

Abstract

Lurambi – Rosterman gold mine consist of miners who engage in daily small-scale artisanal gold mining activities. The gold mine wastes may contain naturally occurring radioactive materials (NORM) which may pose a potential health risk to this population. In this survey, thirty samples were collected from sediments in the tunnels for radioactivity measurements using the NaI(Tl) gamma ray spectrometer. The activity concentrations of ^{40}K , ^{232}Th and ^{238}U were 262 ± 11.48 , 114 ± 5.78 and 84 ± 2.64 Bqkg⁻¹, respectively. The mean radium equivalent for all the collected samples was 274 ± 12.90 Bqkg⁻¹ which is less than the recommended limit of 370 Bqkg⁻¹. The mean outdoor and indoor annual effective dose rates were 0.4 ± 0.02 and 0.3 ± 0.01 mSvy⁻¹ respectively. Since the radium equivalent was less than the recommended criterion value, mining of gold at Rosterman poses no radiological hazardous health risk to the miners and the general public.