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MEETING PAPER

SURFACE FEATURES INDICATIVE OF SUBSURFACE EVAPORITE DISSOLUTION: IMPLICATIONS FOR STORAGE AND MINING

by

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ABSTRACT

Evaporite deposits comprise a substantial portion of the earth's near-surface rocks and are appropriate targets for exploiting storage of liquid and gaseous hydrocarbons, and for extractive mining. They also provide ubiquitous opportunities for dissolution by groundwater; consequently, the surface expression of these processes is widespread. Surface features commonly occur from entirely natural processes, and they are sometimes induced as a result of human activities. Because these processes create subsidence-related depressions, sinkholes, cracks, and other undesirable effects, their etiology becomes important. Therefore, recognizing, understanding, predicting, and mapping these features is crucial to the safety of operations. For these reasons, dissolution features should be a major element in site characterization studies of evaporites.

Bedded and domal salt deposits each show different kinds of surface features resulting from subsurface dissolution, although many are alike. The essential verticality of most features in domal salt combined with limited areal extent is the main difference from features in bedded salt. Similarities with dissolution features over carbonate terrain also exist, producing "salt karst" that has been confused sometimes with limestone karst. A major distinction affecting the two rock types is that groundwater will invade carbonate masses through joints and fractures, whereas salt dissolution most often proceeds from the edges of the body. Accordingly, peripheral portions of salt masses require more complete characterization, especially regarding salt properties and the groundwater regime, and thus the potential rate of dissolution.

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