

DUST PARTICLE SIZE DETERMINATIONS AT AN
OPEN CUT URANIUM MINE AND MILLING OPERATION

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ABSTRACT

To determine the activity median aerodynamic diameter (AMAD) and the mass median aerodynamic diameter (MMAD) of uranium ore dust and product dust. Numerous measurements were made at different stages of the mining and milling operations. Determinations of AMAD and MMAD were made in the following areas: Mine, Crushing (Primary and Secondary), Grinding, General Services areas, and the Uranium packing areas. Once AMAD's are established derived limits for dust in the air can be calculated. Inhalation of radioactive dust is the most significant pathway by which workers receive a radiation exposure.

To collect the required samples cascade impactors were used in conjunction with high volume air samplers. Samples were collected for varying periods depending on the ambient dust concentrations and work related considerations. Two methods were used to determine the activity deposited on the various cascade impactor stages, one method assessed the total long-lived alpha activity, and the other the total amount of uranium present. Results indicate that the calculated AMAD's can vary greatly depending on where the samples are collected from. It is envisaged that maybe two or three AMAD's may have to be used to derive dust concentration limits for different locations in the mine and mill.