Influence of La Popa Salt Wall on the Depositional Patterns and Stratal Architecture of the Shallow-Marine Siliciclastic Deposits of the Viento Formation, La Popa Basin, Mexico

Platon, Constantin P.[1]; Weislogel, Amy [1] (1) Department of Geological Sciences, University of Alabama, Tuscaloosa, AL.

Salt-sediment interaction deposits are important to understand because they host economically significant hydrocarbon resources. La Popa basin, part of deformed Hidalgoan (≈Laramide) foreland in northeastern Mexico, offers well exposed and preserved evaporite structures and associated strata, which can be used as an analog model to predict facies pattern and stratal architecture of structures buried deep in the subsurface. Viento Formation deposits exposed on the western side of the La Popa secondary salt weld record evaporite movement within the former La Popa salt wall during the Middle Eocene time. Four stratigraphic sections measured thus far document growth strata geometries, lateral decrease in thickness from 1040 m to zero, and at least one intraformational angular unconformity of ≈20° that becomes conformable within tens of meters away from the La Popa weld. Lithofacies analysis record upward-fining siliciclastic cycles with well rounded, mafic-intermediate diapir-derived metaigneous clasts (2-30 cm) in conjunction with abundant, large (4-15 cm), disarticulated oysters commonly found at the base of the cycle. These clasts are interpreted to have been cyclically extruded along with diapiric evaporite of the Jurassic Minas Viejas Formation from the La Popa evaporite wall and exposed at the sea floor. Together, these preliminary field observations indicate Viento Formation strata adjacent to the La Popa evaporite wall formed as a wedge-type halokinetic sequence, which reflects the influence of mean evaporite rise rates that only slightly exceeded mean sediment accumulation rates. Lateral thickness variation with changing distance from the weld/wall associated with vertical lithofacies patterns implies higher-energy depositional environment developed close to the salt wall compared to lower-energy depositional environments that dominated 1 - 2 km away. A higher topographic zone was associated with the evaporite rise as the basin and adjacent strata was subsiding. The metaigneous clasts presence in a coarser lithology reflects short-lived episodes of rapid evaporite extrusion along the diapiric wall, possibly related to Hidalgoan shortening events.