



16. APPENDIX C: WESTERN - METROPOLITAN RAIL SYSTEMS COAL DUST MONITORING PROGRAM

Western - Metropolitan Rail Systems Coal Dust Monitoring Program

Objectives

- To undertake a Dust Monitoring Program on the Western and Metropolitan Rail Systems to evaluate the impact of coal dust from trains.
- Assess both the health risk and nuisance impacts of dust on communities adjacent to these rail systems, and to determine the percentage contribution of coal dust particles to overall dust levels.
- Assess the impact of coal wagon dust mitigation measures on dust levels in communities adjacent to the rail systems.
- Establish a long-term (12 months) monitoring site to measure and report on seasonal trends in coal dust emissions and the progress of measures to reduce coal dust emissions.

Conduct of Dust Monitoring Program

- An independent agency, the Environmental Monitoring and Assessment Sciences Branch of the Department of Science, Information Technology, Innovation and the Arts (DSITIA) has been commissioned by the Queensland Resources Council (on behalf of the South West Users Group) to undertake the dust monitoring program.
- DSITIA operates up to 40 air quality monitoring stations across Queensland with 30 out of the 40 stations reporting air pollutant levels in near real-time to the Department of Environment and Heritage Protection (EHP) website.

Description of the Dust Monitoring Program

The ambient air quality monitoring program for particles will be conducted using two monitoring regimes:

- 1) **Campaign monitoring** at six locations across the Western and Metropolitan Rail Systems (and one background location) for two separate one-month sampling periods – one month prior to implementation of coal wagon veneering at New Hope Coal's New Acland Mine (accounting for around 60% of tonnage on the rail systems) and one month following full implementation of veneering at the New Acland Mine – to assess the impact of this dust mitigation measure on dust levels adjacent to the rail corridor; and
- 2) **Continuous monitoring** at one location for a 12 month period to assess seasonal changes in dust levels and to measure and report on the progress of measures to reduce coal dust emissions.

Monitoring of particles will be undertaken using sampling equipment and methodologies that are in accordance with this project brief. The sampling equipment will be operated in accordance with the relevant Australian Standard or Ambient Air Quality NEPM protocol.

Objectives of the ambient air quality monitoring program are to:

- Undertake dust monitoring at sites along the track which are representative of dust exposure levels at or near key population areas.
- Quantify the exposure to particles that pose a health risk and/or nuisance that the community experiences near the edge of the rail corridor.
- Quantify, to the extent possible given different seasonal sampling conditions, the impact of coal wagon dust mitigation measures on dust levels in the community.
- Report on the air quality monitoring results and provide an assessment of likely environmental impacts and health risks from current dust exposures.

The Coal Dust Monitoring Program is designed to measure dust emissions of primary concern comprising the following:

- **Deposited Dust** (particles less than 1 mm in size) – Visible dust deposition that can cause soiling, loss of amenity and minor health impacts. The composition analysis of the deposited dust will include at least the percentage of **coal dust**, other black dust including soot and black rubber, mineral dust, plant and insect debris.
- **Fine Particles** – Particles that are invisible to the naked eye and can impact human health. Due to their small size, these particles can remain suspended in air for considerable periods. Monitoring will obtain measurements of levels of PM₁₀ (particles of less than 10 microns in diameter) and PM_{2.5} (particles of less than 2.5 microns in diameter).

1.1 Key Components of the Campaign Dust Monitoring Program

The campaign monitoring component of the dust monitoring program is intended to obtain information on dust levels in key population centres located along the Western and Metropolitan Rail System (with a focus on locations where coal dust complaints have originated from) before and after the implementation of coal wagon veneering by New Hope Coal. Both sampling periods will be one month in duration.

The campaign dust monitoring program will be conducted at seven locations; six locations adjacent to the rail corridor used for coal transport, and a seventh location adjacent to a rail corridor that is not used to transport coal.

Paired dust deposition gauges will be sited at the six coal rail corridor locations, plus Partisol[®] dichotomous samplers measuring PM₁₀ and PM_{2.5} at four of these locations. A dust deposition gauge and Partisol[®] dichotomous sampler will also be sited at the background location. Wind measurements will be recorded at the Partisol[®] sampler locations. Dusttrak[™] DRX Aerosol Monitors will be sited at three locations on the Metropolitan Rail System to measure short-term changes in suspended coarse dust (<20µm in diameter) levels associated with train movements (all train types, not just coal trains).

The first round of the campaign dust monitoring program is to be conducted for a period of one month from the first week of March 2013 to obtain information on particle

levels at the six campaign monitoring sites prior to any treatment of coal wagons to reduce dust loss during transport.

The second round of the campaign dust monitoring program is to be conducted as soon as practicable following full implementation of veneering of the New Acland mine's coal wagons to obtain information on particle levels at the seven campaign monitoring sites following treatment of coal wagons to reduce dust loss during transport. This monitoring will be conducted for a period of one month.

The program will, where practicable, locate monitoring equipment at sites used in Queensland Rail Coal Dust Monitoring Study: West Ipswich to Fisherman Islands (1999). This will allow comparability and trend analysis compared to the previous study.

The monitoring site locations and parameters to be monitored are summarised in the table below. Decisions on the final monitoring locations were based on input received from all stakeholders and logistical factors such as site access, electrical power, staff safety and equipment security. To the extent practicable, equipment is being sited at a similar distance from and elevation above the rail track at each site.

Campaign Monitoring Sites and Measurement Parameters

Location	Measurement Parameters
Oakey	2 × dust deposition (paired) PM ₁₀ and PM _{2.5} Wind speed and direction
Toowoomba	2 × dust deposition (paired)
Ipswich	2 × dust deposition (paired) PM ₁₀ and PM _{2.5} Wind speed and direction
Tennyson	2 × dust deposition (paired) Real-time coarse particles Wind speed and direction
Fairfield	2 × dust deposition (paired) PM ₁₀ and PM _{2.5} Real-time coarse particles Wind speed and direction
Coorparoo	2 × dust deposition (paired) PM ₁₀ and PM _{2.5} Real-time coarse particles Wind speed and direction
Chelmer (<u>background measure</u>)	1 × dust deposition PM ₁₀ and PM _{2.5} Wind speed and direction

An interim report summarising the results of the first round of the campaign monitoring program will be delivered within two months of the completion of the field sampling for

this round of monitoring. A campaign monitoring program evaluation report will be delivered within two months of the completion of the second round of the campaign monitoring program field sampling. The reports will be made available on relevant Queensland Government websites.

1.2 Key Components of the Continuous Dust Monitoring Program

The purpose of the continuous dust monitoring program is to measure seasonal coal dust emissions trends and to track the progress of measures to reduce coal dust emissions on ambient dust levels in one key population area on the Metropolitan rail line. The results of the campaign dust monitoring program will be used to identify a suitable site for the continuous monitoring station that will reflect particle exposure in the upper portion of the range experienced by communities along the rail corridor. The continuous monitoring equipment proposed to be used will enable information on ambient particle levels to be disseminated to the public via the Web in near real-time.

Two continuous TEOM[®] particle samplers will be located at the continuous monitoring station – a dichotomous TEOM[®] sampler that will provide hourly measurements of PM₁₀ and PM_{2.5} to evaluate health risk, and a second TEOM[®] sampler that will provide hourly measurements of total suspended particles (TSP) to evaluate possible nuisance impacts. A dust deposition gauge will be sited to collect deposited dust for coal composition analysis. A wind sensor will also be sited at the station to assist with identification of the contribution of different dust sources to overall dust levels. A Partisol[®] sampler measuring PM₁₀ and PM_{2.5} operating on a one-day-in-six basis will also be co-located to cross-reference the dichotomous TEOM[®] continuous measurements against those from a standard reference sampler.

Following a commissioning phase of approximately one month, measurements recorded at the continuous monitoring station will be reported in near real-time to the Department of Environment and Heritage Protection (EHP) website. Monitoring data from the continuous monitoring station will also be incorporated in DSITIA's monthly Air Quality Bulletin for South-East Queensland available from the EHP website.

The continuous monitoring station will operate for a 12 month period. A report on the continuous monitoring results will be delivered within 2 months of completion of the 12 month monitoring period. The report will be made available on relevant Queensland Government websites.

Prepared by:

Environmental Monitoring and Assessment Sciences Branch

Queensland Department of Science, Information Technology, Innovation and the Arts

February 2013

