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Assessment of annual effective dose due to inhalation and ingestion of radon from groundwater at Kantharawichai District, Maha Sarakham Province

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Assessment of annual effective dose due to inhalation and ingestion of radon from 43 groundwater samples at Kantharawichai District, Maha Sarakham Province by using Radon Gas Monitor ATMOS 12 DPX. The results were as follows: 1. radon concentrations in groundwater were ranged from 1.04 –21.87 Bq/L with the mean value of 8.27 Bq/L., 2. The annual effective dose due to inhalation from groundwater (Dinh) was ranged from 2.61 –54.68 µSv/y with the mean value of 20.66 µSv/y. The annual effective dose due to ingestion from groundwater (Ding) was ranged from 0.19 –3.94 µSv/y with the mean value of 1.49 µSv/y., 3. The annual effective dose on organs, namely the dose on lungs (Dinh-lung) was ranged from 6.26 –131.24 µSv/y with the mean value of 49.59 µSv/y, and the dose on stomach (Ding-stomach) is 0.45 –9.45 µSv. /y and has a mean of 3.57 µSv/y., and 4. The mean of excess lifetime cancer risk (ELCR x 10-4) in males was 0.88 and in females, it was 0.96. The results will be compared with the action levels of various organizations, including: The maximum allowable radon concentration in water is 11.1 Bq/L, according to United States Environmental Protection Agency, and The allowable annual effective dose due to inhalation and ingestion of radon from groundwater (D) is 100 µSv/y, according to the World Health Organization. The result of analysis by comparing the data of research with the action levels of various organizations can indicate the safety of inhalation and ingestion of groundwater radon in the research area.

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