

Safety In Mines Research Advisory Committee

Project Summary: SIM 050603

Project Title:	Pilot study to determine the extent and nature of occupational exposure to airborne pollutants associated with clay mining and brick-making , 46pages		
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Category:	Occupational Health	Applied Research	Occupational Hygiene

Summary

The study set out to:

- To identify typical airborne pollutants associated with clay-mining and brick-making
- To assess the potential impact on the occupational health of mining and factory staff
- To recommend the need for further research, and strategies for improvement, monitoring and reporting
- To recommend, where necessary, the need and potential for the elimination, control and management of hazards, exposure and pollution

The clay brick production industry has been identified as a major source of air pollution in developing countries ⁽¹⁾. However, there is only one study into the dust exposure in the clay mining and brick making industry in South Africa. The environmental impacts of the clay brick-making industry in South Africa have tended to be ignored. It is often assumed that because they are small these industries have little impact.

For this reason the Clay Brick Association approached the Mine Health and Safety Council to investigate the nature and extent of occupational exposure in the brick-making industry. The pilot study was commissioned to assess the potential risk associated with clay mining and brick-making and identify any need for further focused research or interventions.

Due the nature of the clay mining and brick manufacturing process, particulate matter is the primary pollutant emitted by brick plants. The main source of particulates (dust) is the materials handling procedure, which generally includes mining, drying, grinding, screening, and storing

and kiln firing would result in emission of combustion products (e.g., NO_x, CO) which would vary in composition, depending on the fuel source. Sulphur Dioxides may also be emitted during this firing process.

During the study qualitative measurements were taken for airborne particulates, SO₂, CO, CO₂, and NO_x. Ground level dust concentration in the workplace depends upon the location, nature of activity, calm/windy conditions as well as weather. In calm conditions the dust level could be 0.3-1.3 mg/m³ in no activity zones. Dust levels in areas around the kiln while it is being fired were between 28-33 mg/m³. In windy conditions the dust level on the top and around the kiln might be considerably higher, even in the absence of the above activities, due to dust.

Although, the main focus of the study was to identify the airborne hazards, a number of other non airborne hazards were observed. These included, noise, ergonomic problems, and heat stress.