

STRATIGRAPHIC, DIAGENETIC AND PETROPHYSICAL STUDY OF THE OVERBURDEN OF THE CARNARVON BASIN (NORTH WEST SHELF, WESTERN AUSTRALIA)

Rosine Louise Riera

University of Western Australia, School of Earth and Environment / Geology, Perth, Australia

rosine.riera@research.uwa.edu.au

ABSTRACT

The Northern Carnarvon Basin is the premier hydrocarbon province of Australia. Its overburden (rocks overlying the hydrocarbon-bearing reservoirs) is composed of carbonate ramp deposits of Late Cretaceous to Quaternary age. These deposits are several km thick and they are associated with a complex internal architecture, which causes velocity anomalies and drilling risks. This project aims to better understand the overburden of the Carnarvon Basin to predict the spatial arrangement of the petrophysical and geological facies. A major component of the project is to generate a model correlating onshore and offshore data and predicting rock properties of the overburden at the basin scale. To realise these goals a field trip will be realised in the Cape Range anticline, where the overburden is outcropping, to observe the spatial organisation of the geobodies and better constrain the timing of deposition. Offshore data (wells and seismic) will be analysed and the formations and geobodies will be identified and mapped on 3D seismic. A first strati-diagenetic model correlating field and offshore data will be created. Relationships between stratigraphy, diagenesis and petrophysics will be investigated and a 2D geological and petrophysical overburden model will be created in PETREL software. Model accuracy will be tested by creating synthetic seismic, which will be compared with field seismic data.

This project will produce a support for seismic data reprocessing and help to locate geohazards for drilling de-risking. It will also improve the global understanding of carbonate ramps and of the Miocene history of the North West Shelf.

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