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## **The Impact of Anomalous Salt and Boundary Shear Zones on Salt Cavern Geometry, Cavern Operations, and Cavern Integrity**

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### **Abstract:**

Anomalous salt in domal or deformed salt deposits tends to be more frequently associated with boundary shear zones between differentially moving salt spines and edge zones near the periphery of the salt mass. Anomalous salt is often problematic and can directly affect a cavern or be an indicator of geologic processes that may have a negative impact on cavern development, cavern operations and cavern integrity. In several cases the presence of anomalous salt has resulted in the loss of well and/or cavern integrity.

Highly soluble and weak salt zones may preferentially leach creating irregular cavern geometries that are often difficult to manage during solution mining or image with sonar surveys. These zones of preferential leaching may result in trapped product and may pose a risk for maintaining sufficient offset from property boundaries, other caverns or the edge of salt.

Weak, sheared and permeable salt can provide potential leak paths through the salt that can negatively impact cavern integrity or cavern operating pressures. These anomalous features can also be indicators of geologic processes (i.e., faulting or differential salt movement) that can impact cavern integrity within the salt and also casing integrity in the caprock and overburden sediments.

Often these problematic zones can be identified from geologic mapping, core data, well logs and cavern sonars.

This paper will discuss the geology and apparent geologic risk of boundary shear zones and anomalous salt for salt cavern storage integrity. Several examples are included sourced from public domain records.

**Key words:** Salt Domes, Geology, Gulf Coast of US, Anomalous Salt, Boundary Shear Zones, Geologic Risk.

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