

# **PS Pre-salt Facies in the Carmópolis Area, Northeast Brazil: Stratigraphy and Depositional Model\***

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## **Abstract**

The Carmópolis field, the first giant field discovered in Brazil in the late 1960s, is located in Sergipe-Alagoas Basin, a typical rift basin that evolved to a passive margin after the breakup of the Gondwana. The field has been producing oil onshore from Muribeca Formation and its underlying basement and has not reached the top of the production curve yet. The Muribeca Formation is interpreted as deposited in a transitional environment with some marine evidences. There are occurrences of microbial boundstones in the Upper-Aptian of Sergipe Basin (base of Ibura Mb.), and they are located at the Aracaju High which is a basement structural high in the margin of the basin.

The aim of this work is to discuss the carbonate sequence that occurs just below the salt sequence. The studied interval is composed of carbonatic, siliciclastic, evaporitic and hybrid facies. Core description (facies and facies association) logfacies analysis and composite logs have been applied. The occurrences of microbial boundstones are stratigraphically correlated in the entire Aracaju High and at the time of deposition, they were thicker in low areas and thinner in high areas. At the studied area the depositional environment was interpreted as a restrict evaporitic lacustrine-lagoon due to: (A) rare presence of fossils, which are limited to some specimens of ostracods, (B) microbial boundstones in the form of mats or laminites, (C) lack of sedimentary structures related to flow and tides, (D) evidences of high salinity and intense evaporation during the deposition in the form of diagenetic anhydrite and evaporite dissolution breccias, (E) presence of nodular and stratified anhydrite layered with carbonaceous mudstone as evidence of shallow water, (F) presence of exposure features like teepees and desiccation cracks and (G) dominance of low-energy lithologies.

The sedimentary environment would consist of higher marginal areas with basement exposure and a series of shallow water ponds with occasional influx of saline waters probably from a nearby lagoon. Thus, it is proposed the term Lake-Lagoon Complex for the facies associations found in the Carmópolis area of the Sergipe Alagoas Basin.

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