Simultaneous Process of Leaching and Gas Storing - Special Aspects for Planning of Cavern Staßfurt S 106

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Abstract

Solution mining and gas storing simultaneously provides both commercial and operational advantages over conventional storage development and operation. This method will be used for premature use of the cavern Staßfurt S 106 for gas storing at the Gas Cavern Facility, Staßfurt, Germany.

A special leaching technology was created to develop a specific cavern shape. The leaching process starts with conventional technology. After reached the special shaped cavern the cavern will partially dewatered. During leaching under gas the interface moves down stepwise but will be fixed during each leaching period.

The stability of this cavern shape and the stress situation around the wall have been investigated by geomechanical modelling.

The obtained results have been used for specification of operation pressure range and for design the leaching facilities.

The well completion consists of a 9 $^5/_8$"-gas tubing with packer and a leaching string combination of 6 $^5/_8$" – 4 ½". A special designed well head with the gas tubing hanger, Y-tree, valves and the leaching string hanger with accessories will be assembled.

Due to simultaneous process a permanent dewatering unit for degassing the brine has to be operated. To leaching under the maximum pressurized gas cap an additional fresh water pump for increasing the injection pressure was specified.

The cavern control under solution mining and gas storing process means a daily interface control by using a special software and a periodically shape control with sonar measurements.

Furthermore the operational staff can monitor all measured data of rates, well head pressures and temperatures in the control room due to the planned automatization concept.

In summary this method allows a cavern development based on the actual demand on working gas and gas market situation.

The concept yields to develop an modified cavern space quickly, safety and economically.

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