BASS BASIN EVOLUTION

The Bass and Gippsland basins are excellent examples of aborted, or failed rifts. Crustal extension during the Cretaceous developed a high relief, rifted terrane of graben and half-graben depocenters filled during the Early Cretaceous with volcanogenic detritus under fluviatile and alluvial conditions. In the Bass Basin the rift system trends NW-SE. In the northwest half of the Bass Basin most rift faults are downthrown to the southwest, forming a series of half-grabens with similar polarity. In the southeast half, rifting was more complex with two rift sequences of different trends.

Worldwide, aborted rifts are ideal environments for occurences of hydrocarbons. The combination of high quality source rocks and optimum thermal history allow for above average productivity on a volumetric basis. Good examples of aborted rifts include the Gippsland basin, the Dampier basin, Vulcan graben and the Viking graben. All of these examples developed through a two-stage evolution. The stages are:

1. Crustal upwarp and extensional rifting
2. Post-rift sag

Large reserves in aborted rifts are generally found in sediments of the first phase. The boundary between the rift and sag phase in the Bass Basin is not clearly understood and is tentatively placed at the base Tertiary.

Exploration to date in the Bass Basin has concentrated on sediments of the second phase (Tertiary sag phase). Results have been disappointing. Continued exploration must be directed towards understanding the Pre-Tertiary rift phase.