# Tectono-Stratigraphic Evolution of the Centaur 3-D Survey, Exmouth Plateau, North West Shelf, Australia

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## ABSTRACT

This project illustrates the tectono-stratigraphic evolution of the Exmouth Plateau, a deep-water sub-basin within the Northern Carnarvon Basin, completed by a full seismic interpretation of the Centaur survey and regional data. The hydrocarbon potential of the region was assessed after a detailed qualitative and quantitative seismic analysis of the structural and stratigraphic elements. The Centaur provided spectacular imaging of the highly-segmented rift-border faults that make up the main graben-forming boundaries formed between the Late Triassic and Early Cretaceous, as a consequence of rifting of Greater India from Australia. Since the Late Cretaceous, the plateau has been subjected to subsidence, slumping, minor episodic fault reactivation and Neogene inversion, which produced a localized anticlinal structure. Several lines of evidence suggest that the overall structural evolution of the fault geometry was influenced by the reactivation of pre-existing structures, these include, 1) existence of fault-propagation folding of Triassic rift-border faults, 2) along strike variations in geometry and orientation of rift faults and 3) the appearance of faults propagating upwards obliquely through pre-rift Lower Triassic strata. Seismic facies analysis of the Triassic has shown a multitude of stratigraphic elements including deltaic channel systems, igneous intrusions and hydrothermal vent complexes. Amplitude extractions identified these as potential stratigraphic traps along including potential structural traps in tilted Triassic fault blocks. The results suggest varying levels of risk and reward in the prospective play targets for petroleum exploration. While the Triassic strata provide potential hydrocarbon targets, fault reactivation since the Early Cretaceous, mass-transport complexes and fluid escape features of the Top Triassic pose a threat to the seal quality of trapped hydrocarbons and slope stability for drilling infrastructure.