W814

WCR VOL 2

TERAGLIN-1

W814

ESSO EXPLORATION AND PRODUCTION AUSTRALIA INC.

WELL COMPLETION REPORT
TERAGLIN-1
26 MAY 1987
VOLUME 2

GIPPSLAND BASIN
VICTORIA

ESSO AUSTRALIA LIMITED

Compiled by:G.LINDSAY/W.MUDGE **FEBRUARY 1987**

TERAGLIN-1

WELL COMPLETION REPORT

VOLUME II

(Interpretative Data)

CONTENTS

FIGURES

APPENDICES

ENCLOSURES

ATTACHMENTS

1901L/10

TERAGLIN-1

INTRODUCTION

Teraglin-1 was plugged and abandoned as a dry hole.

The primary objective of the well was to test a small topographic high at the top of the Latrobe Group and a series of truncation traps against the Marlin Channel. The truncation traps were relying on the presence of intra Latrobe Group seals as well as Turrum Formation seal.

The well was also designed to provide stratigraphic information about the Latrobe Group to aid in future exploration within the channel complex.

Although Teraglin-1 achieved the stratigraphic objective, it did not encounter any significant hydrocarbon shows.

STRATIGRAPHIC SUMMARY

AGE	FORMATION	DEPTH		
		PREDICTED	DRILLED	
		(mKB)	(mKB)	(mSS)
Miocene to Recent	Seaspray Group	103-2466	100-2412	79-2391
	Gippsland Limestone	103-2086	100-2135	79-2114
	Lakes Entrance Fm.	2086-2466	2135-2421	2114-2391
Upper Cretaceous to Oligocene	Latrobe Group	2466-TD	2421-TD	2400-TD
	TOTAL DEPTH	3371	3373	3352

PREVIOUS DRILLING HISTORY

No wells had been drilled on the Teraglin structure. The closest wells are Halibut-1, 3km to the SW and Mackerel-1, 12 km to the S.

GEOLOGICAL SUMMARY

Structure - The post-drill interpretation of the Teraglin structure has not changed significantly. The top of the Latrobe Group in the vicinity of Teraglin-1 is an erosional surface within the Marlin Channel. A small domal closure, measuring about 1 km across, is interpreted to be present at the well location.

Within the Latrobe Group, strata dip to the west at about six degrees and are truncated to the east by the Marlin Channel. The Marlin Channel trends approximately northwest-southeast.

STRATIGRAPHY

Seaspray Group

The marls and limestones of the Lakes Entrance Formation and Gippsland Limestone were encountered essentially as expected.

Latrobe Group

The top of the Latrobe Group was intersected at 2421 mKB, or 45m shallow to prediction. The top of the Latrobe Group is marked by an erosional hiatus of about 10 MA (Figure 1, Appendix 1). The Latrobe Group as intersected can be divided into six intervals on the basis of lithology and age zonation.

1. 2421 - 2425 mKB

   This interval consists of a "hardground" composed of glauconite and limonitised glauconite.

   On the basis of one sidewall core, the interval has been assigned to the Middle Eocene Lower N. asperus Zone. It is considered to be a condensed sequence representing a long period of non-deposition probably in a shelfal environment. This represents the edge of the Turrum Formation which fills the Marlin channel.

2. <u>2425 - 2450 mKB</u>

This interval has been interpreted as Paleocene in age. (Appendix 2). The interval is a fine grained finely bedded sequence which contains Lower *L. balmei* Zone assemblages. This interval represents an offshore-lower shoreface facies.

3. <u>2450 - 2625 mKB</u>

This interval consists of a series of thick, 20m to 40m sandstones with minor shale and siltstone layers and several thin coal layers. The interval appears to be essentially nearshore marine composed of stacked shoreface deposits.

4. <u>2625 - 2825 mKB</u>

This interval is composed of well bedded sandstones, shales and coal. The sandstones are thinner, generally less than 5m towards the base of the interval where they appear to be fluvial in origin and thicker, generally less than 10m towards the top where some may be of a marine origin. The base of the interval represents the Mid Paleocene Seismic Marker.

5. <u>2825 - 3050 mKB</u>

This interval consists of numerous thick, 20 metres, sandstones. The shales present are generally thin, less than 5 metres, with the exception of the shale/siltstone between about 2875 mKB and 2975 mKB. The sandstones appear to represent shoreface deposits and the thick shale an offshore deposit. The whole interval represents a major marine incursion into the basin and can be correlated over a large area. It is the stratigraphic equivalent of the Flounder Field seal and reservoir.

6. <u>3050 - 3373 mKB</u>

This interval consists of well bedded sandstones, shales and coal. The sandstones are generally less than 5 metres thick averaging 2 to 3 metres. Coals are thin and poorly developed. The interval is fluvial in origin with possibly some marine influence towards the top.

HYDROCARBONS

The Teraglin-1 well was plugged and abandoned as a dry hole. Post drill studies indicate that a valid structural closure still exists.

The most probable reason for the well being dry is that the Turrum Formation within the channel fill does not provide an adequate seal.

Minor shows were recorded in cores, sidewall cores and cuttings at 2450-2470 mKB and 3250-3280 mKB. No other hydrocarbon indications were recorded and log analysis (Appendix 3) indicates that the sands in these intervals are water wet.

GEOPHYSICAL ANALYSIS

Teraglin-1 tested the updip truncation of the sands at the top of the Lower L. balmei Zone penetrated at 2654 mKB in Halibut-1. Top seal was expected to be provided by the overlying marine shale units and up-dip seal by the Lakes Entrance and Turrum Formations. The lithologies were encountered as expected and the post-drill maps (Enclosures 1 to 3) show a valid geometry, despite the prediction error of 2.3% to Top of Latrobe.

The summary table of results shows that the prediction error at Top of Latrobe is in effect a velocity error. The depth conversion pre-drill was performed by isopaching below sea-bottom using Dix interval velocities tied to the surrounding vertical wells; including Halibut-1, West Halibut-1, Fortescues 1-4, Mackerel-1 and -3, Flounder-6 and Pilotfish-1. The shallow horizons mapped for this purpose were selected to define the major velocity components.

The most obvious feature is a high velocity Miocene channel trending northwest-southeast across the eastern flank of the Halibut field. The axis of high velocities lies between Halibut-1 and Teraglin-1.

The time and depth to the channel were predicted at .733 sec (one-way) and 2086 mKB respectively. The actual time to 2086 mKB is .740 sec, which represents a velocity prediction error of about 1%. The remaining 1.3% prediction error at Top of Latrobe was introduced in the velocity of the relatively thin interval between the channel and the Top of Latrobe.

Summary Table of Results

Horizon	Predicted Time (Sec)	Predicted Depth (Ss)	Actual Time (Sec)	Actual Depth (Ss)
Miocene Channel	.733	2065	.755	2114
Mid Miocene Marker	.789	2246	.790	2212
Top of Latrobe	.851	2445	.849	2400

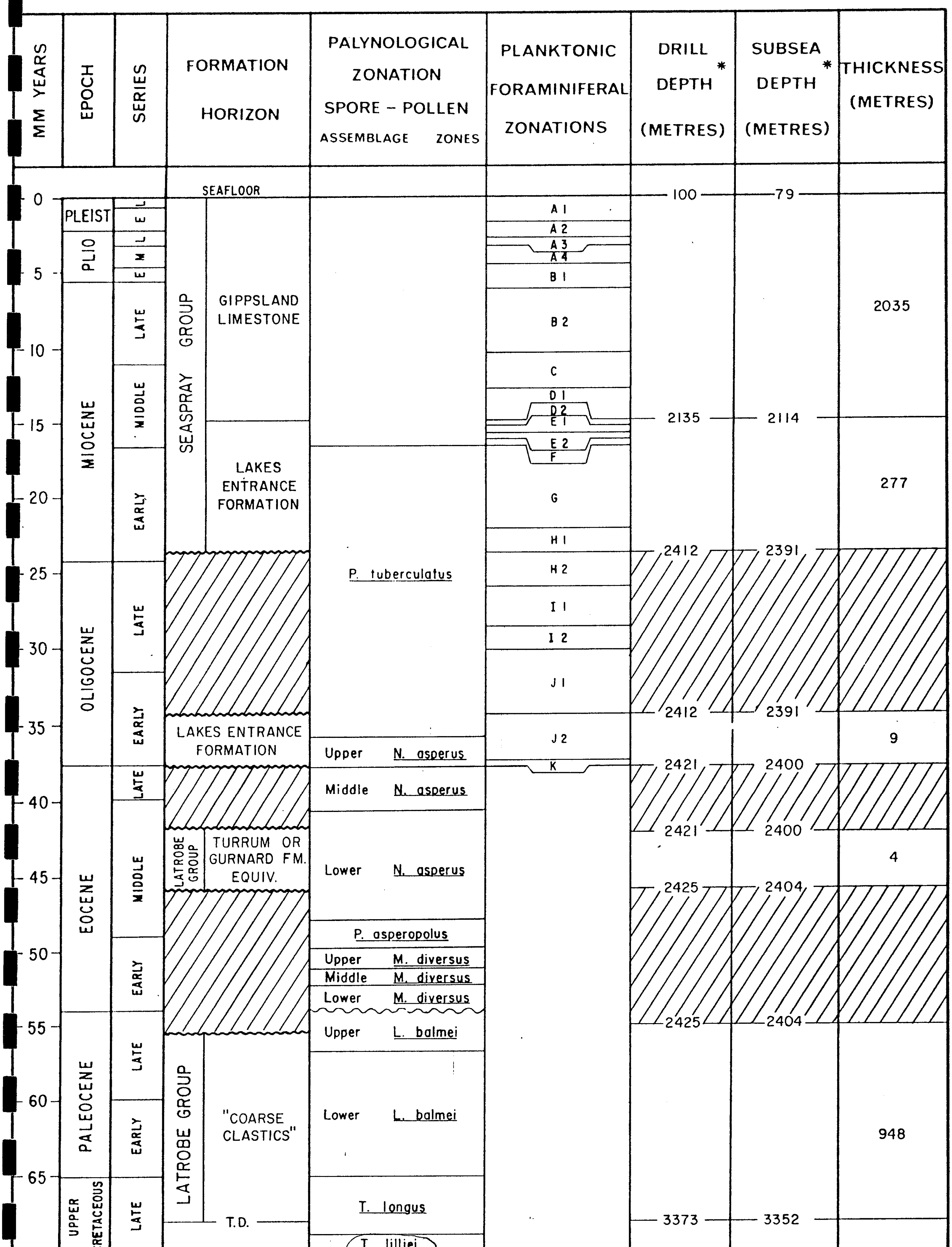
The post-drill depth conversion was performed using VNMO trends tied to the wells. A constant interval velocity of 3375 m/sec was used for the Turrum Formation from Wrasse-1 and 3700 m/sec for the Base of Turrum Formation to Lower L. balmei seismic marker from Halibut-1.

1847L/49-53

FIGURES

TERAGLIN – 1

STRATIGRAPHIC TABLE



* Depths are True Vertical Depths

Dwg. 2167/OP/8

APPENDIX 1

APPENDIX-1

MICROPALAEONTOLOGICAL ANALYSIS

APPENDIX

FORAMINIFERAL ANALYSIS, TERAGLIN-1, GIPPSLAND BASIN.

by

J.P. Rexilius.

(revised by

A.D. Partridge

December, 1986)

Esso Australia Ltd.

Palaeontological Report 1983/31. August 25, 1983.

0563L Revised December, 1986.

INTERPRETATIVE DATA

INTRODUCTION

Fifty one (51) sidewall cores were examined for their foraminiferal content from 1780.0 to 2450.0m in Teraglin-1. Adequate planktonic foraminiferal assemblages were recovered from all samples of the marine carbonate section except the following: SWC 73 at 2420.5m, SWC 128 at 1870.1m and SWC 130 at 1830.0m. Only rare agglutinated foraminifera were found in the limonitized hardground unit (2421-2425m) in SWC 121 at 1423.0m. The undifferentiated clastic unit of the Latrobe Group (2425-2450.5m) was barren of foraminifera.

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

SUMMARY

AGE	UNIT	ZONE	DEPTH (m)
		(not sampled)	(seafloor to 1780)
Late Miocene	Gippsland	B-2	1780.0
-	Limestone	Indeterminate	1830.0-1870.1
Mid Miocene		C	1810.0-1910.0
Mid Miocene		D-2/D-1	1929.9-2110.0
	log break at 2135m		
Mid Miocene	Lakes	D-2/D-1	2139.5-2170.0
Early Miocene	Entrance	G	2233.9-2321.0
Early Miocene	Formation	H-1	2349.0-2412.0
	log break at 2412m		
Early Oligocene	unnamed	J-2	2415.0-2418.0
latest Late Eocene/ earliest Early Oligocene	carbonate unit	K	2419.0
	log break at 2421m		
* Middle Eocene	Latrobe Group (unnamed limonitized unit)	Lower _N.asperus_	2423.0
	log break at 2425m		
		Upper _L.balmei_	2428.0-2433.0
* Paleocene-	Latrobe Group	Lower _L.balmei_	2440.0-2937.0
Maastrichtian	(coarse clastics)	Upper _T.longus_	2947.0-3235.0
		Lower _T. longus_	3282.0-3372.5

* age based on palynology (see Macphail, 1983) T.D. 3373m.

GEOLOGICAL COMMENTS

1. The laminated clastic sequence near the top of the Latrobe Group (2425-2450.5m) is barren of foraminifera. The palynological assemblage in the sequence is dominated by Paleocene spore/pollen but contains younger elements of Eocene age. Contamination by Eocene palynomorphs is preferred to alternative interpretation that this section represents massive reworking of Paleocene sediments into an Eocene channel.

2. The laminated clastic sequence is overlain by a 5m thick limonitised hardground horizon. A sample from the middle of the unit (SWC 23 at 2423.0m) has been age dated as Middle Eocene and assigned to the Lower N. asperus palynological Zone (Macphail, 1983). On the basis of lithological character (the unit contains limonitised glauconite and minor fresh glauconite) and faunal content (the unit contains rare fish teeth), the unit is interpreted as having originally represented a greensand which was deposited very slowly. The top 2m of the unit (unsampled) may range up into the Late Eocene. The hardground probably formed during a period of non-deposition in the Late Eocene. The presence of minor fresh glauconite in the SWC sample at 2423m indicates that submarine diagenesis has only partially altered the original greensand.

3. The limonitized hardground horizon is disconformably overlain by a 9m thick unnamed carbonate unit. The unit is latest Late Eocene to earliest Early Oligocene (Zones K and J-2) in age. The hiatus between the unnamed carbonate unit and the limonitized hardground probably spans part of the Late Eocene. The unit has a higher bulk density and higher gamma log response than the overlying section of the Lakes Entrance Formation. The base of the unit consists of recrystallised limestone (2420.5m) and grades up into recrystallised marl (2419.0m) and finally into planktonic foraminiferal ooze at the top (2415.0-2418.0m). The unit contains minor coarse, well rounded quartz grains at the base (2420.5-2419.0m), and 2-5 percent pelletal glauconite and an unusually high proportion of fish teeth throughout. On the basis of lithological character and fossil content, the unit is interpreted as representing a condensed sequence deposited during a maximum rise in relative sea-level (transgression).

4. The condensed latest Late Eocene-earliest Early Oligocene unit is disconformably overlain by a thick section of calcareous shale (Lakes Entrance Formation), the basal part of which is Early Miocene (Zone H-1) in age. The hiatus between the units spans approximately 10 million

hiatus between the units spans approximately 10 million years. The two lowest samples of the calcareous shale (SWC 78 at 2412.0m and SWC 123 at 2409.0m) contain Early Oligocene planktonic foraminifera which have been reworked during Early Miocene (Zone H-1) time. Reworking of this nature has been documented in several wells in the Gippsland Basin including Cobia-2 (Rexilius, in prep.), Yellowtail-1 and Yellowtail-2 (Rexilius, 1982) and Opah-1 (Rexilius, 1983).

5. The boundary between the Gippsland Limestone and the Lakes Entrance Formation is difficult to delineate in the offshore Gippsland Basin but can be inferred from changes in lithological, faunal and log character. On the basis of log character, the boundary between the Gippsland Limestone and Lakes Entrance Formation in Teraglin-1 is selected at 2135m. The sidewall core sample immediately below this log break (SWC 95 at 2139.5m) is a planktonic foraminiferal ooze (pelagic sediment). The lowest sidewall core above the log break (SWC 96 at 2110.0m) is a calcareous shale comprising a moderate proportion of echinoid spines. The lithological character and fossil content of this sample indicates that it probably represents the distal edge of the prograding Gippsland Limestone. The prograding Gippsland Limestone reached the Teraglin-1 site during the Mid Miocene (Zones D-2/D-1 time). Typical fine grained shelfal calcarenite with abundant sponge spicules and echinoid spines makes its first appearance uphole at 1988.0m (SWC 100).

DISCUSSION OF ZONES

The Tertiary biostratigraphy in Teraglin-1 is based on the Gippsland Basin planktonic foraminiferal zonal scheme of Taylor (in prep).

Indeterminate Interval : 2420.5 - 2450.0m.

The laminated clastic sequence (2425.0-2450.5m) is barren of foraminifera. The palynological assemblage is dominated by Paleocene spore/pollen but contains younger elements of Eocene age. The limonitised hardground horizon (2421.0-2425.0m) is barren of planktonic foraminifera and only contains rare agglutinates. The unit cannot be age dated using foraminifera. Palynological analysis of SWC 121 at 2423.0m indicates that the middle portion of the unit is Middle Eocene in age and assignable to the Lower N. asperus Zone (Macphail, 1983). The lowest sample of the un-named carbonate unit (SWC 73 at 2420.5m) is strongly recrystallised and only contains a low yield of very poorly preserved, indeterminate planktonic foraminifera. The assemblage is not age diagnostic but is suspected to be Zone K (latest Late Eocene - earliest Early Oligocene) in age.

Zone K : 2419.0m.

The presence of Globigerina linaperta and G. brevis indicates that SWC 74 at 2419.0m is assignable to Zone K. The planktonic foraminiferal assemblage is moderately diverse but poorly preserved.

Zone J-2 : 2415.0 - 2418.0m.

The association of Globigerina angiporoides, G. brevis and Globorotalia postcretacea, and the absence of Globigerina linaperta, indicates that the interval is assignable to Zone J-2. The assemblage is dominated by Globigerina angiporoides, G. euapertura and specimens transitional between G. euapertura and G. ampliapertura. Other species in the assemblage include Globigerina ampliapertura, G. brevis, G. tripartita and Globorotalia postcretacea.

Zone H-1 : 2349.0 - 2412.0m.

The uphole appearance of Globigerina woodi connecta at 2412.0m defines the base of Zone H-1 in Teraglin-1. The preservation of the assemblages in the interval are moderate to poor.

Zone G : 2199.0 - 2321.0m.

The uphole appearance of Globigerinoides trilobus at 2321.0m defines the base of Zone G.

Zones D-2/D-1 : 1929.9 - 2170.0m.

The base of Zone D-2 is defined by the uphole entry of Orbulina universa at 2170.0m. 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. The value of Globorotalia peripheroacuta for zonal designation is questionable because the species is itinerant and when present is generally rare.

Zone C : 1810.0 - 1910.0m.

The uphole first appearance of Globorotalia miotumida miotumida at 1910.0m defines the base of Zone C in Teraglin-1.

Zone B-2 : 1780.0m.

The base of Zone B-2 is defined by the uphole entry of Globorotalia acostaensis at 1780.0m.

REFERENCES

MACPHAIL, M.K., 1983. Palynological analysis, Teraglin-1, Gippsland Basin. Esso Australia Ltd., Palaeontology Report, 1983/29.

REXILIUS, J.P., 1982. Foraminiferal analysis, Yellowtail-2, Gippsland Basin. Esso Australia Ltd., Palaeontology Report 1982/45.

REXILIUS, J.P., 1983. Revised Foraminiferal biostratigraphy, Opah-1, Gippsland Basin. Esso Australia Ltd., Palaeontology Report 1983/14.

REXILIUS, J.P., (in prep). Revised foraminiferal biostratigraphy, Cobia-2, Gippsland Basin.

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

MICROPALEONTOLOGICAL DATA SHEET

BASIN: GIPPSLAND ELEVATION: KB: 21.0m GL: -79.3m

WELL NAME: TERAGLIN-1 TOTAL DEPTH: 3373m

AGE		FORAM. ZONULES	HIGHEST DATA Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	LOWEST DATA Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
PLEISTOCENE		A_1										
PLEISTOCENE		A_2										
PLIOCENE		A_3										
PLIOCENE		A_4										
MIOCENE		B_1										
MIOCENE	LATE	B_2	1780.0	1				1780.0	1			
MIOCENE	LATE	C	1810.0	1				1910.0	1			
MIOCENE	MIDDLE	D_1	1929.9	1								
MIOCENE	MIDDLE	D_2						2170.0	0			
MIOCENE	MIDDLE	E_1										
MIOCENE	MIDDLE	E_2										
MIOCENE	EARLY	F										
MIOCENE	EARLY	G	2199.0	1				2321.0	1			
MIOCENE	EARLY	H_1	2349.0	1				2412.0	1			
OLIGOCENE	LATE	H_2										
OLIGOCENE	LATE	I_1										
OLIGOCENE	LATE	I_2										
OLIGOCENE	EARLY	J_1										
OLIGOCENE	EARLY	J_2	2415.0	0				2418.0	0			
EOCENE		K	2419.0	1				2419.0	1			
EOCENE		Pre-K										

COMMENTS: There is a substantial hiatus spanning most of the Oligocene (Zones J-1 to H-2 missing) in Teraglin-1. The 2 lowermost Early Miocene sample (SWC 78 at 2412.0m and SWC 123 to 2409.0m) contain reworked Early Oligocene (Zone J-2) assemblages. The absence of Zones F and E may be the result of a gap in sampling or may be the result of hiatus.

CONFIDENCE RATING:

- O: 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: J.P. Rexilius DATE: June 2, 1983.

DATA REVISED BY: J.P. Rexilius DATE: August 25, 1983.

TABLE 1

SUMMARY OF PALAEONTOLOGICAL ANALYSIS, TERAGLIN-1, GIPPSLAND BASIN

INTERPRETATIVE DATA

NATURE OF SAMPLE	DEPTH (M)	PLANKTONIC FORAMINIFERAL YIELD	PRESERVATION	DIVERSITY	ZONE	AGE	COMMENTS
SWC 57	2450.0	Barren	-	-	-	-	-
SWC 58	2444.5	Barren	-	-	-	-	-
SWC 59	2447.0	Barren	-	-	-	-	-
SWC 60	2445.0	Barren	-	-	-	-	-
SWC 61	2444.0	Barren	-	-	-	-	-
SWC 62	2443.0	Barren	-	-	-	-	-
SWC 63	2440.0	Barren	-	-	-	-	-
SWC 64	2438.5	Barren	-	-	-	-	-
SWC 65	2435.5	Barren	-	-	-	-	-
SWC 66	2433.0	Barren	-	-	-	-	-
SWC 67	2430.5	Barren	-	-	-	-	Substantial downhole contamination.
SWC 68	2429.5	Barren	-	-	-	-	-
SWC 69	2428.0	Barren	-	-	-	-	-
SWC 70	2427.0	Barren	-	-	-	-	-
SWC 71	2425.5	Barren	-	-	-	-	-
SWC 121	2423.0	Barren	-	-	-	-	Agglutinate forams (rare) and fish teeth (rare).
SWC 73	2420.5	Low	Very poor	Very low	Indeterminate	-	Fish teeth.
SWC 74	2419.0	High	Poor	Moderate	K	latest Eocene/ earliest Oligocene.	Fish teeth.
SWC 75	2418.0	High	Poor	Moderate	J-2	Early Oligocene	Fish teeth.
SWC 77	2415.0	High	Moderate/poor	Moderate	J-2	Early Oligocene	Fish teeth.
SWC 78	2412.0	Low/moderate	Poor	Low	H-1	Early Miocene	Contains reworked Early Oligocene.
SWC 123	2409.0	High	Poor	Low	H-1	Early Miocene	Contains reworked Early Oligocene.

TABLE 1

SUMMARY OF PALAEONTOLOGICAL ANALYSIS, TERAGLIN-1, GIPPSLAND BASIN

INTERPRETATIVE DATA

NATURE OF SAMPLE	DEPTH (M)	PLANKTONIC FORAMINIFERAL YIELD	PRESERVATION	DIVERSITY	ZONE	AGE	COMMENTS
SWC 124	2406.0	High	Poor/moderate	Low	H-1	Early Miocene	
SWC 125	2404.1	Moderate	Poor/moderate	Low/moderate	H-1	Early Miocene	
SWC 82	2400.5	Moderate	Poor	Low/moderate	H-1	Early Miocene	
SWC 83	2397.5	Low/moderate	Poor	Low	H-1	Early Miocene	
SWC 84	2394.5	Low/moderate	Poor	Low	H-1	Early Miocene	
SWC 85	2390.0	Low	Poor	Low	H-1	Early Miocene	
SWC 86	2385.0	Moderate	Poor	Moderate	H-1	Early Miocene	
SWC 87	2379.9	High	Moderate	High	H-1	Early Miocene	
SWC 88	2349.0	Moderate/high	Poor	Moderate	H-1	Early Miocene	
SWC 89	2321.0	Moderate/low	Poor	Moderate/high	G	Early Miocene	
SWC 90	2290.0	Low	Poor/moderate	Moderate	G	Early Miocene	
SWC 91	2260.5	Very low	Poor	Low	G	Early Miocene	Shell fragments, bryozoa, echinoid spines.
SWC 92	2233.9	High	Moderate/good	Moderate/high	G	Early Miocene	
SWC 93	2199.0	Moderate	Poor/moderate	Low	G	Early Miocene	Opaline Ammodiscus common.
SWC 94	2170.0	High	Good	High	D-2/D-1	Mid Miocene	
SWC 95	2139.5	High	Moderate/good	High	D-2/D-1	Mid Miocene	
SWC 96	2110.0	Low/moderate	Poor	Moderate	D-2/D-1	Mid Miocene	
SWC 97	2079.9	High	Moderate/good	Moderate	D-2/D-1	Mid Miocene	
SWC 98	2049.9	High	Poor/moderate	Moderate/high	D-2/D-1	Mid Miocene	
SWC 99	2021.9	Moderate	Poor	Low/moderate	D-2/D-1	Mid Miocene	
SWC 100	1988.0	Low/moderate	Poor/moderate	Moderate	D-2/D-1	Mid Miocene	Sponge spicules, echinoid spines.

TABLE 1

SUMMARY OF PALAEONTOLOGICAL ANALYSIS, TERAGLIN-1, GIPPSLAND BASIN

INTERPRETATIVE DATA

NATURE OF SAMPLE	DEPTH (M)	PLANKTONIC FORAMINIFERAL YIELD	PRESERVATION	DIVERSITY	ZONE	AGE	COMMENTS
SWC 101	1961.0	Moderate/high	Moderate	Moderate	D-2/D-1	Mid Miocene	Sponge spicules, echinoid spines.
SWC 102	1929.9	Low/moderate	Poor	Moderate	D-2/D-1	Mid Miocene	Echinoid spines.
SWC 126	1910.0	Moderate	Poor	Moderate	C	Mid Miocene	Sponge spicules (rare)
SWC 127	1890.0	Moderate	Poor	Moderate	C	Mid Miocene	Sponge spicules.
SWC 128	1870.1	Very low	Poor/moderate	Low	Indeterminate	-	Sponge spicules.
SWC 130	1830.0	Low	Poor	Low	Indeterminate	-	Sponge spicules (rare)
SWC 131	1810.0	High	Moderate	Moderate/high	C	Mid Miocene	Sponge spicules, high proportion of juvenile planktonics.
SWC 132	1780.0	Moderate	Poor/moderate	Moderate/high	B-2	Late Miocene	Echinoid spines, fish teeth (rare).

BASIC DATA

TABLE 2 : FORAMINIFERAL DATA, TERAGLIN-1.

RANGE CHART : TERTIARY PLANKTONIC FORAMINIFERA.

TABLE 2

SUMMARY OF PALAEONTOLOGICAL ANALYSIS, TERAGLIN-1, GIPPSLAND BASIN

BASIC DATA

NATURE OF SAMPLE	DEPTH (M)	PLANKTONIC FORAMINIFERAL YIELD	PRESERVATION	DIVERSITY	COMMENTS
SWC 57	2450.0	Barren	-	-	-
SWC 58	2444.5	Barren	-	-	-
SWC 59	2447.0	Barren	-	-	-
SWC 60	2445.0	Barren	-	-	-
SWC 61	2444.0	Barren	-	-	-
SWC 62	2443.0	Barren	-	-	-
SWC 63	2440.0	Barren	-	-	-
SWC 64	2438.5	Barren	-	-	-
SWC 65	2435.5	Barren	-	-	-
SWC 66	2433.0	Barren	-	-	-
SWC 67	2430.5	Barren	-	-	Substantial downhole contamination.
SWC 68	2429.5	Barren	-	-	-
SWC 69	2428.0	Barren	-	-	-
SWC 70	2427.0	Barren	-	-	-
SWC 71	2425.5	Barren	-	-	-
SWC 121	2423.0	Barren	-	-	Agglutinate forams (rare) and fish teeth (rare).
SWC 73	2420.5	Low	Very poor	Very low	Fish teeth.
SWC 74	2419.0	High	Poor	Moderate	Fish teeth.
SWC 75	2418.0	High	Poor	Moderate	Fish teeth.
SWC 77	2415.0	High	Moderate/poor	Moderate	Fish teeth.
SWC 78	2412.0	Low/moderate	Poor	Low	Contains reworked Early Oligocene.
SWC 123	2409.0	High	Poor	Low	Contains reworked Early Oligocene.
SWC 124	2406.0	High	Poor/moderate	Low	-
SWC 125	2404.1	Moderate	Poor/moderate	Low/moderate	-
SWC 82	2400.5	Moderate	Poor	Low/moderate	-
SWC 83	2397.5	Low/moderate	Poor	Low	-
SWC 84	2394.5	Low/moderate	Poor	Low	-
SWC 85	2390.0	Low	Poor	Low	-
SWC 86	2385.0	Moderate	Poor	Moderate	-
SWC 87	2379.9	High	Moderate	High	-
SWC 88	2349.0	Moderate/ high	Poor	Moderate	-
SWC 89	2321.0	Moderate/low	Poor	Moderate/high	-
SWC 90	2290.0	Low	Poor/moderate	Moderate	-

TABLE 2

SUMMARY OF PALAEONTOLOGICAL ANALYSIS, TERAGLIN-1, GIPPSLAND BASIN

BASIC DATA

NATURE OF SAMPLE	DEPTH (M)	PLANKTONIC FORAMINIFERAL YIELD	PRESERVATION	DIVERSITY	COMMENTS
SWC 91	2260.5	Very low	Poor	Low	Shell fragments, bryozoa, echinoid spines.
SWC 92	2233.9	High	Moderate/good	Moderate/high	-
SWC 93	2199.0	Moderate	Poor/moderate	Low	Opaline Ammodiscus common.
SWC 94	2170.0	High	Good	High	-
SWC 95	2139.5	High	Moderate/good	High	-
SWC 96	2110.0	Low/moderate	Poor	Moderate	-
SWC 97	2079.9	High	Moderate/good	Moderate	-
SWC 98	2049.9	High	Poor/moderate	Moderate/high	-
SWC 99	2021.9	Moderate	Poor	Low/moderate	-
SWC 100	1988.0	Low/moderate	Poor/moderate	Moderate	Sponge spicules, echinoid spines.
SWC 101	1961.0	Moderate/ high	Moderate	Moderate	Sponge spicules, echinoid spines.
SWC 102	1929.9	Low/moderate	Poor	Moderate	Echinoid spines.
SWC 126	1910.0	Moderate	Poor	Moderate	Sponge spicules (rare)
SWC 127	1890.0	Moderate	Poor	Moderate	Sponge spicules.
SWC 128	1870.1	Very low	Poor/moderate	Low	Sponge spicules.
SWC 130	1830.0	Low	Poor	Low	Sponge spicules (rare)
SWC 131	1810.0	High	Moderate	Moderate/high	Sponge spicules, high proportion of juvenile planktonics.
SWC 132	1780.0	Moderate	Poor/moderate	Moderate/high	Echinoid spines, fish teeth (rare).

PE906423

This is an enclosure indicator page.
The enclosure PE906423 is enclosed within the container PE902555 at this location in this document.

The enclosure PE906423 has the following characteristics:

ITEM_BARCODE =	PE906423
CONTAINER_BARCODE =	PE902555
NAME =	Planktonic Foraminifera Range Chart
BASIN =	GIPPSLAND
PERMIT =	VIC/L5
TYPE =	WELL
SUBTYPE =	DIAGRAM
DESCRIPTION =	Planktonic Foraminifera Range Chart (enclosure from WCR vol.2) for Teraglin-1
REMARKS =	
DATE_CREATED =	
DATE_RECEIVED =	26/05/87
W_NO =	W814
WELL_NAME =	TERAGLIN-1
CONTRACTOR =	
CLIENT_OP_CO =	ESSO AUSTRALIA LIMITED

(Inserted by DNRE - Vic Govt Mines Dept)

APPENDIX 2

APPENDIX-2

PALYNOLOGICAL ANALYSIS

APPENDIX

PALYNOLOGICAL ANALYSIS

TERAGLIN-1, GIPPSLAND BASIN

by

M.K. Macphail.

(revised by

A.D. Partridge

December, 1986)

Esso Australia Ltd.

Palaeontological Report 1983/29.

First issued August 1983.

Revised December 1986.

0546L

INTERPRETATIVE DATA

INTRODUCTION

Fifty seven (57) sidewall cores, one core and twelve (12) cuttings samples were processed and examined for spore-pollen and dinoflagellates. Recovery was mostly fair but consistent reworking and/or contamination of Late Cretaceous and Eocene species in the Paleocene sediments, and poor preservation of the Late Cretaceous palynofloras has resulted in low confidence in some of the age-determinations.

Palynological zones and lithological facies divisions from near the base of the Lakes Entrance Formation to the total depth of the well are given below. Occurrences of spore-pollen and dinoflagellate species are tabulated in the accompanying range chart. Anomalous and unusual occurrences of taxa are listed at the end of the Biostratigraphy Section (see Table 2).

SUMMARY

UNIT FACIES	ZONE	DEPTH (m)
Lakes Entrance Fm. & Unnamed carbonate unit	P. tuberculatus	2400.5-2420.5m
	log break at 2421m	
Hardground (Turrum or Gurnard Formation equiv.)	Lower N. asperus	2423.0m
	log break at 2425m	
Latrobe Group coarse clastics	Upper L. balmei	2428.0-2433.0m
	Lower L. balmei	2440.0-2937.0m
	Upper T. longus	2947.0-3235.0m
	Lower T. longus	3282.0-3372.5m

T.D. 3373m.

GEOLOGICAL COMMENTS

1. The Teraglin-1 well contains an apparently continuous sequence of sediments from the Maastrichtian (Upper T. longus Zone) to the Paleocene (Upper L. balmei Zone).

2. The unnamed carbonate unit picked on lithological and log characteristics between 2412.0 to 2421.0m (Rexilius 1983), is P. tuberculatus Zone in age, probably Early Oligocene on the basis of forams recovered at 2419.0m (Rexilius ibid). The overlying Lakes Entrance Formation sampled at 2400.5m and 2411.9m is on palynology unlikely to be older than Miocene in age, a result that supports macro palaeontological data for an unconformity at 2412m (Rexilius ibid).

3. A distinctive unit is represented on log characteristics between the base of the Lakes Entrance Formation at 2421.0m and the top of coarse clastics of the Latrobe Group picked at 2425.0m. On the basis of the single sidewall core from this unit at 2423.0m, which contains limontized glauconite, minor fresh glauconite associated with rare agglutinate forams and fish teeth, the unit has been interpreted as a condensed section or hardground horizon (Rexilius, 1983). The sample is referred to the Lower N. asperus spore-pollen Zone and W. echinosuturatum dinoflagellate Zone and is Middle Eocene in age. The unit is interpreted as a condensed section or hardground and could be referred to either the Gurnard or Turrum Formations.

4. The top of the Latrobe Group coarse clastics is picked on lithogical and log characteristics at 2425.0m. However, the unit of shales and siltstones bounded by log breaks at 2425.0 and 2450.0m contains frequent well-stained Eocene taxa and Late Cretaceous spores mixed with Paleocene spore-pollen assemblages. It is not clear whether this unit represents (1) insitue Paleocene sediments with sidewall cores from this interval contaminated with Late Cretaceous and Eocene palynomorphs from the mud system or (2) an Eocene channel fill sequence with sediments derived predominately from the underlying eroded Paleocene. The second interpretation is supported by the presence of Late Cretaceous palynomorphs which are uncommon as reworked elements other than in the channel fill sequences. Overall however a Paleocene age is preferred even though confidence in zone assignment is poor. This interpretation is supported by the tendency for indicator species of the Upper L. balmei Zone to be concentrated in the upper 8m and Lower L. balmei Zone indicator species in the lower 17m of this section.

5. Lower L. balmei Zone marine samples are recorded at 2553.5m, 2759.3m and 2788.5m. The youngest is characterised by abundant Glaphryocysta retiintexta with Svalbardella sp. and cannot be correlated with any of the transgressions recognised by Partridge (1976). Another (2788.5m) is represented by Palaeoperidinium pyrophorum, a species restricted to the T. evittii Zone event in Hapuku-1 (Partridge 1975) and present only in a greensand (2927.0-2935.0m) in Pilotfish-1A (Macphail 1983). In addition the T. evittii Zone is recorded at 2937.0m and marine sediments of the Maastrichtian age I. druggii Zone occur at 2947.0m.

6. Unfortunately, because of low diversity and poor preservation, the aim of improving the biostratigraphic control in this area of the Gippsland Basin, cannot be fully realised.

BIOSTRATIGRAPHY

The zone boundaries have been established using the criteria of Stover & Evans (1974), Stover & Partridge (1973) and subsequent proprietary revisions.

Lower T. longus Zone : 3282.0 - 3372.5m.
Four samples are provisionally placed in this zone based on the frequent to common occurrence of Gambierina and the absence of Upper T. longus Zone indicator species. Tetracolporites verrucosus and Proteacidites wahooensis occur at 3349.4m and 3282.0m.

Upper T. longus Zone : 2947.0 - 3235.0m.
Samples within this unit are dominated by Gambierina rudata, Proteacidites spp. and a number of gymnosperms including Podocarpidites and Phyllocladidites mawsonii. Except for the sample at 2947.0m, rare occurrences of dinoflagellates are probably due to caving since these include the Paleocene-Eocene species Apectodinium homomorphum. The base of the zone is defined by the first appearance of Stereisporites punctatus at 3235.0m. Other species which first appear in the Upper T. longus Zone, eg. Proteacidites gemmatus, or which range no higher than this zone, eg. Tricolpites waiparaensis, Tricolporites lilliei, Proteacidites otwayensis and P. reticuloconcavus occur infrequently throughout the section. The nominate species first occurs at 3051.0m. The highest occurrences of Tricolpites longus and abundant Gambierina rudata are at 3000.5m. The upper boundary is defined by Isabelidinium druggii with Quadraplanus brossus at 2947.0m.

Lower L. balmei Zone : 2440.0 - 2947.0m.
The zone falls within an interval in which most samples are either barren or contain spore-pollen assemblages of low diversity and limited stratigraphic utility. Although dinoflagellates are usually present, these are rarely abundant and even more rarely include species restricted in range to the Early Paleocene. Because of widespread reworking of Late Cretaceous spores, it is possible that some occurrences of Tetracolporites verrucosus (a species which first appears in the Upper T. longus Zone but which in association with frequent to abundant Lygistepollenites balmei is a reliable indicator of the Lower L. balmei Zone) are also due to reworking from Late Cretaceous sediments.

Samples within the interval are characterised by general L. balmei Zone markers in gymnosperm and Proteacidites-dominated assemblages, eg. frequent to abundant Lygistepollenites balmei, Australopollis obscurus, Basopollis spp., and (infrequently) Polycolpites langstonii and Nothofagidites endurus. The Proteacidites pollen are almost wholly 25 microns or less in diameter, a size class that is particularly prominent in the Lower L. balmei Zone. The base of the zone is placed at 2947.0m, the first sample to lack Late Cretaceous indicator species and frequent to abundant Gambierina rudata. Polycolpites langstonii, a species which first appears in this zone and Basopollis otwayensis, a species which is typical of Paleocene sediments, occur in this sample. The first occurrence of frequent Lygistepollenites balmei is at 2920.0m. Occurrences of Apectodinium homomorphum at 2826.5m and 2788.5m, Palaeoperidinium pyrophorum at 2788.5m and 2778.2m, and Glaphyrocysta retiintexta from 2552.0 to 2622m are also consistent with a Lower L. balmei Zone age for the section. Tetracolporites verrucosus is present to common throughout. The lowest occurrences of other spore-pollen species which first appear in the Lower L. balmei Zone are: Haloragacidites harrisii (2759.3m) and Integricorpus antipodus (2645.9m). The top of the zone is confidently placed at 2451.8m, the highest sample containing a Lygistepollenites balmei - Tetracolporites verrucosus assemblage with (abundant) Australopollis obscurus and lacking signs of reworking/caving.

The assemblages extracted from sidewall cores over the interval 2440.0 to 2450.0m can only be assigned to the Lower L. balmei Zone with low confidence because of (1) the frequent occurrence of Late Cretaceous species including Proteacidites amolosexinus, P. otwayensis and P. wahooensis and (2) less frequent occurrences of Eocene species including Nothofagidites falcatus and Vozzhenikovia extensa. These mixed assemblages are interpreted as contamination of the sidewall cores by Late Cretaceous and Eocene palynomorph which have been incorporated in the drilling mud.

Upper L. balmei Zone: 2428.0 - 2433.0m

Assemblages from both sidewall cores and cuttings over this interval are mainly characteristic of L. balmei Zone assemblages mixed with a minor but conspicuous component of reworked or contaminated Late Cretaceous spore-pollen and caved or contaminated Eocene to Oligocene palynomorphs. Upper L. balmei Zone indicator species are restricted to presence of the spore Verrucosisporites kopukuensis in samples at 2428m and 2433m. As this species could be caved or contamination confidence in recognition of Upper subdivision of the L. balmei Zone is poor.

Lower N. asperus Zone : 2423.0m.

The zone is represented by one sample only. This contains the Lower N. asperus Zone indicator dinoflagellate species Areosphaeridium diktyoplokus as well as Wilsonidium echinosuturatum a species which is restricted to middle portion of this zone. Recovery of spore-pollen was negligible.

Proteacidites tuberculatus : 2400.5 - 2420.5m.

The consistent occurrence of rare to frequent Cyatheacidites annulatus from 2400.5 to 2420.5m confirm a P. tuberculatus Zone age for this glauconite-free, calcareous interval. The sample at 2420.5m, picked as the base of the zone, contains (1) Polyporina chenopodiaceoides and Myrtaceidites eucalyptoides, species which first appear in the Early Oligocene and (2) Sapotaceoidaepollenites rotundus, a species which is last recorded in Miocene sediments. The highest sidewall core sample examined at 2400.5m, contained Polyadopollenites myriosporites a species which is rarely recorded earlier than the Middle-Late Miocene.

REFERENCES

MACPHAIL, M.K., 1983. Palynological analysis, Pilotfish-1A, Gippsland Basin. Esso Australia Ltd. Palaeontological Report, 1983/20.

PARTRIDGE, A.D., 1975. Palynological analysis, Hapuku-1, Gippsland Basin. Esso Australia Ltd. Palaeontological Report, 1975/13.

PARTRIDGE, A.D., 1976. The geological expression of eustacy in the Early Tertiary of the Gippsland Basin. Apea J. 16(1), 73-79.

REXILIUS, J.P., 1983. Micropalaeontological analyses of Teraglin-1, Gippsland Basin, Victoria. Esso Australia Ltd., Palaeontological Report, 1983/31.

STOVER, L.E. & EVANS, P.R., 1974. Upper Cretaceous spore-pollen zonation, offshore Gippsland Basin, Australia. Spec. Publ. Geol. Soc. Aust., 4, 55-72 (imprint 1973).

STOVER, L.E. & PARTRIDGE, A.D., 1973. Tertiary and Late Cretaceous spores and pollen from the Gippsland Basin, Southeastern Australia. Proc. Roy. Soc. Vict. 85, 237-286.

TABLE I : SUMMARY OF PALYNOLOGICAL ANALYSIS TERAGLIN-1, GIPPSLAND BASIN.

INTERPRETATIVE DATA

SAMPLE NO.	DEPTH (m)	YIELD	DIVERSITY SPORE POLLEN	LITHOLOGY	ZONE	AGE & ENVIRONMENT	CONFIDENCE RATING	COMMENTS
CTS	2355-60	Low	V. low	-	Indeterminate	-	-	-
SWC 82	2400.5	Good	Moderate	Calc. Sh.	P. tuberculatus	Early Miocene, Marine.	0	C. annulatus, P. myriosporites.
CTS	2400-05	Fair	Low	-	P. tuberculatus	Early Miocene, Marine.	3	C. annulatus.
CTS	2405-10	Low	Low	-	Indeterminate		-	Dacrycarpites australiensis
SWC 78	2411.9	Good	Low	Calc. Sh.	P. tuberculatus	Early Miocene, Marine	2	C. annulatus
CTS	2410-15	Barren	-	-	-	-	-	-
CTS	2415-20		Moderate	Coal in cuttings	L. balmei (reworked)	-	-	N. endurus, P. verrucosus
SWC 77	2415.0	Good	Low	Calc. slst.	P. tuberculatus	Early Oligocene, Marine	0	C. annulatus, M. ornamentalis
SWC 75	2418.0	Low	Low	Calc. slst.	P. tuberculatus	Early Oligocene, Marine		C. annulatus.
SWC 74	2419.0	V. good	Low	Calc. slst.	P. tuberculatus	Early Oligocene/ Late Eocene, Marine	0	C. annulatus frequent
CTS	2420-25	Barren	-	-	-	-	-	
SWC 73	2420.5	Fair	High	Calc. slst.	P. tuberculatus	Early Oligocene/ Late Eocene,	0	C. annulatus, P. chenopodiaceoides, N. falcatus, reworked T. verrucosus
SWC 121	2423.0	V. low	Low	Slst, glau, pyr.	Lower N. asperus	Middle Eocene	1	A. diktyoplokus, W. echinosuturatum
SWC 71	2425.5	V. low	V. low	Sh.	L. balmei	Paleocene,?	-	L. balmei frequent, P. langstonii
CTS	2425-30	Good	High	-	Indeterminate	-	-	Mixed P. tuberculatus, N. asperus, L. balmei & T. longus Zone Palynofloras
SWC 70	2427.0	Insufficient material for palynological processing				-	-	- -
SWC 69	2428.0	Good	Moderate	Slst.	Upper L. balmei	Paleocene ?Marine	2	L. balmei common, V. kopukuensis
SWC 68	2429.5	Good	Moderate	Slst.	L. balmei	Paleocene, ?Marine		L. balmei common, T. verrucosus, caved Eocene dinoflagellates
CTS	2430-35	Good	Moderate	-	L. balmei	Paleocene ?Marine	3	L. balmei, J. pieratus, H. harrisii & reworked Late Cretaceous spp.

TABLE I : SUMMARY OF PALYNOLOGICAL ANALYSIS TERAGLIN-1, GIPPSLAND BASIN.

INTERPRETATIVE DATA

SAMPLE NO.	DEPTH (m)	YIELD	DIVERSITY SPORE POLLEN	LITHOLOGY	ZONE	AGE & ENVIRONMENT	CONFIDENCE RATING	COMMENTS
SWC 66	2433.0	Fair	Low	Sh.	Upper L. balmei	Paleocene Marginal	2	L. balmei, V. kopukuensis, H. harrisii
CTS	2435-40	Fair	Moderate	-	Lower L. balmei	Paleocene Marginal	3	L. balmei, T. verrucosus & reworked T. longus Zone spp.
SWC 65	2435.5	Good	Moderate	Sh.	L. balmei	Paleocene Marginal	-	
SWC 64	2438.5	Good	Moderate	Sh.	L. balmei	Paleocene Marginal		P. langstonii, abund. L. balmei
SWC 63	2440.0	Good	Moderate	Ss.	Lower L. balmei	Paleocene Marginal	2	J. pieratus, H. harrisii
CTS	2440-45	Good	High	-	Lower L. balmei	Paleocene Marine	3	Includes caved N. asperus Zone spp.
SWC 62	2443.0	Good	Low	Sh.	Lower L. balmei	Paleocene	2	T. verrucosus, abundant L. balmei.
SWC 61	2444.0	Good	Low	Slst.	L. balmei	Paleocene Marginal	-	L. balmei frequent
CTS	2445-50	V. low	V. low	-	L. balmei	Paleocene Marginal	-	reworked Mesozoic spp.
SWC 59	2447.0	Good	Moderate	Sh.	Lower L. balmei	Paleocene Marginal	2	T. verrucosus, caved N. falcatus.
SWC 57	2450.0	V.good	Moderate	Sh.	Lower L. balmei	Paleocene Marine	2	L. balmei common, J. pieratus, T. verrucosus, T. multistrixus, H. harrisii
SWC 56	2451.8	Good	Moderate	Sh.,carb.	Lower L. balmei	Paleocene Marginal	1	T. verrucosus, H. harrisii, abundant Australopollis obscurus
SWC 55	2453.0	Low	Low	Ss.	L. balmei	Paleocene Marginal	-	L. balmei, caved Eocene spp.
CTS	2455-60	Fair	Low	-	L. balmei	Paleocene Marginal	-	L. balmei
SWC 54	2456.0	Barren	-	Ss.	-	-	-	
CORE	2469.4	Barren	-	Sh.	-	-	-	
SWC 52	2479.5	V.low	V.low	Ss.	L. balmei	Paleocene, Marine	-	L. balmei

TABLE I : SUMMARY OF PALYNOLOGICAL ANALYSIS TERAGLIN-I, GIPPSLAND BASIN.

INTERPRETATIVE DATA

SAMPLE NO.	DEPTH (m)	YIELD	DIVERSITY SPORE POLLEN	LITHOLOGY	ZONE	AGE & ENVIRONMENT	CONFIDENCE RATING	COMMENTS
SWC 50	2493.0	V.low	V.low	Slst.	L. balmei	Paleocene, Fluvial	-	L. balmei
SWC 49	2494.5	V.low	V.low	Slst.	L. balmei	Paleocene, Fluvial	-	L. balmei
SWC 48	2499.4	V.low	V.low	Sh.	L. balmei	Paleocene, Fluvial	-	L. balmei
SWC 47	2552.0	Low	Moderate	Ss.	Lower L. balmei	Paleocene, Marginal	2	Abundant L. balmei & Proteacidites; V. kopukuensis, G. retiintexta
SWC 46	2553.5	Good	High	Ss.	Lower L. balmei	Paleocene, Marine	1	Abundant L. balmei & G. retiintexta; S. australina
SWC 44	2622.0	Fair	Moderate	Sh.	Lower L. balmei	Paleocene, Marginal	2	H. harrisii, P. verrucosus G. retiintexta
SWC 43	2645.9	Fair	Low	Sh.	Lower L. balmei	Paleocene,	2	I. integricorpus, V. kopukuensis
SWC 42	2672.0	Good	Low	Slst.	Lower L. balmei	Paleocene, Marine	1	L. balmei, T. verrucosus, Deflandrea spp., P. angulatus
SWC 39	2741.5	Low	Moderate	Sh.	Lower L. balmei	Paleocene, Fluvial	1	L. balmei, T. verrucosus, P. angulatus
SWC 38	2759.3	Good	Moderate	Sh.	Lower L. balmei	Paleocene, Marine	1	L. balmei frequent, H. harrisii P. angulatus, A. homomorpha
SWC 37	2774.9	V.low	V.low	Slst.	Lower L. balmei	Paleocene Marginal	1	P. pyrophorum
SWC 36	2788.5	Good	Good	Sh.	Lower L. balmei	Paleocene, Marine	0	L. balmei frequent, I. antipodus P. pyrophorum, A. homomorphum
SWC 35	2793.6	Good	High	Slst.,carb.	L. balmei	Paleocene, Marginal	-	and B. otwayensis common
SWC 32	2826.5	Low	Moderate	Slst.	Lower L. balmei	Paleocene, Marginal	1	L. balmei & P. angulatus frequent; A. homomorphum rare.
SWC 31	2875.9	Good	High	Slst.	Lower L. balmei	Paleocene, Marginal	2	L. balmei & T. verrucosus frequent P. amolosexinus, P. otwayensis
SWC 120	2903.0	Low	Moderate	Slst.	Lower L. balmei	Paleocene, Fluvial	2	L. balmei, T. verrucosus
SWC 119	2920.0	Fair	Moderate	Slst.	Lower L. balmei	Paleocene, Marginal	1	L. balmei, T. verrucosus; Late Cretacesus spores, Deflandrea speciosa

TABLE I : SUMMARY OF PALYNOLOGICAL ANALYSIS TERAGLIN-I, GIPPSLAND BASIN.

INTERPRETATIVE DATA

SAMPLE NO.	DEPTH (m)	YIELD	DIVERSITY SPORE POLLEN	LITHOLOGY	ZONE	AGE & ENVIRONMENT	CONFIDENCE RATING	COMMENTS
SWC 118	2937.0	Good	Low	Slst.	Lower L. balmei	Paleocene, Marine	0	L. balmei, T. verrucosus, frequent T. evittii
SWC 117	2947.0	Low	Low	Slst.	Upper T. longus	Maastrichtian, Marginal marine	0	I. druggii, Q. brossus
SWC 116	2957.0	Negligible spore-pollen		Slst.	Indeterminate	-	-	
SWC 114	3000.5	Low	Moderate	Slst.	Upper T. longus	Maastrictian, Fluvial	1	G. rudata abundant, P. otwayensis T. longus
SWC 112	3051.0	Fair	High	Slst.	Upper T. longus	Maastrictian, Fluvial	1	as for SWC 114 plus P. gemmatus, Q. brossus, T. lilliei, C. horrendus S. punctatus. Occasional
SWC 111	3073.5	V.low	Moderate	Slst.	Upper T. longus	Maastrichtian, Fluvial	1	P. gemmatus, P. wahooensis, S. punctatus
SWC 110	3103.0	Good	Moderate	Ss.	Upper T. longus	Maastrichtian, Fluvial	1	G. rudata frequent, T. lilliei, T. waiparaensis
SWC 108	3120.0	V.low	Low	Sh., carb.	Upper T. longus	Maastrichtian, Fluvial	1	S. punctatus, T. verrucosus, T. lilliei
SWC 107	3135.5	V.low	Low	Coal	Upper T. longus	Maastrichtian, Swamp	2	T. truswellii, T. waiparaensis
SWC 14	3169.0	Low	Moderate	Slst.	Upper T. longus	Maastrichtian, Fluvial	1	T. verrucosus, T. waiparaensis, T. lilliei
SWC 12	3201.9	Good	Low	Sh.	Upper T. longus	Maastrichtian, Fluvial	1	G. rudata abundant, P. gemmatus, P. otwayensis, T. verrucosus
SWC 9	3235.0	Good	High	Sh.	Upper T. longus	Maastrichtian, Fluvial	1	as for SWC 12 plus S. punctatus, P. wahooensis, P. reticuloconcavus, P. palisadus, T. securus, T. waiparaensis
SWC 7	3277.0	Barren	-	Ss., carb.	-	-	-	
SWC 5	3282.0	Low	Low	Ss.	Lower T. longus	Maastrichtian, Fluvial	2	T. verrucosus, P. wahooensis, T. waiparaensis
SWC 103	3295.0	Low	Low	Sh., carb.	Lower T. longus	Maastrichtian, Fluvial	2	G. rudata common, P. wahooensis, T. lilliei
SWC 2	3349.4	Fair	High	Slst.	Lower T. longus	Maastrichtian, Fluvial	2	G. rudata common, T. verrucosus, P. wahooensis, T. securus, P. otwayensis
SWC 1	3372.5	Low	Low	Ss.	Lower T. longus	Late Cretaceous, Fluvial	2	G. rudata common

TABLE 2

ANOMALOUS AND UNUSUAL OCCURRENCES OF SPORE-POLLEN TAXA IN TERAGLIN-1, GIPPSLAND BASIN.

SAMPLE NO.	DEPTH(m)	ZONE	CONF. RATING	TAXON	COMMENTS
SWC 82	2400.5	P. tuberculatus	(0)	Polyadopollenites myriosporites	Early Miocene (H-1) sample.
SWC 82	2400.5	P. tuberculatus	(0)	Proteacidites leightonii	Reworked Not recorded above Middle N. asperus Zone.
CTS	2415-20	L. balmei		Elphedripites notensis	From Palaeocene coal.
SWC 73	2420.5	P. tuberculatus	(0)	Myrtaceidites eucalyptoides	Early Oligocene. J-2/K forams at 2419.0m.
SWC 73	2420.5	P. tuberculatus	(0)	Polyporina chenopodiaceoides	Modern Taxon.
SWC 71	2425.5	L. balmei		Camarozonosporites dumus	Ms sp. (A.D.P.) reworked Late Cretaceous?
SWC 68	2429.5	L. balmei		Contiguisporites fornicatus	Reworked Late Cretaceous sp.
SWC 65	2435.5	L. balmei		Tricolporites reticulatus	Ms sp. Stover & Evans 1969.
SWC 57	2450.0	Lower L. balmei	(2)	Elphedripites notensis	Reworked?
SWC 47	2552.0	L. balmei (Lower)		Verrucosisporites cf kopukuensis	Possible precursor of V. kopukuensis, lacks strong development of verrucae.
SWC 43	2645.9	Lower L. balmei	(2)	Integricorpus antipodus	Rare species.
SWC 43	2645.9	Lower L. balmei	(2)	Verrucosisporites cf kopukuensis	As for SWC 47. In marine shale.
SWC 36	2788.5	Lower L. balmei	(0)	Integricorpus antipodus	Rare species.
SWC 36	2788.5	Lower L. balmei	(0)	Camarozonosporites dumus	Reworked Late Cretaceous species?
SWC 36	2788.5	Lower L. balmei	(0)	Tetradopollis securus	Reworked Late Cretaceous sp?
SWC 31	2875.9	Lower L. balmei	(2)	Proteacidites otwayensis	Reworked Late Cretaceous sp?
SWC 31	2875.9	Lower L. balmei	(2)	Tricolpites vergilius	Ms sp. (A.D.P.), may represent a genuine extension of range into Paleocene.
SWC 120	2903.0	Lower L. balmei	(2)	Tricolpites vergilius	As for SWC 31.
SWC 119	2920.0	Lower L. balmei	(1)	Camarozonosporites eyrensis	Ms sp. (A.D.P.) Reworked Late Cretaceous?
SWC 112	3051.0	Upper T. longus	(0)	Camarozonosporites horrendus	Rare sp.
SWC 111	3073.5	Upper T. longus	(0)	Camarozonosporites cf passarius	Ms. sp. (A.D.P.)
SWC 117	2947.0	Upper T. longus	(0)	Polycolpites langstonii	In I. druggii Zone assemblage with Q. brossus, P. otwayensis, I. coronatum

PALYNOLOGY DATA SHEET

BASIN: GIPPSLAND ELEVATION: KB: +21m GL: -79.3m

WELL NAME: TERAGLIN-1 TOTAL DEPTH: 3373m

AGE	PALYNOLOGICAL ZONES	HIGHEST DATA Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	LOWEST DATA Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
NEOGENE	*T. pleistocenicus*										
	M. lipsis										
	C. bifurcatus										
	T. bellus										
PALEOGENE	*P. tuberculatus*	2400.5	0				2420.5	0			
	Upper *N. asperus*										
	Mid *N. asperus*										
	Lower *N. asperus*	2423.0	1				2423.0	1			
	P. asperopolus										
	Upper *M. diversus*										
	Mid *M. diversus*										
	Lower *M. diversus*										
	Upper *L. balmei*	2428.0	2				2433.0	2			
	Lower *L. balmei*	2440.0	2	2451.8	1		2937.0	0			
LATE CRETACEOUS	Upper *T. longus*	2947.0	0				3235.0	1			
	Lower *T. longus*	3282.0	2				3372.5	2			
	T. lilliei										
	N. senectus										
	T. apoxyexinus										
	P. mawsonii										
	A. distocarinatus										
EARLY CRET.	*P. pannosus*										
	C. paradoxa										
	C. striatus										
	C. hughesi										
	F. wonthaggiensis										
	C. australiensis										

COMMENTS: Wilsonidium (Wetzeliella) echinosuturatum Zone 2423.0m(1)

Trithyrodinium evittii Zone 2937.0m(1)

Manumiella (Isabellidinium) druggii Zone 2947.0m(1)

CONFIDENCE RATING:
- O: SWC or Core, Excellent Confidence, assemblage with zone species of spores, pollen and microplankton.
- 1: SWC or Core, Good Confidence, assemblage with zone species of spores and pollen or microplankton.
- 2: SWC or Core, Poor Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.
- 3: Cuttings, Fair Confidence, assemblage with zone species of either spores and pollen or microplankton, or both.
- 4: Cuttings, No Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.

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.K. Macphail DATE: August 11, 1983

DATA REVISED BY: A.D. Partridge DATE: December 31, 1986

BASIC DATA

TABLE 3: BASIC DATA
RANGE CHARTS.

TABLE 3 : SUMMARY OF PALYNOLOGICAL ANALYSIS TERAGLIN-1, GIPPSLAND BASIN.

BASIC DATA

SAMPLE NO	DEPTH (M)	YIELD	DIVERSITY SPORE POLLEN	LITHOLOGY	COMMENTS
CTS	2355-60	Low	V. low	-	-
SWC 82	2400.5	Good	Moderate	Calc. Sh.	C. annulatus, P. myriosporites.
CTS	2400-05	Fair	Low	-	C. annulatus.
CTS	2405-10	Low	Low	-	Dacrycarpites australiensis
SWC 78	2411.9	Good	Low	Calc. Sh.	C. annulatus
CTS	2410-15	Barren	-	-	-
CTS	2415-20		Moderate	Coal in cuttings	N. endurus, P. verrucosus
SWC 77	2415.0	Good	Low	Calc. slst.	C. annulatus, M. ornamentali
SWC 75	2418.0	Low	Low	Calc. slst.	C. annulatus.
SWC 74	2419.0	V. good	Low	Calc. slst.	C. annulatus frequent
CTS	2420-25	Barren	-	-	-
SWC 73	2420.5	Fair	High	Calc. slst.	C. annulatus, P. chenopodiaceoides, N. falcatus, reworked T. verrucosus
SWC 121	2423.0	V. low	Low	Slst, glau,	A. diktyoplokus, W. echinosuturatum
SWC 71	2425.5	V. low	V. low	Sh.	L. balmei frequent, P. langstonii
CTS	2425-30	Good	High	-	Mixed P. tuberculatus, N. asperus, L. balmei & T. longus Zone Palynofloras
SWC 70	2427.0	Insufficient material for palynological processing			
SWC 69	2428.0	Good	Moderate	Slst.	L. balmei common, V. kopukuensis
SWC 68	2429.5	Good	Moderate	Slst.	L. balmei common, T. verrucosus, reworked Eocene dinoflagellates
CTS	2430-35	Good	Moderate	-	L. balmei, J. pieratus, H. harrisii & reworked Late Cretaceous spp.
SWC 66	2433.0	Fair	Low	Sh.	L. balmei, V. kopukuensis, H. harrisii
CTS	2435-40	Fair	Moderate	-	L. balmei, T. verrucosus & reworked T. longus Zone spp.
SWC 65	2435.5	Good	Moderate	Sh.	
SWC 64	2438.5	Good	Moderate	Sh.	P. langstonii, abund. L. balmei
SWC 63	2440.0	Good	Moderate	Ss.	J. pieratus, H. harrisii
CTS	2440-45	Good	High	-	Includes caved N. asperus Zone spp.
SWC 62	2443.0	Good	Low	Sh.	T. verrucosus, abundant L. balmei.
SWC 61	2444.0	Good	Low	Slst.	L. balmei frequent
CTS	2445-50	V. low	V. low	-	reworked Mesozoic spp.
SWC 59	2447.0	Good	Moderate	Sh.	T. verrucosus, caved N. falcatus.
SWC 57	2450.0	V.good	Moderate	Sh.	L. balmei common, J. pieratus, T. verrucosus, T. multistrixus, H. harrisii
SWC 56	2451.8	Good	Moderate	Sh.,carb.	T. verrucosus, H. harrisii, abundant Australopollis obscurus

TABLE 3 : SUMMARY OF PALYNOLOGICAL ANALYSIS TERAGLIN-1, GIPPSLAND BASIN.

BASIC DATA

SAMPLE NO	DEPTH (M)	YIELD	DIVERSITY SPORE POLLEN	LITHOLOGY	COMMENTS
SWC 55	2453.0	Low	Low	Ss.	L. balmei, caved Eocene spp.
CTS	2455-60	Fair	Low	-	L. balmei
SWC 54	2456.0	Barren	-	Ss.	
CORE	2469.4	Barren	-	Sh.	
SWC 52	2479.5	V.low	V.low	Ss.	L. balmei
SWC 50	2493.0	V.low	V.low	Slst.	L. balmei
SWC 49	2494.5	V.low	V.low	Slst.	L. balmei
SWC 48	2499.4	V.low	V.low	Sh.	L. balmei
SWC 47	2552.0	Low	Moderate	Ss.	Abundant L. balmei & Proteacidites; V. kopukuensis, G. retiintexta
SWC 46	2553.5	Good	High	Ss.	Abundant L. balmei & G. retiintexta; S. australina
SWC 44	2622.0	Fair	Moderate	Sh.	H. harrisii, P. verrucosus, G. retiintexta
SWC 43	2645.9	Fair	Low	Sh.	I. integricorpus, V. kopukuensis
SWC 42	2672.0	Good	Low	Slst.	L. balmei, T. verrucosus, Deflandrea spp., P. angulatus
SWC 39	2741.5	Low	Moderate	Sh.	L. balmei, T. verrucosus, P. angulatus
SWC 38	2759.3	Good	Moderate	Sh.	L. balmei frequent, H. harrisii P. angulatus, A. homomorphum
SWC 37	2774.9	V.low	V.low	Slst.	P. pyrophorum
SWC 36	2788.5	Good	Good	Sh.	L. balmei frequent, I. antipodus P. pyrophorum, A. homomorphum
SWC 35	2793.6	Good	High	Slst.,carb.	Acritachs and B. otwayensis common
SWC 32	2826.5	Low	Moderate	Slst.	L. balmei & P. angulatus frequent; A. homomorphum rare.
SWC 31	2875.9	Good	High	Slst.	L. balmei & T. verrucosus frequent P. amolosexinus, P. otwayensis
SWC 120	2903.0	Low	Moderate	Slst.	L. balmei, T. verrucosus
SWC 119	2920.0	Fair	Moderate	Slst.	L. balmei, T. verrucosus; Late Cretacesus spores, Deflandrea speciosa
SWC 118	2937.0	Good	Low	Slst.	L. balmei, T. verrucosus, frequent Deflandrea spp.
SWC 117	2947.0	Low	Low	Slst.	P. langstoni, Deflandrea sp.
SWC 116	2957.0	Negligible spore-pollen			
SWC 114	3000.5	Low	Moderate	Slst.	G. rudata abundant, P. otwayensis T. longus
SWC 112	3051.0	Fair	High	Slst.	As for SWC 114 plus P. gemmatus, Q. brossus, T. lilliei, C. horrendus S. punctatus. Occasional dinoflagellates
SWC 111	3073.5	V.low	Moderate	Slst.	P. gemmatus, P. wahooensis, S. punctatus
SWC 110	3103.0	Good	Moderate	Ss.	G. rudata frequent, T. lilliei, T. waiparaensis
SWC 108	3120.0	V.low	Low	Sh., carb.	S. punctatus, T. verrucosus, T. lilliei

TABLE 3 : SUMMARY OF PALYNOLOGICAL ANALYSIS TERAGLIN-1, GIPPSLAND BASIN.

BASIC DATA

SAMPLE NO	DEPTH (M)	YIELD	DIVERSITY SPORE POLLEN	LITHOLOGY	COMMENTS
SWC 107	3135.5	V.low	Low	Coal	T. truswellii, T. waiparaensis
SWC 14	3169.0	Low	Moderate	Slst.	T. verrucosus, T. waiparaensis, T. lilliei
SWC 12	3201.9	Good	Low	Sh.	G. rudata abundant, P. gemmatus, P. otwayensis, T. verrucosus
SWC 9	3235.0	Good	High	Sh.	as for SWC 12 plus S. punctatus, P. wahooensis, P. reticuloconcavus, P. palisadus, T. securus, T. waiparaensis
SWC 7	3277.0	Barren	-	Ss., carb.	
SWC 5	3282.0	Low	Low	Ss.	T. verrucosus, P. wahooensis, T. waiparaensis
SWC 103	3295.0	Low	Low	Sh., carb.	G. rudata common, P. wahooensis, T. lilliei
SWC 2	3349.4	Fair	High	Slst.	G. rudata common, T. verrucosus, P. wahooensis, T. securus, P. otwayensis
SWC 1	3372.5	Low	Low	Ss.	G. rudata common

0546L

PE906422

This is an enclosure indicator page.
The enclosure PE906422 is enclosed within the container PE902555 at this location in this document.

The enclosure PE906422 has the following characteristics:

ITEM_BARCODE =	PE906422
CONTAINER_BARCODE =	PE902555
NAME =	Palynological Range Chart
BASIN =	GIPPSLAND
PERMIT =	VIC/L5
TYPE =	WELL
SUBTYPE =	DIAGRAM
DESCRIPTION =	Palynological Range Chart (enclosure from WCR vol.2) for Teraglin-1
REMARKS =	
DATE_CREATED =	
DATE_RECEIVED =	26/05/87
W_NO =	W814
WELL_NAME =	TERAGLIN-1
CONTRACTOR =	
CLIENT_OP_CO =	ESSO AUSTRALIA LIMITED

(Inserted by DNRE - Vic Govt Mines Dept)

APPENDIX 3

APPENDIX-3

QUANTITATIVE LOG ANALYSIS

TERAGLIN-1

QUANTITATIVE LOG INTERPRETATION

Interval: 1250-3010m KB

Analyst : T.M. Frankham

Date : August, 1983

TERAGLIN #1 QUANTITATIVE LOG INTERPRETATION

Teraglin #1 wireline logs have been analysed for effective porosity and water saturation over the interval 1250-3010m KB. Analysis was carried out using a reiterative technique which incorporates hydrocarbon correction to the porosity logs, density-neutron crossplot porosities, a Dual Water saturation relationship, and convergence on a preselected grain density window by shale volume adjustment.

Logs Used

LLD, LLS, MSFL, GR, Caliper, RHOB (LDT), PHIN (CNL).

Resistivity, gamma ray and neutron porosity logs were corrected for borehole and environmental effects.

The corrected resisitivity logs were then used to derive Rt and invasion diameter.

Coals and carbonaceous shales were edited for an output of:

VSH = 0, PHIE = 0, and Swe = 1.

Log Quality

The field recorded LDT/CNL log exhibited excessive apparent gas crossover in the clean water sands. Schlumberger have since claimed that the neutron calibrating tank had been damaged and they have subsequently provided a recalibrated neutron log, along with an LDT with RHOB calculated according to their new "3 window algorithm", rather than their original "2 window algorithm" (used for the field log). The excessive apparent gas crossover has been practically eliminated on the recomputed LDT/CNL, and hence values from this recomputed log have been used for the interpretation.

Inconsistencies occur in the calipers recorded on various logging runs. Both the dipmeter, which records calipers in 2 axes, and the MSFL caliper indicate that mudcake is no more than 1/2 an inch thick, and generally much less. However the LDT-CNL caliper, run between the MSFL and HDT runs, indicates generally 1/2 to 1 inch of mudcake. In view of these inconsistencies a constant mudcake thickness of 1/8 inch was assumed for all environmental corrections.

Analysis Parameters

Table #1 summarises analysis parameters used in this interpretation.

Apparent shale density and shale neutron porosity values were derived by crossplotting RHOB vs. PHIN. Apparent shale resistivities were determined by crossplotting Rt vs. gamma ray.

A crossplot of density and neutron log values is shown in Figure #1.

Salinity

Apparent free water salinities and resistivities derived from clean water bearing sands via the following relationships:

$$Rw = \frac{Rt * PHIT^{m}}{a}$$

where PHIT = total porosity determined from density-neutron crossplot algorithms outlined below

and Salinity (ppm NaCleq.) = $\left[\frac{300,000}{Rw(Ti+7)-1}\right]^{1.05}$

where Ti = formation temperature in ^{o}F.

Mudlog and RFT data indicate that the section penetrated by Teraglin #1 is water bearing, except perhaps for some sands between 3250 and 3300m where the mud log shows increased levels of mud gas. On the basis of this, the salinity profile shown in Figure #2 was derived via the method outlined above, and used for water saturation calculations. use of this salinity profile means minor hydrocarbon saturations are calculated in some sands between 3250 and 3300m. To calculate 100% Sw in these latter sands, it would be necessary to invoke free water salinities in the order of 2000 ppm NaCleq.

Shale Volume

An initial estimate of VSH was calculated from the GR assuming a linear response between shale and clean sand:

$$VSH = \frac{GRlog - GRmin}{GRmax - GRmin}$$

Total Porosities

Total porosity was initially calculated from a density-neutron logs using the following algorithms:

$$h = 2.71 - RHOB + PHIN\ (RHOF - 2.71) \qquad -1$$

if h is greater than 0, then

$$\text{apparent matrix density, } RHOMa = 2.71 - h/2 \qquad -2$$

if h is less than 0, then

$$\text{apparent matrix density, } RHOMa = 2.71 - 0.64h \qquad -3$$

$$\text{Total porosity: } PHIT = \frac{RHOMa - RHOB}{RHOMa - RHOF}$$

where RHOB = environ. corrected bulk density in gms/cc
PHIN = environ. corrected neutron porosity in limestone porosity units.
RHOF = fluid density (1.0 gm/cc)

Bound Water Resistivities (Rwb) and Saturation of Bound Water (Swb)

Rwb and Swb were calculated using the following relationships:

$$Rwb = \frac{RSH * PHISH^{m}}{a}$$

where PHISH = total porosity in shale from density-neutron crossplot algorithms.
RSH = Rt in shales.

$$Swb = \frac{VSH * PHISH^{m}}{PHIT}$$

Water Saturations

Water saturations were determined from the Dual Water model using the following relationships:

$$\frac{1}{Rt} = SwT^{n} * \left[\frac{PHIT^{m}}{aRw}\right] + SwT^{(n-1)} \left[\frac{Swb * PHIT^{m}}{a}\left(\frac{1}{Rwb} - \frac{1}{Rw}\right)\right]$$

and

$$\frac{1}{Rxo} = SwT^{n} * \left[\frac{PHIT^{m}}{aRmf}\right] + SwT^{(n-1)} \left[\frac{Swb * PHIT^{m}}{a}\left(\frac{1}{Rwb} - \frac{1}{Rmf}\right)\right]$$

where SwT = total saturation in the virgin formation
SxoT = total saturation in the invaded zone
Rmf = resistivity of mud filtrate
n = saturation exponent

Grain Density

Grain density was calculated by first correcting density and neutron logs for shale using the following relationships:

$$RHOBC = \frac{RHOB - VSH * RHOBSH}{1 - VSH}$$

$$PHINC = \frac{PHIN - VSH * PHINSH}{1 - VSH}$$

The shale corrected density and neutron values were then used in the density-neutron crossplot algorithms (1, 2 and 3, above) to derive apparent grain density.

(ie. RHOGa = RHOMa calculated from RHOBC and PHINC).

The calculated grain density was then compared to the upper and low limits of the grain densities and if it fell within the limits, effective porosity (PHIE) and effective saturation (Swe) were calculated as follows:

$$PHIE = PHIT - VSH * PHITSH$$

$$Swe = 1 - \frac{PHIT}{PHIE}(1-SwT)$$

If the calculated grain density fell outside the limits, VSH was adjusted in small increments or decrements and PHIT, SwT, SxoT and RHOG were then recalculated.

In all zones with VSH greater than 60%, Swe was set to 1 and PHIE set to 0.

Results

- The results of the log interpretation are summarised in Table #2.
- A porosity vs. depth plot is given in Figure #3.
- Enclosed is a level by level result listing and a 1:300 scale Porosity/Sw/GR plot.

Comments

The salinity plot shows that top of Latrobe sands have water salinities in the order of 30000 ppm NaCleq. down to 2620m. Below this, the formation water salinity drops to 10000 ppm by 2725m. Between 2725m and T.D. formation water salinity appears to vary between 18000 and 5000 ppm NaCleq. For the purposes of this analysis water salinity in sands between 3250 and 3280m, where the mud log recorded an increase in mud gas, was taken as being 5000 ppm, ie. equivalent to that in the overlying and underlying sands. This yields minor hydrocarbon saturations (Sw of 80%). RFT data in this interval is not definitive. Samples recovered at 3273m had tritrated chlorides between 17000 and 21000 ppm which is close to equivalent filtrate salinites. Pressure data plots slightly above the water gradient shown by data from higher sands, and could be interpreted to represent either a displaced water gradient or a very small gas column.

If the sands between 3250 and 3280m do not contain hydrocarbons, then an apparent salinity of approximately 2000 ppm Nacleq. is indicated. if they do contain gas, then water saturations would be high and they would probably be effectively water productive.

Encl:

11451/61

TABLE #1 ANALYSIS PARAMETERS

a		0.62
m		2.15
n		2
GR minimum		20 API units
GR maximum		130 API units
Apparent Shale Density		2.62 gm/cc
Apparent Shale Neutron Porosity		0.30 limestone p.u.
Apparent Shale Resistivity	(2400-2650m)	10 ohm.m.
	(2650-2850m)	20 ohm.m.
	(2850-2925m)	15 ohm.m.
	(2925-3050m)	10 ohm.m.
	(3050-3100m)	15 ohm.m.
	(3100-3350m)	35 ohm.m.

Free water salinities used are shown on Figure #2.

TABLE #2 INTERPRETATION SUMMARY

Depth Range (m)	Gross Thickness (m)	Net Thickness (m)	Average* Porosity	Average Calculated* Water Saturation
2450 - 2619	169	161.00	.20	0.98
2630 - 2638	8	6.50	.18	1.01
2648 - 2667	19	18.00	.19	0.96
2680 - 2692	12	11.50	.12	0.99
2700 - 2708	8	7.00	.17	1.05
2731 - 2739	8	8.00	.17	1.03
2757 - 2767	10	10.00	.17	1.09
2779 - 2781	2	1.50	.12	0.80
2794 - 2797	3	2.50	.16	1.00
2800 - 2804	4	3.75	.17	0.90
2812 - 2818	6	5.75	.16	0.99
2822 - 2826	4	2.25	.14	1.03
2829 - 2842	13	13.00	.16	1.05
2844 - 2870	26	14.00	.14	1.00
2959 - 2960	1	1.00	.15	0.98
2973 - 3003	30	27.00	.15	1.06
3009 - 3020	11	11.00	.14	1.08
3023 - 3035	12	12.00	.17	1.04
3035 - 3047	12	6.00	.15	1.13
3061 - 3068	7	5.00	.13	1.01
3092 - 3101	9	4.75	.13	0.99
3105 - 3118	13	11.00	.13	0.97
3138 - 3156	18	4.00	.12	1.04
3163 - 3167	4	3.00	.15	0.94
3204 - 3206	2	0.50	.12	0.93
3214 - 3221	7	7.00	.15	0.98
3221 - 3230	9	3.50	.12	1.02
3269 - 3279	10	6.00	.14	0.80
3286 - 3288	2	0.50	.13	0.89
3304 - 3309	5	3.00	.12	1.10
3313 - 3318	5	4.50	.15	0.98
3324 - 3348	24	13.00	.13	1.02
Total Section				
2400 - 3350	950	416.00	.169	0.997

*Average Porosity and Average Calculated Sw are derived from net interval only. Net porosity cutoff used is 0.10.

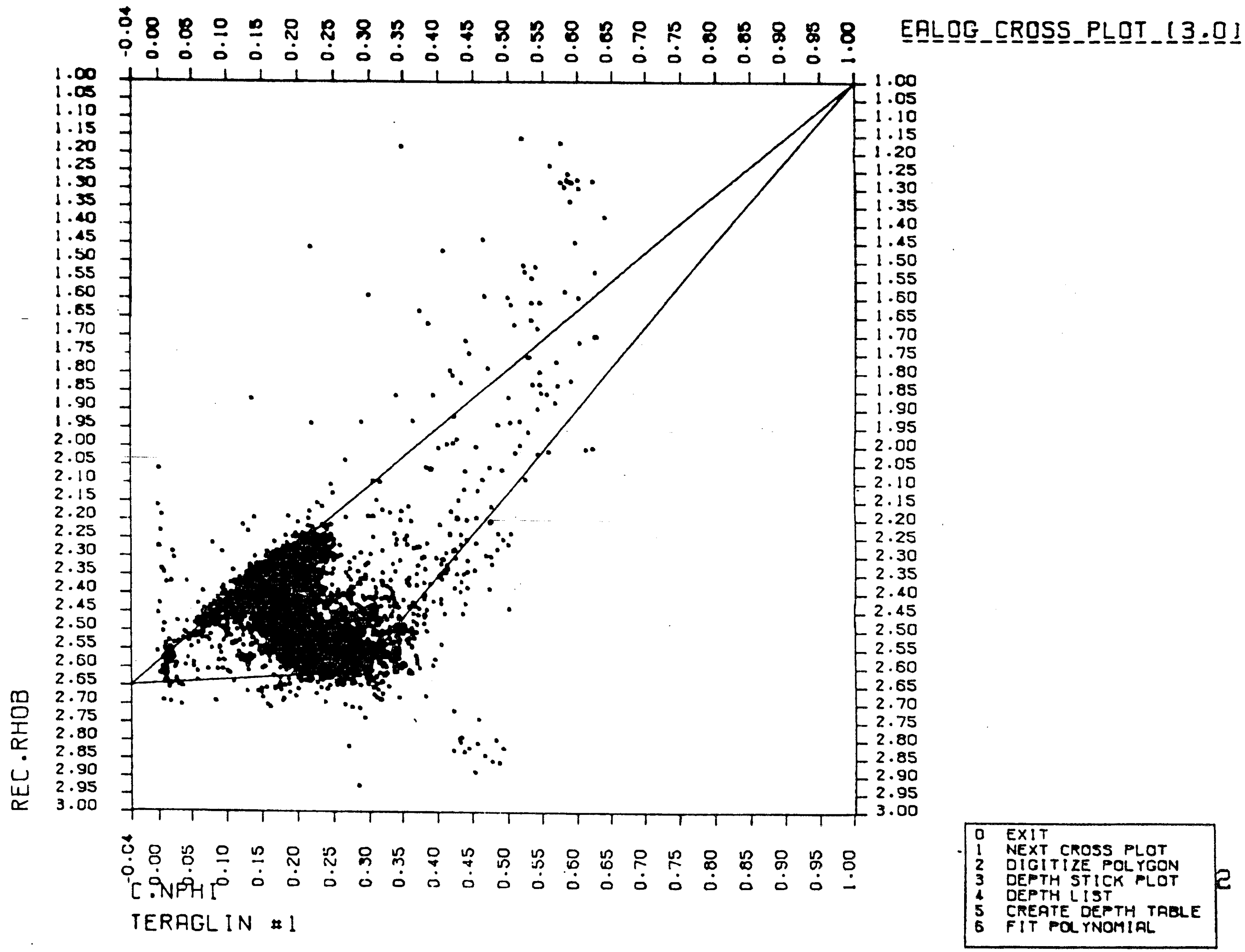
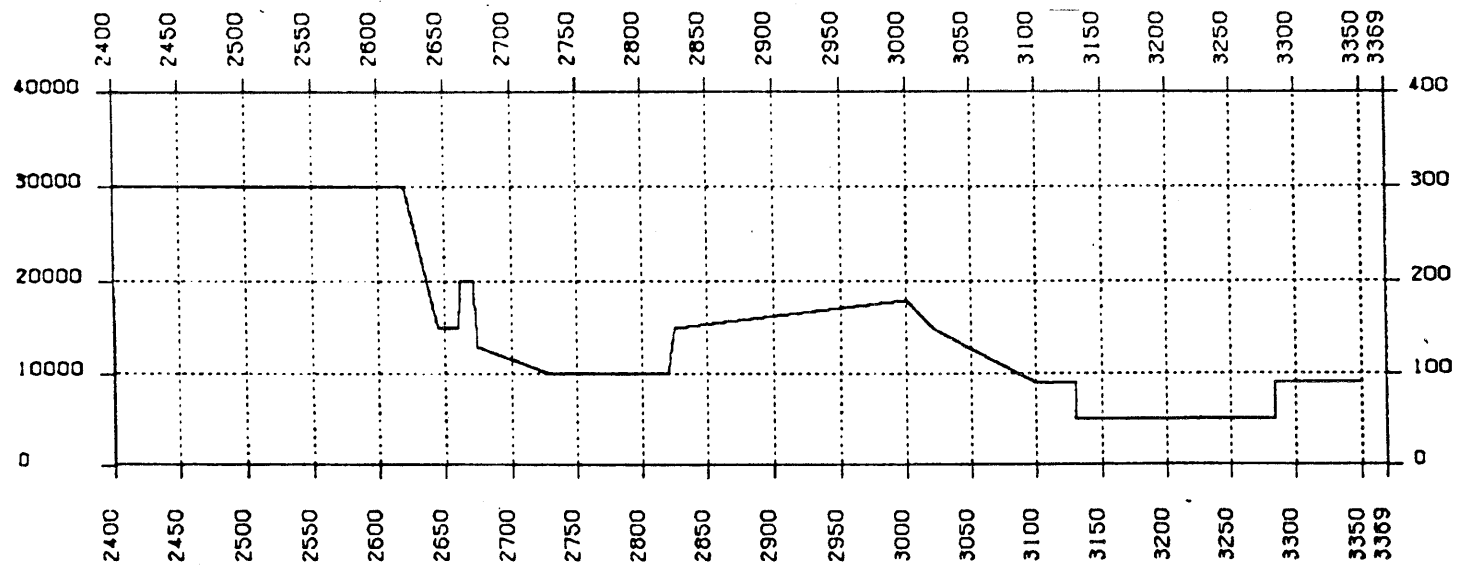

EALOG CROSS PLOT [3.0]
REC.RHOB
C.NPHI
TERAGLIN #1
0 EXIT
1 NEXT CROSS PLOT
2 DIGITIZE POLYGON
3 DEPTH STICK PLOT
4 DEPTH LIST
5 CREATE DEPTH TABLE
6 FIT POLYNOMIAL

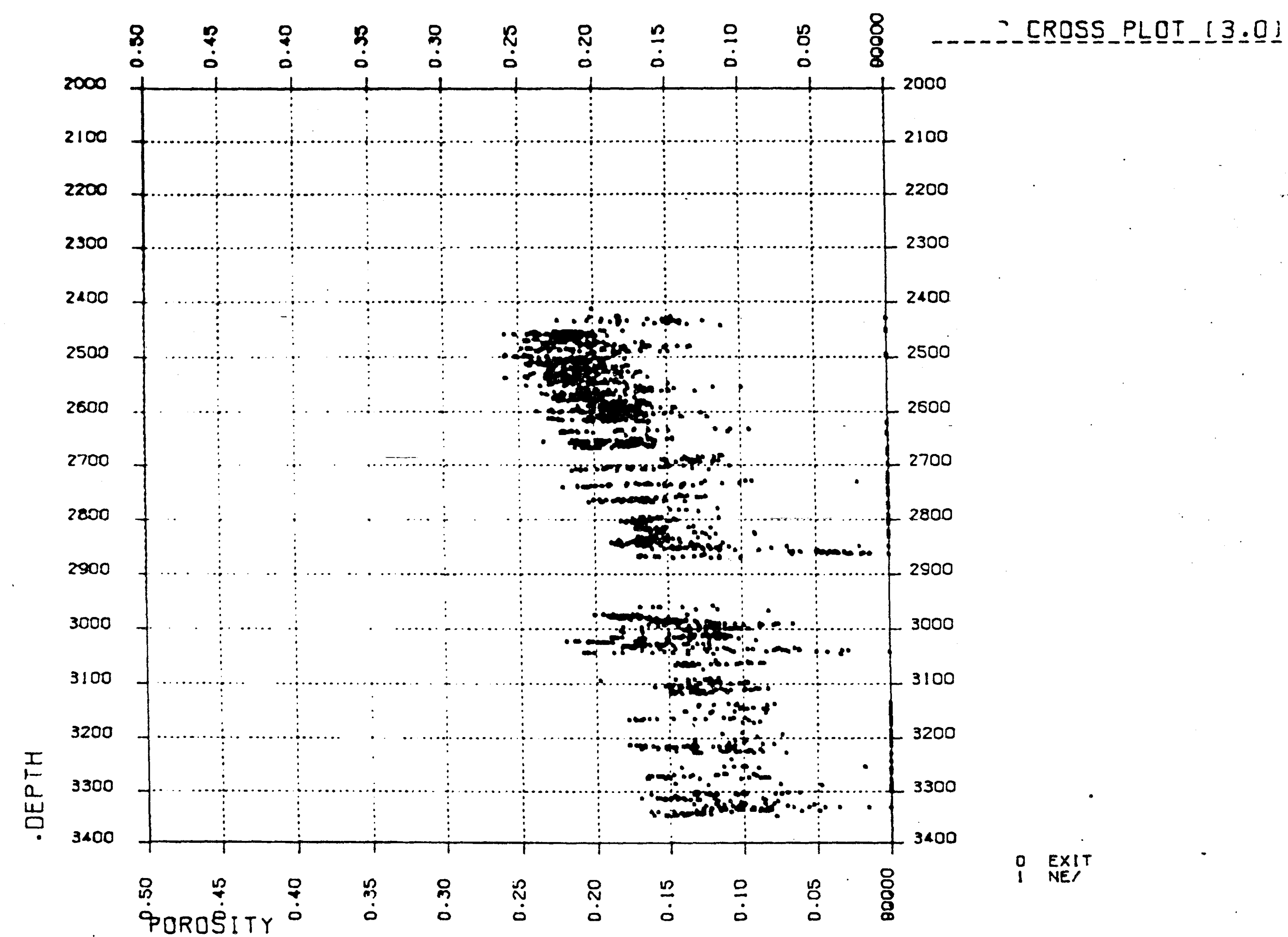
FIGURE #1

:UDD:PETRO:PLOTS
)



TERAGLIN #1. DERIVED APPARENT SALINITY (PPM.NACL.EQ)

FIGURE #2



TERAGLIN #1. POROSITY VS DEPTH PLOT

FIGURE #3

PE601274

This is an enclosure indicator page.
The enclosure PE601274 is enclosed within the container PE902555 at this location in this document.

The enclosure PE601274 has the following characteristics:

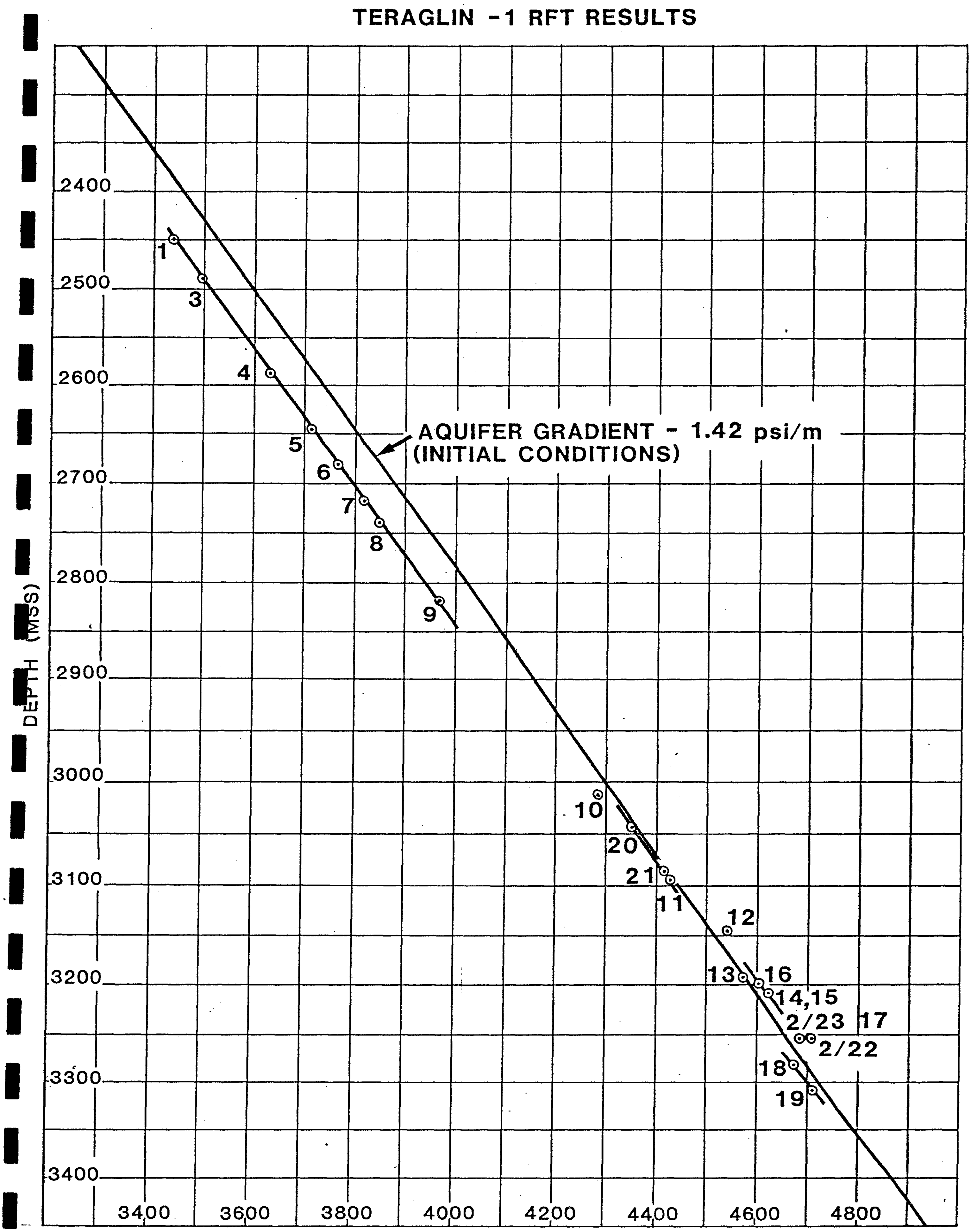
ITEM_BARCODE = PE601274
CONTAINER_BARCODE = PE902555
NAME = Quantitative Log
BASIN = GIPPSLAND
PERMIT = VIC/L5
TYPE = WELL
SUBTYPE = WELL_LOG
DESCRIPTION = Quantitative Log (enclosure from WCR vol.2) for Teraglin-1
REMARKS =
DATE_CREATED = 31/08/83
DATE_RECEIVED = 26/05/87
W_NO = W814
WELL_NAME = Teraglin-1
CONTRACTOR = ESSO
CLIENT_OP_CO = ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

APPENDIX 4

APPENDIX-4

WIRELINE TEST REPORT



TERAGLIN -1 RFT RESULTS
AQUIFER GRADIENT - 1.42 psi/m
(INITIAL CONDITIONS)
DEPTH (MSS)
PRESSURE (PSIG)
2400
2500
2600
2700
2800
2900
3000
3100
3200
3300
3400
3400
3600
3800
4000
4200
4400
4600
4800
1
3
4
5
6
7
8
9
10
20
21
11
12
13
16
14,15
2/23
17
2/22
18
19

TERAGLIN-1 RFT RESULTS

Two RFT runs were made in the Teraglin-1 well on 28/5/83. On the first run, twenty successful pretests were obtained, and on the second run 2 3/4 and 6 gallon samples were taken. Note that the RFT gauge only was used; the Hewlett-Packard gauge was not run. No hydrocarbons were encountered.

Pressure seats one to nine were located at the Top of Latrobe in the Gippsland Aquifer. As indicated in the attached Depth versus Pressure graph, there is good communication between sands at the Top of Latrobe. A drawdown from the original aquifer pressure of 105 psi was seen, which is due to Gippsland production, particularly from the nearby Halibut field. This drawdown compares well with the aquifer model prediction of 95 psi at this location.

Below seat number nine, between -2850m and -2950m, there is a major shale which appears to be acting as a seal. The pressure seats below this shale showed less drawdown, with the maximum being 30 psi at the number ten. In addition the sands are hydraulically isolated and pressure communication between sands is localized. There are a number of zones which are anomalous in both pressure and log response. 2 3/4 and 6 gallon samples were taken in the most prospective of these zones at -3252.2m. A mixture of formation water and mud filtrate was recovered. There were no indications of hydrocarbons. Based on log and RFT interpretation, it is concluded that there are no significant hydrocarbons present in Teraglin-1.

REPEAT FORMATION TESTS

RFT No. SEAT No.	DATE OF TEST	DEPTH MKB	NAME OF FORMATION	TYPE OF TEST	RESULTS OF PRETESTS
1/1	28/5/83	2468.7	Latrobe	Pretest	FP 3432 psig = 8.3 ppg HP 3934 psig = 9.4 ppg
1/2	28/5/83	2508.4	Latrobe	Pretest	FP Seal failure HP 3994 psig = 9.4 ppg
1/3	28/5/83	2508.4	Latrobe	Pretest	FP 3489 psig = 8.3 ppg HP 3999 psig = 9.4 ppg
1/4	28/5/83	2608.8	Latrobe	Pretest	FP 3629 psig = 8.3 ppg HP 4160 psig = 9.4 ppg
1/5	28/5/83	2665.3	Latrobe	Pretest	FP 3710 psig = 8.3 ppg HP 4247 psig = 9.4 ppg
1/6	28/5/83	2701.9	Latrobe	Pretest	FP 3763 psig = 8.3 ppg HP 4306 psig = 9.4 ppg
1/7	28/5/83	2737.2	Latrobe	Pretest	FP 3812 psig = 8.3 ppg HP 4361 psig = 9.4 ppg
1/8	28/5/83	2760.7	Latrobe	Pretest	FP 3847 psig = 8.3 ppg HP 4400 psig = 9.4 ppg
1/9	28/5/83	2837.3	Latrobe	Pretest	FP 3962 psig = 8.3 ppg HP 4521 psig = 9.4 ppg
1/10	28/5/83	3032.2	Latrobe	Pretest	FP 4286 psig = 8.4 ppg HP 4826 psig = 9.4 ppg
1/11	28/5/83	3114.9	Latrobe	Pretest	FP 4424 psig = 8.4 ppg HP 4956 psig = 9.4 ppg
1/12	28/5/83	3167.0	Latrobe	Pretest	FP 4540 psig = 8.5 ppg HP 5040 psig = 9.4 ppg
1/13	28/5/83	3215.4	Latrobe	Pretest	FP 4588 psig = 8.5 ppg HP 5114 psig = 9.4 ppg
1/14	28/5/83	3228.4	Latrobe	Pretest	FP 4613 psig = 8.5 ppg HP 5134 psig = 9.4 ppg Very low flowing pressure - check
1/15	28/5/83	3228.6	Latrobe	Pretest	FP Tight HP 5133 psig = 9.4 ppg
1/16	28/5/83	3227.0	Latrobe	Pretest	FP 4609 psig = 8.5 ppg HP 5132 psig = 9.4 ppg

1/17	28/5/83	3272.9	Latrobe	Pretest	FP 4689 psig = 8.5 ppg HP 5204 psig = 9.4 ppg
1/18	28/5/83	3305.5	Latrobe	Pretest	FP 4672 psig = 8.4 ppg HP 5254 psig = 9.3 ppg
1/19	28/5/83	3328.6	Latrobe	Pretest	FP 4713 psig = 8.6 ppg HP 5290 psig = 9.6 ppg
1/20	28/5/83	3063.4	Latrobe	Pretest	FP 4351 psig = 8.4 ppg HP 4878 psig = 9.4 ppg
1/21	28/5/83	3106.5	Latrobe	Pretest	FP 4413 psig = 8.4 ppg HP 4947 psig = 9.4 ppg
2/22	28/5/83	3273.0	Latrobe	Pretest	FP Tight, could not fill chamber HP 5201 psig = 9.3 ppg
2/23	28/5/83	3273.1	Latrobe	Pretest	FP 4685 psig = 8.5 ppg HP 5205 psig = 9.4 ppg Recovery: 22.7 lit chamber - 0.0031m^3 gas, 20.5 litres water; 10.4 lit chamber - 0.0708m^3 gas, 10.5 litres water.

11521/53-54

RFT PRETEST PRESSURES - TERAGLIN 1

SERVICE COMPANY: Schlumberger   SUITE NO: ONE   DATE: 28/5/83   OBSERVERS: M. Fittall, P. Priest

SEAT NO.	DEPTH (m)	DEPTH (SS) (m)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP		FM. PRESS		FHP		TEST RESULT
							psi	ppg	psi	ppg	psi	ppg	
1/1	2468.7	2447.7	PT	SCH	Y	G	3934	9.4	3432	8.3	3935	9.4	Valid
1/2	2508.4	2487.4	PT	SCH	Y	G	3994	9.4			3997	9.4	Seal failure
1/3	2508.4	2487.4	PT	SCH	Y	G	3999	9.4	3489	8.3	4000	9.4	Valid
1/4	2608.8	2587.8	PT	SCH	Y	G	4160	9.4	3629	8.3	4225	9.5	Valid FHP rising - filling hole?
1/5	2665.3	2644.3	PT	SCH	Y	G	4247	9.4	3710	8.3	4249	9.4	Valid
1/6	2701.9	2680.9	PT	SCH	Y	G	4306	9.4	3763	8.3	4306	9.4	Valid
1/7	2737.2	2716.2	PT	SCH	Y	G	4361	9.4	3812	8.3	4361	9.4	Valid
1/8	2760.7	2739.7	PT	SCH	Y	G	4400	9.4	3847	8.3	4401	9.4	Valid
1/9	2837.3	3816.3	PT	SCH	Y	G	4521	9.4	3962	8.3	4522	9.4	Valid
1/10	3032.2	3011.2	PT	SCH	Y	G	4827	9.4	4286	8.4	4826	9.4	Valid
1/11	3114.9	3093.9	PT	SCH	Y	G	4956	9.4	4424	8.4	4958	9.4	Valid
1/12	3167.0	3146.0	PT	SCH	Y	G	5040	9.4	4540	8.4	5040	9.4	Valid
1/13	3215.4	3194.4	PT	SCH	Y	G	5114	9.4	4588	8.5	5114	9.4	Valid
1/14	3228.4	3207.4	PT	SCH	Y	G	5134	9.4	4613	8.5	5135	9.4	Very low flowing pressure

1. Pressure Test = PT
   Sample & Pressure = SPT
2. Gauges = SCH = Schlumberger Strain Gauge
   = HP = Hewlett Packard
3. Yes = Y
   No = N
4. PSIA = A
   PSIG = G

RFT PRETEST PRESSURES

SERVICE COMPANY: Schlumberger SUITE NO: ONE DATE: 28/5/83 OBSERVERS: M. Fittall, P. Priest

SEAT NO.	DEPTH (m)	DEPTH (SS) (m)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP		FM. PRESS		FHP		TEST RESULT
							psi	ppg	psi	ppg	psi	ppg	
1/15	3228.5	3207.6	PT	SCH	Y	G	5134	9.4	4612	8.5	5135	9.4	Valid, tight
1/16	3227.0	3206.0	PT	SCH	Y	G	5132	9.4	4609	8.5	5132	9.4	Valid
1/17	3272.9	3251.9	PT	SCH	Y	G	5204	9.4	4689	8.5	5205	9.4	Valid
1/18	3305.5	3284.5	PT	SCH	Y	G	5254	9.3	4672	8.4	5254	9.3	Valid
1/19	3328.6	3207.6	PT	SCH	Y	G	5290	9.3	4714	8.6	5291	9.6	Valid
1/20	3063.4	3042.4	PT	SCH	Y	G	4878	9.4	4351	8.4	4878	9.4	Valid
1/21	3106.5	3085.5	PT	SCH	Y	G	4947	9.4	4413	8.4	4947	9.4	Valid
2/22	3273.0	3252.0	SPT	SCH	Y	G	5201	9.3			5203	9.4	Tight could not fill chamber - test abandoned
2/23	3273.1	3252.1	SPT	SCH	Y	G	5205	9.4	4685	8.5	5211	9.4	Valid. Segregated sample taken.

1. Pressure Test = PT
   Sample & Pressure = SPT

2. Gauges = SCH = Schlumberger Strain Gauge
   = HP = Hewlett Packard

3. Yes = Y
   No = N

4. PSIA = A
   PSIG = G

RFT SAMPLE TEST REPORT

WELL: Teraglin-1

OBSERVER: J.ROBERTS, M.FITTAL, P.PRIEST DATE: 28.5.83 RUN: 2

	CHAMBER 1 (22.7 litres)		CHAMBER 2 (10.4 litres)	
SEAT NO. 28/204	2/23		2/23	
DEPTH	3273.2		3273.2	
A. RECORDING TIMES				
Tool Set	14:09		N/A	
Pretest Open	14:10		N/A	
Time Open	1 min		N/A	
Chamber Open	14:11		14:34	
Chamber Full	14:26		14:45	
Fill Time	15 mins		11 mins	
Start Build-up	14:26		14:45	
Finish Build-up	14:33		14:58	
Build-Up Time	7 mins		13 mins	
Seal Chamber	14:33		14:58	
Tool Retract	N/A		15:00	
Total Time	0.40 hrs		0.43 hrs	
B. SAMPLE PRESSURES				
IHP	5204	psig	N/A	
ISIP	4686		N/A	
Initial Flowing Press.	157		402	
Final Flowing Press.	500		903	
Sampling Press. Range	343		501	
FSIP	4688		4686	
FHP	N/A		5211	
Form. Press. (Horner)	-		-	
C. TEMPERATURE				
Depth Tool Reached	3273.2	m	3273.2	m
Max. Rec. Temp.		°C		°C
Time Circ. Stopped	1845 hr on 26/5	hrs	1845 hr on 26/5	hrs
Time since Circ.	43.6	hrs	43.8	hrs
Form. Temp. (Horner)	-		-	
D. SAMPLE RECOVERY				
Surface Pressure	200	psig	350	psig
Amt Gas	10.8	lit.	70.8	lit.
Amt oil	0	lit.	0	lit
Amt Water	20.8	lit.	9.0	lit.
Amt Others	-	lit.	-	lit.
E. SAMPLE PROPERTIES				
Gas Composition				
C1	122,400	ppm	221,800	ppm
C2	4,900	ppm	9,300	ppm
C3	470	ppm	410	ppm
1C4/nC4	73	ppm	94	ppm
C5	0	ppm	17	ppm
C6+	0	ppm	Trace in one sample	
CO_2/H_2S	0.0005	ppm	0.0012	
Oil Properties	- °API @ 20	°C	- °API @	°C
Colour	-		-	
Fluorescence	-		-	
GOR	-		-	
Water Properties				
Resistivity	0.34 ohm m @ 19	°C	0.52 ohm m @ 18	°C
NaCl Equivalent	21,000	ppm	15,000	ppm
Cl-titrated	21,500	ppm	17,000	ppm
NO_3	44	ppm	22	ppm
Est. Water Type pH	7.5		7.0	
Mud Properties				
Resistivity	0.193 ohm m @ °C 42	°C	0.52 ohm m @ 18	°C
NaCl Equivalent	35,000	ppm	15,000	ppm
Cl - titrated	20,000-21,000	ppm	22	ppm
Calibration				
Calibration Press.	-	psig		psig-
Calibration Temp.	-	°C	-	°C
Hewlett Packard No.	9.3 ppg		9.3 ppg	
Mud Weight	5175		5175	
Calc. Hydrostatic				
RFT Chokesize				

Remarks:

(5265f:54)

APPENDIX 5

GEOCHEMICAL REPORT

TERAGLIN-1 WELL, GIPPSLAND BASIN

VICTORIA

by

J.K. EMMETT

Sample handling and analyses by

J. Maccoll)
D.M. Ford) Esso Australia Ltd.
D.M. Hill)

Exxon Production Research Company
Geochem Laboratories

0711L

CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDIX

TERAGLIN-1

INTRODUCTION

Various geochemical analyses were performed on samples of wet canned cuttings and sidewall cores collected during drilling of the Teraglin-1 well. Canned cuttings composited over 15-metre intervals were collected from 240m (KB) down to Total Depth (T.D.) at 3373 m (KB). Light hydrocarbon (C_{1-4}) headspace gases were determined for alternate 15-metre intervals from 255m (KB) down to 3360m (KB). Selected samples were then hand-picked for more detailed analyses such as Total Organic Carbon (T.O.C.), Rock-Eval pyrolysis, kerogen isolation and elemental analysis, and C_{15+} liquid and gas chromatography. Vitrinite reflectance ($\bar{R}_v$ max) measurements were performed by Professor A.C. Cook of Wollongong.

DISCUSSION OF RESULTS:

The detailed C_{1-4} headspace cuttings gas data are shown in Table 1, but are more conveniently represented in Figure 1. Total gas values are generally in the moderately rich range (i.e. 1000 - 10,000 ppm) down to about 3150m (KB), below which some rich values were also recorded down to T.D. The latter rich zone occurs toward the base of the Latrobe Group section and indicates very good hydrocarbon source potential for these sediments.

Total Organic Carbon (T.O.C.) values throughout the Latrobe Group sediments are fairly rich (average T.O.C. = 2.13%) confirming very good hydrocarbon source potential, particularly when compared to the overlying Lakes Entrance Formation (average T.O.C. = 0.44%) and Gippsland Limestone (average T.O.C. = 0.51%).

Vitrinite Reflectance data are presented in Table 3, and $\bar{R}_v$max has been plotted against depth in Figure 2. The data points can be connected by a straight line gradient which indicates that the top of organic maturity for significant hydrocarbon generation (taken to be $\bar{R}_v$max = 0.65%) occurs at about 3100m (KB). Detailed vitrinite reflectance and exinite fluorescence data are given in Appendix-1 - Report by A.C. Cook.

Elemental analyses of selected kerogen samples isolated from sidewall cores and cuttings are listed in Table 4. Approximate Hydrogen : Carbon (H/C), Oxygen : Carbon (O/C) and Nitrogen : Carbon (N/C) atomic ratios for these samples are given in Table 5. These ratios are labelled "approximate" since the oxygen % is calculated by difference and the naturally occurring organic sulphur %, which may be up to a few percent, was not determined. Figure 3 is a modified Van Krevelen Plot of atomic H/C ratio versus atomic O/C ratio. Comparison of Figure 3 with Figure 4, a similar plot showing the principal products of kerogen evolution shows that the Latrobe Group sediments contain predominantly Type III kerogen (composed of woody-herbaceous organic matter types), and that although most of the section is presently immature, those samples below about 3050 - 3100m (KB) (Table 5) are located in the oil generation window.

Those samples with T.O.C. values of 0.5% or more were analysed by Rock-Eval pyrolysis, and the results are presented in Table 6. In Figure 5, Hydrogen Index (HI) has been plotted against T_{max} (^{o}C), and again fields delineating the basic kerogen types and their degree of maturation (indicated by equivalent vitrinite reflectance values) are also shown. In a similar manner to Figure 4, Figure 5 confirms that Type III organic matter predominates in the Latrobe Group sediments, although a few samples indicate more hydrogen rich (oil-prone) Type II kerogen is also present. Table 6 and Figure 5 reaffirm that below about 3100m (KB), the Latrobe Group sediments are presently mature for significant hydrocarbon generation. The sample from the Gippsland Limestone Formation although indicative of quite oil-prone organic matter, is presently immature.

The C_{15+} liquid chromatography results from selected canned cuttings are listed in Table 7. All the samples analysed are from the Latrobe Group section, and in general they have rich total extract values indicating again, very good hydrocarbon source potential. The amounts of hydrocarbons in the extracts increases with depth, corresponding with an increase in organic maturity. The amounts of hydrocarbon material in the two deepest samples are a favourable indication that the Latrobe Group sediments have potential to source both oil and gas. The corresponding C_{15+} saturate chromatograms from rock extracts are shown in Figures 6 - 11. On the whole, the chromatograms exhibit features of dominantly terrestrial organic matter becoming more mature with increasing depth. Organic immaturity is indicated in Figure 6 (from 2475 - 2490 m (KB)) by the odd-over-even carbon number predominance of high molecular weight waxy n-alkanes, significant pristane (peak 'a') : phytane (peak 'b') ratio, and the obvious presence of a relatively high amount of naphthenes, most probably terpane material, particularly in the higher molecular weight region of the chromatogram. Figures 7-11 are fairly similar in appearance, with the increase in maturity evident from the reduction in odd-over-even predominance and the shift in n-alkane maximum from n-C_{29} down to n-C_{25}.

CONCLUSIONS

1. The top of maturity in Teraglin-1 occurs at 3100 m KB.

2. The Latrobe Group sediments have very good source potential for both oil and gas.

TABLE 1

C1-C4 HYDROCARBON ANALYSES

REPORT A - HEADSPACE GAS

BASIN - GIPPSLAND
WELL - TERAGLIN 1

SAMPLE NO.	DEPTH	METHANE C1	ETHANE C2	PROPANE C3	IBUTANE IC4	NBUTANE C4	WET C2-C4	TOTAL C1-C4	WET/TOTAL PERCENT	TOTAL GAS M	E	P	IB	NB	WET GAS E	P	IB	NB
		GAS CONCENTRATION (VOLUME GAS PER MILLION VOLUMES CUTTINGS)								GAS COMPOSITION (PERCENT)								
72688 B	270.00	31	4	6	0	3	13	44	29.55	70.	9.	14.	0.	7.	31.	46.	0.	23.
72688 D	305.00	24	0	6	0	6	12	36	33.33	67.	0.	17.	0.	17.	0.	50.	0.	50.
72688 F	335.00	30	3	4	0	0	7	37	18.92	81.	8.	11.	0.	0.	43.	57.	0.	0.
72688 H	365.00	290	8	11	2	3	24	314	7.64	92.	3.	4.	1.	1.	33.	46.	8.	13.
72688 J	395.00	625	24	25	15	6	70	695	10.07	90.	3.	4.	2.	1.	34.	36.	21.	9.
72688 N	455.00	860	10	5	3	1	19	879	2.16	98.	1.	1.	0.	0.	53.	26.	16.	5.
72688 P	465.00	3710	27	20	15	4	66	3776	1.75	98.	1.	1.	0.	0.	41.	30.	23.	6.
72688 R	515.00	3159	29	22	17	4	72	3231	2.23	98.	1.	1.	1.	0.	40.	31.	24.	6.
72688 T	545.00	480	11	9	6	4	30	510	5.88	94.	2.	2.	1.	1.	37.	30.	20.	13.
72688 V	570.00	342	14	8	3	1	26	368	7.07	93.	4.	2.	1.	0.	54.	31.	12.	4.
72688 X	600.00	351	18	12	5	2	37	388	9.54	90.	5.	3.	1.	1.	49.	32.	14.	5.
72688 Z	630.00	472	35	16	6	2	59	531	11.11	89.	7.	3.	1.	0.	59.	27.	10.	3.
72689 B	660.00	695	58	17	8	2	85	780	10.90	89.	7.	2.	1.	0.	68.	20.	9.	2.
72689 D	690.00	1401	69	22	12	3	106	1507	7.03	93.	5.	1.	1.	0.	65.	21.	11.	3.
72689 F	720.00	1084	68	20	8	3	99	1183	8.37	92.	6.	2.	1.	0.	69.	20.	8.	3.
72689 H	750.00	1509	96	40	14	5	155	1664	9.31	91.	6.	2.	1.	0.	62.	26.	9.	3.
72689 J	780.00	1441	98	45	12	5	160	1601	9.99	90.	6.	3.	1.	0.	61.	28.	7.	3.
72689 L	810.00	1743	55	49	16	5	125	1868	6.69	93.	3.	3.	1.	0.	44.	39.	13.	4.
72689 N	840.00	1742	34	30	10	4	78	1820	4.29	96.	2.	2.	1.	0.	44.	38.	13.	5.
72689 P	870.00	3245	78	70	22	7	177	3422	5.17	95.	2.	2.	1.	0.	44.	40.	12.	4.
72689 R	900.00	4235	99	98	32	11	240	4475	5.36	95.	2.	2.	1.	0.	41.	41.	13.	5.
72689 T	930.00	1605	153	101	37	16	307	1912	16.06	84.	8.	5.	2.	1.	50.	33.	12.	5.
72689 V	960.00	805	516	316	73	43	948	1753	54.08	46.	29.	18.	4.	2.	54.	33.	8.	5.
72689 X	990.00	1978	214	94	23	10	341	2319	14.70	85.	9.	4.	1.	0.	63.	28.	7.	3.
72689 Z	1020.00	892	61	67	21	9	158	1050	15.05	85.	6.	6.	2.	1.	39.	42.	13.	6.
72690 B	1050.00	1069	53	80	25	11	169	1238	13.65	86.	4.	6.	2.	1.	31.	47.	15.	7.
72690 F	1110.00	2168	103	141	49	25	318	2486	12.79	87.	4.	6.	2.	1.	32.	44.	15.	8.
72690 H	1140.00	1725	75	114	44	22	255	1980	12.88	87.	4.	6.	2.	1.	29.	45.	17.	9.
72690 J	1170.00	1720	91	160	62	31	344	2064	16.67	83.	4.	8.	3.	2.	26.	47.	18.	9.
72690 L	1200.00	1062	50	101	51	27	229	1291	17.74	82.	4.	8.	4.	2.	22.	44.	22.	12.
72690 N	1230.00	1021	53	102	52	32	239	1260	18.97	81.	4.	8.	4.	3.	22.	43.	22.	13.
72690 P	1260.00	712	35	43	26	13	117	829	14.11	86.	4.	5.	3.	2.	30.	37.	22.	11.
72690 R	1290.00	412	19	23	15	7	64	476	13.45	87.	4.	5.	3.	1.	30.	36.	23.	11.
72690 T	1320.00	82	15	3	1	1	20	102	19.61	80.	15.	3.	1.	1.	75.	15.	5.	5.
72690 V	1350.00	535	59	15	11	7	92	627	14.67	85.	9.	2.	2.	1.	64.	16.	12.	8.
72690 X	1380.00	199	13	12	5	2	32	231	13.85	86.	6.	5.	2.	1.	41.	38.	16.	6.
72690 Z	1410.00	2716	152	168	74	34	428	3144	13.61	86.	5.	5.	2.	1.	36.	39.	17.	8.
72691 C	1455.00	3739	204	226	93	44	567	4306	13.17	87.	5.	5.	2.	1.	36.	40.	16.	8.
72691 D	1470.00	2680	100	126	53	25	304	2984	10.19	90.	3.	4.	2.	1.	33.	41.	17.	8.
72691 F	1500.00	7206	168	179	75	36	458	7664	5.98	94.	2.	2.	1.	0.	37.	39.	16.	8.
72691 H	1530.00	639	39	72	44	23	178	817	21.79	78.	5.	9.	5.	3.	22.	40.	25.	13.
72691 J	1560.00	406	32	54	27	15	128	534	23.97	76.	6.	10.	5.	3.	25.	42.	21.	12.
72691 L	1575.00	3838	66	109	59	38	272	4110	6.62	93.	2.	3.	1.	1.	24.	40.	22.	14.
72691 N	1605.00	1254	132	177	77	49	435	1689	25.75	74.	8.	10.	5.	3.	30.	41.	18.	11.
72691 P	1635.00	5948	170	285	136	98	689	6637	10.38	90.	3.	4.	2.	1.	25.	41.	20.	14.
72691 R	1665.00	917	67	99	48	41	255	1172	21.76	78.	6.	8.	4.	3.	26.	39.	19.	16.
72691 T	1695.00	1264	79	110	54	48	291	1555	18.71	81.	5.	7.	3.	3.	27.	38.	19.	16.

TABLE 1 (Cont'd) C1-C4 HYDROCARBON ANALYSES

REPORT A - HEADSPACE GAS

BASIN - GIPPSLAND
WELL - TERAGLIN 1

SAMPLE NO.	DEPTH	METHANE C1	ETHANE C2	PROPANE C3	IBUTANE IC4	NBUTANE C4	WET C2-C4	TOTAL C1-C4	WET/TOTAL PERCENT	TOTAL GAS M	TOTAL GAS E	TOTAL GAS P	TOTAL GAS IB	TOTAL GAS NB	WET GAS E	WET GAS P	WET GAS IB	WET GAS NB
		GAS CONCENTRATION (VOLUME GAS PER MILLION VOLUMES CUTTINGS)								GAS COMPOSITION (PERCENT)								
72691 V	1725.00	1006	25	58	39	29	151	1157	13.05	87.	2.	5.	3.	3.	17.	38.	26.	19.
72691 X	1755.00	610	49	76	42	31	198	808	24.50	75.	6.	9.	5.	4.	25.	38.	21.	16.
72691 Z	1785.00	347	29	54	34	23	140	487	28.75	71.	6.	11.	7.	5.	21.	39.	24.	16.
72692 B	1815.00	1488	66	99	56	34	255	1743	14.63	85.	4.	6.	3.	2.	26.	39.	22.	13.
72692 D	1845.00	559	56	97	62	36	251	810	30.99	69.	7.	12.	8.	4.	22.	39.	25.	14.
72692 F	1875.00	814	70	118	87	48	323	1137	28.41	72.	6.	10.	8.	4.	22.	37.	27.	15.
72692 H	1905.00	687	48	69	52	28	197	884	22.29	78.	5.	8.	6.	3.	24.	35.	26.	14.
72692 J	1935.00	953	27	49	49	28	153	1106	13.83	86.	2.	4.	4.	3.	18.	32.	32.	18.
72692 L	1965.00	260	10	19	26	16	71	331	21.45	79.	3.	6.	8.	5.	14.	27.	37.	23.
72692 N	1995.00	420	18	34	39	30	121	541	22.37	78.	3.	6.	7.	6.	15.	28.	32.	25.
72692 P	2025.00	376	11	28	29	25	93	469	19.83	80.	2.	6.	6.	5.	12.	30.	31.	27.
72692 R	2055.00	64	4	11	12	10	37	101	36.63	63.	4.	11.	12.	10.	11.	30.	32.	27.
72692 T	2085.00	316	23	40	32	20	115	431	26.68	73.	5.	9.	7.	5.	20.	35.	28.	17.
72692 V	2115.00	739	52	82	75	45	254	993	25.58	74.	5.	8.	8.	5.	20.	32.	30.	18.
72692 X	2145.00	666	11	131	120	66	328	994	33.00	67.	1.	13.	12.	7.	3.	40.	37.	20.
72692 Z	2175.00	686	54	91	102	37	284	970	29.28	71.	6.	9.	11.	4.	19.	32.	36.	13.
72693 B	2205.00	230	20	43	62	16	141	371	38.01	62.	5.	12.	17.	4.	14.	30.	44.	11.
72693 D	2235.00	1483	33	61	82	23	199	1682	11.83	88.	2.	4.	5.	1.	17.	31.	41.	12.
72693 F	2265.00	2225	69	102	88	30	289	2514	11.50	89.	3.	4.	4.	1.	24.	35.	30.	10.
72693 I	2295.00	107	13	35	77	17	142	249	57.03	43.	5.	14.	31.	7.	9.	25.	54.	12.
72693 K	2325.00	347	27	68	144	42	281	628	44.75	55.	4.	11.	23.	7.	10.	24.	51.	15.
72693 M	2355.00	180	24	62	142	43	271	451	60.09	40.	5.	14.	31.	10.	9.	23.	52.	16.
72693 O	2385.00	86	16	41	99	27	183	269	68.03	32.	6.	15.	37.	10.	9.	22.	54.	15.
72693 Q	2415.00	6211	35	90	186	53	364	6575	5.54	94.	1.	1.	3.	1.	10.	25.	51.	15.
72693 S	2445.00	2441	487	261	58	48	854	3295	25.92	74.	15.	8.	2.	1.	57.	31.	7.	6.
72693 U	2475.00	988	173	88	57	20	338	1326	25.49	75.	13.	7.	4.	2.	51.	26.	17.	6.
72693 W	2505.00	1764	254	147	53	31	485	2249	21.57	78.	11.	7.	2.	1.	52.	30.	11.	6.
72693 Y	2535.00	516	183	188	131	54	556	1072	51.87	48.	17.	18.	12.	5.	33.	34.	24.	10.
72694 A	2565.00	173	45	64	53	18	180	353	50.99	49.	13.	18.	15.	5.	25.	36.	29.	10.
72694 C	2595.00	415	97	131	132	35	395	810	48.77	51.	12.	16.	16.	4.	25.	33.	33.	9.
72694 E	2625.00	1171	222	129	31	28	410	1581	25.93	74.	14.	8.	2.	2.	54.	31.	8.	7.
72694 G	2655.00	1328	269	180	33	24	506	1834	27.59	72.	15.	10.	2.	1.	53.	36.	7.	5.
72694 I	2685.00	3041	243	58	10	6	317	3358	9.44	91.	7.	2.	0.	0.	77.	18.	3.	2.
72694 K	2715.00	3804	473	245	66	46	830	4634	17.91	82.	10.	5.	1.	1.	57.	30.	8.	6.
72694 M	2745.00	2410	373	164	34	25	596	3006	19.83	80.	12.	5.	1.	1.	63.	28.	6.	4.
72694 O	2785.00	3849	453	233	52	38	776	4625	16.78	83.	10.	5.	1.	1.	58.	30.	7.	5.
72694 S	2845.00	290	92	62	12	11	177	467	37.90	62.	20.	13.	3.	2.	52.	35.	7.	6.
72694 U	2865.00	78	45	82	21	22	170	248	68.55	31.	18.	33.	8.	9.	26.	48.	12.	13.
72694 W	2915.00	15	10	19	2	3	34	49	69.39	31.	20.	39.	4.	6.	29.	56.	6.	9.
72694 Y	2945.00	54	36	40	7	5	88	142	61.97	38.	25.	28.	5.	4.	41.	45.	8.	6.
72695 A	2975.00	73	36	36	6	6	84	157	53.50	46.	23.	23.	4.	4.	43.	43.	7.	7.
72695 C	3005.00	31	30	43	8	11	92	123	74.80	25.	24.	35.	7.	9.	33.	47.	9.	12.
72695 E	3035.00	101	52	87	19	25	183	284	64.44	36.	18.	31.	7.	9.	28.	48.	10.	14.
72695 G	3065.00	400	249	240	24	28	541	941	57.49	43.	26.	26.	3.	3.	46.	44.	4.	5.
72695 I	3095.00	3569	625	414	49	46	1134	4703	24.11	76.	13.	9.	1.	1.	55.	37.	4.	4.
72695 K	3120.00	340	322	555	96	101	1074	1414	75.95	24.	23.	39.	7.	7.	30.	52.	9.	9.
72695 M	3150.00	9182	1225	756	126	100	2207	11389	19.38	81.	11.	7.	1.	1.	56.	34.	6.	5.

TABLE 1 (Cont'd) C1-C4 HYDROCARBON ANALYSES

REPORT A - HEADSPACE GAS

BASIN - GIPPSLAND
WELL - TERAGLIN 1

GAS CONCENTRATION (VOLUME GAS PER MILLION VOLUMES CUTTINGS) | GAS COMPOSITION (PERCENT)

SAMPLE NO.	DEPTH	METHANE C1	ETHANE C2	PROPANE C3	IBUTANE IC4	NBUTANE C4	WET C2-C4	TOTAL C1-C4	WET/TOTAL PERCENT	TOTAL GAS M	E	P	IB	NB	WET GAS E	P	IB	NB
72695 O	3180.00	22607	2614	1221	138	106	4279	26886	15.92	84.	10.	5.	1.	0.	66.	29.	3.	2.
72695 Q	3210.00	12872	2102	1159	167	130	3558	16430	21.66	78.	13.	7.	1.	1.	59.	33.	5.	4.
72695 S	3240.00	3134	772	459	74	54	1359	4493	30.25	70.	17.	10.	2.	1.	57.	34.	5.	4.
72695 U	3270.00	29239	3065	940	117	77	4199	33438	12.56	87.	9.	3.	0.	0.	73.	22.	3.	2.
72695 W	3300.00	42436	3576	1495	206	201	5478	47916	11.43	89.	7.	3.	0.	0.	65.	27.	4.	4.
72695 Y	3330.00	4955	721	409	59	62	1251	6206	20.16	80.	12.	7.	1.	1.	58.	33.	5.	5.
72696 A	3360.00	3327	467	266	42	47	822	4149	19.81	80.	11.	6.	1.	1.	57.	32.	5.	6.

TABLE 2

TOTAL ORGANIC CARBON REPORT

BASIN - GIPPSLAND
WELL - TERAGLIN 1

SAMPLE NO.	DEPTH	AGE	FORMATION	AN	TOC%	AN	TOC%	AN	TOC%	DESCRIPTION
72665 A	1810.00	MIOCENE-PLEISTOCENE	GIPPSLAND LIMESTONE	1	.69					MED OL GRY SLST. VV CALC.
72664 W	1910.00	MIOCENE-PLEISTOCENE	GIPPSLAND LIMESTONE	1	.46					MED OL GY MUDST. VV CALC.
72663 Y	1988.00	MIOCENE-PLEISTOCENE	GIPPSLAND LIMESTONE	1	.40					MED OL GRY SLST. VV CALC.
72663 V	2079.90	MIOCENE-PLEISTOCENE	GIPPSLAND LIMESTONE	1	.49					MED-DK GY SLTYSH. VV CALC

===> DEPTH : .00 TO 2135.00 METRES. <=== I ===> AVERAGE TOC : .51 % EXCLUDING VALUES GREATER THAN 10.00 % <===

SAMPLE NO.	DEPTH	AGE	FORMATION	AN	TOC%	AN	TOC%	AN	TOC%	DESCRIPTION
72663 R	2199.00	EARLY-MID. MIOCENE	LAKES ENTRANCE	1	.55					MED-DK GY SLTYSH. CALC.
72663 O	2290.00	EARLY-MID. MIOCENE	LAKES ENTRANCE	1	.48					MED GRY SLTYSH. CALC.
72663 M	2349.00	EARLY-MID. MIOCENE	LAKES ENTRANCE	1	.48					MED-DK GRY SLST. V CALC.
72663 I	2394.40	EARLY-MID. MIOCENE	LAKES ENTRANCE	1	.33					MED-DK GY SLST. V CALC.
72663 F	2411.90	EARLY-MID. MIOCENE	LAKES ENTRANCE	1	34					MED-DK GRY SLST. MDY. CALC

===> DEPTH : 2135.00 TO 2412.00 METRES. <=== I ===> AVERAGE TOC : .44 % EXCLUDING VALUES GREATER THAN 10.00 % <===

SAMPLE NO.	DEPTH	AGE	FORMATION	AN	TOC%	AN	TOC%	AN	TOC%	DESCRIPTION
72663 A	2425.50	EOCENE-LATE CRET.	LATROBE GROUP	1	1.97					DK GY SLTYSH. MICA. N CALC
72662 V	2433.00	EOCENE-LATE CRET.	LATROBE GROUP	1	1.44					OL GRY SLST. MICA N CALC.
72662 R	2443.00	EOCENE-LATE CRET.	LATROBE GROUP	1	2.27					DK GY SLTYSH. MICA. N CALC
72662 L	2451.50	EOCENE-LATE CRET.	LATROBE GROUP	1	13.10					GRY-BLK SH. V CARB. FISS.
72693 V	2490.00	EOCENE-LATE CRET.	LATROBE GROUP	2	.40					MED. GY-MED. LT. GY CLAYST.
72662 D	2495.80	EOCENE-LATE CRET.	LATROBE GROUP	1	5.26					DK GRY SHALE. MICA. N CALC
72662 B	2553.50	EOCENE-LATE CRET.	LATROBE GROUP	1	2.52					DK GRY SHALE. MICA. N CALC
72661 Z	2622.00	EOCENE-LATE CRET.	LATROBE GROUP	1	3.45					DK GY SH. MICA. MDY. N CALC
72661 Y	2645.90	EOCENE-LATE CRET.	LATROBE GROUP	1	2.67					MED GY LAM SLST. MICA. NC.
72661 X	2672.00	EOCENE-LATE CRET.	LATROBE GROUP	1	1.50					MED-DK GY SLST. CARB. NC.
72661 W	2711.50	EOCENE-LATE CRET.	LATROBE GROUP	1	1.93					DK GY SLTYSH. MDY. SL CALC
72661 U	2741.50	EOCENE-LATE CRET.	LATROBE GROUP	1	2.37					GY-BLK SLTYSH. MDY. N CALC
72661 T	2759.30	EOCENE-LATE CRET.	LATROBE GROUP	1	3.25					DK GY SLTYSH. MICA. N CALC
72661 R	2791.60	EOCENE-LATE CRET.	LATROBE GROUP	1	3.39					GRY-BLK SLST. MICA. N CALC
72694 P	2800.00	EOCENE-LATE CRET.	LATROBE GROUP	2	1.51					MED. DK. GY-OL GY SHALE
72661 P	2809.00	EOCENE-LATE CRET.	LATROBE GROUP	1	2.02					DK GRY SLST. MICA. N CALC.
72661 N	2826.50	EOCENE-LATE CRET.	LATROBE GROUP	1	2.05					DK GRY SLST. MICA. N CALC.
72661 M	2875.90	EOCENE-LATE CRET.	LATROBE GROUP	1	1.06					OL GRY SHALE. QTZ. N CALC.
72664 Q	2920.00	EOCENE-LATE CRET.	LATROBE GROUP	1	1.17					MED-DK GY SLST. MICA. NC.
72694 X	2930.00	EOCENE-LATE CRET.	LATROBE GROUP	2	.57					MED. GY-LT. OL GY SLTY SH.
72664 O	2947.00	EOCENE-LATE CRET.	LATROBE GROUP	1	1.29					MED-DK GY SLST. CARB SPKS
72664 L	3000.50	EOCENE-LATE CRET.	LATROBE GROUP	1	.63					MED-DK GY SLST. PYR. MICA.
72664 J	3073.50	EOCENE-LATE CRET.	LATROBE GROUP	1	1.53					MED-DK GY CARB SLTST. NC.
72664 G	3120.00	EOCENE-LATE CRET.	LATROBE GROUP	1	6.24					DK GY SH. COALY PATCHES.
72661 L	3169.00	EOCENE-LATE CRET.	LATROBE GROUP	1	1.40					DK GRY SLST. QTZ. N CALC.
72661 K	3185.00	EOCENE-LATE CRET.	LATROBE GROUP	1	2.01					DK GY SLST. QTZ. MICA. NC.
72695 P	3195.00	EOCENE-LATE CRET.	LATROBE GROUP	2	.84					MED. GY-LT. OL GY SLTY SH.
72661 J	3201.90	EOCENE-LATE CRET.	LATROBE GROUP	1	2.31					DK GY SLTYSH. QTZ LAM. NC.

TABLE 2 (Cont'd) TOTAL ORGANIC CARBON REPORT

BASIN - GIPPSLAND
WELL - TERAGLIN 1

SAMPLE NO.	DEPTH	AGE	FORMATION	AN	TOC%	AN	TOC%	AN	TOC%	DESCRIPTION
72661 G	3235.00	EOCENE-LATE CRET.	LATROBE GROUP	1	4.35					DK GRY SHALE. CALC.
72695 T	3255.00	EOCENE-LATE CRET.	LATROBE GROUP	2	1.79					MED. GY-LT. OL GY SLTY SH.
72664 C	3273.00	EOCENE-LATE CRET.	LATROBE GROUP	1	.84					LT OL GY SST. CALC SPECKS
72695 X	3315.00	EOCENE-LATE CRET.	LATROBE GROUP	2	2.28					MED. GY-LT. OL GY SLST+SH.
72661 B	3349.40	EOCENE-LATE CRET.	LATROBE GROUP	1	1.72					OLGY SLST. QTZ LAM. N CALC

===> DEPTH : 2412.00 TO 3349.40 METRES. <=== I ===> AVERAGE TOC : 2.13 % EXCLUDING VALUES GREATER THAN 10.00 % <===

TABLE 3

VITRINITE REFLECTANCE REPORT

BASIN - GIPPSLAND
WELL - TERAGLIN 1

SAMPLE NO.	DEPTH	AGE	FORMATION	AN	MAX. RO	FLUOR. COLOUR	NO.CNTS.	MACERAL TYPE
72662 L	2451.50	EOCENE-LATE CRET.	LATROBE GROUP	5	.51	YEL-BRN	28	V>E>>I,DOM ABUNDANT
72661 Z	2622.00	EOCENE-LATE CRET.	LATROBE GROUP	5	.55	YEL-OR	36	V>E>I,DOM ABUNDANT
72661 M	2875.90	EOCENE-LATE CRET.	LATROBE GROUP	5	.60	YEL-BRN	35	I>V>E,DOM ABUNDANT
72664 F	3135.50	EOCENE-LATE CRET.	LATROBE GROUP	5	.63	YEL-BRN	34	V>E>I,COAL
72664 B	3295.00	EOCENE-LATE CRET.	LATROBE GROUP	5	.75	YEL-BRN	20	V>E>I,DOM ABUNDANT

TABLE 4

KEROGEN ELEMENTAL ANALYSIS REPORT

BASIN - GIPPSLAND
WELL - TERAGLIN 1

SAMPLE NO.	DEPTH	SAMPLE TYPE	--- ELEMENTAL % (ASH FREE) --- N%	C%	H%	S%	O%	ASH%	COMMENTS
72653 A	2425.30	CTS	.98	64.72	3.51	.00	30.80	4.77	
72663 A	2425.50	SWC	.93	72.30	5.28	.00	21.49	11.87	ASH MORE THAN 10%
72662 Y	2428.00	SWC	1.07	73.58	5.24	.00	20.12	8.93	
72662 X	2429.00	SWC	1.00	72.74	4.88	.00	21.38	11.66	
72653 B	2430.35	CTS	.99	65.58	3.71	.00	29.72	6.97	
72662 W	2430.50	SWC	1.13	70.92	5.12	.00	22.84	14.87	ASH MORE THAN 10%
72662 V	2433.00	SWC	1.24	65.40	4.79	.00	28.57	13.62	ASH MORE THAN 10%
72653 C	2435.40	CTS	1.00	68.80	3.69	.00	26.51	7.13	
72662 U	2435.50	SWC	.99	71.74	4.98	.00	22.29	11.70	ASH MORE THAN 10%
72662 T	2438.50	SWC	1.26	72.65	5.34	.00	20.75	10.17	ASH MORE THAN 10%
72662 S	2440.00	SWC	.92	76.50	4.98	.00	17.60	4.97	
72662 R	2443.00	SWC	1.31	70.07	5.24	.00	23.38	12.24	ASH MORE THAN 10%
72662 Q	2444.00	SWC	.79	70.43	5.15	.00	23.63	11.39	ASH MORE THAN 10%
72653 D	2445.50	CTS	.67	68.65	4.09	.00	26.58	5.13	
72662 O	2447.00	SWC	1.07	73.56	5.14	.00	20.23	12.49	ASH MORE THAN 10%
72662 M	2450.00	SWC	.69	73.17	5.33	.00	20.82	9.55	
72662 L	2451.50	SWC	.60	73.29	6.10	.00	20.01	5.20	
72653 E	2455.60	CTS	.76	71.32	4.89	.00	23.03	8.96	
72662 F	2493.00	SWC	.55	73.85	5.11	.00	20.49	7.13	
72662 E	2494.50	SWC	.67	73.77	5.23	.00	20.32	7.92	
72662 D	2495.80	SWC	.59	73.52	5.71	.00	20.18	10.85	ASH MORE THAN 10%
72662 B	2553.50	SWC	.91	73.64	5.03	.00	20.41	10.00	
72661 Z	2622.00	SWC	.81	72.78	5.34	.00	21.08	10.89	ASH MORE THAN 10%
72661 Y	2645.90	SWC	.90	75.59	4.88	.00	18.63	7.09	
72661 X	2672.00	SWC	.94	74.38	5.13	.00	19.55	11.76	ASH MORE THAN 10%
72661 W	2711.50	SWC	.94	74.99	4.90	.00	34.35	9.32	
72661 V	2723.00	SWC	1.07	74.95	5.08	.00	18.90	11.10	ASH MORE THAN 10%
72661 U	2741.50	SWC	.94	77.67	5.14	.00	16.24	6.30	
72661 T	2759.30	SWC	.90	71.72	5.00	.00	22.38	14.44	ASH MORE THAN 10%
72661 S	2778.20	SWC	1.43	74.36	5.16	.00	19.05	11.81	ASH MORE THAN 10%
72661 R	2791.60	SWC	1.06	66.91	4.92	.00	27.11	22.42	ASH MORE THAN 10%
72661 Q	2793.60	SWC	.88	77.30	4.67	.00	17.15	9.43	
72661 P	2809.00	SWC	.73	76.33	5.31	.00	17.62	10.97	ASH MORE THAN 10%
72661 N	2826.50	SWC	.74	73.95	5.19	.00	20.12	14.83	ASH MORE THAN 10%
72661 M	2875.90	SWC	.97	59.75	5.06	.00	34.23	38.91	ASH MORE THAN 10%
72664 R	2903.00	SWC	1.23	75.94	4.71	.00	18.11	10.46	ASH MORE THAN 10%
72664 Q	2920.00	SWC	1.26	77.08	4.72	.00	109.88	10.02	ASH MORE THAN 10%
72664 P	2937.00	SWC	1.25	75.32	4.52	.00	18.91	7.47	
72664 O	2947.00	SWC	1.11	79.65	4.02	.00	15.22	6.63	
72664 N	2957.00	SWC	1.49	78.46	3.93	.00	16.12	5.35	
72664 L	3000.50	SWC	1.16	79.03	4.45	.00	15.36	42.96	ASH MORE THAN 10%
72664 K	3051.00	SWC	1.46	80.41	4.93	.00	13.20	5.29	
72664 J	3073.50	SWC	1.39	80.13	4.57	.00	13.91	6.50	
72664 I	3103.00	SWC	1.35	82.78	4.99	.00	10.87	3.88	
72664 G	3120.00	SWC	1.26	73.89	6.06	.00	18.79	1.60	

TABLE 4 (Cont'd) KEROGEN ELEMENTAL ANALYSIS REPORT

BASIN - GIPPSLAND
WELL - TERAGLIN 1

SAMPLE NO.	DEPTH	SAMPLE TYPE	--- ELEMENTAL % (ASH FREE) --- N%	C%	H%	S%	O%	ASH%	COMMENTS
72661 L	3169.00	SWC	1.34	78.20	5.76	.00	14.70	8.75	
72661 K	3185.00	SWC	1.41	78.19	4.76	.00	15.64	13.90	ASH MORE THAN 10%
72661 J	3201.90	SWC	1.52	80.57	4.55	.00	13.35	5.56	
72661 G	3235.00	SWC	1.70	77.65	5.40	.00	15.25	9.45	
72661 D	3282.00	SWC	1.33	81.65	5.31	.00	11.71	5.58	
72664 B	3295.00	SWC	1.00	79.36	5.57	.00	14.07	5.71	
72661.B	3349.40	SWC	1.19	81.67	4.62	.00	12.52	8.39	

TABLE 5

KEROGEN ELEMENTAL ANALYSIS REPORT

BASIN - GIPPSLAND
WELL - TERAGLIN 1

SAMPLE NO.	DEPTH	SAMPLE TYPE	AGE	FORMATION	ATOMIC RATIOS H/C	ATOMIC RATIOS O/C	ATOMIC RATIOS N/C	COMMENTS
72653 A	2425.30	CTS	EOCENE-LATE CRET.	LATROBE GROUP	.65	.36	.01	
72663 A	2425.50	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.88	.22	.01	ASH MORE THAN 10%
72662 Y	2428.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.85	.21	.01	
72662 X	2429.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.80	.22	.01	
72653 B	2430.35	CTS	EOCENE-LATE CRET.	LATROBE GROUP	.68	.34	.01	
72662 W	2430.50	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.87	.24	.01	ASH MORE THAN 10%
72662 V	2433.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.88	.33	.02	ASH MORE THAN 10%
72653 C	2435.40	CTS	EOCENE-LATE CRET.	LATROBE GROUP	.64	.29	.01	
72662 U	2435.50	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.83	.23	.01	ASH MORE THAN 10%
72662 T	2438.50	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.88	.21	.01	ASH MORE THAN 10%
72662 S	2440.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.78	.17	.01	
72662 R	2443.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.90	.25	.02	ASH MORE THAN 10%
72662 Q	2444.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.88	.25	.01	ASH MORE THAN 10%
72653 D	2445.50	CTS	EOCENE-LATE CRET.	LATROBE GROUP	.71	.29	.01	
72662 O	2447.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.84	.21	.01	ASH MORE THAN 10%
72662 M	2450.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.87	.21	.01	
72662 L	2451.50	SWC	EOCENE-LATE CRET.	LATROBE GROUP	1.00	.20	.01	
72653 E	2455.60	CTS	EOCENE-LATE CRET.	LATROBE GROUP	.82	.24	.01	
72662 F	2493.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.83	.21	.01	
72662 E	2494.50	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.85	.21	.01	
72662 D	2495.80	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.93	.21	.01	ASH MORE THAN 10%
72662 B	2553.50	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.82	.21	.01	
72661 Z	2622.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.88	.22	.01	ASH MORE THAN 10%
72661 Y	2645.90	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.77	.18	.01	
72661 X	2672.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.83	.20	.01	ASH MORE THAN 10%
72661 W	2711.50	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.78	.34	.01	
72661 V	2723.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.81	.19	.01	ASH MORE THAN 10%
72661 U	2741.50	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.79	.16	.01	
72661 T	2759.30	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.84	.23	.01	ASH MORE THAN 10%
72661 S	2778.20	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.83	.19	.02	ASH MORE THAN 10%
72661 R	2791.60	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.88	.30	.01	ASH MORE THAN 10%
72661 Q	2793.60	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.73	.17	.01	
72661 P	2809.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.84	.17	.01	ASH MORE THAN 10%
72661 N	2826.50	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.84	.20	.01	ASH MORE THAN 10%
72661 M	2875.90	SWC	EOCENE-LATE CRET.	LATROBE GROUP	1.02	.43	.01	ASH MORE THAN 10%
72664 R	2903.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.74	.18	.01	ASH MORE THAN 10%
72664 Q	2920.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.74	1.07	.01	ASH MORE THAN 10%
72664 P	2937.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.72	.19	.01	
72664 O	2947.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.61	.14	.01	
72664 N	2957.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.60	.15	.02	
72664 L	3000.50	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.68	.15	.01	ASH MORE THAN 10%
72664 K	3051.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.74	.12	.02	
72664 J	3073.50	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.68	.13	.01	
72664 I	3103.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.72	.10	.01	
72664 G	3120.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.98	.19	.01	

TABLE 5 (Cont'd) KEROGEN ELEMENTAL ANALYSIS REPORT

BASIN - GIPPSLAND
WELL - TERAGLIN 1

SAMPLE NO.	DEPTH	SAMPLE TYPE	AGE	FORMATION	ATOMIC RATIOS H/C	ATOMIC RATIOS O/C	ATOMIC RATIOS N/C	COMMENTS
72661 L	3169.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.88	.14	.01	
72661 K	3185.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.73	.15	.02	ASH MORE THAN 10%
72661 J	3201.90	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.68	.12	.02	
72661 G	3235.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.83	.15	.02	
72661 D	3282.00	SWC	EOCENE-LATE CRET	LATROBE GROUP	.78	.11	.01	
72664 B	3295.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.84	.13	.01	
72661 B	3349.40	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.68	.11	.01	

TABLE 6

ROCK EVAL ANALYSES

REPORT A - SULPHUR & PYROLYZABLE CARBON

BASIN - GIPPSLAND
WELL - TERAGLIN 1

SAMPLE NO.	DEPTH	SAMPLE TYPE	AGE	TMAX	S1	S2	S3	PI	S2/S3	PC	COMMENTS
72665 A	1810.0	SWC	MIOCENE-PLEISTOCENE	413.	.42	3.77	.33	.10	11.42	.34	
72663 R	2199.0	SWC	EARLY-MID. MIOCENE	415.	.12	.21	.27	.37	.77	.02	
72663 A	2425.5	SWC	EOCENE-LATE CRET.	425.	.57	2.82	.07	.17	40.28	.28	
72662 V	2433.0	SWC	EOCENE-LATE CRET.	421.	.50	1.53	.23	.25	6.65	.16	
72662 R	2443.0	SWC	EOCENE-LATE CRET.	419.	.94	3.67	.29	.20	12.65	.38	
72662 D	2495.8	SWC	EOCENE-LATE CRET.	410.	3.10	22.34	.53	.12	42.15	2.12	
72662 B	2553.5	SWC	EOCENE-LATE CRET.	421.	.92	3.39	.37	.21	9.16	.35	
72661 Z	2622.0	SWC	EOCENE-LATE CRET.	425.	1.71	8.01	.53	.18	15.11	.81	
72661 Y	2645.9	SWC	EOCENE-LATE CRET.	424.	.83	1.74	.54	.32	3.22	.21	
72661 X	2672.0	SWC	EOCENE-LATE CRET.	421.	.53	1.61	.33	.25	4.87	.17	
72661 W	2711.5	SWC	EOCENE-LATE CRET.	429.	.65	1.67	.35	.28	4.77	.19	
72661 U	2741.5	SWC	EOCENE-LATE CRET.	424.	1.50	2.93	.36	.34	8.13	.36	
72661 T	2759.3	SWC	EOCENE-LATE CRET.	426.	.86	5.27	.31	.14	17.00	.51	
72661 R	2791.6	SWC	EOCENE-LATE CRET.	429.	.72	4.63	.35	.13	13.22	.44	
72661 P	2809.0	SWC	EOCENE-LATE CRET.	428.	.52	3.63	.28	.13	12.96	.34	
72661 N	2826.5	SWC	EOCENE-LATE CRET.	425.	.79	3.50	.19	.18	18.42	.35	
72661 M	2875.9	SWC	EOCENE-LATE CRET.	426.	.28	.87	.18	.25	4.83	.09	
72664 Q	2920.0	SWC	EOCENE-LATE CRET.	428.	.63	.81	.24	.44	3.37	.12	
72664 O	2947.0	SWC	EOCENE-LATE CRET.	432.	.43	.42	.25	.51	1.68	.07	
72664 L	3000.5	SWC	EOCENE-LATE CRET.	424.	.10	.21	.13	.33	1.61	.02	
72664 J	3073.5	SWC	EOCENE-LATE CRET.	434.	.42	.95	:01	.31	95.00	.11	
72664 G	3120.0	SWC	EOCENE-LATE CRET.	431.	2.23	18.59	.43	.11	43.23	1.73	
72661 L	3169.0	SWC	EOCENE-LATE CRET.	436.	2.28	.81	.38	.74	2.13	.25	
72661 K	3185.0	SWC	EOCENE-LATE CRET.	438.	.43	1.23	.26	.26	4.73	.13	
72661 J	3201.9	SWC	EOCENE-LATE CRET.	434.	.50	1.95	.28	.20	6.96	.20	
72661 G	3235.0	SWC	EOCENE-LATE CRET.	441.	1.15	8.37	.42	.12	19.92	.79	
72664 C	3273.0	SWC	EOCENE-LATE CRET.	436.	.47	.54	.24	.47	2.25	.08	
72661 B	3349.4	SWC	EOCENE-LATE CRET.	432.	.73	.70	.37	.51	1.89	.11	

PI=PRODUCTIVITY INDEX PC=PYROLYZABLE CARBON TC=TOTAL CARBON HI=HYDROGEN INDEX OI=OXYGEN INDEX

TABLE 6 (Cont'd)

ROCK EVAL ANALYSES

REPORT B - TOTAL CARBON, H/O INDICES

BASIN - GIPPSLAND
WELL - TERAGLIN 1

SAMPLE NO.	DEPTH	SAMPLE TYPE	FORMATION	TC	HI	OI	HI/OI	COMMENTS
72665 A	1810.0	SWC	GIPPSLAND LIMESTONE	.69	546.	47.	11.62	
72663 R	2199.0	SWC	LAKES ENTRANCE	.55	38.	49.	.78	
72663 A	2425.5	SWC	LATROBE GROUP	1.97	143.	3.	47.67	
72662 V	2433.0	SWC	LATROBE GROUP	1.44	106.	15.	7.07	
72662 R	2443.0	SWC	LATROBE GROUP	2.27	161.	12.	13.42	
72662 D	2495.8	SWC	LATROBE GROUP	5.26	424.	10.	42.40	
72662 B	2553.5	SWC	LATROBE GROUP	2.52	134.	14.	9.57	
72661 Z	2622.0	SWC	LATROBE GROUP	3.45	232.	15.	15.47	
72661 Y	2645.9	SWC	LATROBE GROUP	2.67	65.	20.	3.25	
72661 X	2672.0	SWC	LATROBE GROUP	1.50	107.	22.	4.86	
72661 W	2711.5	SWC	LATROBE GROUP	1.93	86.	18.	4.78	
72661 U	2741.5	SWC	LATROBE GROUP	2.37	123.	15.	8.20	
72661 T	2759.3	SWC	LATROBE GROUP	3.25	162.	9.	18.00	
72661 R	2791.6	SWC	LATROBE GROUP	3.39	136.	10.	13.60	
72661 P	2809.0	SWC	LATROBE GROUP	2.02	179.	13.	13.77	
72661 N	2826.5	SWC	LATROBE GROUP	2.05	170.	9.	18.89	
72661 M	2875.9	SWC	LATROBE GROUP	1.06	82.	16.	5.13	
72664 Q	2920.0	SWC	LATROBE GROUP	1.17	69.	20.	3.45	
72664 O	2947.0	SWC	LATROBE GROUP	1.29	32.	19.	1.68	
72664 L	3000.5	SWC	LATROBE GROUP	.63	33.	20.	1.65	
72664 J	3073.5	SWC	LATROBE GROUP	1.53	62.	0.	.00	
72664 G	3120.0	SWC	LATROBE GROUP	6.24	297.	6.	49.50	
72661 L	3169.0	SWC	LATROBE GROUP	1.40	57.	27.	2.11	
72661 K	3185.0	SWC	LATROBE GROUP	2.01	61.	12.	5.08	
72661 J	3201.9	SWC	LATROBE GROUP	2.31	84.	12.	7.00	
72661 G	3235.0	SWC	LATROBE GROUP	4.35	192.	9.	21.33	
72664 C	3273.0	SWC	LATROBE GROUP	.84	64.	28.	2.29	
72661 B	3349.4	SWC	LATROBE GROUP	1.72	40.	21.	1.90	

T.O.C. = Total organic carbon, wt. %
S1 = Free hydrocarbons, mg HC/g of rock
S2 = Residual hydrocarbon potential (mg HC/g of rock)
S3 = CO2 produced from kerogen pyrolysis (mg CO2/g of rock)
PC* = 0.083 ($S_1 + S_2$)
Hydrogen Index = mg HC/g organic carbon
Oxygen Index = mg CO2/g organic carbon
PI = S1/S1+S2
Tmax = Temperature Index, degrees C.

PI=PRODUCTIVITY INDEX PC=PYROLYZABLE CARBON TC=TOTAL CARBON HI=HYDROGEN INDEX OI=OXYGEN INDEX

TABLE 7

C15+ EXTRACT ANALYSES

REPORT A - EXTRACT DATA (PPM)

BASIN - GIPPSLAND
WELL - TERAGLIN 1

SAMPLE NO.	DEPTH	TYPE	AN	AGE	TOTAL EXTRACT	HYDROCARBONS SATS.	HYDROCARBONS AROMS.	HYDROCARBONS TOTAL H/CARBS	NON-HYDROCARBONS ASPH.	NON-HYDROCARBONS ELUTED NSO	NON-HYDROCARBONS NON-ELT NSO	NON-HYDROCARBONS TOTAL NSO	NON-HYDROCARBONS SULPHUR	NON-HYDROCARBONS TOTAL NON/HCS
72693 V	2490.00	CTS	2	EOCENE-LATE CRET.	304.	14.	30.	44.	183.	50.	2.	52.	25.	260.
72694 P	2800.00	CTS	2	EOCENE-LATE CRET.	1587.	83.	211.	294.	986.	202.	65.	267.	40.	1293.
72694 X	2930.00	CTS	2	EOCENE-LATE CRET.	462.	21.	56.	77.	268.	58.	8.	66.	51.	385.
72695 P	3195.00	CTS	2	EOCENE-LATE CRET.	673.	49.	78.	127.	432.	79.	12.	91.	23.	546.
72695 T	3255.00	CTS	2	EOCENE-LATE CRET.	999.	166.	148.	314.	459.	122.	39.	161.	65.	685.
72695 X	3315.00	CTS	2	EOCENE-LATE CRET.	1430.	255.	237.	492.	736.	169.	12.	181.	21.	938.

C15+ EXTRACT ANALYSES

REPORT B - EXTRACTS % OF TOTAL

BASIN - GIPPSLAND
WELL - TERAGLIN 1

SAMPLE NO.	DEPTH	FORMATION	HYDROCARBONS SAT. %	HYDROCARBONS AROM.%	NON-HYDROCARBONS NSO. %	NON-HYDROCARBONS ASPH.%	NON-HYDROCARBONS SULPH%	SAT/AR	HC/NHC	COMMENTS
72693 V	2490.00	LATROBE GROUP	4.6	9.9	17.1	60.2	8.2	.5	.2	IMMATURE,NON-MARINE
72694 P	2800.00	LATROBE GROUP	5.2	13.3	16.8	62.1	2.5	.4	.2	IMMATURE,NON-MARINE
72694 X	2930.00	LATROBE GROUP	4.5	12.1	14.3	58.0	11.0	.4	.2	IMMATURE,NON-MARINE
72695 P	3195.00	LATROBE GROUP	7.3	11.6	13.5	64.2	3.4	.6	.2	IMMATURE,NON-MARINE
72695 T	3255.00	LATROBE GROUP	16.6	14.8	16.1	45.9	6.5	1.1	.5	IMMATURE,NON-MARINE
72695 X	3315.00	LATROBE GROUP	17.8	16.6	12.7	51.5	1.5	1.1	.5	EARLY MATURE,NON-MAR.

PE603802

This is an enclosure indicator page.
The enclosure PE603802 is enclosed within the container PE902555 at this location in this document.

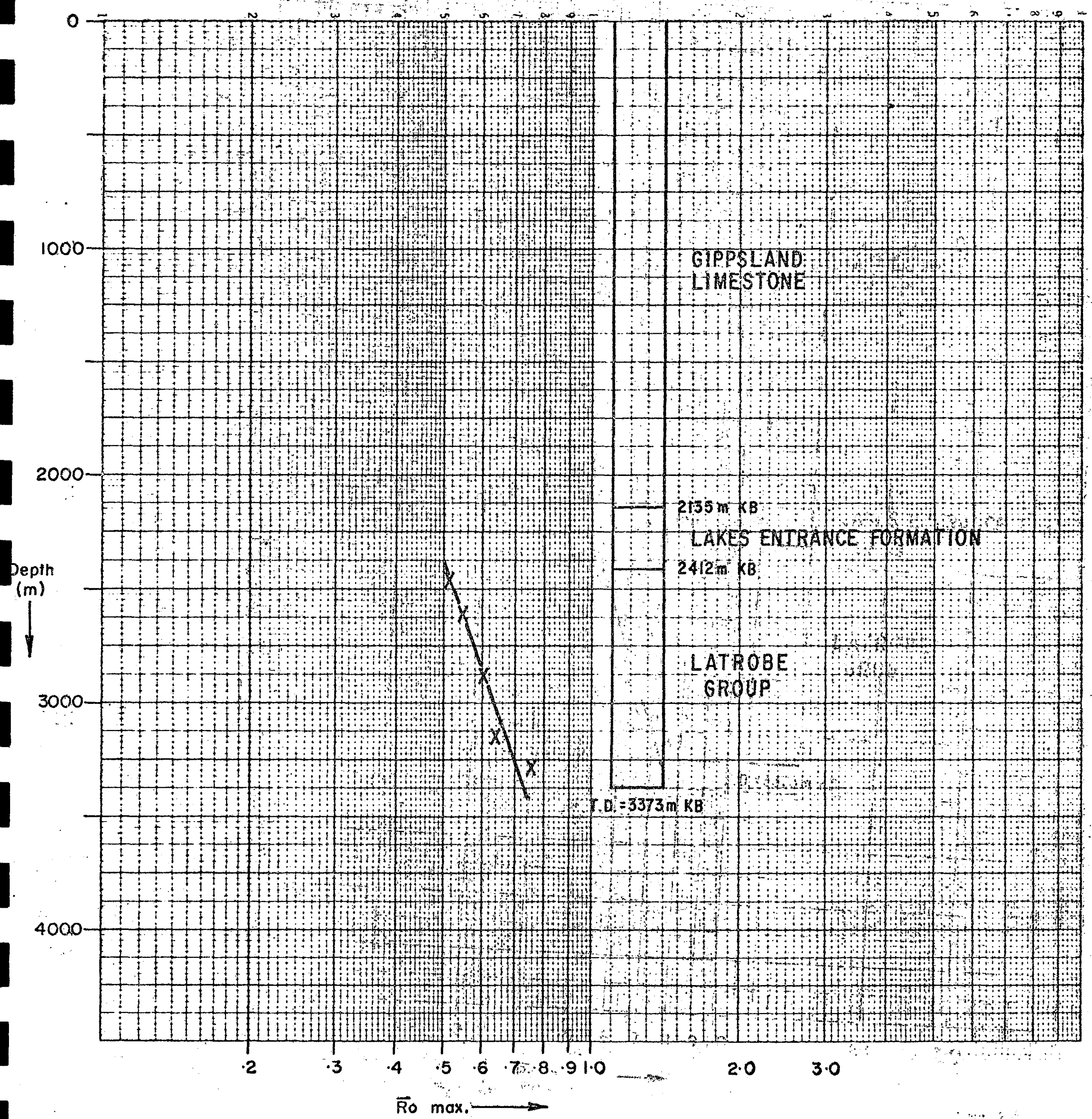
The enclosure PE603802 has the following characteristics:

ITEM_BARCODE	= PE603802
CONTAINER_BARCODE	= PE902555
NAME	= C1-4 Cuttings Gas Log
BASIN	= GIPPSLAND
PERMIT	= VIC/L5
TYPE	= WELL
SUBTYPE	= WELL_LOG
DESCRIPTION	= C1-4 Cuttings Gas Log (enclosure from WCR vol.2) for Teraglin-1
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	= 26/05/87
W_NO	= W814
WELL_NAME	= TERAGLIN-1
CONTRACTOR	=
CLIENT_OP_CO	= ESSO AUSTRALIA LIMITED

(Inserted by DNRE - Vic Govt Mines Dept)

TERRAGLIN-1 Fig. 2

VITRINITE REFLECTANCE vs DEPTH

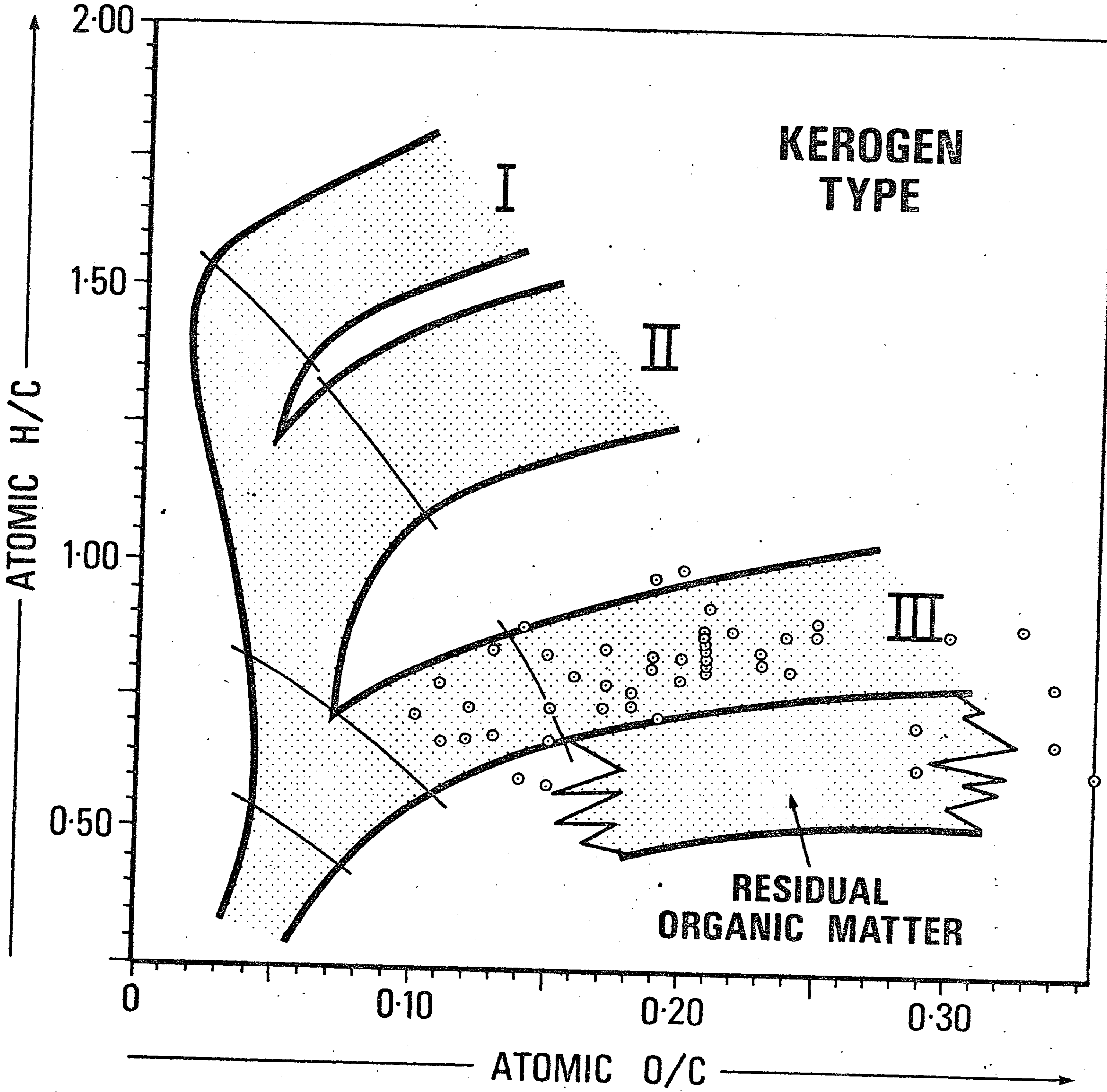


Base dwg. 1107/OP/207

Dwg. 2167/OP/5

TERAGLIN-1

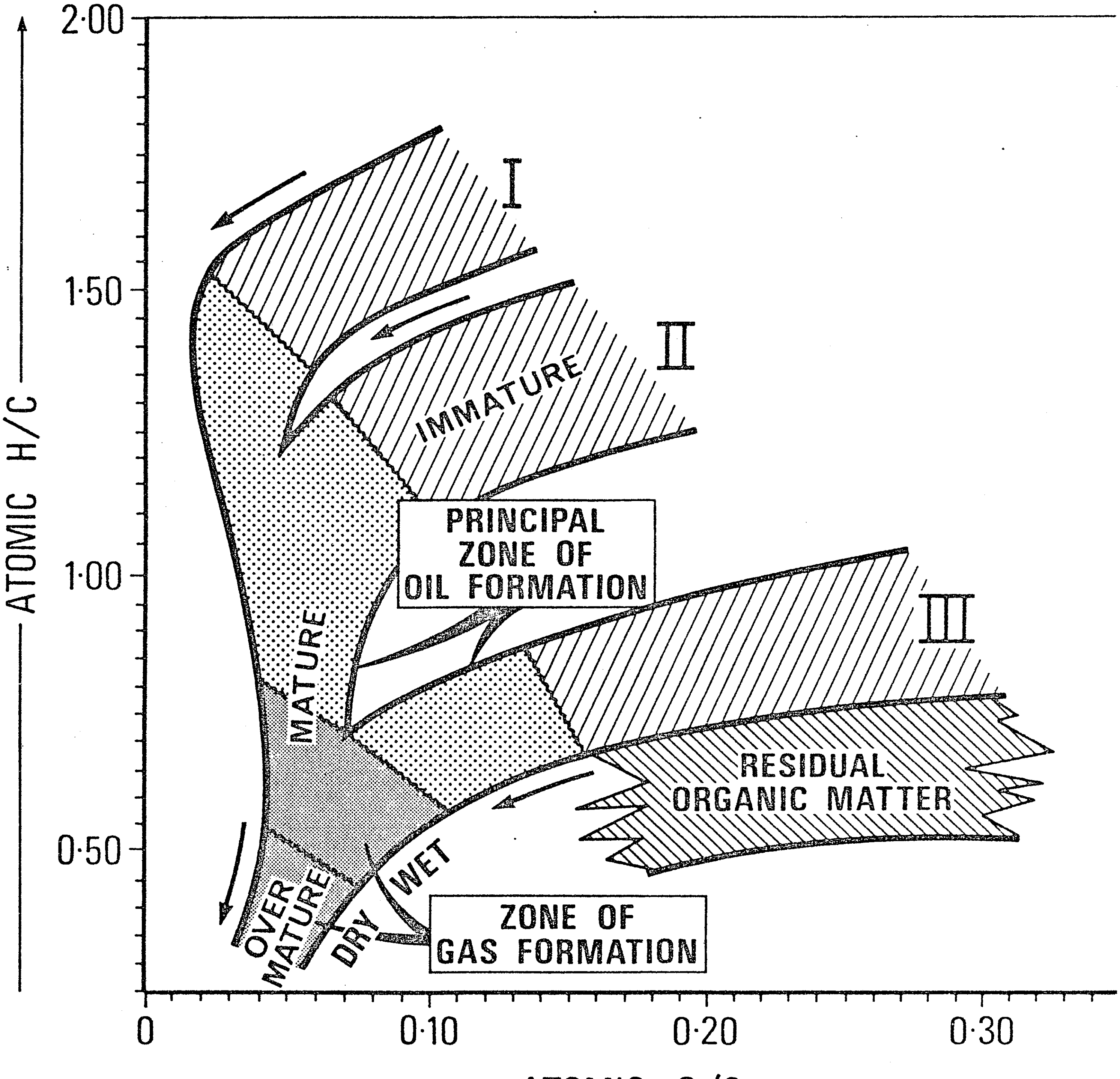
Fig.3



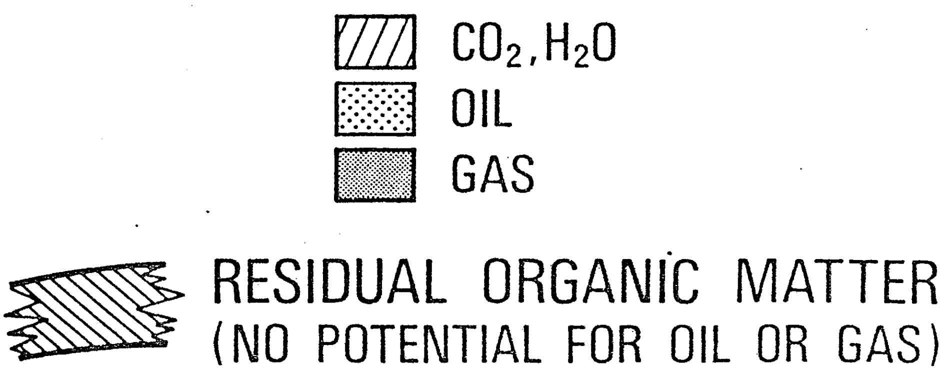
⊙ LATROBE GROUP

1107/OP/235 Base

Dwg. 2167/OP/4



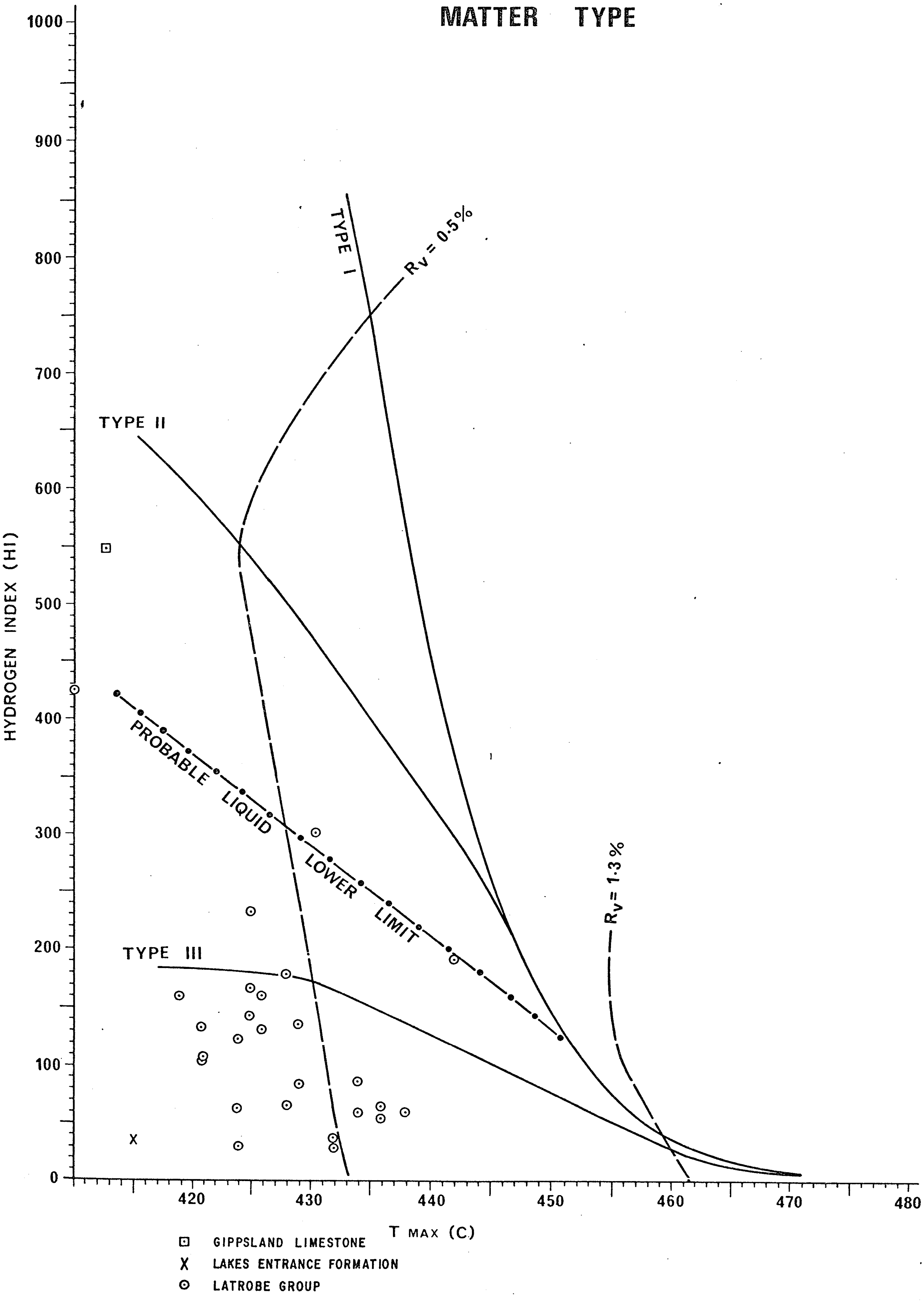
PRINCIPAL PRODUCTS OF KEROGEN EVOLUTION



1380/BS/75

Fig. 5

TERAGLIN-1
ROCKEVAL MATURATION AND ORGANIC MATTER TYPE



Rock Extract

GC Chromatogram C15+ (P-N) Hydrocarbon

GeoChem Sample No. E566-001

Exxon Identification No. 72693-V

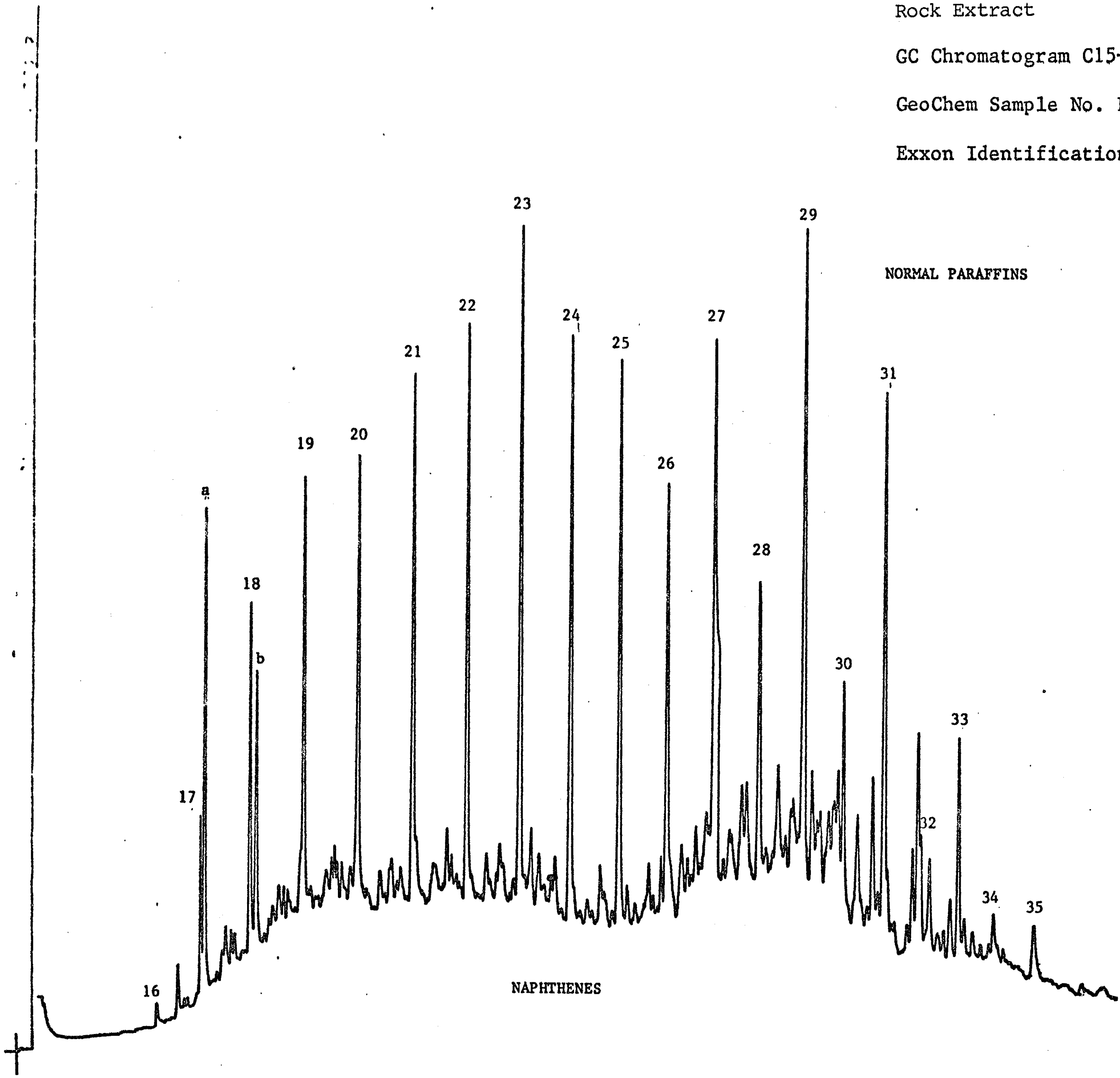


FIGURE 6. Teraglin-1, 2475 - 2490m (KB), Latrobe Group

Rock Extract

GC Chromatogram C15+ (P-N) Hydrocarbon

GeoChem Sample No. E566-002

Exxon Identification No. 72694-P

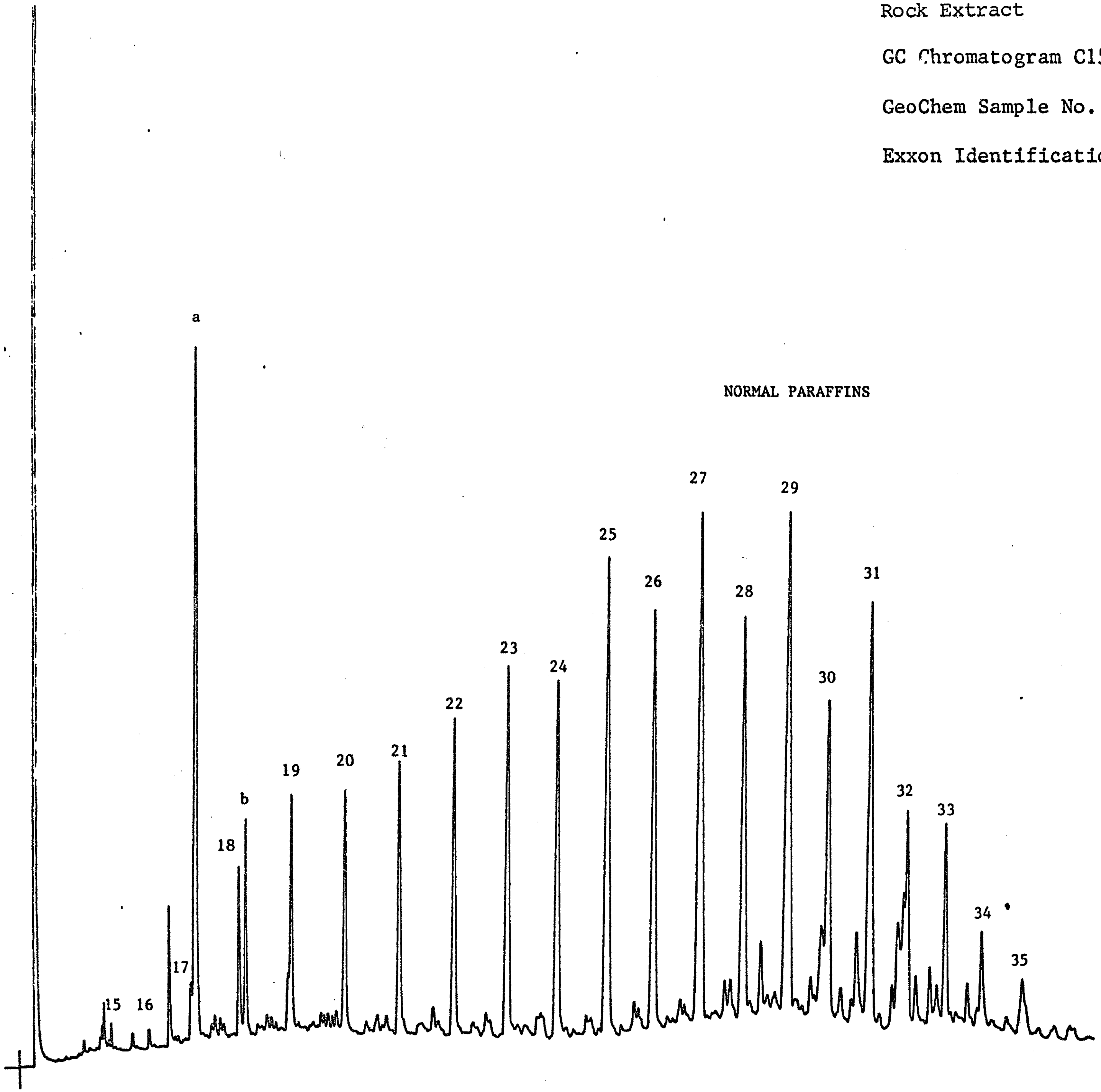


FIGURE 7. Teraglin-1, 2785 - 2800 m (KB), Latrobe Group

Rock Extract

GC Chromatogram C15+ (P-N) Hydrocarbon

GeoChem Sample No. E566-003

Exxon Identification No. 72694-X

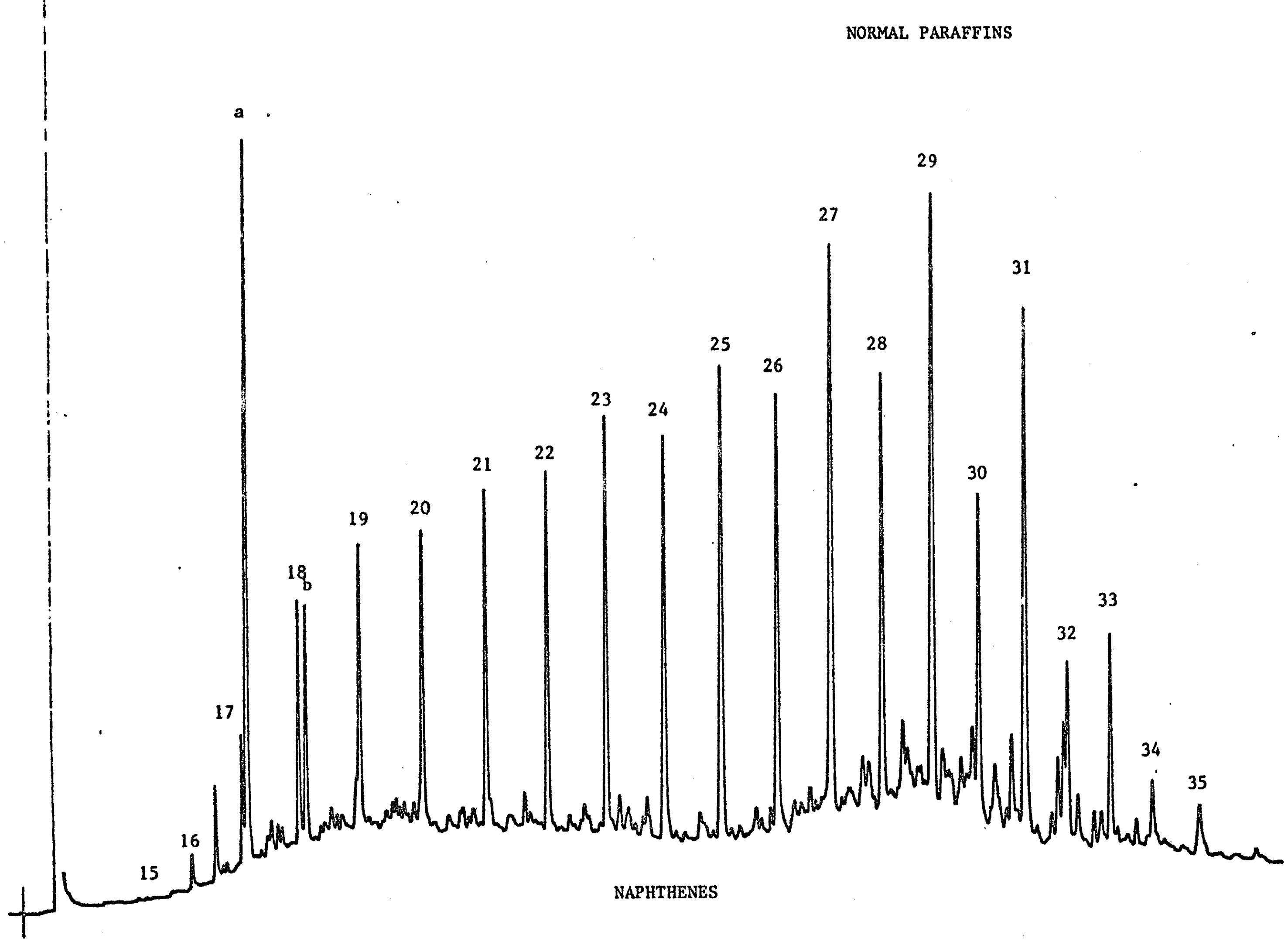


FIGURE 8. Teraglin-1, 2915 - 2930m (KB), Latrobe Group

Rock Extract

GC Chromatogram C15+ (P-N) Hydrocarbon

GeoChem Sample No. E566-004

Exxon Identification No. 72695-P

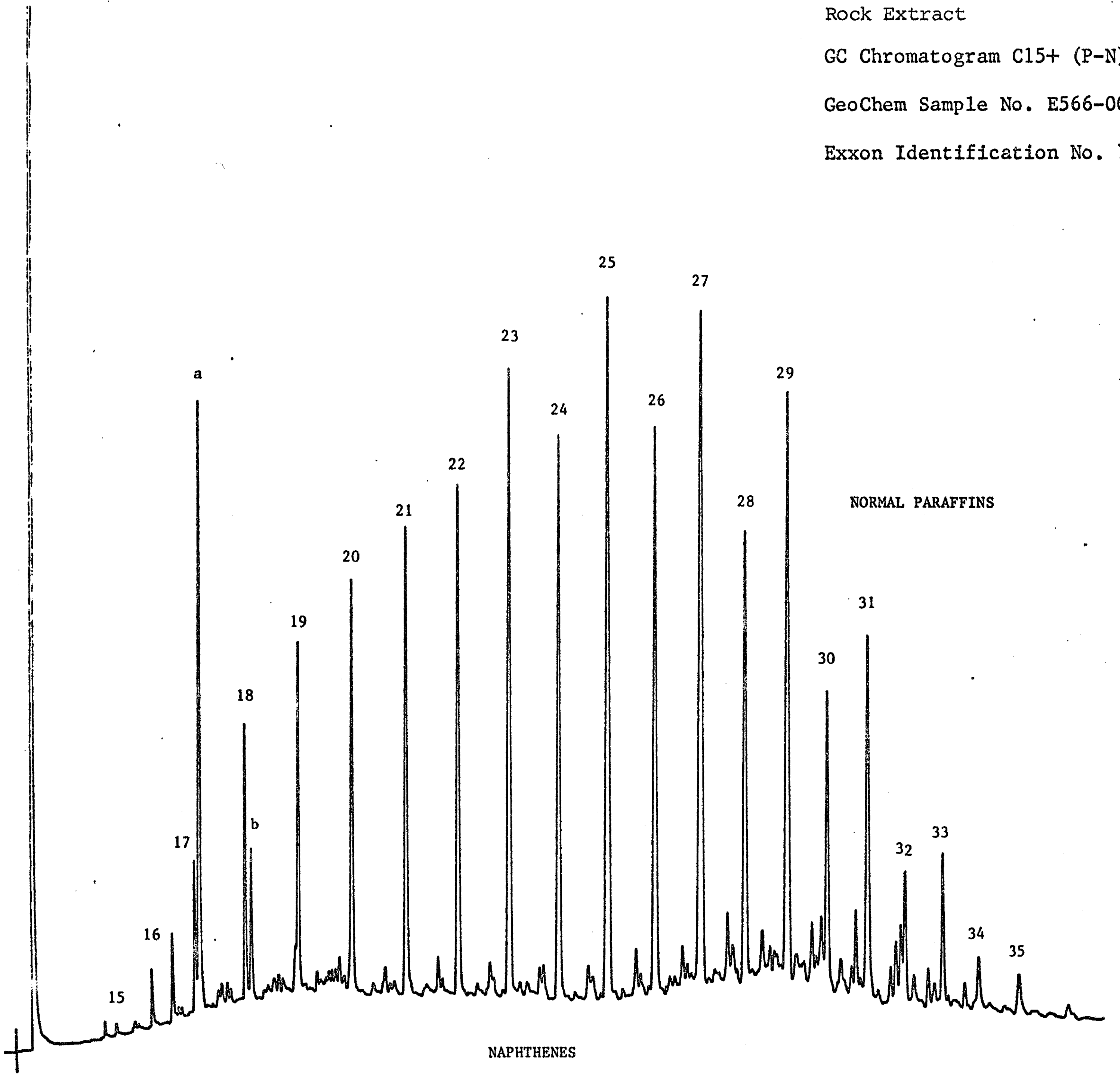


FIGURE 9. Teraglin-1, 3180 - 3195m (KB), Latrobe Group

Rock Extract

GC Chromatogram C15+ (P-N) Hydrocarbon

GeoChem Sample No. E566-005

Exxon Identification No. 72695-T

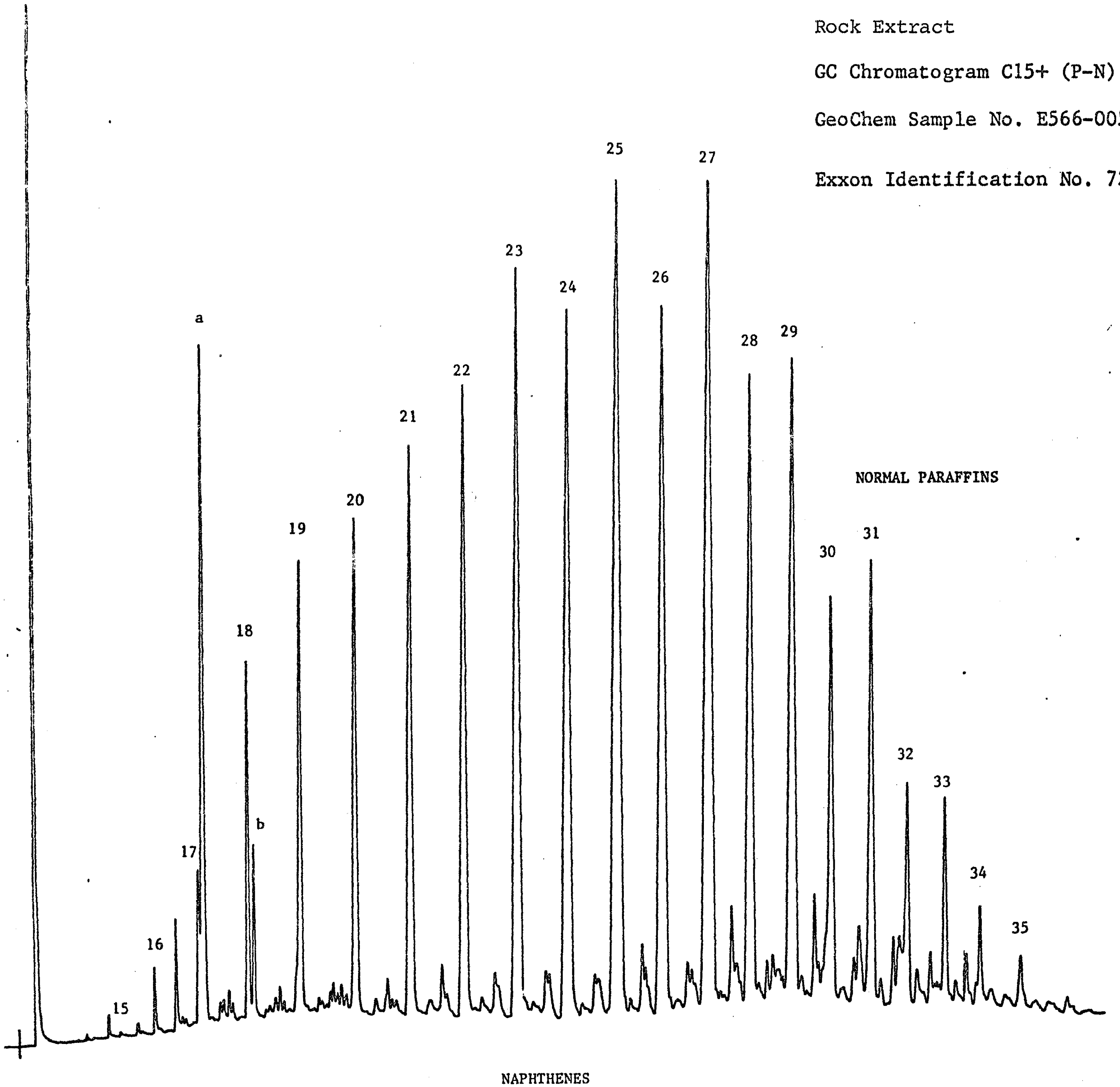


FIGURE 10. Teraglin-1, 3240 - 3255m (KB), Latrobe Group

Rock Extract

GC Chromatogram C15+ (P-N) Hydrocarbon

GeoChem Sample No. E566-006

Exxon Identification No. 72695-X

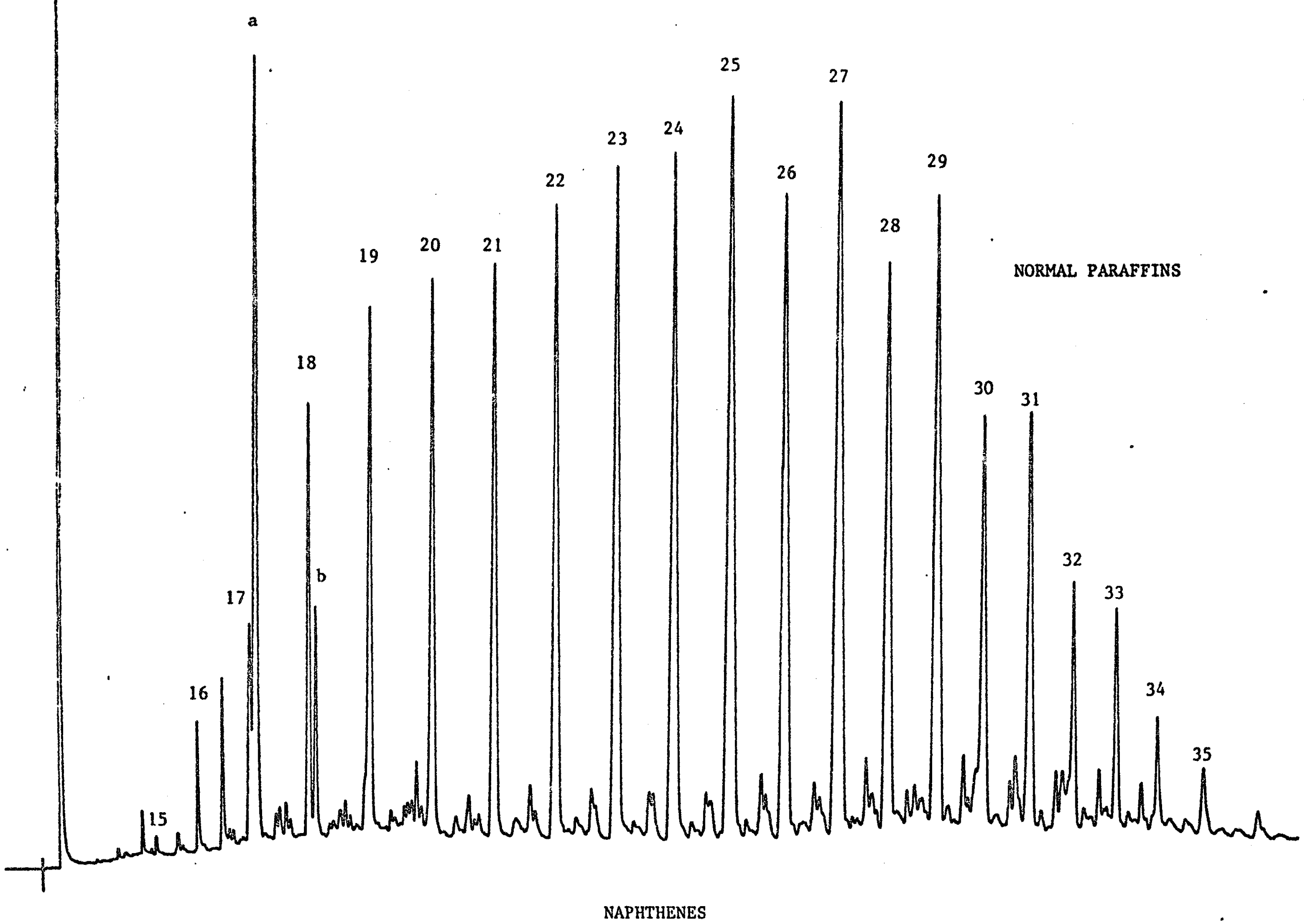


FIGURE 11. Teraglin-1, 3300 - 3315m (KB), Latrobe Group

APPENDIX-1

Detailed Vitrinite Reflectance and Exinite

Fluorescence Data - by A.C. Cook

26.8.83

APPENDIX 1

TERAGLIN No. 1

UW No.	Esso No.	Depth m	$\bar{R}_v$ max %	Range R_v max %	N	Exinite fluorescence (Remarks)
				Eocene - Late Cretaceous		
18010	72662 -L	2451.5 SWC	0.51	0.43-0.63	28	Abundant sporinite, yellow to orange, abundant cutinite, yellow to dull orange, abundant suberinite, brown, common resinite, green/yellow to brown, rare fluorinite, green. (Calcareous claystone>coal. Coal, vitrinite>clarite. D.o.m. abundant, V>E>>I. Vitrinite and exinite abundant, inertinite rare. Weak oil cut from some vitrinite. Abundant pyrite.)
18011	72661 -Z	2622 SWC	0.55	0.46-0.62	36	Common cutinite, orange, sparse sporinite, yellow to orange. (Calcareous claystone and silty claystone>sandstone. D.o.m. abundant, V>E>I. Vitrinite abundant, inertinite and exinite common. Micrinite present. Abundant pyrite.)
18012	72661 -M	2875.9 SWC	0.60	0.52-0.73	35	Sparse sporinite, yellow/orange to orange, rare cutinite, orange to dull orange. (Siltstone with sparse clarodurite and rare clarite. D.o.m. abundant, I>V>E. Inertinite and vitrinite abundant, exinite sparse. Abundant pyrite.)
18013	72664 -F	3135.5 SWC	0.63	0.53-0.81	34	Abundant sporinite and cutinite, yellow to orange, abundant suberinite, brown, common resinite, bright yellow to dull orange/brown. Coal>>shaly coal. Coal, V>E>I, duroclarite>vitrinite>clarite. Shaly coal, V>E>I. Vitrinite shows dull brown fluorescence. Weak green oil cuts from vitrinite in duroclarite. Desmocollinite>telocollinite. Telocollinite present in significant amounts. Pyrite abundant.)
18014	72664 -B	3295.0 SWC	0.75	0.65-0.83	20	Common sporinite and cutinite, yellow to orange, common suberinite, brown, sparse resinite, orange. (Claystone>coal. Coal abundant, V>E>I, vitrite>clarite. D.o.m. abundant, V>E>I. Vitrinite and exinite abundant, inertinite common. Abundant pyrite. Very weak green oil staining.)

APPENDIX 6

ADDITIONAL DATA ADDED BY DNRE

FROM TERAGLIN-1 BOX

11-5-99

TABLE: 1 DEPTH TO MAPPED HORIZONS

"South Channel Mapping Report" By Esso (D. Garrad)

14 JUN 19●

DEPTH (MSS) 14 JUN 1988

Doc. 2927L/10

HORIZON	CODE	TERAGLIN-1	EAST HALIBUT-1	PILOTFISH-1A	HALIBUT-1	FLOUNDER-1	FLOUNDER-2	FLOUNDER-3	FLOUNDER-6	MACKERAL-1	MACKERAL-3
Water bottom	0001	79	85	206	72	87	99	111	93	98	100
Miocene unit	1000	nl	684	nl	497	615	628	820	218	556	nl
" " "	1200	nl	827	1179	748	719	806	1040	817	826	863
" " "	1520	996	1015	1436	1066	848	879	1233	889	1210	1182
" " "	1300	1077	1121	1565	1186	927	940	t	956	1396	1371
" " "	1350	1302	1501	1619	1587	1136	1193	1288	1213	np	np
" " "	1400	1583	1791	1914	np	1287	1348	t	1369	np	np
" " "	1450	1732	1919	2153	np	1393	1436	1457	1427	np	np
Base of Limestone	1500	2024	1968	2352	1758	1603	1702	1718	1630	1661	1770
Lakes Entrance Fm	1600	2114	2146	2520	2058	1787	1813	1829	1853	2139	2145
" " "	1700	2279	2284	2622	2173	np	np	–	np	2297	2304
Top of Latrobe	2000	2400	2374	2894	2275	1899	1938	1967	1907	2376	2368
Base Marlin Chan.	2100	2406	nt	2904	nt	nt	nt	nt	nt	t	t
61Ma Unconformity	2610	2647	np	t	2840	t	t	t	t	2751	np
63Ma Unconformity	2680	2842	np		3032	2400	2408	2407	2368	2885	np
68Ma Unconformity	2680	2974	np		np	2540	2536	2544	2745	2956	np
Intra-T. Longus Seismic Marker	2710	3281	np	3122	np	2791	np	np	np	np	np

NOTE: nl – not logged

np – not pentrated

t – trucated

APPENDIX 1

RAYVNMO MODELLING

14 JUN 1988

The RAYVNMO program uses interval thickness and interval velocity pairs to perform raytracing. The program assumes a simple layercake model, and therefore gives no indication of dip effects and raypath distortions that may be inherent in the real data. An anisotropy factor may be included in any layer. Cable paramenters are input according to the parameters used by the particular seismic survey being matched.

Results of the RAYVNMO raytracing are given in the following table.

An anisotropy factor (k) of 1.0 was used in the Lakes Entrance Formation (between 1500 and 2000).

WELL NAME	TERAGLIN-1			EAST HALIBUT-1			PILOTFISH-1A		
HORIZON Code	Z above	VINT above	VNMO	Z above	VINT above	VNMO	Z above	VINT above	VNMO
0001	79	1480	1480	85	1480	1480	206	1480	1480
1000				599	2303	2209			
1200				143	2860	2338	973	2446	2263
1250	917	2490	2404	188	3159	2484	257	3253	2429
1300	81	3115	2460	106	3072	2526	129	3685	2522
1350	225	3571	2648	380	3707	2790	54	3724	2555
1400	281	3512	2777	290	3625	2900	295	3734	2704
1450	149	3634	2837	128	4000	2961	239	3464	2772
1500	292	3539	2923	49	3500	2973	199	3184	2817
1600	90	3333	2942	178	3236	2996	168	3111	2812
1700	165	2973	2950	138	3000	3000	102	2615	2831
2000	121	3361	2969	90	3214	3011	272	3126	2849

* TABLE CONTINUED OVER.

Doc. 2927L/15

APPENDIX 1 CONTINUED

14 JUN 1988

WELL NAME	MACKEREL-1			MACKEREL-3		
HORIZON	Z	VINT	VNMO	Z	VINT	VNMO
Code	above	above		above	above	
0001	98	1480	1480	100	1480	1480
1000	458	2195	2091			
1200	270	2784	2329	762	2490	2371
1250	384	2833	2449	319	2774	2468
1350						
1400						
1450						
1500	265	3581	2718	399	3746	2830
1600	478	3274	2844	375	3318	2915
1700	158	2926	2854	159	3057	2931
2000	79	2981	2862	64	3047	2934

Doc. 29271/14

APPENDIX 1 CONTINUED

14 JUN 1988

WELL NAME	HALIBUT-1			FLOUNDER-1			FLOUNDER-2			FLOUNDER-3			FLOUNDER-6		
HORIZON Code	Z above	VINT above	VNMO	Z above	VINT above	VNMO	Z above	VINT above	VNMO	Z above	VINT above	VNMO	Z above	VINT above	VNMO
0001	72	1480	1480	88	1480	1480	99	1480	1480	111	1480	1480	93	1480	1480
1000	426	2201	2123	527	2234	2149	528	2211	2111	709	2419	2301	524	2185	2094
1200	252	3231	2573	167	2738	2305	178	2871	2311	220	3142	2499	199	2745	2271
1250	317	3202	2695	66	3000	2373	73	3174	2387	193	3477	2640	72	3200	2368
1300	120	3076	2719	79	3038	2421	62	3100	2423				67	3116	2406
1350	401	3713	2932	209	3190	2544	252	3252	2564	55	3235	2658	257	3294	2563
1400				151	3471	2641	155	3299	2634			156	3319	2613	
1450				106	3365	2683	88	3385	2670	169	3347	2718	58	3412	2657
1500	171	3842	3007	210	3043	2715	266	3148	2730	261	3089	2759	203	3147	2705
1600	300	3209	3040	184	319	2755	111	3171	2757	111	3041	2776	223	3186	2762
1700	105	3134	3047												
2000	111	3083	3053	112	3200	2782	125	3205	2787	138	2968	2785	54	3176	2774

TABLE CONTINUED OVER

14 JUN [illegible]8
Doc. 2927L/11

TABLE 2. WELL TWO-WAY-TIMES AND LAGS TO LATROBE HORIZONS

14 JUN [illegible]68

HORIZON	TOP OF LATROBE (2000)			61MA (2610)			65MA (2635)			68MA (2680)			INTRA-T. LONGUS (2710)		
	DEPTH (MSS)	TRUE TWT	LAG (TWT)	DEPTH (MSS)	TRUE TWT	LAG (TWT)	DEPTH (MSS)	TRUE TWT	LAG (TWT)	DEPTH (MSS)	TRUE TWT	LAG (TWT)	DEPTH (MSS)	TRUE TWT	LAT (TWT)
TERAGLIN-1	2400	1.700	24	2647	1.828	25	2842	1932	23	2974	1.994	31	3281	2.143	24
EAST HALIBUT-1	2374	1.662	5	np	–	–	np	–	–	np	–	–	np	–	–
PILOTFISH-1A	2894	2.146	18	t	–	–	t	–	–	–	–	–	3122	2.265	25
HALIBUT-1	2275	1.602	7	2.840	1.906	14	3032	2.002		np	–	–	np	–	–
FLOUNDER-1	1899	1.439	20	t	–	–	2400	1.734		2510	1.793	30	2791	1.947	30
FLOUNDER-2	1938	1.472	20	t	–	–	2408	1.746		2536	1.812	20	np	–	–
FLOUNDER-3	1967	1.468	15	t	–	–	2407	1.726		2544	1.806	24	np	–	–
FLOUNDER-6	1907	1.451	28	t	–	–	2368	1.711		2474	1.769	31	np	–	–
MACKEREL-1	2376	1.716	21	2751	1.916	22	2885	1.982		2956	2.02	28	np	–	–
MACKEREL-3	2368	1.696	-8*	np	–	–	np	–	–	np	–	–	np	–	–

* The anomalous lag at Mackerel-3 may be due to poor checkshot data. To avoid creating an anomalous trend on the Vavg map seismic time (lagged) was used to calculate Vavg at Mackerel-3

TABLE 3: VELOCITIES AND CONVERSION FACTORS TO TOP OF LATROBE GROUP

14 JUN 1988

WELL	VNMO	VAVG	CF
Teraglin-1	2995	2823	0.9426
East Halibut-1	3019	2857	0.9463
Polotfish-1A	2855	2697	0.9447
Halibut-1	3010	2840	0.9435
Flounder-1	2775	2639	0.9510
Flounder-2	2772	2633	0.9500
Flounder-3	2717	2680	0.9513
Flounder-6	2780	2628	0.9426
Mackerel-1	2930	2775	0.9471
Mackerel-3	2970	2835	0.9545

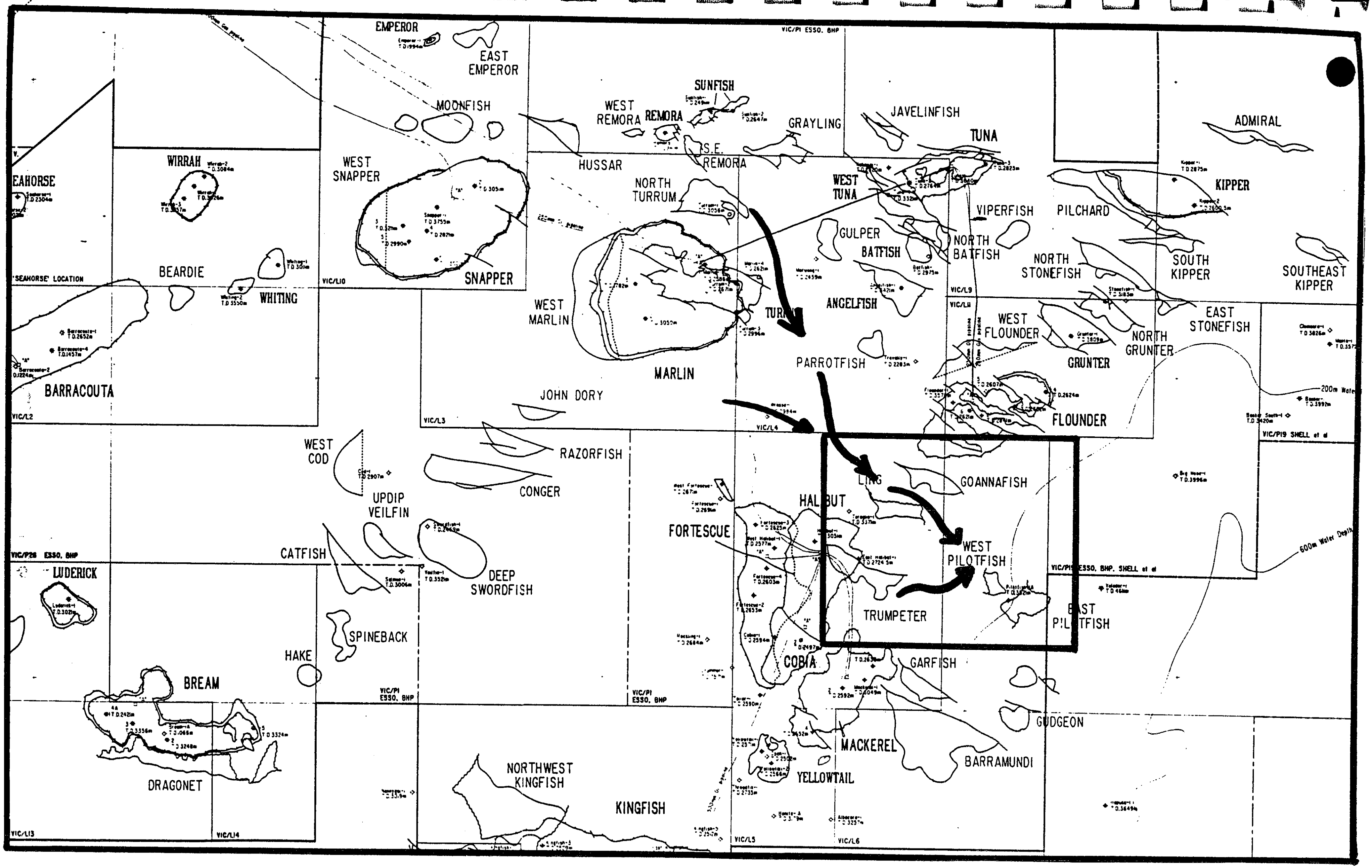


FIG. 1 : Locality map. Arrows indicate trend of Marlin Channel, and Top Latrobe Group channelling.

14 JUN 1988

ENCLOSURES

PE902556

This is an enclosure indicator page.
The enclosure PE902556 is enclosed within the container PE902555 at this location in this document.

The enclosure PE902556 has the following characteristics:

ITEM_BARCODE =	PE902556
CONTAINER_BARCODE =	PE902555
NAME =	Structure Map top of Latrobe
BASIN =	GIPPSLAND
PERMIT =	VIC/L5
TYPE =	SEISMIC
SUBTYPE =	HRZN_CNTR_MAP
DESCRIPTION =	Structure Map top of Latrobe (enclosure from WCR vol.2) for Teraglin-1
REMARKS =	
DATE_CREATED =	31/10/85
DATE_RECEIVED =	26/05/87
W_NO =	W814
WELL_NAME =	Teraglin-1
CONTRACTOR =	ESSO
CLIENT_OP_CO =	ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE902557

This is an enclosure indicator page.
The enclosure PE902557 is enclosed within the container PE902555 at this location in this document.

The enclosure PE902557 has the following characteristics:

ITEM_BARCODE =	PE902557
CONTAINER_BARCODE =	PE902555
NAME =	Structure Map Base of Turrum Formation
BASIN =	GIPPSLAND
PERMIT =	VIC/L5
TYPE =	SEISMIC
SUBTYPE =	HRZN_CNTR_MAP
DESCRIPTION =	Structure Map Base of Turrum Formation (enclosure from WCR vol.2) for Teraglin-1
REMARKS =	
DATE_CREATED =	31/10/85
DATE_RECEIVED =	26/05/87
W_NO =	W814
WELL_NAME =	Teraglin-1
CONTRACTOR =	ESSO
CLIENT_OP_CO =	ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE902558

This is an enclosure indicator page.
The enclosure PE902558 is enclosed within the container PE902555 at this location in this document.

The enclosure PE902558 has the following characteristics:

ITEM_BARCODE = PE902558
CONTAINER_BARCODE = PE902555
NAME = Structure Map Lower L balmei Seismic Marker
BASIN = GIPPSLAND
PERMIT = VIC/L5
TYPE = SEISMIC
SUBTYPE = HRZN_CNTR_MAP
DESCRIPTION = Structure Map Lower L balmei Seismic Marker (enclosure from WCR vol.2) for Teraglin-1
REMARKS =
DATE_CREATED = 31/08/86
DATE_RECEIVED = 26/05/87
W_NO = W814
WELL_NAME = Teraglin-1
CONTRACTOR = ESSO
CLIENT_OP_CO = ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE902559

This is an enclosure indicator page.
The enclosure PE902559 is enclosed within the container PE902555 at this location in this document.

The enclosure PE902559 has the following characteristics:

ITEM_BARCODE = PE902559
CONTAINER_BARCODE = PE902555
NAME = Geological Cross Section A-A'
BASIN = GIPPSLAND
PERMIT =
TYPE = WELL
SUBTYPE = CROSS_SECTION
DESCRIPTION = Geological Cross Section A-A' (enclosure from WCR vol.2) for Teraglin-1
REMARKS =
DATE_CREATED = 30/11/85
DATE_RECEIVED = 26/05/87
W_NO = W814
WELL_NAME = Teraglin-1
CONTRACTOR = ESSO
CLIENT_OP_CO = ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE603803

This is an enclosure indicator page.
The enclosure PE603803 is enclosed within the container PE902555 at this location in this document.

The enclosure PE603803 has the following characteristics:

ITEM_BARCODE = PE603803
CONTAINER_BARCODE = PE902555
NAME = Well Completion Log
BASIN = GIPPSLAND
PERMIT = VIC/L5
TYPE = WELL
SUBTYPE = COMPLETION_LOG
DESCRIPTION = Well Completion Log (enclosure from WCR vol.2) for Teraglin-1
REMARKS =
DATE_CREATED = 2/06/83
DATE_RECEIVED = 26/05/87
W_NO = W814
WELL_NAME = TERAGLIN-1
CONTRACTOR =
CLIENT_OP_CO = ESSO AUSTRALIA LIMITED

(Inserted by DNRE - Vic Govt Mines Dept)