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National University of



MIMOSA MINING COMPANY (Pvt) Ltd



Science and Technology



Faculty of Environmental Science

Department of Environmental Science and Health

Final Year Project

Project Title

Effectiveness of dust control systems in the Crushing and Screening plant at Mimosa Mining Company

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AUG 2009

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NATIONAL UNIVERSITY OF SCIENCE & TECHNOLOGY		
HARARE		
DEPARTMENT OF ENVIRONMENTAL SCIENCE & HEALTH		
LAWAYO		
DATE	ACCESSION	CLASS No.
22/6/10	56	09/55

A dissertation Submitted in partial fulfilment of the requirements for Bachelor of Science (Honours) Degree in Environmental Science and Health



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Abstract

Long term exposure to mine dust increases the risk of pneumoconiosis related disease to employees such as silicosis, asbestosis, black lung, chronic bronchitis and emphysema. Dust control involves putting elimination, substitution, engineering, administrative controls and using Personal Protective equipment. Quantification and reporting provides a basis for periodic evaluation of the dust control system to assess their effectiveness. Mimosa Mining Company has dust control systems in the Crushing and Screening plant. However there has been an increase in occupational respiratory diseases and dust exposure complaints from the section. The purpose of this survey is to assess the effectiveness of the dust control systems in controlling dust to level below Threshold Limit Values (TLVs). The TLV for Total and Respirable dust is $10\text{mg}/\text{m}^3$ and $2\text{mg}/\text{m}^3$ respectively. The assessment was conducted consulting plant design drawings to identify the location of the dust control systems. Physical verification of the dust control systems in place was done by the Crushing and Screening Superintendent and the researcher a checklist to assess their condition. A sample of 27 employees were sampled from a population of 40 employees and sampled for Total and Respirable dust exposure using personal dust sampling equipment. The results were analyzed using t-distribution to compare the mean dust exposure against standard TLVs. From the results it was found the dust control systems are in place as per plant design drawing and they are effective in controlling dust to level below TLV ($10\text{mg}/\text{m}^3$) but Respirable dust was above TLV ($2\text{mg}/\text{m}^3$). The researcher recommended re-evaluation and upgrading of the dust control systems.