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Scenarios and models for radium accumulation from groundwater

ABSTRACT

The content of radium in groundwater can largely influence the contamination dimensions of materials occurring in frame of and installations used in some NORM-processes. Such types of NORM-industries which might be affected include mining especially for coal, oil and gas extraction, waterworks or geothermal energy recovery. Investigations undertaken in the German Ruhr-district as well as in the Polish Upper Silesian Coal Basin will be presented and classified for scenarios.

There are some important (radio)chemical processes being responsible for the releasing of radium into formation water like leaching (adsorption/desorption) or the alpha-recoil-effect. Those will be explained in detail as models and related to ambient gamma dose rates occurring on the surface in the vicinity of such facilities.

The scenarios and models to be presented are intended to help in understanding the radium's migration pathways in the transport medium "groundwater".