

## ABSTRACT

# SALT-INFLUENCED GROWTH-STRATAL GEOMETRIES AND STRUCTURE OF THE MUERTO FORMATION ADJACENT TO AN ANCIENT SECONDARY SALT WELD, LA POPA BASIN, NUEVO LEON, MEXICO

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Master of Science in Geology

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Las Cruces, New Mexico, 2001

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Diapirism and subsequent salt weld development produced growth-stratal geometries and faulting within the Late Cretaceous to early Tertiary La Popa foreland basin. The La Popa basin fill consists of about 5,500 meters of an overall deltaic-shelfal regressive succession with subordinate limestone lenses. Several salt bodies, one of which evolved into a salt weld, penetrate this succession. A salt weld is a planar, fault-like structure that was formerly occupied by salt and separates two bodies of strata. The La Popa salt weld had two stages of development, a diapiric stage and an evacuation stage that resulted in complex but distinctive depositional and structural geometries in the adjacent strata.

The Maastrichtian Muerto Formation was deposited during the diapiric stage, during which time rising Jurassic evaporite created a local topographic high on the basin floor. Variations in sedimentation rates during deposition generated growth-stratal geometries within the adjacent strata. These geometries represent halokinetic sequences, which are relatively conformable successions of strata influenced by near-surface salt movement and locally bounded at the top and base by angular unconformities. Low sedimentation rates allowed abundant time for adjacent strata to upturn and be truncated during regressive shoreface erosion. Higher sedimentation rates did not allot the time necessary for dramatic upturning and instead resulted in onlap of the erosional surface. Repeated variation in sedimentation rates generated stacked halokinetic sequences separated by unconformities that caused the overall thinning and pinch-out of the Muerto Formation in the direction of the weld.

Although conformable with the underlying Parras Shale and overlying Potrerillos Formation in most of the La Popa basin, the contacts with these two formations are angular unconformities within 1 km of the weld, resulting in pinch-out of the Muerto at a distance of 150 m of the weld. Reduction in the width of the original salt body during Muerto deposition caused successive halokinetic sequences to encroach upon the diapir and probably also created a steep pre-Muerto normal growth fault that dipped toward the diapir. During the evacuation stage in the Eocene, salt weld development was accompanied by faulting in all adjacent strata directly northeast of the La Popa salt weld.