

The Mentelle Basin – a Deepwater, Frontier Gondwanan Basin

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The Mentelle Basin is a deep-water, offshore basin located on the southwest Australian continental margin to the southwest of Perth. The Mentelle Basin formed near a triple junction between Australia, Antarctica, and India during the breakup of eastern Gondwana in the Middle Jurassic to Early Cretaceous. The basin has rank frontier status with no petroleum wells drilled.

In order to improve the level of geological understanding and petroleum prospectivity of the basin, Geoscience Australia has acquired 1450 km of regional 2-D seismic together with sub-bottom profiler, and swath bathymetry data. Dredge and core material were also collected. These datasets form the basis of a new regional-scale basin framework from which petroleum systems elements are assessed.

Seismic interpretations suggest that the main depocentres in the western part of the basin contain at least 5 km of sedimentary section. These half graben host a relatively thick syn-rift section that is inferred to be Middle Jurassic to Early Cretaceous in age. A thin, Late Cretaceous to Recent post breakup section blankets the region. The shallower-water eastern parts of the Mentelle Basin contain a thinner section, within a series of tilted fault blocks related to Valanginian breakup of the western margin. There is also potential for Permo-Triassic rocks to be present at depth.

The Mentelle Basin is likely to have petroleum systems elements akin to the southern Perth Basin, with potential for similar generated hydrocarbons. Regionally, Mentelle Basin architecture favours eastward migration from a western source kitchen updip into structural and stratigraphic traps.