

Paper 8**Sequence stratigraphy of the Upper Miocene Stage IVC in the Labuan-Paisley Syncline, northwest Sabah Basin****ROBERT WONG**

Petroleum Resource Assessment Department
Petroleum Management Unit
PETRONAS
Kuala Lumpur

A sequence stratigraphic study of the Upper Miocene Stage IVC has been carried out in the Labuan-Paisley Syncline, Northwest Sabah Basin with the aim of identifying new hydrocarbon plays in the study area. The Stage IVC contains up to 4,000 m thick, clastic sediments deposited in coastal plain to bathyal environments probably between 8.2 Ma and 10.5 Ma indicating an immense sedimentation rate of approximately 1,700 meters/Ma. The top and base of the Stage IVC are marked by the Shallow Regional and Upper Intermediate Unconformities respectively which are pronounced tectonic boundaries in the NW Sabah Basin.

The overall regressive Stage IVC sediments are characterised by oblique to shingled progradation towards the westerly-northwesterly directions as suggested by the mapping of the pronounced shelf-edges. A generalised third-order sequence within the Stage IVC includes very thin transgressive systems tract and very thick highstand and lowstand systems tracts. A Type-1, third order sequence boundary separates the Stage IVC into two third-order sequences. This sequence boundary is evidenced by the occurrence of a major erosional slump scar at the western part of the syncline. The depositional model derived from this study includes thick shelf sands and basin floor/submarine fans interspersed

by thinner sands of the levee-channel complexes at the shelf slopes.

The Intra Stage IVC sequence boundary is thought likely to be caused by the fall in sea-level probably between 8.5 Ma and 9.0 Ma. This fall in sea-level is not represented in the global sea-level chart of Haq *et al.* (1987), suggesting that this fall in sea-level could be small and localised but it is evident in a basin with large sediment supply.

This sequence stratigraphic study has resulted in the identification of various hydrocarbon plays. They comprise basin floor/submarine fans, slope fan/levee channel complex and shelf-edge/slump scar plays. The basin floor/submarine fan play is considered the highest ranked but requires additional seismic coverage for detailed mapping.
