

The lowermost sequence of EVCM sediments is largely unexplored because of its depth of burial. It extends between the major unconformity at the base of the EVCM (usually top Otway Group) to the basal *T.longus* unconformity. The basal *T.longus* unconformity (Late Cretaceous) is associated with a period of major tectonic movement including extensional tilted block faulting and subsequent erosion. No well in T/18P has penetrated this sequence; the nearest control is at Pelican 5 in T/25P.

The middle sequence of EVCM sediments is bounded by the basal *T.longus* unconformity at its base and an unconformity at the base of the upper *M.diversus* zone (Early Eocene). Deposition during the *T.longus* and *L.balmei* zones appears to have been controlled by tectonic subsidence. King 1 did not penetrate this middle sequence due to poor sand content encountered at this level in Cormorant 1, but elsewhere in the basin it is a prospective target for gas and condensate (eg the Yolla and Pelican Fields).

The uppermost sequence of EVCM sediments lies between the base of the upper *M.diversus* unconformity and the top of the formation. Basin sag induced by sediment compaction was the dominant control on deposition. This sequence contained the target reservoirs for the King 1 well. An oil and gas accumulation was discovered at the top of the zone at the Yolla Field in T/RL1 and significant oil and gas shows were recorded in Cormorant 1.

Conformably overlying the EVCM is the Late Eocene Demon's Bluff Formation. Lithologically this unit consists of a sequence of fine grained shale and siltstone deposited in a marine environment. The unit has an average thickness over the basin of approximately 120m but thins towards the basin margins. The Demon's Bluff Formation provides a regional top seal to hydrocarbons reservoired in the uppermost sandstone of the EVCM as demonstrated by the accumulation at Yolla 1.

The Demon's Bluff Formation is overlain by the Oligocene to Pliocene age Torquay Group which consists of a basal sequence of marl and calcareous shale grading upwards into a sequence of bioclastic limestone. The Torquay Group ranges in thickness from approximately 450m around the basin margins to about 1000m in the Cormorant area. In addition to extrusive igneous rocks associated with the basal and intra-EVCM unconformities, intrusive and extrusive igneous rocks of Oligocene to Miocene age have been intersected in a number of wells drilled within the Bass Basin. Seismic data allow the mapping of the extrusives with a high level of confidence whereas the intrusives are difficult to image and identify.

4.3 Regional Hydrocarbon Discoveries

Seven petroleum exploration wells have been drilled in T/18P including King 1 (Figure 1). Five of these wells encountered hydrocarbon shows but no commercial discoveries have been made to date (Table 1). The most significant well is Cormorant 1 which is located two kilometres downdip on the same structure as King 1.

The Cormorant structure has been previously tested by the exploration well Cormorant 1, drilled in 1970 by Esso to a total depth of 3000m. The entire EVCM section penetrated by Cormorant 1 (approximately 1700m) contained hydrocarbon shows which were partly tested by a FIT program.