

*Poster 4***Source rock studies on Luconia carbonate shelf**MICHAEL CARTER¹ AND PETER ABOLINS²¹Mobil²PETRONAS Research & Scientific Services Sdn. Bhd.

Lot 1026 PKNS Industrial Estate

54200 Ulu Klang

Selangor

A world class petroleum system exists in the Luconia carbonate shelf of offshore Sarawak, Malaysia. Approximately 35 to 40 TCF of gas have been discovered to date in relatively shallow, middle to upper Miocene carbonate reservoirs.

Basin modelling and geochemical analyses have suggested that the source for the Luconia shelf hydrocarbons are from pre-carbonate sediments. Most of the exploration within the Luconia carbonate shelf has targeted the shallow Miocene carbonates, resulting in only six deep pre-carbonate well tests. Of these six wells, no source rocks have been discovered which explain the prolific petroleum system which exists. The pre-carbonate source rock quality is always lean, being classified as a fair to poor source. Only in the extreme southern and southwestern parts of the shelf have thin, rare individual source beds been penetrated. The lack of drilled pre-carbonate source rocks have led to the theory that the source rocks are positioned deep in the stratigraphic section, below what has been drilled to date. A separate theory suggests that even though pre-carbonate sediments are lean, a thick section of these sediments in a generative window can generate substantial amounts of hydrocarbons. Basin modelling in the "Western

Graben" of the northern Luconia shelf tests the viability of these theories and introduces additional theories concerning the location of the source rocks.

In addition to the uncertainty of the stratigraphic position of the Luconia shelf source rocks is the uncertainty of their composition. The generally accepted theory concerning the source rocks of the Luconia carbonate shelf is that they are non-marine. This is based largely upon geochemical analyses of oils from the Luconia shelf carbonate reservoirs. However, recent work by Petronas Research and Scientific Services (PRSS) has demonstrated a contribution of marine source rocks to Luconia hydrocarbons from their analyses on selected condensates from the Luconia shelf. This work suggests that marine source rocks may be responsible for some component of the 35 to 40 TCF of gas in the Luconia carbonate shelf. Paleoreconstructions of seismic over the Western Graben of the northern Luconia shelf addresses the possible existence and contribution of marine source rocks to discovered hydrocarbons.
