The temperature profile was then modelled using steady-state heat flow and estimates of the thermal conductivities of the various stratigraphic units. The geothermal gradient method was not used because of its inability to model the effects of varying thermal conductivity with lithology and time.

10.6 Conductivities

The thermal conductivities of each individual lithological unit were selected from published data included in the BMOD® software and are dependent on:

1)   Lithologies (matrix conductivities*)

2)   Porosities (Sclater-Christie Compaction Method Section 10.3)

3)   Temperatures (derived from BHT, DST data Section 10.5)

*   Matrix conductivities of the rocks were calculated from the entered lithology values for the Flinders 1 and Pelican 5 wells (Appendix 6). The computed BMOD values were derived from the results of experimental work done by Brigaud and Vasseur (1989) and Gretener (1981), and were used as guidelines in determining appropriate values for the present modelling study.

10.7 Heat Flow

Present-day heat flow is constrained by measured present-day surface and subsurface temperatures and thermal conductivities (Waples et al., 1992). The palaeo-heat flow values were determined by:

1)   Tectonic concepts (extensional model)

2)   Lithology data (thermal conductivities: Appendix 6)

3)   Thermal indicators (Ro values: Section 10.8)

For modelling purposes, a steady-state equilibrium thermal condition was employed and the heat flows were adjusted within acceptable geological limits (Tissot and Welte, 1978). The generalised heat flow curve for a rifted-type basin is a steady rise in heat flow from the inception of the rifting phase, a peak around break-up, followed