

Studies on Respirable Dust Samples from Lime Stone Mining Industry in Central India

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Abstract

Studies were carried out on respirable dust samples at lime stone mining industry situated at a distance of 30 km from capital city Raipur (21N16 81E42) of a newly formed Chhattisgarh state of Central India. The purpose of the study was to comply with the provisions of regulation 124 of metalliferrous mine regulations (MMR, 1961) under mines act 1952. In the present work, area respirable dust samples (n=6X2= 12) were collected near driller, dumper and repairing shed of heavy earth moving machineries and found to be in the range of 0.155 – 0.507 mg m⁻³. The personal respirable dust samples (n =6X2= 12) were collected from the operators engaged with drilling, dumper and shovel-dozer operations and the concentration was found in the range of 0.335 – 0.705 mg m⁻³. The results show that the concentration of respirable dust collected was below the prescribed limit (3 mg m⁻³) by Director General of Mines Safety (DGMS), India. The samples collected were analyzed for their free silica content by using FT-IR and found to be too low to be determined by standard operation procedure. The results of the case study shows that efficient measures are being taken to lower the dust emission in the study area i.e. sprinkling of water, no secondary drilling and blasting, plantation etc. The mine workers were also found to be using personal protective equipments i.e. respiratory masks so as to prevent diseases such as silicosis, airflow obstruction and emphysema. Results were compared with the results of the unorganized limestone mining industries near the study area. The enrichment factor was found to be ≤ 2.5 . The fate and long term effects of lime stone mining dust emission (organized and unorganized) on the Ecological health of the study area are correlated with the results of the present case study.