Radon content in groundwater from drilled wells in the Stockholm region of Sweden

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Radon is the most important contribution to the radioactivity in groundwater and has been studied for different reasons during the last hundred years in Sweden, in later time focused on radon as a health problem. Based on data from a national survey on radon concentration in drinking water in the 1980s, airborne radiometric measurements, geological maps and uranium prospecting, a groundwater radon risk map of Sweden was compiled in the 1990s. The map showed that there is more pronounced risk for radon in groundwater in several, fairly large areas in central and northern Sweden. The bedrock in these areas usually has a granitic composition. Many detailed investigations of wells on regional and local scales were made during the 1980s and 1990s, altogether 31,000 radon analyses of groundwater from 229 municipalities in Sweden. 12.2% of all wells had a radon value >1000 Bq/L, but some counties had much higher percentage, up to 23%. The highest value in a single well was 57,000 Bq/L. Data from the county of Stockholm showed very large local differences. The conclusions are that there are some pronounced risk areas and a positive correlation between high radon concentrations in drilled wells and granites, pegmatites, acidic volcanites and some acidic gneisses. However, wells with high radon concentrations may be found locally outside areas with such rock types. Statistical analyses of data from Österåker and Uppsala municipalities show that the installations for groundwater withdrawal and the use of the well clearly affect the radon content, whereas no clear correlation between well depth and soil depth versus radon content is seen.

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