

*Paper 13*

**High-resolution stratigraphy of the alluvial-coastal succession  
of the D and E group (Middle Miocene) of a gas-field  
in the northern Malay Basin, offshore Peninsular Malaysia**

MOHD RAPI MOHAMED SOM<sup>1</sup>, ABDUL HADI ABD. RAHMAN<sup>2</sup> AND MOH'D NUREIN BUSHARA<sup>3</sup>

<sup>1</sup>Petronas Research & Scientific Services Sdn. Bhd.  
Bangi, 43000 Kajang, Selangor

<sup>2</sup>Geophysics Group, School of Physics, Universiti Sains Malaysia  
11800 USM Penang

<sup>3</sup>Petronas Carigali Sdn. Bhd.  
Petronas Twin Towers, Kuala Lumpur City Centre, 50088 Kuala Lumpur

Detail sedimentological analysis and core-log facies calibration of the Middle Miocene succession of a gas-field in the northern Malay Basin identified facies associations which reflect deposition in a coastal-estuarine or coastal-deltaic floodplain environment. The presence of the trace fossils *Diplocraterion* and *Teichicnus* within the floodplain facies, in the upper section of the E Group, and the basal part of the D Group indicate brackish-water conditions, and signify marine incursions into the coastal floodplain areas.

Interpreted log facies of the E, D and B Group successions in the field exhibit three major intervals. These are:

- I. **Interval I:** The basal coal-bearing successions of the E Group. Two sub-intervals — a lower floodplain-dominated sub-interval and an upper, sand-prone succession. The lower sub-interval comprises multi-stacked successions of coal-capped floodplains cycles, punctuated by single-story and multi-story fluvial channel sandstones. The upper sand-prone interval is marked by the presence of thick, multi-story, fluvial channel sandstones (10–30 m thick).
- II. **Interval II:** Brackish/tidal/marine sand-shale succession, marked by the absence of coal-bearing floodplain cycles, and the presence of *Diplocraterion* and *Teichicnus*. This is essentially the D Group. The lower sub-interval display deltaic sandy, muddy and mixed tidal flats and sand bars, and fluvial channel sandbodies. The upper sub-interval comprises a thick, mud-dominated succession, with minor thin sandy/silty layers, and capped by a 2.0 m thick coal. This muddy unit is interpreted to represent a prograding, prodelta succession.
- III. **Interval III:** Thick, coarsening-upward deltaic succession. This interval is represented by a basal lowstand fluvial facies, a transgressive prodelta mud succession, and capped by a sandy, delta-front and fluvial channel highstand deposits. The stacking pattern of the deltaic cycle indicates an overall transgressive episode.

This stratigraphic interpretation indicate that the E-D-B Group sediments form an overall thick, retrogradational succession.