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INFERRING THE GEOLOGIC SIGNIFICANCE AND POTENTIAL IMPACT OF SALT FABRIC AND ANOMALOUS SALT ON THE DEVELOPMENT AND LONG-TERM OPERATION OF SALT STORAGE CAVERNS ON GULF COAST SALT DOMES

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Abstract

The fabric of the salt refers to all of the components that make up a deformed rock including such items as texture (size, shape and arrangement of the component grains), structure and preferred orientation. The internal fabric of the salt is related to the growth history of the dome and as such represents the latest snapshot of a complex deformational history of the salt stock where the salt is considered to move upward in an episodic fashion as a series of salt spines. While impurity content has traditionally been the focus for cavern development, as more salt core becomes available, it is increasingly apparent that relatively clean Gulf Coast domal salt exhibits significant variation in internal fabric either within a single well or between wells within the same cavern field. To identify and attach geologic significance to the observed variations of internal salt fabric requires systematic core testing and analysis of various salt types, in context of all of the available geologic data on a site to site basis to provide sufficient insight to allow an assessment of the potential impact on salt cavern development. The identification and assessment of problematic zones within the salt can not be adequately addressed by any single geologic method or geophysical tool, especially without site specific core data. An increased geologic understanding of the various fabric elements observed within the salt, both in terms of geologic trends, geomechanical strength properties and solution mining characteristics will provide for better cavern placement, allow optimization of cavern operating parameters and assist with addressing cavern problems, therefore creating a more efficient storage operation.

Keywords: Domal salt, Evaporites, Geology, Gulf Coast of US and Mexico, Salt domes, Salt properties