

A2 - GEOLOGICAL DATA

A2.1 Regional Geology

A2.1.1 Structure

The Bass Basin is an elongated offshore basin with its long axis trending generally NW-SE. It covers an area of approximately 65,000 sq.km. and contains sediments which range in age from Late Jurassic/Early Cretaceous to Recent. It is bounded to the south by the north coast of Tasmania and to the north by the south coast of Victoria between Mornington Peninsula and Wilsons Promontory. The King Island High and the King Island/Mornington Peninsula Ridge separate the Bass Basin from the Otway Basin to the west, and Flinders Island and the Bassian Rise separate it from the Gippsland Basin to the east. These flanking basins have a similar age to the Bass Basin, the Gippsland being a prolific oil producing basin.

The Bass Basin is believed to have initially formed in response to a NE-SW tensional stress field associated with the separation of the Antarctic Plate from the Australian Plate during the Late Jurassic. This produced a series of NW-SE trending down to the basin normal faults. During about the mid-Cretaceous a right lateral shear was added to the structural palimpsest when the Tasmanian sub-plate moved to the south-west relative to the Australian plate. This movement caused further normal faulting. The tensional stress field remained orientated NE-SW throughout the Tertiary.

A2.1.2 Depositional History.

Initial downwarping of the basin during the Late Jurassic/Early Cretaceous is marked by the deposition of fine grained, volcanoclastic sediments probably derived from a magmatic arch which extended along the eastern margin of the Australian Plate at this time.

During the early Late Cretaceous, structuring occurred in the southeastern part of the basin. During that time asymmetric rifting and rapid subsidence of half grabens commenced. This led to the rapid erosion of active fault scarps and the deposition of coarse clastic sediments in alluvial fan, fluvial, deltaic, and lacustrine conditions. Tectonic activity lessened somewhat after the Late Cretaceous and slower basin-wide subsidence prevailed. Mainly fluvial, deltaic and lacustrine sediments were deposited during the Paleocene until the Late Eocene when structural readjustments and increased rates of sediment loading resulted in a marine transgression. Early Oligocene coarse sediments were deposited followed by marine mudstones, marls and limestones during the remainder of the Oligocene and Miocene. Marine, mainly carbonate conditions have prevailed until the present.