

Sequence Stratigraphy and Depositional Environment of the Miocene-Pliocene Sands in the Lankahuasa Gas Field, Offshore Veracruz

Ulises Hernandez-Romano¹, Juan C. Bermudez-Santana², Alberto Rodriguez-Maya², Hector Ruiz-Ruiz³, Julieta Martinez-Garcia³, Marco A. Rodriguez-Uribe¹, Ma. Lidia De la Huerta-Cobos¹, Ricardo O. Vazquez Romero¹, Agustin Espino-Moreno², and Hugo Flores-Mendez¹

¹Activo Integral Poza Rica-Altamira, Pemex E&P, Interior Campo Pemex, Poza Rica, Ver., 93370, Mexico

²Gerencia de Ingenieria de Yacimientos, Instituto Mexicano del Petroleo, Eje Central No. 152, Ciudad de Mexico, D.F, Mexico

³Activo Regional de Exploracion, Pemex E&P, Interior Campo Pemex, Poza Rica, Ver., 93370, Mexico

ABSTRACT

The Lankahuasa Field is located on the continental shelf, offshore Veracruz. It consists of a series of dry gas accumulations in multiple upper Miocene and lower Pliocene sandstones. The integration of 3-D seismic data, well logs, cores and biostratigraphic data has led to an understanding of the origin, geometry and internal architecture of the sand bodies as well as been critical for planning the exploitation of these reservoirs.

Six main depositional sequences can be recognized in the upper Miocene and lower Pliocene section of the Lankahuasa area. The sequence containing the upper Miocene reservoirs can be subdivided into three dominantly progradational parasequence sets, with the best reservoirs located at the tops of these packages. High resolution seismic data reveal small-scale (20-40 m thick) clinofolds prograding eastwards over the shelf within some of the parasequences. These clinofolds correspond to sedimentary bodies elongated in a NNW-SSE direction, parallel to the contemporaneous shoreline, as revealed by seismic attribute maps. Well log and core characteristics indicate that the best sands were eroded from the upper parts of the parasequences and redeposited during high-frequency transgressions.

Deposition of these sands is inferred to have taken place in two stages: 1) as shoreline-parallel bars in wave-dominated deltas and prograding coastal systems during sea level highstands, and 2) as lag sheets in inner and middle shelf during transgressions. The main sedimentary bodies have a NNW-SSE orientation, and preferential drainage is expected in this direction. Erosion and redeposition of the sands during transgressions interconnected these bodies and conferred a good lateral continuity to the reservoirs.