

Hydrocarbon generation was modelled using the kinetic parameters for standard Type II and III kerogens taken from the work done at LLNL (incorporated in the BMOD® program). Units that appear to have the potential to generate significant amounts of hydrocarbons from the shales are:

- 1) Upper Eocene (albeit immature)
- 2) Lower Eocene
- 3) Palaeocene
- 4) Cretaceous

10.11 Definition of Hydrocarbon Generation Windows and Mature Areas

Whether or not source rocks have actually generated and expelled significant quantities of hydrocarbons in the Pelican Trough is predominantly a function of their present day maturity.

Present-day maturity maps Figures 10.7 to 10.12 have been used to delineate areas of active oil and gas generation in the Pelican Trough. The hydrocarbon generation windows modelled for the study area are outlined in Table 10.1 and illustrated by the Schematic Section through the T/25P permit (Figure 10.19).

On the flanks of the Pelican Trough the Ro data (as Flinders 1, Figure 10.4) indicate that sediments are immature ($< 0.5\%$ Ro max) down to about 1750 metres (Upper *M. diversus* level). The top of the main oil generation window ($\sim 0.7\%$ Ro max) is located at 2300 metres depth (Palaeocene). The section never reaches the peak to late mature oil or main gas generation phase.

Towards the centre of the trough at Pelican 5 the vitrinite reflectance curve (Figure 10.3) indicates the sediments are immature (Ro $< 0.5\%$) down to about 1800 metres (Top EVCM). Eocene sediments within the interval 1800-2500 metres depth are marginally mature for oil. The top of the main oil window at Pelican 5 is located at 2500 metres depth in the lower Eocene. At total depth (4200 metres) the Cretaceous section has attained optimum maturity for gas generation (Ro = 1.3-1.6%).