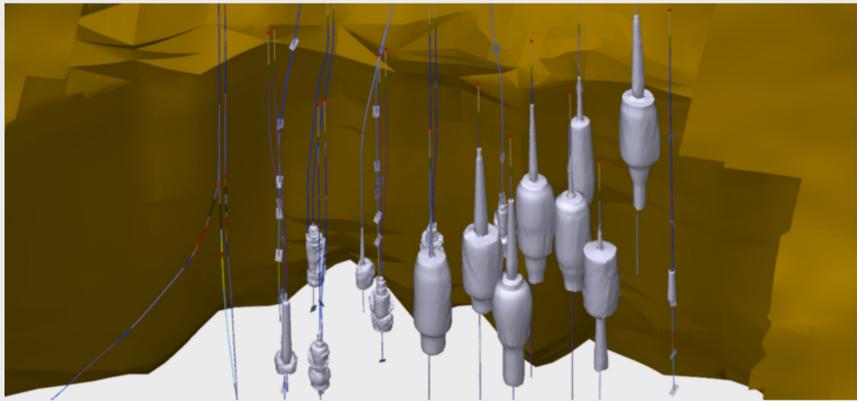


3D INTERPRETATION AND 3D VISUALIZATION OF COMPLEX SALT STRUCTURES



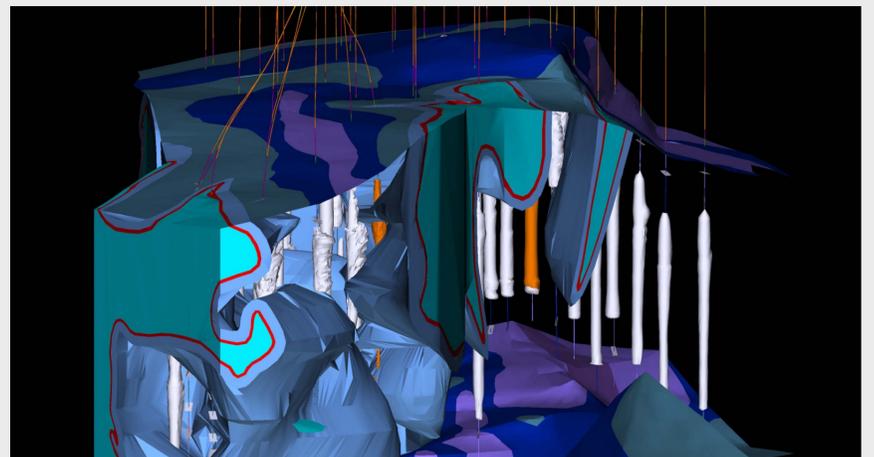
Caverns are artificial cavities in the underground, created in salt deposits by the process of controlled solution mining. They are built and operated for the production of salt and for the storage of liquid or gaseous energy carriers. The cavity must be constructed economically and with a view to its long-term operational safety within an often structurally complex geological environment.



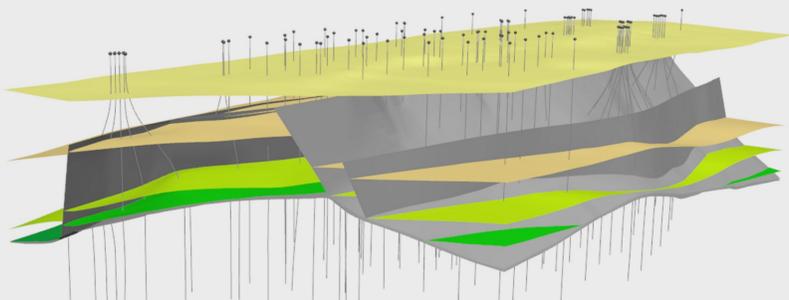
Because of their thickness, salt domes make the construction of large, i.e. several hundred meters high, caverns possible. In addition, the depth of the cavern is largely freely selectable and the pressure range can thus be well adapted to the operational requirements. On the other hand, halokinetic processes usually result in a complex and small-scale distribution of different salt qualities that require a careful selection of cavern locations.

Detailed exploration of the internal structure of a salt deposit is only possible from boreholes. Purpose of the exploration is to recognise the geometry, spatial position and material composition of the various salt units and their associated rocks. The following investigations have proven to be important methods of geological exploration:

- the petrographic and structural evaluation of oriented drill cores
- the determination of the bromide content in halite for the relative age-dating
- the geophysical logging in the open borehole to determine petrophysical properties of the formation and to interpret the lithology
- the borehole radar measurement (GPR) to image bed boundaries and other lithological contrast surfaces and record their orientation to the borehole

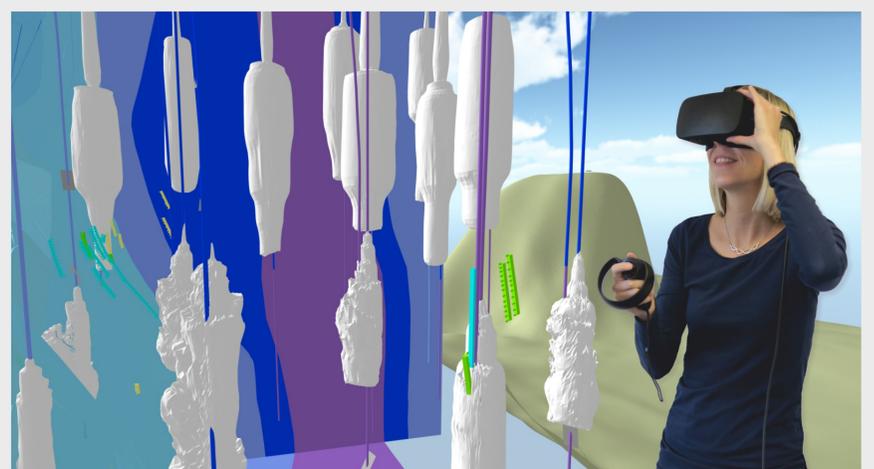


The internal structure of complexly deformed salt deposits can only be conclusively interpreted and visualized in 3D space. With 3D modelling, it is possible to show spatial relations between geological formations that often cannot be depicted in the form of "classic" vertical sections.



Digital 3D models of salt structures and their overburden sequence are used for the following applications:

- definition of locations, assessment of resources and potential
- evaluation of safety distances and pillar dimensions
- integrity assessment
- geological prognosis and forecast logs
- basis for geomechanical and dynamic models
- core of a 3D data management system in solution mining and storage operations



The "Virtual Reality" technology opens up new possibilities for the visualization of complex salt structures. In the medium term, it will also be possible to visualize dynamic processes in a virtual environment.