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Natural radon reduction rate of the Community Groundwater System in South Korea

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Content

There is about 8,000 community groundwater systems (CGS) used in South Korea. CGS is used for domestic water where regional water supply system is not available. Among them, it is reported that about 28.8 percent of CGS showed radon activity greater than 100 Bq/L recommended by WHO. The transport procedure of groundwater to each house is that groundwater from a well using a submersible pump is pumped to a water storage tank of about 10 to 60 m3. The groundwater in a storage tank is supplied to each house by gravity. During this process, radon concentration will decrease by natural radon aeration, radon decay and stagnation. To estimate average radon reduction rate at storage tank of CGS, fourteen CGS with above 100 Bq/L were chosen. The average radon reduction rate at storage tanks was 31.3%. Radon reduction rate at a storage tank would be vary with time due to pumping rate and variation in the radon level at each pumping time. To see seasonal variation of radon reduction rate at storage tank a CGW having radon activity above 100 Bq/L was selected and radon levels at well head and storage tank were measured four times. The radon level in well head varied from 780.6 Bq/L to 1,214.2 Bq/L, and radon reduction rate at storage tank varied from 23.0 to 56.5% (average 44.1%). To see hourly variation of radon reduction rate at storage tank five times of radon level measurement were made at well head and storage tank at the same well. The radon level in well head varied from 696.3 Bq/L to 1,056.2 Bq/L, and radon reduction rate at storage tank was from 27.1 to 56.5% (average 42.5%), which is similar to seasonal radon reduction rate at storage tank. When applying the average radon reduction rate of 31.3% at storage tank, the percentage of exceeding rate of 100 Bq/L in 8,000 CGS would be decrease from 28.8% to 18.0%, although the natural radon reduction rate at the storage tank of every CGS would vary with pumping rate, radon level at the time of pumping, and the capacity of storage tank.

About the Presenter

Dr Byong-Wook Cho is working for KIGAM (Korea Institute of Geoscience and Mineral Resources), especially for groundwater resources and radionuclides in groundwater.

Primary author(s) : Dr. CHO, Byong-Wook (LIGAM)

Co-author(s) : Dr. KIM, Tae-Seong (NIER); Dr. HYUN-KOO, Kim (NIER); Dr. YUN, Uk (KIGAM); Mrs. SOO-YOUNG, Cho (KIGAM)

Presenter(s) : Dr. CHO, Byong-Wook (LIGAM)

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