

Geological Modelling of Paleogene- Neogene Sequences From Akholjuni (Cambay Basin) to Cacd Area (Mumbai Offshore Basin): *An integrated approach*

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Integrated Geological model from Akholjuni in Western Onland Basin to CACD area of Tapti-Daman sector of Western Offshore Basin” was jointly taken up to create an integrated Geological model for these basins measuring about 28000 sq.Km area. An attempt has been made to correlate the sequence boundaries and genetically related depositional units from the basinal part of the offshore basin to the onshore areas for better understanding of the exploration plays and the Petroleum systems in both the Onshore and Offshore areas.

The study has identified the sequence boundaries and integrated Isochron maps were prepared for seven surfaces from Basinal part to Onland areas. These maps indicate that the geometry of the rift system and the transfer fault system has been governed by the basement architecture of the Indian craton. While the NNW-SSE Dharwarian trend controlled the rift axis, the ENE-WSW Satpura-Aravalli trend controlled the transfer fault geometry. Isochronopach and Isopach maps have depicted the major depocentres namely, Purna Low, Daman Low and Navsari low in the offshore areas and in the onland area the Sayan low, Broach and Tankari depressions. Lithofacies , sand isolith and depositional model maps for studied sequences have brought out the areas of better reservoir facies. The Isolith maps prepared for Lower Oligocene to Lower Miocene sands (Daman sands and Miocene Basal sands) show the configuration of the principal conduits for sand transport, which has continued to be through Narmada and Mahisagar river channels from Oligocene onwards. The facies and Paleobathymetric maps show the depositional trend in the basin.

The principal Plays identified in the basin are Paleocene- Eocene clastics, Oligo-Miocene Carbonates and Oligo-Miocene sands. The Paleocene- Eocene clastics are best developed in the proximal part of the basin, where drainage from Proterozoic or Mesozoic provenance from Aravallis or Himmatnagar sandstone have dumped clean sands and are the best targets for the exploration. The Onland area is, therefore, best suited for this play. Paleocene carbonates are not ranked as good prospects because of poor porosity. The Oligo-Miocene Carbonates are most prospective in the southern part of the basin, to the south and west of B-12-10 and additionally in the vicinity of CD-1 to B-170A-1. The high impedance migration controlled by fault systems restricts the hydrocarbon occurrence to vicinity of mature source rocks. Mahuva limestones in the south-western part of the basin, to the west and south-west of well B-12-10 are more promising. The Late Oligocene-Early Miocene sand geometry in Tapti-Daman area shows tidal influence, with tidal sand bars forming the best reservoir prospects. The entrapment is mostly strati-structural, with sand occurrence and fault closures playing major roles in hydrocarbon trap formation. In the gulf area, the inverted structures south of well Gulf-4 appear to be promising for shallower prospects. In the Onland areas, apart from the structural closures, the rising flanks of the lows form good targets for exploration.