

DEPOSITIONAL ENVIRONMENTS AND RESERVOIR PROPERTIES OF THE J SANDSTONE, MALONG FIELD, OFFSHORE WEST MALAYSIA

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Potential reservoirs in the basal part of the J sandstone in the Malong field, Tenggol Arch, offshore West Malaysia, consist mainly of three types of sand bodies representing a) prograding shoreface sequences, b) inner-shelf storm-generated sequences, and c) stacked fluvial channel sequence. The prograding shoreface sequence consists of upward coarsening units whereby very fine-grained argillaceous sandstones are overlain by fine to medium grained, well-sorted sandstone. The inner-shelf storm-generated sequence consists of a) a proximal zone, characterized by amalgamated high-energy indicators and frequent erosional surfaces, b) an intermediate zone of coarsening upward sand units with mixed high and low-energy indicators, and c) a distal zone, comprising low-energy indicators. The stacked fluvial channel sequence is characterized predominantly by trough cross-bedded sandstone.

Porosity and permeability in the J sandstone is primarily controlled by sedimentary facies (lithology, grain size, dispersed matrix content and depositional environments). Poroperm values are highest ($\phi = 22-36\%$, $K = 100-8000$ mD) in channel sandstones and storm-generated shallow marine sandstones. Shoreface deposits have slightly lower poroperm values ($\phi = 24-35\%$, $K = 10-1000$ mD). Permeability barriers ($\phi = 10-22\%$, $K < 10$ mD) may occur in lower shoreface to offshore deposits.