

Facies Analysis and Reservoir Characterization of Eocene Carbonates in East of Daman, Mumbai Offshore Basin, India

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Gas indication in Paleocene- lower Eocene sediments has brought exploration impetus in the area east of Daman, Mumbai Offshore Basin. Additionally a seismic feature was mapped and identified as a carbonate buildup within Eocene. The present paper deals with reservoir characteristics in terms of facies analysis, porosity distribution and understanding diagenetic processes which control the porosity in Eocene carbonates and to validate the existence of carbonate buildup.

Based on core and petrographic studies, the microfacies identified are argillaceous-foram wackestone, foram-algal wackestone and rarely foram algal packstone within Bassein Formation equivalent. Upper part of this formation is mostly limestone with few shale layers in between and changes to argillaceous facies towards northeast part. Whereas middle and lower Bassein Formation is highly argillaceous with thin bands of limestone except in the area around well ED-B. The study indicates poor to moderate secondary porosity (8-10%) preserved within foram algal packstone/ wackestone facies, which normally decreases downward. The porosity is mainly of secondary origin and preserved in form of network of solution channels and interconnected vugs with some micritic porosity enhanced by solution activity.

The secondary porosity lost at several places primarily due to cementation in fresh-water phreatic zone, whereas the imprint of marine cementation is rare. The evidence of fresh water phreatic cement includes blocky calcite spar occupying the channels at many places. Based on the limited porosity data, it is apparent that porosity development is better in the central part around well ED-B as compared to the areas in north-east. The microfacies study suggests doubtful existence of carbonate buildup.