

## **SELECTION OF GEOSTRUCTURES TO ISOLATE HIGH LEVEL WASTE IN A DEEP GEOLOGICAL ENVIRONMENT**

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Running in the technologies for decontamination of high level waste (HLW) is a pressing problem of the 21st century. A prospect to isolate HLW in large diameter wells within a depth range of 2-6km enables to utilize protective properties of a deep geological environment (DGE) at maximum. The studies of a borehole method has been carried out in Russia, USA, Australia and Sweden for about 20 years. Selection of geostructures to locate deep drill hole repositories (DHR) stipulates reliability of knowledge about the structure, composition and properties of DGE under real thermodynamic conditions. A large factual material about DGE in a stratigraphic range from the modern to Archean deposits has been obtained from deep and superdeep drilling by the program «Investigations of the Earth's Interior and Superdeep Drilling». By this data from comprehensive studies 3-D models of a geological environment of areas where DH and SDH were drilled have been developed: in Pechenga graben-syncline, Nizhne-Taguil synclinorium, Puchezh-Katun astroblem, Pechora-Kolva aulacogene, Nadym- Pursky trough, Caspian syneclise, Tokmovsk and Tatar vaults. The models were used as a basis for developing criteria of stability of DGE towards the effects of natural processes and grouping of DGE types according to prospects of location of HLW in DHR. Combined materials are used during radiogeoecological division into areas and selection of geostructures to construct DHR.

Conceptual radiogeochemical natural and engineered systems were developed for different perspective types of DGE. They fully comply with a multibarrier strategy of HLW disposal accepted in world practice, by IAEA recommendations and Russian legislation.