Methods to produce brines from underground caverns in bedded and stock deposits

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Annotation

The paper deals with the experience in operation of more than one hundred of underground dissolution caverns in different mining – and – geological conditions.

Special attention is paid to the issue of creating the initial or so-called preparatory stage in the cavern shapeforming, this stage preceding the operational phase.

Process techniques for commercial production of brines by means of single wells from beds of different thickness are considered herein.

Reasons causing emergency situations at the wells, these arising in the process of mine openings' fracturing, as well as methods and ways for their elimination are being analyzed herein.

1. General background

On the territory of Russia nowadays there are being operated over a dozen of brine-producing facilities having different capacities and totalling about 250 of operating wells. Unified approach to designing, constructing and operating of geotechnological brine wells had been developed in 1950s and turned out unjustifiable and needed to be substituted for the local principle – instead of the regional one – in designing each specific well. The initial factor for such a transition became the classification of natural salts' deposits by geological conditions of their origin. By this principle the deposits have been divided into two main types, namely – bedded and stock-like. Bedded deposits, in its turn, are divided into single – bedded and multibedded (two and more salt beds separated by host insoluble rocks).

When preparing the abovesaid types of deposits for operation, there are taken into account data on salt analysis, availability and thickness of host intercalations and insoluble inclusions, on physico-mechanical rock properties in saline and suprasaline series, hydrogeological conditions, as well as information about surface structures located in the would-be undermined zone. Analysis and processing of accumulated data enable us to impose limitations on geome-