

Structural Complexity in the Burgos Basin, Mexico: Implications for Field Development Planning

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The Burgos Basin, in northeastern Mexico, is part of the Rio Grande Embayment, and forms the westernmost part of the Gulf of Mexico Basin, an area dominated by growth faults, which parallel the Gulf of Mexico coastline. The basin contains a thick sequence of Tertiary and Upper Mesozoic deposits, which are cut by a series of normal faults displaced downward on the Gulf Coast side, roughly parallel to the coastline and formed due to East-West extension. Sediment supply is related to growth faulting in the area; with increasing distance from the controlling growth fault, the amount and reservoir quality of sands generally decreases.

Interpretation of 2D and 3D seismic data sets over portions of the basin resulted in the identification of an east-northeast trending fault system, which complicates the structural style in the area. This fault system cuts the extensional fault system, and appears to show evidence of lateral displacement.

The east-northeast trending faults are interpreted to represent one of the conjugate fault sets related to regional left-lateral trans-tensional movements, which influenced the outer shape of the Burgos Basin. The second conjugate set is assumed to be expressed by a north-south trend of reverse faults, which are locally observed, but which are usually obliterated by the normal faulting in the same strike direction.

The integration of seismic, geological, petrophysical and engineering data proved to be essential in defining reservoir compartmentalization resulting from the structural complexity and for successful infill drilling.