

STRATIGRAPHIC AND STRUCTURAL ANALYSIS OF THE LAS VENTANAS
AREA, LA POPA BASIN, NUEVO LEON, MEXICO

ABSTRACT

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The area of Las Ventanas in northeast Mexico contains Lower Cretaceous carbonate outcrops with 200-300 m of topographic relief that border an active gypsum mine quarrying the Jurassic Minas Viejas Formation. The Las Ventanas area is located at the juncture between two regional structural provinces. The two structural provinces are: 1) the southern margin of La Popa salt basin and 2) the northern margin of the Sierra Madre Oriental fold belt. Lower Cretaceous carbonate strata in La Popa basin were deformed by both regional tectonic shortening during the Hidalgoan orogeny and by local, syndepositional halokinesis of diapiric Jurassic Minas Viejas Formation. In contrast, Lower Cretaceous carbonate strata within the Sierra Madre Oriental are only deformed by Hidalgoan folds detached on Jurassic Minas Viejas evaporites. There have been no documented cases of salt diapirism within the Sierra Madre Oriental. Previous work has placed the Las Ventanas area in the Sierra Madre Oriental structural province. New field-based data collected in this study indicate that the Las Ventanas area contains evidence of both salt diapirism and Hidalgoan regional shortening, and therefore lies within the La Popa basin structural province. Evidence for diapirism includes: (1) a diapiric contact between Jurassic Minas Viejas evaporites and the Albian Aurora Formation, (2) stratal thinning toward the diapir, (3) rotation of strata to near vertical, vertical, and overturned orientations directly adjacent to the diapir, (4) presence of high-angle faults extending away from the diapir, (5) local mass wasting deposits or debris flows associated with failure and erosion of diapirically over-steepened strata, (6) extensive fractures and veins associated with high-angle faulting and/or diapirically rotated strata and, (7) structural trends consistent with those of La Popa salt basin.