

# Wynnum Citizen Science Air Monitoring Project

## Mid Project fact sheet

### About the project

The Department of Environment and Science (DES) is working in partnership with Clean Air Wynnum (CAW) and Bayside Creeks Catchment Group to improve community understanding of air quality monitoring and associated standards through citizen science. The project involves monitoring airborne particles over 12 months (December 2018 – December 2019), dust deposition and dust composition in collaboration with community members from CAW.

The project involves CAW participants using low-cost particle sensors (PurpleAir and ArchHUB devices) to measure particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>) in real-time and assess against national air quality standards. Twelve devices are located across the Wynnum area (Figure 1). The participants also undertook deposition sampling during November 2018 and May 2019 to assess dust deposition (nuisance), and dust composition analysis using surface wipe and dust gauge samples to determine the types of dust present in Wynnum homes.

PM<sub>2.5</sub> and PM<sub>10</sub> concentrations are measured in micrograms per cubic metre of air ( $\mu\text{g}/\text{m}^3$ ), and were monitored and assessed against the [National Environment Protection \(Ambient Air Quality\) Measure \(NEPM\)](#) standards for safeguarding human health.

This fact sheet provides all results from December 2018–June 2019.

### PM<sub>2.5</sub> and PM<sub>10</sub>

Data collected by CAW participants shows that air quality in the Wynnum area is of good quality, and fluctuates in response to regional influences, local events and meteorology. As at 30 June 2019, all daily averages of PM<sub>2.5</sub> were within NEPM standards, with the exception of one day that exceeded the standard due to significant fog and potentially local fires (Figure 2). All daily averages of PM<sub>10</sub> were within NEPM standards. Low-cost devices may record aerosols (fog) as particles and therefore overestimate PM<sub>2.5</sub> and PM<sub>10</sub> in foggy conditions.

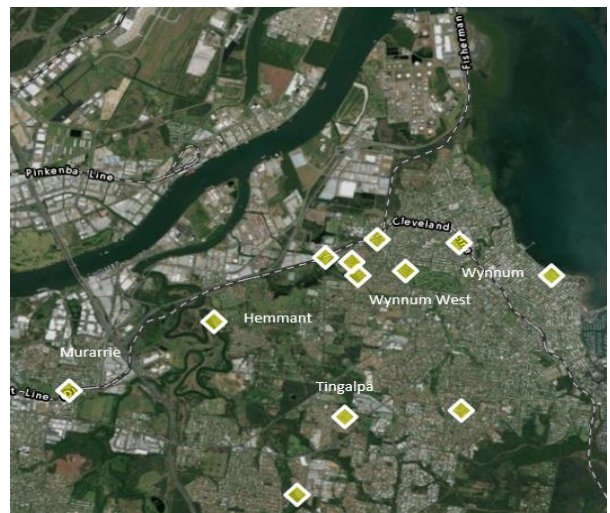


Figure 1: Project area showing device locations.

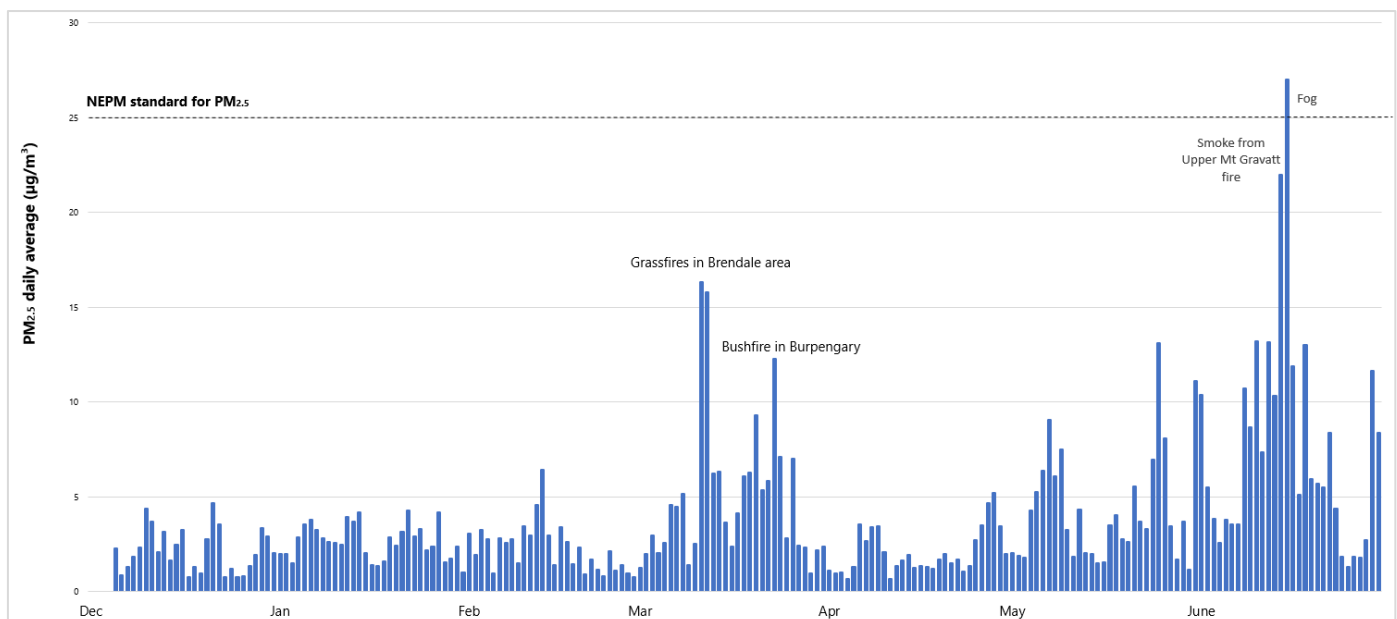


Figure 2: Average daily PM<sub>2.5</sub> concentrations from December 2018 to June 2019.

## Dust deposition

Dust deposition gauges measured dustfall rate at four sites during November 2018 and May 2019. Airborne dust that settled in the gauge was collected, filtered and weighed to determine how much dust was deposited on average each day over one month (reported in **mg/m<sup>2</sup>/day**). A guideline of **120mg/m<sup>2</sup>/day** of insoluble dust averaged over one month is commonly used as an indication of dust nuisance.

The average dustfall rate was **75mg/m<sup>2</sup>/day** during November 2018 and **20mg/m<sup>2</sup>/day** during May 2019. All dustfall rates were below the nuisance guideline (Figure 3).

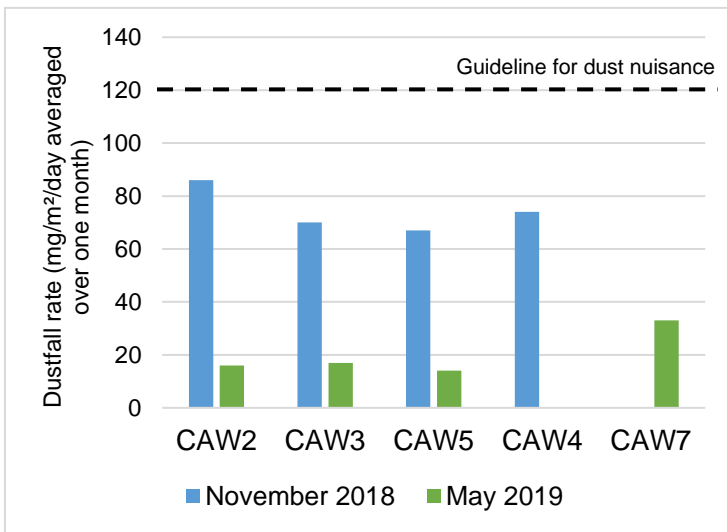


Figure 3: Dustfall rates during November 2018 and May 2019.

## Dust composition

Dust deposited in the gauges were also analysed to identify particle types. The majority of each sample consisted of **mineral dust from soil or rock**, with small amounts of plant and insect debris, rubber dust and slime occurring in all samples. Minor to trace amounts of coal were detected in November samples, with an average of 2% (Figure 4). Only trace amounts were detected in May samples (Figure 5).

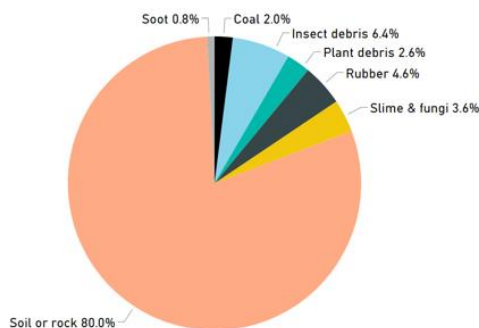


Figure 4: Average particle types of dust samples collected in November 2018.

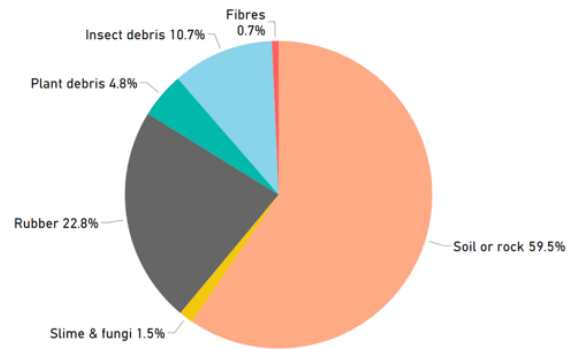


Figure 5: Average particle types of dust samples collected in May 2019.

## Surface wipe dust composition

The majority of each surface wipe dust sample consisted of **mineral dust from soil or rock**, and **black rubber dust** (Figure 6). Only a trace amount (less than 1%) of coal was identified in samples at one property.

Smaller proportions of insect and plant debris, cement dust and fibres were also detected across samples, which is common in domestic environments.

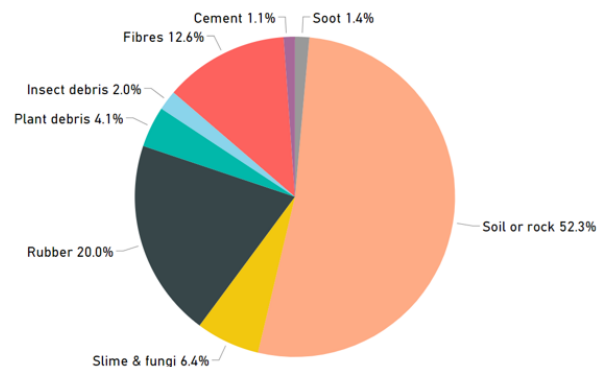


Figure 6: Average particle types of seven surface wipe samples.

**To learn more about the devices and see real-time readings, visit the PurpleAir webpage:**

<https://www.purpleair.com/map?#11.73/-27.4541/153.0985>

**To learn more about the project and air monitoring, visit the DES webpage:**

<https://www.qld.gov.au/environment/pollution/monitoring/air/air-programs/wynnum-citizen-science>