

## DUST FORECASTING SYSTEM SET TO HELP OPEN CUT MINES IMPROVE DUST MANAGEMENT

A dust forecasting system that delivers ongoing, daily meteorological and dust forecasting data is now available to Hunter Valley open cut coal mines and other stakeholders via a dedicated website.

The forecasting was developed from research undertaken by NH2 Dispersion Sciences in association with Sinclair Knight Merz (SKM).

The system's core features and benefits are:

- Hourly dust transport forecasting, up to two days in advance, throughout the Hunter Valley. This information allows site operators to identify locations and times of potentially increased dust risk, and modify mine plans to minimise or avoid potential impacts.
- Meteorological forecasting to help site operators identify potentially problematic or favourable conditions for mining, also with the purpose of facilitating appropriate mine planning to avoid potential impacts.

The dust risk index is provided as a series of coloured contour figures showing the forecast index at a grid of 500 metres by 500 metres cells covering the Hunter Valley.

The project was undertaken in two parts. NH2 Dispersion Sciences investigated the use of meteorological forecast models (the MM5 model) to provide 24 to 36 hour, short-term predictions of a relative dust risk index – a function of space and time and approximately proportional to the rate at which wind erosion dust is expected to be generated. This builds on earlier work using the MM5 model to determine when unfavourable atmospheric conditions for blasting will occur. In the second part of the project, SKM used modelling to predict dust concentrations.

NH2 Dispersion Sciences Atmospheric Modeller Nigel Holmes said the critical parameters required for estimating the dust risk index for a particular period comprised time varying data such as the friction velocity associated with wind gusts, the soil moisture level and recent rainfall and fixed, or slowly changing data, such as the vegetation cover, soil type (and its susceptibility to wind erosion). In this new dust forecasting system, vegetation cover and land use has been determined by digitising aerial photographs. Soil type has been determined from soil survey maps published by Kovac and Lawrie.

"The data that changes slowly, for example vegetation cover, which will change as new areas are disturbed, rehabilitated or otherwise modified by mining and agriculture, will need to be updated periodically to reflect changes in conditions," he said.

"The more rapidly changing parameters, such as soil moisture, wind conditions and recent rain, are dealt with automatically via the meteorological model."

This project has provided additional tools that should enable Hunter Valley coal mines to improve dust management. Maximising the usefulness of the tools will require sites to proactively make use of the forecasts to reduce emissions.

ACARP Monitor Bruce Foster said the technologies developed by this project would help facilitate the development of specialised dust management tools that integrate with real time site monitoring and alarm systems.

"This highly useful project will assist the mining industry in its quest to continually improve the management of air quality," he said.

### The researchers

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