Integration of reprocessing, depth imaging and interpretation in legacy data to provide new insights into salt tectonics and sub salt imaging in the Amadeus Basin, NT

Julie Daws[1,2], Jason Nycz[3] and Greg Staples[4]

The Neoproterozoic geology of the Amadeus Basin is highly complex with many salt-induced tectonic features resulting from multiple phases of deformation. Structural and stratigraphic features within the study area, below the Petermann Unconformity, were poorly imaged on the existing vintage 2D seismic data resulting in low confidence in any structural and stratigraphic interpretation. Reprocessing of the vintage seismic data across the Walker Anticline in the northern Amadeus basin has significantly improved data quality in the Neoproterozoic section. Salt structures and basement horizons became apparent with the improved imaging such that a viable interpretation has been possible.

The reprocessed 2D data has been tied to key deep wells in the basin using the AMSAN regional lines; this has further improved confidence in identification of key stratigraphic horizons and potential leads. Significant extensional structuring below the salt indicates a strong likelihood of traps similar to that drilled by Magee-1 in the southern part of the basin. Interpretation of the new data also supports the likelihood of multiple salt emplacement episodes as observed elsewhere in the basin.

This study has shown that the application of new technology to vintage 2D seismic can significantly aid geological interpretation at depth. Reprocessing legacy 2D data should be one of the first steps in any exploration program when chasing deeper, relatively unexplored targets prior to the acquisition of new seismic data.

[1] Mosman Oil and Gas Limited, Suite 305, Level 3, 35 Lime Street, Sydney NSW 2000
[2] Email: jdaws@mosmanoilandgas.com
[3] Earth Signal Processing Ltd, Suite 1600, 715-5th Avenue SW, Calgary, Alberta, Canada T2P 2X6
[4] Synterra Technologies Ltd, 221-10th Avenue SE, Calgary, Alberta, Canada T2G 0V9