



APPENDIX A

PRELIMINARY FORAMINIFERAL
ANALYSIS, TRITON-1

The following provisional age determinations have been made on 75 cutting samples in the Triton-1 Well from 270m to 3395m.

<u>DEPTH (m)</u>	<u>ZONE</u>	<u>AGE</u>	<u>UNIT</u>
270	E-1	Early Mid Miocene	Port Campbell Limestone
370-470	Indeterminate	Early Mid Miocene - Late Early Miocene	Port Campbell Limestone
560	F	Late Early Miocene	Port Campbell Limestone
600	F	Late Early Miocene	Gellibrand Marl Equivalent
760-900	G	Early Miocene	Gellibrand Marl Equivalent
1000	H-2	Latest Late Oligocene	Gellibrand Marl Equivalent
1100-1550	Indeterminate	Late Oligocene	Gellibrand Marl Equivalent
1590-1605	I	Late Oligocene	Gellibrand Marl Equivalent
1650-1690	J-1	Early Oligocene	Gellibrand Marl Equivalent
1710-1715	J-2	Early Oligocene	Gellibrand Marl Equivalent
1720	J-2	Early Oligocene	Un-named sands and silts
1725-1730	Indeterminate	?Early Oligocene	Un-named sands and silts
1735-1760	Indeterminate	?Senonian	Belfast Formation
1765-2860		Senonian	Belfast Formation
2900-3395	Indeterminate	* Indeterminate	Belfast Formation

* Barren

The following geological comments are made:-

1. The Tertiary carbonate section in Triton-1 represents a continuous stratigraphic sequence that ranges in age from early Mid Miocene to Early Oligocene. There appears to be no major stratigraphic break between the deposition of the Port Campbell Limestone and the Gellibrand Marl Equivalent. The Gellibrand Marl Equivalent conformably overlies a sand/silt unit, the upper part of which is Early Oligocene in age. There appears to be no stratigraphic break across the terrigenous/carbonate boundary. The lower part of the terrigenous unit is predominantly silty and cannot be dated because the foraminiferal fauna is impoverished and poorly preserved. The Tertiary section in Triton-1 is almost identical to that recorded in the nearby Nautilus-1 Well.

2. There is a substantial unconformity between the Early Oligocene sands and silts and the Senonian Belfast Formation in both Triton-1 and Nautilus-1. The absence of Eocene to uppermost Cretaceous sediments in these wells is a typical for the Otway Basin. Most previous wells have been drilled closer to shore in shallower parts of the basin and record marginal marine terrigenous Eocene to uppermost Cretaceous sections. The Triton-1 and Nautilus-1 wells are situated in a deeper part of the basin where a substantial period of non-deposition occurred during this interval. The presence of deep water globigerinid ooze at the base of the Tertiary carbonate section in these wells indicates that the unconformity occurred in a marine slope palaeoenvironment.
3. There is a thick section (approximately 1650m) of Upper Cretaceous Belfast Formation in Triton-1, the upper 1100 metres of which is Senonian in age. No age determination is possible for the lower 500 metres of the unit because of very sparse foraminiferal yields. The Senonian section of Belfast Formation in Triton-1 is considerably thicker than that recorded in the Nautilus-1 Well. On foraminiferal evidence Taylor (1968) recognised 200 metres of Senonian and 68 metres of Turonian Belfast Formation in the Nautilus section. This represents a discrepancy of at least 900 metres between the two wells. Taylor's recognition of Turonian faunas between 1942 and 2010 metres (TD) in Nautilus-1 is based primarily on the presence of the Turonian index species Textularia trilobita. Other indigenous Turonian (XB) species including Colonia austrotrochus and Gavelinopsis cenomanica were not recorded. In Triton-1 rare occurrences of Textularia trilobita have been recorded at comparable levels (between 1975 and 2005 metres). The species is associated with the Senonian (XA) index species Textularia semicomplanata. In other Otway Basin wells Textularia semicomplanata is well documented as phylogenetically replacing T. trilobita at the Turonian/Senonian boundary. Textularia semicomplanata has been recorded as low as 2815m in Triton-1 and another Senonian species, T. anceps, has been recorded at 2860m. Taylor has erroneously recorded Turonian far too high in the Belfast Formation in Nautilus-1. Textularia trilobita apparently is not restricted to the Turonian interval in deeper parts of the Otway Basin where it may range well up into the Senonian. The species is facies controlled and together with the Belfast Formation represents a time transgressive entity.
4. In Triton-1 the Senonian part of the Belfast Formation was deposited rapidly (approximately 70-100 metres per million years) in a relatively deep marine palaeoenvironment. The dominance of agglutinated foraminifera over calcareous benthonic foraminifera and the very low planktonic foraminiferal yields in the unit is attributed to deposition in an anaerobic marine palaeoenvironment with substantial influx of fine terrigenous muds.