

Paper 8

Petrography and reservoir quality of the Tapis sandstones, Sotong Field, southeast Malay Basin

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The reservoir properties of the Upper Oligocene-Lower Miocene Tapis sandstones of the Sotong Field depend on primary depositional facies, mineralogical contents and burial diagenesis. The Tapis sandstones are deposited as deltaic deposits in a fluvio-marine environment.

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Post-depositional diagenetic changes of the reservoir rocks are influenced by the original mineral content of the sandstones. The loss of porosity in these sandstones is due to precipitation of authigenic clays and quartz cementation. Mechanical compaction caused a major loss of primary porosity during shallow burial. Deformation of ductile grains through further mechanical compaction and subsequent formation of clays through degradation of lithic fragments and feldspars caused the major loss of intergranular porosity.

Secondary porosity has been generated by partial and complete dissolution of lithic fragments and feldspars. Appreciable microporosity occurs in altered grains and between clays, especially kaolinite. Late stage calcite cement infills both intergranular and secondary solution pores. Other less common diagenetic products include siderite cement, illite, mixed layer illite/smectite clays with subordinate chlorite.

The best quality reservoirs are found in the predominantly medium grained, non bioturbated sandstones. Generally, the very fine to fine grained sandstones, with varying degrees of bioturbation, are of relatively poor quality reservoirs.
