

### **Bayu/Undan Gas-Condensate Discovery: Western Timor Gap Zone Of Cooperation, Area A**

*Note: This talk is to be presented at the  
APPEA Conference in Darwin.*

*By*

*D. M. Brooks and A. K. Goody  
(BHP Petroleum Pty Ltd)*

*and*

*J. B. O'Reilly and K. L. McCarty  
(Phillips Petroleum Company)*

**T**he Bayu/Undan Gas-Condensate Field straddles the boundary between the ZOCA 91-12 and ZOCA 91-13 PSC areas, within the Timor Gap Zone of Cooperation Area A (ZOCA). The field is located approximately 450 km northwest of Darwin, NT, and 350 km east-southeast of Kupang, Timor. The closure is the culmination of the Flamingo High, a major structural element within the northern Bonaparte Basin. This structure has been viewed as having significant hydrocarbon potential since Flamingo-1 recovered gas from Berriasian sandstones in 1971.

The discovery well, Bayu-1, was drilled by the ZOCA 91-13 contract operator, Phillips Petroleum Company ZOC, in early 1995. Bayu-1 intersected a gross 155 m gas-condensate column within Middle Jurassic sandstones at a depth of 2954.5 mSS. The ZOCA 91-12 joint venture then drilled Undan-1, 10 km northwest of Bayu-1, on a separate culmination within the closure defined by the Bayu-1 gas-water contact. Undan-1 and subsequent wells have confirmed the existence of one large gas-condensate field, with a most likely areal extent of over 160 km<sup>2</sup>.

The sandstone reservoir consists of Late Oxfordian to Callovian, shallow marine, deltaic to shoreface, coarsening upward parasequences, overlying Callovian to Bajocian marginal marine to coastal plain sediments. The trap is an east-west oriented horst block bounded by enechelon normal faults to the north and south, with dip closure to the east and west. Seal is provided by Tithonian to Barremian marine claystones. A likely hydrocarbon source is contained within the Barremian to Callovian interval, some of which is mature for condensate and wet gas expulsion in the southern Sahul Syncline and Malita Graben.