



Evaluation of Levels of Radon Isotopes and Effectiveness of Traditional Mitigation Measure for Radon Contaminated Groundwater

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Recently, numerous studies have reported the risk of stomach and other forms of cancer due to the ingestion of radon isotopes in drinking water. Herein, using RAD-7 electric radon detector, quantification has been performed of radon isotopes (radon and thoron) at point of source and point of use in groundwater from areas reported to have high uranium amplitude. In addition, the effectiveness of traditional radon mitigation measures was assessed and presented. Values recorded for radon activity concentration (in units of Bq/m³) in studied groundwater range from 731 ± 4.9 to $84,300 \pm 530$, calculated effective dose and a working level (WL) range from 0.13 to 15.60 mSv/yr and 0.09 to 4.39, respectively. It was observed that high radon concentration were recorded in water from well drilled in the areas underline by granite and gneiss, where fractures were the main targets for groundwater abstraction and, that boreholes drilled in these areas and fitted with hand pump had the highest radon concentration. This suggest that radon distribution in groundwater of the investigated area is closely related to geology, structures (fractures) and well type. The traditional way of collecting and storing groundwater from wells in clay pot before use as practiced by inhabitants of the area is an effective radon mitigation measure for radon gas contaminated groundwater.