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FORAMINIFERAL ANALYSIS, SNAPPER-4

GIPPSLAND BASIN

by

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INTRODUCTION

Twenty one sidewall core samples were examined for their foraminiferal content from 1988.0m to 1273.0m in Snapper-4. Diverse to moderately diverse planktonic foraminiferal assemblages were recovered from all samples of the marine carbonate section. Four sidewall core samples examined from the Gurnard Formation (sidewall cores at 1260.0, 1266.5, 1270.0 and 1273.0m) were all barren of foraminifera.

Tables 1 and 2 provide a summary (Basic and Interpretative) of the palaeontological analysis in Snapper-4. A summary of the biostratigraphic breakdown of the stratigraphic units in Snapper-4 is given below.

SUMMARY

AGE	UNIT	ZONE	DEPTH (m)
Mid Miocene	Gippsland Limestone	D-2/D-1	988.0-1048.0
----- log break at 1046.5m -----			
Mid Miocene	Lakes	D-2/D-1	1068.0-1129.0
Mid Miocene	Entrance	E-2	1149.8-1168.5
Early Miocene	Formation	F	1189.0-1240.0
Early Miocene		G	1250.0-1258.5
----- log break at 1259.5m -----			
-	Gurnard Formation	Indeterminate	1260.0-1273.0
----- log break at 1288.0m -----			
-	Latrobe Group (coarse clastics)	(not studied)	

GEOLOGICAL COMMENTS

Log character indicates that the base and top of the Gurnard Formation is at 1259.5 and 1288.0m respectively. The Gurnard Formation in Snapper-4 cannot be age dated using foraminifera. The formation is barren of foraminifera. Palynological evidence indicates that the formation ranges in age from Middle Eocene to early Late Eocene (Macphail, 1983).

In Snapper-4 the Gurnard Formation is disconformably overlain by the Lakes Entrance Formation. The hiatus between the two formations spans approximately 16 my. The disconformity at 1259.5m represents a well defined seismic horizon in Snapper-4 and probably equates with the 21.4 type-1 unconformity of Haq et al. (1983).

The boundary between the Lakes Entrance Formation and the Gippsland Limestone is selected at 1046.5m on the basis of a subtle log change. A sidewall core shot on the boundary (SWC 40 at 1048.0m) consists of partly recrystallised fine grained calcarenite with sponge spicules. This is the lowest sample of Gippsland Limestone in the well. This level marks the proximal edge of the prograding Gippsland Limestone at the Snapper-4 location.

DISCUSSION OF ZONES

The Tertiary biostratigraphy in Snapper-4 is based on the Gippsland Basin planktonic foraminiferal zonal scheme of Taylor (in prep).

Indeterminate Interval : 1260.0 - 1273.0m.

The upper part of the Gurnard Formation (1260.0-1273.0m) is barren of foraminifera. Palynological evidence (Macphail, 1983) indicates that the entire Gurnard Formation (1259.5-1288.0m) spans the interval Middle Eocene - earliest Late Eocene (Lower and Middle N. asperus Zones).

Zone G : 1250.0 - 1240.0m.

The uphole appearance of Globigerinoides trilobus at 1258.5m defines the base of Zone G.

Zone F : 1189.0 - 1240.0m.

The uphole entry of Globigerinoides sicanus at 1240.0m defines the base of Zone F.

Zone E-2 : 1149.8 - 1168.5m.

The base of Zone E-2 is marked by the uphole appearance of Praeorbulina glomerosa at 1168.5m.

Zones D-2/D-1 : 988.0 - 1129.0m.

The base of Zone D-2 is defined by the first appearance uphole of Orbulina universa at 1129.0m. Zones D-2 and D-1 have been grouped because the lower boundary defining species of Zone D-1, Globorotalia peripheroacuta, has not been recorded. Taylor (in prep.) also differentiates the two zones on the basis of a diversity decline of Globigerinoides spp. at the top of Zone D-2. This biostratigraphic event however can be obscured by, and possibly confused with, the transition from the pelagic Lakes Entrance Formation to the prograding shelfal Gippsland Limestone (note: the Gippsland Limestone contains more impoverished and more poorly preserved planktonic foraminiferal assemblages than the Lakes Entrance Formation).

REFERENCES

HAQ, B.U., HARDENBOL, J., WRIGHT, R., & BLECHSCHMIDT, J., 1983. Cenozoic Cycle Chart. Exxon Production Research Company (Preliminary).

MACPHAIL, M.K. 1983. Palynological analysis, Snapper-4, Gippsland Basin. Esso Australia Ltd., Palaeontology Report 1983/44.

TAYLOR, D.J. (in prep.) Observed Gippsland biostratigraphic sequences of planktonic foraminiferal assemblages.

MICROPALAEONTOLOGICAL DATA SHEET

BASIN: GIPPSLAND

ELEVATION: KB: 21.0m GL: -57.0m

WELL NAME: SNAPPER-4

TOTAL DEPTH: 2821mKB

AGE	FORAM. ZONULES	HIGHEST DATA					LOWEST DATA				
		Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two W Time
PLEISTOCENE	A ₁										
	A ₂										
	A ₃										
PLIOCENE	A ₄										
	B ₁										
MIOCENE	LATE	B ₂									
		C									
		D ₁	988.0	0							
	MIDDLE	D ₂						1129.0	0		
		E ₁									
		E ₂	1149.8	0				1168.5	0		
		F	1189.0	0				1240.0	0		
	EARLY	G	1250.0	0				1258.5	0		
		H ₁									
		H ₂									
		I ₁									
OLIGOCENE	LATE	I ₂									
		J ₁									
	EARLY	J ₂									
EOCENE	K										
	Pre-K										

COMMENTS: The absence of Zone E-1 may be the result of a gap in sampling or may be the result of hiatus.

- CONFIDENCE RATING:
- 0: SWC or Core - Complete assemblage (very high confidence).
 - 1: SWC or Core - Almost complete assemblage (high confidence).
 - 2: SWC or Core - Close to zonule change but able to interpret (low confidence).
 - 3: Cuttings - Complete assemblage (low confidence).
 - 4: Cuttings - Incomplete assemblage, next to uninterpretable or SWC with depth suspicion (very low confidence).

NOTE: If an entry is given a 3 or 4 confidence rating, an alternative depth with a better confidence rating should be entered, if possible. If a sample cannot be assigned to one particular zone, then no entry should be made, unless a range of zones is given where the highest possible limit will appear in one zone and the lowest possible limit in another.

DATA RECORDED BY: M.J. Hannah

DATA REVISED BY: J.P. Rexilius

DATE: 26/7/83

DATE: 15/8/93

TABLE 1
 SUMMARY OF PALAEOLOGICAL ANALYSIS, SNAPPER-4, GIPPSLAND BASIN.
 INTERPRETATIVE DATA

NATURE OF SAMPLE	DEPTH (M)	MICROFOSSIL YIELD	PRESERVATION	DIVERSITY	ZONE	AGE	COMMENTS
SWC 30	1273.0	Barren	-	-	-	-	
SWC 31	1270.0	Barren	-	-	-	-	
SWC 32	1266.5	Barren	-	-	-	-	
SWC 34	1260.0	Barren	-	-	-	-	
SWC 35	1259.5	High	Good	Moderate/High	G	Early Miocene	
SWC 36	1254.9	High	Good	Moderate/High	G	Early Miocene	
SWC 37	1250.0	High	Good	Moderate	G	Early Miocene	
SWC 38	1240.0	Moderate	Moderate	Moderate/High	G	Early Miocene	
SWC 39	1228.5	Moderate	Moderate/Poor	Moderate/High	F	Early Miocene	
SWC 40	1213.9	Moderate	Moderate/Poor	Moderate	F	Early Miocene	
SWC 41	1189.0	Moderate	Moderate	Moderate/High	F	Early Miocene	
SWC 42	1168.5	High	Moderate	Moderate/High	E-2	Mid Miocene	Rare bryozoan fragments
SWC 43	1149.8	High	Good	Moderate/High	E-2	Mid Miocene	
SWC 44	1129.0	High	Good	High	D-2/D-1	Mid Miocene	
SWC 45	1108.0	Moderate	Good	Moderate/High	D-2/D-1	Mid Miocene	

TABLE 1
 SUMMARY OF PALAEOLOGICAL ANALYSIS, SNAPPER-4, GIPPSLAND BASIN.
 INTERPRETATIVE DATA

NATURE OF SAMPLE	DEPTH (M)	MICROFOSSIL YIELD	PRESERVATION	DIVERSITY	ZONE	AGE	COMMENTS
SWC 46	1088.0	Moderate/High	Good	Moderate/High	D-2/D-1	Mid Miocene	Rare bivalves and bryozoan fragments
SWC 47	1068.0	High	Good	Moderate/High	D-2/D-1	Mid Miocene	
SWC 48	1048.0	Moderate	Moderate/Poor	Moderate	D-2/D-1	Mid Miocene	Sponge spicules
SWC 49	1028.0	Low	Poor	Moderate/Low	D-2/D-1	Mid Miocene	Echinoid spines, sponge spicules, bryozoan fragments, shell fragments
SWC 50	1008.0	Moderate/Low	Moderate/Poor	Moderate	D-2/D-1	Mid Miocene	Sponge spicules
SWC 51	988.0	Moderate	Moderate	Moderate	D-2/D-1	Mid Miocene	Sponge spicules

BASIC DATA

TABLE 2 : FORAMINIFERAL DATA, SNAPPER-4
RANGE CHART : TERTIARY PLANKTONIC FORAMINIFERA

TABLE 1
SUMMARY OF PALAEOLOGICAL ANALYSIS, SNAPPER-4, GIPPSLAND BASIN.
BASIC DATA

NATURE OF SAMPLE ZONE	DEPTH (M) AGE	MICROFOSSIL YIELD	PRESERVATION	DIVERSITY
SWC 30	1273.0	Barren	-	-
SWC 31	1270.0	Barren	-	-
SWC 32	1266.5	Barren	-	-
SWC 34	1260.0	Barren	-	-
SWC 35	1259.5	High	Good	Moderate/High
SWC 36	1254.9	High	Good	Moderate/High
SWC 37	1250.0	High	Good	Moderate
SWC 38	1240.0	Moderate	Moderate	Moderate/High
SWC 39	1228.5	Moderate	Moderate/Poor	Moderate/High
SWC 40	1213.9	Moderate	Moderate/Poor	Moderate
SWC 41	1189.0	Moderate	Moderate	Moderate/High
SWC 42	1168.5	High	Moderate	Moderate/High
SWC 43	1149.8	High	Good	Moderate/High
SWC 44	1129.0	High	Good	High
SWC 45	1108.0	Moderate	Good	Moderate/High
SWC 46	1088.0	Moderate/High	Good	Moderate/High
SWC 47	1068.0	High	Good	Moderate/High
SWC 48	1048.0	Moderate	Moderate/Poor	Moderate
SWC 49	1028.0	Low	Poor	Moderate/Low
SWC 50	1008.0	Moderate/Low	Moderate/Poor	Moderate
SWC 51	988.0	Moderate	Moderate	Moderate

FOSSIL TYPE : PLANKTONIC FORAMINIFERA

Well Name SNAPPER - 4

Basin GIPPSLAND

Sheet No. 1 of 1

SAMPLE TYPE OR NO. *	30	31	32	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51
FOSSIL NAMES	1273-0	1270-0	1266-5	1260-0	1285-5	1254-9	1250-0	1240-0	1228-5	1213-9	1189-0	1168-5	1149-8	1129-0	1108-0	1088-0	1068-0	1048-0	1028-0	1008-0	988-0
<i>Globigerina woodi</i>																					
<i>Globigerina woodi connecta</i>																					
<i>Globigerinoides trilobus</i>																					
<i>Globigerina praebulloides</i>																					
<i>Globoquadrina dehiscens S.l.</i>																					
<i>Globoquadrina dehiscens S.S.</i>																					
<i>Globorotalia continua</i>																					
<i>Globoquadrina advena</i>																					
<i>Globorotalia bella</i>																					
<i>Globorotalia obesa</i>																					
<i>Globorotalia zealandica</i>																					
<i>Globigerina ciperensis</i>																					
<i>Globorotalia miozea miozea</i>																					
<i>Globorotalia praescitula</i>																					
<i>Globorotalia praemenardii</i>																					
<i>Globigerinoides sicanus</i>																					
<i>Globoquadrina altispira</i>																					
<i>Globigerina bulloides</i>																					
<i>Globigerinoides ruber</i>																					
<i>Praeorbulina glomerosa</i>																					
<i>Globorotalia miozea miozea - G.</i>																					
<i>miozea conoidea transition</i>																					
<i>Globorotalia sp. 1</i>																					
<i>Orbulina suturalis</i>																					
<i>Orbulina univarsa</i>																					
<i>Globorotalia peripheronda</i>																					
<i>Globorotalia miozea conoidea</i>																					
<i>Globorotalia sp. aff. G.miotumida</i>																					
<i>conomiozea</i>																					
<i>Globorotalia sp. 2</i>																					
<i>Orbulina bilobata</i>																					

* C=CORE S=SIDEWALL CORE
T=CUTTINGS J=JUNK BASKET

--- Rare
- - - Few
█ Common

PALAEO.CHART-2
DWG.1107/0P/287