

Coupled geological and hydrogeological models in fractured systems: understanding interactions between underground storages and their rockmass

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Abstract Underground unlined mined storage caverns are a technique used worldwide for storing LPG and liquid hydrocarbons products. The knowledge of the structural conditions and the hydrogeological behaviour of the rockmass are essential for the elaboration of an optimized and safe design of the underground storage project. For each underground mined storage, and at each project stage, a visual geological and hydrogeological model integrating all observations from the investigation and construction phases is developed. It gives the best representation of the geological and hydrogeological characteristics of the host rockmass with the available data. At the design stage the model is used to optimize the position of the underground works and especially the orientation of the boreholes of the water curtain system. During the construction and operation phases, it is used to interpret the measurements recorded by the monitoring network and to understand water flow paths through the fracture network.

Key words geology; hydrogeology; model; visualization; underground storage; fissured rockmass