



Rhodes Remediation Projects

Air Quality Monitoring - PM₁₀ Dust Data

PM₁₀ refers to any dust or particulate matter (PM) with an aerodynamic diameter less than or equal to 10 microns (10 millionths of a metre or smaller than 1/7th of a hair width). The symbol for a micron, also known as a micrometre, is μm . Particulate levels in air are measured in micrograms by the weight of the particles per cubic metre of air ($\mu\text{g}/\text{m}^3$).

Health impacts associated with PM₁₀

Monitoring PM₁₀ in the atmosphere is important since elevated levels of particulate matter, especially fine particulate matter, can negatively affect the air we breathe. It is thought that particles smaller than 2.5 μm in diameter are the greatest risk to human health because they can be inhaled deep within the lungs. When particles are between 2.5 and 10 μm in diameter the risk reduces, and when they are larger than 10 μm , as in 'nuisance dust', the risk reduces further still.

Elevated PM₁₀ in the atmosphere can sometimes cause people to experience nose and throat irritation. It can also increase the number and severity of asthma attacks or reduce the body's capacity to combat infection. When communities are exposed to elevated PM₁₀ levels over long periods of time, some individuals may develop more serious health problems such as respiratory or cardiovascular disease.

Sources of PM₁₀

Particulate matter includes a broad range of substances, with particles in the atmosphere originating from both natural and artificial sources. PM₁₀ can include soil dust minerals, sea-salt and pollens, as well as particles from the combustion of fossil fuels in motor vehicles and industrial plants. Particles in smoke from bushfires and wood stoves are another sporadic source of PM₁₀ emissions.



PM₁₀ monitoring is conducted on site and in the community because remediation activities contribute to local atmospheric PM₁₀ levels. PM₁₀ is mainly generated on site when wind blows over newly excavated ground or soil stockpiles, or when vehicles drive along dirt roads. Despite the use of dust controls like water sprays, tarpaulins and sealants, the wind may carry particulate matter beyond site boundaries into the surrounding area.

A secondary source of PM₁₀ on site is combustion emissions. These emissions come from vehicle exhausts as well as from the thermal plants that treat the contaminated soil and sediment. To minimise the thermal plants' contributions to local atmospheric PM₁₀, particulate levels in their steam plumes must fall below a limit set by the NSW Department of Environment and Climate Change (DECC).

PM₁₀ monitoring in the community

Local atmospheric PM₁₀ levels are monitored at two off-site locations: Blaxland Road and Gauthorpe Street, Rhodes. These locations are the closest residential receptors to the Rhodes Remediation Projects and the most sensitive.

The PM₁₀ monitoring standard

The national 24-hour average exposure standard for PM₁₀ in air is specified in the *National Environment Protection Measure for Ambient Air Quality* (also referred to as the Air NEPM). It is set at a concentration of 50µg/m³. This 24-hour concentration level should not be exceeded at a monitoring location licensed by the DECC more than five times in a year. Thiess Services has adopted this standard for monitoring PM₁₀ concentrations at the Gauthorpe Street residential receptor and at the licensed location, Blaxland Road. If the 50µg/m³ 24-hour concentration level is exceeded at any time, Thiess Services must increase 'best practice' controls on site at all dust generating locations. Appropriate regulatory authorities, including the NSW DECC, must also be notified of the exceedance.

How PM₁₀ is measured

PM₁₀ levels are monitored using a tapered element oscillating micro balance analyser (TEOM), fitted with an inlet sized to measure PM₁₀ concentrations.



Average 24-hour PM₁₀ concentrations measured by the TEOMs located at Blaxland Road and Gauthorpe Street, Rhodes, are shown in the air quality monitoring graphs on this website.

(Monitoring using the TEOMs is carried out with consideration to: Australian Standard 3580.9.8-2001 Methods for Sampling and Analysis of Ambient Air – Determination of Suspended Particulate Matter – PM₁₀ Continuous Direct Mass Method using a Tapered Element Oscillating Microbalance Analyser.)