

surface of Otway Group sediments (BMR Line 88-306). The younger unconformity is angular, and correlates to the top of the olivine basalt that overlies the Otway Group at Durroon-1. It is correlated to the relative sea level lowstand of Upper Cenomanian age.

The sediments adjacent to the listric fault show evidence of drag. This may have been caused by the early extrusion of lavas at the listric fault, which thereafter prevented the block from moving freely. The sediments pinch out at the northern termination of the sub-basin, whilst there is seismic evidence of a depositional edge, far to the south of the present erosional one, on the Tasmanian coastline.

Considerable amounts of volcanics have been observed within the sub-basin on seismic data. Cones, mounds, and flows, have been observed, the former in close association with major faults. The flows are interbedded with sediments everywhere. Most of the sediments must have derived from the erosion of the exposed areas of the Otway Group which surrounded the basin. The sediments closest to Tasmania must show a derivation from those areas.

### 3.5.2 Cenomanian Deposition Within the Bark Sub-Basin

This broad sub-basin is demarcated by a complicated zone of listric faulting. A major dog-leg moves this zone markedly to the west, where the zone of listric faulting becomes yet broader. Step faults accomplish what a single listric fault does in the Durroon Sub-Basin.

Cenomanian sediments are deposited on the original erosion surface of Upper Albian age (Line BB 85-20). These sediments are derived from a broad peneplain on the surface of Otway Group sediments that is 45 km long and 6 km wide. This surface is the result of three different periods of peneplanation and correlates with the Cenomanian Unconformity mapped within the basin. The wedge of Cenomanian sediments is likely to contain secondary arenites from the erosion of the Otway Group. The limits of Cenomanian deposition in this sub-basin are such that the pinchout edges can be regarded as prospective traps for oil and gas.

### 3.5.3 Cenomanian Deposition Within the Boobyalla Sub-Basin

There is no seismic evidence for a Cenomanian unconformity in this sub-basin. Sedimentation within the central trough may not have been interrupted, or if it was, there is not an angular unconformity to mark its presence. It is difficult to understand why there is not an unconformity evident in those parts of the sub-basin where deposition occurred in a half-graben, unless the unconformity has been camouflaged by the poor quality of the seismic data.

The facies of Cenomanian sediments within the Boobyalla Sub-Basin can be extrapolated from the nearest outcropping source areas: the exposed areas of Otway Group sediments; the Flinders Island granites, granodiorites, and mudstones; the Tasmanian outcrops of a similar suite of rocks; and the widespread Jurassic volcanics. Some of these derived sediments would ultimately make their way to the subsiding central trough, where coarser clastics from the two periods of lowstands may overlie the finer clastics of the highstand periods. And underlying all are the volcanic outpourings that first covered the surface of the Otway Group.