

Safety In Mines Research Advisory Committee

Project Summary : COL467

Project Title:	The reduction of the safety and health risk associated with the generation of dust on strip coal mine haul roads. (209 total pages)		
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Summary

This report presents the findings of the SIMRAC (SIMCOL) research project COL467 which examines techniques to reduce the safety and health risk associated with the generation of dust on strip coal mine haul roads. The objective of this report was to develop a set of guidelines for the appropriate surface treatment selection, application and maintenance to provide a cost-effective means of reducing the safety and health hazard associated with dust on strip coal mine haul roads. The mining industry, specifically surface strip coal mine operators can use the guidelines to optimise the safety and health of surface strip coal mine transport operations, specifically through the reduction of transport related accidents and the structured recognition, evaluation and solution of dust generation problems on mine haul roads, leading to safer mining operations.

The following conclusions and recommendations were made in the light of the findings of the research contained in this report;

- 1 A set of ideal dust palliative parameters were identified from a mining perspective, encompassing application, management and performance factors.
- 2 The management strategy recommended for any form of dust suppression was based on a user-defined level of dust defect acceptability and an average degree of palliation which can be maintained over a specified period. In general, the consensus of road-users was that a dust defect score of two represented a practical dust defect intervention level. This defect score was based primarily upon the visual effects (road safety and driver discomfort), rather than any perceived health impact.
- 3 A watering model was developed to determine individual mine road watering frequencies for the characteristic site

parameter combinations during summer and winter operating conditions, for a required level of control or maximum dust defect.

- 4 A model was developed to analyse palliative cost-effectiveness (R/m^2), with the aim of identifying and costing the construction, application and maintenance aspects associated with the use of chemical palliatives, compared to that of water-based suppression alone.
- 5 The average degree of palliation achieved using chemical palliatives can significantly reduce dust emissions from mine haul road, and the primary impact of these reductions would be improved visibility and safety, and in the case of open-cab trucks, an improvement in the air quality index. It is recommended that palliatives be considered as a dust suppression system, subject to the limitations described in the research.
- 5 A mix-in establishment is recommended for a mine haul road, irrespective of palliative type, followed by spray-on maintenance re-applications. A poor wearing course material cannot be improved to deliver an adequate performance solely through the addition of a dust palliative and it is recommended that the haul road wearing course material should at least satisfy the minimum material selection specifications. If not, the inherent functional deficiencies of the material will negate any safety or financial benefit of gained from using dust palliatives.