MINERAL RESOURCES

8 July 2003

To

Mine Operators
Contractors in the Mining Industry
Diesel Equipment Manufacturers
Diesel Equipment Plant Hirers

Subject: Diesel Particulate Matter Research and Awareness to the Mining Industry

Community concern worldwide over the past several years has been growing regarding the potential long-term occupational health and safety affects of **diesel engine emissions and diesel particulate matter (DPM).** Research has been continuing throughout the world on its affects. The American EPA has published research findings on the health affects of DPM and has implemented a long term and tiered strategy, Tier 1 to Tier 4, to reduce particulate levels on all newly manufactured diesel engines.

The Department of Mineral Resources views the safety of people when involved with plant and equipment as an integral art of mine safety. It is necessary the mining industry in becomes aware of the hazards and risks associated with the use of diesel engines allowing appropriate reduction and control measures to be implemented.

The following information is a literacy review of the current research and finding throughout the world. David Carberry, a university undergraduate from the University of Newcastle, carried out the review for the Department. The Department is committed to consult with industry and manufacturers to continually improve the health and safety of people involved with diesel engines.

Enclosed is a copy of David's final report and a presentation. These were presented at the NSW Department of Mineral Resources 2003 Mechanical Safety Seminar and to a combined meeting of equipment manufacturers and hirers.

The NSW Department of Mineral Resources is committed to raising community awareness of the issues and supplying industry with relevant information. We are currently in the process of revising our guideline MDG 29, 'Guideline for Diesel and Operator Environment Testing for Underground Coal Mines' to incorporate the management of diesel engine system pollutants in all underground mines.

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Under the delegated authority of the Chief Inspector of Coal Mines

Extract From 'Diesel Particulate Matter – An Overview with Respect to Underground Mining – Final Report by David Carberry'

Note: The full report is available from the DMR Bookshop

Foreword

Diesel particulate matter has been a growing concern for over ten years and due to the insidious nature of how it effects health. Internationally speaking the normal chain of events leading to legislation setting standards has not occurred. In grossly simplified terms, the regulatory body is given evidence from the medical industry concerning a health issue that has been previously overlooked. Based upon the evidence the regulatory body sets the standard that the manufacturers build to. Then the end users comply by using the equipment according to guidelines.

However as far as diesel particulate matter is concerned the medical industry has not provided a 'point blank' exposure limit that the regulatory body can legislate for. In simplified terms the end users are looking at the manufacturers who are looking at the regulatory bodies who are looking at the medical industry who are looking at the end users. This cycle of observation has resulted in no standard being set as yet.

As part of the NSW Department of Mineral Resources ongoing concern of safety and welfare the utilisation of a Newcastle University student was made to collate information regarding diesel particulate matter and produce this report.

Executive Summary

Introduction. Diesel particulate matter is exuded along with other components of diesel exhaust and is comprised of very small particles capable of reaching the deepest recesses of the human lung and thus is absorbed into the system.

Description. Diesel particulate matter comprises of elemental carbon (pure carbon), organic carbon (hydrocarbons including PAHs) and trace elements (nitrates, sulfates, etc.)

Health Impacts. This component of diesel exhaust is capable of irritation, respiratory and cardiovascular negative impacts as well as the more insidious development of cancer most notably lung cancer.

Evidence. There is not as yet a direct link between lung cancer and diesel particulate matter however the growing body of evidence does indicate that a discernible link between the two does exist even if it has not, as yet, been proven.

Exposure. Due to the nature of underground mining those that work underground are subject to far greater levels of diesel particulate. Exposure levels that on road users are subject to are cause for concern to health authorities which is a mere fraction to what underground miners are currently exposed to.

Conclusions. Diesel particulate is currently a source of harm to underground personnel that is not being properly addressed. Sensible control approaches need to be

utilised by all people involved to bring levels of diesel particulate down to a minimum practicable considering the role of diesel equipment.

Recommendations for Regulatory Departments. Regulatory Departments should go about setting the standard of diesel particulate exposure to a predetermined level. The minerals council recommends 0.2mg/m^3 (DP) which is a sensible point at which diesel machinery can operate and harm to humans is minimised. Work should proceed to establish a benchmark method of determining diesel particulate levels in a scientific manner.

Recommendations for Manufacturers. It is in the best interest of diesel mining equipment manufacturers to be undertaking the adoption of electronically controlled diesel engines for underground use in coal mines. Manufacturers should also examine the de-rating procedure of the equipment they produce as a small loss in power leads to large decreases in diesel particulate production.

Recommendations for End Users. Initially for end users the adoption of some form of education program as well as the adoption/alteration of a maintaince program to curb diesel particulate production of all diesel equipment and ensuring the de-rating of engines and examining the potential benefit of de-coking every 6 months. Management should monitor the progress of electronically controlled diesel engine technology in order to have a more informed choice with future purchases or hiring. The adoption of such technology is strongly recommended

Web Address for Further Information on Diesel Engine Emissions and Control technologies

	Web Address	Description
1	www.msha.gov/01-995/Dieselpartcoal.htm	MSHA - Diesel Particulate Final Rules Single Source Page Coal
2	www.msha.gov/01-995/Dieselpartmnm.htm	MSHA - Diesel Particulate Final Rules Single Source Page Metal/Nonmetal Mines
3	www.msha.gov/S&HINFO/DIESEL.HTM	MSHA - Diesel Equipment Health and Safety
4	www.cdc.gov/niosh/mining/pubs/pdfs/ic9462.pdf	NIOSH Report – Review on the technology available to the underground mining industry for control of diesel emissions
5	www.cdc.gov/niosh/mining/projects/default.htm#diesel	NIOSH – Diesel Research projects
6	www.epa.gov/nonroad/	EPA America - Reducing Nonroad Diesel Emissions
7	www.dieselnet.com/	Online information service on clean diesel engines and diesel emissions
8	www.deep.org/	DEEP: Diesel Emissions Evaluation Program