ABSTRACT

STRUCTURAL GEOLOGY AND TECTONOSTRATIGRAPHIC DEVELOPMENT OF PART OF THE LA POPA BASIN, NUEVO LEON, MEXICO

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The La Popa basin of western Nuevo Leon and eastern Coahuila, northeast Mexico is characterized by northwest-trending folds, evaporite diapirs intruded into Upper Cretaceous-Eocene strata and, a ~ 25 km long salt weld previously interpreted as a reverse fault. The structural features exposed in the La Popa basin are interpreted to have formed during two distinct tectonic stages. Stage one consisted of halokinesis and the consequent development of structures and sedimentation patterns related to halokinesis. Halokinetic structures include three evaporite diapirs, a salt weld, lateral facies changes, variations in synhalokinetic stratal thickness, angular unconformities, and salt-withdrawal synclines.

The La Popa salt weld is interpreted to have been an elongate, curviplanar wall of diapiric evaporite bounded by salt-withdrawal synclines in the hanging-wail and footwall in the Late Cretaceous. Stratal thickness changes record deposition in salt withdrawal synclines adjacent to the salt weld and diapirs. Salt-withdrawal synclines are interpreted to have formed in response to an increase of accommodation space created by halokinesis. Biohermal carbonate lentils were deposited on bathymetric highs created by drag zone folding flanking the salt weld and diapirs. Upper Cretaceous siliciclastic strata typically thin toward the

salt weld and diapirs. Adjacent to the salt weld, numerous angular unconformities record episodic uplift of hanging-wail and footwall strata. The timing of halokinesis is recorded by the lateral migration of the hanging-wall syncline toward the salt weld. The location of the synclinal axis suggests that diapiric ascent of the salt wall ceased in the Eocene. Stage two consisted of Laramide shortening that modified the halokinetic structures. Laramide shortening in the basin resulted in evacuation of salt from the salt wall, stratigraphic welding and juxtaposition of hanging-wall and footwall strata. Laramide shortening is characterized by long wavelength, large amplitude folding and minor faulting.