



APPENDIX-4

BREAM-4A FORAMINIFERAL BIOSTRATIGRAPHY

by

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PAPT 1

INTERPRETATIVE DATA

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INTRODUCTION  
by  
A.D. Partridge

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The analysis of the foraminiferal sequence in Bream-4A given in this report was made by David Taylor and presented as a "data package" on October 20, 1981.

The aim of the study, and the reason for the format of this report, was to make a rapid reconnaissance examination of forty sidewall core samples to give a breakdown of the marine sequence into foraminiferal zones and ages. No attempt has been made to fully document the foraminiferal assemblages or to prepare a detailed environmental and geological interpretation of the sequence. The rationale for this approach was to limit costs and to reduce the time spent by the principal investigator, David Taylor, on what is essentially routine age determinations and report preparation. It is also argued that since the Gippsland Basin is now a mature petroleum province detailed discussion of the individual foraminiferal zones in the well is not essential as it has been adequately treated in earlier reports.

EXPLANATION OF MATERIALS

by

David Taylor

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Processed sidewall core samples from Bream-4A were submitted for examination and delineation of planktonic foraminiferal biostratigraphy; particularly in the Greensand and carbonate sequence above the Latrobe Group clastic sequence. In this well, the highest sample documented was at 1298.5 metres which contained a Zone D-2 fauna.

Other fauna in the samples are noted only when obvious; no detailed searching nor precise identifications of benthonics were conducted. The micro-grain character of the residue (approx. 125 microns) was estimated.

Two interesting features in the Bream-4A sequence were:-

- 1) The "Greensand" from 1909.5 to 1860 metres which contained both the uppermost mid Eocene faunal Event N and the uppermost late Eocene Event K. The apparent hiatus between these two events is marked by a brown oxidised sand horizon at 1865.5 metres sandwiched between a Zone N "Greensand" at 1869 metres and a Zone K "Greensand" at 1861 metres. This oxidised horizon at 1865.5 metres contains a mixed association of both Zone N and Zone K planktonic species.
- 2) Fluctuating sedimentary energy conditions are evident in the latest Oligocene to earliest Miocene (H-2 & H-1). These fluctuations are expressed by numerical frequency of planktonic foraminifera, nature of the benthonic component and presence or absence of silt and fine quartz sand. A detailed palaeoecological study of this sequence is recommended.

SUMMARY TABLE - BREAM-4A

<u>SAMPLE</u>	<u>DEPTH IN METRES</u>	<u>ZONE</u>	<u>AGE</u>
SWC 94	1298.5	D-2	Middle Miocene
SWC 93	1375	E-1	Middle Miocene
SWC 92	1449	F	Early Miocene
SWC 91	1525	F	Early Miocene
SWC 90	1599.8	Top of G	Early Miocene
SWC 89	1674.5	G	Early Miocene
SWC 88	1750	G	Early Miocene
SWC 87	1822.7	Top of H-I	Early Miocene
SWC 86	1824.4	H-I	Early Miocene
SWC 85	1826	H-I	Early Miocene
SWC 84	1828	H-I	Early Miocene
SWC 83	1830.8	H-I	Early Miocene
SWC 82	1832.5	H-I	Early Miocene
SWC 81	1835	H-I	Early Miocene
SWC 80	1836.5	H-I	Early Miocene
SWC 79	1839	H-2	Late Oligocene
SWC 78	1841.5	H-2	Late Oligocene
SWC 77	1843	H-2	Late Oligocene
SWC 76	1845.3	I-1	Late Oligocene
SWC 75	1847.3	I-1	Late Oligocene
SWC 74	1850.5	I-1	Late Oligocene
SWC 73	1852.7	I-1	Late Oligocene
SWC 72	1854.5	I-1	Late Oligocene
SWC 71	1857	?J-2	Early Oligocene
SWC 70	1859	K/J2	Late Eocene to Early Oligocene
SWC 69	1860	K	Late Eocene
SWC 68	1861.9	K	Late Eocene
SWC 67	1865.5	K	Late Eocene
SWC 66	1869	N	Middle Eocene
SWC 65	1872.2	N	Middle Eocene
SWC 64	1875.5	Indet.	Eocene
SWC 63	1879	Indeterminate	(Benthonic foraminifera only)
SWC 62	1882.5	Indeterminate	Eocene
SWC 61	1885	Indeterminate	(Benthonic foraminifera only)
SWC 60	1889.5	Indeterminate	(Benthonic foraminifera only)
SWC 59	1891.8	Indeterminate	(Arenaceous foraminifera only)
SWC 58	1896.9	Indeterminate	(Arenaceous fragments only)
SWC 56	1903	Indeterminate	(no foraminiferal fauna)
SWC 55	1905.7	Indeterminate	(no foraminiferal fauna)
SWC 54	1909.5	Indeterminate	(no foraminiferal fauna).

M I C R O P A L E O N T O L O G I C A L D A T A S H E E T

B A S I N : GIPPSLAND

ELEVATION: KB: 21 GL: -80

WELL NAME: BREAM # 4A

TOTAL DEPTH: \_\_\_\_\_

A G E	FORAM. ZONULES	H I G H E S T D A T A					L O W E S T D A T A				
		Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
PLEIS- TOCENE	A <sub>1</sub>										
	A <sub>2</sub>										
PLIO- CENE	A <sub>3</sub>										
	A <sub>4</sub>										
M I O C E N E	L A T E	B <sub>1</sub>									
		B <sub>2</sub>									
		C									
	M I D D L E	D <sub>1</sub>									
		D <sub>2</sub>						1298.5	0		
		E <sub>1</sub>	1375	0				1375	0		
		E <sub>2</sub>									
	E A R L Y	F	1449	0				1525	0		
		G	1599.8	0				1750	0		
		H <sub>1</sub>	1822.7	0				1836.5	1	1835	0
		H <sub>2</sub>	1839	1				1843			
		I <sub>1</sub>	1845.3					1854.5	0		
O L I G O C E N E	L A T E	I <sub>2</sub>									
		J <sub>1</sub>									
	E A R L Y	J <sub>2</sub>	1857.2	2				1859	2		
		K	1859	2	1861.9	0		1865.5	1	1861.9	0
E O C - E N E	Pre-K	1869	1				1882.5	2	1872.2	1	

COMMENTS: Pre-K fauna represent Bio-Event N Hiatus in "GREENSAND" unit  
between Event N and Event K marked by brown oxidised horizon  
at 1865.5 with mixed N/K faunas.

- 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: PALTECH PTY. LTD.

DATE: October 20th, 1981.

DATA REVISED BY: \_\_\_\_\_

DATE: \_\_\_\_\_

PART 2

BASIC DATA

Key to Data Codes and Abbreviations  
Analysis of Samples

KEY TO DATA CODES AND ABBREVIATIONS

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CC #2	= conventional core #2
SWC	= sidewall core
NFF	= no foraminifera found
J-2	= planktonic foram Zone J-2
K/J-2	= exact zonal entity uncertain combined zonal interval.
f	= fine grain size ( .25)
m	= medium grain size (.25-5)
c	= coarse grain size (.5-1mm)
ang	= angular grains
subang	= subangular grains
subrd	= subround grains
rd	= round grains
qtz	= quartz
pyr	= pyrite
lim	= limonite
glauc	= glauconite
lst	= limestone
mic. lst	= micritic limestone
sdst	= sandstone
siltst	= siltstone
mdst	= mudstone
calc. siltst	= calcareous siltstone
calc. aren	= calcarenite
recryx	= recrystalised
plank	= significant grain component of planktonic foraminifera.



ANALYSES OF SAMPLES

SWC 54 at 1909.5 metres:

Lithology: 50% glauc. clay with some glauc. after mica and r. pellet glauc. 40% f. ang. qtz with r. subrd qtz. 10% mica and silt including biotite.  
Fauna: No foraminifera found (NFF).

SWC 55 at 1905.7 metres:

Lithology: 75% f. ang. qtz with r. subrd qtz. 10% glauc. after mica (very early stage) r. pellet glauc. 10% mica including biotite 5% silt grade biotite and r. ferro-mags. SUGGEST GRANITIC SOURCE WITH RAPID BURIAL.  
Fauna: NFF

SWC 56 at 1903 metres:

Lithology: 60% f. ang. qtz. 20% glauc. as clay fragments; ooid and ovoid pellets and "books" after mica. 20% mica including biotite and silt from biotite. Granitic source.  
Fauna: NNF but glauc. ovoid pellets suggestive of faecal pellets thus biogenic activity.

SWC 58 at 1896.9 metres:

Lithology: GREENSAND. 50% glauc. clay with r. pellet glauc. 25% minute rhombs of carbonate some brown, ?siderite, f. ang. qtz; mica and silt grade biotite.  
Fauna: Fragments. of robust specimens of arenaceous spp. including "Haplophragmoides" incisa, "Bathysiphon" anglescaensis and Gaudyrina convexa. Nil planktonics.

SWC 59 at 1891.8 metres:

Lithology: 50% f. ang. qtz. 40% glauc. clay with r. pellet glauc. and glauc. after mica including biotite. Silt grade biotite.  
Fauna: Arenaceous forams only "Haplophragmoides" spp. including H. rondatata.

SWC 60 at 1889.5 metres:

Lithology: 50% f. ang. qtz. 20% ovoid, pellet glauc. with some glauc. after mica. 25% bn clay/silt mica including biotite.

Fauna: Benthonics only. ech. spines; ?bryo fragments;  
"Haplophragmoides" spp. N.B. ovoid glauc. pellets =  
?faecal pellets.

SWC 61 at 1885 metres:

Lithology: 70% f. ang. qtz.  
20% glauc. clay with some ovoid faecal pellets and  
glauc after mica.

10% mica, including biotite - very r. ferro-mags.  
Fauna: Benthonics only. Cibicides brevoralis; Bolivinopsis  
cubensis; "Haplophragmoides" spp.; Bathysiphon;  
Cassidulina subglobosa. N.B. ?faecal pellets.

SWC 62 at 1882.5 metres:

Lithology: 40% m-f. pellet glauc. including ovoid faecal pellets  
40% f. ang. qtz mica, biotite, pyrite.

Fauna: Planktonics:  
Globigerina angiporoides minima  
Globigerina linaperta  
Globigerina spp. indeterminate.  
20 depauperate species of planks mostly too poorly  
preserved for positive identification.  
Benthonics:  
Bolivinopsis cubensis  
Ammosphaeroidina sphaeroidiniformis  
Bathysiphon  
Haplophragmoides  
Other Fauna: Worm tubes "oogenia"

SWC 63 at 1879 metres:

Lithology: 40% glauc. clay including ovoid pellets - some  
glauc. after mica.  
40% f. ang. qtz silt grade biotite, mica, pyrite,  
very r. ferro-mags.

Fauna: Benthonics only  
Cibicides perforatus  
Eulimina truncanella  
Ammobaculites

SWC 64 at 1875.5 metres:

Lithology: "GREENSAND"  
60% glauc. clay with high percentage ovoid pellets.  
30% f. ang. qtz mica, pyrite.

Fauna: Planktonics:  
Globigerina angiporoides minima  
Globigerina spp. indeterminate  
Poor preservation. 10 specimens in all.  
Benthonics:  
Cibicides brevoralis  
Cibicides vortex  
Gyroidinoides  
Cassidulina subglobosa  
Lenticulina  
"Haplophragmoides"  
Bathysiphon  
Nodosaria (striate)  
Other Fauna: Echinoid spines, worm tubes, fish fragments.

SWC 65 at 1872.2 metres:

Lithology: "GREENSAND"  
50% ovoid pellet glauc.  
40% f. ang. qtz pyrite-clay-mica

Fauna: Planktonics:  
Globigerina angiporoides minima  
Globigerina linaperta  
Globorotalia collactea?  
?Globorotalia inconspicua  
Globorotalia nana  
Globigerinatheka index  
Benthonics:  
Siphouvigerina canariensis  
Cibicides perforatus  
Cibicides brevoralis  
Lenticulina  
Cassidulina subglobosa  
Sphaeroidina bulloides  
Vulvulina granulosa  
Guttulina problema  
Nonionella  
Reticulate Bolivina  
Other fauna:  
Echinoid spines, worm tubes, pyrite rods.

SWC 66 at 1869 metres:

Lithology: "GREENSAND"  
50% ovoid pellet glauc.  
40% f. ang. qtz pyrite-clay-mica

Fauna: Planktonics:  
Globigerina angiporoides minima  
Globigerinatheka index  
Globorotalia collactea  
Globorotalia nana  
Benthonics:  
Similar to assemblage in SWC 65 at 1875.5 metres.

SWC 67 at 1865.5 metres:

Lithology: "BROWN SAND"  
50% f. ang. qtz  
40% bn clay = oxidized glauc. green glauc. - mica  
biotite

Fauna: Planktonics:  
Mixed elements of both Mid and late Eocene  
Middle Eocene included.  
Globigerina angiporoides minima  
Late Eocene included  
Globigerina linaperta  
Globigerina angiporoides angiporoides  
Globigerina brevis  
Globorotalia gemma  
Benthonics:  
Anomalinoides vitrinoda  
Trifarina bradyi  
Cassidulina subglobosa  
Other fauna: ?gypsum. Echinoid spines.

SWC 68 at 1861.9 metres:

Lithology: "GREENSAND"  
50% f. ang. qtz.  
50% glauc. as clay, ovoid pellets and moulds of  
forams.

Fauna: Planktonics:  
Globigerinatheka index  
Globigerina angiporoides angiporoides  
Globigerina brevis  
Globigerina linaperta  
Globorotalia gemma  
Globorotalia munda  
Benthonics: Typical Lakes Entrance Greensand  
Assemblage.  
Vaginulina gippslandica  
Cibicides perfortus

Cibicides vortex  
Ramulina  
"Haplophragmoides" spp.  
Trifrina bradyi  
Cassidulina subglobosa  
Anomalinoides vitrinoda  
Other fauna: Echinoid spines

SWC 69 at 1860 metres:

Lithology: "GREENSAND"  
50% f. ang. qtz.  
50% glauc.

Fauna: Planktonics: Not as numerically rich as 1861.9 metres.  
Globigerina linaperta  
Globigerina brevis  
Globigerina angiporoides angiporoides  
Globorotalia gemma  
Globorotalia nana  
Benthonics:  
Anomalinoides macroglabra  
"Haplophragmoides" spp.  
Cibicides brevoralis  
Not as diverse assemblage as at 1861.9 metres.

SWC 70 at 1859 metres:

Lithology: Brown grey calcareous siltstone  
10% f. ang. qtz and f. ang. qtz sandstone rare  
pellet glauc. and calcite.

Fauna: Planktonics: Preservation poor, diversity low.  
Globigerina angiporoides angiporoides  
Benthonics:  
Discamina  
Rhabdammina  
Bathysiphon  
Cribrostomella  
Cassidulina subglobosa  
Anomalinoides vitrinoda

SWC 71 at 1857.5 metres.

Lithology: Recryx. micritic limestone.  
10% ang. qtz and pellet glauc.

Fauna: Planktonics: Indeterminate pres. very poor through diagenesis.  
? Globigerina angiporoides  
Other fauna: Micropelecypods.

SWC 72 at 1854.5 metres.

Lithology: Ooze. 90% plank forams. · 10% micritic limestone.

Planktonics:

Globigerina euapertura

Globigerina praebulloides

Globigerina labiacrassata

Globoquadrina dehiscens (s.l.)

Globoquadrina tripartita

Globorotalia obesa

Globorotalia nana

Globorotalia munda

Globorotalia extans

Benthonics:

Sphaeroidina bulloides

Discamina

Gyroidinoides

Osangularia

Bathysiphon rhabdammina

Siphouvigerina proboscidea

Other fauna: Echinoid spines.

Count: 4000.

% Planks: 98%.

SWC 73 at 1852.7 metres.

Lithology: 50% micritic limestone

40% plank. forams. glauc.

Planktonics:

Globigerina labiacrassata

Globigerina euapertura

Globigerina praebulloides

Globoquadrina tripartita

Globoquadrina dehiscens (s.l.)

Globorotalia nana

Globorotalia opima opima

Globorotalia munda

Globorotalia obesa

Globorotalia continuosa

Benthonics:

Bathysiphon,

Rhabdammina

Sphaeroidina bulloides

Stilostomella

Cibicides

Anomalinoides

Bulimina

Osangularia.

Planulina wuell.

Other fauna: Echinoid spines

Count: 200

% Planks: 90%

SWC 74 at 1850.5 metres.

Lithology: 60% micritic limestone

30% plank. forams

Fauna: Planktonics:

Globigerina euapertura

Globigerina praebulloides

Globoquadrina dehiscens (s.l.)

Globorotalia opima opima

Globorotalia munda

Globorotalia obesa

Globorotalia nana

Globorotalia continuosa

Benthonics: Similar to assemblage in SWC 73 at  
1852.7 metres.

Count: 1000

% Planks: 90%

SWC 75 at 1847.3 metres.

Lithology: 70% plank. forams

25% micrite quartz

Fauna: Planktonics:

Globigerina euapertura

Globigerina praebulloides

Globigerina labiacrassata

Globigerina angisutulalis

Globoquadrina dehiscens

Globoquadrina tripartita

Globorotalia opima opima

Globorotalia nana

Globorotalia continuosa

?Globigerina woodi woodi

Count: 5000

% Planks: 95%

SWC 76 at 1845.3 metres:

Lithology: Planktonic micrite.

Fauna: Similar to assemblage in SWC 75 at 1847.3 metres

SWC 77 at 1843 metres:

Lithology: 50% plank. forams  
50% micrite minor ang. qtz.

Fauna: Planktonics:  
Globigerina woodi woodi  
Globigerina euapertura  
Globigerina ciperoensis  
Globigerina praebulloides  
Globigerina angisutularis  
Globoquadrina dehiscens (s.l.)  
Globoquadrina advena  
Globoquadrina tripartita  
Globorotalia continuosa nana  
Count: 3000  
% Planks: 90%

SWC 78 at 1841.5 metres

Lithology: Micritic "shale"

Fauna: Planktonics: N.B. Specific diversity and numerical decrease compared with 1843 metres.  
Globigerina woodi woodi  
Globigerina praebulloides  
Globoquadrina dehiscens (s.l.)  
Globoquadrina advena  
Globorotalia continuosa  
Benthonics: Poor and small.  
Count: 2000  
% Planks: 90%

SWC 79 at 1839 metres.

Lithology: Micritic shale

Fauna: Planktonics: Assemblage as for SWC 78 at 2841.5 metres.

SWC 80 at 1836.5 metres.

Lithology: 70% plank. micrite glauc.

Fauna: Planktonics:  
Globigerina woodi woodi  
Globigerina woodi connecta  
Globigerina ciperoensis  
Globigerina praebulloides  
Globoquadrina dehiscens (s.l.)  
Globorotalia bella  
Globorotalia continuosa



Benthonics:

Karreria bradyi and slope spp. as below this level.

Count: 3000

% Planks: 90%

SWC 81 at 1835\* metres.

Lithology: Plank. micrite.

Fauna: Planktonics:

Globigerina woodi woodi

Globigerina woodi connecta

Globigerina praebulloides

Globigerina ciproensis

Globoquadrina dehiscens (s.l.)

Globoquadrina advena

Globorotalia bella

Globorotalia nana

Globorotalia continuosa

Globorotalia zealandica

Globorotalia incognito

Benthonics:

Slope species.

Count: 3000

% Planks: 90%

Comments: \* Washing repeated because of contamination

SWC 82 at 1832.5\* metres.

Lithology: Micrite and planks.

Fauna: Planktonics:

Globigerina woodi connecta

Globigerina woodi woodi

Globigerina praebulloides

Globoquadrina dehiscens

Globoquadrina advena

Globorotalia obesa

Globorotalia bella

Globorotalia zealandica

Globorotalia incognito

Globorotalia continuosa

Globorotalia nana

Benthonics:

Cibicides perforatus

Cibicides vortex

Cibicides subhaidingeri

Cassidulina subglobosa

Angulogerina

Bolivina

Count: 3000

% Planks. 90%

Comments: \* Washing repeated because of contamination.

SWC 83 at 1830.8\* metres.

Lithology: Silty micrite, 20% planks, pyrite.

Fauna: Planktonics: Numerical decline upwards, yet warming indicated with incoming of:

Catapsydrax dissimalis

Globorotalia kugleri

Globoquadrina dehiscens

Globigerina woodi connecta

Globigerina woodi woodi

Globigerina praebulloides

Globorotalia bella

Globorotalia continuosa

Globorotalia zealandica zealandica

Benthonics:

Epistomina

Cibicides

Including Cibicides lobatulus etc.

Bathysiphon.

Other Fauna: Echinoid, bryozoa, pelecypods.

Count: 1000

% Planks: 95%

Environment: High energy - ?slope fan or canyon.

Comments: \* Washing repeated because of contamination.

SWC 84 at 1828\* metres.

Lithology: Ooze - 80% plank. species, minor micritic limestone.f-m. ang. qtz; pyrite.

Fauna: Planktonics: Massive (5X) numerical increase from sample at 1830.8 metres.

Catapsydrax dissimilis

Globorotalia kugleri

Globoquadrina dehiscens (s.l.)

Globoquadrina advena

Globigerina woodi connecta

Globigerina woodi woodi

Globigerina praebulloides

Globorotalia bella

Globorotalia nana

Globorotalia obesa

Globorotalia zealandica zealandica

Globorotalia continuosa

Benthonics:

Epistomina

Anomalinoides

Cibicides

Angulogerina

Siphouvigerina

Bolivina

Bathysiphon.

Pseudoclavulina rudis

Other fauna: Echinoid spines.

Count: 5000

% Planks: 90%

Environment: Marked sed. energy decline compared with 1830.8 metres.

Comments: \* Washing repeated because of contamination

SWC 85 at 1826 metres.

Lithology: Plank. micrite minor f. ang. qtz. pyrite.

Fauna:

Planktonics:

Globorotalia kugleri

Globigerina woodi connecta

Globigerina woodi woodi

Globigerina praebulloides

Globoquadrina dehiscens (s.l.)

Globorotalia bella

Globorotalia continuosa

Globorotalia nana

Globorotalia obesa

Globorotalia zealandica zealandica

Benthonics:

Bathysiphon

Rhabdammina

Karrerria bradyi

Textularia carinata

Lagena

Nodosaria

Lenticulina

Globobulimina

Discammina

Pseudoclavulina rudis

Anomalinoides procolligera

Melonis barleeanum

Other fauna: Echinoid spines.

Count: 3000

SWC 86 at 1824.4\* metres.

Lithology: Silty micrite.  
Fauna: Planktonics: Ten times numerical decline from 1826.  
Also spp. diversity reduced. Pres. poor due to  
recryx. Determinations very difficult.  
Globigerina woodi connecta  
Globigerina woodi woodi  
Globigerina praebulloides  
Globorotalia continuosa  
Globorotalia spp. indeterminate.  
Benthonics:  
Cibicides  
Cassidulina  
Otherwise indeterminate.  
Count: 3000  
% Planks: 90%  
Environment: High energy N.B. fluctuating sed.  
energy from 1832.5 metres.  
Comments: \* Washing repeated because of contamination.

SWC 87 at 1822.7 metres.

Lithology: Ooze with f. calcite rhombs.  
Fauna: Planktonics Pres. fair but sugary recryx. large  
spec. size. fifteen times numerical increase from  
1824 metres.  
Catapsydrax dissimilis  
Globorotalia kugleri  
Globigerina woodi connecta  
Globigerina woodi woodi  
Globoquadrina altispira  
Globorotalia zealandica zealandica  
Globorotalia praescitula  
Globorotalia kugleri  
Globorotalia bella  
Globorotalia nana  
Globorotalia continuosa  
Globorotalia obesa  
Benthonics:  
Siphouvigerina proboscidae  
Sigmoidina prygo  
Gaudyrina  
Karrerria bradyi  
Pseudoclavulina rudis  
Cibicides

Anomalinoides  
Melonis barleeianum  
Astrononion ?tax  
Hoeglundina  
Other fauna: Echinoid spines  
Count: 5000

SWC 88 at 1750 metres.

Lithology: Plank. ooze.  
Fauna: Planktonics:  
Globigerinoides trilobus  
Globigerina woodi connecta  
Globigerina woodi woodi  
Globigerina praebulloides  
Globoquadrina dehiscens (s.l.)  
Globoquadrina advena  
Globoquadrina altispira  
Globorotalia continuosa  
Globorotalia zealandica  
Globorotalia bella  
Benthonics:  
Bolivina folium  
"Rosalina"  
Cibicides lobatulus  
Cibicides subhaid  
Cibicides mediocris  
Bulimina and Siphouvigerina  
Gyroidinoides.  
Sphaeroidina  
Count: 3000  
% Planks: 90%

SWC 89 at 1674.5 metres.

Lithology: Planks.  
Fauna: Planktonics:  
Globigerinoides trilobus  
Globorotalia zealandica zealandica  
Globorotalia praescitula  
Globorotalia bella  
Globorotalia continuosa  
Globorotalia nana  
Benthonics:  
Cibicides  
Anomalinoides  
Textularia  
Count: 2000  
% Planks: 95%

SWC 90 at 1599.8 metres.

Lithology: Planks with pyrite "spotting"

Fauna: Planktonics:  
Globigerinoides trilobus (advanced morph.)  
Globigerina woodi connecta  
Globoquadrina dehiscens (s.l)  
Globoquadrina altispira  
Globorotalia miozea miozea  
Globorotalia praescitula  
Globorotalia zealandica zealandica  
Benthonics:  
Vulvulina  
Discamina  
Buliminella  
Nonionella  
Cibicides  
Count: 3000  
% Planks: 95%

SWC 91 at 1515 metres.

Lithology: Planks.

Fauna: Planktonics: Robust fauna - large species sizes.  
Globigerinoides bisphericus (early) plus complete  
multi-layered F association.  
Excellent suite of Tasman Globorotalia.  
Benthonics: Shelf/slope assemblage  
Count: 3000  
% Planks: 90%

SWC 92 at 1449 metres.

Lithology: 70% silty micrite flakes, planks. minor f. ang. qtz.  
siltstones.

Fauna: Planktonics:  
Globigerinoides bisphericus complete suite of  
Tasman Globorotalia with excellent specimens.  
Globorotalia miozea miozea  
Globorotalia praescitula  
Globorotalia praemenardii  
Globorotalia zealandica zealandica  
Count: 1000  
% Planks: 95%

SWC 93 at 1375 metres.

Lithology: 50/50 micrite and forams

Fauna: Planktonics:  
Orbulina suturalis  
Praeorbulina glomerosa plus complete multi-layer E-1  
association.  
Benthonics: Upper slope.  
Count: 3000  
% Planks: 80%

SWC 94 at 1298.5 metres.

Lithology: Ooze.

Fauna: D-2 assemblage.