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Control of Exposure of NORM to humans at the Tarkwa Gold Mines of Ghana

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ABSTRACT
Occupational radiation protection was assessed at the Tarkwa Gold mines in the Western Region of Ghana by measuring the radioactivity levels arising from Naturally Occurring Radioactive Materials (NORM) at the operational area of the mine in order to determine the level of exposure to workers. This was achieved by determining the activity concentration of natural radionuclides namely 238U, 232Th and 40K in soil collected from the mine concession using gamma spectrometry. The average activity concentrations of 238U, 232Th and 40K in the soil samples at the depths of 0-20 cm were found to be 7.25 ±1.03 Bqkg-1, 19.47±3.41 Bqkg-1 and 176.98±8.86 Bqkg-1 respectively, which were far below the exemption values of 1000 Bqkg-1 for 238U and 232Th and 10,000 Bqkg1 for 40K in materials that will warrant regulatory control.
In general, the results do not show significant levels of natural radionuclides in the mine. However, since the workers in the mine may be exposed over a long period of time which may result in bioaccumulation, it is recommended that they apply certain protective measures such wearing appropriate PPEs to protect themselves from chronic exposures which may be detrimental to their health.

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