

Northeast Barrow multi-client exploration study of November gazetted acreage

The State Government of Western Australia is planning to gazette highly prospective acreage in the Northeast Barrow Basin in November. The acreage on offer lies between the established Barrow Island producing trend to the west and the newly emerging Wandoo/Stagg trend to the north. Two Perth based geoscience consultancies, Dolan & Associates (IKODA Pty Ltd.) and PGA Consultants Pty Ltd have published a new interpretation of the geology and exploration potential of State acreage in the Northeast Barrow Basin. The fundamental aim of the whole project has been to present a clear assessment of play concepts and exploration risk in the Northeast Barrow basin based on an interpretation of 17 wells and just over 1,000 km of new non-exclusive well-tie seismic data. The seismic data were acquired by Digicon in association with Australian Seismic Brokers during 1993 and have been processed to eight seconds two way travel time which is deeper than conventional data. The new survey offers significant improvements in data quality over existing open file seismic data. For the first time it is now possible to tie a comprehensive selection of wells using a consistent high quality data set.

The seventeen wells tied by the survey have been completely re-interpreted. The existing lithostratigraphy which can be confusing and often contradictory has been discarded. New palynological data have been obtained and compared with existing palynology to produce a chronostratigraphic framework which is consistent with lithofacies, log data and

the seismic interpretation. The results of the re-interpretation are present as series of geological composite logs at 1:1000 scale and the text discussion of the stratigraphy is illustrated by six regional log correlation cross-sections. The structure of the area is on a series of time structure and isochron maps at a scale of 1:150,000. The text volume contains over 60 colour illustrations of interpreted and un-interpreted seismic data generated on the workstation which form an "interpretation atlas" of the Northeast Barrow Basin.

Much of the gazetted area is available to an oil charge migrating out of Mesozoic source rocks in the Barrow Basin to the west. Where TOC and Rock-Eval data are available for any of the wells studied they have been annotated on a series of geochemical composite logs. These data have been assessed and individual source facies within each of the wells have been identified. These source intervals have been incorporated onto a series of stratigraphic cross-sections which show how the individual source facies correlate across the basin.

In addition to the more conventional plays within the Barrow Basin and on the Peedamullah Shelf which are documented within the study, one of the key features of this gazetted will be an assessment of shallow reservoirs on the Enderby Terrace. The Enderby Terrace is a shallow shelf on the eastern side of the basin where the Mesozoic basin thins against the shallow basement of the adjacent shelf. Recent discoveries such as

Wandoo and Stag demonstrate the potential for shallow (400-500m) Lower Cretaceous reservoirs to be charged by long range lateral migration from the basins to the west.

The main reservoir within the Wandoo Field is an M.australis sandstone which may have been deposited during a minor regressive pulse during the well documented Lower Cretaceous regional transgression. The base of the transgressive sequence (Base Cretaceous) contains a shelf or shoreface sand which also has reservoir potential. Minor reactivation of the underlying Jurassic faults has created a number of trapping possibilities. There is some evidence to suggest that this period of fault reactivation may have breached traps already in existence down dip within the basin resulting in the re-migration of hydrocarbons up-dip towards the Enderby Terrace.

One of the key features of this report has been the use of the latest workstation technology to undertake both the geophysical and geological interpretation. Results can be supplied to clients in digital format suitable for loading into their own workstations. This is a particular advantage for the forthcoming gazetted as clients can load the results of our regional well-tie interpretation into their own workstations and then load additional infill data to undertake prospect level mapping in a cost effective and timely manner. For further details please contact Dolan & Associates (Tel. 09 322 5612) or PGA Consultants (Tel. 09 221 2228).