

RADON CONCENTRATION IN DRINKING WATER SOURCES OF THE LAKHARAI VILLAGE, PESHAWAR, KHYBER PAKHTUNKHWA, PAKISTAN.

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Abstract

The study area is part of Peshawar basin which is filled by meandering and braided river sediments. The unlithified sediments of the basin are predominantly lacustrine silt with fluvial sand and gravels. The current study reported Radon concentration in drinking water of the Lakharai village for the first time. About 32 drinking water samples from different sources including hand pumps, open wells, and tap water in Lakharai village, north of University of Peshawar. All the samples were analyzed with RAD7 electronic device for determination of radon concentration. Results showed that the water samples have a minimum, maximum and mean radon value of 7.07 Bq l⁻¹, 44.5 Bq l⁻¹, and 15.1 Bq l⁻¹ respectively. Out of the total number of drinking water samples from different sources (hand pumps, open wells and tap water etc), about 60% were found to have radon levels in excess of the EPA recommended maximum contaminant level (MCL) of 11.1 Bq L⁻¹. 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 different localities of the World and Pakistan. The mean annual effective doses of 30 samples are lower, 1 of them is equal and 1 is greater than the reference level of 0.1 mSv a⁻¹ for drinking water of WHO and EU Council. It is concluded from this study that drinking water of the Lakharai village is not safe due to presence of high levels of radon gas in drinking water sources of a region. The radon gas is responsible for the radiation related health hazards, both, through ingestion and inhalation. The ground water taken for domestic uses can influence humans and causes stomach and lungs cancer, if concentration of radon is high. It is recommended that drinking water of the area should be ventilated and then stored in water storage tanks for longer duration before use to reduce its radon level. Boiling water from these sources before its final use for drinking purpose will also be advantageous.