SUBURBAN RAIL LOOP

Air Quality Monthly Report

Early Works

Tunnels South

19 March – 18 April 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 March 25 – 18 April 2025

Document Information

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A	Draft issued to SRLA	22/04/2025	Issued for Review
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C	Draft Issued to SRLA	08/05/2025	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 seven 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 dust during excavation works and material/spoil haulage. Trucks were required to cover loads prior to leaving the site to reduce dust.
- In Burwood, the TARP was not implemented 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 twelve 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 twelve days during the reporting period. Hoses were used proactively and reactively to suppress dust during demolition works.
- In Clayton, the TARP was implemented on three days during the reporting period. Hoses were used during landscaping 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 March 2025 and 18 April 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	32.5	19.0	-
Dandenong	PM_{10}	24-hour	35.0	22.1	-
Box Hill					
Site Office	PM_{10}	24-hour	43.4	28.4	7
Uniting AgeWell (UAW)	PM_{10}	24-hour	45.4	15.7	
Irving Avenue	PM_{10}	24-hour	37.5	18.5	
Burwood					
Corner of McComas Grove and Sinnott Street	PM_{10}	24-hour	26.9	18.5	0
16 McComas Grove	PM_{10}	24-hour	23.9	16.9	
Site 4 – East	PM_{10}	24-hour	23.0	13.2	
Site 4 – West	PM_{10}	24-hour	26.0	17.2	
Site 1 – South	PM_{10}	24-hour	46.0	24.2	
Glen Waverley					
Coleman Parade	PM_{10}	24-hour	34.4	21.9	12
Railway Parade	PM_{10}	24-hour	71.9	35.6	
Monash					
Normanby House – West	PM_{10}	24-hour	39.5	23.1	12
Normanby House – East	PM_{10}	24-hour	42.5	27.3	
Clayton					
Clayton Community Space – Site 2	PM_{10}	24-hour	31.9.	24.4	3
Heatherton					
SSY - South	PM_{10}	24-hour	119.5	40.7	8
Site Office	PM_{10}	24-hour	42.2	20.5	
SS17	PM_{10}	24-hour	77.9	35.8	
Cheltenham					
CTM Compound	PM_{10}	24-hour	33.1	17.4	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° Lo 145.12187°	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 2	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
Heatherton – SSY – SS17	26 March 2025	Latitude: -37.9544° Longitude: 145.0975 °	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	32.5	19.0	-
1	Site Office	43.4	28.4	7
2	Uniting AgeWell	45.4	15.7	
3	Irving Avenue	37.5	18.5	

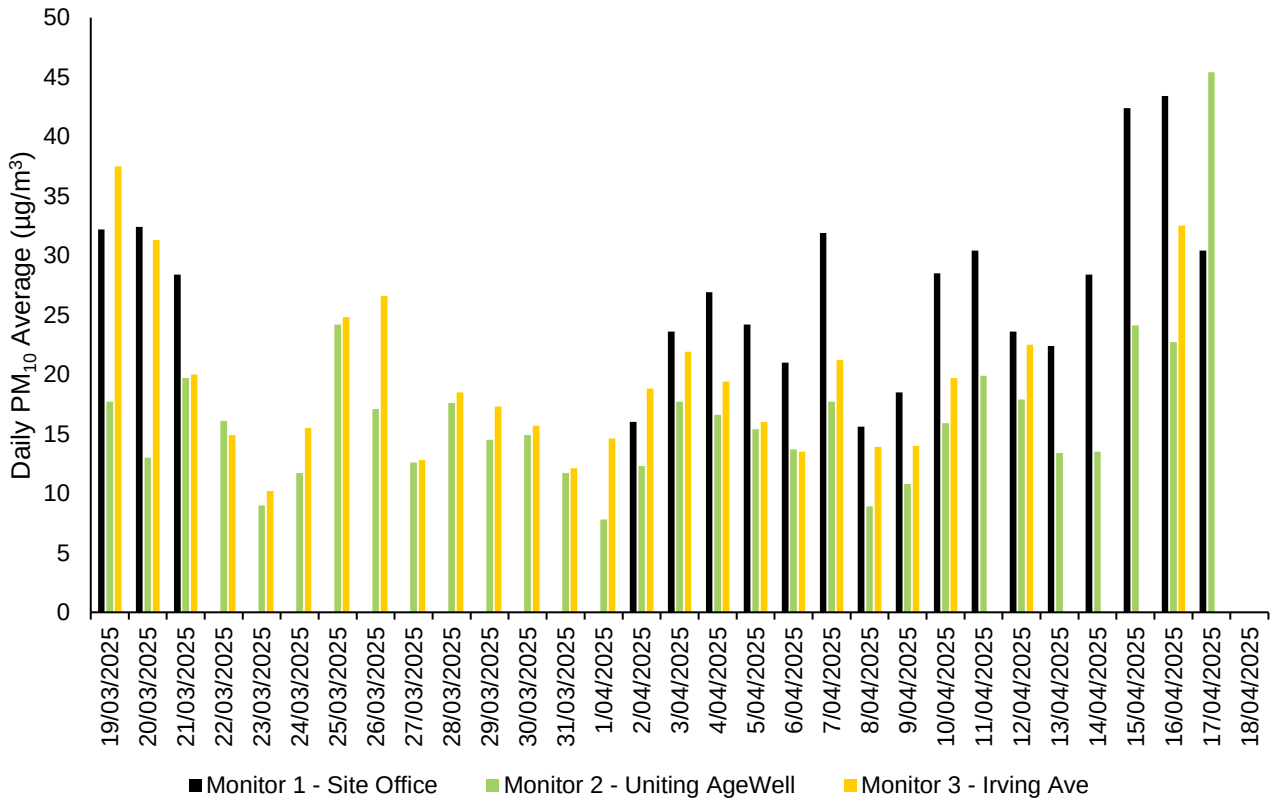

Figure 2: Box Hill PM_{10} daily averages.

3.1.1. Analysis

The maximum daily average PM_{10} concentrations were 43.4 µg/m^3 (n = 19), 45.4 µg/m^3 (n = 30) and 37.5 µg/m^3 (n = 25) at the monitoring stations located at the Site Office (Monitor 1), Uniting AgeWell (Monitor 2) and Irving Avenue (Monitor 3) respectively.

The TARP was implemented on seven days during the reporting period. Dust generated from excavation works and spoil transport was proactively suppressed using water carts and hoses. The proactive use of hoses on exposed surfaces o ensured dust levels were managed.

Additional dust management measures conducted on site included ensuring trucks covered their loads prior to leaving site during spoil haulage and maintaining stockpile height below the top of the site boundary fencing to minimise the risk of dust leaving the site.

3.2. Burwood

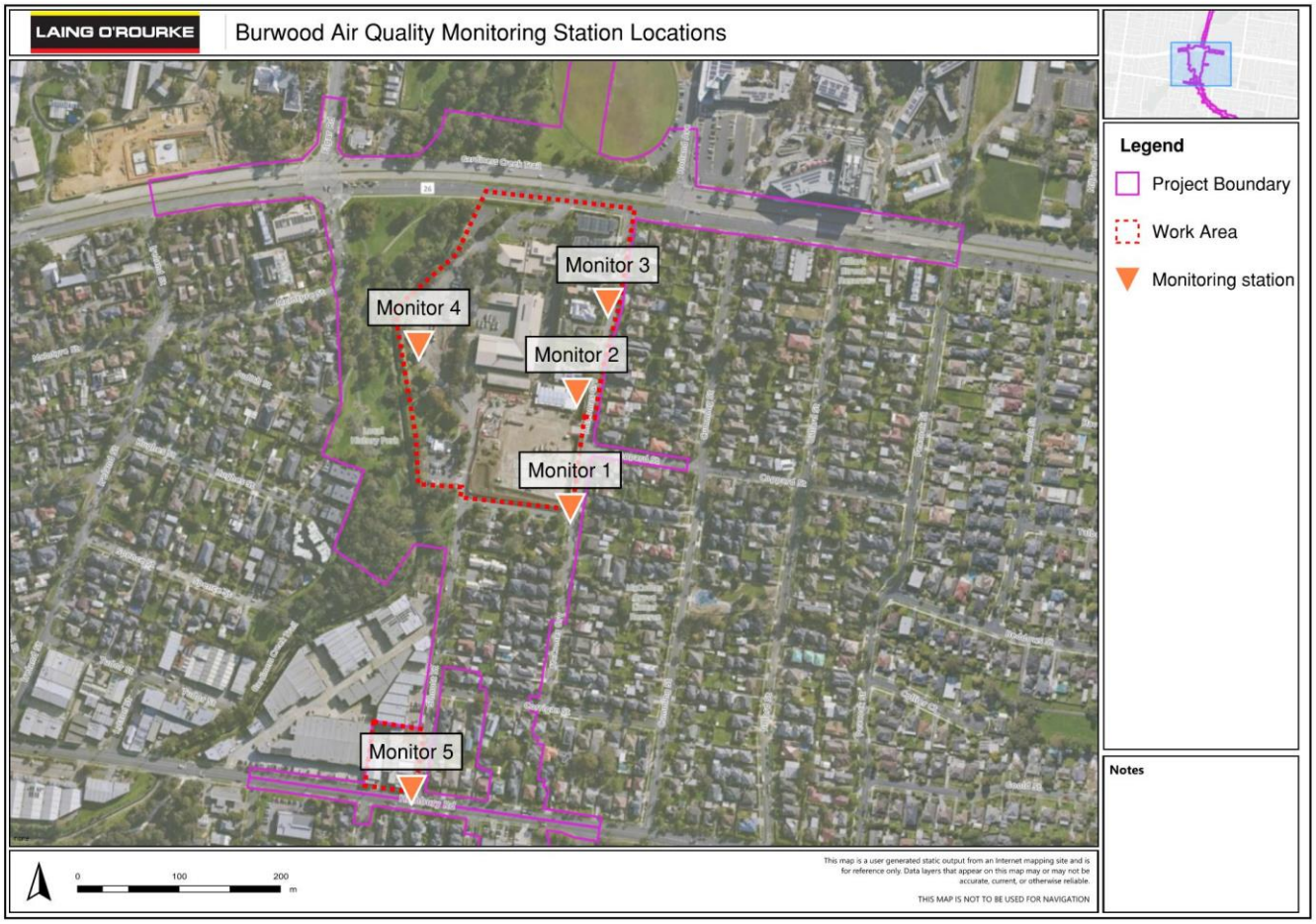

Figure 3: Burwood air quality monitoring stations.

Table 5: Burwood PM_{10} results.

Monitor Number	Monitoring Location	Max Daily PM_{10} Concentration ($\mu g/m^3$)	Median Daily PM_{10} Concentration ($\mu g/m^3$)	Days TARP Implemented in the Month
-	Representative Background - Alphington	32.5	19.0	-
1	Corner of McComas Grove and Sinnott Street	26.9	18.5	0
2	16 McComas Grove	23.9	16.9	
3	Site 4 - East	23.0	13.2	
4	Site 4 – West	26.0	17.2	
5	Site 1 – South	46.0	24.2	

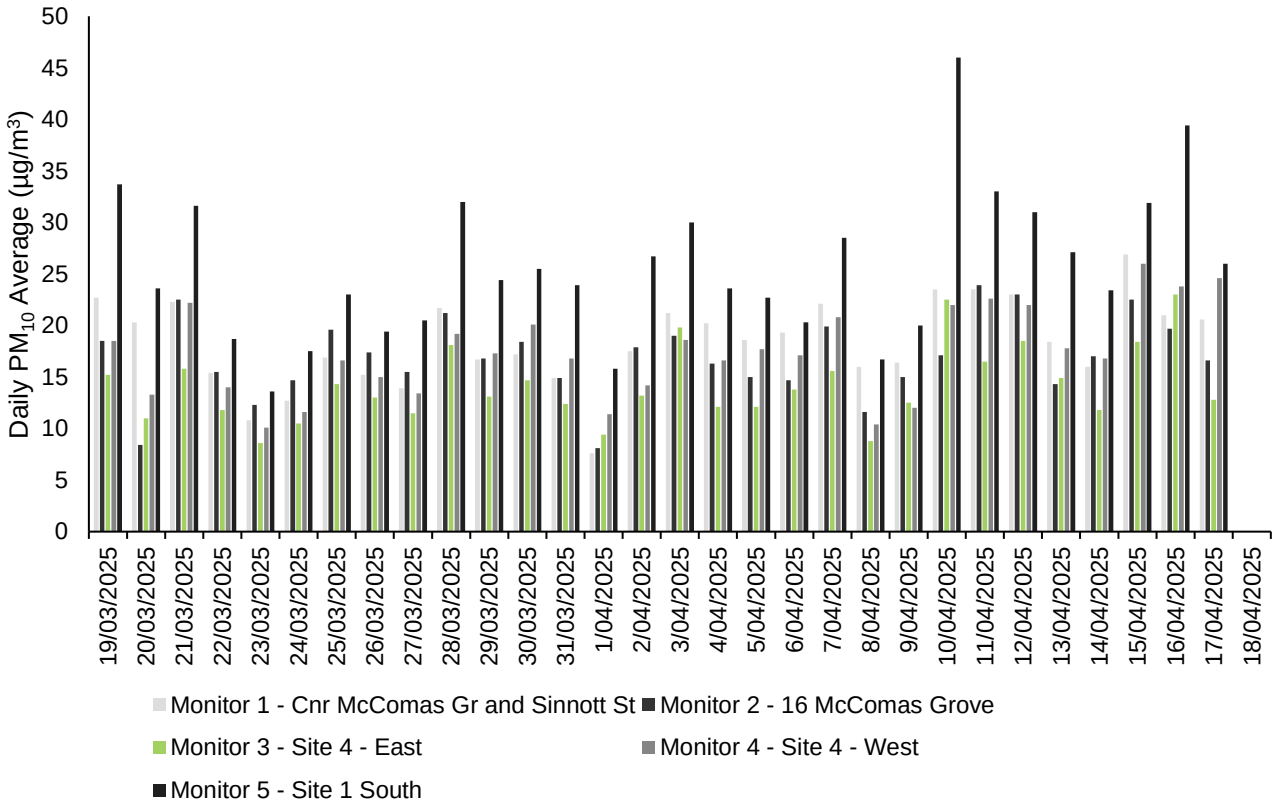

Figure 4: Burwood PM_{10} daily averages.

3.2.1. Analysis

The maximum daily average PM_{10} concentrations reported at the Burwood monitoring stations were 26.9 µg/m^3 (n = 30) at the corner of McComas Grove and Sinnott Street (Monitor 1), 23.9 µg/m^3 (n = 30) at 16 McComas Grove (Monitor 2), 23.0 µg/m^3 (n = 30) at Site 4 – East (Monitor 3), 26.0 µg/m^3 (n = 30) at Site 4 – West (Monitor 4), and 46.0 µg/m^3 (n = 30) at Site 1 South (Monitor 5).

The TARP was not implemented during the reporting period. Water carts and hoses were 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/m³)	Median Daily PM_{10} Concentration (µg/m³)	Days TARP Implemented in the Month
-	Representative Background - Alphington	32.5	19.0	-
1	Coleman Parade	34.4	21.9	12
2	Railway Parade	71.9	35.6	

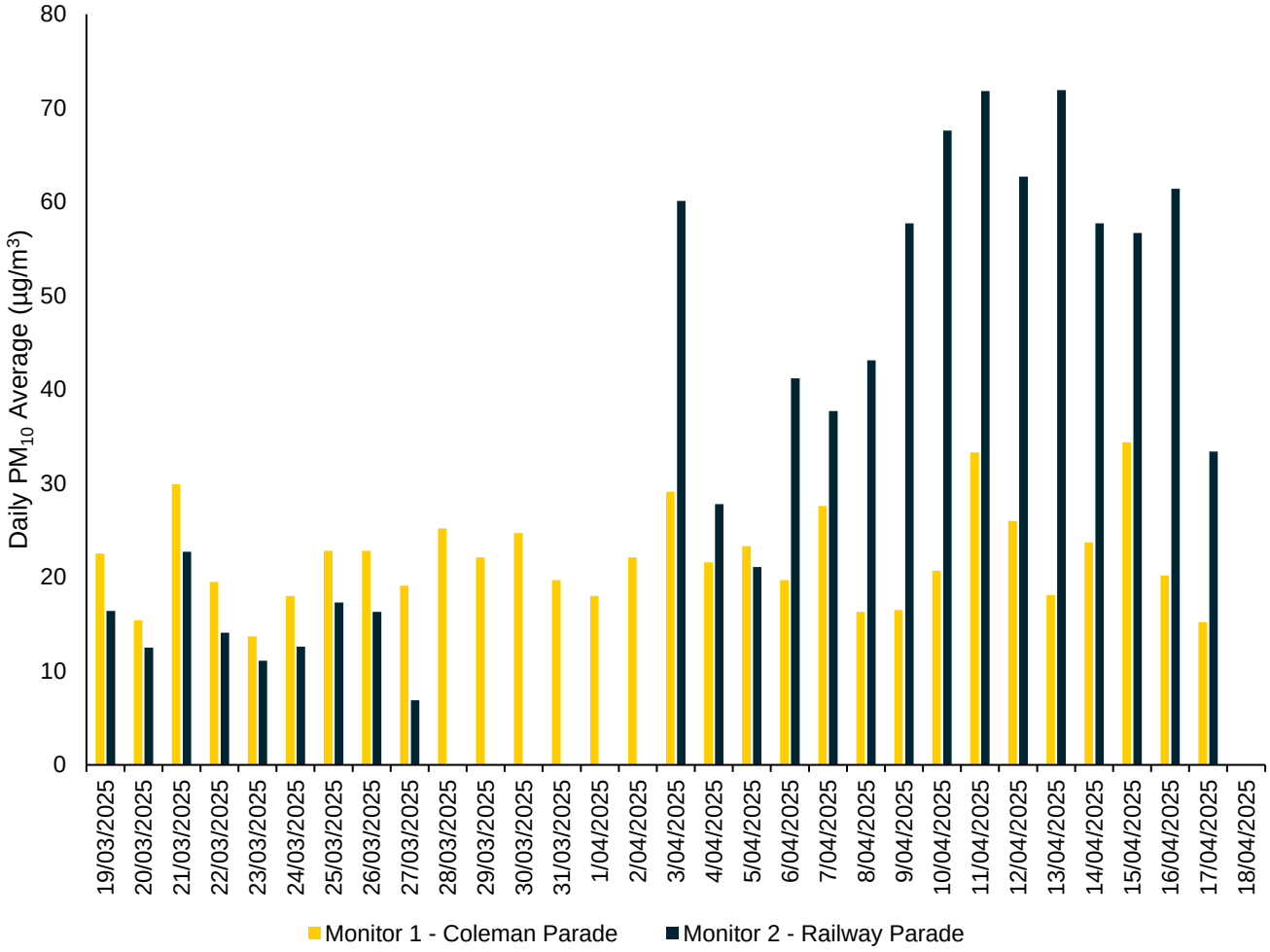

Figure 6: Glen Waverley PM_{10} daily averages.

3.3.1. Analysis

The maximum daily average PM_{10} concentrations were 34.4 µg/m^3 (n = 30), and 71.9 µg/m^3 (n = 24) at the monitoring locations at Coleman Parade (Monitor 1) and Railway Parade (Monitor 2), respectively.

Exceedance of the EPA air quality objective (50 µg/m^3 over a 24-hour period) was recorded for the dates of 3 April 2025, and from 9 to 14 April 2025 at the Railway Parade monitoring point. On these days, earthworks such as excavations and spoil haulage activities were undertaken close to the monitoring point resulting in elevated readings that are not representative of air quality levels experienced by receivers. The monitor was less than 3 metres from the activities causing high levels of dust at the monitor, the dust will dissipate as it travels and levels will reduce at receivers, in addition, no dust was observed leaving site during these activities when investigated. Due to site constraints and works underway at the time, Monitor 2 was positioned close to the extent of works.

On these dates, wind speeds were monitored and were generally moderate (max. gusts ranging between 20km/hr and 43 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 12 days during the reporting period. Regular dust suppression activities, including the use of water carts and hoses, were employed to control dust. 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, exposed soil stockpiles were routinely dampened during worktimes to prevent dust.

3.4. Monash

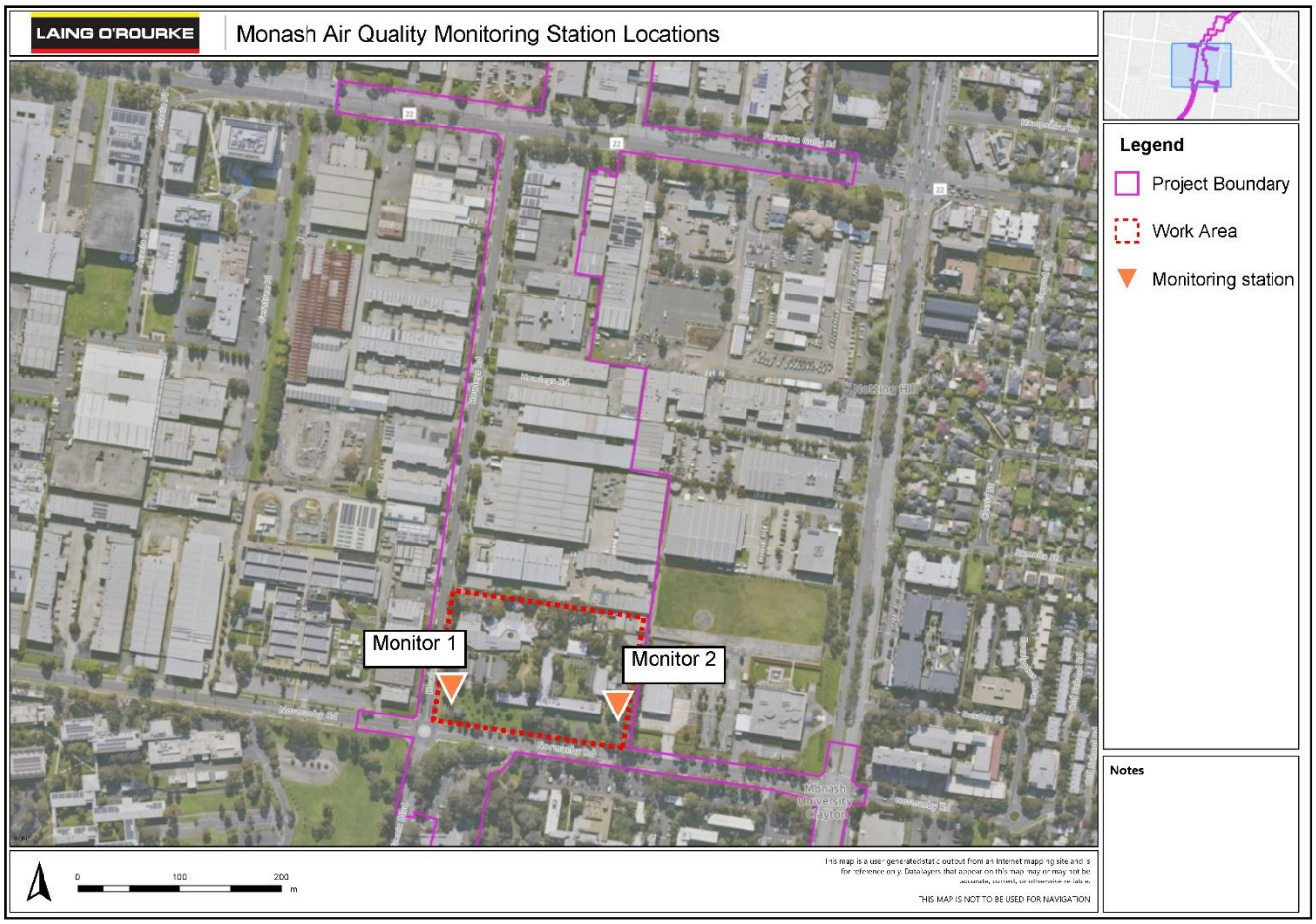

Figure 7: Monash air quality monitoring stations.

Table 7: Monash PM_{10} results.

Monitor Number	Monitoring Location	Max Daily PM_{10} Concentration (µg/m^3)	Median Daily PM_{10} Concentration (µg/m^3)	Days TARP Implemented in the Month
-	Representative Background - Alphington	32.5	19.0	-
1	Normanby House - West	39.5	23.1	12
2	Normanby House - East	42.5	27.3	

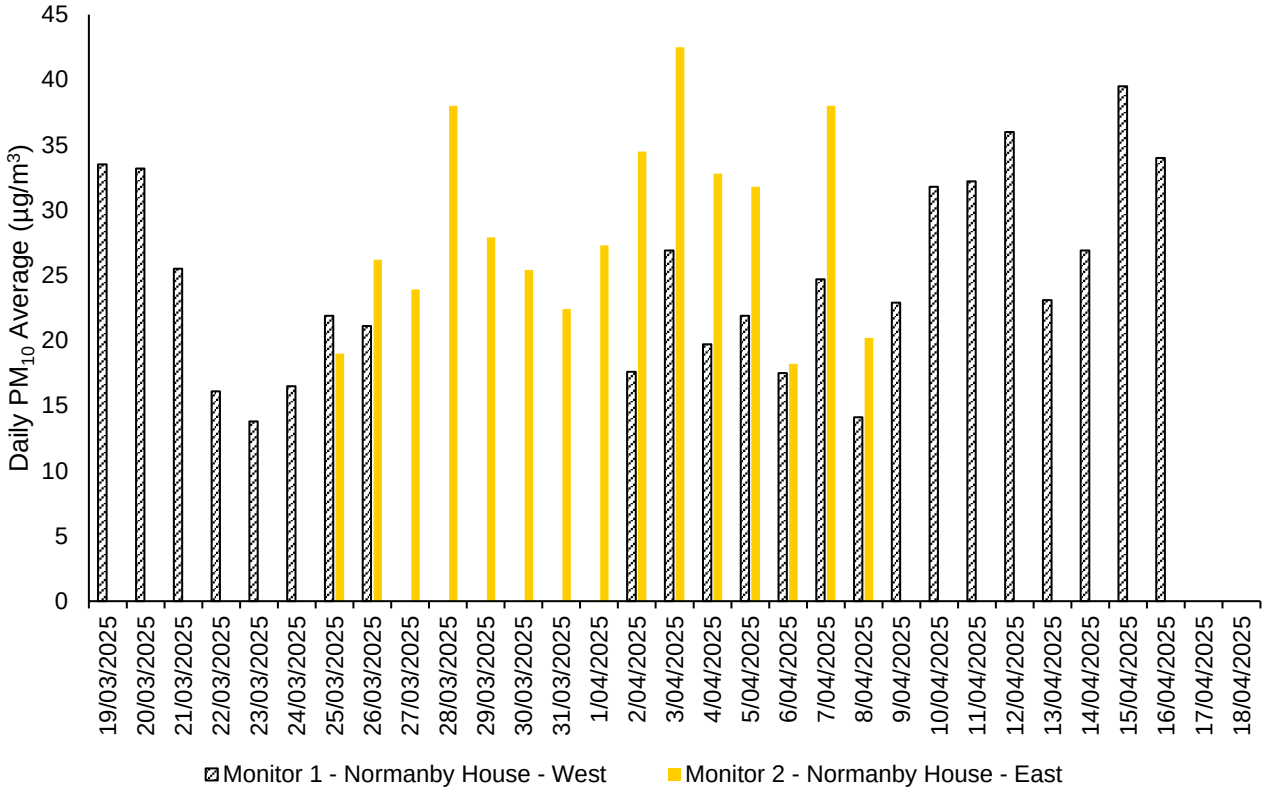

Figure 8: Monash PM_{10} daily averages.

3.4.1. Analysis

The maximum daily average PM_{10} concentrations was 39.5 µg/m3 (n = 23) at the Normanby House – West (Monitor 1), and 42.5 µg/m3 (n = 15) at the Normanby House – East (Monitor 2) monitoring locations, respectively.

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

3.5. Clayton

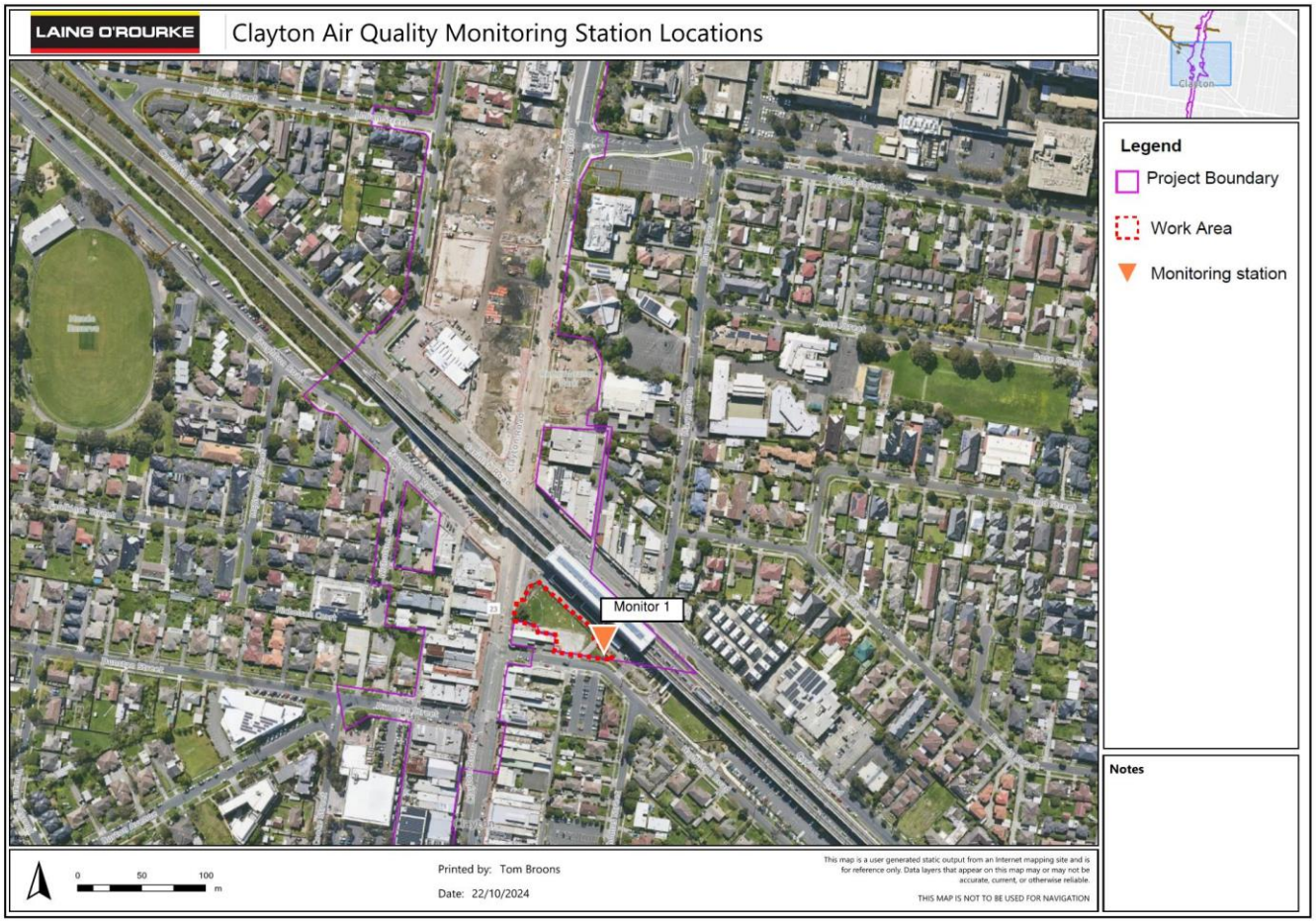

Figure 9: Clayton air quality monitoring stations.

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	32.5	19.0	-
1	Clayton Community Space - Site 2	31.9	24.4	3

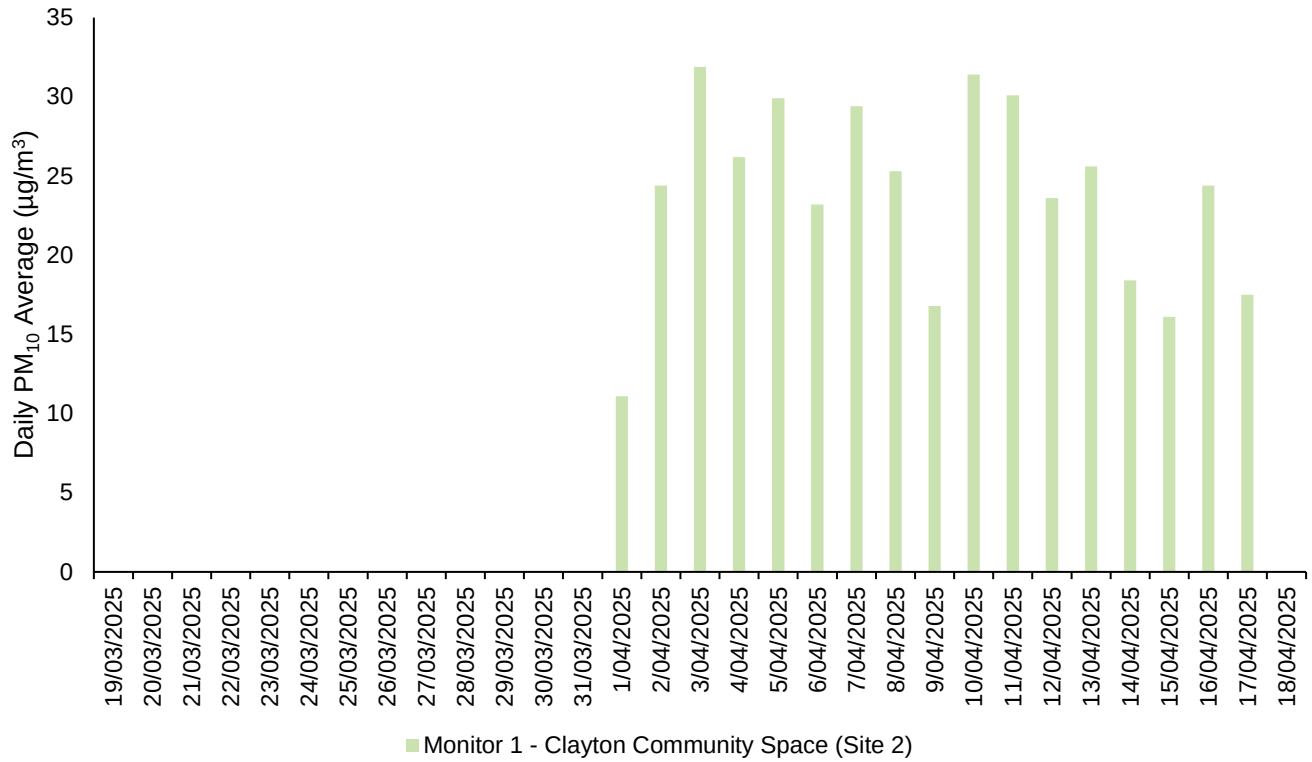

Figure 10: Clayton PM_{10} daily averages.

3.5.1. Analysis

The maximum daily average PM_{10} concentration was 31.9 µg/m^3 (n = 17) at the Clayton Community Space Site 2 (Monitor 1) monitoring locations.

The TARP was implemented on three days during the reporting period. Landscaping 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

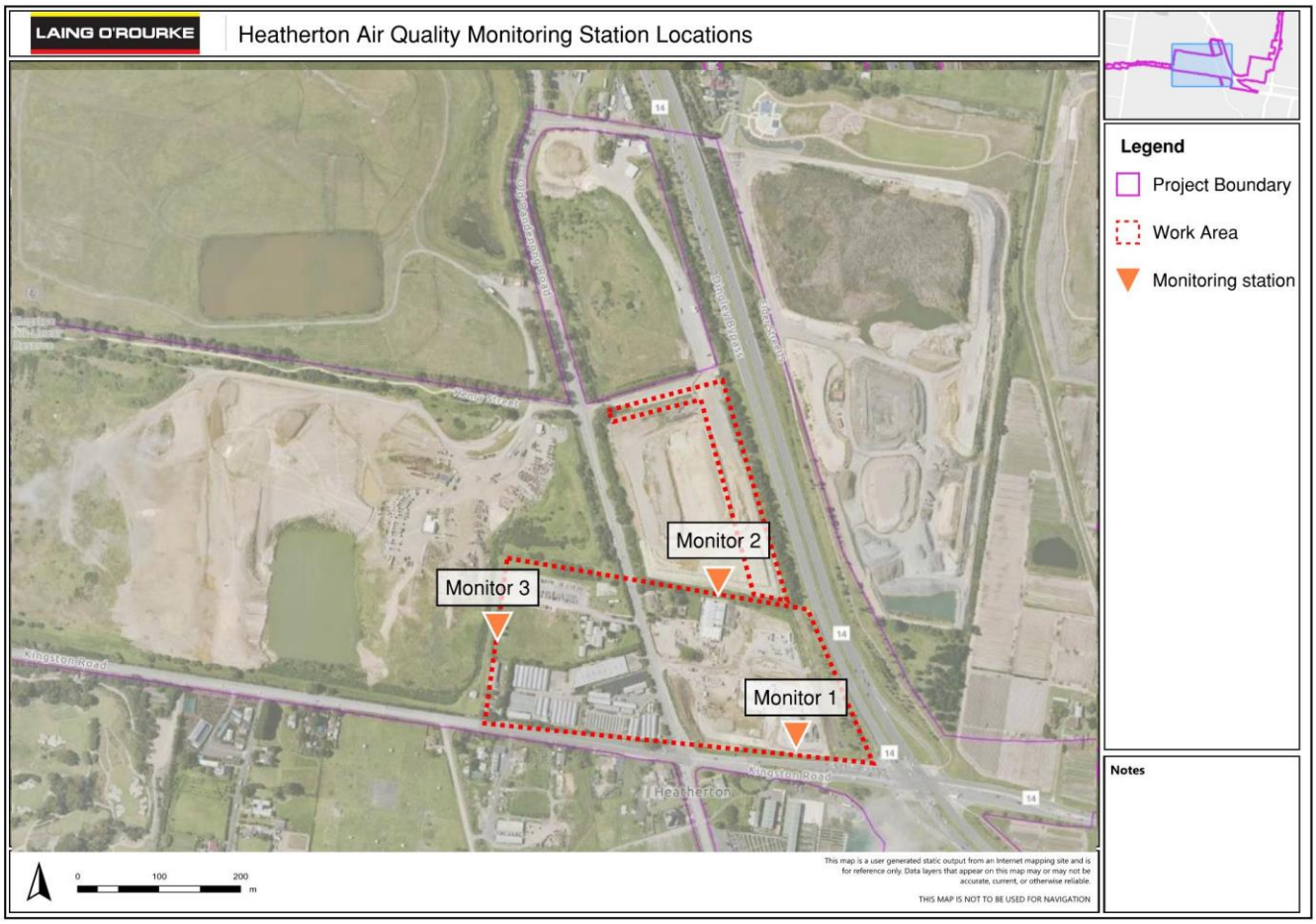

Figure 11: Heatherton air quality monitoring stations.

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	35.0	22.1	-
1	SSY - South	119.5	40.7	8
2	Site Office	42.2	20.5	
3	SS17	77.9	35.8	

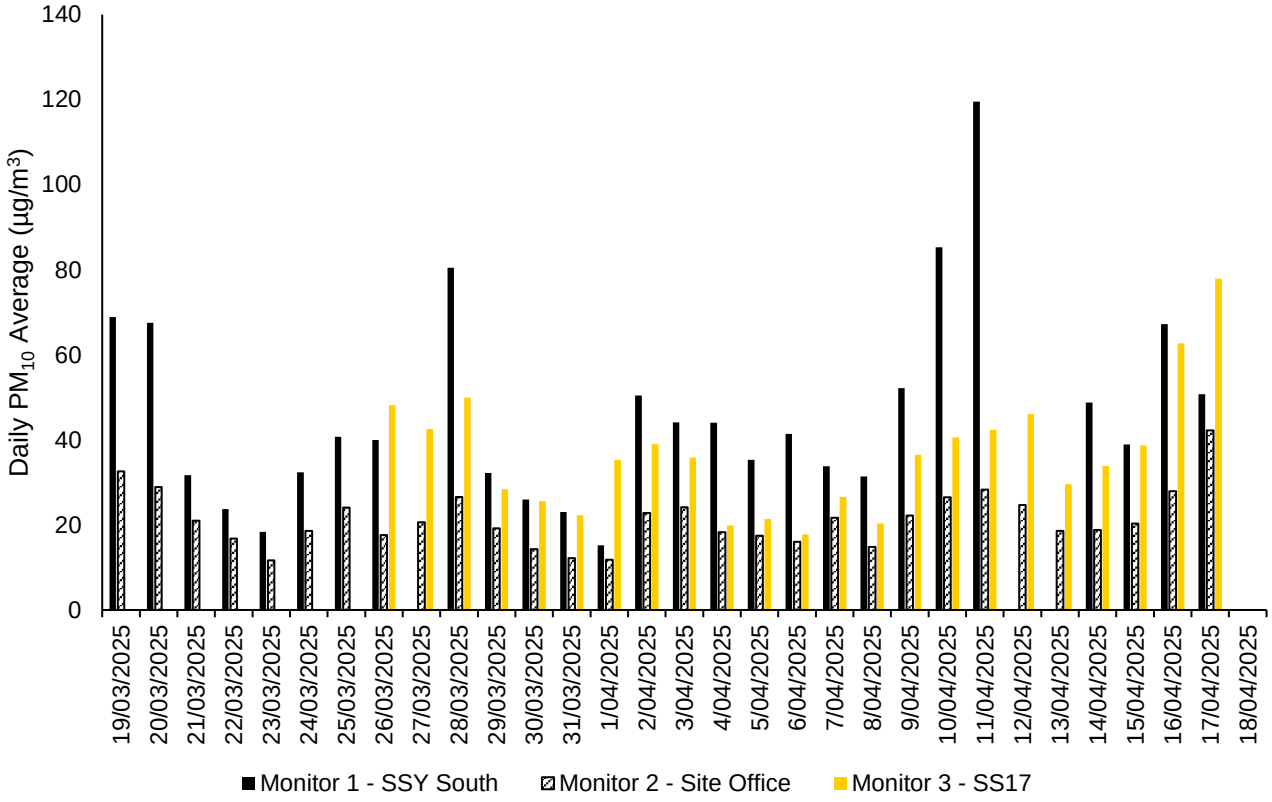

Figure 12: Heatherton PM_{10} daily averages.

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 the Eastern Portal TAS and the safe removal of hazardous materials.

The maximum daily average PM_{10} concentrations were 119.5 µg/m^3 (n =27), 42.2 µg/m^3 (n = 30), and 77.9 µg/m^3 (n = 23) at SSY South (Monitor 1), Site Office (Monitor 2), and SS17 (Monitor 3) respectively. The daily average spike of 119.5µg/m^3 is attributed to the battery going flat on the night of 11 April. This caused the daily average to be captured from only two hours of activity, where an exceedance occurred. The TARP was implemented on eight days during the reporting period, not inclusive of 11 April. Proactive controls were implemented such as water cart operation, soil binders on disused stockpiles and trucks with covered loads. Polymer was also sprayed on unsealed surfaces prior to the Easter break. The area was visually inspected throughout the day, and at no point was dust seen within the worksite boundary or leaving the site.

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/m³)	Median Daily PM_{10} Concentration (µg/m³)	Days TARP Implemented in the Month
-	Representative Background – Alphington	32.5	19.0	-
1	CTM Compound	33.1	17.4	0

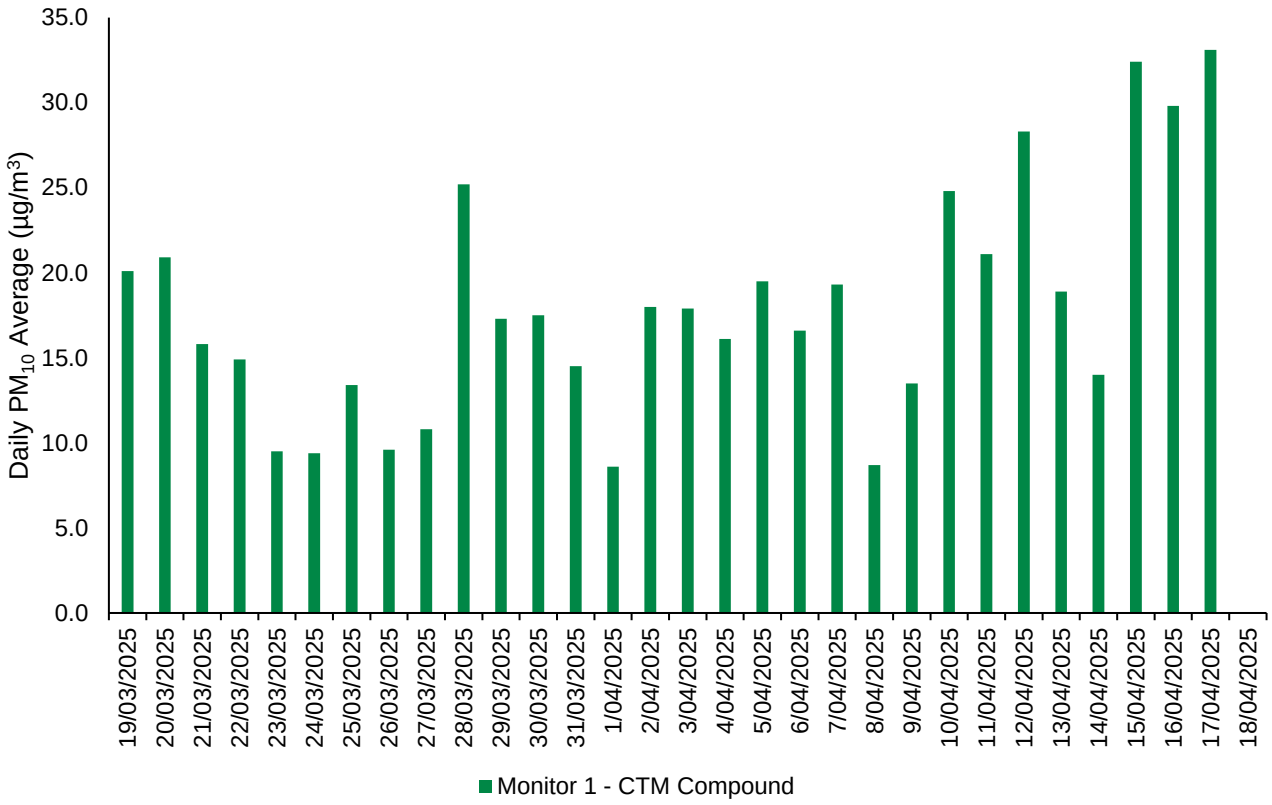

Figure 14: Heatherton PM_{10} daily averages.

3.7.1. Analysis

The maximum daily average PM_{10} concentrations was 33.1 µg/m^3 (n = 29) 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 March 2025 – 18 April 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	13.5	23.6	-	31.2	71.3
Lowest	7.4	17.7	S	15.0	37.0
Highest	18.1	32.5	N	54.0	98.0

Table 12: Daily weather observations for Melbourne (Moorabbin), Victoria 19 March 2025 – 18 April 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	12.6	23.7	-	37.6	71.6
Lowest	6.8	17.6	S	19.0	35.0
Highest	17.3	32.7	NNW	69.0	97.0

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

Statistic	Rain data Olympic Park (mm)	Rain data Moorabbin (mm)
Daily Low	0.0	0.0
Daily High	11.8	17.8
Total	15.0	20.6

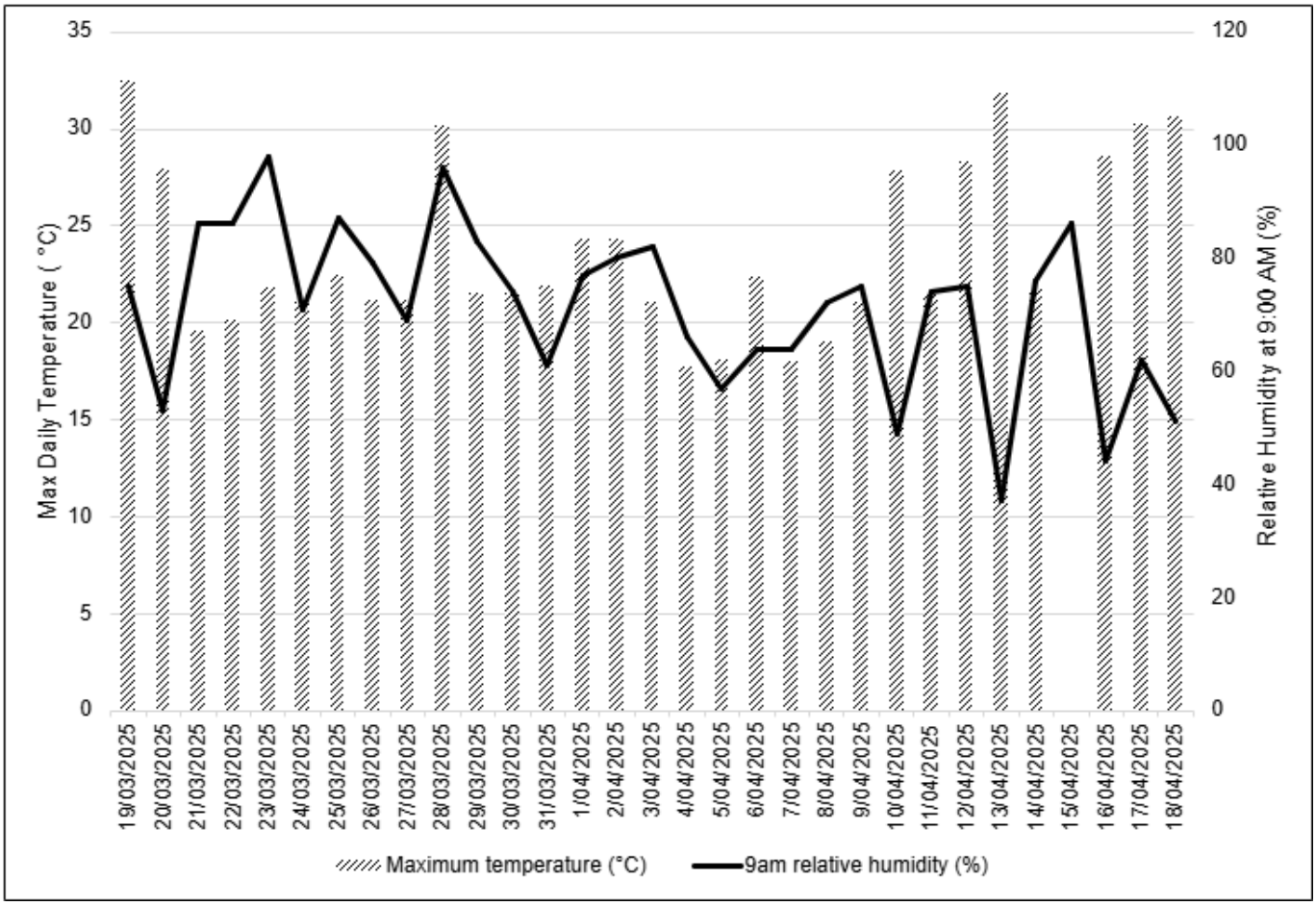

Figure 15: Daily relative humidity and temperature observations for Melbourne (Olympic Park), Victoria 19 March 2025 –18 April 2025. Data Source BOM.

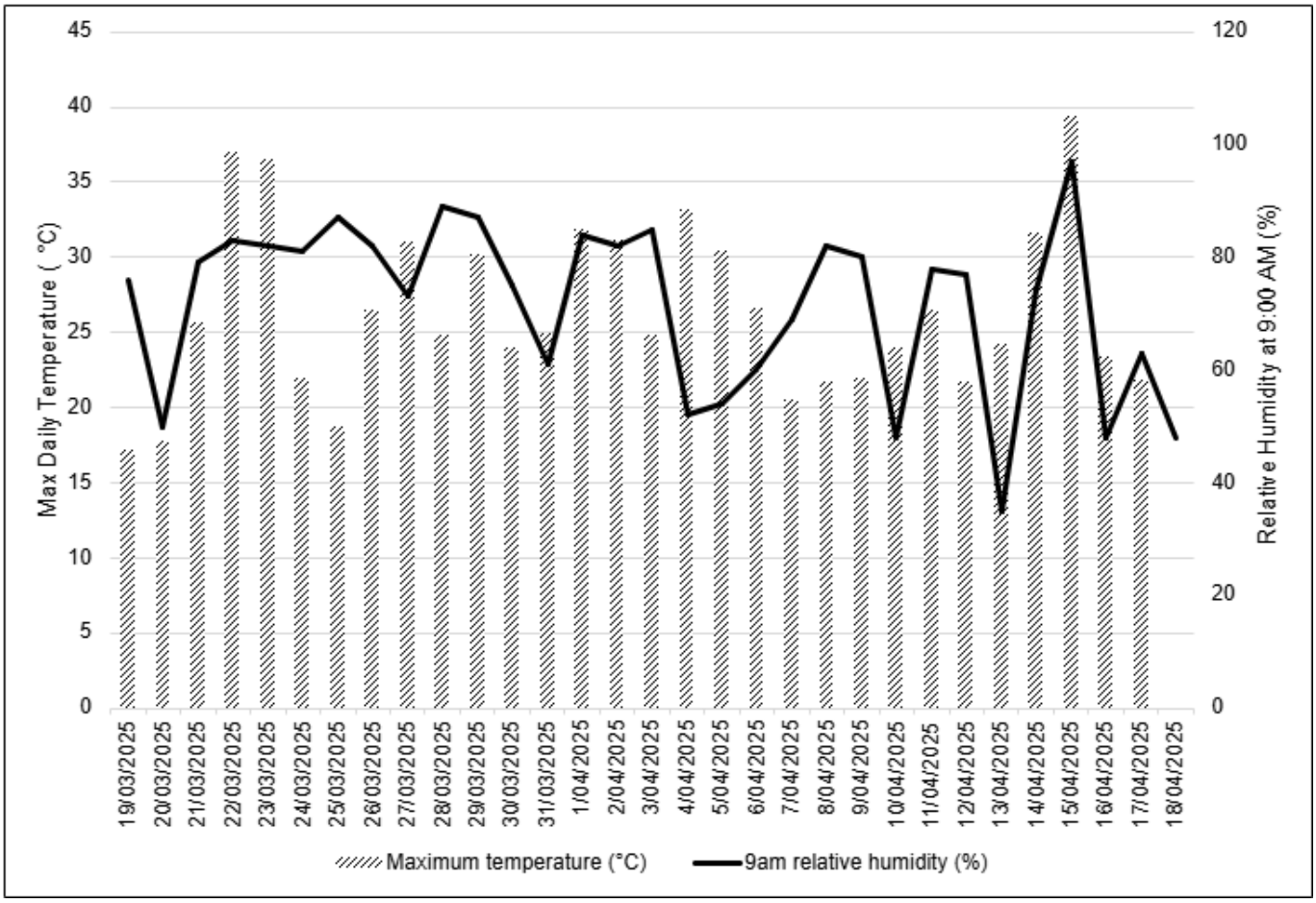

Figure 16: Daily relative humidity and temperature observations for Melbourne (Moorabbin), Victoria 19 March 2025 –18 April 2025. Data Source BOM.

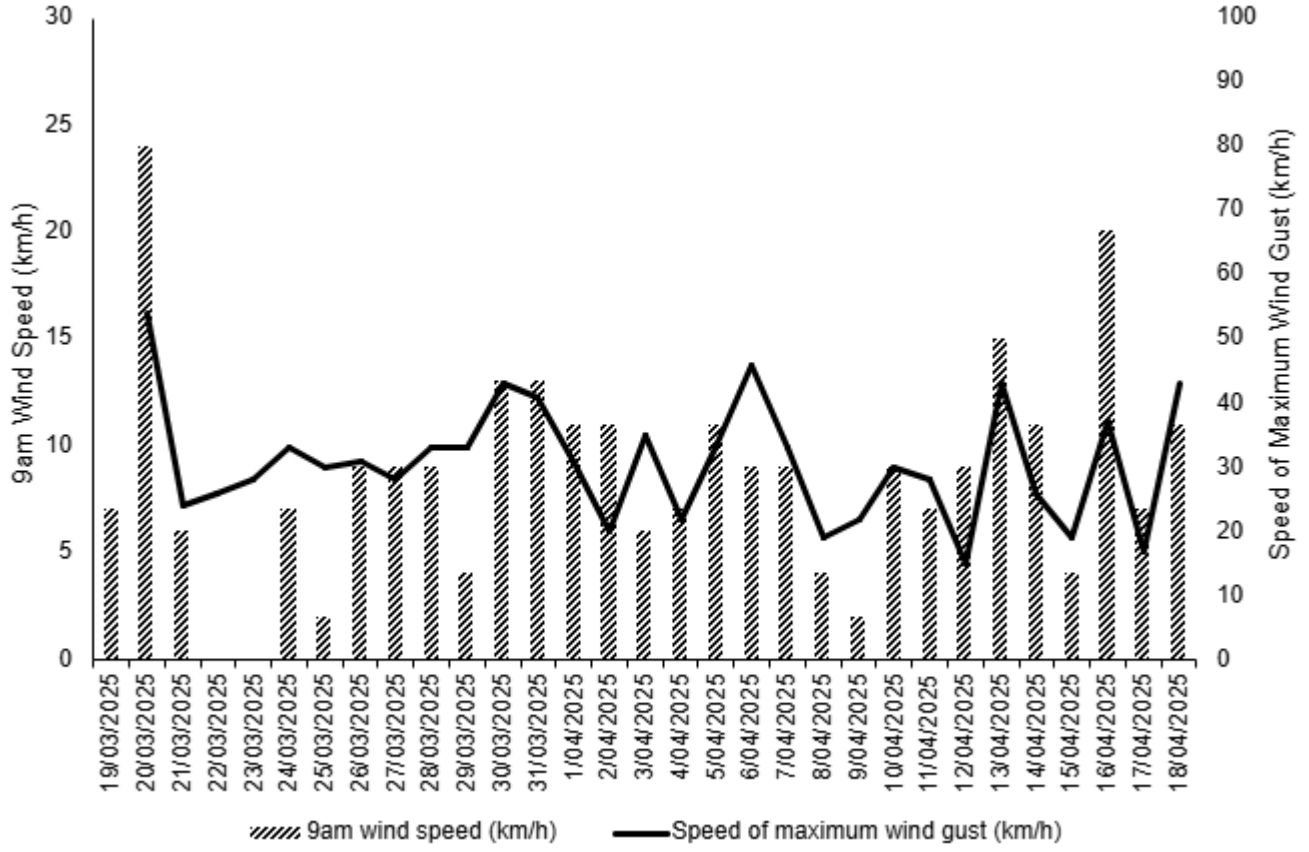

Figure 17: Daily wind speed observations for Melbourne (Olympic Park), Victoria 19 March 2025 –18 April 2025. Data Source BOM.

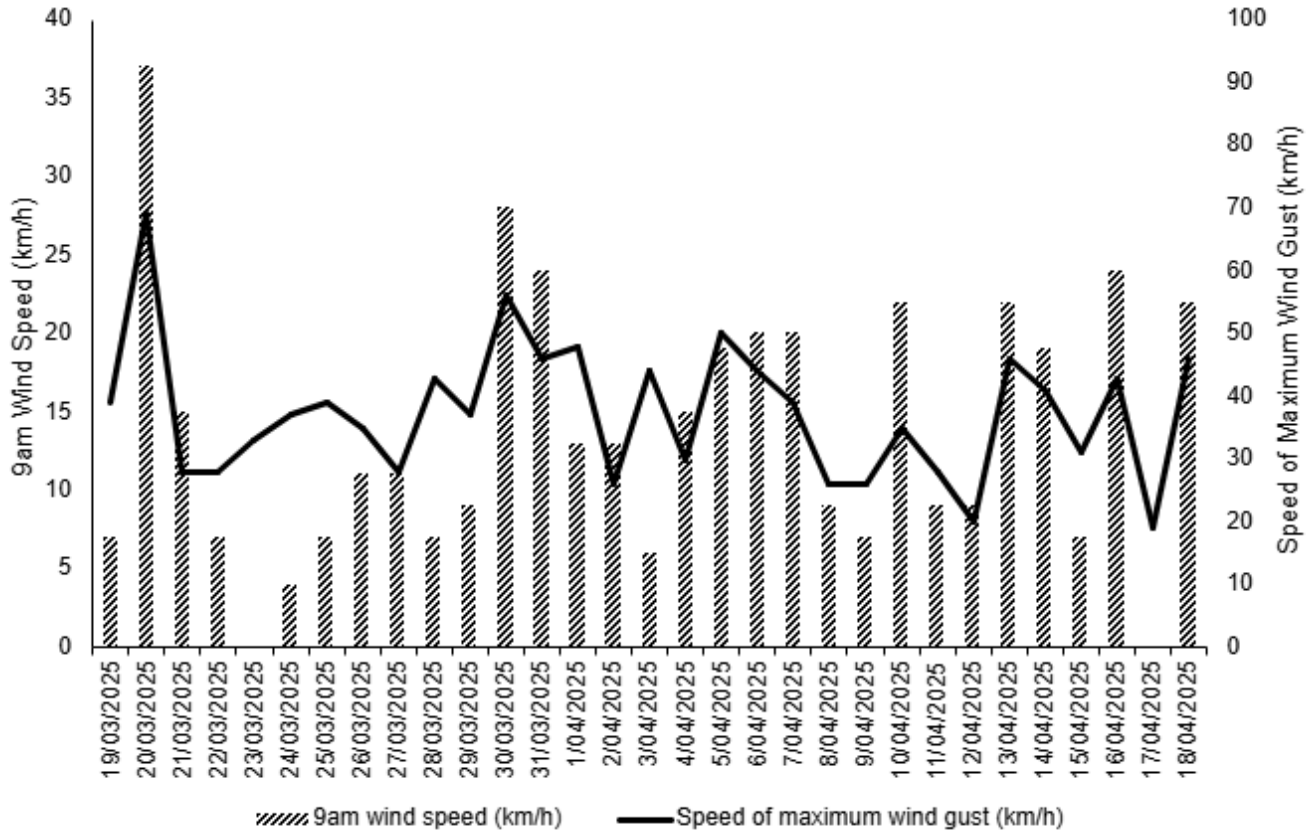

Figure 18: Daily wind speed observations for Melbourne (Moorabbin), Victoria 19 March 2025 –18 April 2025. Data Source BOM.

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 March 2025 to 18 April 2025 are shown in Table 14. Due to the Easter shutdown period, no works were occurring on 18 April 2025.

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 between 22 March 2025 and 1 April 2025 was due to battery charging issues. The gap in reporting data for Monitor 3 between 13 April and 17 April 2025 was due to technical difficulties with the attached solar panel. A replacement will be installed on return from the Easter break.
- At Glen Waverley, that gap in reporting data at Monitor 2 between 28 March 2025 and 2 April 2025 was due to charging issues with the SiteHive device. A replacement battery was installed on 3 April 2025.
- At Monash, the gap in data at Monitor 2 was due to battery charging issues between 19 March 2025 to 24 March 2025 and 9 April 2025 to 16 April 2025. Monitor 1 gap was due to battery issues on the 15 April 2025. This is due to the solar panel only charging periodically resulting in the battery dying. Both monitors were decommissioned on the 16 April 2025 for the site shutdown period.
- At Clayton, from 19 March 2025 the Monitor 1 battery was having issues with the solar panel which resulted in needing the manually charge the battery once it died until the 31 March 2025. The device was then decommissioned for the site shutdown on 17 April 2025.
- At Heatherton, gaps in data of Monitor 1 were due to a technical difficulty with the battery not charging with the solar panel which resulted in needing to manually charge the battery once it died.
- At Heatherton, Monitor 3 was installed on 26 March 2025, therefore there is no data from 19 March 2025 to 25 March 2025
- All monitors were placed in storage from 17 April 2025 for the Easter break, causing no data to be available after that date.
- 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	18	30	60%
Box Hill – Uniting AgeWell	PM_{10}	24-hours	29	30	97%
Box Hill – Irving Avenue	PM_{10}	24-hours	24	30	80%
Burwood – Corner of McComas Grove and Sinnott Street	PM_{10}	24-hours	30	30	100%
Burwood – 16 McComas Grove	PM_{10}	24-hours	30	30	100%
Burwood – Site 4 - West	PM_{10}	24-hours	30	30	100%
Burwood – Site 4 - East	PM_{10}	24-hours	30	30	100%
Burwood – Site 1 - South	PM_{10}	24-hours	30	30	100%
Glen Waverley – Coleman Parade	PM_{10}	24-hours	29	30	97%
Glen Waverley – Railway Parade	PM_{10}	24-hours	23	30	77%
Monash – Normanby House - West	PM_{10}	24-hours	21	28	75%
Monash – Normanby House - East	PM_{10}	24-hours	15	28	54%
Clayton – Clayton Community Space Site 2	PM_{10}	24-hours	26	29	90%
Heatherton – SSY – South	PM_{10}	24-hours	27	30	90%
Heatherton – SSY – Site Office	PM_{10}	24-hours	30	30	100%

Location	Parameter	Averaging Period	Collected Periods	Available Periods	Data Capture
Heatherton – SSY - SS17	PM_{10}	24-hours	23	23	100%
Cheltenham – CTM Compound	PM_{10}	24-hours	30	30	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 2	HEX-000329	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
Heatherton – SSY - SS17	HEX-000499	5 March 2025	5 March 2027
Cheltenham – CTM Compound	HEX-000794	18 Dec 2024	18 Dec 2026

Suburban Rail Loop East Tunnels South

Air Quality Monitoring Report

19 March 2025 to 18 April 2025

Document Information

Document Details	
Document Number	SRL-WPC-SCC-SPKW-REP-XEV-PWD-000007
Revision Date	9-May-2025
Revision Number	C

Revision Control

Revision Number	Change Detail	Date	Comment
A	Draft issued to SRLA	28/04/2025	Issued For Review
B	Draft issued to SRLA	8/05/2025	Issued For Review
C	Draft issued to SRLA	9/05/2025	Issued For Review

Contents

Tables

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Executive Summary

Key Outcomes

Key outcomes arising from the monthly air quality monitoring program:

- Works took place at:
  - Train Stabling Facility West
  - Clarinda CC01
  - Clarinda Tunnel Access Structure Site
  - Clayton
- 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 not triggered 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 March 2025 to 18 April 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:

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

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

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

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	34.4	25.1	N/A
Suburban Connect Monitoring Locations					
Train Stabling Facility West – West	PM_{10}	24-hour	38.9	26.3	0
Train Stabling Facility West – South-West	PM_{10}	24-hour	59.5	31.7	0
Train Stabling Facility West – South	PM_{10}	24-hour	55.1	30.1	0
Clarinda CC01	PM_{10}	24-hour	45.5	24.5	0
Clarinda TAS - South Boundary	PM_{10}	24-Hour	84.4	42.1	0
Clarinda Tunnel Access Structure Site –-East	PM_{10}	24-hour	73.2	44.6	0
Clarinda Tunnel Access Structure Site - North	PM_{10}	24-hour	76.8	41.6	0
Clayton Site – West	PM_{10}	24-hour	41.0	24.5	0
Clayton Site – South	PM_{10}	24-hour	55.7	30.4	0

Location	Parameter	Averaging Period	Max Concentration (µg/m^3)	Median Concentration (µg/m^3)	Days TARP Actions Implemented in the Month
Clayton Site – East	PM_{10}	24-hour	47.5	25.4	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
Train Stabling Facility – West	3 Feb 2025	Latitude: -37.9539 Longitude: 145.0886	PM_{10}	Dandenong EPA monitoring station
Train Stabling Facility – South-West Point	4 April 2025	Latitude: -37.9545 Longitude: 145.0887	PM_{10}	Dandenong EPA monitoring station
Train Stabling Facility – South	3 Feb 2025	Latitude: -37.95466 Longitude: 145.0904	PM_{10}	Dandenong EPA monitoring station
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 Boundary	21 Feb 2025	Latitude: -37.95695° Longitude: 145.1093°	PM_{10}	Dandenong EPA monitoring station
Clarinda Tunnel Access Structure Site – East Boundary	3 Dec 2024	Latitude: -37.95700° Longitude: 145.11020°	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
Clayton Site - West	3 Dec 2024	Longitude: -37.92149° Latitude: 145.11933°	PM_{10}	Dandenong EPA monitoring station
Clayton Site - South	5 Mar 2025	Latitude: -37.92389° Longitude: 145.1192°	PM_{10}	Dandenong EPA monitoring station
Clayton Site - East	3 Dec 2024	Latitude: -37.92241° Longitude: 145.12012°	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

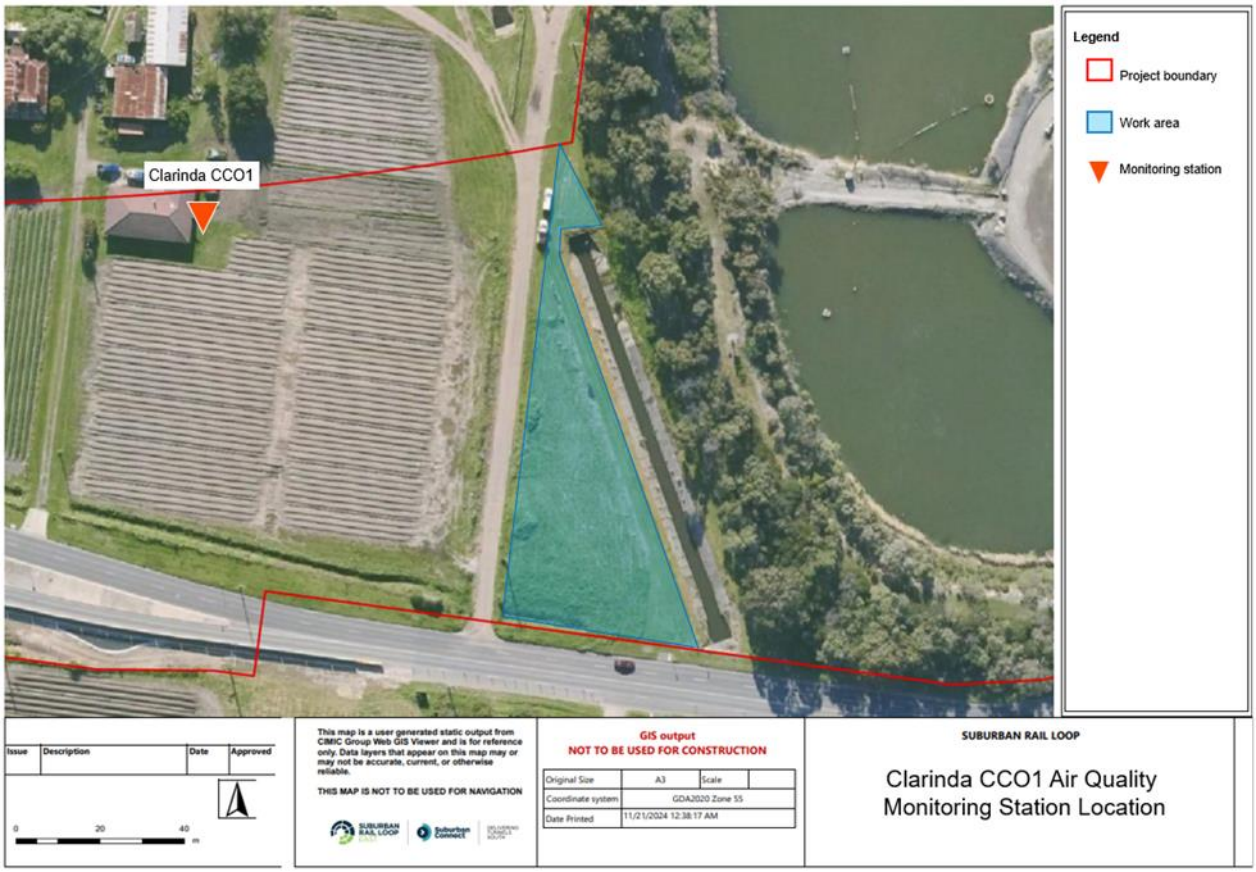

Figure 1: Clarinda CC01 air quality monitoring station.

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	34.4	25.1	-
1	Clarinda CC01 – nearest residential property	45.5	24.5	0

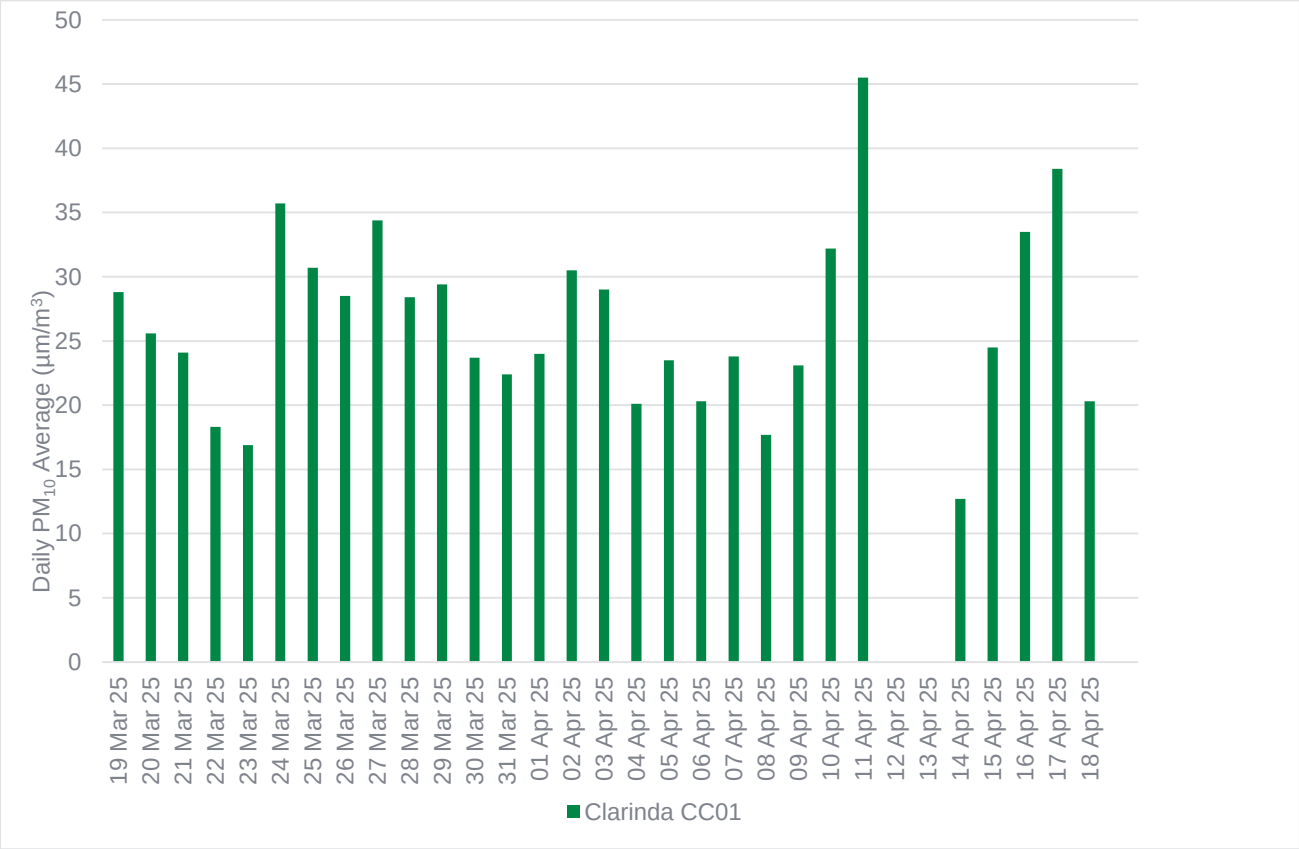

Figure 2: Daily Averages PM_{10} Results at Clarinda CC01

3.1.1 Analysis

Water carts were used proactively on site when works were occurring. The existing mitigation measures were sufficient to manage dust onsite, there were no elevated PM_{10} events and the TARP was not implemented during the reporting period.

There were two days, Saturday 12 April and Sunday 13 April, where daily PM_{10} data was not recorded by air quality monitoring equipment at CC01. The equipment was inspected and required minor maintenance; monitoring was reinstated on Monday 14 April.

3.2 Clarinda Tunnel Access Structure Site

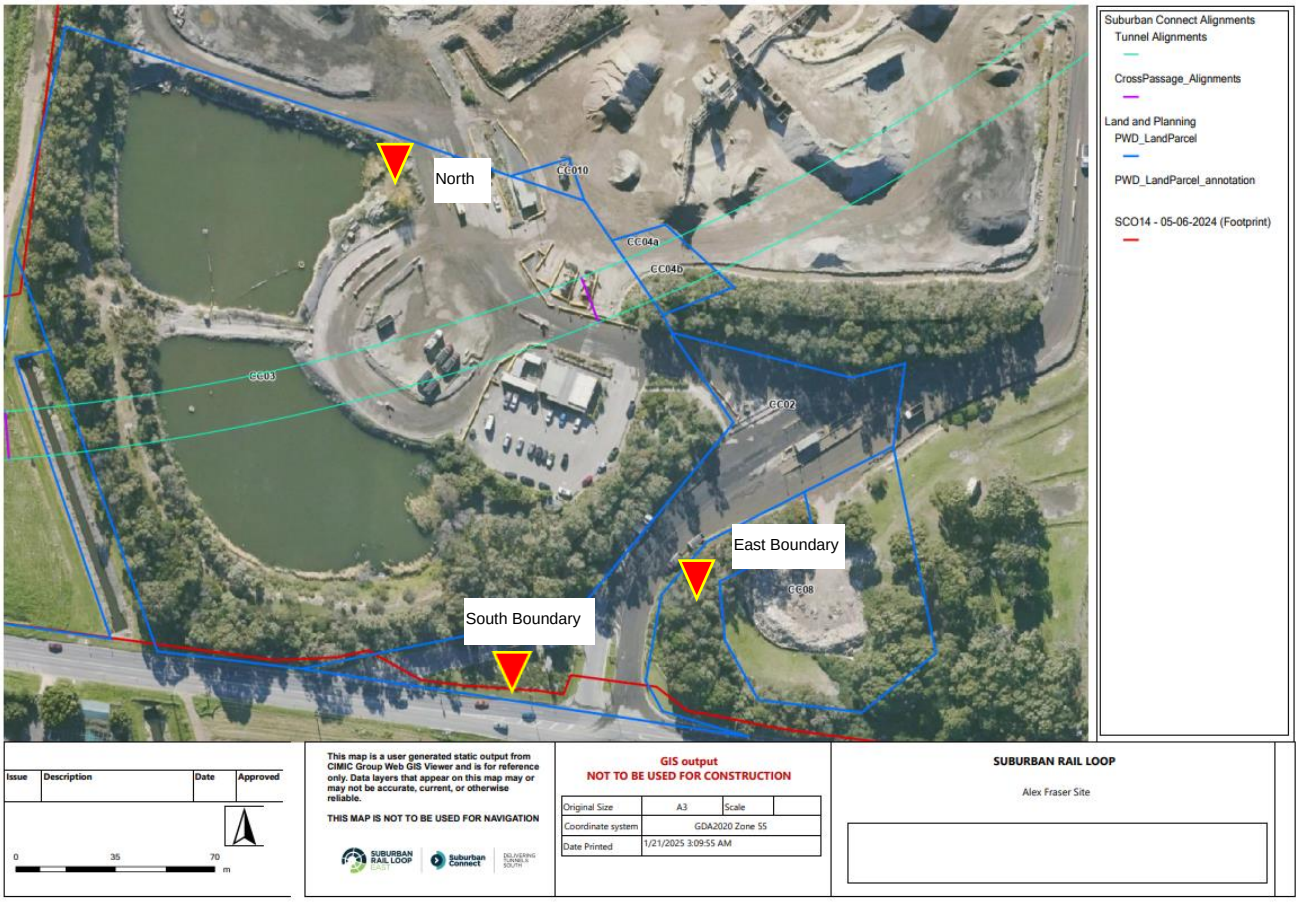

Figure 3: Clarinda Tunnel Access Structure Site air quality monitoring station.

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	34.4	25.1	-
1	Clarinda - Tunnel Access Structure Site – North	76.8	41.6	0
2	Clarinda - Tunnel Access Structure Site – East Boundary	73.2	44.6	0
3	Clarinda – Tunnel Access Structure Site – South Boundary	84.4	42.1	0

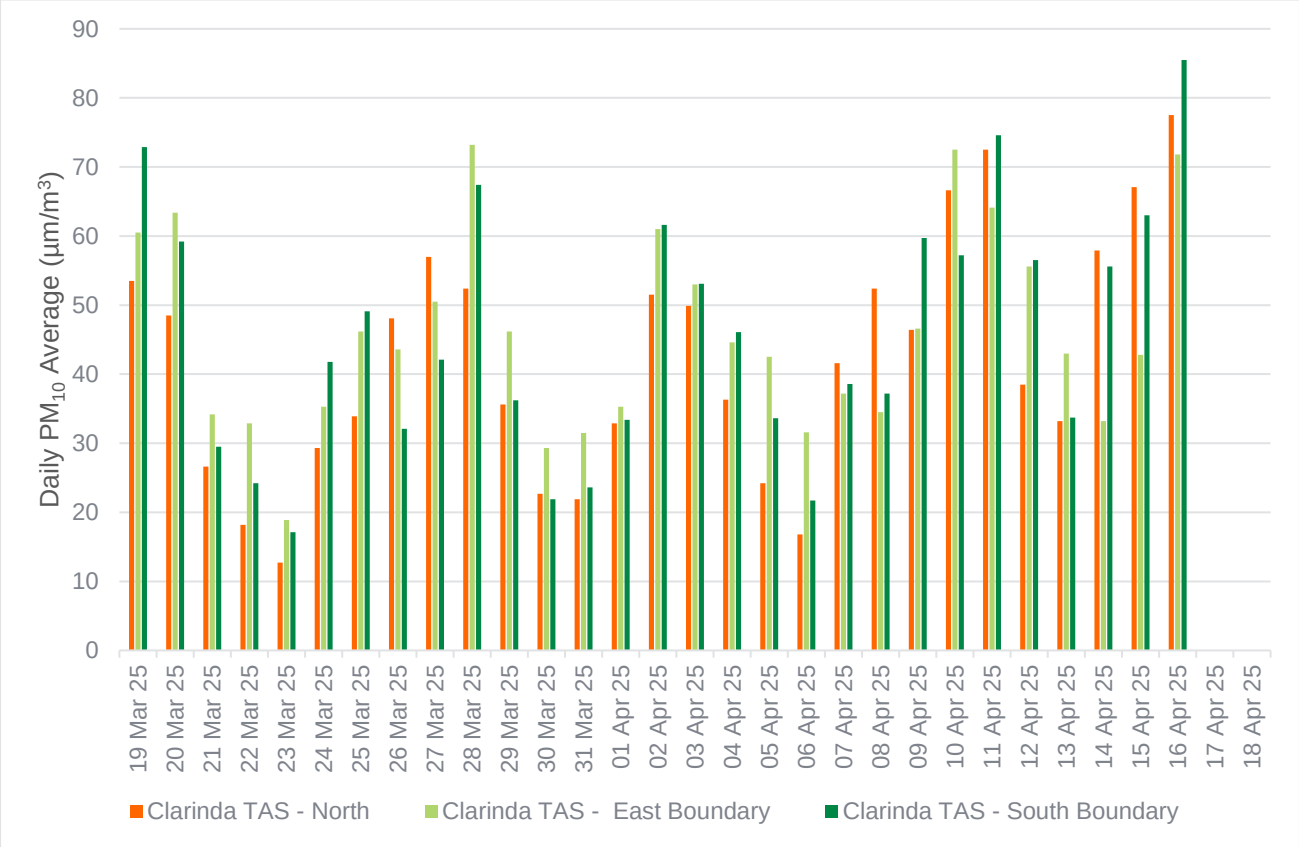

Figure 4: Daily Averages PM10 Results at Clarinda Tunnel Access Structure Site

3.2.1 Analysis

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 has been operating. There were twelve (12) elevated PM_{10} events recorded during the reporting period, all were attributed to external sources therefore there were no additional TARP actions required. All elevated PM_{10} events were investigated and confirmed to be unrelated to project construction activities. Elevated PM_{10} readings were attributed to dust migration across the site from external sources, particularly on days with a northerly wind.

Visual air inspections were also undertaken to proactively monitor and confirm there were no off site dust impacts due to construction activities 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	34.4	25.1	-
1	Clayton Site – East	47.5	25.4	0
2	Clayton Site – West	41.0	24.5	0
3	Clayton Site – South	55.7	30.4	0

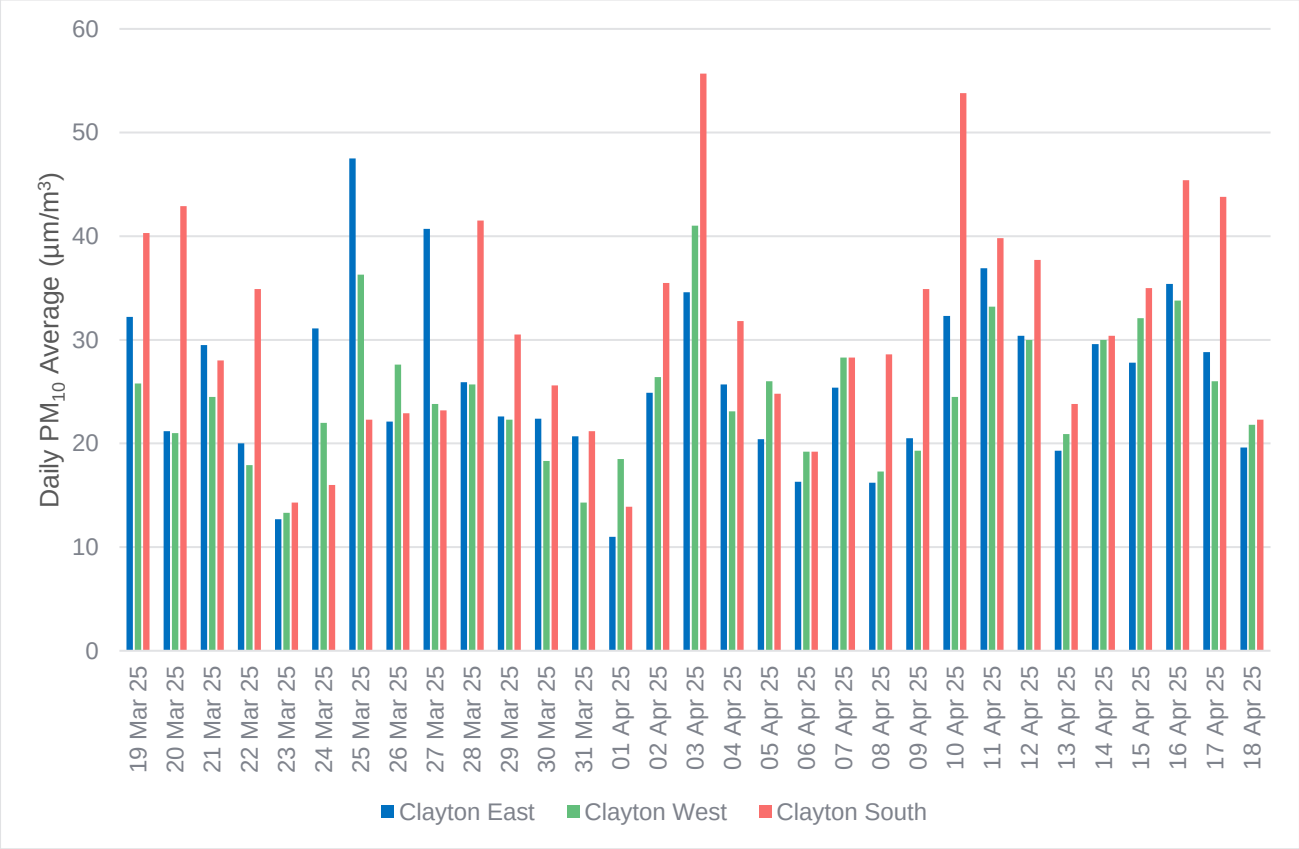

Figure 6: Daily Averages PM_{10} Results at Clayton

3.3.1 Analysis

The elevated PM_{10} readings recorded at Clayton were attributed to equipment operating in very close proximity to the air quality monitor. The readings recorded were confirmed via visual inspection as to be not representative of overall air quality, and there was no evidence that dust generated by these activities was migrating off site.

Water carts and street sweepers were used proactively on site and no additional TARP actions were required.

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

3.4 Train Stabling Facility West

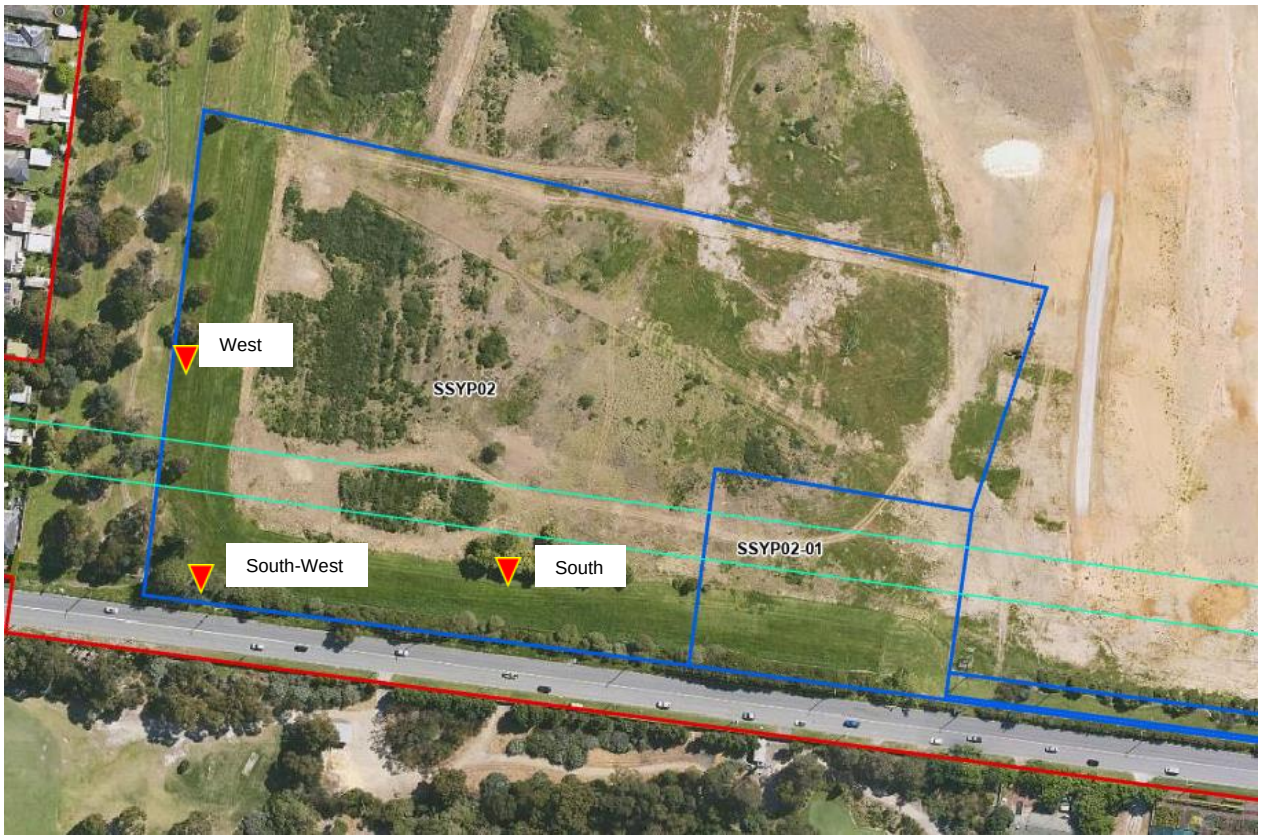

Figure 7: Train Stabling Facility West site air quality monitoring station

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

Monitor Number	Monitoring Location	Max Daily PM_{10} Concentration (µg/m^3)	Median Daily PM_{10} Concentration (µg/m^3)	Days TARP Implemented in the Month
-	Representative Background – Dandenong	34.4	25.1	-
1	South-West (4 – 18/04)	59.5	31.7	0
2	South	55.1	30.1	0
3	West (19/03 – 4/04)	38.9	26.3	0

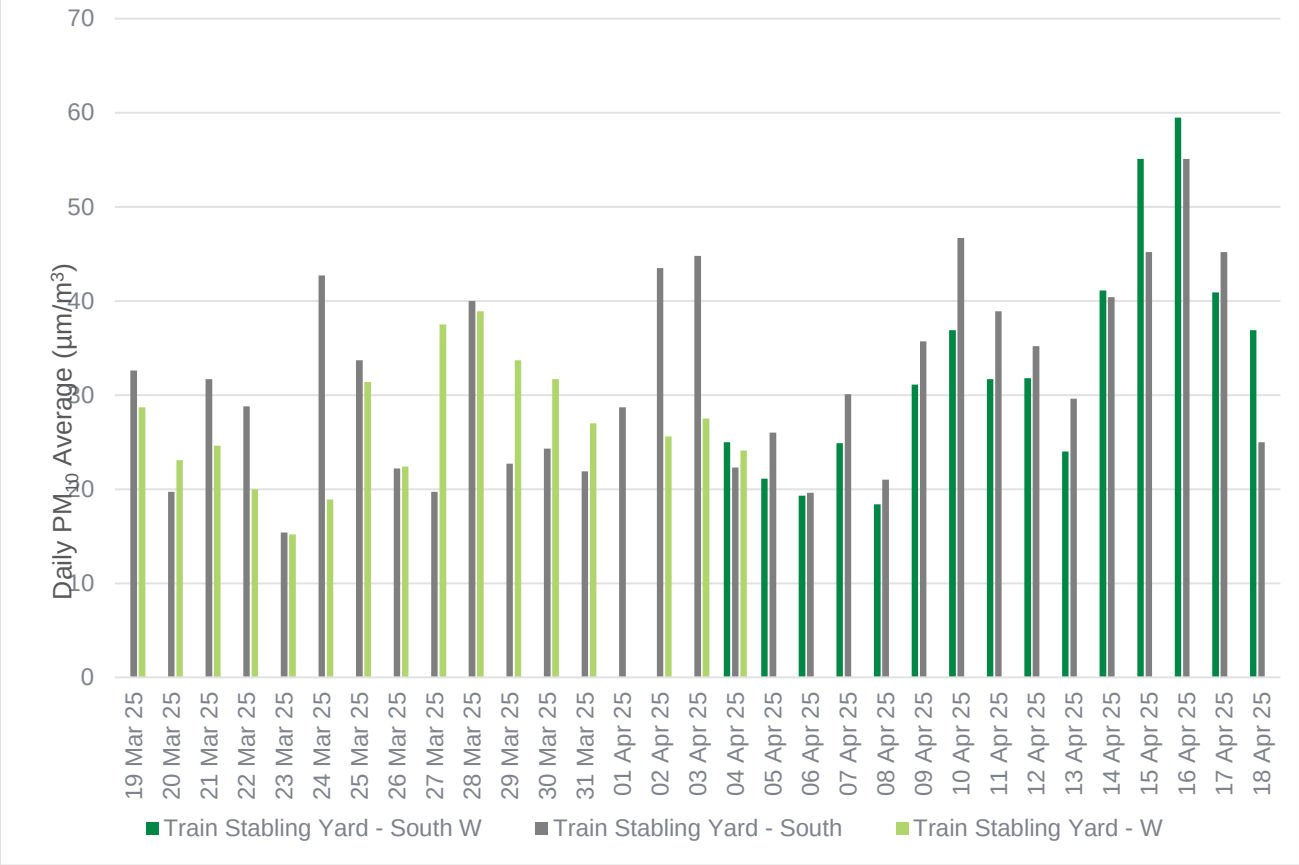

Figure 8: Daily Averages PM_{10} Results at Train Stabling Facility West

3.4.1 Analysis

Train stabling yard west - West Point monitoring position was moved to the South West Point on 4 April to avoid interaction with construction activities during bund wall removal works along the western boundary of site.

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.

There were two elevated PM_{10} events measured during the reporting period at the train stabling yard west site. Both elevated PM_{10} events were investigated during visual field observations and determined to be localised to the working area and due to the close proximity of monitoring equipment to construction activities and not representative of any off site impact. Suburban Connect applied polymer to the site prior to the Easter holiday period. The existing proactive controls were appropriate to manage these events.

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	12.6	23.7	N/A	37.6	71.6
Lowest	6.8	17.6	SSW	19.0	35.0
Highest	17.3	32.7	NNW	69.0	97.0

Table 9: Daily rain data for Moorabbin, Victoria

Statistic	Rain (mm)
Daily Low	0.0
Daily High	17.8
Total	20.6

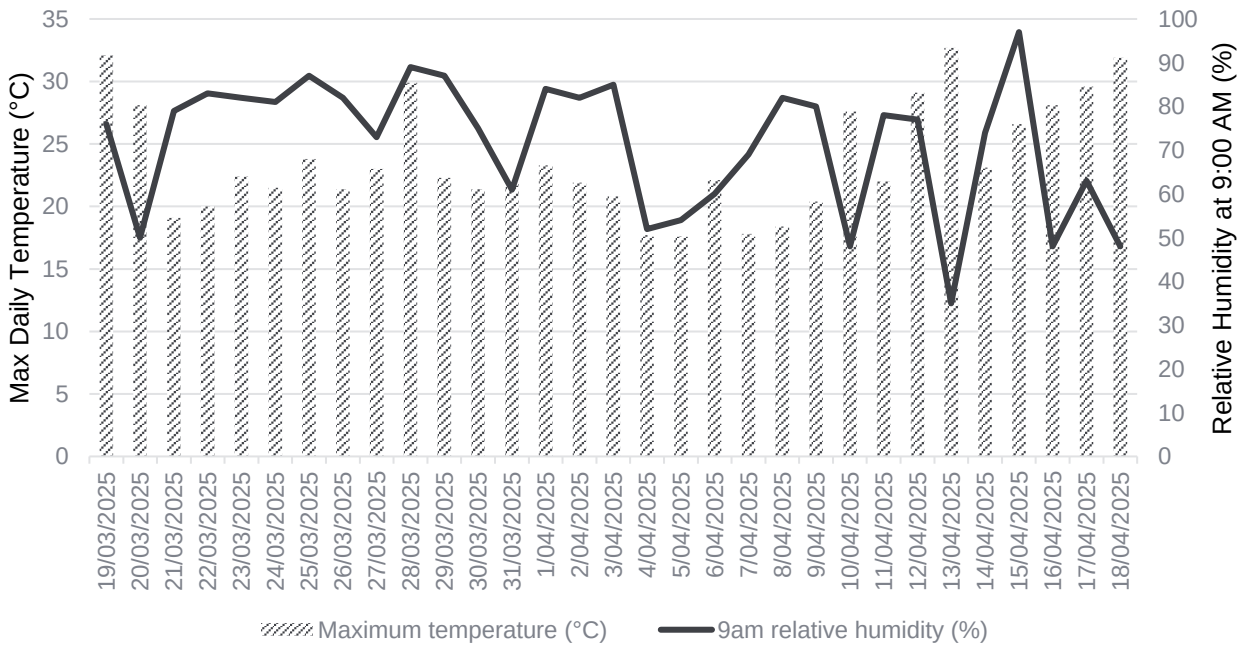

Figure 9: Daily relative humidity and temperature observations for Moorabbin, Victoria

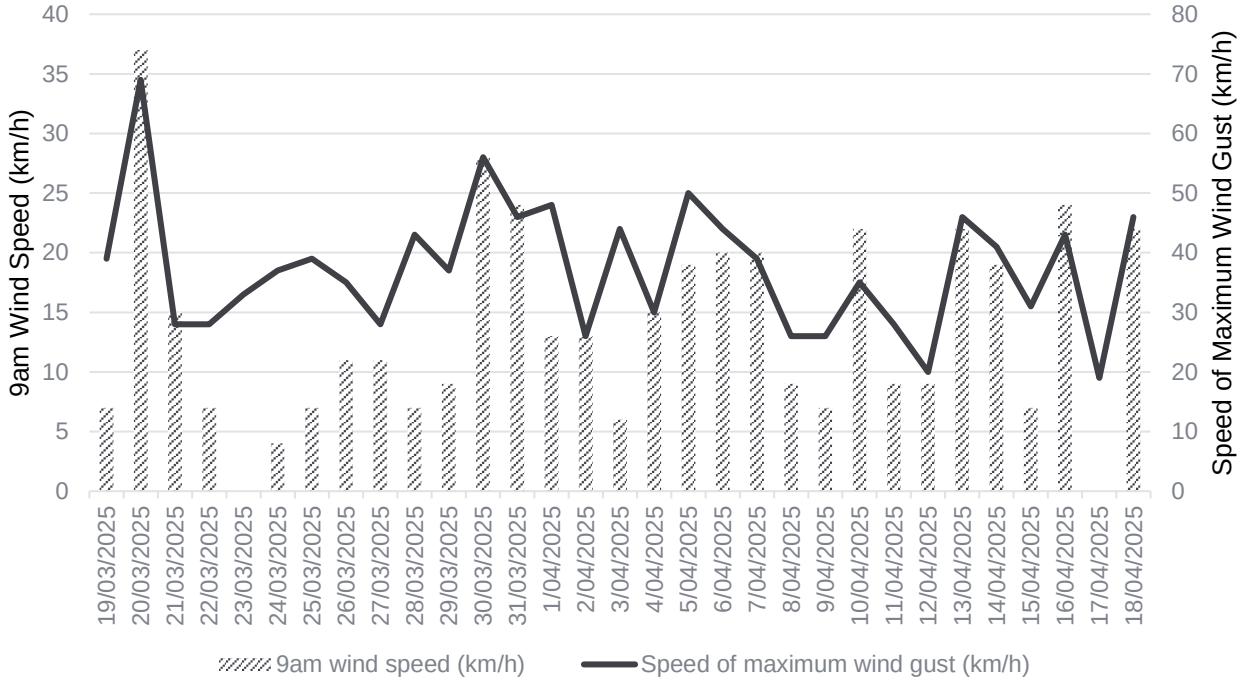

Figure 10: Daily wind speed observations for Moorabbin, Victoria

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 March 2025 to 18 April 2025 are shown below.

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

Location	Available Periods	Collected Periods	Data Capture	Details
Train Stabling Facility West – West Point	16	17	94%	There was 1 day of interruption on 1 April due to a fault with monitoring equipment. The faulty monitoring equipment was replaced, and monitoring was reinstated on 2 April. Monitor was then relocated (4 April) to the South West Point due to proximity to construction activities on the western boundary of site.
Train Stabling Facility West – South West Point	15	15	100%	Monitoring position was established on 4 April to avoid interaction with construction activities on the western boundary of site. The device was moved from the West Point position. After being moved, there was no interruptions.

Location	Available Periods	Collected Periods	Data Capture	Details
Train Stabling Facility West – South	31	31	100%	There were no interruptions to monitoring at this location during the reporting period
Clarinda Tunnel Access Structure Site – South Boundary	31	31	100%	There were no interruptions to monitoring at this location during the reporting period
Clarinda Tunnel Access Structure Site – East Boundary	31	31	100%	There were no interruptions to monitoring at this location during the reporting period
Clarinda Tunnel Access Structure Site – North	31	31	100%	There were no interruptions to monitoring at this location during the reporting period
Clarinda – CC01	31	29	94%	There was a temporary interruption to monitoring at this location during the reporting period. Solar panel required cleaning to assist with battery charge.
Clayton - South	31	31	100%	There were no interruptions to monitoring at this location during the reporting period
Clayton – East	31	31	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
Train Stabling Facility West – West (replaced 1 April - faulty)	HEX-000694	03 Oct 2024	03 Oct 2026
Train Stabling Facility West – West (replacement 1 April)	HEX-000706	19 Feb 2025	19 Feb 2027
Train Stabling Facility West– South-West Point (relocated 4 April)	HEX-000706	19 Feb 2025	19 Feb 2027
Train Stabling Facility West – South	HEX-000498	20 Sep 2024	20 Sep 2026
Clarinda CC01 – Nearest Residential property	HEX-000403	20 Sep 2024	20 Sep 2026

Location	Device Serial Number	Calibration Date	Calibration Due
Clarinda Tunnel Access Structure Site – South Boundary	HEX-000619	21 Aug 2024	21 Aug 2026
Clarinda Tunnel Access Structure Site – East Boundary	HEX-000780	18 Dec 2024	18 Dec 2026
Clarinda Tunnel Access Structure Site – North	HEX-000791	18 Dec 2024	18 Dec 2026
Clayton – East	HEX-000705	24 Oct 2024	24 Oct 2026
Clayton – West	HEX-000623	19 Feb 2025	19 Feb 2027
Clayton – South	HEX-000744	27 Nov 2024	27 Nov 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