Implications of Stratigraphic and Sedimentological Models in the Fractured Reservoir Development of the Middle Cretaceous May Field

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ABSTRACT

This work focuses on the influence that the stratigraphic and sedimentological models had for the development and distribution of fracture systems at the middle Cretaceous May Field. The lithology consists of packstone, calcareous sandstones, dolomites, and breccias associated with foreslope facies, as well as mudstone and wackestone of open shelf and basin facies. There were several lithostratigraphic controls on geology and hydrocarbon production. The first is the presence of argillaceous limestone confining the top and bottom of the middle Cretaceous, which conditioned the development of tectonic wedges and hydrocarbon vertical migration. The second corresponded to the distribution of clays, values below 4% generally do not fill the fractures and allow the oil production, while higher values generate less fractures and production. The last lithostratigraphic control affected the development of fractures, which occur in carbonate rocks, while not seen in argillaceous rocks with lenses of organic matter lithology, showing the lamination and stylolitic planes as the boundary between them. Further, the pressure-solution diagenetic process generated abundant individual and braided systems of stylolites impregnated with hydrocarbons, which was considered as another fracture system for subsequent microstructural analysis. Also, the largest hydrocarbon production is associated with younger and open east-west fractures, present in central and southeastern of the May Field.

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