

FORAMINIFERAL BIOSTRATIGRAPHY

NANGKERO-1 WELL

BASS BASIN

by David Taylor.

Twenty three side wall cores were examined between 3280 feet and 6150 feet. No fauna was found in side wall cores from 5390 feet, 5580 feet and 5670 feet. Rotary cutting samples were examined at 100 foot intervals between 2000 feet and 3200 feet and at 3600 feet, 3700 feet, 5100 feet and 5200 feet. No new fauna was recognised below 5950 feet.

A distribution chart of planktonic foraminifera and an environmental analysis diagram are submitted with this report. The environmental analysis diagram shows that planktonic foraminifera are restricted mainly to the interval between 2700 feet and 3900 feet so that it was only in this interval that some degree of biostratigraphic control could be achieved.

The planktonic fauna at 2900 feet is indicative of Zone D. At 3000 feet the highest appearance of Globigerinoides bisphericus curvus marks the top of Zone E, whilst the top of Zone F is at 3280 feet which corresponds with the top of the early Miocene. It is impossible to pick the Oligo/Miocene boundary because of the paucity of planktonics. The oldest planktonic species is Globigerina angioporoides at 5950 feet. This species ranges from Zone K (late Eocene) to Zone J (early Oligocene).

The environmental sequence in Nangkero-1 is similar to that in other Bass Basin wells. The faunally barren sand interval (5390 feet, 5580 feet and 5670 feet) can be equated with the Angahook Formation of the Anglesea section (on-shore Victoria) and could represent a barrier bar, in vertical sequence, between the tidal marsh or lagoonal sediments of the Demons Bluff Formation and the inner continental shelf deposits of the Jan Juk Formation. It is noted that the sand contains limonitic coated quartz grains suggesting aerial exposure and laterite formation. However detailed sedimentological studies would have to be conducted in order to confirm a barrier bar origin.

Variation in benthonic foraminiferal components between 5260 feet and 4030 feet demonstrate fluctuations in bottom circulation on the continental shelf. At times oxygenation was fairly high (e.g. at 4900 feet) with a planktonic and elphidid fauna, whilst at other times (e.g. at 4290 and 4030 feet) it was minimal with a complete dominance of arenaceous forms. The basin wide Miocene Transgression is first apparent at 3900 feet and increases in intensity to 3510 feet (= Zone F or G) and declines in Zone D (late Miocene). Despite this transgression there was no appreciable increase in water depth as cibicidids dominate the benthonic faunas as they do in the lower continental shelf deposits. Above 2700 feet there was a regressive trend with shallowing indicated by fragmented bryozoal sediments indicative of high energy conditions above the wave base.