

Radon concentration in drinking water sources of the Mulazai area, Peshawar, KP, Pakistan

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Abstract

Presence of high levels of radon gas in drinking water sources of a region is responsible for the radiation related health hazards, both, through ingestion and inhalation. In this study 30 drinking water samples from different sources including hand pumps, open wells, and in Mulazai village, north of University of Peshawar were analyzed with RAD7 electronic device for determination of radon concentration. These water have a minimum, maximum and mean radon value of 2.6 Bq l⁻¹, 23 Bq l⁻¹, and 12 Bq l⁻¹.

Out of the total number of 30 drinking water samples from different sources analyzed during this study 53.33 % were found to have radon levels in excess of the EPA recommended maximum contaminant level (MCL) of 11.1 Bq L⁻¹. These include 96.66% from hand pumps, 3.33% from open well.

The annual effective dose from radon in water due to its ingestion and inhalation per person has also been estimated. The mean radon concentration and mean annual effective dose due to radon in water of study have been compared with the mean radon concentration and mean annual effective dose of earlier investigators of different localities of the World and Pakistan. The mean annual effective doses of 13 samples are lower, 1 of them is equal and 16 are greater than the reference level of 0.1 mSv a⁻¹ for drinking water of WHO and EU Council.

The reason of these high values may be due to presence of hidden fault below or in the vicinity of the Mulazai village but we cannot say it surely because this area is fully alluvium covered and no subsurface geological study has been done till date. If there is some fault present then high levels of radon come to the surface through the permeable pathway of the faults. The ground water taken for domestic uses can influence humans and causes stomach and lungs cancer, if concentration of radon is high.