

CENOZOIC BASIN DEVELOPMENT IN THE UPPER GUAJIRA AND RELATIONSHIPS WITH THE SOUTH CARIBBEAN DEFORMED BELT (NORTHERN COLOMBIA)

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*MSc in Reservoir Geology and Geophysics
July, 2018*

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ABSTRACT

This document evaluates the structural evolution of the Cenozoic sedimentary sequence, and its relationship with the South Caribbean deformed belt (SCDB) in the upper Guajira offshore basin. The Cenozoic SCDB is a 40-km-wide fold-and-thrust wedge formed where the Caribbean and South American plates converge. Using a 190-km-long 2D regional seismic line integrated with information provided by two wells, seven chrono-stratigraphic units are interpreted (Mesozoic, Paleocene?-Eocene, Oligocene, lower, middle and upper Miocene and Plio-Pleistocene). A six steps structural restoration using horizons and faults product of interpretation, suggests Paleocene?-Eocene syn-rift, Oligocene to upper Miocene post-rift and Plio-Pleistocene syn-convergence depositional sequences. The syn-rift event is characterized by hyperthinning of the continental crust of the South American margin resulting in crustal boudinage and lower crustal removal. Deposition occurred as half-graben shallow marine systems, where the existence of carbonate platforms, patch reefs, carbonate debris flow and delta plain reservoirs are proposed. The post-rift sedimentary deposition started with an Oligocene "Failed Rift Sag basin" product of the rifting abortion process. From Eocene to late Miocene, more than 7 km of passive margin sequences were deposited on the continental margin, where deep water turbiditic deposits are proposed as the main reservoir. During Plio-Pleistocene the passive margin deposits were imbricated against an isolated crustal massif (boudin), which together with syn-convergence deposits forms the actual South Caribbean deformed belt. The kinematic evolution, the existence of possible reservoirs and source rocks, allow to propose the SCDB as a very prospective objective.

Keywords: Colombia, Upper Guajira, Offshore, Cenozoic, South Caribbean deformed belt.

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