

Undiscovered Hydrocarbon Resources Potential for the Northern Offshore Guajira Basin, Colombia; A Dormant Giant Hydrocarbon Province

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Abstract

The Guajira offshore area is a frontier basin, largely unexplored, and poorly understood, where very few wells have been drilled in its offshore portion. It is located in northern Colombia and in the southwestern part of the Caribbean Sea. The basin currently produces only gas from three fields: Chuchupa, Ballenas and Riohacha. The produced hydrocarbon gases were initially attributed to a bacterial origin, however, later studies reported carbon isotope data that indicated that these gases corresponded to a mixture of hydrocarbons including thermogenic origin, which has been confirmed by evidence of wells recently drilled. This basin has been mainly considered as a gas prone exploration area, due to the absence of liquid hydrocarbons, as well as, by the presence of huge Tertiary pelitic sedimentary sections composed of type III kerogen, considered to be a gaseous source-rock system. However, recent studies of oil slick satellite and piston core surveys, as well as the presence of Cretaceous sedimentary sections have suggested the presence of liquid hydrocarbons widespread in the oil slicks, piston cores and even in extracts of some cretaceous sediments analyzed in this basin. This study will show as an example, the hydrocarbon potential evaluation of the Upper Cretaceous source rock and reservoir systems drilled through the San José-1 well, located north of the Basin. This well has drilled the largest Cretaceous section (Campanian - Maastrichtian), up to today in the Basin and although it did not reach the same source-rock quality as the Luna formation (Turonian - Campanian), considered

to be the main source rock of the neighboring Supergiant Maracaibo basin, it can contribute with significant liquid hydrocarbon resource potential in this Caribbean offshore Basin.