporting requirements of this document. These included earthworks associated with site establishment and the safe removal of hazardous materials.

The maximum daily average PM_{10} concentrations were 78.3 µg/m^3 (n =28), 51.6 µg/m^3 (n = 28) at SSY South (Monitor 1), and Site Office (Monitor 2) respectively. The TARP was implemented on eight days during the reporting period. Proactive controls were implemented such as water cart operation, soil binders on disused stockpiles and trucks with covered loads.

On 23 February, early morning Northerly wind speeds of 70km/hr were experienced. On site mitigations for dust were in place, including spraying stockpiles with polymer. On 28 February, a stockpile was placed directly next to the monitor, interfering with results. The area was visually inspected throughout the day, and at no point was dust seen within the worksite boundary or leaving the site. The water cart was used in the area intermittently and the stockpile was moved an appropriate distance from the monitor.

Throughout the month, Southerly winds caused high readings for the SSY South Monitor. These readings do not accurately reflect on-site conditions. The Heatherton site is in an industrial area with several neighbouring properties undertaking earthworks with large areas of exposed soil. On days where there are strong winds, airborne dust generated off-site has been observed to be blown onto the Heatherton site, contributing to elevated onsite monitoring results.

3.7. Cheltenham

Figure 113: Cheltenham air quality monitoring stations.

Table 10: Cheltenham PM_{10} results.

Monitor Number	Monitoring Location	Max Daily PM_{10} Concentration (µg/m^3)	Median Daily PM_{10} Concentration (µg/m^3)	Days TARP Implemented in the Month
-	Representative Background – Alphington	42.3	22.7	-
1	CTM Compound	30.5	15.1	0

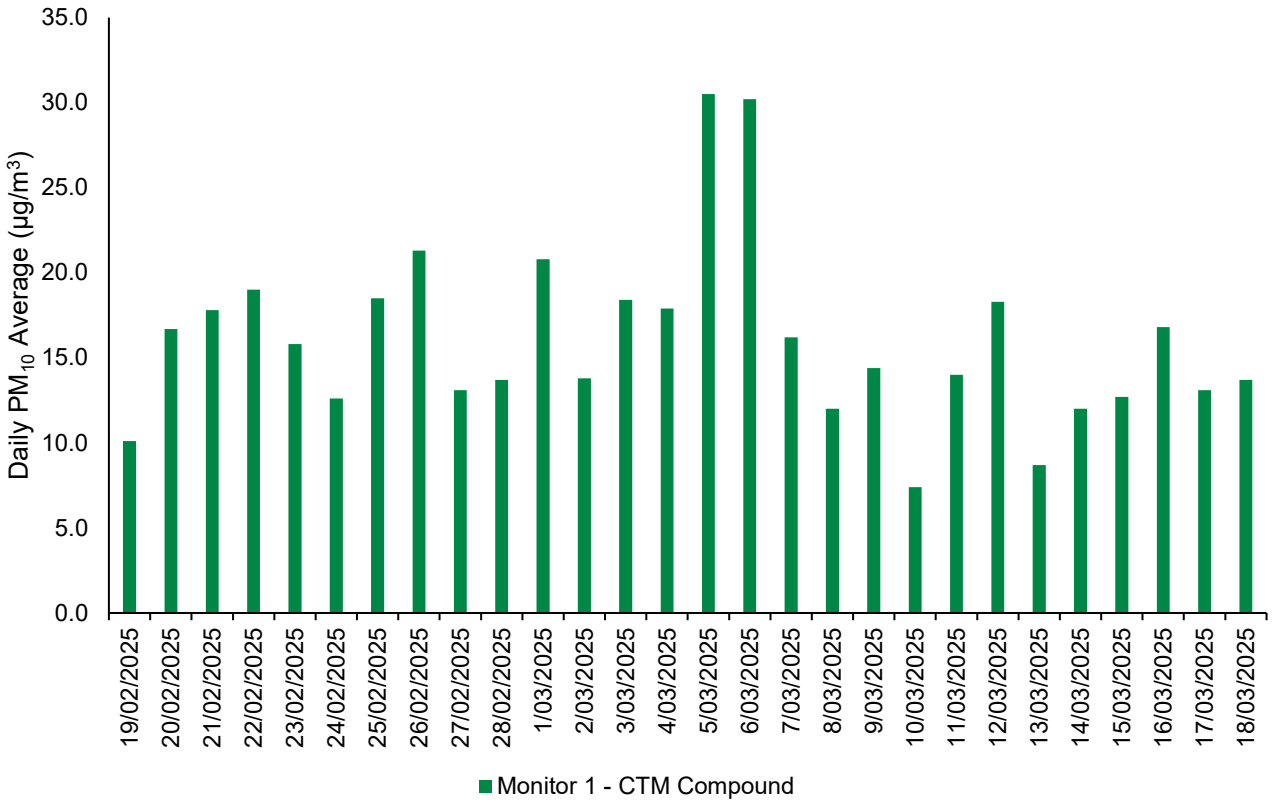


Figure 14: Heatherton PM_{10} daily averages.

3.7.1. Analysis

The maximum daily average PM_{10} concentrations was 30.5 µg/m^3 (n = 28) at the monitoring location at CTM Compound (Monitor 1).

The TARP was not implemented during this reporting period because regular dust suppression activities were sufficient to maintain air quality levels.

4.Meteorological Conditions

Table 11: Daily weather observations for Melbourne (Olympic Park), Victoria 19 February 2025 – 18 March 2025. Data Source BOM.

Statistic	Min Temperature (°C)	Max Temperature (°C)	Maximum Wind Gust Direction	Maximum Wind Gust Speed (km/h)	Relative Humidity @ 9:00 AM (%)
Mean	16.2	27.8	-	35.1	67.8
Lowest	10.8	19.1	SE	22	42
Highest	26.2	36.3	N	65	97

Table 12: Daily weather observations for Melbourne (Moorabbin), Victoria 19 February 2025 – 18 March 2025. Data Source BOM.

Statistic	Min Temperature (°C)	Max Temperature (°C)	Maximum Wind Gust Direction	Maximum Wind Gust Speed (km/h)	Relative Humidity @ 9:00 AM (%)
Mean	15.2	27.9	-	41.6	67.2
Lowest	8.8	19.1	SSW	28.0	67.2
Highest	26.7	37.2	N	70.0	97.0

Table 13: Daily rain data for Melbourne (Olympic Park and Moorabbin), Victoria 19 February 2025 – 18 March 2025. Data Source BOM.

Statistic	Rain data Olympic Park (mm)	Rain data Moorabbin (mm)
Daily Low	0.0	0.0
Daily High	18	22.6
Total	34.6	45.4

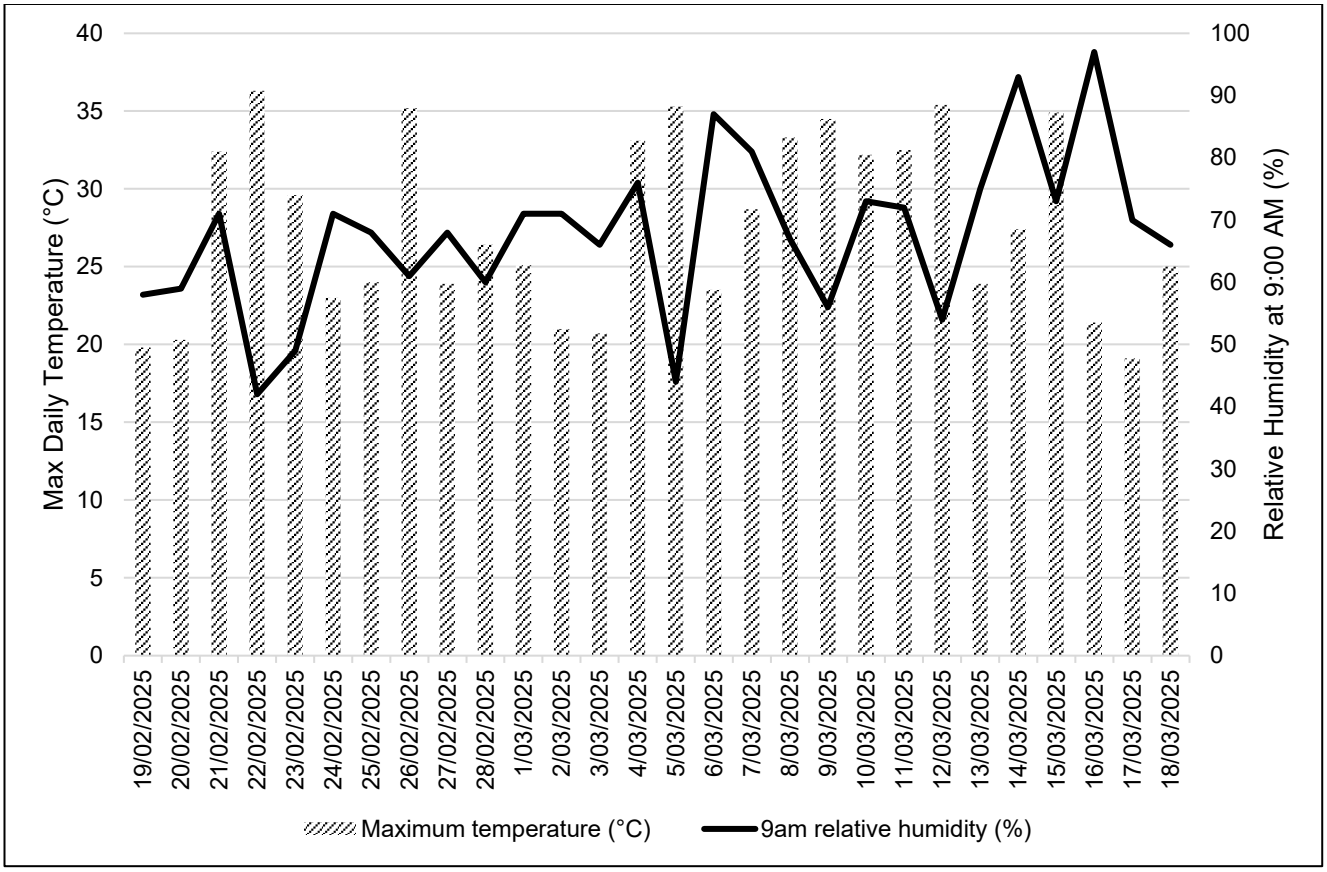


Figure 15: Daily relative humidity and temperature observations for Melbourne (Olympic Park), Victoria 19 February 2025 –18 March 2025. Data Source BOM.

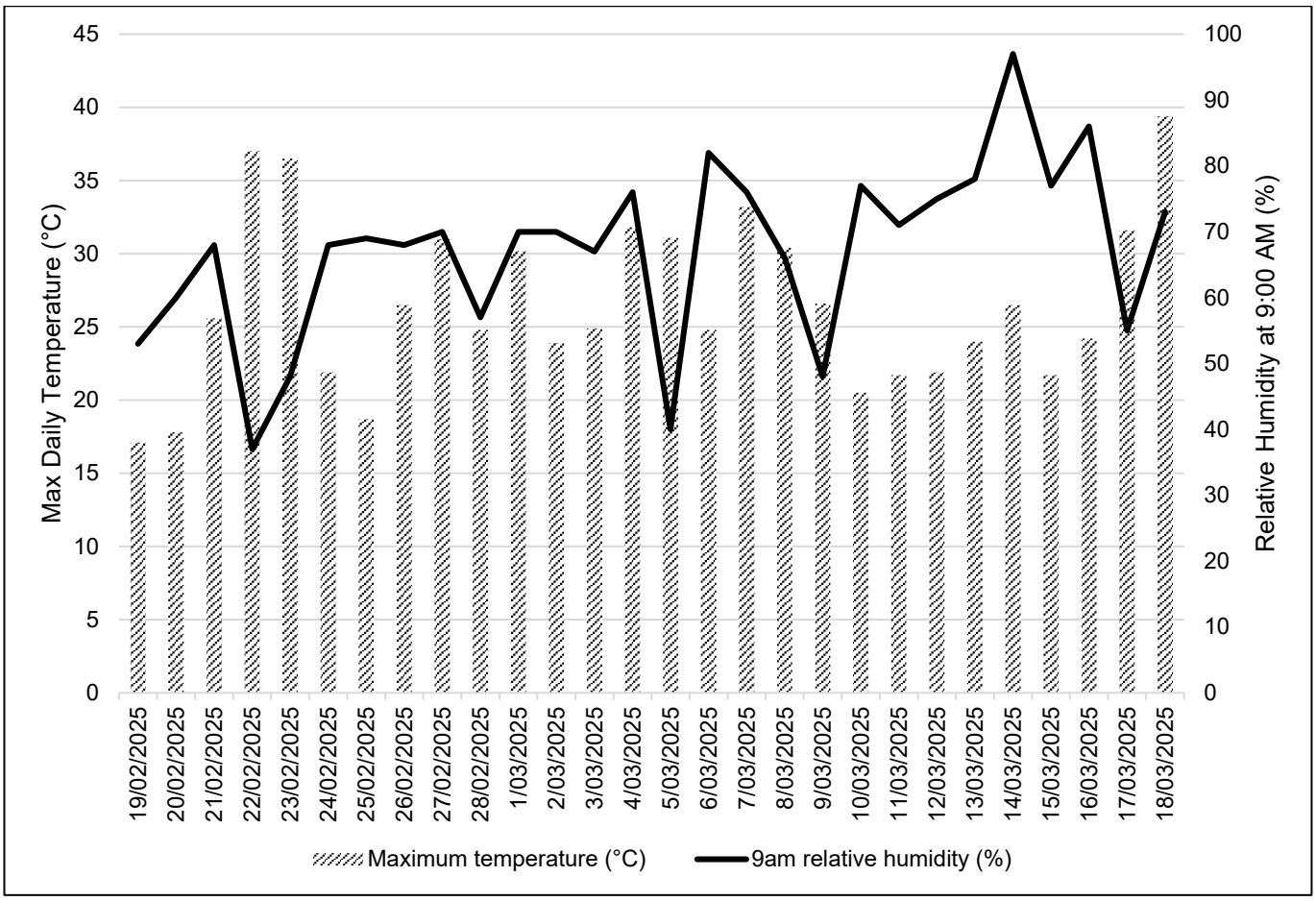


Figure 16: Daily relative humidity and temperature observations for Melbourne (Moorabbin), Victoria 19 February 2025 –18 March 2025. Data Source BOM.

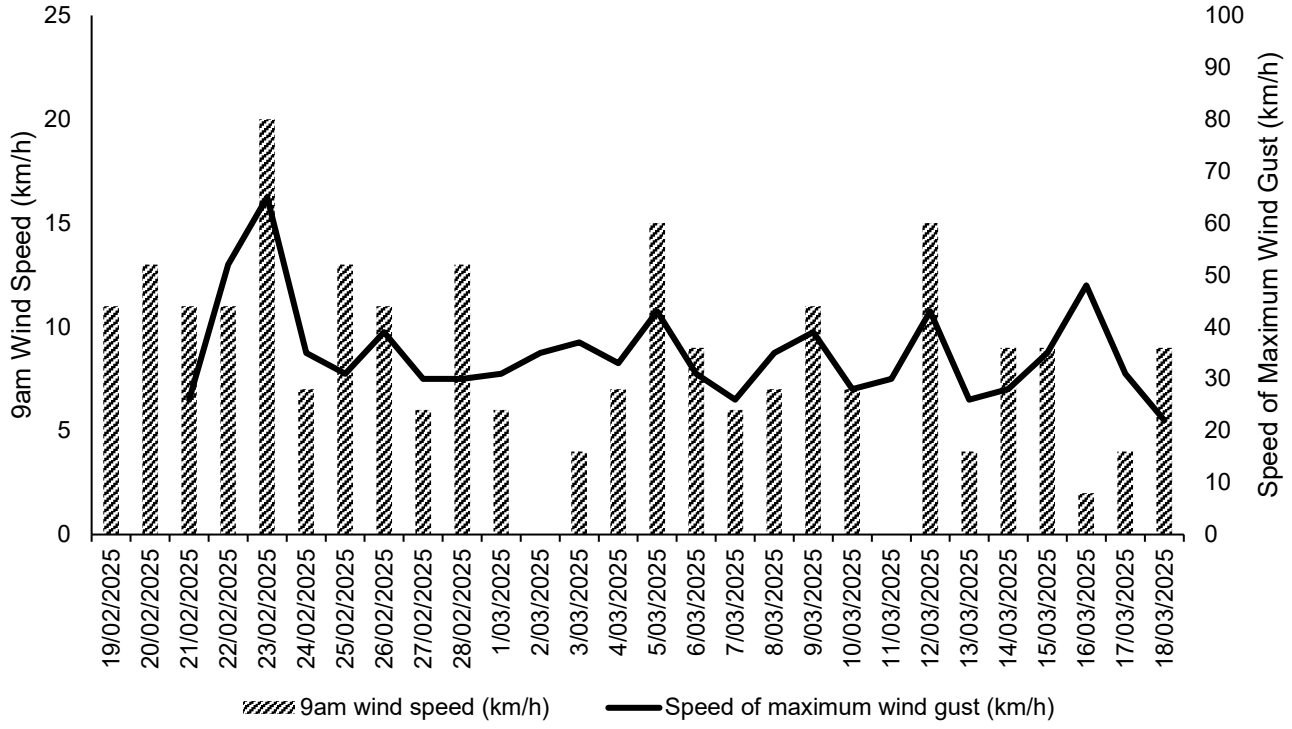


Figure 17: Daily wind speed observations for Melbourne (Olympic Park), Victoria 19 February 2025 –18 March 2025. Data Source BOM.

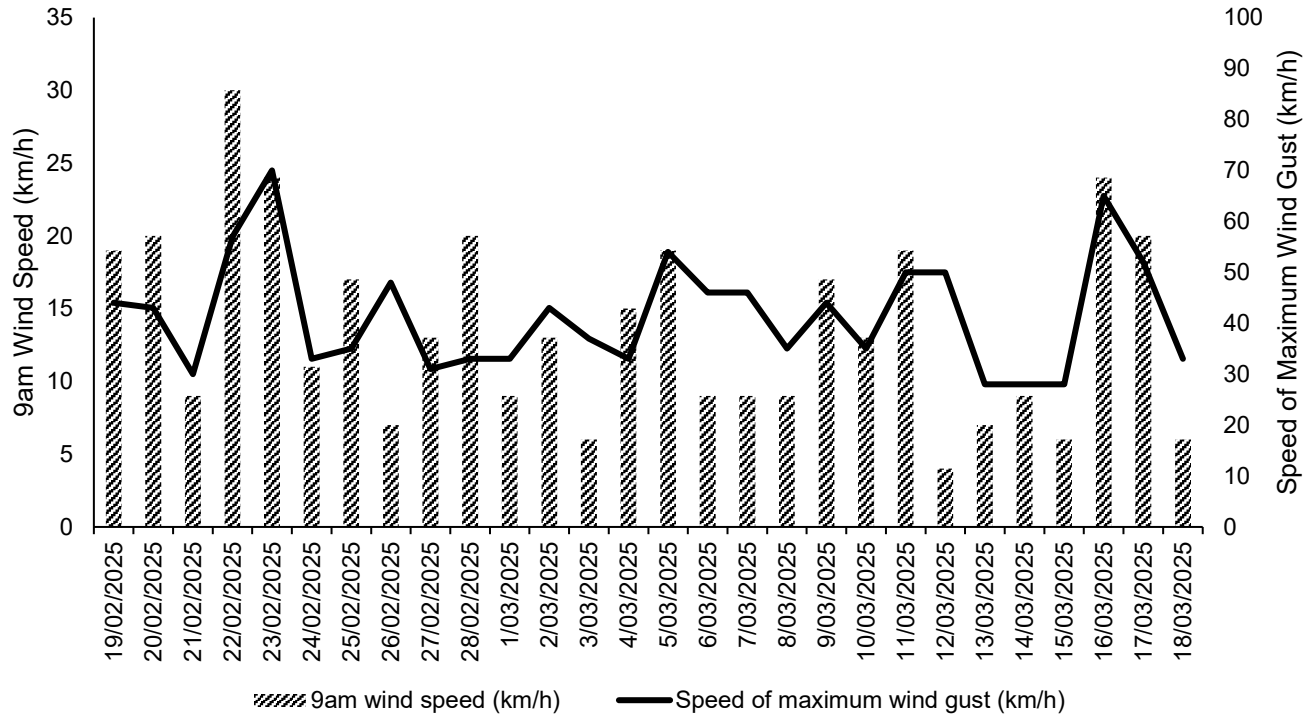


Figure 18: Daily wind speed observations for Melbourne (Moorabbin), Victoria 19 February 2025 –18 March 2025. Data Source BOM.

5. Quality Assurance

5.1. Data Capture

Data capture is defined as the number of valid data periods collected divided by the number of available data periods. Valid data excludes period where the instrument is unavailable due to calibration and maintenance and excludes periods where the data has been rejected due to quality assurance/data validation procedures.

Data capture statistics for the reporting period 19 February 2025 to 18 March 2025 are shown in Table 13.

Data capture statistics were 100% for all parameters at all stations for the reporting period, except for the following:

- At Box Hill, the gap in reporting data for monitor 1 was caused by the monitor getting accidentally disconnected when being repositioned to not obstruct works. The gap in reporting data for monitor 2 was due to the battery breaking. A new battery is being delivered to resume monitoring at the East of Market St monitoring point. No works were undertaken in the Eastern extent of Site 2 during the data gap.
- At Burwood, the gap in reporting data at Monitor 5 was due to the battery going flat. There was no works occurring during this time and the battery was changed prior to works starting.
- At Monash, the gap in data at Monitor 2 was due to battery charging issues between 23 February 2025 to 18 March 2025.
- At Clayton, both devices experienced technical difficulties surrounding the batteries not charging with the solar panel which resulted in needing to manually charge the battery once it died. The site 1 device was also moved from its location and unplugged accidentally resulting in the missing data towards the end of the month.
- The construction program has been reviewed to ensure monitoring devices are installed prior to works. The MC is continuing to closely monitor the operation of the SiteHive units.

Table 14: Air quality monitoring, data capture summary

Location	Parameter	Averaging Period	Collected Periods	Available Periods	Data Capture
Box Hill – Site Office	PM_{10}	24-hours	27	28	96%
Box Hill – East of Market Street	PM_{10}	24-hours	8	28	29%
Box Hill – Uniting AgeWell	PM_{10}	24-hours	28	28	100%
Box Hill – Irving Avenue	PM_{10}	24-hours	28	28	100%
Burwood – Corner of McComas Grove and Sinnott Street	PM_{10}	24-hours	28	28	100%
Burwood – 16 McComas Grove	PM_{10}	24-hours	28	28	100%
Burwood – Site 4 - West	PM_{10}	24-hours	28	28	100%
Burwood – Site 4 - East	PM_{10}	24-hours	28	28	100%
Burwood – Site 1 - South	PM_{10}	24-hours	25	28	89%
Glen Waverley – Coleman Parade	PM_{10}	24-hours	28	28	100%
Glen Waverley – Railway Parade	PM_{10}	24-hours	28	28	100%
Monash – Normanby House - West	PM_{10}	24-hours	28	28	100%
Monash – Normanby House - East	PM_{10}	24-hours	4	28	14%
Clayton – Clayton Community Space Site 1	PM_{10}	24-hours	15	28	54%
Heatherton – SSY – South	PM_{10}	24-hours	28	28	100%
Heatherton – SSY – Site Office	PM_{10}	24-hours	28	28	100%
Cheltenham – CTM Compound	PM_{10}	24-hours	28	28	100%

5.2. Data Validation

Data contained in this report has been validated against performance and calibration requirements for each instrument.

Table 15: Monitoring device calibration information.

Location	Device Serial Number	Calibration Date	Calibration Due
Box Hill – Site Office	HEX-000407	29 Aug 2023	29 Aug 2025
Box Hill – East of Market Street	HEX-000339	19 Apr 2023	19 Apr 2025
Box Hill – Uniting AgeWell	HEX-000011	8 Apr 2024	8 Apr 2026
Box Hill – Irving Avenue (retired)	HEX-000222	13 June 2024	13 June 2026
Box Hill – Irving Avenue (replacement)	HEX-000748	27 November 2024	27 November 2026
Burwood – 16 McComas Grove	HEX-000162	22 July 2024	22 July 2026
Burwood – Corner of McComas Grove and Sinnott Street	HEX-000308	3 Apr 2023	3 Apr 2025
Burwood – Site 4 - West	HEX-000489	6 Dec 2023	06 Dec 2025
Burwood – Site 4 – East	HEX-000541	24 Apr 2024	24 Apr 2026
Burwood – Site 1 South	HEX-000525	4 Mar 2024	4 Mar 2026
Glen Waverley – Coleman Parade	HEX-000477	12 Dec 2023	12 Dec 2025
Glen Waverley – Railway Parade	HEX-000528	4 Mar 2024	4 Mar 2026
Monash – Normanby House - West	HEX-000540	24 Apr 2024	24 Apr 2026
Monash – Normanby House - East	HEX-000238	23 Oct 2024	23 Oct 2026
Clayton – Clayton Community Space Site 1	HEX-000031	5 Mar 2024	5 March 2026
Heatherton – SSY – South	HEX-000050	21 Apr 2023	21 Apr 2025
Heatherton – SSY – Site Office	HEX-000317	13 Dec 2023	13 Dec 2025
Cheltenham – CTM Compound	HEX-000794	18 Dec 2024	18 Dec 2026

Suburban Rail Loop East Tunnels South

Air Quality Monitoring Report

19 February 2025 to 18 March 2025

Document Information

Document Details	
Document Number	SRL-WPC-SCC-SPKW-REP-XEV-PWD-000006
Revision Date	10-Apr-2025
Revision Number	D

Revision Control

Revision Number	Change Detail	Date	Comment
A	Draft issued to SRLA	21/03/2025	Issued For Review
B	Draft issued to SRLA	31/03/25	Issued For Review
C	Draft issued to SRLA	07/04/25	Issued For Review
D	Final Draft Issued to SRLA	10/04/25	Issued For Review

Contents

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Executive Summary

Key Outcomes

Key outcomes arising from the monthly air quality monitoring program:

- Works took place at:
  - Clarinda CC01,
  - Clarinda Tunnel Access Structure Site
  - Clayton,
  - Train Stabling Facility West
- Visual air inspections were undertaken proactively to monitor and confirm there were no dust impacts due to works on site.
- All instances of elevated monitoring results were investigated and confirmed existing mitigation measures were sufficient to manage dust risks onsite.
- The TARP was triggered 4 times during the reporting period.

Further explanation is provided in Section 3 regarding these observations.

Purpose of the Report

This report presents the results of the monthly review of the air quality monitoring data for each Suburban Rail Loop (SRL) East main works construction site for the period between 19 February 2025 to 18 March 2025 in accordance with SRL East Environmental Management Framework (EMF) and Environmental Performance Requirements (EPRs) AQ1 and AQ2.

Suburban Connect is delivering the following scope of works as part of Suburban Rail Loop (SRL) East – Tunnels South:

- Initial launch of four Tunnel Boring Machines (TBM) from the Clarinda Tunnel Access Structure site
- Construction of approximately 16km of twin tube tunnels between Cheltenham and Glen Waverley

- Construction of 55 cross passages between the tunnels (surface-based ground improvement at eight locations with the remainder to be frozen from within the main tunnels)
- Construction of the western and eastern decline structures at the train stabling facility
- Protection of the South East Trunk Sewer (SETS)
- Box excavations at Clayton and Monash station locations
- Interface works with the Melbourne Metropolitan Rail Network (MMRN).

Suburban Connect is implementing an air quality monitoring program on each site that includes both visual observation and instrumental air quality monitoring. The purpose of the air quality monitors is to measure the concentration of small dust particles in the air near the construction site. These particles, known as PM_{10} have the potential to impact human health. PM_{10} refers to particles with an aerodynamic diameter of 10 µm or less.

This report compares the measured concentrations to air quality objectives that are defined in the Environment Reference Standard (ERS) which is a tool under the Environment Protection Act 2017. The ERS sets out the air quality objectives for PM_{10} which are measured over a 24-hour averaging period. The objectives are risk-based concentrations that are not intended to be compliance levels, but they assist Suburban Connect understand the risk to human health. When the instrumental monitor and/or visual observations identify a change in site conditions this prompts Suburban Connect to take actions on site to reduce dust impacts, and review mitigation measures applied.

Scope of Reporting

Construction works requiring air quality monitoring occurred at the following site/s during this reporting period:

- Clarinda – CC01
- Clarinda – Clarinda Tunnel Access Structure Site
- Clayton – Clayton Site
- Train Stabling Facility West

There were no construction works requiring air quality monitoring at the following site/s during this reporting period:

- Cheltenham
- Monash
- Glen Waverley
- Train Stabling Facility East

This report does not include:

- works delivered as SRL Initial Works. The SRL Initial Works, which include investigative works are not subject to the EMF and EPRs.
- monitoring related to asbestos containing material removal works, which is monitored and reported separately.

Results

The key findings are summarised in Table 1. An analysis of these findings is provided in Section 3.

Table 1: Summary of air quality monitoring results

Location	Parameter	Averaging Period	Max Concentration (µg/m³)	Median Concentration (µg/m³)	Days TARP Actions Implemented in the Month
Representative Background Locations					
Dandenong	PM_{10}	24-hour	45.2	23.5	N/A
Suburban Connect Monitoring Locations					
Clarinda CC01	PM_{10}	24-hour	44.1	22.4	0
Clarinda Tunnel Access Structure Site – South-East	PM_{10}	24-hour	59.2	47.6	4
Clarinda Tunnel Access Structure Site – Pond	PM_{10}	24-hour	79.0	57.2	4
Clarinda Tunnel Access Structure Site - North	PM_{10}	24-hour	79.7	54.9	4
Clarinda TAS - South Boundary	PM_{10}	24-Hour	77.9	58.8	4
Clayton Site – East	PM_{10}	24-hour	50.7	26.6	0
Clayton Site – West	PM_{10}	24-hour	55.1	24.9	0
Clayton Site – South	PM_{10}	24-hour	44.8	25.9	0
Train Stabling Facility West – South	PM_{10}	24-hour	63.1	23.8	0

Location	Parameter	Averaging Period	Max Concentration (µg/m^3)	Median Concentration (µg/m^3)	Days TARP Actions Implemented in the Month
Train Stabling Facility West – South West	PM_{10}	24-hour	39.3	22.1	0

1 Introduction

1.1 SRL East

Suburban Rail Loop (SRL) will deliver a 90km rail line linking every major suburban line from the Frankston Line to the Werribee Line via Melbourne Airport, better connecting Victorians to jobs, retail, education, health services and each other. Construction of SRL East from Cheltenham to Box Hill is underway and will connect major employment, health, education and retail destinations in Melbourne's east and south-east. The new underground train line will reduce travel times, connect people travelling on the Gippsland corridor and building it will create up to 8000 direct local jobs. Trains will be running by 2035.

The SRL East – Tunnels South scope of works include:

- Initial launch of four Tunnel Boring Machines (TBM) from the Clarinda Tunnel Access Structure site
- Construction of approximately 16km of twin tube tunnels between Cheltenham and Glen Waverley
- Construction of 55 cross passages between the tunnels (surface-based ground improvement at eight locations with the remainder to be frozen from within the main tunnels)
- Construction of the western and eastern decline structures at the train stabling facility
- Protection of the South East Trunk Sewer (SETS)
- Box excavations at Clayton and Monash station locations
- Interface works with the Melbourne Metropolitan Rail Network (MMRN).

This report does not include works delivered as SRL Initial Works. The SRL Initial Works, which includes investigative works, were subject to a separate approval process under Clause 52.30 of the VPP and were approved by the Minister for Planning on 19 December 2021. These works are required to comply with Clause 52.30 of the VPP and are not subject to the EMF and EPRs.

1.2 Environmental Management Framework

The Environmental Management Framework (EMF) for SRL East (the Project) provides a transparent and integrated framework to manage environmental effects of the Project and includes EPRs that define environmental outcomes that must be achieved during the design, construction, and operation phases of the Project. The EMF is available on the SRL east website at https://bigbuild.vic.gov.au/library/suburban-rail-loop/planning/srl-east-environmental-management-framework.

The development of the EMF has been informed by relevant legislation, policy and guidelines, and the specialist impact assessment studies completed for the SRL East Environment Effects Statement (EES) and the Minister's Assessment, dated 5 August 2022.

The EMF requires the Principal Contractor (PC) to develop and implement an Environmental Air Quality and Dust Management Plan (EAQDMP). As part of implementing this document plan, the PC is required to conduct monitoring of PM_{10} concentrations and measure wind speed and direction at each Early Works construction site and at a representative control site. The EAQDMP also includes a Trigger Action Response Protocol (TARP) which defines a set of triggers that prompt actions on site to reduce dust impacts, and review mitigation measures applied.

The PC regularly reviews the monitoring data at each site, for the purpose of assessing the effectiveness of EAQDMP implementation. The verified results of the PM_{10} monitoring for the applicable monthly period are contained in this report, which will be available to the public, in accordance with the requirements of the EMF.

2 Air Quality Monitoring

2.1 Context

Maintaining air quality is important for public health, the liveability of our cities and our environment. Overall air quality conditions in Melbourne are good, however like all major cities, there are days where the background concentrations of air pollutants are very high on a regional basis. Sometimes these elevated concentrations are due to regional influences such as windblown continental dust, bushfires or hazard reduction burns. Emissions from traffic, home heating, and industrial emissions across Melbourne can also cause high background concentrations, especially when the weather is calm. Environment Protection Authority (EPA) monitoring stations measure these background levels of pollution that already exist in the air within the surrounding area. The EPA monitoring station at Dandenong is used as the representative control site for Suburban Connect work sites.

Without effective management, construction of the Project has the potential to contribute to these background concentrations which may impact public health. Comparison of SRL East monitoring results with publicly available EPA monitoring data is used by the PC to identify when construction-related activities are impacting local air quality, and conversely when the local air quality results may be influenced by background conditions outside of the influence of the construction site.

Meteorological conditions such as wind direction and speed can impact on the dispersion of particulates in the air and by monitoring these, the PC can respond when conditions on site change. Having records of wind conditions is also helpful for retrospectively identifying the activity that is causing any elevated dust concentrations.

2.2 Purpose

The purpose of the air quality monitors is to measure the concentration of small dust particles in the air near the construction site. These particles, known as PM_{10} have the potential to impact human health. PM_{10} refers to particles with an aerodynamic diameter of 10 µm or less.

The measured concentrations are compared to air quality objectives that are defined in the Environment Reference Standard (ERS) which is a tool under the Environment Protection Act 2017. The air quality objectives defined in the ERS informed the objectives for air quality for the Project, noting that the ambient air ERS is not a compliance standard that one can pollute up to. The ERS does not provide an indicator or objective for nuisance dust.

The objectives are risk-based concentrations that are not intended to be compliance levels, but they assist the PC to understand the risk to human health. The ERS sets out the air quality objectives for PM_{10} which are measured over a 24-hour averaging period, as reproduced below in Table 2.

Table 2: Ambient air quality objectives for PM_{10}

Indicator	Air Quality Objective (µg/m^3)	Averaging Period
Indicator Particles as PM_{10} (maximum concentration)	50	24-hour

The measured concentrations (which include both existing background concentrations and the Project's incremental contribution over a 24-hour period) are presented in Section 3 and compared against the air quality objective. Monitoring is continuous, even when there are no construction-related activities occurring on the site. Periods of time where there are no site activities are classified as 'Out of Hours'. The potential for

dust generation from the work sites is much lower when there are no site activities occurring, however dust can still be generated at the work site during 'Out of Hours' periods due to wind erosion.

2.3 Monitoring Locations

Air quality monitors are located on or adjacent to the construction sites, to represent local air quality conditions, in positions that enable the PC to adequately measure potential impact of works on local sensitive receivers including residents.

The air quality monitors were installed on the following dates at each of the following locations. The location of these monitors is shown on maps in Section 3 of this Report.

Table 3: Air quality monitoring locations active during reporting period

Monitoring Location	Date Commissioned	Coordinates	Monitoring Parameters	Representative Control Site
Clarinda CC01 – Nearest residential property	24 Oct 2024	Latitude: -37.9558° Longitude: 145.1062°	PM_{10}	Dandenong EPA monitoring station
Clarinda Tunnel Access Structure Site – South East	3 Dec 2024	Latitude: -37.95700° Longitude: 145.11020°	PM_{10}	Dandenong EPA monitoring station
Clarinda Tunnel Access Structure Site - Pond	23 Jan 2025	Latitude: -37.95589° Longitude: 145.1084°	PM_{10}	Dandenong EPA monitoring station
Clarinda Tunnel Access Structure Site – North	23 Jan 2025	Latitude: -37.9553° Longitude: 145.1091°	PM_{10}	Dandenong EPA monitoring station
Clarinda Tunnel Access Structure Site – South Boundary	21 Feb 2025	Latitude: -37.95695° Longitude: 145.1093°	PM_{10}	Dandenong EPA monitoring station
Clayton Site - South	5 Mar 2025	Latitude: -37.92413° Longitude: 145.1197°	PM_{10}	Dandenong EPA monitoring station
Clayton Site - East	3 Dec 2024	Latitude: -37.92241° Longitude: 145.12012°	PM_{10}	Dandenong EPA monitoring station
Clayton Site - West	3 Dec 2024	Longitude: -37.92149° Latitude: 145.11933°	PM_{10}	Dandenong EPA monitoring station
Train Stabling Facility – South	3 Feb 2025	Latitude: -37.95444 Longitude: 145.094	PM_{10}	Dandenong EPA monitoring station
Train Stabling Facility – SW Point	3 Feb 2025	Latitude: -37.95321 Longitude: 145.089	PM_{10}	Dandenong EPA monitoring station

2.4 Data Limitations and Verification

The following limitations apply to this data:

- Meteorological conditions on site can affect measurements made by monitoring devices. For instance, dust measurements can be impacted by rainfall, fog and/or humidity (with water droplets in the air

being mistaken as dust particles). Displaying periods of inclement weather allows reviewers to identify measurements that may have been impacted.

- Breaks in data availability may occur due to sensor outages, instrument errors, technical issues, or removal of sensors during non-working periods to ensure the security of the equipment.
- Proximity of site monitors to public roads, industrial businesses and other factors will impact data recording.
- Monitors may need to be located close to works due to security requirements
- Monitor locations will change as works progress and construction activity locations change.

Data has been provided in tabular and graphical form in Section 3 to visually present 24-hour averages of PM_{10} over the monthly period. The data included in this report has been verified by the Suburban Connect and relevant subject matter experts.

3 Results

Data has been presented in graphical form below to visually present 24-hour averages of PM_{10} dust concentration over the monthly period for each active construction site.

3.1 Clarinda CC01

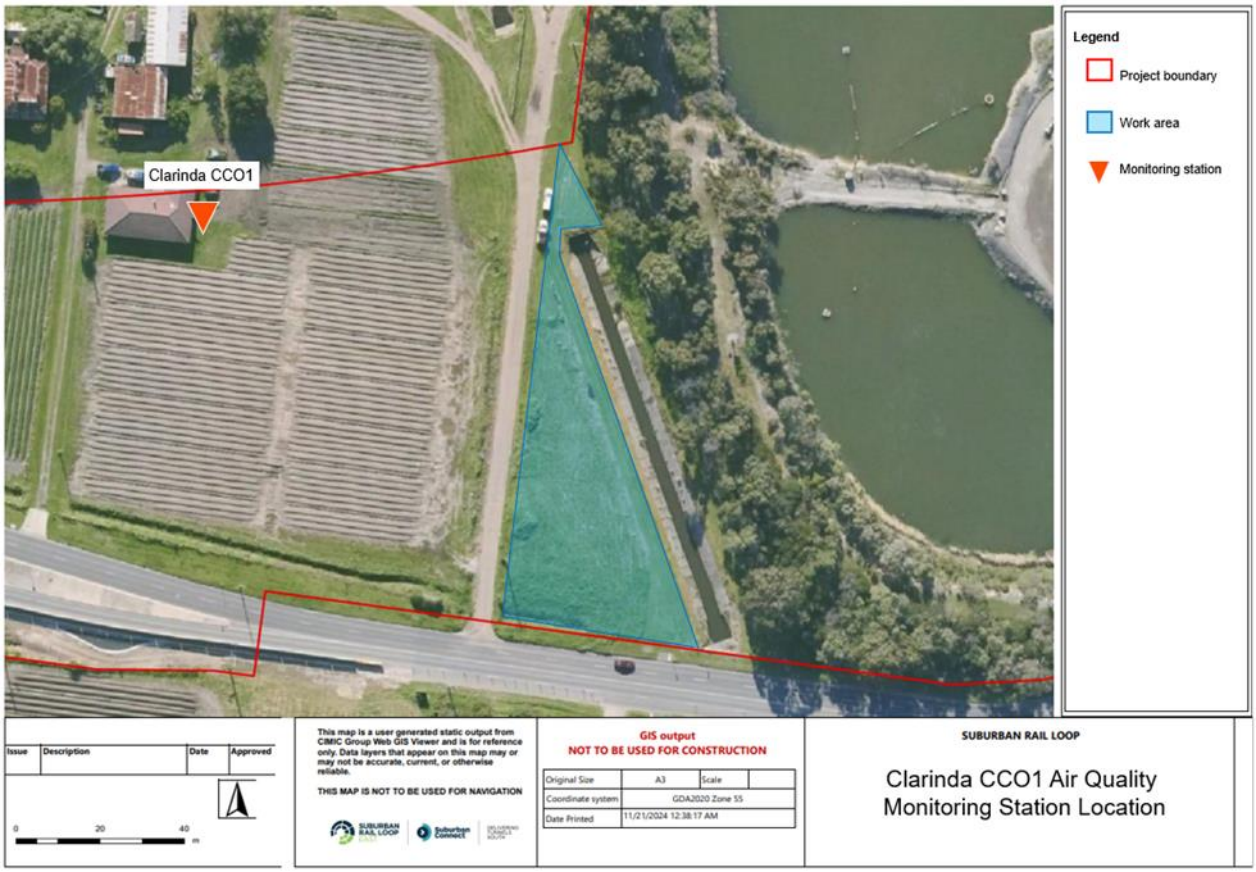

Figure 1: Clarinda CC01 air quality monitoring station.

Table 4: Clarinda CC01 PM_{10} Results

Monitor Number	Monitoring Location	Max Daily PM_{10} Concentration ($\mu g/m^3$)	Median Daily PM_{10} Concentration ($\mu g/m^3$)	Days TARP Implemented in the Month
-	Representative Background – Dandenong	45.2	23.5	-
1	Clarinda CC01 – nearest residential property	44.1	22.4	0

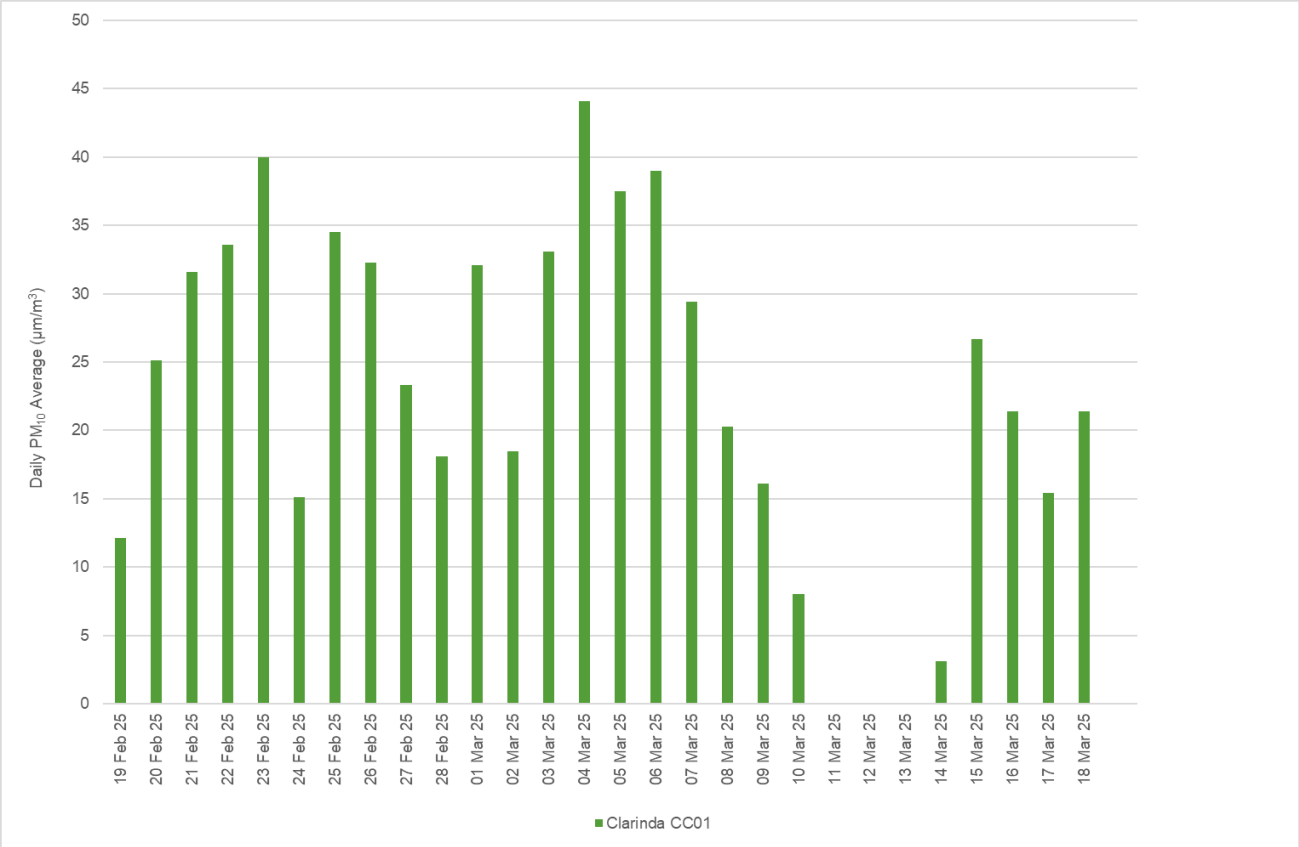

Figure 2: Daily Averages PM_{10} Results at Clarinda CC01

3.1.1 Analysis

Water carts were used proactively on site when works were occurring. The existing mitigation measures were sufficient to manage dust risks onsite, and the TARP was not implemented during the reporting period.

3.2 Clarinda Tunnel Access Structure Site

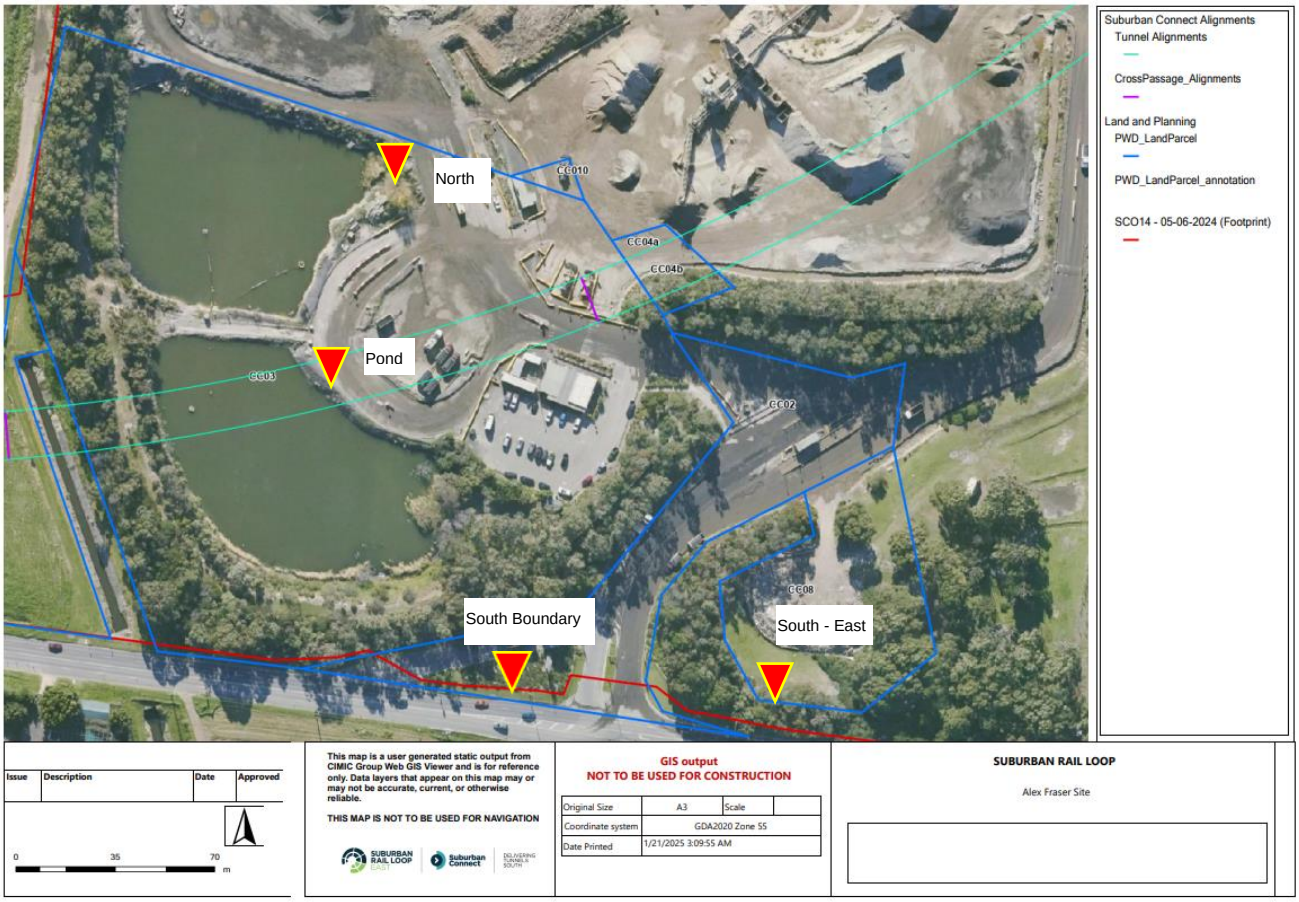

Figure 3: Clarinda Tunnel Access Structure Site air quality monitoring station.

Table 5: Clarinda Tunnel Access Structure Site PM_{10} Results

Monitor Number	Monitoring Location	Max Daily PM_{10} Concentration ($\mu g/m^3$)	Median Daily PM_{10} Concentration ($\mu g/m^3$)	Days TARP Implemented in the Month
-	Representative Background – Dandenong	45.2	23.5	-
1	Clarinda - Tunnel Access Structure Site – South East	59.2	47.6	4
2	Clarinda - Tunnel Access Structure Site – Pond	79.0	57.2	4
3	Clarinda - Tunnel Access Structure Site – North	79.7	54.9	4
4	Clarinda – Tunnel; Access Structure Site – South Boundary	77.9	58.8	4

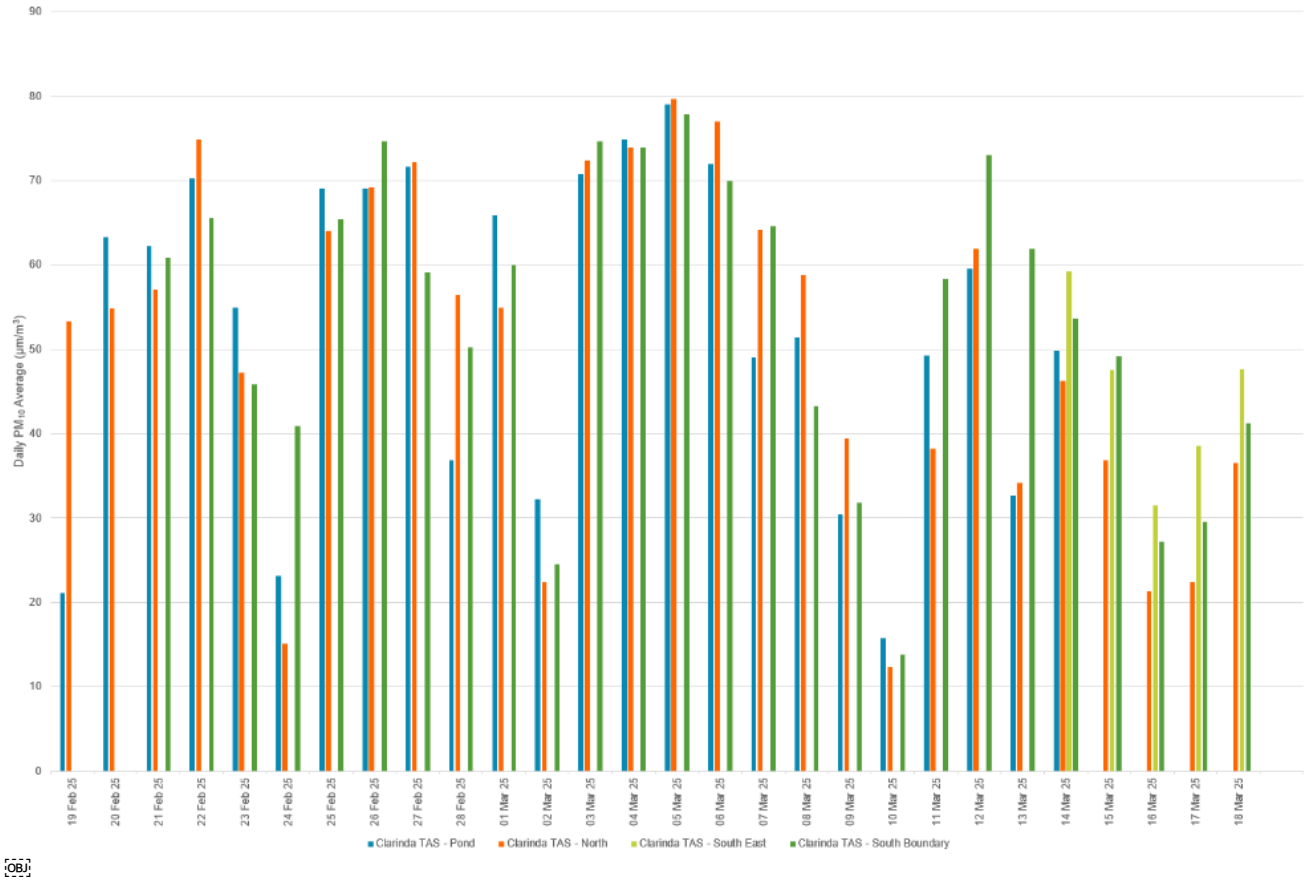

Figure 4: Daily Averages PM_{10} Results at Clarinda Tunnel Access Structure Site

3.2.1 Analysis

On 15 March 2025, Pond monitoring point was moved to the South East.

During site establishment works, dust was mitigated by two dedicated water carts, rumble grids at entry and exit points, and street sweepers. Constant monitoring of air quality was conducted, in addition to daily observations by supervisors and environmental representatives to respond to areas of concern.

To further improve environmental outcomes, a boundary sprinkler system was installed to limit and reduce dust migration throughout site. Installation commenced at the end of February 2025 and progressed through the first week of March 2025 and was operational by 7 March 2025. All dust events were investigated and confirmed to be unrelated to project works. Elevated readings were attributed to dust migration across the site from external sources, particularly on days with a northerly wind. In response to elevated readings however on particularly dry days, there were four days where the TARP action response was applied.

Visual air inspections were also undertaken to proactively monitor and confirm there were no dust impacts due to works on site.

3.3 Clayton Site

Figure 5: Clayton site air quality monitoring station

Table 6: Clayton Site PM_{10} Results

Monitor Number	Monitoring Location	Max Daily PM_{10} Concentration (µg/m^3)	Median Daily PM_{10} Concentration (µg/m^3)	Days TARP Implemented in the Month
-	Representative Background – Dandenong	45.2	23.5	-
1	Clayton Site – East	50.7	26.6	0
2	Clayton Site – West	55.1	24.9	0
3	Clayton Site – South	44.8	25.9	0

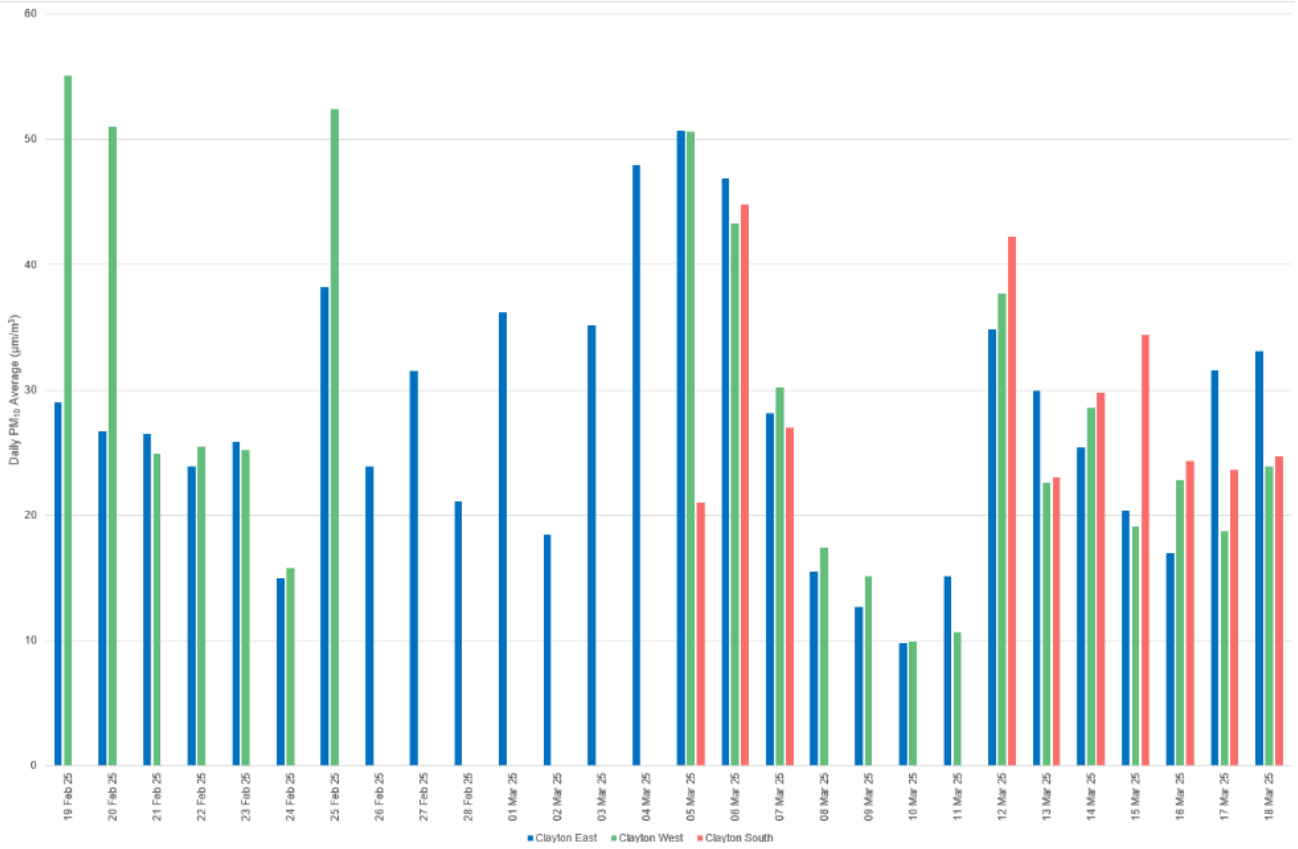

Figure 6: Daily Averages PM_{10} Results at Clayton

3.3.1 Analysis

An additional monitor was installed at the Southern End of the site on the 5 March 2025.

Elevated readings at Clayton were attributed to equipment operating in close proximity to the air quality monitor, which was investigated and confirmed to be not representative of overall air quality. In addition, some elevated readings occurred outside of operating hours.

All elevated monitoring levels were investigated, and additional visual inspections and SiteHive data reviews undertaken which confirmed the events were not due to works on site. Site inspections observed dust suppression active on site including water carts and street sweepers, and no additional TARP actions were required.

Visual air inspections were also undertaken to proactively monitor and confirm there were no dust impacts due to works on site.

3.4 Train Stabling Facility West

Figure 7: Train Stabling Facility West site air quality monitoring station

Table 7: Train Stabling Facility West - Site PM_{10} Results

Monitor Number	Monitoring Location	Max Daily PM_{10} Concentration ($\mu g/m^3$)	Median Daily PM_{10} Concentration ($\mu g/m^3$)	Days TARP Implemented in the Month
-	Representative Background – Dandenong	45.2	23.5	-
1	South-W	39.3	22.1	0
2	South	63.1	23.8	0

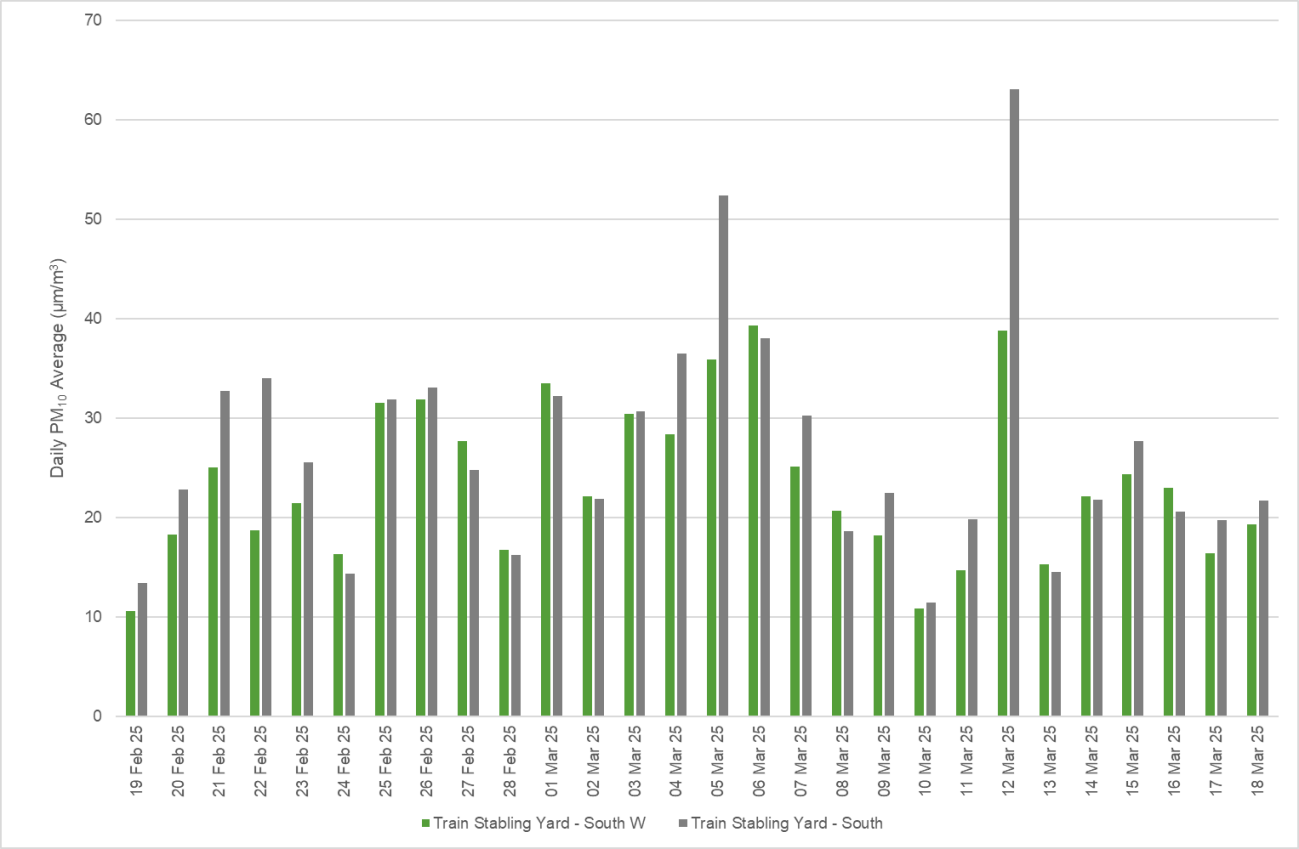

Figure 8: Daily Averages PM_{10} Results at Train stabling facility west

3.4.1 Analysis

Water carts and street sweepers were used proactively on site. The existing mitigation measures were sufficient to manage dust on site, and the TARP was not implemented during the reporting period. Elevated readings on 5 March 2025 and 12 March 2025 were not related to Project activities.

Visual air inspections were also undertaken to proactively monitor and confirm there were no dust impacts due to works on site.

3.5 Meteorological Conditions

Table 8: Daily weather observations for Moorabbin, Victoria

Statistic	Min Temperature (°C)	Max Temperature (°C)	Maximum Wind Gust Direction	Maximum Wind Gust Speed (km/h)	Relative Humidity @ 9:00 AM (%)
Mean	15.2	27.9	N/A	41.6	67.2
Lowest	8.8	19.1	SSW	28	37
Highest	26.7	37.2	N	70	97

Table 9: Daily rain data for Moorabbin, Victoria

Statistic	Rain (mm)
Daily Low	0.0
Daily High	22.6
Total	45.4

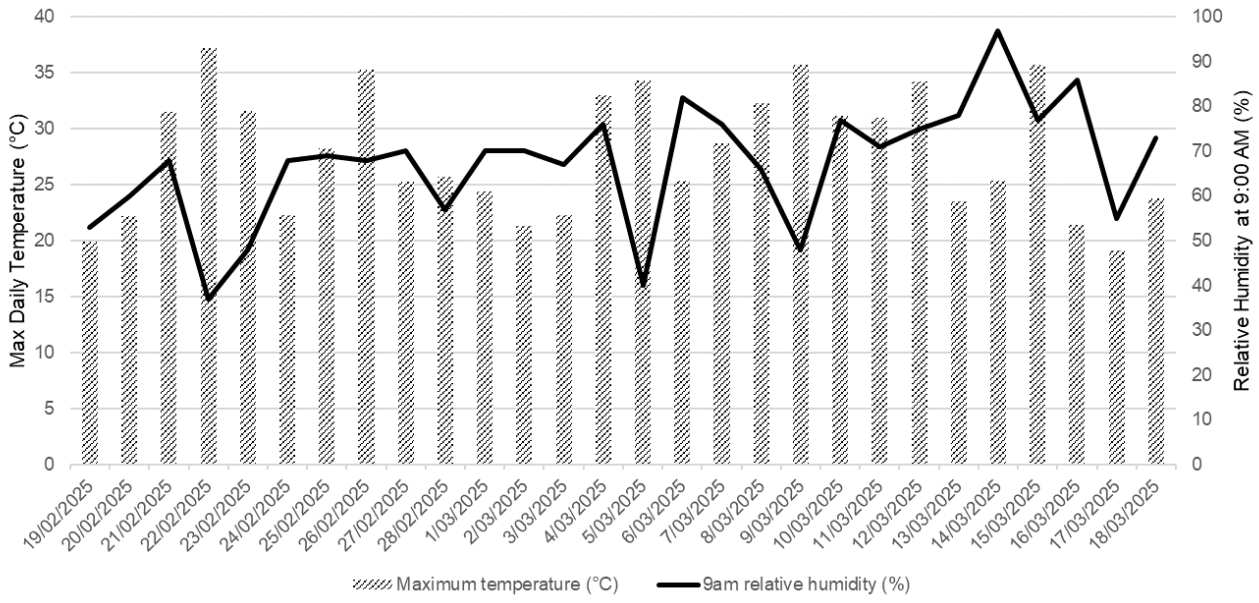

Figure 9: Daily relative humidity and temperature observations for Moorabbin, Victoria

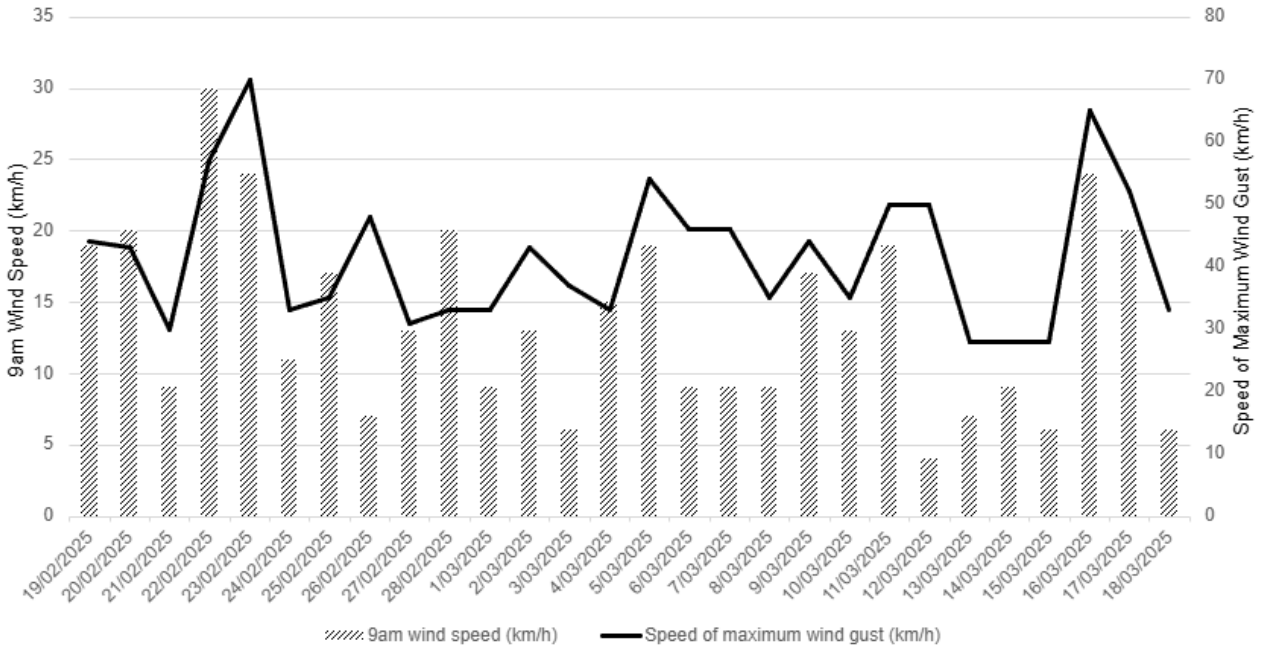

Figure 10: Daily wind speed observations for Moorabbin, Victoria

4 Quality Assurance

4.1 Data Capture

Data capture is defined as the number of valid data periods collected divided by the number of available data periods. Valid data excludes period where the instrument is unavailable due to calibration and maintenance and excludes periods where the data has been rejected due to quality assurance/data validation procedures. Data capture statistics for the reporting period 19 February 2025 to 18 March 2025 are shown below.

Table 10: Daily PM_{10} Air Quality Monitoring Data Capture

Location	Available Periods	Collected Periods	Data Capture	Details
Clarinda – CC01	28	28	100%	There were no interruptions to monitoring at this location during the reporting period.
Clayton - South	28	10	**36%**	This monitoring location was established on the 5 March. Due to an installation fault, equipment was interrupted for four days.
Clayton – East	28	28	100%	There were no interruptions to monitoring at this location during the reporting period.
Clayton – West	28	21	75%	Due to equipment malfunction, there were seven days of interruptions through this monitoring period.

Location	Available Periods	Collected Periods	Data Capture	Details
Clarinda Tunnel Access Structure Site – North	28	28	100%	Monitoring continued as normal.
Clarinda Tunnel Access Structure Site – Pond	28	24	86%	Monitoring concluded at this location on 14 March. Monitor was active everyday prior to this.
Clarinda Tunnel Access Structure Site – South Boundary	28	26	93%	Monitoring commences at this location on the 21 February. Monitor was active everyday following
Clarinda Tunnel Access Structure Site - SE	28	5	18%	Monitoring commenced at this location on the 14 March. It was active everyday following.
Train Stabling Facility West – South	28	28	100%	There were no interruptions to monitoring at this location during the reporting period.
Train Stabling Facility West – SW Point	28	28	100%	There were no interruptions to monitoring at this location during the reporting period.

4.2 Data Validation

Data contained in this report has been validated against performance and calibration requirements for each instrument. Data during commissioning, maintenance and calibration periods has been removed from the validated data sets.

Table 11: Monitoring device calibration information

Location	Device Serial Number	Calibration Date	Calibration Due
Clarinda CC01 – Nearest Residential property	HEX-000403	20 Sep 2024	20 Sep 2026
Clayton – East	HEX-000705	24 Oct 2024	24 Oct 2026
Clayton – West	HEX-000623	19 Feb 2025	19 Feb 2027

Location	Device Serial Number	Calibration Date	Calibration Due
Clayton – South	HEX-000744	27 Nov 2024	27 Nov 2026
Clarinda Tunnel Access Structure Site – South East	HEX-000780	18 Dec 2024	18 Dec 2026
Clarinda Tunnel Access Structure Site – South Boundary	HEX-000619	21 Aug 2024	21 Aug 2026
Clarinda Tunnel Access Structure Site - Pond	HEX-000780	18 Dec 2024	18 Dec 2026
Clarinda Tunnel Access Structure Site – North	HEX-000791	18 Dec 2024	18 Dec 2026
Train Stabling Facility West – South	HEX-000498	20 Sep 2024	20 Sep 2026
Train Stabling Facility West– SW Point	HEX-000694	03 Oct 2024	03 Oct 2026

Glossary

Term / Abbreviation	Definition
µg/m^3	micrograms per cubic metre is a unit of measurement used to measure the mass of air pollutants (micrograms) per volume of air (cubic metre) as a concentration.
EAQDMP	The Environmental Air Quality and Dust Management Plan (EAQDMP) is environmental management documentation prepared by the PC to manage and monitor air quality impacts during construction of SRL East. It includes the RMMP and TARP and is verified by the IEA.
EES	Environment Effects Statement (EES) in Victoria, environment assessment of the potential environmental impacts or effects of a proposed development under the Environment Effects Act 1978.
EMF	The Environmental Management Framework (EMF) provides a transparent and integrated framework to manage environmental effects of the SRL East Project during construction and operation to achieve acceptable environmental outcomes.
EPA	Environment Protection Authority (EPA) is the Victorian regulator established under the Environment Protection Act 2017 and which has the statutory objective to protect human health and the environment from the harmful effects of pollution and waste.
EPRs	The Environmental Performance Requirements (EPRs) define the environmental outcomes that must be achieved during the design, construction and operation of SRL East and are included within the EMF.
ERS	The Environmental Reference Standard (ERS) is a tool made under the Environment Protection Act 2017 to identify and assess environmental values, including air quality, in Victoria.
IEA	The Independent Environmental Auditor (IEA) is appointed by the Victorian Government to undertake independent environmental reviews and audits of project activities including assessing compliance with the EMF and EPRs.
PC	Principal Contractor
PM_{10}	Particulate matter with an aerodynamic diameter of 10 micrometres (µm) or less. PM_{10} particles are small enough to have a potential impact on human health.
RMMP	The Risk Management and Monitoring Program (RMMP) plan outlines the approach to air quality monitoring and includes instrumental, visual monitoring, TARP and public reporting processes. The RMMP forms part of the EAQDMP.
TARP	The Trigger Action Response Protocol (TARP) defines a series of adaptive management measures that are implemented to avoid or mitigate impacts from dust emissions for nearby sensitive receptors in response to the results from monitoring. The TARP forms part of the EAQDMP