WCR VOL 2

TERAKIHI-1

W1025

ESSO EXPLORATION AND PRODUCTION AUSTRALIA INC.

WELL COMPLETION REPORT

PG KM

TERAKIHI-1

VOLUME 2

INTERPRETED DATA

VIC/P24

ESSO AUSTRALIA RESOURCES LIMITED

COMPILED BY: D. L. E. MORETON

JUNE 1990

0690RP4:4

CONTENTS

FIGURES

APPENDICES

ENCLOSURES

GEOLOGICAL AND GEOPHYSICAL ANALYSIS

1. SUMMARY OF WELL RESULTS

Formation/Horizon	Pre-drill Depth (mSS)	Post Drill Depth (mSS)	(MKB)
Gippsland Limestone (seafloor)	-390	-403	424
Top of Latrobe Group	-2848	-2815	2836
TD	-2950	-3019	3040m

2. INTRODUCTION

The objective of the Terakihi-1 exploration well was to test an erosional remnant mapped on the top of Latrobe Group and sealed by Lakes Entrance marls and limestones. The well encountered an 18.5m gross oil column reservoired in T. longus aged sediments. Wireline tests recovered a 51° API gravity oil from two sample points.

The well was cased and suspended as a successful exploration well at a total depth of 3040mRKB. The Terakihi-1 well represents the Year 3 commitment well for the VIC/P24 permit.

Stratigraphy

Terakihi-1 was prognosed to encounter marginal marine sediments of the 54.5 to 63 million year sequences based on a sequence stratigraphic correlation between Mackerel-1 and Hapuku-1 together with seismic geometry which suggested that Terakihi-1 would encounter younger section within the Latrobe Group that was seen at the top of Latrobe Group at Hapuku-1.

Terakihi-1 encountered the top of Latrobe Group at 2836mRKB, below which 200m of "Coarse Clastics" were encountered. The section consists of sandstones, siltstones and shales, which palynological data suggest is all Upper T. longus in age. The lack of coals and the presence of the dinoflagellate M. druggii suggest a marginal marine environment. This is confirmed with facies analysis of the core with common trough cross bedding and well sorted grains suggesting a high

energy environment and is probably upper shoreface.

The identification of the M. druggii dinoflagellate zone suggests that these sediments belong to the 67 to 68 million year sequences. The 68 million year sequence boundary is interpreted at 2946mRKB.

Structure

The pre-drill interpretation of the structure being an erosional remnant was confirmed. Pre-drill the intra-Latrobe was interpreted dipped gently to the northeast negating the possibility of an intra-Latrobe trap.

Dipmeter interpretation suggests that this interpretation is correct.

Hydrocarbons

Terakihi-1 discovered an 18.5m gross oil column below the top of Latrobe Group at 2836mRKB. An oil-water contact is clearly evident at 2854.5mRKB. 18.3m of net sand occur within the oil zone, the calculated net to gross being 99%. Gamma-ray readings are anomalously high in places due to the presence of some radio active minerals: Porosities determined from log analysis average 21.6% and range between 15% and 26%.

Samples of oil from the column recovered a light 51° API crude oil with a very high gas at oil ratio. The oil is similar in character to the Blackback/Hapuku top of Latrobe oil which may suggest a similar source or migration pathway.

3. SUMMARY OF WELL RESULTS

The pre-drill Terakihi-1 interpretation was based on a grid of GH88B data and G89AB 2D seismic lines. The G89AB 2D lines were taken from the Blackback 3D seismic survey at 500m intervals and processed to a preliminary stack for the Terakihi interpretation. Data quality on these preliminary stacks generally were as good and in some areas better than the existing data in the area.

Post-drill Terakihi-1, top of Latrobe was intersected at 2815mSS, 33m high to the interpretation based on the G89AB seismic data. The factors contributing to the depth error between actual and predicted are:

- The seismic time pick for top of Latrobe was about 20 msec deeper (longer) than the actual time.

- The average interval velocity from seafloor to top of Latrobe was about 50 m/sec faster than the pre-drill prognosis.

- Depth to seafloor at the Terakihi-1 location was about 13m deeper than the prognosis from the G89AB interpretation.

4. DISCUSSION

Terakihi-1 was a successful exploration well. Post-drill mapping suggests that the structure is full to spill. The age at the reservoir section is older than that predicted pre-drill. Poor structural control from the G88A and older data made correlations to Mackerel-1 and Hapuku-1 difficult.

FIGURES

TERAKIHI-1

LOCALITY MAP

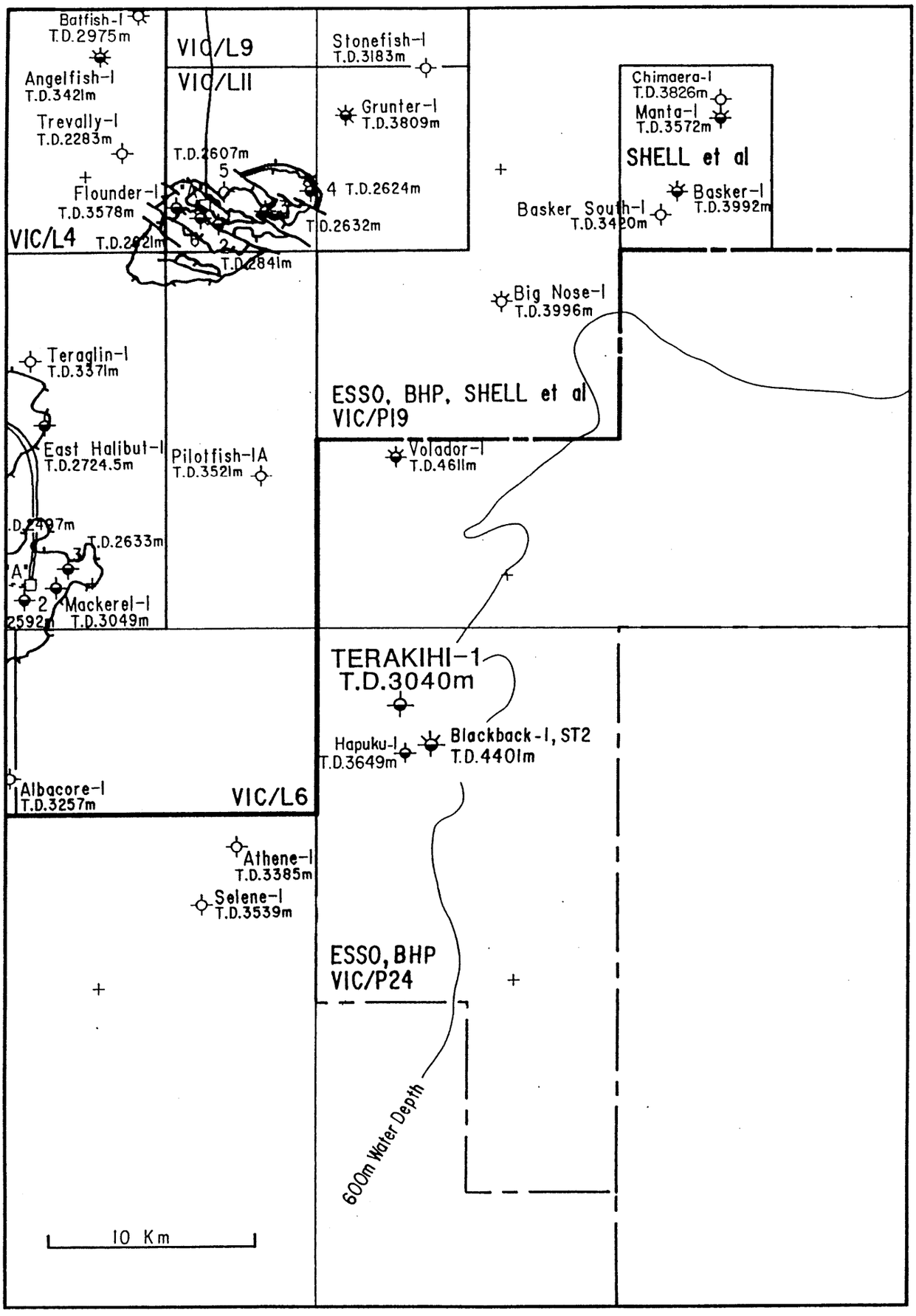


Figure 1

Dwg.2464/C

APPENDIX 1

APPENDIX-1

PALYNOLOGICAL ANALYSIS OF TERAKIHI-1
GIPPSLAND BASIN.

by

A.D. PARTRIDGE
ESSO AUSTRALIA LTD.

Esso Australia Ltd.
Palaeontology Report 1990/13

July, 1990

INTERPRETED DATA

INTRODUCTION

Twenty-one sidewall core samples were processed from Terakihi-1 and examined for spores, pollen and microplankton. Palynomorph concentrations were mostly low to very low from the generally low quantities of oxidized organic residue extracted from the samples. As a consequence only moderate diversity spore-pollen assemblages (average 15.6 species per productive sample), and very low diversity microplankton assemblages (1 to 3 species per sample), were recorded from a majority of samples. Overall the preservation of the palynomorphs was fair to good, and in some cases very good.

Lithological units and palynological zones from base of Lakes Entrance Formation to T.D. are given in the following summary. Interpretative data with indentification of zones and confidence ratings are recorded in Table-1 and basic data on residue yields, preservation and diversity are recorded in Table-2. All species which can be identified with binomial names are tabulated on the accompanying range chart.

PALYNOLOGICAL SUMMARY OF TERAKIHI-1

AGE	UNIT/FACIES	SPORE-POLLEN ZONES (Dinoflagellate Zones)	DEPTH RANGE (mKB)
Oligocene	Lakes Entrance	*P. tuberculatus*	2826.5
	2836.0m		
Maastrichtian	Latrobe Group (Coarse clastic facies)	Upper *T. longus* (*M. druggii*)	2837.0-3005.0 2872.0-3005.0
	T.D. 3040.0m		

GEOLOGICAL COMMENTS

1. The entire Latrobe Group section intersected in Terakihi-1 lies within the Upper *T. longus* Zone. Although the key dinoflagellates were not found in every sample it is considered that the section is entirely marine and lies wholly within the *M. druggii* Dinoflagellate Zone.

2. The Latrobe Group section in Terakihi-1 correlates with the sample intervals 3008-3142mMD (Measured Depth) in Blackback-1 Sidetrack-2 and 2937.7-3068.7m (9638-10068 ft) in Hapuku-1 (Partridge, 1975, 1990).

3. The above sections in all three wells are considered marine because they contain microplankton and lack the coals typical of the non-marine or coastal plain environments found in equivalent age sediments in wells to the west. The lithology of the section in Terakihi-1 differs however from the other two wells in lacking obvious glauconite, which is described as an accessory mineral in the sidewall core samples from both Hapuku-1 and Blackback-1 Sidetrack-2. From analogy with younger parts of the Latrobe Group, where glauconite is only found in the more condensed sections, it is suggested the depositional rate in Terakihi-1 is higher than in either of the other two wells. It is speculated therefore that the erosion at the top of the Latrobe may have cut well down into the Upper *T. longus* Zone at Terakihi-1.

4. No Gurnard Formation or section equivalent to the "*N. asperus*" Channel Fill in Blackback-1 and Hapuku-1 is present in Terakihi-1. The time break at the top of Latrobe unconformity at this location extends from the Maastrichtian to probably the late Oligocene an interval of 37+ million years.

BIOSTRATIGRAPHY

Zone and age-determinations have been made using criteria proposed by Stover & Partridge (1973), Helby *et al.* (1987) and unpublished observations made on Gippsland Basin wells drilled by Esso Australia Ltd.

Author citations for most spore-pollen species can be sourced from Stover & Partridge (1973), Helby *et al.* (1987) and Dettmann & Jarzen (1988) or other references cited herein. Species names followed by "ms" are unpublished manuscript names. Author citations for dinoflagellates can be found in Lentin & Williams (1985, 1989).

Upper *Tricolpites longus* Zone: 2837.0-3005.0 metres Maastrichtian.

Twelve of the eighteen sidewall cores analysed from the Latrobe Group could be confidently assigned to the Upper subdivision of the *T. longus* Zone because they contained either or both of *Stereisporites (Tripunctisporis)* sp. or/and an abundance of *Gambierina rudata*, in association with a variety of other *T. longus* Zone index species. These latter can be divided between species which are repesented in most samples and which may be either frequent or common, and those species which are present in only a few samples and are rare to very rare. Examples of species representing the former group and their ranges are: *Proteacidites clinei* ms (2839.5-3005m), *P. reticuloconcavus* ms (2886.2-3005m), *Tricolpites confessus* (2837.5-3005m). Examples of rare species which are restricted to the Upper and Lower subdivisions of the *T. longus* Zone, and the samples from which they are recorded are: *Forcipites* (al. *Tricolpites*) longus (2837.0m), *Grapnelispora evansii* (fragments of processes identified at 2837.0m and 2839.5m), *Proteacidites wahooensis* ms (2892.9m, 3005.0m), *Pseudowinterapollis* (al. *Gephrapollenites*) *wahooensis* (2839.5m), and *Quadraplanus brossus* (2892.9m). Examples of rare species which range no younger than the Upper *T. longus* Zone, and the samples from which they are recorded are: *Camarozonosporites horrendus* ms (2837.0m), *Proteacidites otwayensis* ms (2886.2), *P. palisadus* (2892.9m, 3005.0m), *P. retiformis* (3005.0m), *Tetradopollis securus* ms (2892.9m), *Tricolporites lilliei* (2875.5m, 3005.0m), and *Triporopollenites sectilis* (2839.5m, 3005.0m). Finally, *Tetracolporites verrucosus* (2839.5m, 2894.1m) is an example of a rare species that commences in the Lower *T. longus* Zone and ranges into the Paleocene *L. balmei* Zone. Overall the zone is of high diversity, even though average diversity in individual samples is only moderate because of the low residue yields recovered. In particular those

samples over this interval given as either indeterminate or just *T. longus* Zone reflect the situation where the yields were too low for reliable age determinations.

Manumiella druggii **Dinoflagellate Zone: 2872.0-3005.0 metres** **Maastrichtian.**

Twelve of the eighteen samples in the Latrobe Group also contained members of the *Manumiella druggii* species complex. *Manumiella conorata* was the most frequent type, followed by *M. druggii* with *M. seelandica* being the rarest of the indicator species for this zone. Although the entire section is obviously marine and the dinoflagellates are consistently present in low numbers the overall diversity of the section is surprisingly low. Other microplankton species present are restricted to *Micrhystridium* spp. in several samples, *Palaeocystidinium golzowense* at 2892.9m, and the *Alterbidinium acutulum* (Wilson) Lentin & Williams 1985 in the deepest sample at 3005.0m. This last species is an interesting occurrence as it is an important zone fossil in New Zealand for the interval below the *M. druggii* Zone, although it does range up into the latter zone (Wilson, 1984, Helby *et al.* 1987). It has previously been tentitatively identified in the Gippsland Basin in Pisces-1 and from a sea floor grab sample from the Bass Canyon (Marshall, 1990).

Proteacidites tuberculatus **Zone: 2826.5 metres** **Oligocene.**

The samples at 2826.5m is assigned to the *P. tuberculatus* Zone because of the common occurrence of simple spherical to ellipsoidal spinose dinoflagellates with a precingular (3'' only) archeopyle which has been called *Protoellipsodinium simplex* ms. This species is "typically" common from a stratigraphic position high within the Lakes Entrance Formation to somewhere in the Gippsland Limestone. The associated spore-pollen assemblage is not diagnostic and consists exclusively of long ranging species, but overall is conformable to this zone determination. The key spore *Cyatheacidites annulatus* was not found in the very low yield available from the sample, and consequently only a poor confidence rating can be given to the sample. The extremely low yields from the immediately underlying and overlying sidewall cores could not be confidently assigned to a zone, but the few species that were recorded are certainly consistent with a *P. tuberculatus* Zone age, and this is supported by the lithologies of the samples.

REFERENCES

DETTMANN, M.E. & JARZEN, D.M., 1988. Angiosperm pollen from uppermost Cretaceous strata of southeastern Australia and the Antarctic Peninsula. *Mem. Ass. Australas. Palaeontols 5*, 217-237.

HELBY, R., MORGAN, R. & PARTRIDGE, A.D., 1987. A palynological zonation of the Australian Mesozoic. *Mem. Ass. Australas. Palaeontols 4*, 1-94.

LENTIN, J.K. & WILLIAMS, G.L., 1985. Fossil dinoflagellates: Index to genera and species, 1985 Edition. *Canadian Tech. Rep. Hydrog. Ocean Sci. 60*, 1-451.

LENTIN, J.K. & WILLIAMS, G.L., 1989. Fossil dinoflagellates: Index to genera and species, 1989 Edition. *AASP Contribution Series No. 20*, 1-473.

MARSHALL, N. G., 1990. Campanian Dinoflagellates from southeastern Australia. *Alcheringa 14*, 1-38.

PARTRIDGE, A.D., 1975. Palynological analysis of Hapuku-1, Gippsland Basin. *Esso Australia Ltd. Palaeo. Rept. 1975/13*, 9p.

PARTRIDGE, A.D., 1990. Palynological analysis of Blackback-1 and its Sidetracks 1 and 2 in permit VIC/P24, Gippsland Basin. *Esso Australia Ltd. Palaeo. Rept. 1990/4*, 1-22.

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

WILSON, G.J., 1984, New Zealand Late Jurassic to Eocene dinoflagellate biostratigraphy - a summary. *Newsl. Stratigr. 13*, 104-117.

TABLE-1: INTERPRETATIVE PALYNOLOGICAL DATA TERAKIHI-1, GIPPSLAND BASIN

SAMPLE TYPE	DEPTH (metres)	SPORE-POLLEN ZONE	DINOFLAGELLATE ZONE	CONFIDENCE RATING	COMMENT
SWC 30	2820.5	Indeterminate			Probably Lakes Entrance Formation
SWC 29	2826.5	*P. tuberculatus*	*(P. simplex)*	2	
SWC 28	2834.0	Indeterminate			Virtually barren.
SWC 27	2837.0	Upper *T. longus*		1	LAD *Forcipites longus*, *Gambierina* spp. 8%
SWC 26	2839.5	Upper *T. longus*			*Proteacidites clinei*, *Triporopollenites sectilis* present.
SWC 24	2872.0	Indeterminate	*M. druggii*	1	*Manumiella conoratum* present.
SWC 23	2875.5	Upper *T. longus*	*M. druggii*	0	*Tricolporites lilliei* present.
SWC 22	2886.2	Upper *T. longus*	*M. druggii*	0	
SWC 21	2891.0	Upper *T. longus*	*M. druggii*	0	
SWC 20	2892.9	Upper *T. longus*	*M. druggii*	0	*Quadraplanus brossus* present.
SWC 19	2894.1	Upper *T. longus*		2	
SWC 15	2915.3	Upper *T. longus*		1	*Gambierina* spp. 15%
SWC 14	2942.8	Indeterminate			Barren.
SWC 13	2947.0	Indeterminate			
SWC 11	2954.5	Upper *T. longus*	*M. druggii*	1	
SWC 9	2959.0	Upper *T. longus*	*M. druggii*	0	
SWC 7	2971.5	*T. longus*	*M. druggii*	1	
SWC 5	2983.2	*T. longus*	*M. druggii*	1	
SWC 4	2990.5	Upper *T. longus*	*M. druggii*	1	
SWC 3	2994.0	*T. longus*	*M. druggii*	1	
SWC 2	3005.0	Upper *T. longus*	*M. druggii*	0	*Alterbidinium acutula* present.

LAD = Last Appearance Datum
FAD = First Appearance Datum

PALYNOLOGY DATA SHEET

BASIN: GIPPSLAND ELEVATION: KB: +21 m GL: -403 m

WELL NAME: TERAKIHI-1 TOTAL DEPTH: 3040 m

AGE	PALYNOLOGICAL ZONES	HIGHEST DATA				LOWEST DATA			
		Preferred Depth	Rtg	Alternate Depth	Rtg	Alternate Depth	Rtg	Preferred Depth	Rtg
NEOGENE	*T. pleistocenicus*								
	M. lipsis								
	C. bifurcatus								
	T. bellus								
	P. tuberculatus							2826.5	2
PALEOGENE	Upper *N. asperus*								
	Middle *N. asperus*								
	Lower *N. asperus*								
	P. asperopolus								
	Upper *M. diversus*								
	Middle *M. diversus*								
	Lower *M. diversus*								
	Upper *L. balmei*								
	Lower *L. balmei*								
LATE CRETACEOUS	Upper *T. longus*	2837	1	2875.5	0			3005	0
	Lower *T. longus*								
	T. lilliei								
	N. senectus								
	T. apoxyexinus								
	P. mawsonii								
	A. distocarinatus								
EARLY CRET.	*P. pannosus*								
	C. paradoxa								
	C. striatus								
	C. hughesii								
	F. wonthaggiensis								
	C. australiensis								

COMMENTS: Depths in metres.

Manumiella druggii Dinoflagellate Zone: 2872-3005 m

CONFIDENCE RATING:

0: 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 and/or microplankton.

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 abetter 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: A.D. Partridge DATE: July 1990

DATA REVISED BY: _____ DATE: _____

BASIC DATA

TABLE-2: BASIC DATA

RANGE CHART

TABLE-2: BASIC PALYNOLOGICAL DATA TERAKIHI-1, GIPPSLAND BASIN

SAMPLE TYPE	DEPTH (metres)	LAB. NO.	LITHOLOGY	RESIDUE YIELD	PALYNOMORPH CONCENTRATION	PRESERVATION	NO. OF S-P SPECIES*	MICROPLANKTON ABUNDANCE	NO. SPECIES*
SWC 30	2820.5	78314 D	Calcareous Claystone	Very Low	Very Low	Fair	2+	Very Low	2+
SWC 29	2826.5	78314 C	Calcareous Claystone	Very Low	Very Low	Fair-good	8+	Very Low	3+
SWC 28	2834.0	78314 B	Calcareous Claystone	Very Low	Very Low	Good	NR	Very Low	1
SWC 27	2837.0	78314 A	Cal. Siltstone, tr. glauconite	High	Low	Good	21+		
SWC 26	2839.5	78313 Z	Very fine pyritic sandstone	Moderate	Low	Poor-good	20+	Very Low	1
SWC 24	2872.0	78313 X	Medium grey sandstone	Very Low	Very Low	Fair	NR	Very Low	1
SWC 23	2875.5	78313 W	Dark grey siltstone	Moderate	Low	Good	19+	Low	2
SWC 22	2886.2	78313 V	Medium grey siltstone	Very Low	Very Low	Fair	7+	Very Low	1
SWC 21	2891.0	78313 U	Dark grey-brown sandstone	Moderate	Low	Fair-good	18+	Very Low	1
SWC 20	2892.9	78313 T	Dark grey siltstone	High	High	Poor-good	32+	Low	3
SWC 19	2894.1	78313 S	Medium grey sandstone	Moderate	Low	Fair-good	9+		
SWC 15	2915.3	78313 O	Dark grey-brown siltstone	Moderate	Low	Good	21+	Very Low	1
SWC 14	2942.8	78313 N	Grey sandstone	Very Low	Barren				
SWC 13	2947.0	78313 M	Sandstone grading to siltstone	Low	Low	Fair-good	7+		
SWC 11	2954.5	78313 K	Dark grey-brown siltstone	Low	Low	Fair-good	16+	Very Low	1
SWC 9	2959.0	78313 I	Dark grey-brown siltstone	Low	Moderate	Good	12+	Moderate	2
SWC 7	2971.5	78313 G	Very fine med. grey sandstone	Low	Low	Good	9+	Low	1
SWC 5	2983.2	78313 E	Dark brown pyritic siltstone	Moderate	Low	Good	11+	Low	2
SWC 4	2990.5	78313 D	Argillaceous sandstone	Moderate	Low	Good	20+	Very Low	1
SWC 3	2994.0	78313 C	Glauconitic siltstone	Low	Very Low	Fair-good	5+	Low	3
SWC 2	3005.0	78313 B	Grey-brown sst. with tr. glauc.	Low	Low-High	Good	43+	Low	3+

* Diversity:
Very Low = 1- 5 species
Low = 6-10 species
Moderate = 11-25 species
High = 26-74 species
Very High = 75+ species

(ADP275)

PE900495

This is an enclosure indicator page.
The enclosure PE900495 is enclosed within the container PE902086 at this location in this document.

The enclosure PE900495 has the following characteristics:

ITEM_BARCODE	= PE900495
CONTAINER_BARCODE	= PE902086
NAME	= Palynological Range Chart
BASIN	= GIPPSLAND
PERMIT	= VIC/P24
TYPE	= WELL
SUBTYPE	= DIAGRAM
DESCRIPTION	= Palynological Range Chart for Terakihi-1
REMARKS	=
DATE_CREATED	= 31/07/90
DATE_RECEIVED	=
W_NO	= W1025
WELL_NAME	= TERAKIHI-1
CONTRACTOR	=
CLIENT_OP_CO	= ESSO AUSTRALIA LIMITED

(Inserted by DNRE - Vic Govt Mines Dept)

APPENDIX 2

PE600940

This is an enclosure indicator page.
The enclosure PE600940 is enclosed within the container PE902086 at this location in this document.

The enclosure PE600940 has the following characteristics:

ITEM_BARCODE	= PE600940
CONTAINER_BARCODE	= PE902086
NAME	= Quantitative Log Analysis
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= REPORT
DESCRIPTION	= Quantitative Log Analysis (enclosure from WCR vol.2) for Terakihi-1
REMARKS	=
DATE_CREATED	= 31/07/90
DATE_RECEIVED	= 31/07/90
W_NO	= W1025
WELL_NAME	= Terakihi-1
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE600941

This is an enclosure indicator page.
The enclosure PE600941 is enclosed within the container PE902086 at this location in this document.

The enclosure PE600941 has the following characteristics:

ITEM_BARCODE	= PE600941
CONTAINER_BARCODE	= PE902086
NAME	= Quantitative log
BASIN	= GIPPSLAND
PERMIT	= VIC/P24
TYPE	= WELL
SUBTYPE	= WELL_LOG
DESCRIPTION	= Quantitative log (enclosure from WCR vol.2) for Terakihi-1
REMARKS	=
DATE_CREATED	= 24/04/90
DATE_RECEIVED	= 31/07/90
W_NO	= W1025
WELL_NAME	= Terakihi-1
CONTRACTOR	= SOLAR
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE600945

This is an enclosure indicator page.
The enclosure PE600945 is enclosed within the container PE902086 at this location in this document.

The enclosure PE600945 has the following characteristics:

ITEM_BARCODE	= PE600945
CONTAINER_BARCODE	= PE902086
NAME	= Quantitative log
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= WELL_LOG
DESCRIPTION	= Quantitative log (enclosure from WCR vol.2) for Terakihi-1
REMARKS	=
DATE_CREATED	= 13/07/90
DATE_RECEIVED	= 31/07/90
W_NO	= W1025
WELL_NAME	= Terakihi-1
CONTRACTOR	= SOLAR
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

APPENDIX 3

APPENDIX-3

GEOCHEMICAL REPORT

ON

TERAKIHI 1 WELL

GIPPSLAND BASIN

BY

B.J.BURNS

JUNE 1990

Analyses by
H. Schiller

LIST OF TABLES AND FIGURES

INTRODUCTION

Terakihi 1 was located approx. 5-6 km from the Blackback 1-ST2 and Hapuku 1 wells and it penetrated only 204m of Latrobe Group sediments. Most of this Latrobe section was sandy with only a few minor shale units of questionable source significance. Since the equivalent section had been analysed in Blackback and Hapuku wells it was decided that no additional source rock analyses would be carried out in this well. However the oil that was recovered in Terakihi 1 was analysed and compared with oils from Blackback and Hapuku in order to ascertain if the three fields shared a common oil column at the Top Latrobe level.

RESULTS

Oil recovered from Terakihi 1 is a light oil with an API Gravity of 50.2 degrees which is slightly lighter than the Top Latrobe oils from the nearby Blackback 1-ST2 (48.5 API) and Hapuku 1 (46.1 API) wells (Table 1).

Whole oil chromatograms of Top Latrobe oils from Terakihi 1 2851m, Blackback 1-ST2 2908m, and Hapuku 1 2836.5m are shown in Figures 1-3. The Blackback and Hapuku oils are very similar to each other, both in the shape of the overall 'envelope' of n-alkanes and also in the finer detail of the smaller intervening peaks (eg area "a"). However the Terakihi oil has a slightly different composition as seen by the shape of the n-alkane envelope in the C_{18} - C_{27} range. Terakihi has a definite "less waxy" content.

But in other respects, such as the finer peaks of area "a", Terakihi is almost identical to both Blackback and Hapuku. For example, in Table 1 a number of component ratios are listed for the three oils and the close similarities are apparant. This raises the question as to how significant is the difference in "waxy" composition? This latter difference is believed to be real and not just an artifact of analytical proceedures or sample collection/storage. This would imply that the source area feeding into Terakihi contains more waxy material, or is slightly less mature, than the source feeding Hapuku/Blackback.

In answer to the more important question namely "Are the three oils part of a single reservoir?" the present geochemical data cannot provide a definitive answer. The Top Latrobe oils in Blackback and Hapuku oils are identical, which is consistant with the current geological picture of a common reservoir. In Terakihi, the small, but real, differences in the C_{18-23} content suggests that it could be a separate accumulation. (This is based on the assumption that, under normal reservoir conditions, diffusion within a continous oil column would tend to smoothe out the sort of C_{18-23} differences noted above in relatively short geological time.) However, if some sort of permeability restriction, such as a facies change or faulting, was present between Terakihi and Blackback/Hapuku it would be possible to preserve such a subtle chemical difference from one side of of a reservoir to the other.

(BJB154)

TABLE 1

OIL API and HYDROCARBON RATIOS

WELL	DEPTH (m)	API GRAVITY	HYDROCARBON RATIOS						
			Pr/Ph	Pr/nC17	Ph/nC18	TMTD/Pr	Tol/nC7	nC7/MCH	Benz/Tol
Terakihi 1	2851.0	50.2	7.22	0.50	0.08	0.68	0.79	0.49	0.82
Blackback 1–ST2	2908.0	48.5	6.91	0.49	0.08	0.66	0.68	0.52	0.82
Hapuku 1	2836.5	46.1	6.83	0.48	0.07	0.67	0.71	0.46	0.90

Pr = Pristane
Ph = Phytane
TMTD = trimethyltetradecane
Tol = Toluene
Benz = Benzene

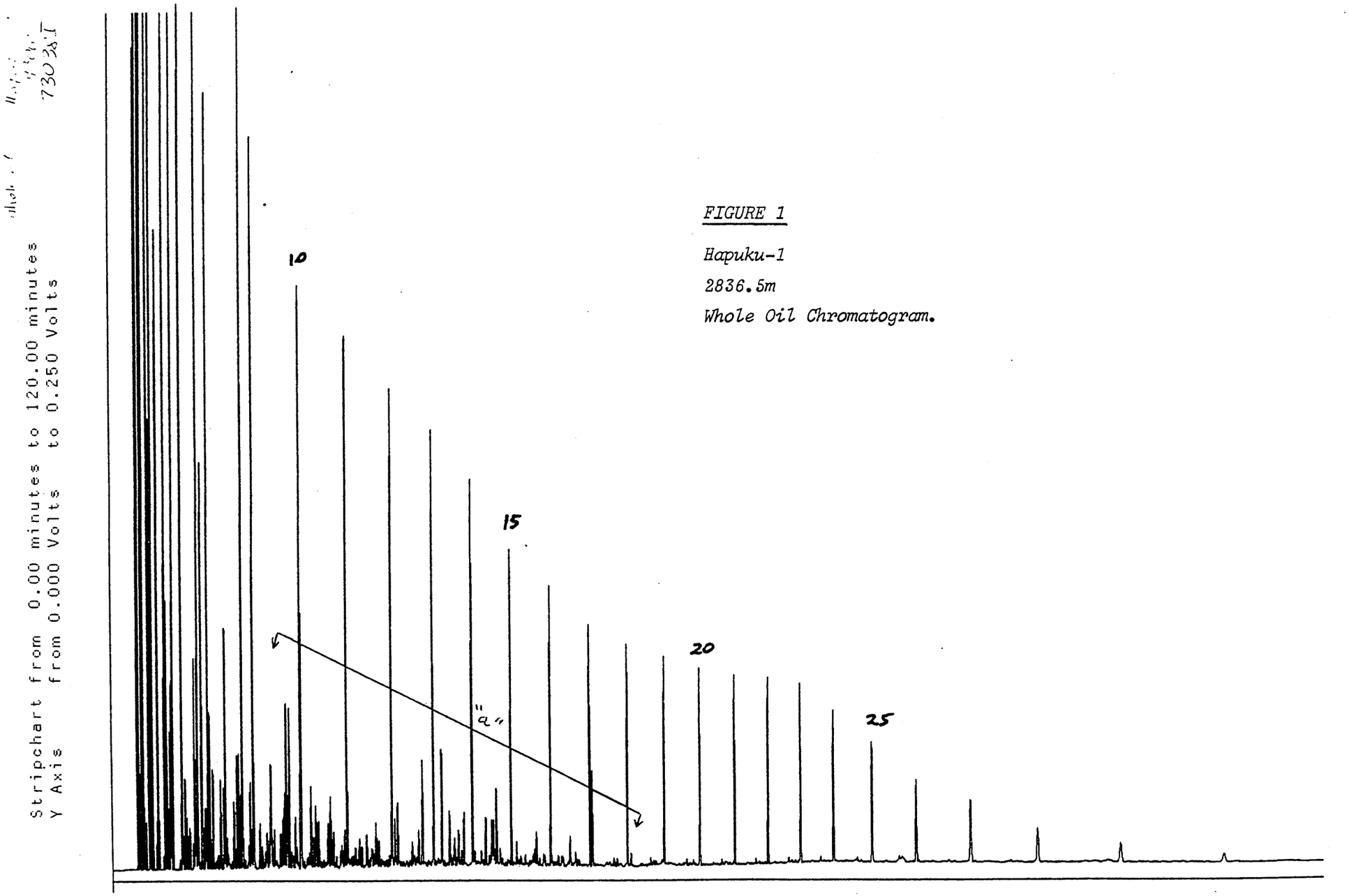


FIGURE 1

Hapuku-1

2836.5m

Whole Oil Chromatogram.

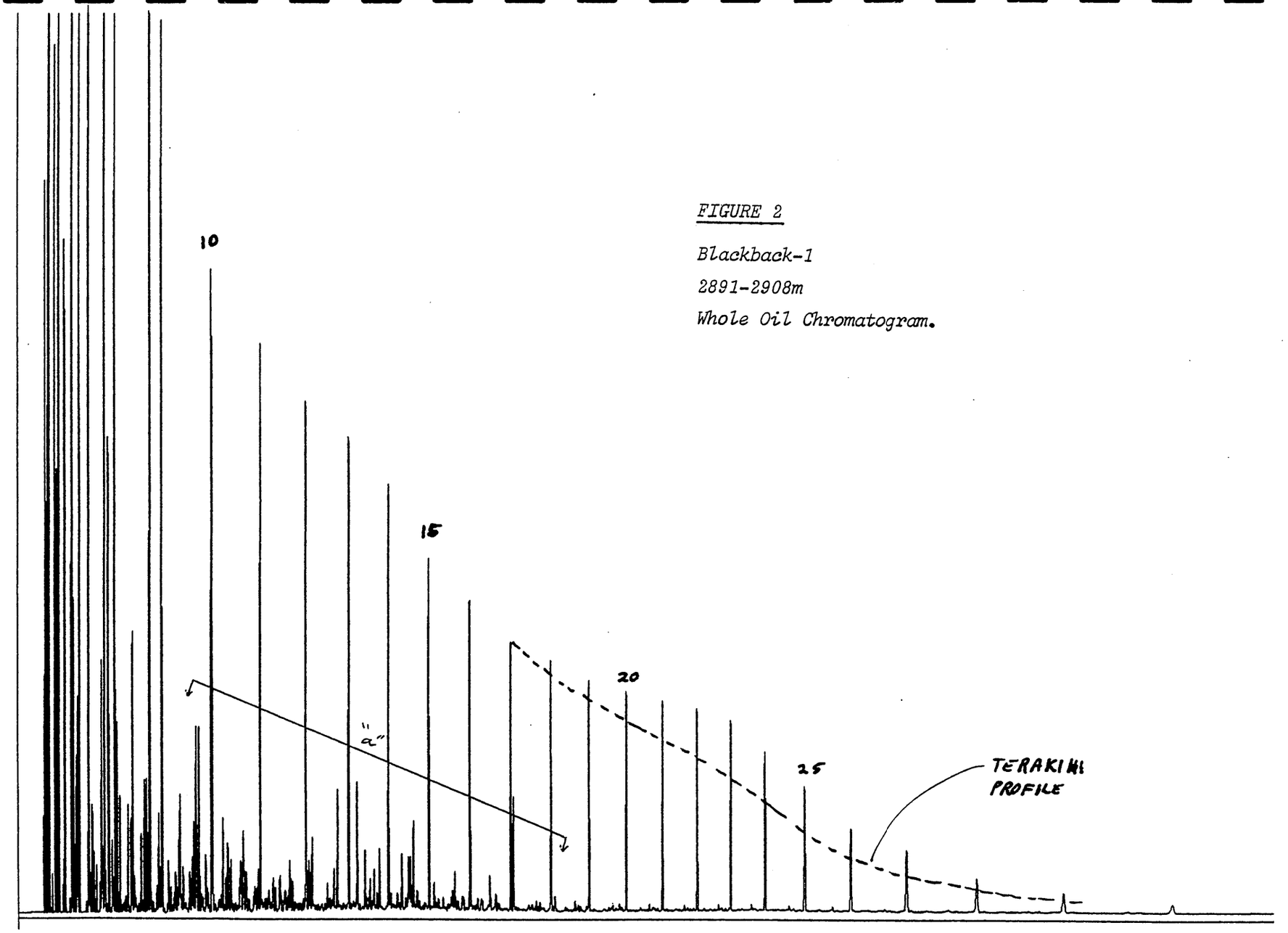


FIGURE 2

Blackback-1

2891-2908m

Whole Oil Chromatogram.

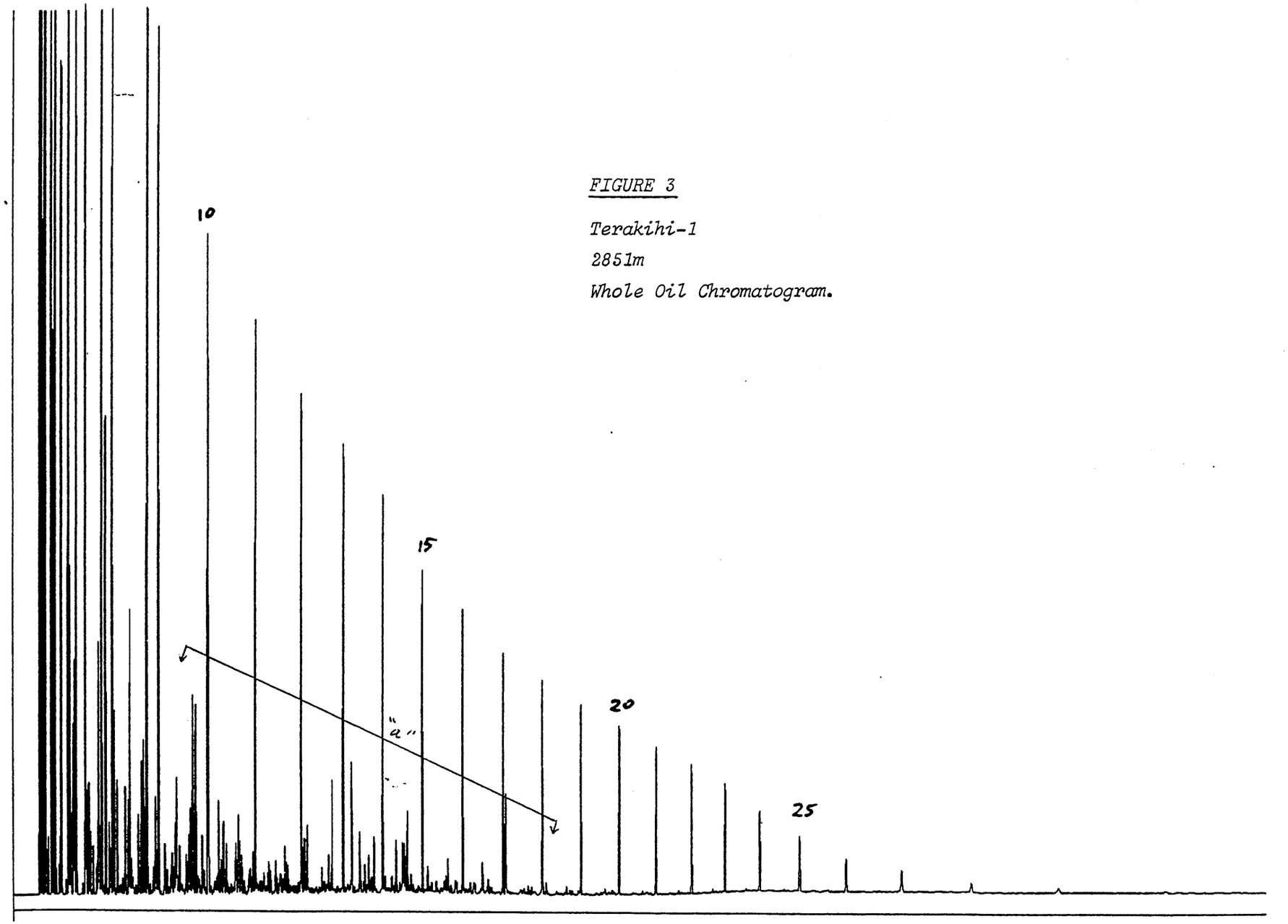


FIGURE 3

Terakihi-1

2851m

Whole Oil Chromatogram.

APPENDIX 4

APPENDIX 4

TERAKIHI RFT REPORT

A.B.Thomson
April 1990.

TERAKIHI-1 RFT REPORT

SUMMARY

The results of the RFT survey in the Terakihi-1 well are summarised in Table 1. The RFT program indicated a 17 metre oil column at the Top of Latrobe. Two oil samples were taken from the Top of Latrobe oil accumulation.

RESULTS

A total of 9 RFT pretest seats were attempted in the Top of Latrobe interval in Terakihi-1 on the 15th of April 1990. The Terakihi RFT program consisted of 1 pretest/sample run and one sample only run. All 9 pretests were successful. The results of the pretest program are summarised on Table 1.

The RFT data indicates an OWC at -2834.5 m TVDSS which agrees with the OWC picked off the open hole logs at -2834.5 m TVDSS. Figure 1 shows the RFT interpretation for the Top Latrobe interval. A drawdown of 60 psi from the original Gippsland Basin aquifer gradient was seen in the water directly below the oil. This shows that the Terakihi oil accumulation is in good communication with the basin wide aquifer system.

The two oil samples were taken, one at 2841.0 m MDKB (-2820 m TVDSS) the other at 2851.0 m MDKB (-2840 m TVDSS). Both samples had an identical recovery of 97 cu.ft. of gas and 14.2 litres of oil from the 6 gallon chamber. The GOR was 1230 SCF/STB. The 1 gallon chamber from both samples was preserved. Recovery of oil from the sample taken at 2841 m MDKB has established high proved oil at -2820 m TVDSS.

TABLE 1
TERAKIHI-1 OPEN-HOLE RFT PRESSURE DATA
APRIL 15TH 1990

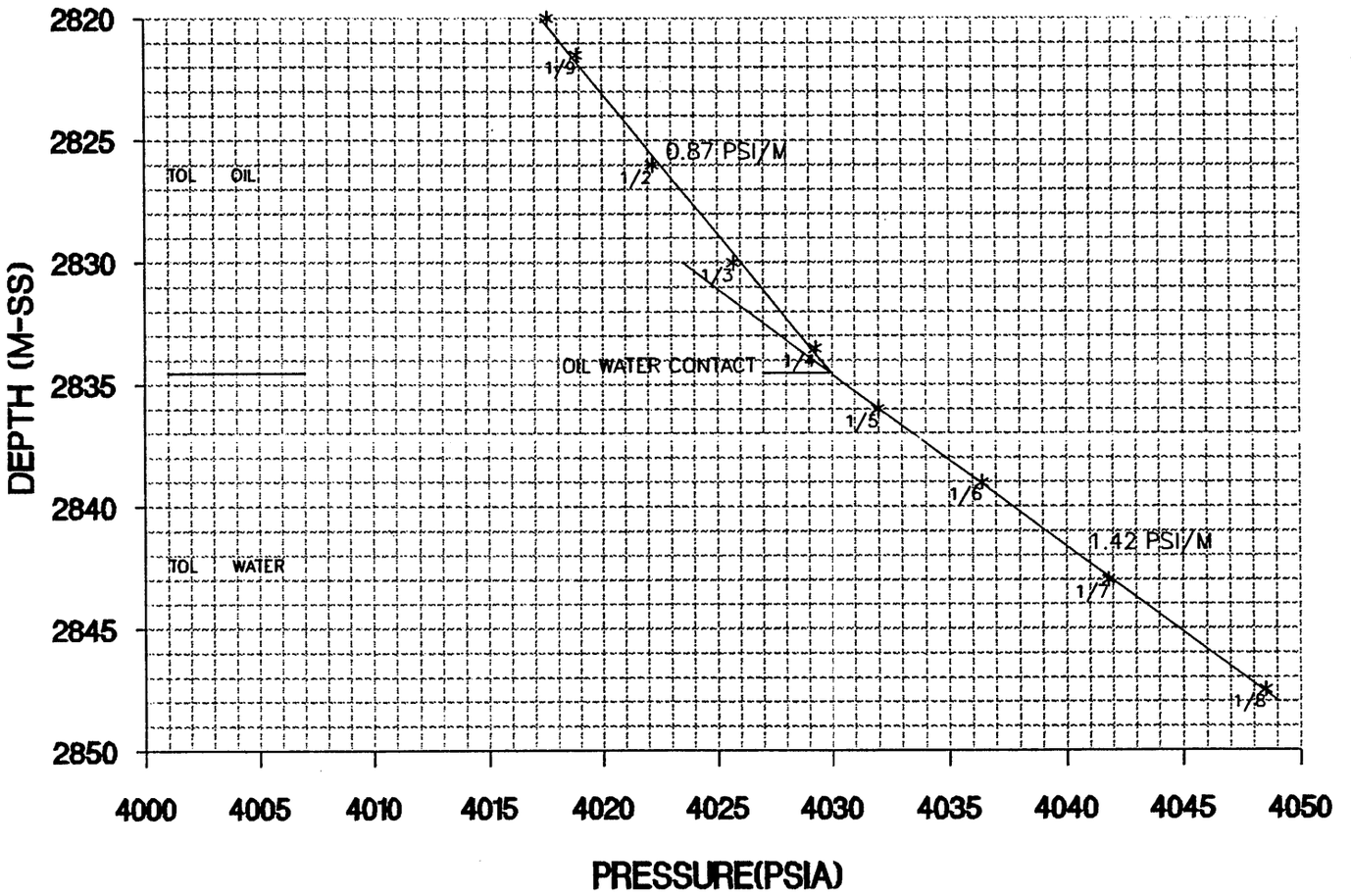
ZONE OR SAND=TOL

RUN \SEAT	DEPTH MEASURED (M MDRT)	ZONE OR SAND	ASSUMED FORMATION FLUID	DEPTH TVD (M SS)	FORMATION PRESSURE (PSIA)	SEAT VALIDITY	CALC. PT. TO PT. GRADIENT	LEAST SQRS FIT GRAD. FOR ZONE	ASSUMED HYDRAULIC GRADIENT
1/1	2841.0	TOL	OIL	2820.0	4017.6	GOOD	.	0.851	0.870
1/9	2842.5	TOL	OIL	2821.5	4018.9	GOOD	0.867	0.851	0.870
1/2	2847.0	TOL	OIL	2826.0	4022.2	GOOD	0.733	0.851	0.870
1/3	2851.0	TOL	OIL	2830.0	4025.7	GOOD	0.875	0.851	0.870
1/4	2854.5	TOL	OIL	2833.5	4029.3	GOOD	1.029	0.851	0.870
1/5	2857.0	TOL	WATER	2836.0	4032.0	GOOD	1.080	1.426	1.420
1/6	2860.0	TOL	WATER	2839.0	4036.4	GOOD	1.467	1.426	1.420
1/7	2864.0	TOL	WATER	2843.0	4041.8	GOOD	1.350	1.426	1.420
1/8	2868.5	TOL	WATER	2847.5	4048.5	GOOD	1.489	1.426	1.420

FIGURE 1

TERAKIHI-1 OPEN-HOLE RFT PRESSURE DATA

APRIL 15TH 1990



APPENDIX 5

AMDEL
CORE
SERVICES

29 June 1990

Esso Australia
Esso House
127 Kent Street
SYDNEY NSW 2000

Attention: Mr A P Whittle

REPORT: 008/044

CLIENT REFERENCE:	RSA 001104
MATERIAL:	Core Plugs
LOCALITY:	Bass Strait - Terakihi No 1
WORK REQUIRED:	Conventional Core Analysis

Please direct technical enquiries regarding this work to the signatory below under whose supervision the work was carried out.

RUSSELL R MARTIN
Laboratory Supervisor
Core Analysis/Special Core Analysis

Please reply to: PO Box 109 Eastwood SA 5063 Ph: (08)372 2834

Amdel Core Services Pty Limited
Incorporated in South Australia

29 June 1990

Esso Australia
Esso House
127 Kent Street
SYDNEY NSW 2000

Attention: Mr A P Whittle

FINAL DATA REPORT - CONVENTIONAL CORE ANALYSIS

REPORT: 008/044 - TERAKIHI NO 1

A total of eighty one (81) core plugs were received by Amdel Core Services, Adelaide from Esso's Terakihi No 1 well.

The following report includes tabular data of permeability to air, helium injection porosity, residual fluid saturations and density determinations. Data presented graphically includes a porosity versus permeability to air plot.

The data contained in this report has been derived by the following methods:

1. FLUID SATURATION

Samples were first placed in a Dean and Stark apparatus in which toluene (boiling point 110°C) vapour is condensed and collects in a calibrated side arm where it overflows and passes down onto the sample, leaching the residual hydrocarbons and water. The toluene and water are continually refluxed and water collects in the side arm. After drying the extracted core plug, the oil volume is determined as the difference between the core plug weight loss and the weight of accumulated water. Oil volume present is corrected by assuming an oil specific gravity of 0.85.

After drying the plugs at 100°C to complete Dean and Stark results, all plugs were dried at 50°C and 50% relative humidity prior to porosity and permeability to air determinations.

2. PERMEABILITY TO AIR

A plug sample is used for this measurement and is placed in a Hassler cell to which a confining pressure of 150 psig (1035 kpa) is applied; this pressure is used to prevent bypassing of air around the sides of the sample when the measurement is made. A known pressure is then applied to the upstream sample face and the differential pressure (between the upstream and downstream faces) is monitored at the downstream face. Permeability is then calculated using Darcy's Law.

3. HELIUM INJECTION POROSITY

The porosity of a clean dry core plug is determined as follows: it is first placed in a matrix cup where the grain volume is measured by helium injection: a known volume of helium at a known pressure is expanded into the matrix cup which contains the core plug; the resulting pressure is recorded and the unknown volume (that is, the volume of the grains) is determined using Boyle's Law. The bulk volume is determined by mercury immersion. The difference between the grain volume and the bulk volume is the pore volume and from this the porosity is calculated as the volume percentage of pores with respect to the bulk volume.

4. APPARENT GRAIN DENSITY

The apparent grain density is derived from the measurements described in Section 3, above, and is the ratio of the weight of the core plug divided by the grain volume determined as in paragraph 4.

5. POROSITY AND PERMEABILITY AT OVERBURDEN PRESSURE

To determine the porosity and permeability of the core plug at overburden pressure, the sample is first placed in a cylindrical neoprene sheath and this assembly is loaded into a triaxial hydrostatic cell. The pore volume is then determined at "ambient" pressure. The overburden pressure (the value as supplied by the client) is then applied to the sample in the cell and the pore volume reduction caused by this increase in pressure, is measured. By this means the actual overburden pore volume and the bulk volume can be determined and are used to derive a value for the porosity at the applied overburden pressure. The permeability at overburden pressure is then measured in the hydrostatic cell exactly as described in paragraph 2.

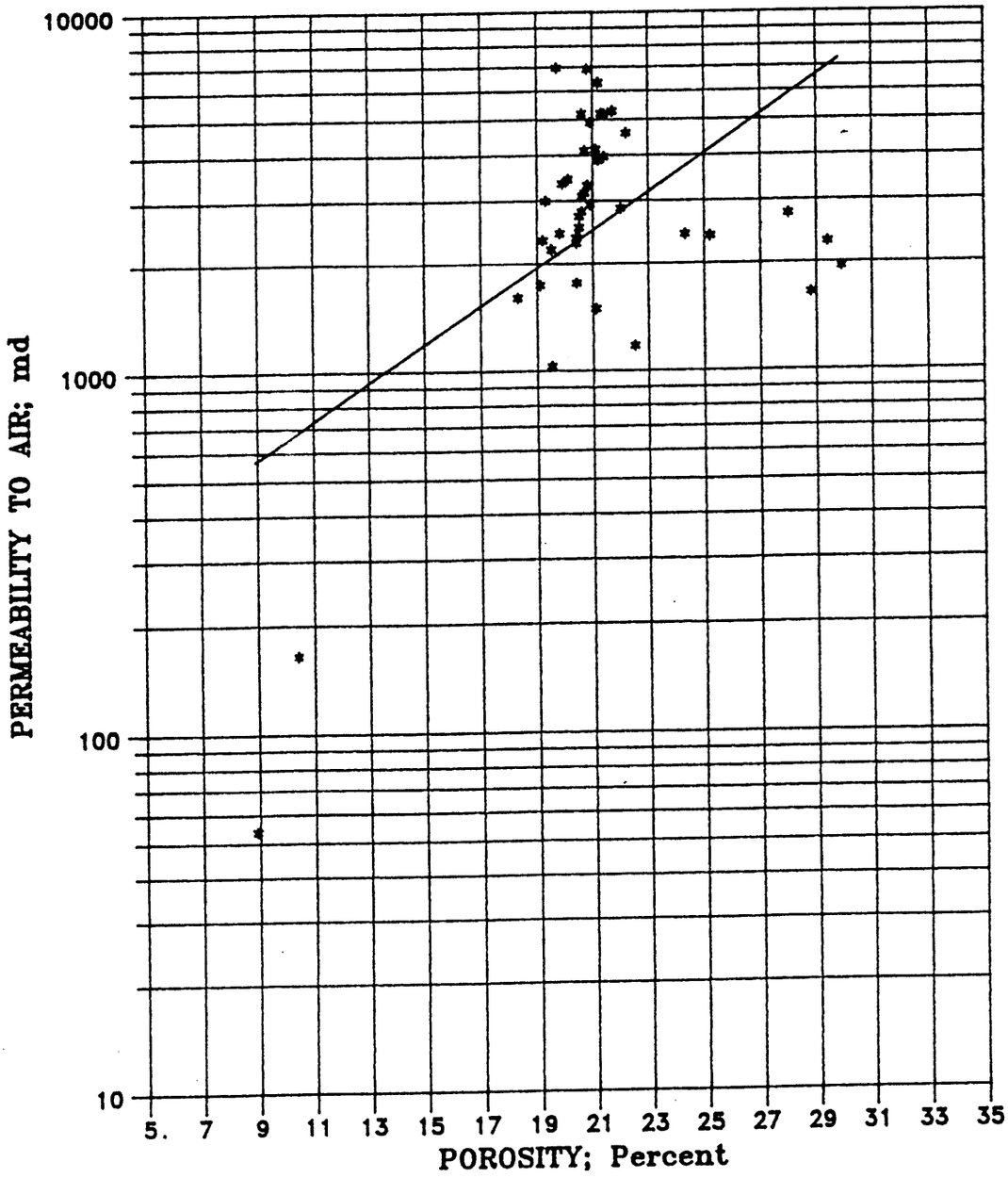
6. ABSOLUTE GRAIN DENSITY

An irregular fragment of sample which has been dried is used for this determination; the sample is coarsely crushed to approximately grain size or a little coarser and the granular material is then weighed. The volume of the grains is determined by conventional pycnometry and by this means the actual density of the grains is determined.

POROSITY vs PERMEABILITY

Company: Esso Australia
Well : Terakihi No. 1 Core No. 1

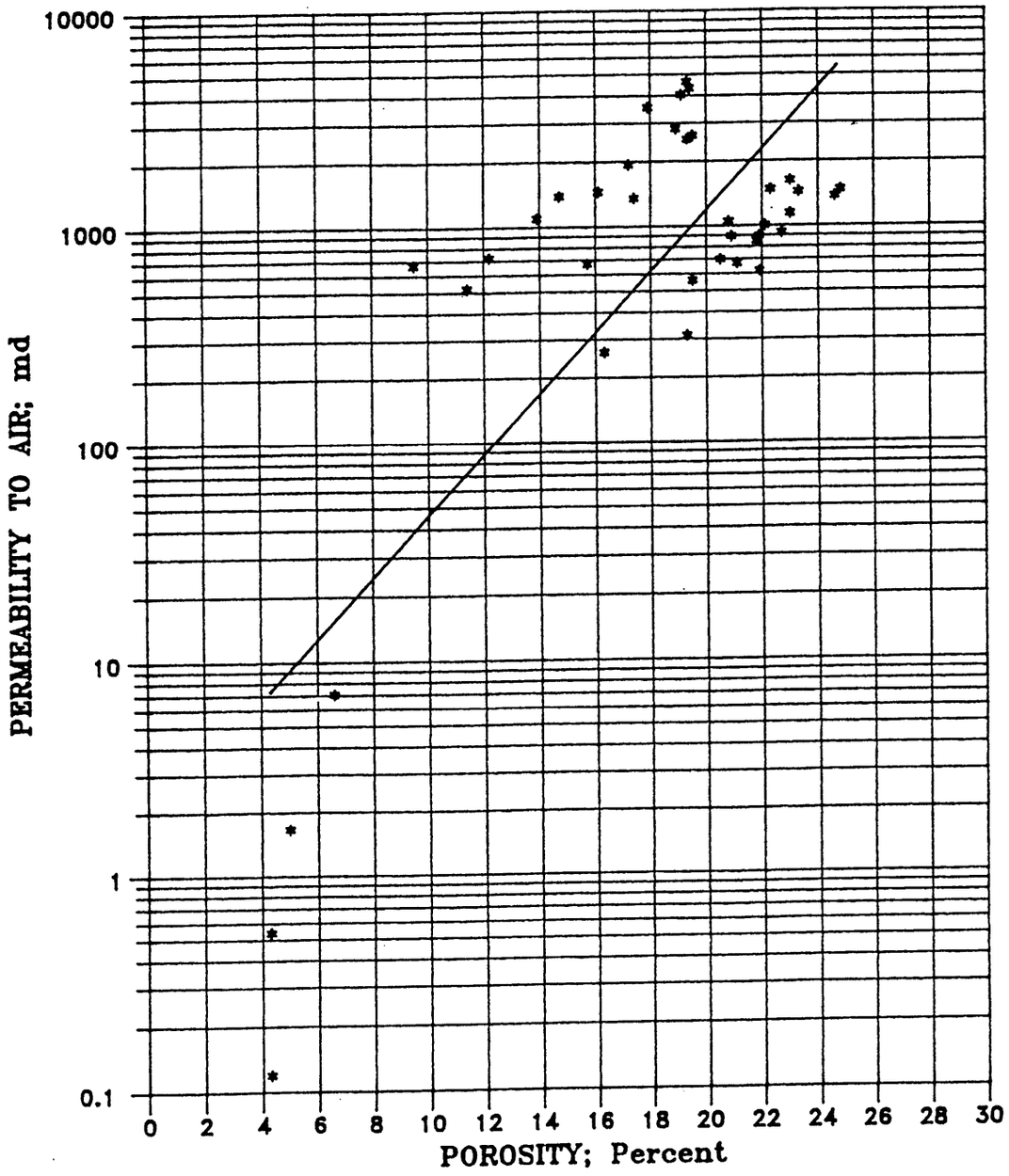
Ambient Y = EXP(0.1224X) * 190.7



POROSITY vs PERMEABILITY

Company: Esso Australia
Well : Terakihi No. 1 Core No. 2

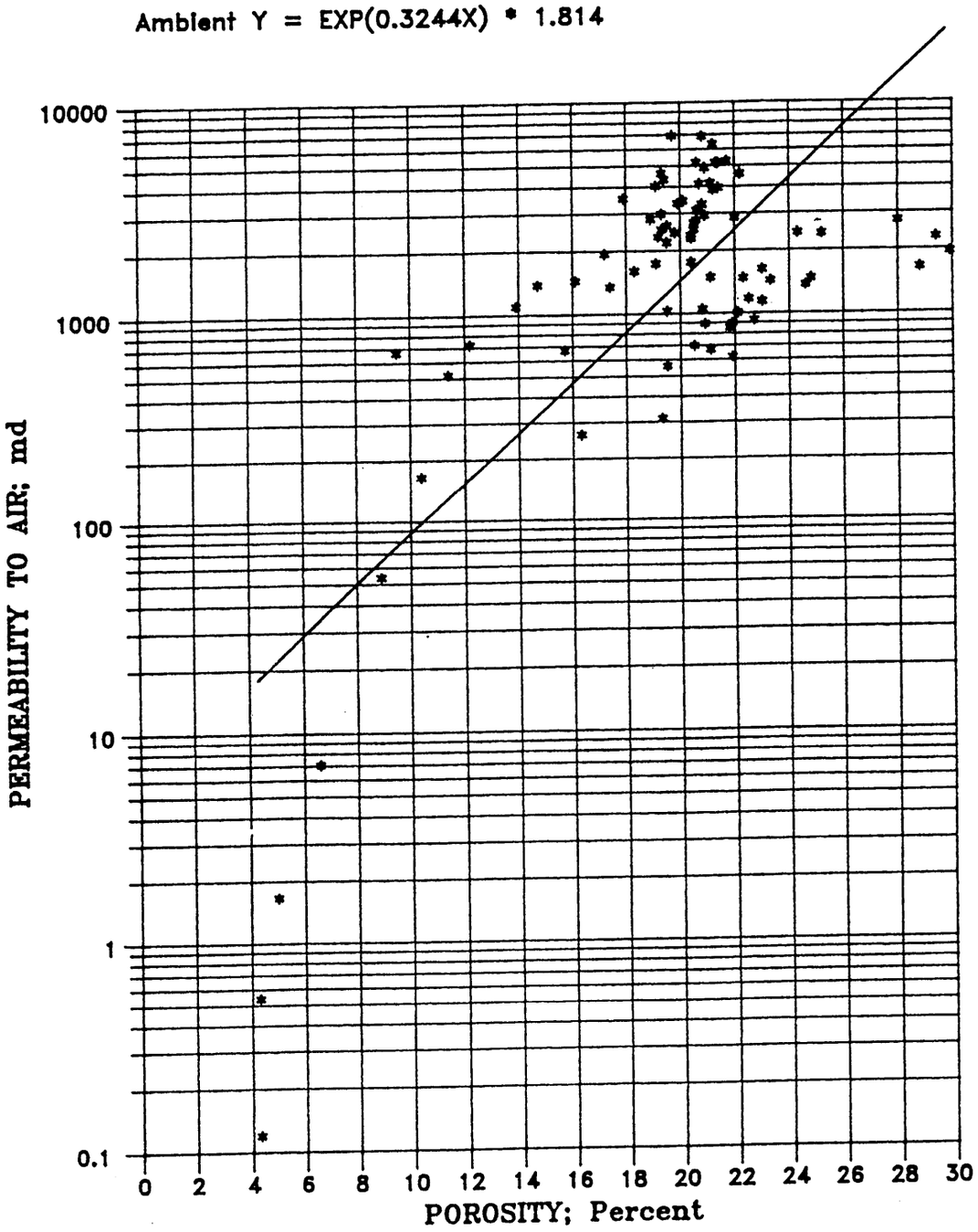
Ambient Y = EXP(0.3244X) * 1.814



POROSITY vs PERMEABILITY

Company: Esso Australia
Well : Terakihi No. 1 Composite

Ambient Y = EXP(0.3244X) * 1.814



ROUTINE CORE ANALYSIS RESULTS

Company: Esso Australia
Well: Terakihi No 1

Location: Bass Strait
Overburden Pressure: 4550 psi
Core No: 1

Report: 008/044

Sample Number	Depth feet	Permeability to air, md		Porosity percent		Grain Density gms/cc		Residual Fluids		Bulk Dry Density		Bulk Volume ccs	
		Ambient	NOBP	Ambient	NOBP	Calculated	Absolute	Sw%	So%	Ambient	NOBP	Ambient	NOBP
2	2844.12	1173	993	22.5	22.2	2.62	2.65	67.9	9.9	2.03	2.04	16.59	16.51
5	2844.28	2417	2162	24.3	24.0	2.61	2.64	72.1	1.9	1.98	1.98	21.15	21.09
7	2844.69	1760	1521	20.4	19.9	2.62	2.64	72.4	9.3	2.09	2.10	17.98	17.87
9	2844.83	2390	2099	25.2	24.9	2.61	2.65	76.8	4.9	1.95	1.96	19.36	19.27
13	2845.17	1490	1177	21.1	18.1	2.63	2.65	73.9	13.0	2.07	2.15	22.32	21.49
16	2845.40	1640	1439	28.8	26.0	2.62	2.64	70.5	5.2	1.86	1.94	20.39	19.62
18	2845.60	1941	1686	29.9	27.0	2.62	2.64	77.5	5.7	1.83	1.91	22.12	21.23
21	2845.80	2287	2038	29.4	27.1	2.70	2.67	62.6	2.2	1.90	1.97	21.60	20.93
24	2846.04	2745	2391	28.0	24.3	2.62	2.63	75.7	7.4	1.89	1.99	22.38	21.30
38	2848.60	2287	1745	20.4	16.0	2.64	2.65	82.5	4.2	2.10	2.21	19.64	18.62
40	2849.81	2928	2272	20.9	16.2	2.65	2.65	65.3	17.6	2.09	2.22	19.41	18.31
46	2849.24	2327	1772	19.2	16.4	2.64	2.65	47.8	20.9	2.13	2.21	21.20	20.50
48	2849.43	1601	1219	18.3	15.4	2.63	2.65	41.6	13.6	2.15	2.23	22.24	21.50

Amdel Core Services Pty Limited
Incorporated in South Australia

Sample Number	Depth feet	Permeability to air, md		Porosity percent		Grain Density gms/cc		Residual Fluids		Bulk Dry Density		Bulk Volume ccs	
		Ambient	NOBP	Ambient	NOBP	Calculated	Absolute	Sw%	So%	Ambient	NOBP	Ambient	NOBP
50	2849.60	1735	1262	19.1	15.9	2.64	2.64	32.5	14.1	2.13	2.22	21.52	20.70
52	2849.73	6331	5531	21.2	17.5	2.64	2.65	56.0	13.0	2.08	2.18	21.86	20.87
54	2850.21	4159	3384	21.1	17.0	2.64	2.65	70.0	17.7	2.08	2.19	21.58	20.50
56	2850.40	4122	3491	20.7	16.3	2.64	2.64	80.6	9.0	2.09	2.21	19.69	18.66
59	2850.63	3346	2716	19.9	16.1	2.63	2.64	46.3	12.7	2.11	2.21	19.56	18.67
62	2850.83	3436	2761	20.1	16.9	2.64	2.64	56.0	3.4	2.11	2.20	19.08	18.33
63	2851.00	6909	5924	20.8	18.4	2.64	2.64	63.8	1.6	2.09	2.16	19.25	18.67
66	2851.26	2993	2253	19.3	16.1	2.64	2.64	46.9	11.5	2.13	2.22	19.20	18.47
68	2851.40	2189	1685	19.5	15.7	2.64	2.64	62.6	6.3	2.12	2.22	19.50	18.62
71	2851.64	4908	4232	20.9	17.8	2.63	2.65	69.8	9.9	2.08	2.17	19.33	18.60
72	2851.78	2524	2059	20.5	17.5	2.64	2.65	71.9	5.9	2.10	2.18	19.26	18.55
76	2852.03	3095	2562	20.6	18.1	2.64	2.65	68.2	4.8	2.09	2.16	19.51	18.91
78	2852.23	5181	4412	21.4	18.6	2.64	2.64	68.9	8.7	2.07	2.15	19.37	18.70
79	2852.28	2716	2241	20.5	17.2	2.64	2.64	63.4	7.2	2.10	2.19	19.44	18.67
85	2852.83	5203	4464	21.3	18.3	2.73	2.65	47.3	2.3	2.15	2.23	19.37	18.66
87	2853.03	1030	777	19.5	16.1	2.68	2.66	78.2	7.0	2.16	2.25	19.35	18.56

Sample Number	Depth feet	Permeability to air, md Ambient	NOBP	Porosity percent Ambient	NOBP	Grain Density gms/cc Calculated	Absolute	Residual Fluids Sw%	So%	Bulk Dry Density Ambient	NOBP	Bulk Volume ccs Ambient	NOBP
89	2853.17	3156	2413	20.7	18.0	2.64	2.64	57.5	5.0	2.10	2.17	19.72	19.05
92	2853.43	2367	1925	20.4	17.1	2.64	2.65	67.9	3.8	2.10	2.19	19.81	19.01
93	2853.53	2796	2218	20.6	17.3	2.65	2.65	66.0	11.8	2.10	2.19	19.85	19.06
96	2853.72	3306	2617	20.8	17.7	2.65	2.65	65.5	10.1	2.10	2.18	19.41	18.69
98	2854.00	2854	2140	22.0	18.2	2.65	2.65	65.3	7.5	2.07	2.17	19.40	18.50
104	2854.46	6962	5913	19.7	18.8	2.68	2.65	72.2	7.8	2.15	2.17	19.34	19.13
105	2854.60	3870	3179	21.2	18.0	2.69	2.66	81.7	9.3	2.12	2.20	19.77	18.99
108	2854.84	2433	3029	19.8	16.8	2.63	2.65	71.2	14.7	2.11	2.19	19.89	19.18
110	2855.00	3954	3043	21.4	17.5	2.63	2.64	71.9	11.5	2.07	2.17	20.33	19.36
115	2855.33	5194	4359	20.6	17.5	2.64	2.64	56.2	8.1	2.10	2.18	16.40	15.78
117	2855.43	4598	3606	22.2	18.1	2.64	2.65	67.6	3.6	2.05	2.16	18.77	17.83
120	2855.63	5280	4191	21.7	17.7	2.64	2.64	70.7	7.1	2.06	2.17	19.53	18.60
122	2856.43	53.8	39.7	8.9	6.7	2.68	2.65	76.9	5.5	2.44	2.50	20.34	19.86
124	2856.54	165	141	10.4	8.2	2.67	2.66	71.9	8.4	2.40	2.46	21.52	21.00

ROUTINE CORE ANALYSIS RESULTS

Company: Esso Australia
Well: Terakihi No 1

Location: Bass Strait
Overburden Pressure: 4600 psi
Core No: 2

Report: 008/044

Sample Number	Depth feet	Permeability to air, md		Porosity percent		Grain Density gms/cc		Residual Fluids		Bulk Dry Density		Bulk Volume ccs	
		Ambient	NOBP	Ambient	NOBP	Calculated	Absolute	Sw%	So%	Ambient	NOBP	Ambient	NOBP
127	2863.39	2520	440	19.3	18.2	2.63	2.65	59.7	1.5	2.13	2.16	18.68	18.42
130	2864.20	2625	2260	19.5	16.8	2.63	2.66	56.3	1.7	2.12	2.19	18.77	18.17
134	2864.46	4631	3423	19.3	17.1	2.64	2.64	58.4	0.9	2.13	2.19	19.35	18.82
137	2864.64	4040	3015	19.1	16.8	2.63	2.64	63.4	0.7	2.13	2.19	19.20	18.68
139	2864.77	4326	3205	19.4	16.4	2.63	2.64	57.2	0.9	2.12	2.20	19.26	18.57
143	2865.04	2824	2115	18.9	16.4	2.63	2.63	54.2	3.3	2.13	2.20	19.55	18.96
145	2865.20	3538	2698	17.9	16.0	2.63	2.63	61.7	2.3	2.16	2.21	19.21	18.78
148	2865.36	1380	1046	14.7	12.4	2.82	2.63	60.0	2.9	2.41	2.47	19.96	19.43
151	2865.60	1345	1017	17.4	15.1	2.64	2.65	68.8	1.1	2.18	2.24	19.34	18.82
154	2865.75	1929	1341	17.2	14.8	2.64	2.65	67.6	0.8	2.18	2.25	19.44	18.89
158	2866.00	1444	1072	16.1	13.3	2.65	2.65	68.5	1.6	2.22	2.30	19.51	18.88
161	2866.20	520	270	11.4	9.5	2.65	2.65	55.5	6.5	2.35	2.40	20.11	19.69

Sample Number	Depth feet	Permeability to air, md Ambient	NOBP	Porosity percent Ambient	NOBP	Grain Density gms/cc Calculated	Absolute	Residual Fluids Sw%	So%	Bulk Dry Density Ambient	NOBP	Bulk Volume ccs Ambient	NOBP
165	2866.40	1096	505	13.9	11.7	2.65	2.65	51.2	4.2	2.28	2.34	16.48	16.07
168	2866.61	674	485	15.7	14.6	2.65	2.65	69.2	1.2	2.23	2.26	19.61	19.35
172	2866.94	723	558	12.2	10.5	2.65	2.65	70.0	2.0	2.33	2.37	19.31	18.96
176	2867.15	1.66	0.296	5.0	4.3	2.67	2.66	60.6	3.6	2.54	2.56	19.89	19.74
179	2867.31	7.08	3.02	6.6	5.7	2.67	2.66	40.3	0.0	2.50	2.52	19.86	19.68
182	2867.59	0.54	0.082	4.3	3.6	2.67	2.65	47.6	6.3	2.55	2.57	20.26	20.11
185	2867.80	670	497	9.5	7.6	2.67	2.65	54.0	3.1	2.41	2.47	11.23	10.99
189	2868.46	0.12	0.028	4.3	3.7	2.68	2.66	51.2	3.7	2.56	2.58	20.03	19.91
192	2868.63	262	195	16.3	15.4	2.65	2.65	63.7	6.9	2.22	2.24	19.77	19.55
195	2868.84	312	260	19.3	17.7	2.64	2.65	66.4	6.0	2.13	2.17	19.93	19.53
199	2869.00	561	466	19.5	17.9	2.64	2.65	71.1	3.7	2.12	2.17	19.49	19.11
202	2869.23	671	573	21.1	19.6	2.64	2.65	72.2	2.6	2.08	2.12	19.77	19.40
205	2869.42	1367	1219	24.6	23.1	2.63	2.65	71.6	0.8	1.98	2.02	20.14	19.73
209	2869.63	1464	1308	24.8	23.3	2.63	2.64	79.8	2.7	1.98	2.02	19.79	19.40
213	2869.94	1140	1006	23.0	20.8	2.63	2.64	77.4	2.9	2.03	2.08	19.43	18.91
216	2870.17	618	534	21.9	20.3	2.63	2.65	74.2	3.6	2.05	2.10	19.64	19.24

Sample Number	Depth feet	Permeability to air, md		Porosity percent		Grain Density gms/cc		Residual Fluids		Bulk Dry Density		Bulk Volume ccs	
		Ambient	NOBP	Ambient	NOBP	Calculated	Absolute	Sw%	So%	Ambient	NOBP	Ambient	NOBP
220	2870.38	929	809	22.7	20.8	2.63	2.62	77.5	1.3	2.04	2.08	19.56	19.10
223	2870.61	894	775	20.9	19.1	2.64	2.65	78.2	2.2	2.09	2.14	19.49	19.04
226	2870.82	700	599	20.5	18.3	2.62	2.62	78.6	0.7	2.09	2.14	19.44	18.92
231	2871.24	1620	1405	23.0	21.0	2.63	2.65	56.9	2.1	2.03	2.08	19.11	18.63
234	2871.44	1431	1233	23.3	21.2	2.63	2.66	73.1	3.5	2.02	2.07	19.01	18.51
238	2871.66	899	763	21.9	20.4	2.63	2.65	67.2	2.1	2.05	2.09	19.33	18.96
240	2871.82	1472	1275	22.3	20.4	2.63	2.65	57.2	9.9	2.04	2.09	19.39	18.93
244	2872.06	1049	873	20.8	18.9	2.63	2.65	66.3	0.5	2.08	2.13	19.13	18.68
247	2872.23	1006	863	22.1	20.0	2.63	2.65	70.4	0.5	2.05	2.10	19.19	18.67
250	2872.43	852	720	21.8	19.7	2.63	2.65	74.5	0.4	2.06	2.11	19.07	18.56

Amdel Core Services Pty Limited
Incorporated in South Australia

Terakihi No 1 - Core No 1

2 Sst: lt gry, fn gr w/ rr crs gr thru, w/ srt, p cmt, v fri, sbang, carb spk thru, mnr arg mtrx

5 Sst: a/a but incr abd of rndd crs gr

7 Sst: a/a but incr abd of crs gr

9 Sst: lt gry, mnr fn gr - v crs gr, p srt, p cmt, v fri, sbang - rndd w/ crs, dom cln

13 Sst: lt gry, fn - crs gr, p srt, p cmt, v fri, sbang - sbrnd, mnr arg mtrx

16 Sst: lt gry,fn - rr med gr thru, mod w/ srt, p cmt, v fri, sbang, carb incl thru mnr lam, mnr arg mtrx

18 Sst: lt gry,fn gr, wl srt, p cmt, v fri, sbang, mnr carb spk thru, mnr arg mtrx

21 Sst: lt gry, fn - med gr, mod wl srt, p cmt, v fri, sbang mnr carb lam & spk thru, mnr arg mtrx

24 Sst: lt gry, dom fn gr w/ crs - v crs grn thru, p srt, p cmt, v fri, sbang, arg mtrx

38 Sst: lt gry, rr fn gr - dom crs - v crs gr, mod srt, p cmt, v fri, sbang - occ sbrnd, dom cln Sst

40 Sst: a/a

46 Sst: a/a

48 Sst: a/a

50 Sst: a/a but w/ slightly more mtrx matl

52 Sst: a/a but dom med - crs gr

54 Sst: a/a

56 Sst: a/a but dom med gr

59 Sst: a/a

62 Sst: lt gry, rr fn - v crs gr, p srt, p cmt, v fri, sbang - rr sbrnd gr, dom cln Sst w/v mnr arg mtrx matl

63 Sst: a/a

66 Sst: a/a

68 Sst: a/a dom crs gr

71 Sst: a/a dom crs gr

72 Sst: a/a

76 Sst: lt gry, rr fn - v crs gr, dom crs, p srt, p cmt, v fri, sbang - rr sbrnd gr thru, dom cln Sst w mnr arg mtrx matl

78 Sst: a/a

79 Sst: a/a dom crs gr w/ mnr v crs gr

85 Sst: a/a

87 Sst: a/a

89 Sst: a/a but w/ more abd crs gr thru

92 Sst: a/a but w/ v crs gr thru

93 Sst: a/a

96 Sst: a/a

98 Sst: a/a

104 Sst: a/a

105 Sst: a/a

108 Sst: a/a dom crs gr w/ rr v crs gr thru

110 Sst: a/a

115 Sst: a/a but w/ more crs gr thru

117 Sst: a/a dom med - crs gr

120 Sst: a/a

122 Sst: lt gry/wh, rr fn - dom crs gr, mod srt, wl cmt, sbang - rr sbrnd gr thru, abd wh cly mtrx

124 Sst: a/a

Terakihi No 1 - Core No 2

127 Sst: lt gry, rr fn - dom v crs gr, mod-p srt, p cmt, v fri, rr sbang w/ fn gr - dom mod w rndd w/ crs gr, rr carb spks thru, dom cln v mnr arg mtrx

130 Sst: a/a

134 Sst: a/a w/ marginal incr in arg mtrx matl

137 Sst: a/a but dom med gr w/ incr matrx matl abd carb incl

139 Sst: lt gry, fn - v crs gr, dom crs gr, p srt, p cmt, v fri, dom sbrnd - sbang w/ fn gr, mnr arg mtrx thru

143 Sst: a/a w/ mnr frac thru

145 Sst: a/a

148 Sst: a/a but dom med gr

151 Sst: a/a but dom med gr & more abd mtrx

154 Sst: a/a

158 Sst: lt gry fn - rr v crs gr dom crs gr p - mod srt, p cmt, fri, dom sbrnd - sbang w/ fn gr, arg mtrx thru rr tr mica thru & rr pyr incl

161 Sst: a/a but no pyr and predom cln

165 Sst: lt gry fn - rr v crs gr dom crs gr p - mod srt, p cmt, fri, dom sbrnd, sbang w/ fn gr, mnr arg mtrx dom cln, rr tr mica thru, rr qtz o'gth

168 Sst: a/a

172 Sst: a/a

176 Sst: lt gry dom fn gr - v crs gr, p - mod srt, w cmt, dom sbang w/ fn sbrnd - rnd w/ crs gr, arg mtrx, tr mica thru

179 Sst: a/a

182 Sst: a/a

185 Sst: a/a but only mod w/ cmt

189 Sst: a/a

192 Sst: a/a but only mod w/ cmt

195 Sst: lt gry, dom fn gr w/ crs gr thru, w srt, mod cmt, fri, dom sbang w/ fn gr crs gr sbrnd, mnr arg mtrx, tr mica thru

199 Sst: a/a but w/ rr v crs grn thru

202 Sst: a/a

205 Sst: a/a

209 Sst: lt gry, dom fn - med gr w/ rr crs gr thru, mod w/ srt, p - mod cmt, fri, sbang, mnr arg mtrx dom cln, rr tr mica thru

213 Sst: a/a

216 Sst: a/a but incr abd of crs - v crs gr thru v fri

220 Sst: a/a

223 Sst: lt gry, fn - med gr w/ abd crs gr thru p - mod srt, p cmt, v fri, sbang - rnd w/ crs gr, rr arg mtrx dom cln, rr tr mica thru

226 Sst: a/a

231 Sst: a/a mnr frac thru

234 Sst: a/a

238 Sst: lt gry, dom fn - med gr, w/ rr crs gr thru, mod wl srt, p cmt, v fri, sbang, mnr arg mtrx dom cln

240 Sst: a/a

244 Sst: a/a

247 Sst: a/a

250 Sst: lt gry, fn - dom med gr, w/ srt, p cmt, v fri, sbang - sbrnd, rr carb spk thru, rr tr mica thru, mnr arg mtrx, dom cln

ENCLOSURES

PE902087

This is an enclosure indicator page.
The enclosure PE902087 is enclosed within the container PE902086 at this location in this document.

The enclosure PE902087 has the following characteristics:

ITEM_BARCODE	= PE902087
CONTAINER_BARCODE	= PE902086
NAME	= Structural Cross Section
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= CROSS_SECTION
DESCRIPTION	= Structural Cross Section (enclosure from WCR vol.2) for Terakihi-1
REMARKS	=
DATE_CREATED	= 24/04/90
DATE_RECEIVED	= 31/07/90
W_NO	= W1025
WELL_NAME	= Terakihi-1
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE902088

This is an enclosure indicator page.
The enclosure PE902088 is enclosed within the container PE902086 at this location in this document.

The enclosure PE902088 has the following characteristics:

ITEM_BARCODE	= PE902088
CONTAINER_BARCODE	= PE902086
NAME	= Structure Map Water Bottom
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= SEISMIC
SUBTYPE	= HRZN_CNTR_MAP
DESCRIPTION	= Structure Map Water Bottom (enclosure from WCR vol.2) for Terakihi-1
REMARKS	=
DATE_CREATED	= 30/06/90
DATE_RECEIVED	= 31/07/90
W_NO	= W1025
WELL_NAME	= Terakihi-1
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE902089

This is an enclosure indicator page.
The enclosure PE902089 is enclosed within the container PE902086 at this location in this document.

The enclosure PE902089 has the following characteristics:

ITEM_BARCODE	= PE902089
CONTAINER_BARCODE	= PE902086
NAME	= Structure map of Latrobe group
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= SEISMIC
SUBTYPE	= HRZN_CNTR_MAP
DESCRIPTION	= Structure map of Latrobe group(enclosure from WCR vol.2) for Terakihi-1
REMARKS	=
DATE_CREATED	= 30/06/90
DATE_RECEIVED	= 31/07/90
W_NO	= W1025
WELL_NAME	= Terakihi-1
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE600942

This is an enclosure indicator page.
The enclosure PE600942 is enclosed within the container PE902086 at this location in this document.

The enclosure PE600942 has the following characteristics:

ITEM_BARCODE	= PE600942
CONTAINER_BARCODE	= PE902086
NAME	= Formation Evaluation log
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= MUD_LOG
DESCRIPTION	= Formation Evaluation log(enclosure from WCR vol.2) for Terakihi-1
REMARKS	=
DATE_CREATED	= 14/04/90
DATE_RECEIVED	= 30/03/90
W_NO	= W1025
WELL_NAME	= Terakihi-1
CONTRACTOR	= EXLOG
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE600943

This is an enclosure indicator page.
The enclosure PE600943 is enclosed within the container PE902086 at this location in this document.

The enclosure PE600943 has the following characteristics:

ITEM_BARCODE	= PE600943
CONTAINER_BARCODE	= PE902086
NAME	= Well Completion log
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= COMPLETION_LOG
DESCRIPTION	= Well Completion log (enclosure from WCR vol.2) for Terakihi-1
REMARKS	=
DATE_CREATED	= 1/05/90
DATE_RECEIVED	= 30/03/90
W_NO	= W1025
WELL_NAME	= Terakihi-1
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO AUSTRALIA RESOURCES LTD

(Inserted by DNRE - Vic Govt Mines Dept)

PE600944

This is an enclosure indicator page.
The enclosure PE600944 is enclosed within the container PE902086 at this location in this document.

The enclosure PE600944 has the following characteristics:

ITEM_BARCODE	= PE600944
CONTAINER_BARCODE	= PE902086
NAME	= Synthetic Seismogram
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= SYNTH_SEISMOGRAM
DESCRIPTION	= Synthetic Seismogram (enclosure from WCR vol.2) for Terakihi-1
REMARKS	=
DATE_CREATED	= 2/07/90
DATE_RECEIVED	= 30/03/90
W_NO	= W1025
WELL_NAME	= Terakihi-1
CONTRACTOR	= SIERRA GEOPHYSICS INC
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)