

Snider, H.I. 1966. Stratigraphy and Associated Tectonics of the Upper Permian Castile-Salado-Rustler Evaporite Complex, Delaware Basin, West Texas and Southeast New Mexico [Ph.D. dissertation]. University of New Mexico, Albuquerque.

ABSTRACT, P 1;

" The Delaware basin of west Texas and southeast New Mexico is roughly pear-shaped with a northwest-southeast length of about 140 miles and a width of 100 miles in the northwest tapering to 60 miles in the southeast--an area of about 10,000 square miles. In late Permian time the basin was essentially encircled by a carbonate depositional environment or reef zone.

The Upper Permian evaporite complex within the Delaware basin consists of Castile, Salado, and Rustler Formations. The Castile Formation contains laminated calcareous anhydrite, halite, and limestone. The Castile Formation was subdivided into seven units: Anhydrite I, Halite I, Anhydrite II, Halite II, Anhydrite III, Anhydrite IV, and Anhydrite V. The lowest four units can be traced over two-thirds of the basin. The upper three units can only be differentiated in the eastern part of the basin. The Salado Formation consists of halite and anhydrite with minor clastics, magnesite, and potassium minerals in the north and east parts of the basin. In the south and west parts of the basin, the Salado consists mainly of anhydrite dolomite, and clastics. The Rustler Formation contains anhydrite, dolomite, clastics, and halite.

The distribution of halite may reflect tectonism during Castile time. Little to no halite is found on the intrabasin shelf, while thick halite beds are found in the Ochoa trough. Halite units of the Castile Formation may have overlapped to the south due to differential subsidence or 'tilting' southward of the Ochoa trough. A reversal of this tilting occurred in Salado time.

Evidence of local movement in Castile units is abundant. Four models are analyzed to account for salt structures found: 1. salt movement contemporaneous with deposition--'down building'; 2. post-depositional halite piercement; 3. post-depositional lateral movement of upper halite over lower halite stock, dome, or anticline; and 4. gravity flow of upper halite over a lower halite structure--'anticline on anticline.' Tectonic 'triggering' is suggested as the major cause of Castile halite movement. Regional movement resulting in structures similar to 'salt pillows' or 'salt stocks' is believed to have occurred in the northeast part of the Delaware basin in Lea County, New Mexico."

