

A review of the seismic stratigraphy and hydrocarbon potential of the Triassic sequence in the Timor Sea region

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The petroleum potential of the Triassic section has long been established in the Carnarvon Basin, as demonstrated by giant gas/condensate discoveries on the Rankin Platform and Exmouth Plateau. Elsewhere on the Northwest Shelf, however, exploration efforts in the Triassic sections have yielded mixed results. Nevertheless, the potential remains attractive and there has been a renewed push by various operators to extend the Triassic targets into more remote areas, such as the deep basinal areas of the Roebuck and adjoining Rowley Sub-basins. More recently, a regional broadband 2D seismic survey by PGS has revealed the existence of a thick Triassic succession in the Ashmore Platform which extends into the Indonesian part of the West Timor region. The sequence, which is up to 10 km thick, comprises obvious elements of transgressive-regressive cycles similar to other better known regions of the Northwest Shelf.

Uplift and erosion, associated with the Late Triassic Fitzroy Movement and/or main Callovian break-up events stripped the overlying Jurassic and eroded the top of the Triassic section on the Ashmore Platform, the only area so far tested by drilling. Consequently, most of the Triassic horst/tilted fault block and associated drape features, including potential deeper intra-Triassic plays, have remained untested. Previously, access to mature source rocks and the presence of an effective seal (due to shallow faults) were perceived to be major risks. However, the new seismic data has indicated the presence of potential source rocks within the Mount Goodwin Fm equivalent, where deeper burial has occurred, and these can be modeled as being within the gas generation window. In addition, early to mid-Jurassic Plover Formation equivalent may exist along the flanks of the Timor Trough, also potentially providing charge to the Triassic reservoirs based on analogy with accumulations such as Challis in the Vulcan Sub-basin.