

Insights into the nature and extent of sedimentary basins underlying the Eucla Basin from reprocessing and interpretation of the 13GA-EG1 Eucla-Gawler Seismic Survey

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One of the main objectives behind the acquisition of the 13GA-EG1 Eucla-Gawler Seismic Survey was to image the crustal architecture of the geology underlying the Eucla Basin, and to establish the subsurface extent of this and older basins, such as the Bight, Denman and Officer basins. The distribution of the Cenozoic Eucla Basin is reasonably well constrained offshore by petroleum industry seismic reflection datasets, but a paucity of both seismic data and drilling penetrations onshore mean that the thickness of the basin, and the presence of older sedimentary units sandwiched between the Eucla Basin and cratonic basement, is poorly understood. Older sedimentary sequences whose presence beneath the Eucla Basin have been confirmed by widely-spaced drilling, but whose thickness, extent and character are uncertain include Lower Cretaceous clastic units that form the northern extent of the prospective Bight Basin, Upper Palaeozoic (?Permian), glacially-influenced sediments ascribed to the Denman Basin, and the Neoproterozoic-Lower Palaeozoic Officer Basin. Initial interpretations of the eastern part of 13GA-EG1 indicate that the combined Eucla and Officer basins may reach a maximum thickness of ~1.8 s TWT over the Coompana Province, though there is large uncertainty associated with this interpretation due to the possible presence of seismic multiples. This contribution reports on the insights into the thickness of the Eucla Basin and the basins that underlie it based on reprocessing of the western section of 13GA-EG1, with the shallowest ~2 s of the profile specifically targeted in order to enhance seismic reflectivity, and thus enable more confident interpretations.