

EGU21-9429

<https://doi.org/10.5194/egusphere-egu21-9429>

EGU General Assembly 2021

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## Preliminary safety assessments in the high-level radioactive waste site selection procedure in Germany

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The Federal Company for Radioactive Waste Disposal mbH (BGE mbH) is as Germans waste management organization responsible to implement the search for a site with the best possible safety for the disposal of high-level radioactive waste for at least one million years, following the amendments of the Repository Site Selection Act in 2017. The selection procedure is meant to be a participatory, transparent, learning and self-questioning process based on scientific expertise.

This contribution will provide an overview of the methodology of the forthcoming preliminary safety assessments as a major part of the next steps in the site selection procedure. This procedure overall consists of three phases with increasing level of detail for identification of the best site. The first phase consists of two steps. The objective of the first step was to determine sub-areas in the three considered host rocks, salt (halite), clay and crystalline rock, by applying legally defined exclusion criteria, minimum requirements and geoscientific weighing criteria. 90 sub-areas that cover approximately 54 % of the area of Germany were identified due to their general suitable geological conditions. The result was published in September 2020.

The second step of phase one is currently in progress and consists of representative preliminary safety assessments that aim to assess the safety of the repository system as well as its robustness. The requirements for the preliminary safety assessments in the site selection procedure are defined by a governmental directive released in October 2020. Representative preliminary safety assessments have to be performed for each sub-area and consist of the compilation of all geoscientific information relevant to the safety of a repository, the development of preliminary safety and repository concepts and the analysis of the repository system. In addition, a systematically identification and characterization of uncertainties has to be undertaken and the need for exploration, research and development must be determined. The application of the representative preliminary safety assessments as well as the following renewed application of geoscientific weighing criteria will lead to the identification of siting regions within the larger sub-areas of step one. These regions will be considered, first for surface-based geoscientific and geophysical exploration, including i.e. seismic exploration and drilling of boreholes. Subsequently the last phase of the site selection will proceed with subsurface exploration. Finally, all suitable sites will be proposed and the German government will decide the actual site. This process is

expected to be finalized in 2031.