

SOURCE POTENTIAL GENERATION AND MIGRATION.

The EVCM are time equivalent with the Latrobe Group in the Gippsland Basin. The greatest source potential in the Bass Basin occurs within the EVCM below the middle *M. diversus* zone. Ubiquitous coals and carbonaceous shales within this package possess very good source rock characteristics with TOC values commonly exceeding 10%. The drilling of Pelican 5 confirmed excellent source potential for wet gas in this zone. As a generalisation, it appears that the Pelican Trough is one of two half grabens (the other is Cormorant Trough) in the Bass Basin which are the main hydrocarbon generative centres.

Maturity studies of wells within the Cormorant and Pelican Troughs indicate that the lowermost EVCM (pre-middle *M. diversus*) is the zone of maximum generation of hydrocarbons. A maturity model, using the kinetic method, for the Pelican 5 location in the depocentre of the Pelican half graben is shown in Figure 8. Notice that a significant proportion of the lower EVCM are within the wet gas window. A good fit between the measured maturity values and the calculated maturity curve from Figure 8 is observed in Figure 9.

Maturity maps have been constructed for three stratigraphic levels, top EVCM, top middle *M. diversus* and, top *L. balmei* Figures 10,11 and 12. The presence of high vitrinite reflectance values at Pipipa 1 has not been incorporated in the maturity maps, as the extent of these anomalies is not known, but it is predicted to be on a local rather than regional scale. At the top EVCM the maturity map shows an increase in maturity from less than 0.5% in the southwest to greater than 1.1% in the deepest part of the Pelican Trough. This pattern is repeated at the middle *M. diversus* level, with maturity rising from 0.4% in the southwest to 0.7% in the Pelican Trough. A section showing the present day maturity profile across the Pelican Trough is shown in Figure 13.

Data from Yolla 1 in T/RL1 has shown that some generation of liquid hydrocarbons can occur from resinite source material at maturities as low as 0.4% vitrinite reflectance. The oil recovery from Cormorant 1 and the oil flow from Yolla 1 suggest that the Cormorant Trough may be more oil prone than the Pelican Trough. Alternatively, it may be that early generated oil has been able to migrate to top EVCM closures at Yolia and Cormorant by vertical migration up faults, whereas in T91-2 such conduits do not occur to the structures drilled to date.