

SHAPES OF CAVERNS IN DIFFERENT POLISH SALT DEPOSITS

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Abstract

Designing the shape and dimensions of the salt cavern is a complex engineering problem related to consideration of many factors such as geological and mining conditions, mechanical parameters of rock salt and nearby nonevaporites and failure criteria. The shape of the salt cavern is an important concern with a view to the safety and stability issues during the construction stage. Engineering experience and available papers show that rational design of the shape and dimension of salt cavern can effectively reduce negative effects and improve safety.

The occurrence of significant differences in a shape and dimensions of the salt cavern in various rock salt formations and rock salt deposits are generally known. Lithological variability, complex structure of deposit and rock salt layers as well as changeability in the content of both insoluble minerals such as clays, anhydrite and freely soluble minerals like carnallite, sylvite, contributes to the unpredictability of cavern shapes. The presented study compares cavern shapes in Polish rock salt deposits from different salt formations. The attention was paid to factors connected with geological and mining conditions such as: structure of rock salt deposit, strike and dip of rock salt layers, mineralogy and petrology. Caverns selected for this study are characterised by irregular shapes and location in distinct geological and mining conditions including salt domes and bedded salt deposits.

Key words: Cavern Shape, Geological Structure, Polish Salt Deposits, Domal Salt Deposits, Stratified Salt Deposits