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REPORT

Ambient Air Quality Monitoring (AAQM) Report – June 2025

West Gate Tunnel Project

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Executive Summary

Air quality monitoring for the West Gate Tunnel Project has been specifically established to develop a ‘baseline’ of data from current local conditions. This baseline will be used to measure any changes once the tunnel opens. When the project opens, air quality monitoring will continue for up to five years.

The results of the West Gate Tunnel Project Ambient Air Quality Monitoring (AAQM) program for the period of 1 June 2025 to 30 June 2025 are presented below.

The following tables present the maximum measured concentration for each parameter at Stations 1, 2, 3, 4, 5, and 6 during the reporting period. The maximum concentration for each parameter is compared with the respective criteria.

The June 2025 ambient air quality monitoring programme results met their respective air quality objectives for all parameters measured at all ambient air quality stations.

Data capture statistics for June 2025 were 90 percent and above for all parameters.

Station 1 Summary – June 2025

Parameter	Units	Averaging period	Maximum concentration	SEPP Air quality objective[A]	Exceedances[C]	ERS Air quality objective[B] (APAC)	Exceedances[C]
$PM_{2.5}$	µg/m^3	24 hour	17	25	Nil	25	Nil
PM_{10}	µg/m^3	24 hour	26	50	Nil	50	Nil

Notes: A – SEPP(AAQ) objective
B – ERS Objective (APAC)
C – Exceedances refers to the number of individual days the criterion was exceeded at any station.

Station 2, Station 3, Station 5, and Station 6 Summary – June 2025

Parameter	Units	Averaging period	Maximum concentration				SEPP Air quality objective[A]	Exceedances[C]	ERS Air quality objective[B] (APAC)	Exceedances[C]
			Station 2	Station 3	Station 5	Station 6				
$PM_{2.5}$	µg/m^3	24 hour	19	18	17	18	36	Nil	25	Nil
PM_{10}	µg/m^3	24 hour	35	29	23	46	60	Nil	50	Nil

Notes: A – SEPP(AQM) Intervention level
B – ERS Objective (APAC)
C – Exceedances refers to the number of individual days the criterion was exceeded at any station.

Station 4 Summary – June 2025

Parameter	Units	Averaging period	Maximum concentration	Air quality objective	Exceedances[D]	ERS Air quality objective[C] (APAC)	Exceedances[D]
$PM_{2.5}$	µg/m^3	24 hour	17	36[A]	Nil	25[C]	Nil
PM_{10}	µg/m^3	24 hour	30	60[A]	Nil	50[C]	Nil
NO_2	ppb	1 hour	40	140[A]	Nil	80[C]	Nil
CO	ppm	1 hour	1.2	29[A]	Nil	-	-
CO	ppm	8 hour	0.80	-	-	9[C]	Nil
Benzene	ppb	24 hour	0.6	3.0[B]	Nil	9[C]	Nil
Ethylbenzene	ppb	24 hour	0.7	-	-	5000[C]	Nil
Toluene	ppb	24 hour	2.9	1000[B]	Nil	-	-
Total xylene isomers	ppb	24 hour	2.8	250[B]	Nil	2000[B]	Nil

Notes: A – SEPP(AQM) Intervention level
B – Air NEPM Monitoring investigation level
C – ERS objective (APAC)
D – Exceedances refers to the number of individual days the criterion was exceeded at any station

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1.0 INTRODUCTION

Air quality monitoring for the West Gate Tunnel Project has been specifically established to develop a 'baseline' of data from current local conditions. This baseline will be used to measure any changes once the tunnel opens. When the project opens, air quality monitoring will continue for up to five years.

The results of the West Gate Tunnel Project Ambient Air Quality Monitoring (AAQM) program for the period of 1 June 2025 to 30 June 2025, are contained in the following report.

The AAQM program was conducted in accordance with the Environmental Performance Requirement (EPR) AQP4 for the Project and consists of six AAQM stations (AAQMS) monitoring the following ambient air quality indicators:

- continuous measurement of particulate matter with an equivalent aerodynamic diameter less than 10 microns (PM10)
- continuous measurement of particulate matter with an equivalent aerodynamic diameter less than 2.5 microns (PM2.5)
- continuous measurement of wind speed and wind direction.

Additionally, one of the specified AAQMS (Primula Avenue) monitors the following additional air quality indicators in combination with PM_{10} and $PM_{2.5}$:

- continuous monitoring of oxides of nitrogen ([NOx] comprising of nitrogen dioxide (NO2) and nitric oxide [NO])
- continuous monitoring of carbon monoxide (CO)
- one in six day monitoring of benzene, toluene, ethylbenzene, and xylene isomers (BTEX)
- continuous measurement of atmospheric pressure.

AAQMS Station 1 to Station 6 were installed and commissioned during the period 22/08/2018 to 12/10/2018. Specific installation dates can be found below in Section 2.1.

Details of the air quality indicators monitored at each AAQMS are provided in Table 1.

Table 1: AAQMS monitoring details

Site name	Location	Coordinates	Monitoring parameters
Station 1	Barbara Beyer Reserve, 2 Harris Street, Yarraville	-37.812730°S 144.900017°E	PM_{10} and $PM_{2.5}$ Ambient temperature, relative humidity, wind speed, and wind direction
Station 2	51-53 Francis Street	-37.821800°S 144.894383°E	PM_{10} and $PM_{2.5}$ Ambient temperature, relative humidity, wind speed, and wind direction
Station 3	Railway Lot 64, (part) 15 Goulburn Street, Yarraville	-37.814063°S 144.891320°E	PM_{10} and $PM_{2.5}$ Ambient temperature, relative humidity, wind speed, and wind direction
Station 4	44 Primula Avenue, Brooklyn	-37.824284°S 144.846425°E	PM_{10} and $PM_{2.5}$ NO, NO_2, NOx and CO BTEX – one in six day sampling (24 hour average) Ambient temperature, relative humidity, atmospheric pressure, wind speed, and wind direction
Station 5	Donald McLean Reserve, Spotswood	-37.826442°S 144.882133°E	PM_{10} and $PM_{2.5}$ Ambient temperature, relative humidity, atmospheric pressure, wind speed, and wind direction
Station 6	44 Millers Road Brooklyn	-37.821252°S 144.848878°E	PM_{10} and $PM_{2.5}$ Ambient temperature and relative humidity

2.0 AAQMS DETAILS

2.1 Site locations

AAQMS Station 1 to Station 5 were installed and commissioned during the period 22/08/2018 to 31/08/2018. AAQMS Station 6 (Millers Road) was commissioned on 12/10/2018. Meteorological sensors (wind speed and direction) were installed later due to delays in calibration from the instrument supplier. AAQMS commissioning dates are provided in Table 2. Figure 1 presents the locations of the AAQMS.

Table 2: AAQMS commissioning dates

Parameter	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6
AAQMS	23/08/2018	22/08/2018	22/08/2018	22/08/2018	31/08/2018	12/10/2018
Wind speed & direction	07/09/2018	20/09/2018	14/09/2018	10/09/2018	17/09/2018	23/11/2018[A]

Notes: A) wind sensor is not compliant with siting criteria specified in AS 3580.14

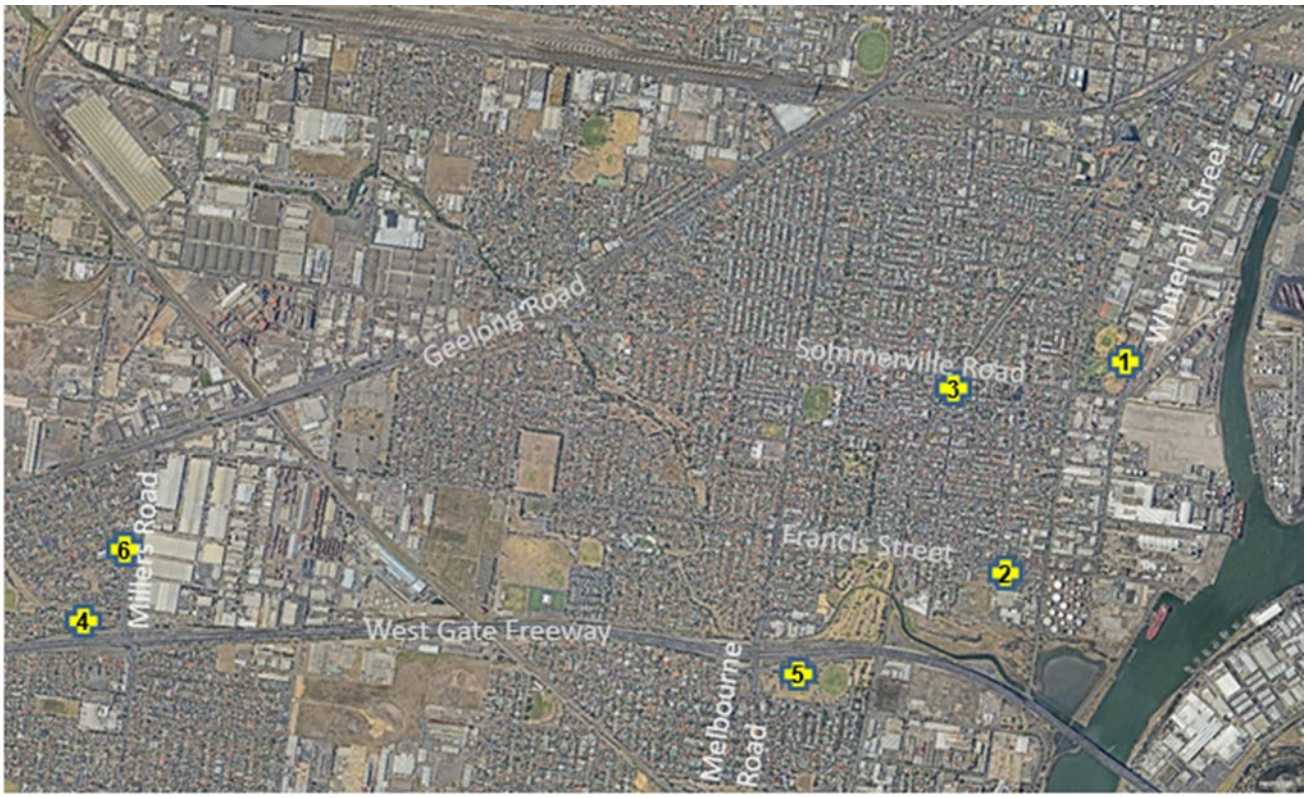


Figure 1: West Gate Tunnel AAQMS site locations

2.2 Siting assessment

Australian Standard AS/NZS 3580.1.1 *"Methods for Sampling and Analysis of Ambient Air – Part 1.1. Guide to Siting Air Monitoring Equipment"* provides general guidance for the siting of ambient air monitoring equipment and specific siting parameters for individual air pollutants. Table 3 provides a comparison between recommended criteria contained in the Standard for the parameters monitored at neighbourhood and peak monitoring stations with actual conditions at each AAQMS.

Table 3: Australian standard AAQMS siting criteria compliance

Station	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6
Station type	Neighbourhood	Peak	Peak	Peak	Peak	Peak
Inlet height above ground level 1.0 m – 15 m	✓	✓	✓	✓	✓	✓
Clear sky angle 120° (Neighbourhood)	✓	-	-	-	-	-
Unrestricted 270° airflow around inlet (Neighbourhood)	✓	-	-	-	-	-
Unrestricted 180° airflow around inlet (Peak)	-	✓	✓	✓	✓	✓
Distance to supporting structure ≥ 1 m	✓	✓	✓	✓	✓	✓
10 m from drip line of trees	✓	✓	✓	✓	✓	✗[A]
No extraneous sources nearby	✓	✓	✓	✗[B]	✓	✗[C]
Greater than 50 m from road (≤ 10,000 vehicles/day)	✓	-	-	-	-	-
Greater than 2 m from road (Peak station)	-	✓	✓	✓	✓	✓

Notes: A) Tree drip line is <3 m from sampler inlets and meteorological monitoring equipment
B) Temporary construction area for Millers Road noise wall and exit ramp relocation works
C) Residential chimney is <5 m from the sampler inlet.

2.3 Equipment specifications

Table 4 provides a list of the monitoring equipment installed at the AAQMS.

Table 4: AAQMS instrumentation

Parameter	Equipment item	Manufacturer	Model
$PM_{2.5}$	Beta Attenuation Monitor (BAM)	Thermo Fisher Scientific Inc.	5014i
PM_{10}	Beta Attenuation Monitor (BAM)	Thermo Fisher Scientific Inc.	5014i
Oxides of Nitrogen	Chemiluminescence	Thermo Fisher Scientific Inc.	42i
Carbon Monoxide	Infra-red gas filter correlation	Thermo Fisher Scientific Inc.	48i
Temperature	Pt100 resistive platinum sensor	Thermo Fisher Scientific Inc.	5014i
BTEX	Summa canister	Restek	6 litre
Relative humidity	Capacitive thin film sensor	Thermo Fisher Scientific Inc.	5014i
Atmospheric Pressure	Beta Attenuation Monitor (BAM)	Thermo Fisher Scientific Inc.	5014i
Wind speed and wind direction	Ultrasonic anemometer	RM Young	Model 86000

3.0 AIR QUALITY CRITERIA

The ambient air quality criteria applicable to the West Gate Tunnel Project were derived from the State Environment Protection Policies (SEPPs); Ambient Air Quality (SEPP(AAQ)), Air Quality Management (SEPP(AQM)) and the National Environment Protection (Air Toxics) Measure Monitoring Investigation Levels (MILs).

As part of the implementation of the Environment Protection Act 2017 (Act) which came into effect on 1 July 2021, the SEPP(AAQ) and SEPP(AQM) have been discontinued and some of their content has been replaced by the “Environment Reference Standard” (ERS), publication S245. In addition, some elements of the SEPPs will ultimately be replaced by proposed guidelines.

EPA publication 1998 – June 2021 “Compliance Code for Victoria’s Big Build Projects” states for the West Gate Tunnel Project, the obligations under Section 25(1) of the Act for General Environmental Duty (GED) are met during design and construction by complying with the West Gate Tunnel Project Environmental Performance Requirements (EPRs), which include undertaking ambient air quality monitoring in accordance with SEPP(AAQ) and SEPP(AQM). This report therefore continues to make reference to the SEPP(AAQ) and SEPP(AQM).

3.1 SEPP (AAQ)

The SEPP(AAQ) sets out the environmental indicators and objectives for ambient air quality that seek to achieve or maintain environmental values in Victoria. The SEPP(AAQ) adopts the requirements of the *National Environment Protection (Ambient Air Quality) Measure* (Air NEPM) and its environmental quality objectives (EQOs) for CO, NO_2, and particles (as PM_{10} and $PM_{2.5}$). The SEPP(AAQ) EQOs apply to air quality within a region or sub-region considered to be representative of exposure of the general population in Victoria. These objectives have been adopted for the purposes of comparison with results from background/ neighbourhood monitoring stations for the West Gate Tunnel Project and are relevant to Station 1 (Yarraville Gardens).

3.2 SEPP (AQM)

The SEPP(AQM) sets out legislative requirements for managing and assessing air emissions in Victoria. The aim of the SEPP(AQM) is to ensure that prescribed air quality objectives are met and protect the beneficial uses of the air environment. Schedule B lists intervention levels which are used in the assessment of local or neighbourhood air monitoring data. Consistent with assessment of impacts described in the Environment Effects Statement for the West Gate Tunnel Project, the SEPP(AQM) intervention levels will continue to be adopted for purposes of comparison with results from peak monitoring stations for the West Gate Tunnel Project. These AQO are applicable to Station 2 (Francis Street), Station 3 (Railway Reserve), Station 4 (Primula Avenue), Station 5 (Donald McLean Reserve), and Station 6 (Millers Road).

3.3 NEPM (Air Toxics)

The aim of the Air Toxics NEPM is to gain a greater understanding of the levels of air toxics at specific locations where elevated concentrations are likely to occur and where the potential for significant human exposure exists. The Air Toxics NEPM established monitoring investigation levels (MILs) relevant for the West Gate Tunnel Project for benzene, toluene and xylene isomers. The MILs are used purposes of comparison with results from the air toxics monitored at Station 4 (Primula Avenue). Table 5 presents the air quality indicators and objectives for each AAQMS for the West Gate Tunnel Project.

Table 5: Air quality indicators and objectives

Location	Pollutant	Units	Air Quality Objective	Averaging period
Station 1	PM_{10}	$\mu g/m^3$	50	24 hour
			20	Annual
	$PM_{2.5}$		25	24 hour
			8	Annual
Station 2 Station 3 Station 4 Station 5 Station 6	PM_{10}	$\mu g/m^3$	60	24 hour
	$PM_{2.5}$		36	
Station 4	CO	ppm	29	1 hour
	NO_2	ppb	140	1 hour
	Benzene	ppb	3	Annual
	Toluene	ppb	1000	24 hour
			100	Annual
	Ethylbenzene	ppb	-	24 hour
	Xylene isomers	ppb	250	24 hour
			200	Annual

3.4 Environmental Reference Standard (ERS)

The environmental reference standard (ERS) is formed under the Environmental Protection Act (2017) to support the protection of human health and the environment from pollution and waste in Victoria by identifying environmental values to be achieved or maintained. The ERS sets indicators and objectives to be measured to determine or assess whether the environmental values are being achieved. The Air Pollution Assessment Criteria (APAC) set out in the ERS and subordinate publication EPA Publication 1961, "Guideline for Assessing and Minimising Air Pollution in Victoria", relevant for the West Gate Tunnel Project are presented in Table 6.

Table 6: ERS Ambient air quality indicators and objectives

Location	Pollutant	Units	Air Quality Objective (APAC)[1]	Averaging period
Stations 1 – 6	PM_{10}	µg/m^3	50	24 hour
			20	Annual
	$PM_{2.5}$	µg/m^3	25	24 hour
			8	Annual
Station 4	CO	ppm	9.0	8 hour rolling
	NO_2	ppb	80	1 hour
	Benzene	ppb	9	24 hour
		ppb	3	Annual
	Ethylbenzene	ppb	5000	24 hour
		ppb	60	Annual
	Xylene isomers	ppb	2000	24 hour
		ppb	20	Annual

Notes: [1] EPA Publication 1961 (Guideline for Assessing and Minimising Air Pollution in Victoria)

4.0 TEST METHODS

4.1 Particulate matter ($PM_{2.5}$)

$PM_{2.5}$ concentrations are determined using a Beta Attenuation Monitor (BAM).

Suspended particulate matter in ambient air is measured using the attenuation of beta rays as a surrogate for continuous mass determination. Beta rays are high energy electrons generated from the radioactive decay of the radon isotope Rn-222. When contacting particulate matter beta rays are either absorbed or their energy level is diminished. The relationship between the attenuation of beta rays between the source and detector is used to determine the mass density.

The BAM is equipped with a flow control and measurement system. The flow control system volumetrically controls the flowrate to 16.7 L/min. The flowrate is used with the mass density to calculate the particulate matter concentration.

The sampler is fitted with a size selective inlet, which separates particles with an equivalent aerodynamic diameter greater than 10 microns from the sample stream. An in-line $PM_{2.5}$ particle size separator is also fitted to further separate particles; only those with an equivalent aerodynamic diameter less than 2.5 microns can pass through the particle size separator to the filter for mass determination.

The $PM_{2.5}$ monitoring method is based on the requirements contained within Australian Standard AS/NZS 3580.9.12 "*Methods for Sampling and Analysis of Ambient Air – Method 9.12: Determination of Suspended Particulate Matter – $PM_{2.5}$ Beta Attenuation Monitors*" (NATA Laboratory Accreditation No. 1910).

4.2 Particulate matter (PM_{10})

PM_{10} concentrations are determined using a continuous BAM without an in-line $PM_{2.5}$ particle size separator. All other measurement processes remain the same as for the $PM_{2.5}$ test method.

The PM_{10} monitoring method is based on the requirements contained within Australian Standard AS/NZS 3580.9.11:2016 "*Methods for Sampling and Analysis of Ambient Air – Method 9.11: Determination of Suspended Particulate Matter – PM_{10} Beta Attenuation Monitors*" (NATA Laboratory Accreditation No. 1910).

4.3 Nitrogen dioxide (NO_2)

Oxides of nitrogen concentrations were determined using a 42i Thermo Scientific chemiluminescence gas analyser.

Automatic calibrations are carried out daily against a NATA certified reference gas mixture. Manual calibrations are conducted at one month intervals.

The oxides of nitrogen (NO, NO_2, and NO_x) monitoring method is based on the requirements of Australian Standard AS 3580.5.1, *"Determination of Oxides of Nitrogen – Chemiluminescence Method"*.

4.4 Carbon monoxide (CO)

Carbon monoxide concentrations are determined using a 48i Thermo Scientific infra-red gas filter correlation analyser.

Automatic calibrations are carried out daily against a NATA-certified reference gas mixture. Manual calibrations are conducted at one month intervals.

The carbon monoxide monitoring method is based on the requirements of Australian Standard AS 3580.7.1, "*Determination of Carbon Monoxide – Direct Reading Instrumental Method"*.

4.5 Volatile organic compounds (BTEX)

A sample is collected in an evacuated electro-polished and passivated stainless steel canister. Analysis involves separation by gas chromatography (GC) and measurement by mass selective (MS) detector.

The procedure for sampling Volatile Organic Compounds (VOCs) using evacuated canisters, and for the subsequent analysis, is described in USEPA Method TO-15 "Determination of Volatile Organic Compounds (VOCs) in air collected in specially-prepared canisters and analysed by Gas Chromatography/Mass Spectrometry (GC/MS)".

Samples were analysed by Queensland Health (NATA Laboratory Accreditation No. 41) based on USEPA method TO-15. The test method used was in accordance with Golder Source Test Method C9, "Canister (Evacuated) Sampling for VOC: In Ambient Air and Source Emissions".

4.6 Meteorological parameters

Monitoring of meteorological parameters; wind speed/direction, temperature, relative humidity, solar radiation and rainfall was conducted in accordance with Australian Standard AS 3580.14 "*Methods for Sampling and Analysis of Ambient Air – Part 14: Meteorological Monitoring for Ambient Air Quality Monitoring Applications"* (NATA Laboratory Accreditation No. 1910).

5.0 MEASUREMENT UNCERTAINTY

5.1 $PM_{2.5}$

The measurement uncertainty for $PM_{2.5}$ by BAM is published by Thermo-Fisher as ±2 µg/m^3 (24 hour average).

5.2 PM_{10}

The measurement uncertainty for $PM_{2.5}$ by BAM is published by Thermo-Fisher as ±2 µg/m^3 (24 hour average).

5.3 NO_2

The measurement uncertainty for NO, NO2 and NOx by Chemiluminescence is published in AS3580.5.1 as ±10% (24 hour average).

5.4 CO

The measurement uncertainty for CO by Infra-red gas filter correlation is published in AS3580.7.1 as ±10% (24 hour average).

5.5 Benzene

USEPA Method TO-15 cites the accuracy and precision for two ambient air quality studies conducted in the United States of America. The average replicate precision for a range of 16 compounds in both studies was 15%. Replicate precision was defined as the ratio of the average difference between replicates to the average value of replicates.

The reported accuracies for both studies ranged between ± 4 % and ± 31%. The average accuracy for both studies for the range of 16 compounds was ± 11%. Accuracy is defined as the ratio of the difference between expected and observed audit results to the expected audit result.

5.6 Meteorological parameters

The estimated measurement uncertainty for each of the parameters is presented in Table 7.

Table 7: Meteorological parameters measurement uncertainty

Parameter	Measurement uncertainty [A]
Wind speed	Greater of ±0.6 m/s or 5%
Wind direction	±5°
Barometric pressure	±3 hPa
Temperature	±0.6°C
Relative humidity	±5 – 7%RH

Notes: A) Measurement uncertainty estimates are as published in AS3580.14 "*Methods for Sampling and Analysis of Ambient Air – Part 14 Meteorological Monitoring for Ambient Air Quality Monitoring Applications*".

5.7 Calibration and maintenance

Sample flow rate calibration was conducted on a monthly basis using a NATA calibrated primary standard flowmeter. Calibration details for the reporting period are presented in Table 8.

Table 8: Calibrations

Location	Parameter	Last Calibration Date	Calibration Type
Station 1	PM_{10}	26/06/2025	3 monthly
	$PM_{2.5}$	26/06/2025	3 monthly
	Wind speed and direction	21/08/2024	Two yearly
Station 2	PM_{10}	26/06/2025	3 monthly
	$PM_{2.5}$	26/06/2025	3 monthly
	Wind speed and direction	7/08/2024	Two yearly
Station 3	PM_{10}	26/06/2025	3 monthly
	$PM_{2.5}$	26/06/2025	3 monthly
	Wind speed and direction	29/10/2024	Two yearly
Station 4	PM_{10}	30/06/2025	3 monthly
	$PM_{2.5}$	30/06/2025	3 monthly
	$NO/NO_2/NOx$	20/06/2025	3 monthly
	CO	20/06/2025	3 monthly
	BTEX	NA	Flow-controllers and canisters certified by lab
	Wind speed and direction	2/09/2024	Two yearly

Location	Parameter	Last Calibration Date	Calibration Type
Station 5	PM_{10}	20/06/2025	3 monthly
	$PM_{2.5}$	20/06/2025	3 monthly
	Wind speed and direction	30/09/2024	Two yearly
Station 6	PM_{10}	30/06/2025	3 monthly
	$PM_{2.5}$	30/06/2025	3 monthly

6.0 RESULTS

The monitoring results for 1 June 2025 to 30 June 2025 are presented in the following sections.

6.1 Particulate matter (BAM $PM_{2.5}$ & PM_{10})

$PM_{2.5}$ and PM_{10} were continuously monitored and 5-minute averages logged. The 5-minute average data was transformed to 24 hour averages for reporting.

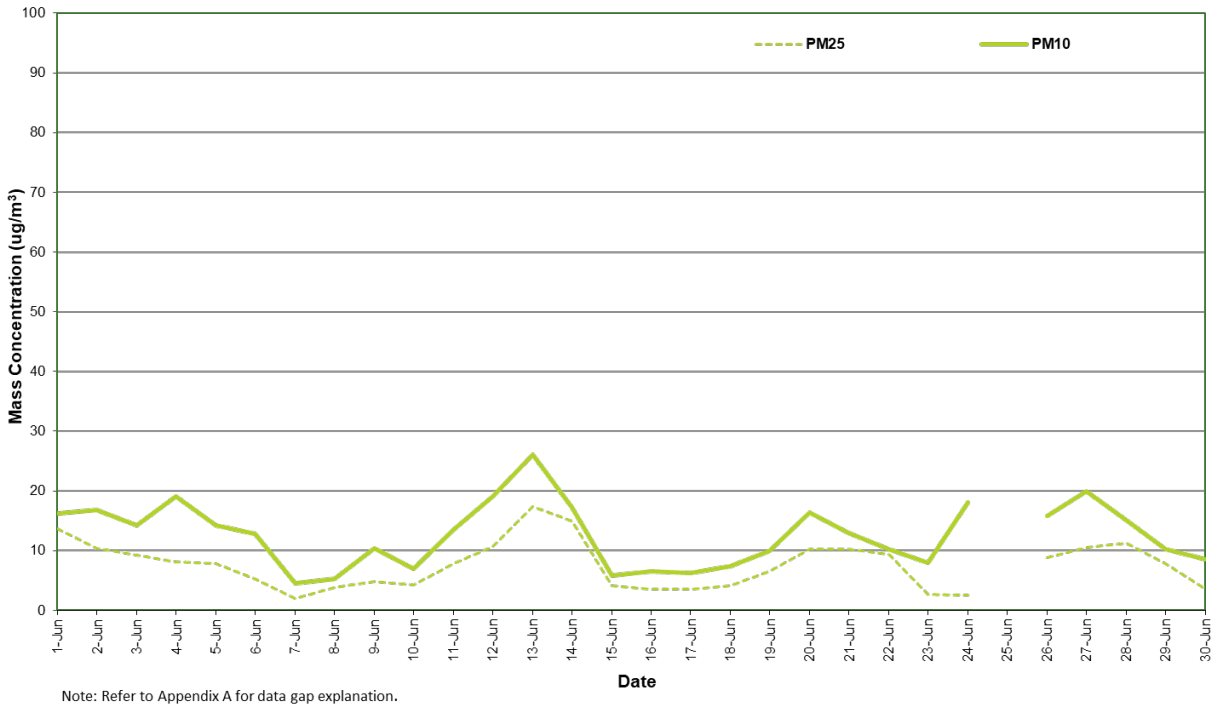
$PM_{2.5}$ and PM_{10} concentration statistics from the reporting period for Station 1 to Station 6 are presented in Table 9 to Table 14. The 24 hour average plots for Station 1 to Station 6 are presented in Figure 2 to Figure 7.

6.1.1 Station 1 – Yarraville Gardens

Table 9: Station 1 (Yarraville Gardens AAQMS) $PM_{2.5}$ and PM_{10} percentiles (24 hour average)

Parameter	Concentration (µg/m³)[A]							SEPP Air quality objective[B]	ERS Air quality objective[C]
	Maximum	99th	(µg/m³)	95th	90th	75th	50th	(µg/m³)	(µg/m³)
$PM_{2.5}$	17	17	16	14	12	10	7.8	25	25
PM_{10}	26	24	23	20	19	16	13	50	50

Notes: A) Micrograms per cubic metre at 0°C and 101.3 kPa
B) SEPP(AAQ) Objective
C) ERS AAQ Objective
Values rounded to two significant figures.



Note: Refer to Appendix A for data gap explanation.

Figure 2: Station 1 $PM_{2.5}$ and PM_{10} concentration (24 hour average) – June 2025

6.1.2 Station 2 – Francis Street

Table 10: Station 2 (Francis Street AAQMS) $PM_{2.5}$ and PM_{10} percentiles (24 hour average)

Parameter	Concentration (µg/m³)[A]							SEPP Air quality objective[B]	ERS Air quality objective[C]
	Maximum	99th	(µg/m³)	95th	90th	75th	50th	(µg/m³)	(µg/m³)
$PM_{2.5}$	19	19	18	16	14	10	7.0	36	25
PM_{10}	35	34	33	29	26	23	17	60	50

Notes: A) Micrograms per cubic metre at 0°C and 101.3 kPa
B) SEPP(AAQ) Objective
C) ERS AAQ Objective
Values rounded to two significant figures.

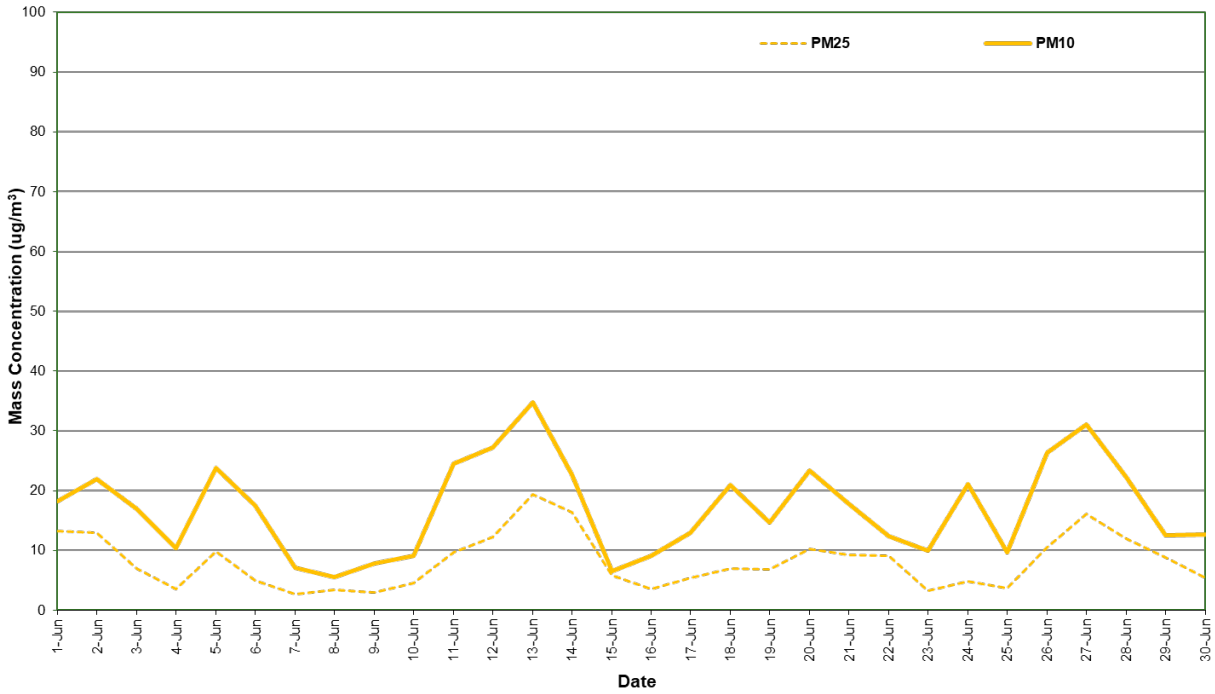


Figure 3: Station 2 $PM_{2.5}$ and PM_{10} concentration (24 Hour Average) – June 2025

6.1.3 Station 3 – Railway Reserve

Table 11: Station 3 (Railway Reserve AAQMS) $PM_{2.5}$ and PM_{10} percentiles (24 hour average)

Parameter	Concentration (µg/m³)[A]							SEPP Air quality objective[B]	ERS Air quality objective[C]
	Maximum	99th	98th	95th	90th	75th	50th	(µg/m³)	(µg/m³)
$PM_{2.5}$	18	17	16	14	13	9.3	6.1	36	25
PM_{10}	29	27	24	20	18	17	12	60	50

Notes: A) Micrograms per cubic metre at 0°C and 101.3 kPa
B) SEPP(AAQ) Objective
C) ERS AAQ Objective
Values rounded to two significant figures.

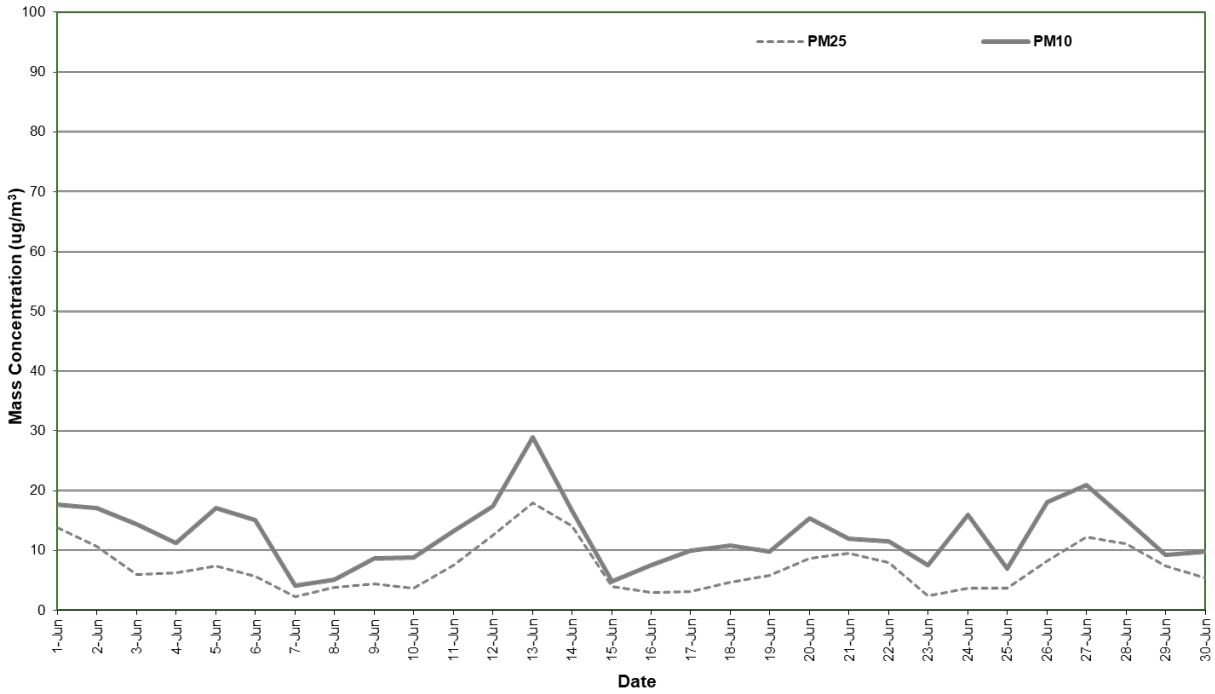


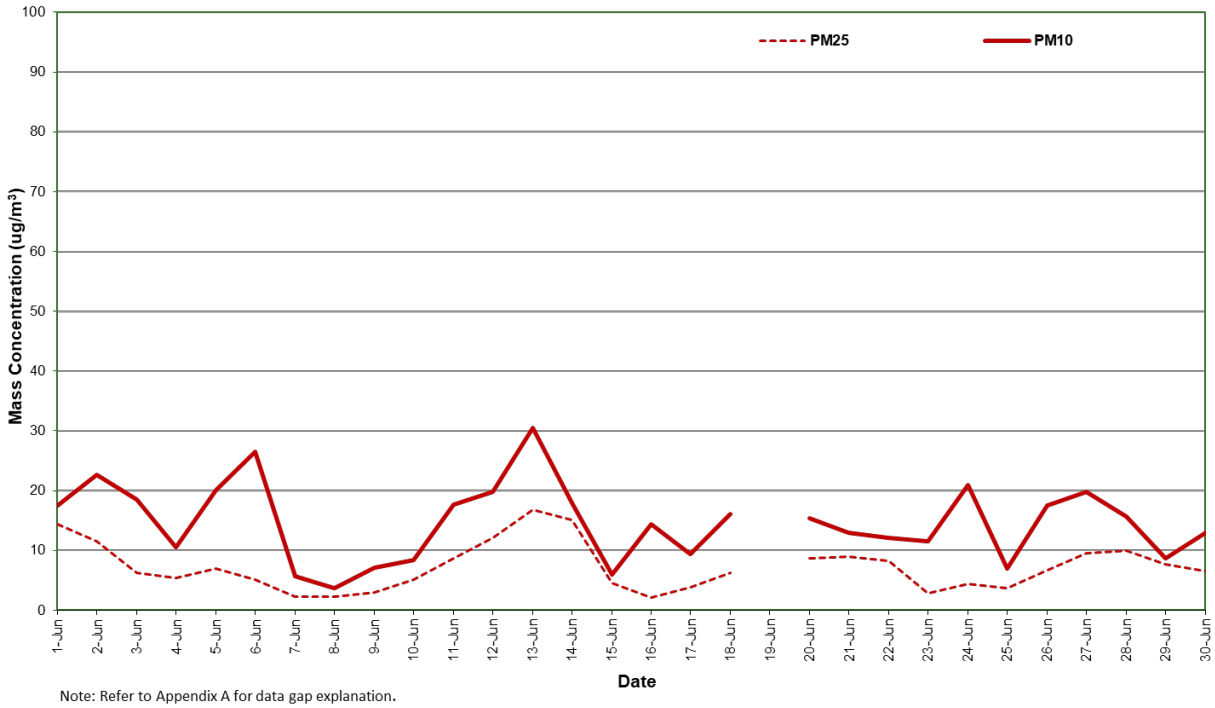
Figure 4: Station 3 $PM_{2.5}$ and PM_{10} concentration (24 hour average) – June 2025

6.1.4 Station 4 – Primula Avenue

Table 12: Station 4 (Primula Avenue AAQMS) $PM_{2.5}$ and PM_{10} percentiles (24 hour average)

Parameter	Concentration (µg/m³)[A]							SEPP Air quality objective[B]	ERS Air quality objective[C]
	Maximum	99th	98th	95th	90th	75th	50th	(µg/m³)	(µg/m³)
$PM_{2.5}$	17	16	16	15	13	9.0	6.5	36	25
PM_{10}	30	29	28	25	21	19	15	60	50

Notes: A) Micrograms per cubic metre at 0°C and 101.3 kPa
B) SEPP(AAQ) Objective
C) ERS AAQ Objective
Values rounded to two significant figures.



Note: Refer to Appendix A for data gap explanation.

Figure 5: Station 4 $PM_{2.5}$ and PM_{10} concentration (24 hour average) – June 2025

6.1.5 Station 5 – Donald McLean Reserve

Table 13: Station 5 (Donald McLean Reserve AAQMS) $PM_{2.5}$ and PM_{10} percentiles (24 hour average)

Parameter	Concentration (µg/m³)[A]							SEPP Air quality objective[B]	ERS Air quality objective[C]
	Maximum	99th	98th	95th	90th	75th	50th	(µg/m³)	(µg/m³)
$PM_{2.5}$	17	17	16	16	12	11	6.4	36	25
PM_{10}	23	22	21	20	19	16	12	60	50

Notes: A) Micrograms per cubic metre at 0°C and 101.3 kPa
B) SEPP(AAQ) Objective
C) ERS AAQ Objective
Values rounded to two significant figures.

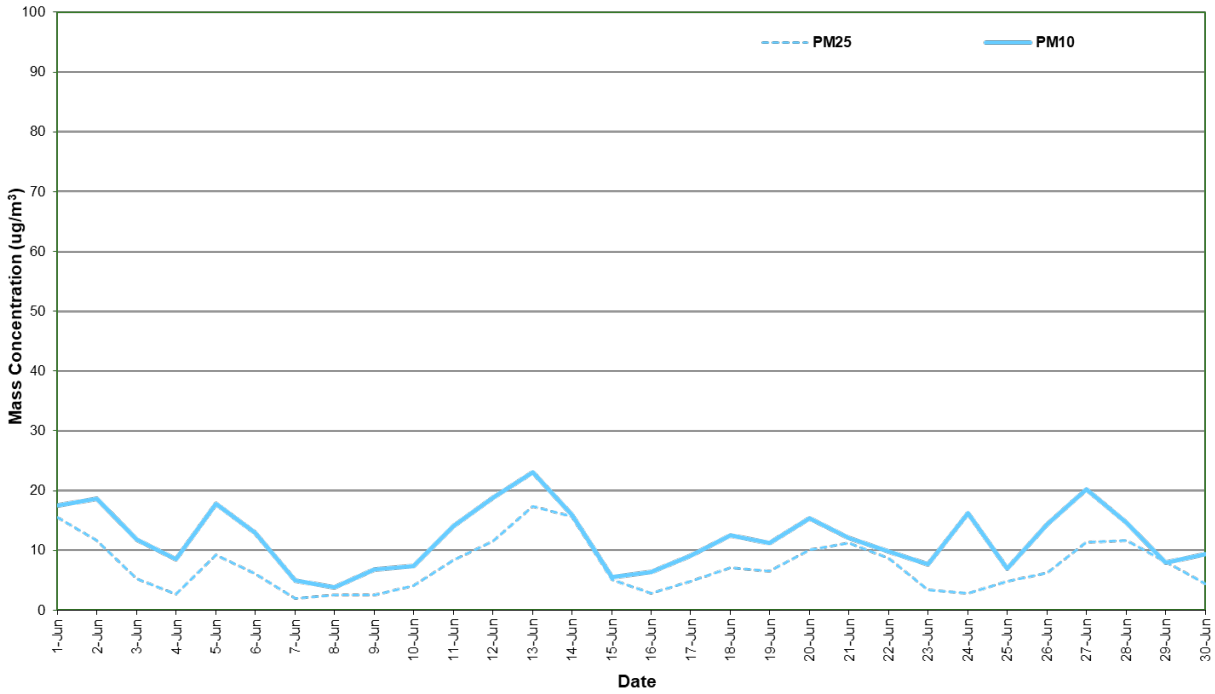


Figure 6: Station 5 $PM_{2.5}$ and PM_{10} concentration (24 hour average) – June 2025

6.1.6 Station 6 – Millers Road

Table 14: Station 6 (Millers Road AAQMS) $PM_{2.5}$ and PM_{10} percentiles (24 hour average)

Parameter	Concentration (µg/m³)[A]							SEPP Air quality objective[B]	ERS Air quality objective[C]
	Maximum	99th	98th	95th	90th	75th	50th	(µg/m³)	(µg/m³)
$PM_{2.5}$	18	17	17	15	13	8.4	6.6	36	25
PM_{10}	46	42	37	31	30	25	20	60	50

Notes: A) Micrograms per cubic metre at 0°C and 101.3 kPa
B) SEPP(AAQ) Objective
C) ERS AAQ Objective
Values rounded to two significant figures.

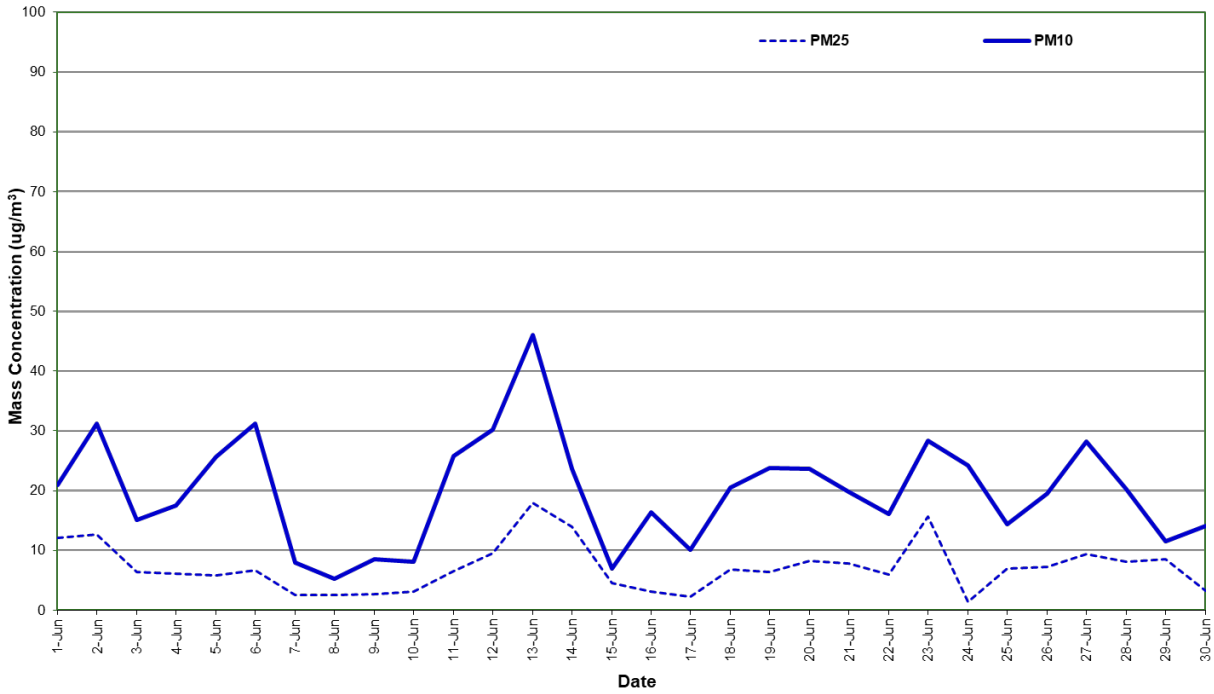


Figure 7: Station 6 $PM_{2.5}$ and PM_{10} concentration (24 hour average) – June 2025

6.1.7 Combined $PM_{2.5}$ mass concentrations

Combined plots of the AAQMS $PM_{2.5}$ and PM_{10} are presented in Figure 8 and Figure 9 respectively.

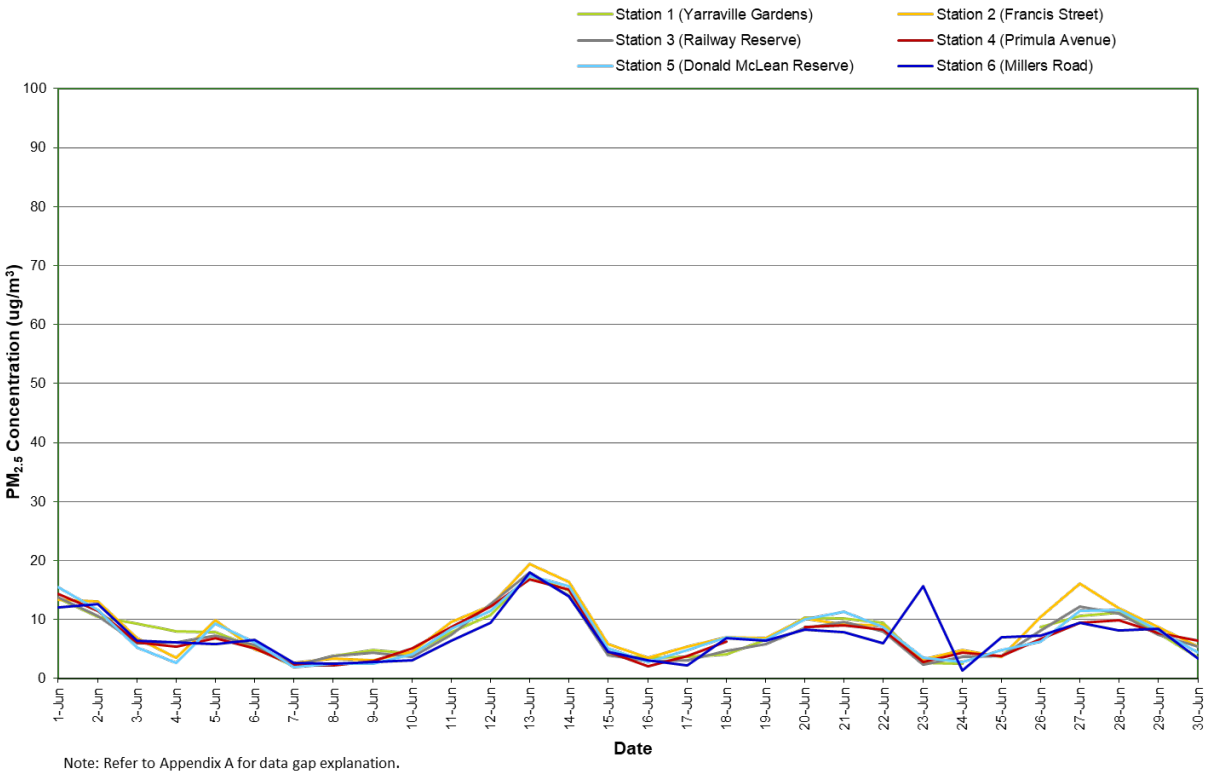


Figure 8: Combined $PM_{2.5}$ concentration (24 hour average) – June 2025

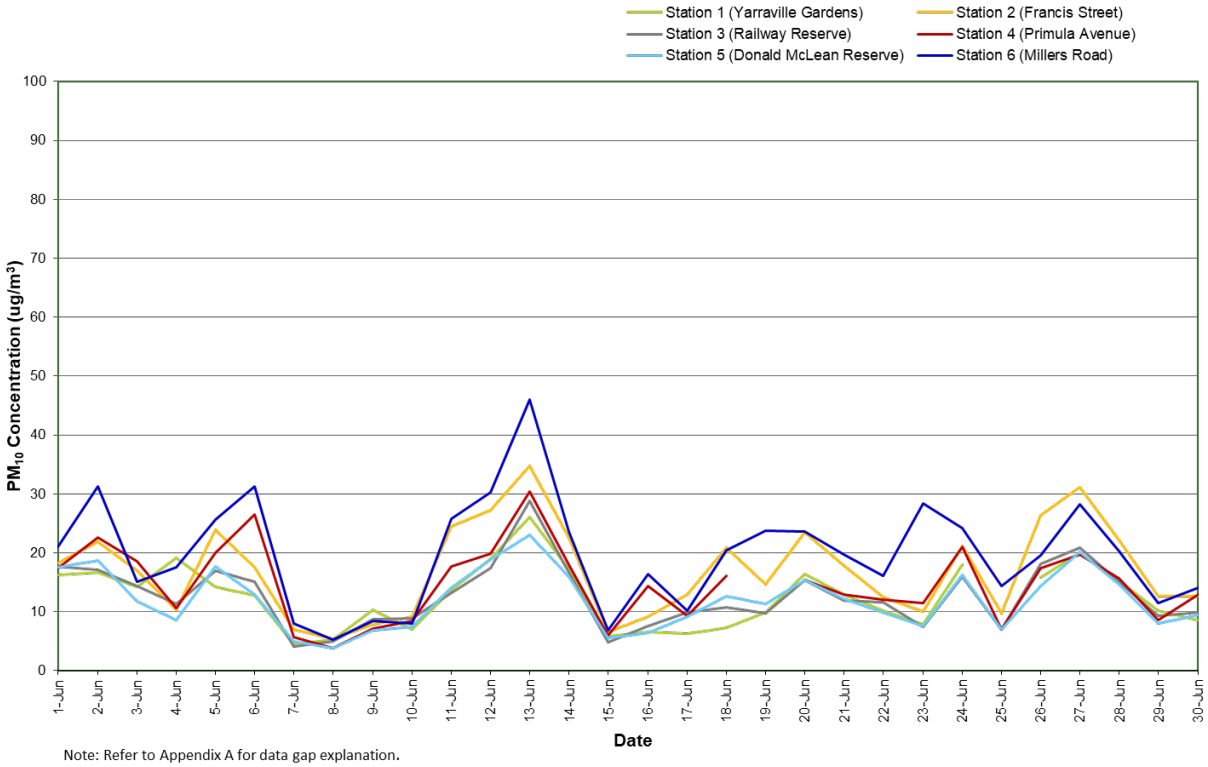


Figure 9: Combined PM_{10} concentration (24 hour average) – June 2025

6.2 Nitrogen dioxide (NO_2)

NO_2 (1 hour average) mass concentration statistics for the reporting period are given in Table 15. A plot of NO_2 (1 hour average) mass concentration for the reporting period is presented in Figure 10.

Table 15: Station 4 (Primula Avenue AAQMS) NO_2 percentiles (1 hour average)

Parameter	Concentration (ppb)[A]							SEPP (AQM) Air quality objective[B]	ERS Air quality objective[C]
	Maximum	99th	(ppb)	95th	90th	75th	50th	(ppb)	(ppb)
NO_2	40	37	34	32	28	20	14	140	80

Notes: A) Parts per billion
B) SEPP(AAQ) Objective
C) ERS AAQ Objective
Values rounded to two significant figures.

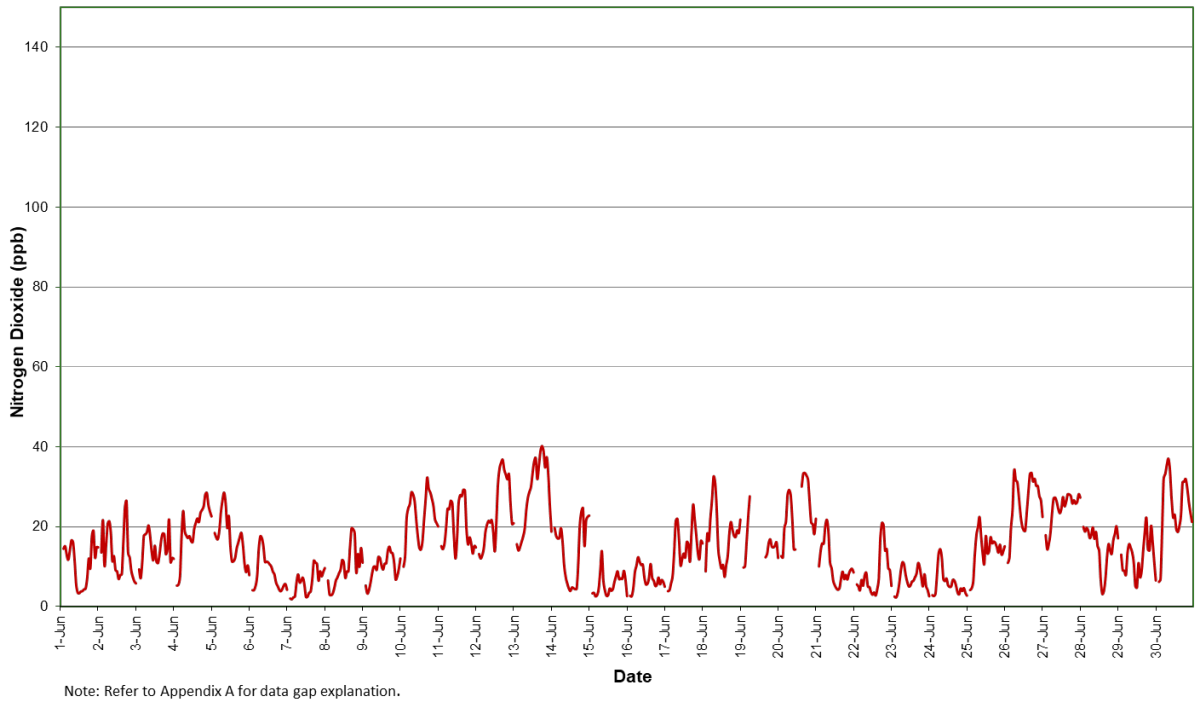


Figure 10: Station 4 NO_2 concentration (1 hour average) – June 2025

6.3 Carbon monoxide (CO)

Carbon monoxide (1-hour average and 8-hour rolling average) mass concentration statistics for the reporting period are given in Table 16. A plot of CO (1 hour average) and CO (8-hour rolling average) concentrations for the reporting period is presented in Figure 11 and Figure 12 respectively.

Table 16: Station 4 (Primula Avenue AAQMS) CO percentiles (1 hour and 8-hour average)

Averaging period	CO Concentration (ppm)[A]							SEPP Air quality objective[B]	ERS Air quality objective[C]
	Maximum	99th	98th	95th	90th	75th	50th	(ppm)	(ppm)
1-hour	1.2	0.83	0.73	0.57	0.50	0.33	0.21	29	-
8-hour (rolling)	0.80	0.75	0.73	0.58	0.48	0.35	0.21	-	9

Notes: A) Parts per million
B) SEPP(AAQ) Objective
C) ERS AAQ Objective
Values rounded to two significant figures

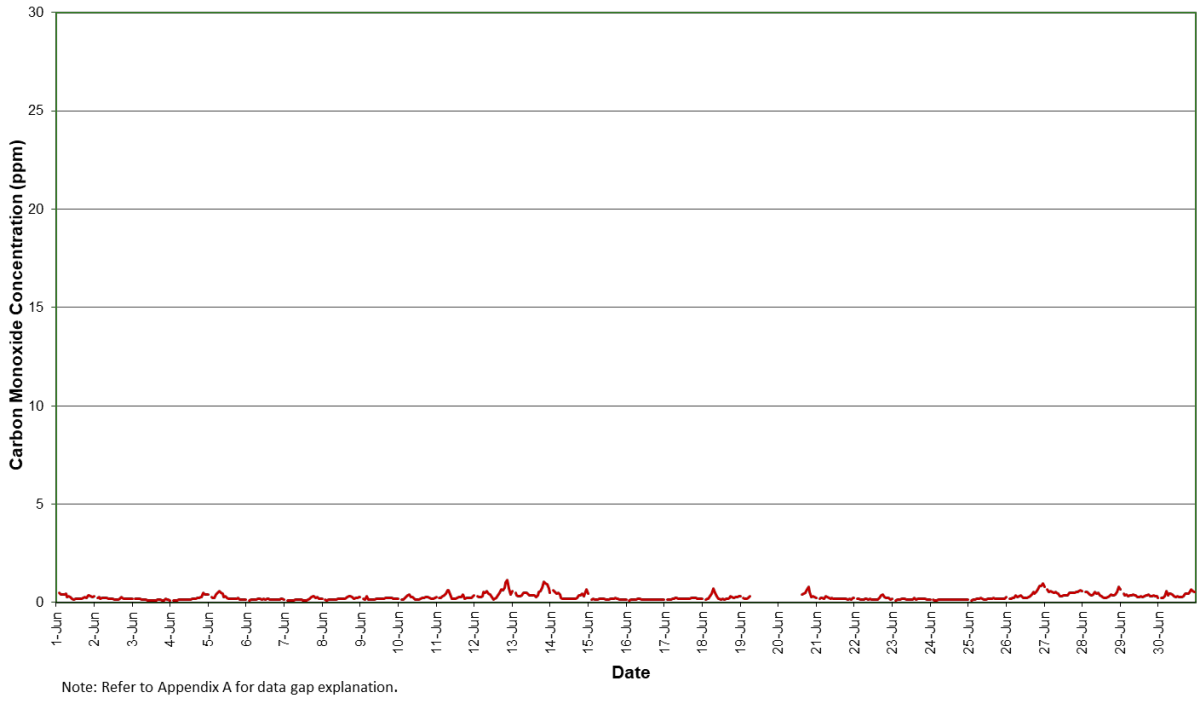


Figure 11: Station 4 CO concentration (1 hour average) – June 2025

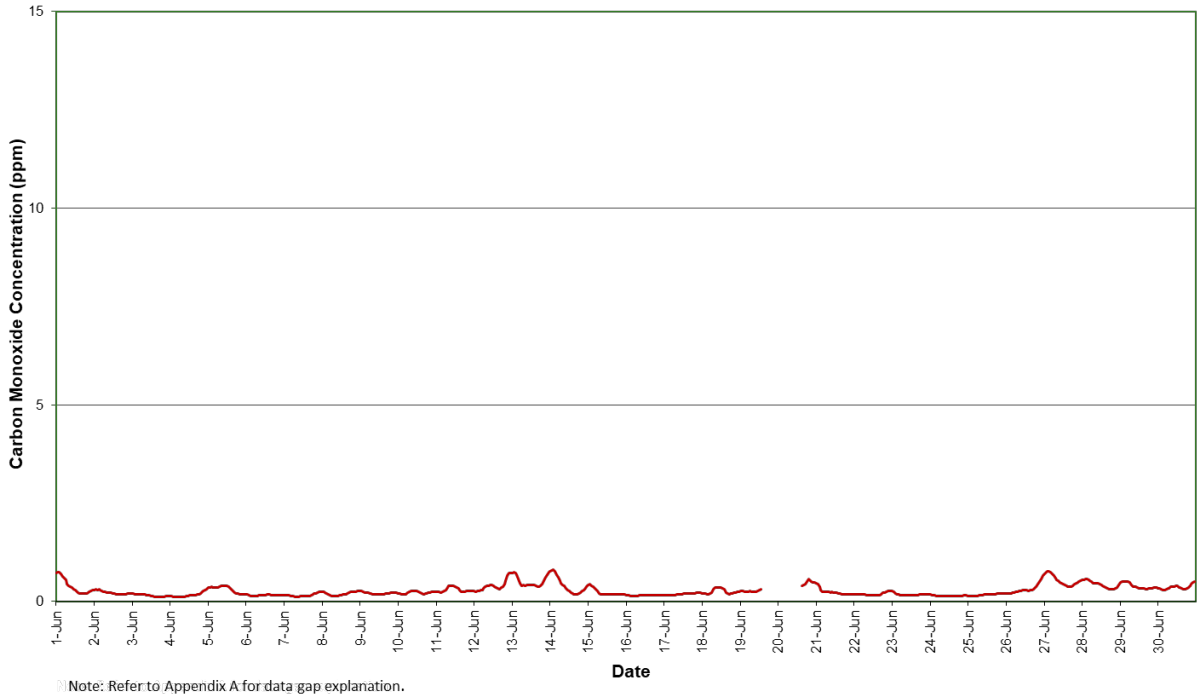


Figure 12: Station 4 CO concentration (8 hour rolling average) – June 2025

6.4 Volatile organic compounds (BTEX)

VOC samples were collected from Station 4 (Primula Avenue), in an evacuated electro-polished and passivated stainless steel canister. Analysis involves separation by gas chromatography (GC) and measurement by mass selective (MS) detector.

The procedure for sampling Volatile Organic Compounds (VOCs) using evacuated canisters, and for the subsequent analysis, is described in USEPA Method TO-15 ”Determination of Volatile Organic Compounds (VOCs) in air collected in specially-prepared canisters and analysed by Gas Chromatography/Mass Spectrometry (GC/MS)”.

Samples were analysed by Eurofins Pty Ltd (NATA Accreditation No. 1261) and Queensland Health (NATA Laboratory Accreditation No. 41), based on USEPA method TO-15 (Laboratory Report Nos. 1235437-TO, SSP94658, SSP94659).

The test method used was in accordance with Golder Source Test Method C9, "Canister (Evacuated) Sampling for VOC: In Ambient Air and Source Emissions".

BTEX (24 hour average) mass concentration statistics for the reporting period are given in Table 17. Laboratory certificates are presented in Appendix B.

Table 17: Station 4 – Primula Avenue AAQMS BTEX concentrations (24 hour average)

Date	Sample no.	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	Total xylene isomers (ppb)
29/05/2025	25-604	0.6	2.7	0.7	2.8
4/06/2025	25-605	0.6	2.9	0.7	<1
10/06/2025	25-677	<0.5	1.4	<0.5	<1
16/06/2025	25-678	<0.5	<0.5	<0.5	<1
22/06/2025	25-685	<0.5	<0.5	<0.5	<1
28/06/2025	25-713	<0.5	0.9	<0.5	<1
NEPM MIL[A]		3.0[B]	1000	-	250
APAC[C]		9	-	5000	2000

Notes: A) National Environment Protection Measure (Air Toxics) Monitoring Investigation Level
B) Annual average
C) EPA Publication 1961 APAC
Sample analysis conducted by Eurofins Pty Ltd, NATA Accreditation No. 1261\ Queensland Health, NATA Accreditation No. 41.
Analysis dates: 23/06/2025 (25-604, 25-605); 3/07/2025 (25-677, 25-678, 25-685, 25-713).

6.5 Meteorological parameters

6.5.1 Ambient temperature

Ambient Temperature data for all AAQMS sites are presented in Figure 13 for the reporting period.

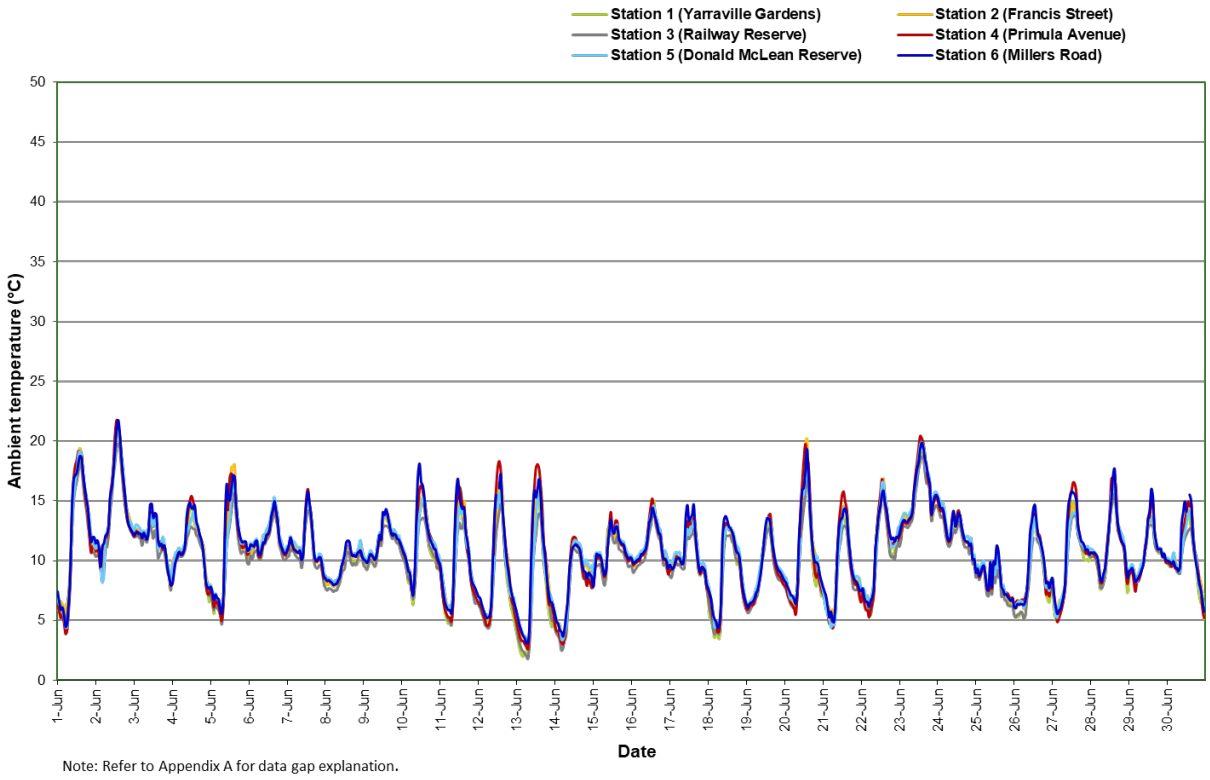


Figure 13: Ambient temperature (1 hour average) All AAQMS – June 2025

6.5.2 Relative humidity

Relative Humidity data for all AAQMS sites are presented in Figure 14 for the reporting period. Relative Humidity at Station 1 (Yarraville Gardens) is periodically impacted by the gardens sprinkler system.

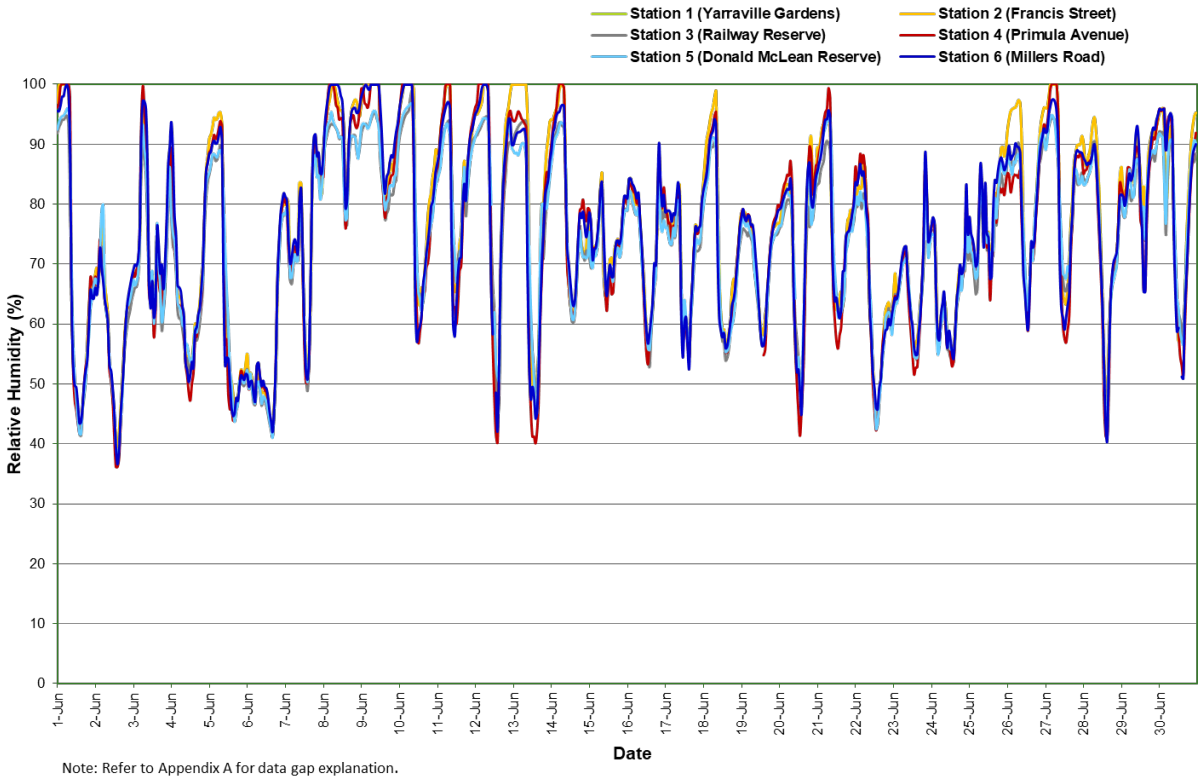


Figure 14: Relative humidity (1 hour average) All AAQMs – June 2025

6.5.3 Atmospheric pressure

Atmospheric pressure data for Station 4 (Primula Avenue AAQMS) is presented in Figure 15 for the reporting period.

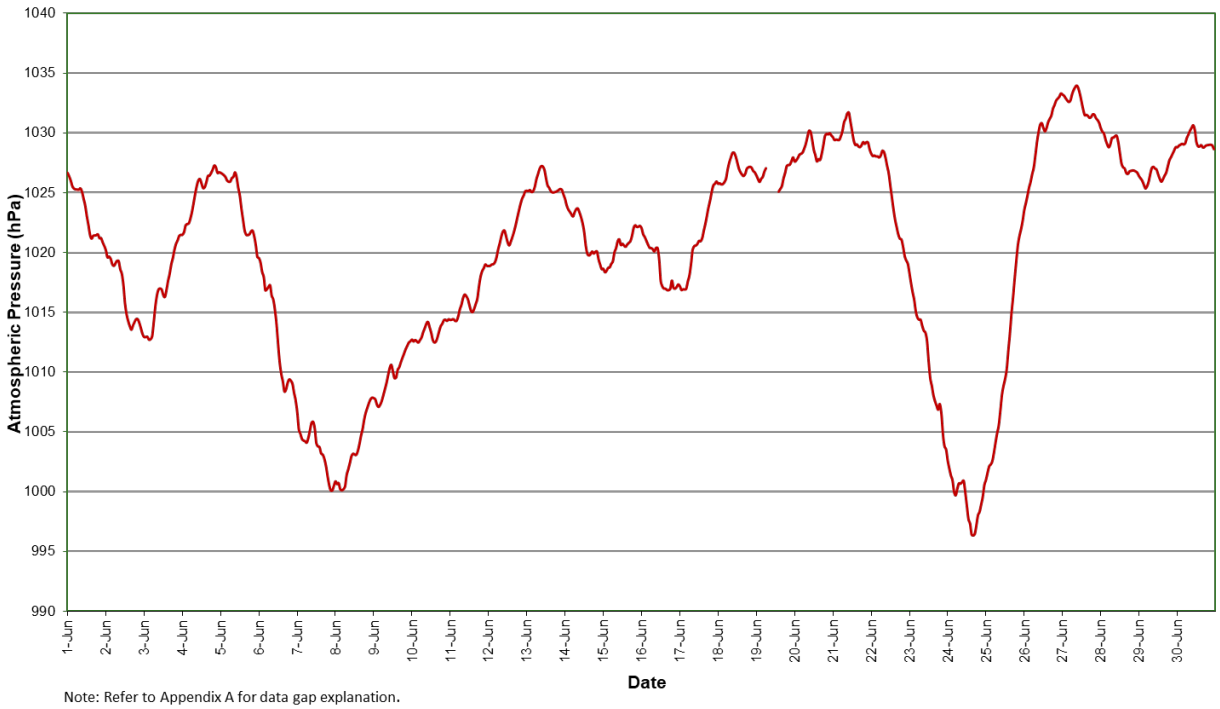


Figure 15: Atmospheric pressure (1 hour average) Station 4 Primula Avenue – June 2025

6.5.4 Wind speed

Wind Speed data for all AAQMS sites are presented in Figure 16 for the reporting period.

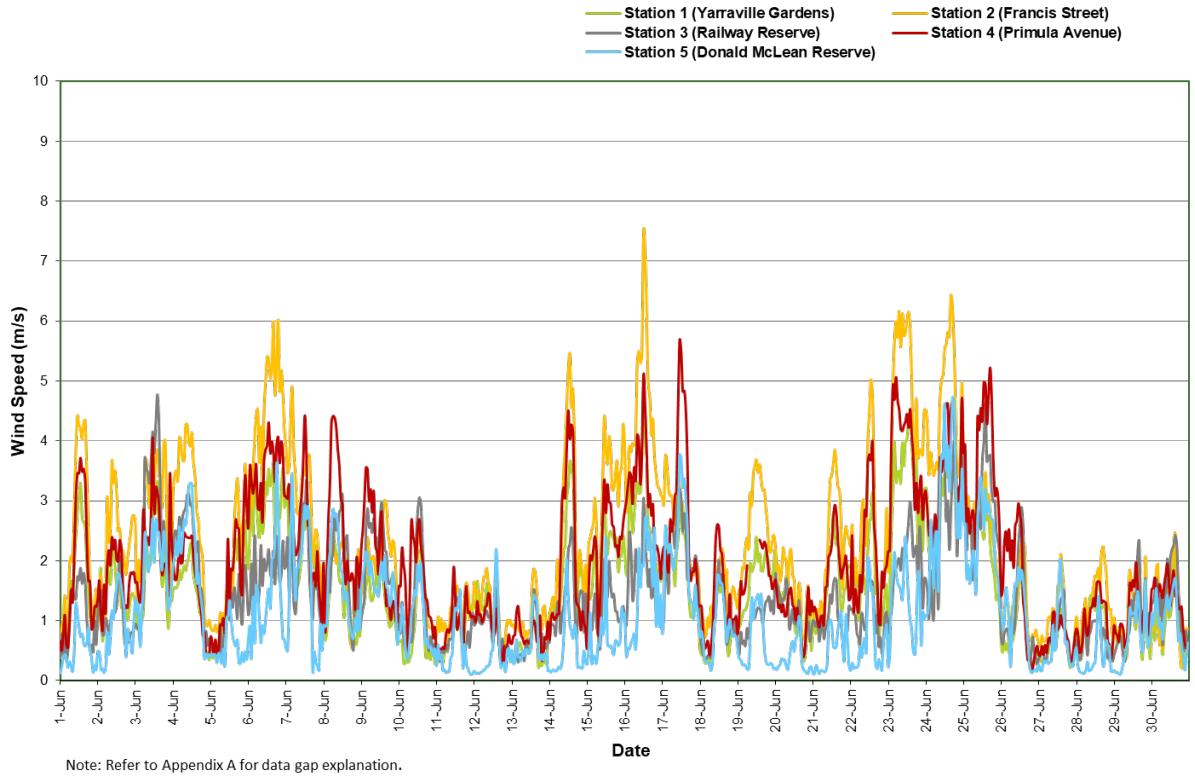


Figure 16: Wind speed (1 hour average) All AAQMs – June 2025

6.5.5 Wind rose – Station 1 (Yarraville Gardens)

A wind rose (1 hour average) for Yarraville Gardens AAQMS is presented in Figure 17.

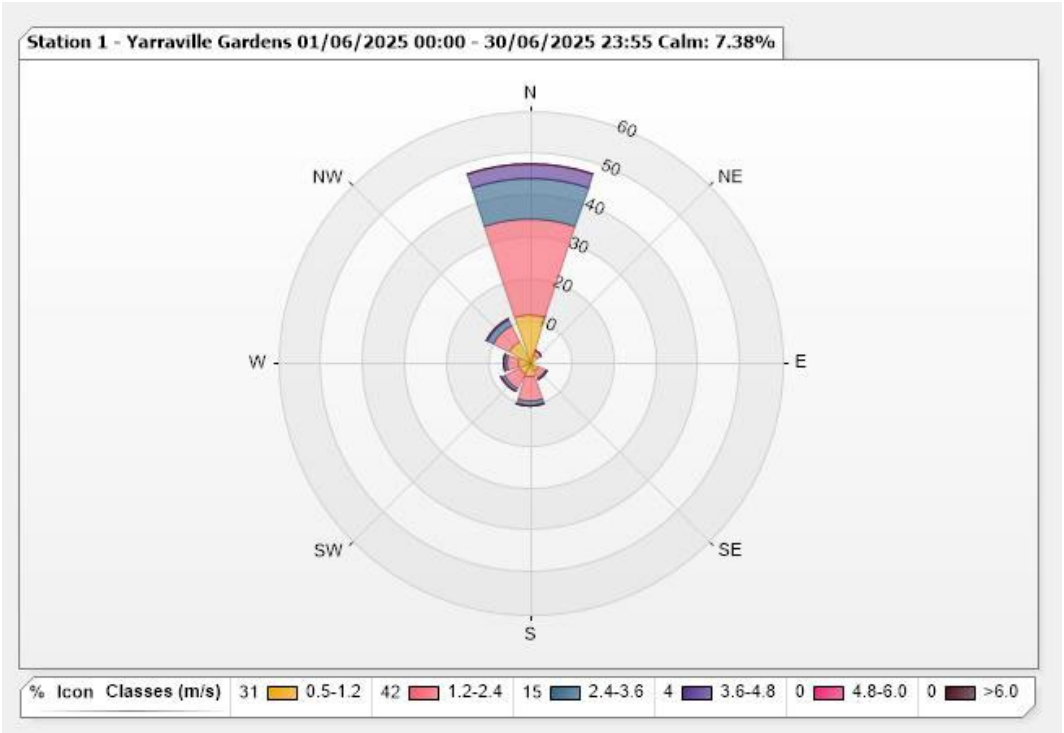


Figure 17: Wind speed (1 hour average) Station 1 – Yarraville Gardens

6.5.6 Wind rose – Station 2 (Francis Street)

A wind rose (1 hour average) for Station 2 (Francis Street AAQMS) is presented in Figure 18.

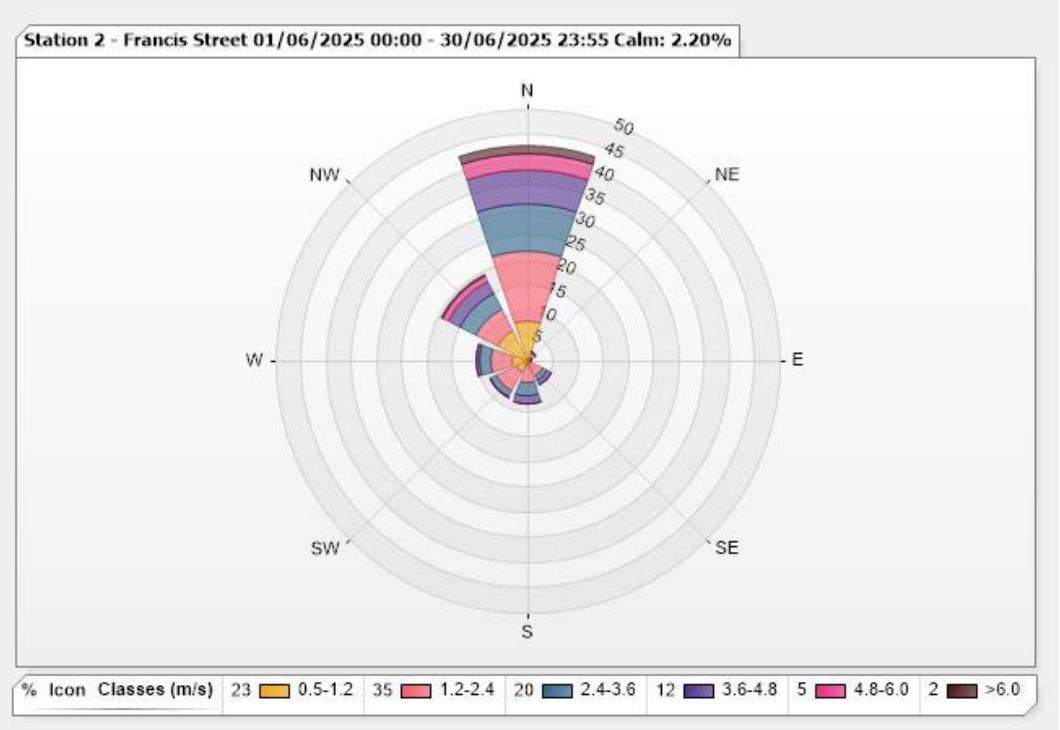


Figure 18: Wind speed (1 hour average) Station 2 – Francis Street

6.5.7 Wind rose – Station 3 (Railway Reserve)

A wind rose (1 hour average) for Station 3 (Railway Reserve AAQMS) is presented in Figure 19.

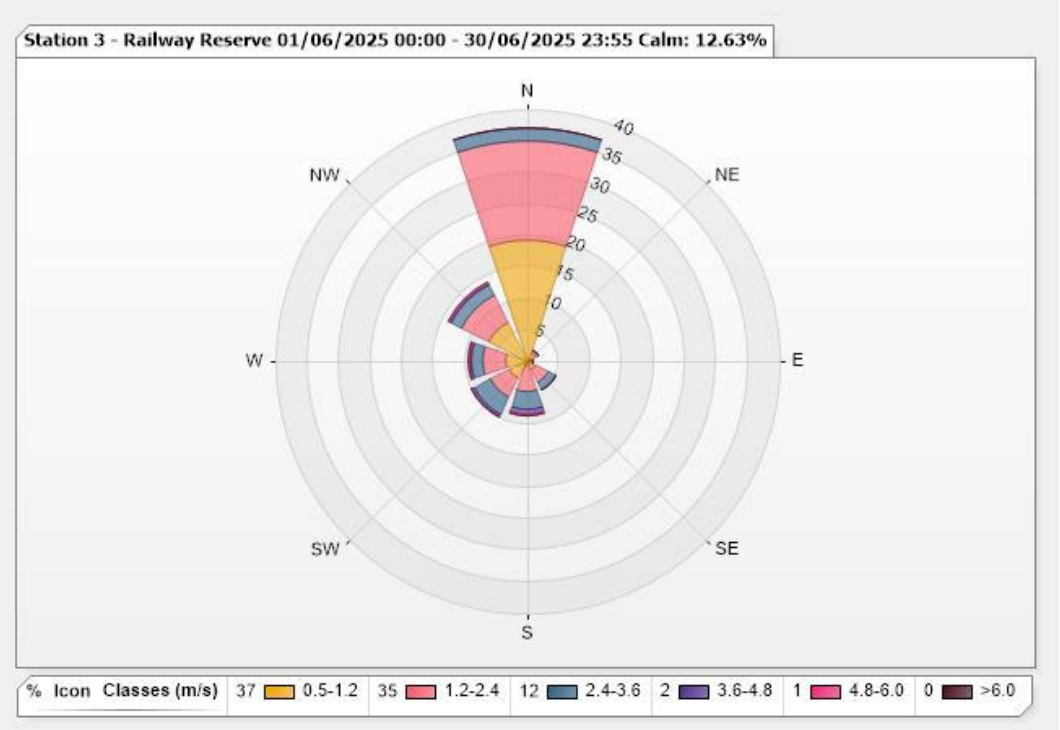


Figure 19: Wind speed (1 hour average) Station 3 – Railway Reserve

6.5.8 Wind rose – Station 4 (Primula Avenue)

A wind rose (1 hour average) for Station 4 (Primula Avenue AAQMS) is presented in Figure 20.

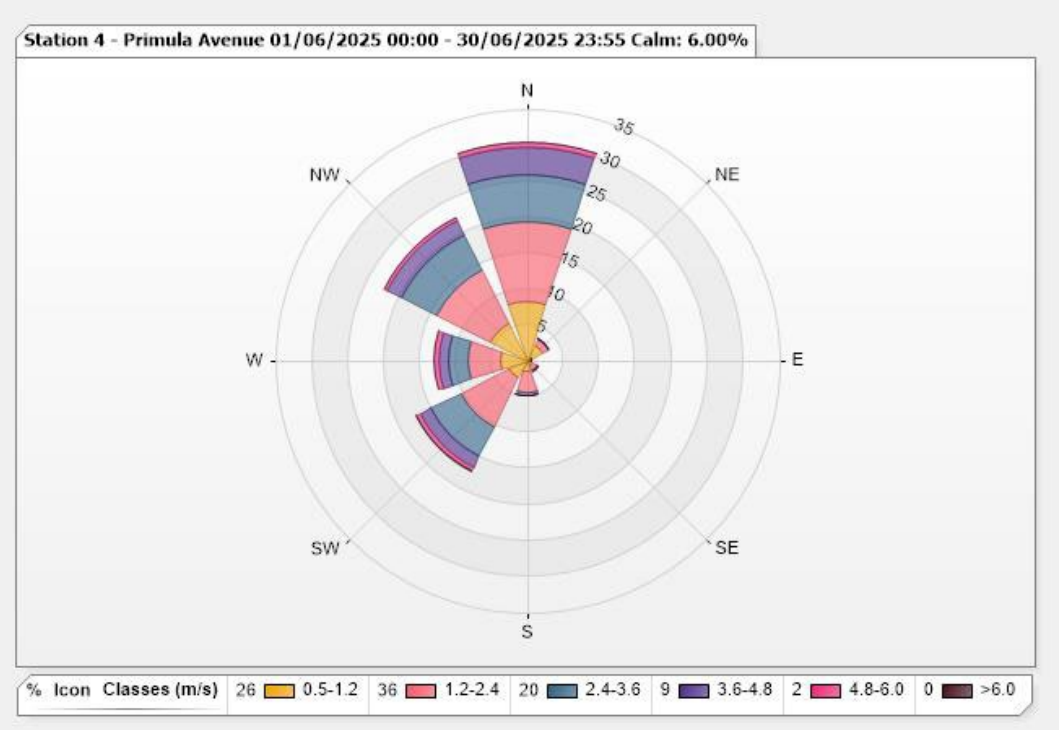


Figure 20: Wind speed (1 hour average) Station 4 – Primula Avenue

6.5.9 Wind rose – Station 5 (Donald McLean Reserve)

A wind rose (1 hour average) for Station 5 (Donald McLean Reserve AAQMS) is presented in Figure 21.

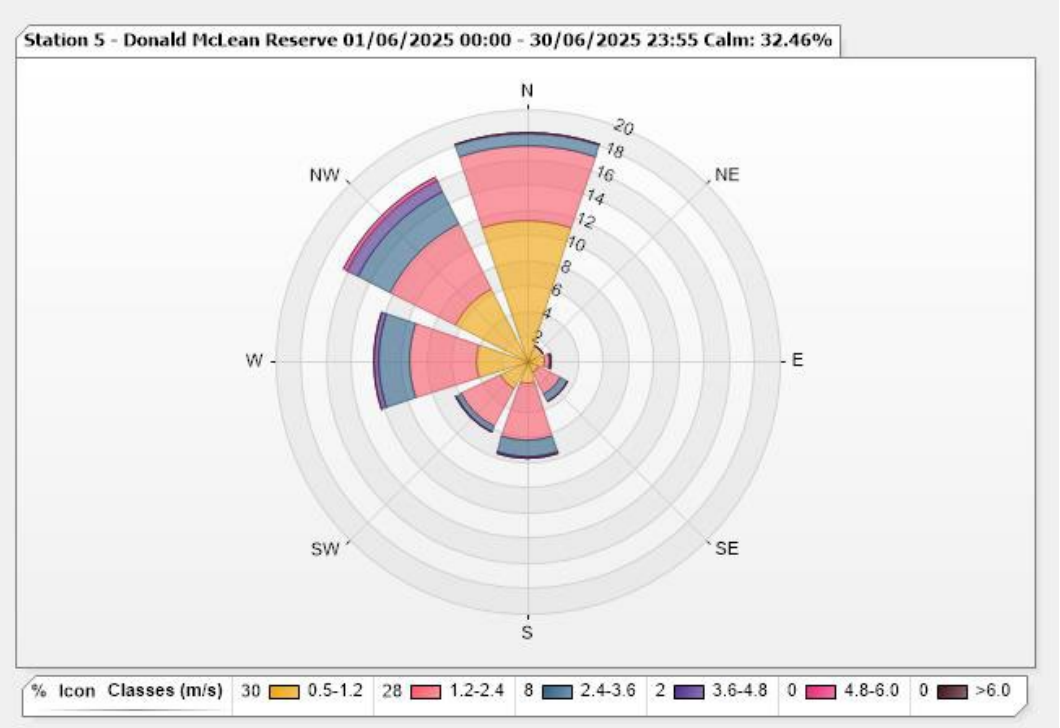


Figure 21: Wind speed (1 hour average) Station 5 – Donald McLean Reserve

7.0 QUALITY ASSURANCE

7.1 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 periods 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.

Automatic calibrations are conducted for NO_2 and CO daily to monitor and correct instrument drift where necessary. NO_2 and CO automatic calibrations are conducted once per day between 01:00 and 01:45 hours.

Data capture statistics for the reporting period 1 June to 30 June 2025 are shown in Table 18.

Averages were only collected for those periods where the 5 minute data constituted 75% data capture.

Data capture statistics for June 2025 were 90 percent and above for all parameters at all stations.

Table 18: Data capture

Parameter	Averaging period	Station	Collected periods	Available periods	Data capture[A]
$PM_{2.5}$	24 hour	1 – Yarraville Gardens	29	30	97%
	24 hour	2 – Francis Street	30	30	100%
	24 hour	3 – Railway Reserve	30	30	100%
	24 hour	4 – Primula Avenue	29	30	97%
	24 hour	5 – Donald McLean Reserve	30	30	100%
	24 hour	6 – Millers Road	30	30	100%
PM_{10}	24 hour	1 – Yarraville Gardens	29	30	97%
	24 hour	2 – Francis Street	30	30	100%
	24 hour	3 – Railway Reserve	30	30	100%
	24 hour	4 – Primula Avenue	29	30	97%
	24 hour	5 – Donald McLean Reserve	30	30	100%
	24 hour	6 – Millers Road	30	30	100%
NO_2	1 hour	4 – Primula Avenue	678	720	94%
CO	1 hour	4 – Primula Avenue	659	720	92%
Ambient temperature and relative humidity	1 hour	1 – Yarraville Gardens	703	720	98%
	1 hour	2 – Francis Street	719	720	100%
	1 hour	3 – Railway Reserve	719	720	100%
	1 hour	4 – Primula Avenue	713	720	99%
	1 hour	5 – Donald McLean Reserve	719	720	100%
	1 hour	6 – Millers Road	719	720	100%
Atmospheric pressure	1 hour	4 – Primula Avenue	713	720	99%
Wind speed and direction	1 hour	1 – Yarraville Gardens	704	720	98%
	1 hour	2 – Francis Street	720	720	100%
	1 hour	3 – Railway Reserve	720	720	100%
	1 hour	4 – Primula Avenue	713	720	99%
	1 hour	5 – Donald McLean Reserve	720	720	100%

Notes: A) Rounded to two significant figures

7.2 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. Appendix A lists the data exceptions for all AAQMS. Missing data periods during automatic calibrations of the gaseous atmospheric contaminants NO_2 and CO are not shown.

8.0 DISCUSSION

Table 19 presents the maximum measured concentration during the reporting period at Station 1 for $PM_{2.5}$ and PM_{10} compared with the respective criteria.

Table 20 presents the maximum measured concentration during the reporting period at Station 2, Station 3, Station 5, and Station 6 for $PM_{2.5}$ and PM_{10} compared with the respective criteria.

Table 21 presents maximum measured concentration during the reporting period at Station 4 for $PM_{2.5}$, PM_{10}, NO_2, CO, and BTEX compared with the respective criteria.

The June 2025 ambient air quality monitoring programme results met their respective air quality objectives for all parameters measured at all ambient air quality stations.

Data capture statistics for June 2025 were 90 percent and above for all parameters at all stations.

Table 19: Station 1 Summary – June 2025

Parameter	Units	Averaging period	Maximum concentration	SEPP Air quality objective[A]	Exceedances[C]	ERS Air quality objective[B] (APAC)	Exceedances[C]
$PM_{2.5}$	µg/m^3	24 hour	17	25	Nil	25	Nil
PM_{10}	µg/m^3	24 hour	26	50	Nil	50	Nil

Notes: A – SEPP(AAQ) objective
B – ERS Objective (APAC)
C – Exceedances refers to the number of individual days the criterion was exceeded at any station.

Table 20: Station 2, Station 3, Station 5, and Station 6 Summary – June 2025

Parameter	Units	Averaging period	Maximum concentration				SEPP Air quality objective[A]	Exceedances[C]	ERS Air quality objective[B] (APAC)	Exceedances[C]
			Station 2	Station 3	Station 5	Station 6				
$PM_{2.5}$	µg/m^3	24 hour	19	18	17	18	36	Nil	25	Nil
PM_{10}	µg/m^3	24 hour	35	29	23	46	60	Nil	50	Nil

Notes: A – SEPP(AQM) Intervention level
B – ERS Objective (APAC)
C – Exceedances refers to the number of individual days the criterion was exceeded at any station.

Table 21: Station 4 Summary – June 2025

Parameter	Units	Averaging period	Maximum concentration	SEPP Air quality objective	Exceedances[D]	ERS Air quality objective[C] (APAC)	Exceedances[D]
$PM_{2.5}$	µg/m^3	24 hour	17	36[A]	Nil	25[C]	Nil
PM_{10}	µg/m^3	24 hour	30	60[A]	Nil	50[C]	Nil
NO_2	ppb	1 hour	40	140[A]	Nil	80[C]	Nil
CO	ppm	1 hour	1.2	29[A]	Nil	-	-
CO	ppm	8 hour	0.80	-	-	9[C]	Nil
Benzene	ppb	24 hour	0.6	3.0[B]	Nil	9[C]	Nil
Ethylbenzene	ppb	24 hour	0.7	-	-	5000[C]	Nil
Toluene	ppb	24 hour	2.9	1000[B]	Nil	-	-
Total xylene isomers	ppb	24 hour	2.8	250[B]	Nil	2000[B]	Nil

Notes: A – SEPP(AQM) Intervention level
B – Air NEPM Monitoring investigation level
C – ERS objective (APAC)
D – Exceedances refers to the number of individual days the criterion was exceeded at any station

9.0 IMPORTANT INFORMATION RELATING TO THIS REPORT

Your attention is drawn to the document titled – “Important Information Relating to this Report”, which is included in Appendix C of this report. The statements presented in that document are intended to inform a reader of the report about its proper use. There are important limitations as to who can use the report and how it can be used. It is important that a reader of the report understands and has realistic expectations about those matters. The Important Information document does not alter the obligations Golder has under the contract between it and its client.

Signature Page

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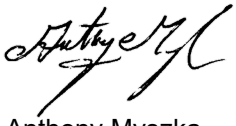

Anthony Myszka
Environmental Technician

Mark Tulau
Principal Environmental Scientist – Air and Noise

AM/MDT/hsl

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APPENDIX A

Data exceptions

Date from	Date to	Station	Parameters	Reason
12/06/2025 10:05	12/06/2025 13:00	1	PM_{10}, $PM_{2.5}$	Stabilisation after power failure
12/06/2025 10:00	12/06/2025 13:00	5	PM_{10}, $PM_{2.5}$	Power failure
12/06/2025 10:05	12/06/2025 13:00	2	PM_{10}, $PM_{2.5}$	Stabilisation after power failure
19/06/2025 07:45	19/06/2025 13:55	4	All parameters	Power failure
19/06/2025 14:00	20/06/2025 12:35	4	CO	Stabilisation after power failure
19/06/2025 14:00	20/06/2025 00:55	4	PM_{10}, $PM_{2.5}$	Stabilisation after power failure
20/06/2025 12:05	20/06/2025 16:00	5	PM_{10}, $PM_{2.5}$	Maintenance/calibration
20/06/2025 12:40	20/06/2025 14:50	4	CO, NO, NO_2, NO_x	Maintenance/calibration
24/06/2025 20:35	25/06/2025 11:25	1	All parameters	Power failure
25/06/2025 11:30	25/06/2025 20:00	1	PM_{10}, $PM_{2.5}$	Stabilisation after power failure
26/06/2025 11:40	26/06/2025 15:00	2	$PM_{2.5}$	Maintenance/calibration
26/06/2025 11:40	26/06/2025 17:00	2	PM_{10}	Maintenance/calibration
26/06/2025 12:55	26/06/2025 16:00	1	PM_{10}, $PM_{2.5}$	Maintenance/calibration
26/06/2025 13:20	26/06/2025 18:00	3	PM_{10}, $PM_{2.5}$	Maintenance/calibration
30/06/2025 11:45	30/06/2025 16:55	4	PM_{10}, $PM_{2.5}$	Maintenance/calibration
30/06/2025 13:20	30/06/2025 15:35	6	PM_{10}, $PM_{2.5}$	Maintenance/calibration

APPENDIX B

Laboratory certificates

WSP Australia P/L QLD
900 Ann Street
Fortitude Valley
QLD 4006

NATA Accredited
Accreditation Number 1261
Site Number 20794 & 2780

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Anthony Myszka**

Report **1235437-TO**
Project name
Project ID PS138652
Received Date Jun 23, 2025

Client Sample ID			**25-604 (CANISTER 1948)**	**25-605 (CANISTER 1945)**
Sample Matrix			**6L Passivated Canister**	**6L Passivated Canister**
Eurofins Sample No.			**B25-Jn0059996**	**B25-Jn0059997**
Date Sampled			**May 29, 2025**	**Jun 04, 2025**
Receipt Vac./Pressure (inHg)			**0.9**	**2.7**
Final Pressure (psi)			**5.1**	**5.1**
Test/Reference	LOR	Unit		
Dilution Factor*	0.1		1.4	1.5
US EPA Compendium Methods TO-15				
1.1-Dichloroethane	2	ug/m3	< 3	< 3
1.1-Dichloroethene	2	ug/m3	< 3	< 3
1.1.1-Trichloroethane	2.7	ug/m3	< 4	< 4
1.1.2-Trichloroethane	2.7	ug/m3	< 4	< 4
1.1.2.2-Tetrachloroethane	3.4	ug/m3	< 5	< 5
1.2-Dibromoethane (EDB)	3.6	ug/m3	< 5	< 5
1.2-Dichlorobenzene	3	ug/m3	< 4	< 4
1.2-Dichloroethane	2	ug/m3	< 3	< 3
1.2-Dichloropropane	2.3	ug/m3	< 3	< 3
1.2.4-Trichlorobenzene	15	ug/m3	< 21	< 22
1.2.4-Trimethylbenzene	2.5	ug/m3	< 4	< 4
1.3-Butadiene	2.2	ug/m3	< 3	< 3
1.3-Dichlorobenzene	3	ug/m3	< 4	< 4
1.3.5-Trimethylbenzene	2.5	ug/m3	< 4	< 4
1.4-Dichlorobenzene	3	ug/m3	< 4	< 4
1.4-Dioxane	7.2	ug/m3	< 10	< 11
2-Butanone (Methyl Ethyl Ketone)	5.9	ug/m3	< 8	< 9
2-Hexanone	8.2	ug/m3	< 11	< 12
2.2.4-Trimethylpentane	9.3	ug/m3	< 13	< 14
3-Chloropropene	1.6	ug/m3	< 2	< 2
4-Ethyltoluene	2.5	ug/m3	< 4	< 4
4-Methyl-2-Pentanone (MIBK)	2.1	ug/m3	< 3	< 3
Acetone	16.6	ug/m3	< 23	< 25
Benzene	1.6	ug/m3	< 2	< 2
Bromodichloromethane	3.4	ug/m3	< 5	< 5
Bromoform	5.2	ug/m3	< 7	< 8
Bromomethane	19.4	ug/m3	< 27	< 29
Carbon Disulfide	15.6	ug/m3	< 22	< 23
Carbon Tetrachloride	3.1	ug/m3	< 4	< 5

Client Sample ID			25-604 (CANISTER 1948)	25-605 (CANISTER 1945)
Sample Matrix			**6L Passivated Canister**	**6L Passivated Canister**
Eurofins Sample No.			**B25-Jn0059996**	**B25-Jn0059997**
Date Sampled			**May 29, 2025**	**Jun 04, 2025**
Receipt Vac./Pressure (inHg)			**0.9**	**2.7**
Final Pressure (psi)			**5.1**	**5.1**
Test/Reference	LOR	Unit		
US EPA Compendium Methods TO-15				
Chlorobenzene	2.3	ug/m3	< 3	< 3
Chloroethane	5.3	ug/m3	< 7	< 8
Chloroform	2.4	ug/m3	< 3	< 4
Chloromethane	10.3	ug/m3	< 14	< 15
Chlorotoluene (Benzyl Chloride)	2.6	ug/m3	< 4	< 4
cis-1.2-Dichloroethene	2	ug/m3	< 3	< 3
cis-1.3-Dichloropropene	2.3	ug/m3	< 3	< 3
Cyclohexane	3.5	ug/m3	< 5	< 5
Dibromochloromethane	4.3	ug/m3	< 6	< 6
Methylene Chloride	17.4	ug/m3	< 24	< 26
Ethanol	9.4	ug/m3	< 13	< 14
Ethylbenzene	2.2	ug/m3	< 3	< 3
Freon 11 (Trichlorofluoromethane)	2.8	ug/m3	< 4	< 4
Freon 113 (Trichlorotrifluoroethane)	3.8	ug/m3	< 5	< 6
Freon 114	3.5	ug/m3	< 5	< 5
Freon 12 (Dichlorodifluoromethane)	2.5	ug/m3	< 4	< 4
Heptane	2.1	ug/m3	< 3	< 3
Hexachlorobutadiene	21.3	ug/m3	< 30	< 32
Hexane	5	ug/m3	< 7	< 8
Isopropanol	50	ug/m3	< 70	< 75
m.p-Xylene	4.4	ug/m3	< 6	< 7
Xylenes - Total*	6.6	ug/m3	< 9	< 10
Methyl t-Butyl Ether (MTBE)	7.2	ug/m3	< 10	< 11
Naphthalene	10.5	ug/m3	< 15	< 16
o-Xylene	2.2	ug/m3	< 3	< 3
Propylene	8.6	ug/m3	< 12	< 13
Styrene	2.1	ug/m3	< 3	< 3
Tetrachloroethene	3.4	ug/m3	< 5	< 5
Tetrahydrofuran	1.5	ug/m3	< 2	< 2
Toluene	7.5	ug/m3	< 10	< 11
trans-1.2-Dichloroethene	2	ug/m3	< 3	< 3
trans-1.3-Dichloropropene	2.3	ug/m3	< 3	< 3
Trichloroethene	2.7	ug/m3	< 4	< 4
Vinyl Acetate	7.0	ug/m3	< 10	< 10
Vinyl Chloride	2.5	ug/m3	< 4	< 4
4-Bromofluorobenzene (surr.)	1	%	70	67

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
US EPA Compendium Methods TO-15	Brisbane	Jun 23, 2025	30 Days

- Method: SOP #6 Analysis of Volatile Organic Compounds in Summa Polished Canisters EPA Method TO-15 And Modified EPA Method TO-14A

eurofins

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Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	+61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

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IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: WSP Australia P/L QLD
Address: 900 Ann Street
Fortitude Valley
QLD 4006

Project Name:
Project ID: PS138652

Order No.: PS138652-106
Report #: 1235437
Phone: 07 3218 2222
Fax: 07 3831 4223

Received: Jun 23, 2025 7:40 AM
Due: Jul 7, 2025
Priority: 10 Day
Contact Name: Anthony Myszka

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Dilution Factor*	Final Pressure (psi)*	Receipt Vac./Pressure (in Hg)*	US EPA Compendium Methods TO-15
Brisbane Laboratory - NATA # 1261 Site # 20794 & 2780						X	X	X	X
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	25-604 (CANISTER 1948)	May 29, 2025		6L Passivated Canister	B25-Jn0059996	X	X	X	X
2	25-605 (CANISTER 1945)	Jun 04, 2025		6L Passivated Canister	B25-Jn0059997	X	X	X	X
Test Counts						2	2	2	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. Dilutions are performed on samples due to the presence of high level target species or the presence of high level non-target species.
3. Results are uncorrected for surrogate recoveries.
4. All QC limit exceedances and affected sample results are noted by flags. Each qualifying flag is defined below in section entitled 'Definition of Data Qualifying Flags' and additionally on individual sample results (where relevant).
5. "100% certification" is defined as evaluating the sampling system with humid zero air/N2 and humid calibration gases that pass through all active components of the sampling system. The system is "100% certified" if no significant additions or deletions (less than 0.2 ppbv each of target compounds) have occurred when challenged with the test gas stream.
6. The conversion equation from ppbv to g/m3 uses a temperature of 25 °C and an ambient sea level atmospheric pressure of 1 atmosphere (101.325 kPa) is assumed.
7. All canister samples are only analysed once temperature equilibrium with the laboratory has been achieved.
8. Safe Sampling Volume (SSV) - calculated by taking two-thirds of the breakthrough volume (direct method) and Appendix 1 of Method T0-17.
9. Samples were analysed on an 'as received' basis.
10. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
11. This report replaces any interim results previously issued.

Definition of Data Qualifying Flags

Qualifiers may have been used on the data analysis sheets and indicates as follows:

A01 Compound present in laboratory blank greater than reporting limit (background subtraction not performed).
A02 Estimated value.
A03 Exceeds instrument calibration range.
A04 Saturated peak.
A05 Exceeds quality control limits.
A06 Compound analysed for but not detected above the Limit of Reporting (LOR). See data page for project specific U-flag definition.
A07 Non-detected compound associated with low bias in the CCV.
A08 The identification is based on presumptive evidence.
A09 SSV has been exceeded for this compound. It is likely that this compound has been underestimated.
A10 LORs cited do not take into account sample dilution due to canister pressurisation.
A11 Naphthalene elutes outside the >C10-C12 range on the system used for sample analysis. As a result, >C10-C12 TRH value is equivalent to the modified F2 value.

Holding Times

Under conditions of normal usage for sampling ambient air, most Volatile Organic Compounds (VOCs) can be recovered from canisters near their original concentrations after storage times of up to thirty days. For thermal desorption tubes (TDT) samples should be refrigerated at <4°C in a clean environment during storage and analysed within 30 days of sample collection (within one week for limonene, carene, bis-chloromethyl ether and labile sulfur or nitrogen containing volatiles).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

ppbv: parts per billion by volume
ug/m3: micrograms per cubic metre
kPa: kilopascal
psig: pounds per square inch gauge

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
US EPA Compendium Methods TO-15							
1.1-Dichloroethane	ug/m3	< 2			2	Pass	
1.1-Dichloroethene	ug/m3	< 2			2	Pass	
1.1.1-Trichloroethane	ug/m3	< 2.7			2.7	Pass	
1.1.2-Trichloroethane	ug/m3	< 2.7			2.7	Pass	
1.1.2.2-Tetrachloroethane	ug/m3	< 3.4			3.4	Pass	
1.2-Dibromoethane (EDB)	ug/m3	< 3.6			3.6	Pass	
1.2-Dichlorobenzene	ug/m3	< 3			3	Pass	
1.2-Dichloroethane	ug/m3	< 2			2	Pass	
1.2-Dichloropropane	ug/m3	< 2.3			2.3	Pass	
1.2.4-Trichlorobenzene	ug/m3	< 15			15	Pass	
1.2.4-Trimethylbenzene	ug/m3	< 2.5			2.5	Pass	
1.3-Butadiene	ug/m3	< 2.2			2.2	Pass	
1.3-Dichlorobenzene	ug/m3	< 3			3	Pass	
1.3.5-Trimethylbenzene	ug/m3	< 2.5			2.5	Pass	
1.4-Dichlorobenzene	ug/m3	< 3			3	Pass	
1.4-Dioxane	ug/m3	< 7.2			7.2	Pass	
2-Butanone (Methyl Ethyl Ketone)	ug/m3	< 5.9			5.9	Pass	
2-Hexanone	ug/m3	< 8.2			8.2	Pass	
2.2.4-Trimethylpentane	ug/m3	< 9.3			9.3	Pass	
3-Chloropropene	ug/m3	< 1.6			1.6	Pass	
4-Ethyltoluene	ug/m3	< 2.5			2.5	Pass	
4-Methyl-2-Pentanone (MIBK)	ug/m3	< 2.1			2.1	Pass	
Acetone	ug/m3	< 16.6			16.6	Pass	
Benzene	ug/m3	< 1.6			1.6	Pass	
Bromodichloromethane	ug/m3	< 3.4			3.4	Pass	
Bromoform	ug/m3	< 5.2			5.2	Pass	
Bromomethane	ug/m3	< 19.4			19.4	Pass	
Carbon Disulfide	ug/m3	< 15.6			15.6	Pass	
Carbon Tetrachloride	ug/m3	< 3.1			3.1	Pass	
Chlorobenzene	ug/m3	< 2.3			2.3	Pass	
Chloroethane	ug/m3	< 5.3			5.3	Pass	
Chloroform	ug/m3	< 2.4			2.4	Pass	
Chloromethane	ug/m3	< 10.3			10.3	Pass	
Chlorotoluene (Benzyl Chloride)	ug/m3	< 2.6			2.6	Pass	
cis-1.2-Dichloroethene	ug/m3	< 2			2	Pass	
cis-1.3-Dichloropropene	ug/m3	< 2.3			2.3	Pass	
Cyclohexane	ug/m3	< 3.5			3.5	Pass	
Dibromochloromethane	ug/m3	< 4.3			4.3	Pass	
Methylene Chloride	ug/m3	< 17.4			17.4	Pass	
Ethanol	ug/m3	< 9.4			9.4	Pass	
Ethylbenzene	ug/m3	< 2.2			2.2	Pass	
Freon 11 (Trichlorofluoromethane)	ug/m3	< 2.8			2.8	Pass	
Freon 113 (Trichlorotrifluoroethane)	ug/m3	< 3.8			3.8	Pass	
Freon 114	ug/m3	< 3.5			3.5	Pass	
Freon 12 (Dichlorodifluoromethane)	ug/m3	< 2.5			2.5	Pass	
Heptane	ug/m3	< 2.1			2.1	Pass	
Hexachlorobutadiene	ug/m3	< 21.3			21.3	Pass	
Hexane	ug/m3	< 5			5	Pass	
Isopropanol	ug/m3	< 50			50	Pass	
m.p-Xylene	ug/m3	< 4.4			4.4	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Xylenes - Total*	ug/m3	< 6.6			6.6	Pass	
Methyl t-Butyl Ether (MTBE)	ug/m3	< 7.2			7.2	Pass	
Naphthalene	ug/m3	< 10.5			10.5	Pass	
o-Xylene	ug/m3	< 2.2			2.2	Pass	
Propylene	ug/m3	< 8.6			8.6	Pass	
Styrene	ug/m3	< 2.1			2.1	Pass	
Tetrachloroethene	ug/m3	< 3.4			3.4	Pass	
Tetrahydrofuran	ug/m3	< 1.5			1.5	Pass	
Toluene	ug/m3	< 7.5			7.5	Pass	
trans-1.2-Dichloroethene	ug/m3	< 2			2	Pass	
trans-1.3-Dichloropropene	ug/m3	< 2.3			2.3	Pass	
Trichloroethene	ug/m3	< 2.7			2.7	Pass	
Vinyl Acetate	ug/m3	< 7			7.0	Pass	
Vinyl Chloride	ug/m3	< 2.5			2.5	Pass	
LCS - % Recovery							
US EPA Compendium Methods TO-15							
1.1-Dichloroethane	%	120			70-130	Pass	
1.1-Dichloroethene	%	96			70-130	Pass	
1.1.1-Trichloroethane	%	108			70-130	Pass	
1.1.2-Trichloroethane	%	121			70-130	Pass	
1.1.2.2-Tetrachloroethane	%	124			70-130	Pass	
1.2-Dibromoethane (EDB)	%	111			70-130	Pass	
1.2-Dichlorobenzene	%	106			70-130	Pass	
1.2-Dichloroethane	%	119			70-130	Pass	
1.2-Dichloropropane	%	118			70-130	Pass	
1.2.4-Trichlorobenzene	%	87			70-130	Pass	
1.2.4-Trimethylbenzene	%	71			70-130	Pass	
1.3-Butadiene	%	98			70-130	Pass	
1.3-Dichlorobenzene	%	98			70-130	Pass	
1.3.5-Trimethylbenzene	%	80			70-130	Pass	
1.4-Dichlorobenzene	%	90			70-130	Pass	
1.4-Dioxane	%	115			70-130	Pass	
2-Butanone (Methyl Ethyl Ketone)	%	85			70-130	Pass	
2-Hexanone	%	97			70-130	Pass	
2.2.4-Trimethylpentane	%	74			70-130	Pass	
3-Chloropropene	%	121			70-130	Pass	
4-Ethyltoluene	%	91			70-130	Pass	
4-Methyl-2-Pentanone (MIBK)	%	76			70-130	Pass	
Acetone	%	128			70-130	Pass	
Benzene	%	118			70-130	Pass	
Bromodichloromethane	%	129			70-130	Pass	
Bromoform	%	93			70-130	Pass	
Bromomethane	%	90			70-130	Pass	
Carbon Disulfide	%	110			70-130	Pass	
Carbon Tetrachloride	%	114			70-130	Pass	
Chlorobenzene	%	89			70-130	Pass	
Chloroethane	%	112			70-130	Pass	
Chloroform	%	117			70-130	Pass	
Chloromethane	%	117			70-130	Pass	
Chlorotoluene (Benzyl Chloride)	%	121			70-130	Pass	
cis-1.2-Dichloroethene	%	94			70-130	Pass	
cis-1.3-Dichloropropene	%	90			70-130	Pass	
Cyclohexane	%	71			70-130	Pass	
Dibromochloromethane	%	110			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Methylene Chloride	%	123			70-130	Pass	
Ethanol	%	129			70-130	Pass	
Ethylbenzene	%	76			70-130	Pass	
Freon 11 (Trichlorofluoromethane)	%	111			70-130	Pass	
Freon 113 (Trichlorotrifluoroethane)	%	83			70-130	Pass	
Freon 114	%	87			70-130	Pass	
Freon 12 (Dichlorodifluoromethane)	%	113			70-130	Pass	
Heptane	%	71			70-130	Pass	
Hexachlorobutadiene	%	115			70-130	Pass	
Hexane	%	76			70-130	Pass	
Isopropanol	%	107			70-130	Pass	
m.p-Xylene	%	98			70-130	Pass	
Xylenes - Total*	%	93			70-130	Pass	
Methyl t-Butyl Ether (MTBE)	%	74			70-130	Pass	
Naphthalene	%	125			70-130	Pass	
o-Xylene	%	81			70-130	Pass	
Propylene	%	121			70-130	Pass	
Styrene	%	76			70-130	Pass	
Tetrachloroethene	%	90			70-130	Pass	
Tetrahydrofuran	%	76			70-130	Pass	
Toluene	%	89			70-130	Pass	
trans-1.2-Dichloroethene	%	112			70-130	Pass	
trans-1.3-Dichloropropene	%	99			70-130	Pass	
Trichloroethene	%	91			70-130	Pass	
Vinyl Acetate	%	91			70-130	Pass	
Vinyl Chloride	%	114			70-130	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	N/A
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	N/A
Some samples have been subcontracted	No

Authorised by:

Zoe Flynn	Analytical Services Manager
Jonathon Angell	Senior Analyst-Air

Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Queensland Government

Forensic and Scientific Services

CERTIFICATE OF ANALYSIS

CLIENT:

WSP Golder Associates
Building 7, Botanicca Corporate Park
570 - 588 Swan Street
Richmond VIC 3121

ATTN: Anthony Myszka

Laboratory Reference	: SSP94658
Client Order Number	: n/a
Quote Number	: n/a
Client Project	: n/a
Client Batch Reference	: PS138652-106
Date Received	: 03-July-2025
Date Commenced	: 03-July-2025
Laboratory Number/s	: 25KS902-903

CC:

Submitting Authority : WSP-Golder Associates

Number of Samples : Two (2) Summa canisters

Reason for Analysis : Analysis of Volatile Organic Compounds (VOCs) in air

Method/s of Analysis : QIS28237 – Identification, confirmation and quantitation of Volatile Organic Compounds (VOCs) by GCMS using an in-house method as per EPA method TO15

Remarks : Sample details and results are summarised in Table 1.

.....
Renu Patel
Analyst, Organics Laboratory
08th July 2025

NATA Accredited Laboratory 41
Accredited for compliance with ISO/IEC 17025 - Testing

This report overrides all previous reports. The results relate solely to the sample/s as received and are limited to the specific tests undertaken as listed on the report. The results of this report are confidential and are not to be used or disclosed to any other person or used for any other purpose, whether directly or indirectly, unless that use is disclosed or the purpose is expressly authorised in writing by Queensland Health and the named recipient on this report. To the fullest extent permitted by law, Queensland Health will not be liable for any loss or claim (including legal costs calculated on an indemnity basis) which arise because of (a) problems related to the merchantability, fitness or quality of the sample/s, or (b) any negligent or unlawful act or omissions by Queensland Health that is connected with any activities or services provided by Queensland Health under this agreement (including the timing and/or method under which the sample/s were taken, stored or transported).

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CERTIFICATE OF ANALYSIS

Laboratory Reference: SSP94658
Laboratory Number: 25KS902-903

Table 1: Results for Summa canister analysis

Client Reference				25-677	25-678
Sample Type				Silco Canister #1726	Silco Canister #1930
Sampling Time / Date				n/a	n/a
Sample Description				ambient air	ambient air
Method	Volatile Organic Compounds (VOCs) by GCMS	Units	Reporting Limit	25KS902	25KS903
28237	Benzene	ppbv	0.5	< LOR	< LOR
28237	Toluene	ppbv	0.5	**1.4**	< LOR
28237	Ethylbenzene	ppbv	0.5	< LOR	< LOR
28237	m- & p-Xylene	ppbv	0.5	**0.6**	**0.5**
28237	o-Xylene	ppbv	0.5	< LOR	< LOR
Sample volume#		L	n/a	5.2	5.4
Final pressure#		psi	n/a	1.8	1.4

Temperature and atmospheric pressure at time of sampling unavailable

Calculated sample volumes and final pressures are not covered by NATA accreditation

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Queensland Government

Forensic and Scientific Services

CERTIFICATE OF ANALYSIS

CLIENT: WSP Golder Associates
Building 7, Botanicca Corporate Park
570 - 588 Swan Street
Richmond VIC 3121

ATTN: Anthony Myszka

CC:

Laboratory Reference	: SSP94659
Client Order Number	: n/a
Quote Number	: n/a
Client Project	: n/a
Client Batch Reference	: PS138652-106
Date Received	: 03-July-2025
Date Commenced	: 03-July-2025
Laboratory Number/s	: 25KS904-905

Submitting Authority : WSP-Golder Associates

Number of Samples : Two (2) Summa canisters

Reason for Analysis : Analysis of Volatile Organic Compounds (VOCs) in air

Method/s of Analysis : QIS28237 – Identification, confirmation and quantitation of Volatile Organic Compounds (VOCs) by GCMS using an in-house method as per EPA method TO15

Remarks : Sample details and results are summarised in Table 1.

.....
Renu Patel
Analyst, Organics Laboratory
08th July 2025

NATA Accredited
Laboratory 41
Accredited for compliance with ISO/IEC 17025 - Testing

SSP94659

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CERTIFICATE OF ANALYSIS

Laboratory Reference: SSP94659
Laboratory Number: 25KS904-905

Table 1: Results for Summa canister analysis

Client Reference				25-685	25-713
Sample Type				Silco Canister #1738	Silco Canister #2498
Sampling Time / Date				n/a	n/a
Sample Description				ambient air	ambient air
Method	Volatile Organic Compounds (VOCs) by GCMS	Units	Reporting Limit	25KS904	25KS905
28237	Benzene	ppbv	0.5	< LOR	< LOR
28237	Toluene	ppbv	0.5	< LOR	**0.9**
28237	Ethylbenzene	ppbv	0.5	< LOR	< LOR
28237	m- & p-Xylene	ppbv	0.5	**0.5**	**0.7**
28237	o-Xylene	ppbv	0.5	< LOR	< LOR
Sample volume#		L	n/a	4.6	4.1
Final pressure#		psi	n/a	3.4	4.7

Temperature and atmospheric pressure at time of sampling unavailable

Calculated sample volumes and final pressures are not covered by NATA accreditation

This report overrides all previous reports. The results relate solely to the sample/s as received and are limited to the specific tests undertaken as listed on the report. The results of this report are confidential and are not to be used or disclosed to any other person or used for any other purpose, whether directly or indirectly, unless that use is disclosed or the purpose is expressly authorised in writing by Queensland Health and the named recipient on this report. To the fullest extent permitted by law, Queensland Health will not be liable for any loss or claim (including legal costs calculated on an indemnity basis) which arise because of (a) problems related to the merchantability, fitness or quality of the sample/s, or (b) any negligent or unlawful act or omissions by Queensland Health that is connected with any activities or services provided by Queensland Health under this agreement (including the timing and/or method under which the sample/s were taken, stored or transported).

APPENDIX C

Important information relating to this report

The document ("Report") to which this page is attached and which this page forms a part of, has been issued by Golder Associates Pty Ltd ("Golder") subject to the important limitations and other qualifications set out below.

This Report constitutes or is part of services ("Services") provided by Golder to its client ("Client") under and subject to a contract between Golder and its Client ("Contract"). The contents of this page are not intended to and do not alter Golder's obligations (including any limits on those obligations) to its Client under the Contract.

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The scope of Golder's Services and the period of time they relate to are determined by the Contract and are subject to restrictions and limitations set out in the Contract. If a service or other work is not expressly referred to in this Report, do not assume that it has been provided or performed. If a matter is not addressed in this Report, do not assume that any determination has been made by Golder in regards to it.

At any location relevant to the Services conditions may exist which were not detected by Golder, in particular due to the specific scope of the investigation Golder has been engaged to undertake. Conditions can only be verified at the exact location of any tests undertaken. Variations in conditions may occur between tested locations and there may be conditions which have not been revealed by the investigation and which have not therefore been taken into account in this Report.

Golder accepts no responsibility for and makes no representation as to the accuracy or completeness of the information provided to it by or on behalf of the Client or sourced from any third party. Golder has assumed that such information is correct unless otherwise stated and no responsibility is accepted by Golder for incomplete or inaccurate data supplied by its Client or any other person for whom Golder is not responsible. Golder has not taken account of matters that may have existed when the Report was prepared but which were only later disclosed to Golder.

Having regard to the matters referred to in the previous paragraphs on this page in particular, carrying out the Services has allowed Golder to form no more than an opinion as to the actual conditions at any relevant location. That opinion is necessarily constrained by the extent of the information collected by Golder or otherwise made available to Golder. Further, the passage of time may affect the accuracy, applicability or usefulness of the opinions, assessments or other information in this Report. This Report is based upon the information and other circumstances that existed and were known to Golder when the Services were performed and this Report was prepared. Golder has not considered the effect of any possible future developments including physical changes to any relevant location or changes to any laws or regulations relevant to such location.

Where permitted by the Contract, Golder may have retained subconsultants affiliated with Golder to provide some or all of the Services. However, it is Golder which remains solely responsible for the Services and there is no legal recourse against any of Golder's affiliated companies or the employees, officers or directors of any of them.

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