Esso

153 pages. &
11 enclosures

OIL and GAS DIVISION

OIL and GAS DIVISION

WELL COMPLETION REPORT

PALMER - 1

GIPPSLAND BASIN

VICTORIA

ESSO AUSTRALIA LIMITED

COMPILED BY: R. KEY

JUNE, 1982

WELL COMPLETION REPORT

PALMER-1

CONTENTS

FIGURES

APPENDICES

ENCLOSURES

ATTACHMENTS

mudlog supplied 2/2/83

ESSO AUSTRALIA LTD.

COMPLETION REPORT

1. WELL DATA RECORD

LOCATION

WELL NAME	STATE	PERMIT or LICENCE	GEOLOGICAL BASIN	FIELD
PALMER-1	VIC.	VIC/P1	GIPPSLAND	WILDCAT

CO-ORDINATES	MAP PROJECTION	GEOGRAPHICAL LOCATION
LATITUDE 38° 33' 49.33 S LONGITUDE 147° 19' 46.85 E X 528722m E Y 5731572m N	AMG ZONE 55	BASS STRAIT

ELEVATIONS & DEPTHS

ELEVATIONS	WATER DEPTH	TOTAL DEPTH / MEASURED DEPTH	Average Angle
KB 21m RT	42.6m	1723m 1723m	Vertical
	PLUG BACK TYPE: P & A	REASONS FOR PLUGGING BACK: Plug and Abandonment	

DATES

MOVE IN	RIG UP	SPUDDED
11.8.81	11.8.81	12.8.81 Re-entered 29.9.81
RIG DOWN COMPLETE	**RIG RELEASED**	**PRODUCTION UNIT - RIG UP**
14.10.81	14.10.81	
PRODUCTION UNIT - RIG DOWN		**INITIAL PRODUCTION ESTABLISHED**
-		-

MISCELLANEOUS

OPERATOR	PERMITTEE or LICENCE	ESSO INTEREST / OTHER INTEREST
ESSO AUSTRALIA LTD	HEMATITE PETROLEUM PTY LTD	100% -

CONTRACTOR	RIG NAME	EQUIPMENT TYPE
SOUTH SEAS DRILLING COMPANY	SOUTHERN CROSS	SEMI-SUBMERSIBLE

TOTAL RIG DAYS	DRILLING AFE NO.	COMPLETION NO.	TYPE COMPLETION
19	-	-	P & A

LAHEE WELL CLASSIFICATION	Before Drilling	-	NEW FIELD WILDCAT
	After Drilling	-	DRY NEW FIELD WILDCAT

WELL : PALMER-1

2. CASING - LINER - TUBING RECORD

Type	Size	Weight	Grade	Thread	No. Joints	Depth KB
PILEJOINT	20"	670#	X-52	CC	1	72. m
CROSSOVER	20"	129#	X-52	CC-JV	1	84.9m
CONDUCTOR	20"	94#	X-52	JV	5	187.6m
SURFACE	13-3/8"	54.5#	K-55	BUTT	59	769.0m

3. CEMENT RECORD

String	20" Conductor		13-3/8" Surface CSG		
Type of Cement	Australian 'N' 12% GEL 2% $CaCl_2$	2% $CaCl_2$	Australian 'N'		
Slurry Volume	627 sx 250.2 BBL	350 sx 73.6 BBL	692 sx 145.4 BBL	250 sx 52.5 BBL	
Slurry Density	12.3 ppg (1.47 sg)	15.6 ppg (1.87 sg)	15.6 ppg (1.87 sg)	15.6 ppg (1.87 sg)	
Cement Top	SEAFLOOR		312m		
Casing Thread	JV		BUTT		
No. of Centralizers	5		13		
No. of Scratchers	–		–		
Stage Collars	–		–		
Remarks	Cement returns to Seafloor		Plugs did not bump Floats held		

4. CEMENT PLUGS

Plug	1	2	4
Cement Type	Australian 'N' 1%HR-6L	Australian 'N'	Australian 'N'
Slurry Volume	180 sx 37.8 BBL	300 sx 63.1 BBL	145 sx 15 BBL below + 15.4 BBL above retainer
Cement Base	1250m	810m	232m
Cement Top	1180m	700m	90m
Remarks		Pressure tested plug to 6900k Pa (1500 psi)	Bridge Plug 360m Cement retainer 120m Annulus Plug 232 - 137m Casing Plug 137 - 90m

WELL : PALMER-1

5. SAMPLES, CONVENTIONAL CORES, SIDEWALL CORES.			
INTERVAL	TYPE	INTERVAL	TYPE
203 - 1723	5m samples washed & dried cuttings.		
775 - 1715	102 sidewall cores.		

6. WIRELINE LOGS AND SURVEYS				
	Type ¢ Scale	From To	Type & Scale	From To
1.	ISF/Sonic/GR 1:500 1:200	42 - 785m	6. WST 1:200	200 - 1719m
2.	ISF/Sonic/MSFL/GR 1:500 1:200	769 - 1721m	7. Seismic Quicklook	400 - 1219m
3.	LDT/CNL/GR 1:500 1:200	769 - 1721m		
4.	HDT 1:200	1150 - 1721m		
5.	CST (102 shots)	775 - 1715m		

7. GEOLOGICAL & GEOPHYSICAL ANALYSIS

		DEPTH (m)			
		PREDICTED	A C T U A L		
AGE	UNIT/HORIZON	KB	KB	SUBSEA	THICKNESS (m)
Pliocene/Miocene	Gippsland Limestone	59	42.6	21.6	1001.4
Miocene/Oligocene	Lakes Entrance Formation	1051	1044	1023	148
Eocene/Paleocene	LATROBE GROUP (Gurnard Fm)	1176	1192	1171	27
	(Coarse Clastics)	1207	1219	1198	+504
	Total Depth	1721	1723	1702	

INTRODUCTION

Palmer-1 was drilled to test an interpreted anticlinal structure on the northern downthrown side of the fault which separates Palmer from the Perch oil accumulation.

PREVIOUS DRILLING HISTORY

No wells have been previously drilled on the Palmer structure. The nearest drilled structures, Perch (1.5km, SSW) and Dolphin (9km NNE), both contain small oil accumulations.

STRUCTURE

The Palmer structure was interpreted to be an elongate NW trending anticlinal closure, to the north of the Perch fault-bounded oil accumulation. Movement on the fault separating Palmer from Perch, led to the development of a simple roll-over in the downthrown block. Contemporaneous antithetic faulting, to the NE of and parallel to the main fault between Perch and Palmer does not appear to displace sediments at the top of Latrobe Group.

STRATIGRAPHY

Palmer-1 drilled the predicted limestones and calcareous sediments of the Gippsland Limestone and Lakes Entrance Formation.

The Gurnard Formation at the top of Latrobe Group is composed of glauconitic siltsto and sandstone. The pick of the top of Gurnard (at -1171m) was made difficult becaus the gradational boundary from the Lakes Entrance Formation to the Latrobe Group reflects a continuous depositional sequence. The pick was made using the following criteria:-

1. Palynological age data - top of Middle N. asperus (Appendix-4) at -1171m.
2. A change from calcareous to non-calcareous lithology from -1169 to -1171m.
3. A significant increase in the glauconite content at -1173m.
4. A change in character for density, sonic and resistivity logs at -1171m.

As predicted, the Latrobe Group "Coarse Clastics" consist of a fluvio-deltaic sequenc ranging in age from Middle N. asperus to L. balmei.

The units of N. asperus age consist of a sequence of thick coals, shales and sands. The net to gross ratio for these sediments is 46%.

The underlying units of M. diversus age consist of sands, shales and a small percentage of coals. These sediments have a net to gross of 61%. They unconformably overlie sediments of L. balmei age.

The units of L. balmei age, consist of sands, shales and a minor percentage of thin coals. The sediments of this age have a net to gross of 50%.

HYDROCARBONS

No hydrocarbons were encountered during the drilling of Palmer-1. The reasons for this are not yet clearly understood. One possibility is that the hydrocarbon leaked up to Perch via the bifurcating of the NW trending fault. If this fault were not a simple sinusoidal curve, but two offset faults, then the Palmer structure would be breached to the SSW allowing leakage up to Perch. Re-examination of all the availabl seismic data suggests this possibility is remote.

GEOPHYSICAL ANALYSIS

In Palmer-1 the Top of Latrobe Group came in 16m deep to prediction, an error of 1.3%. The bulk of this discrepancy is a result of selecting the Dolphin-1 "conversio factor" for the depth conversion at the Palmer-1 location. The postdrill "conversion factor" necessary at the Palmer location to convert V_{NMO} to $V_{average}$ is 98.5%, whereas the factor used was 96.3%. The remainder of the error is attributed to a small difference in the seismic lag between the Dolphin-1 and Palmer-1 wells.

8. PALMER-1 TEMPERATURE RECORD

LOGGING RUN	THERMOMETER DEPTH (m)	MAX. RECORDED TEMPERATURE (C°)	CIRCULATION TIME (t_k) (hours)	TIME AFTER CIRCULATION STOPPED (t)	HORNER* TEMPERATURE (C°)	GEOTHERMAL GRADIENT (C°/km)
RUN 1						
ISF/Sonic/GR	785	57.7	10	3.0	-	-
RUN 2						
ISF/Sonic/GR	1721	72.2	10	2.0		
LDT/CNL/GR	1721	75.5	10	5.0	81.7	0.0469
HDT	1721	77.7	10	8.5		

NOTE:
1) Depth in metres below Kelly Bushing
2) Water Depth 42.6m below KB
3) Kelly Bushing 21.0 metres ASL
4) Sea Bottom temperature assumed as 4°C

FIGURES

LOCALITY MAP

SCALE – 1: 250 000

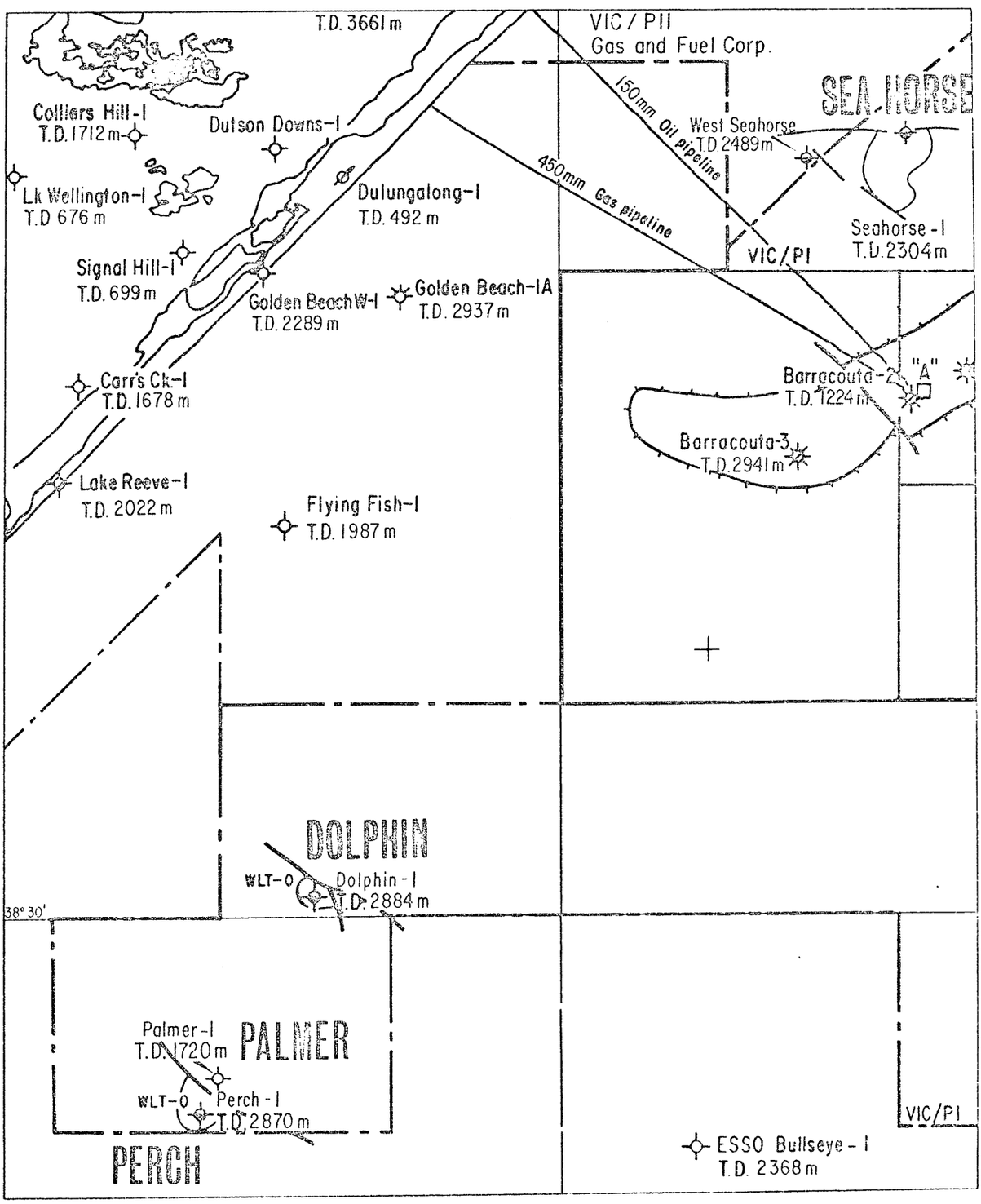


FIGURE 1

Dwg 1659/OP/15

WELL PROGRESS CURVE
ESSO AUSTRALIA WELL PALMER-1
SOUTHERN CROSS SEMI SUBMERSIBLE

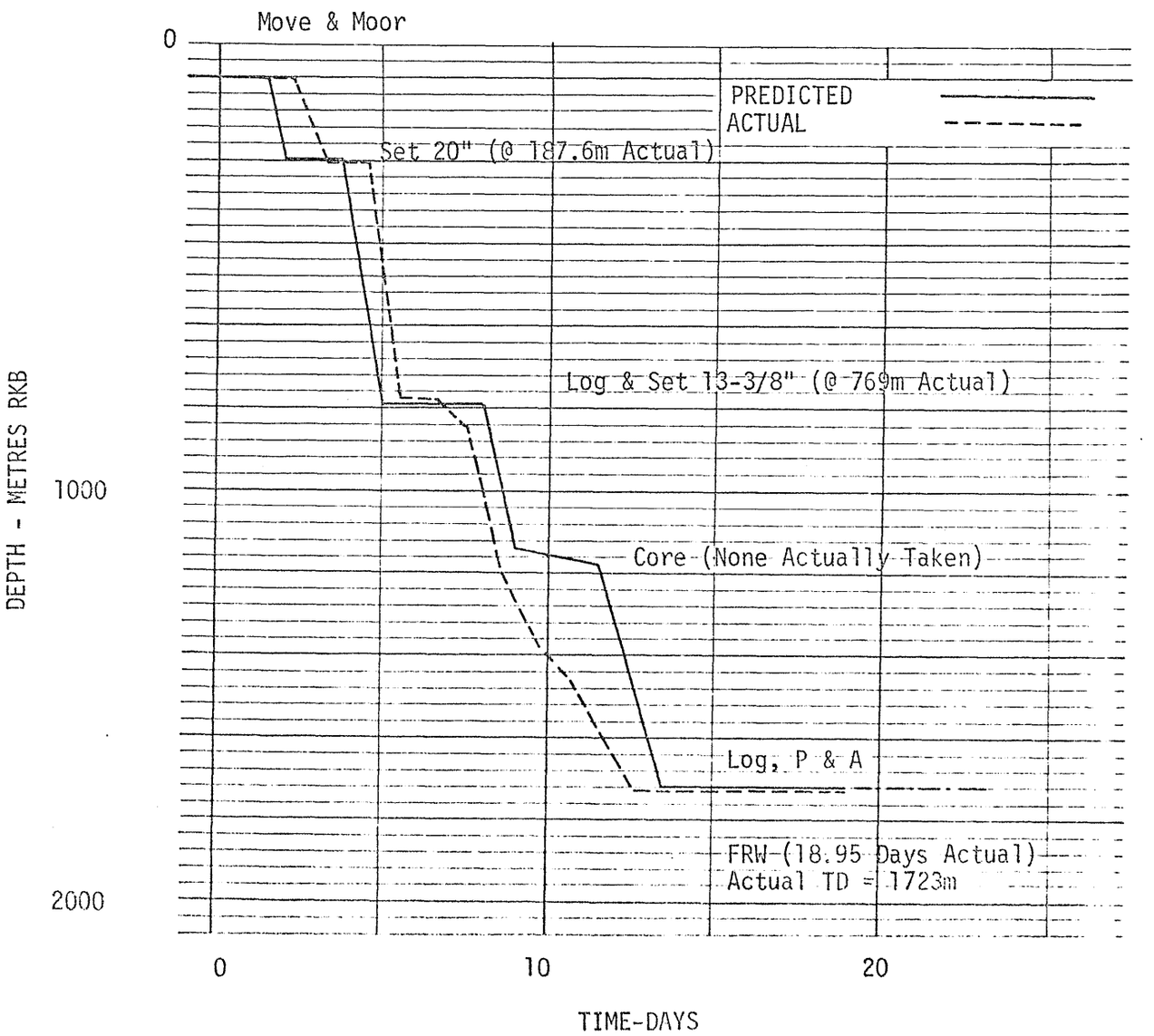
1. During suspension of Bream 4 operations while awaiting BOP repairs :

Begin run temporary guide base	: 2015 hrs, 11 Aug '81
Spud Palmer-1	: 0330 hrs, 12 Aug
Begin jump divers to unshackle G/L's after running 20" csg.	: 1530 hrs, 13 Aug

2. Following completion of Bream 4/4A operations :

Depart Bream 4/4A	: 0400 hrs, 27 Sept '81
Arrive Palmer-1	: 1615 hrs, 28 Sept
Tag cement in 20" csg	: 0515 hrs, 30 Sept
Depart Palmer-1	: 0730 hrs, 14 Oct

Water Depth : 42.6m
RKB-MSL : 21.0m



NOTE: Above curve constructed as though Palmer-1 operations followed normal sequence

FIGURE 2

PALMER-1
ABANDONMENT SCHEMATIC

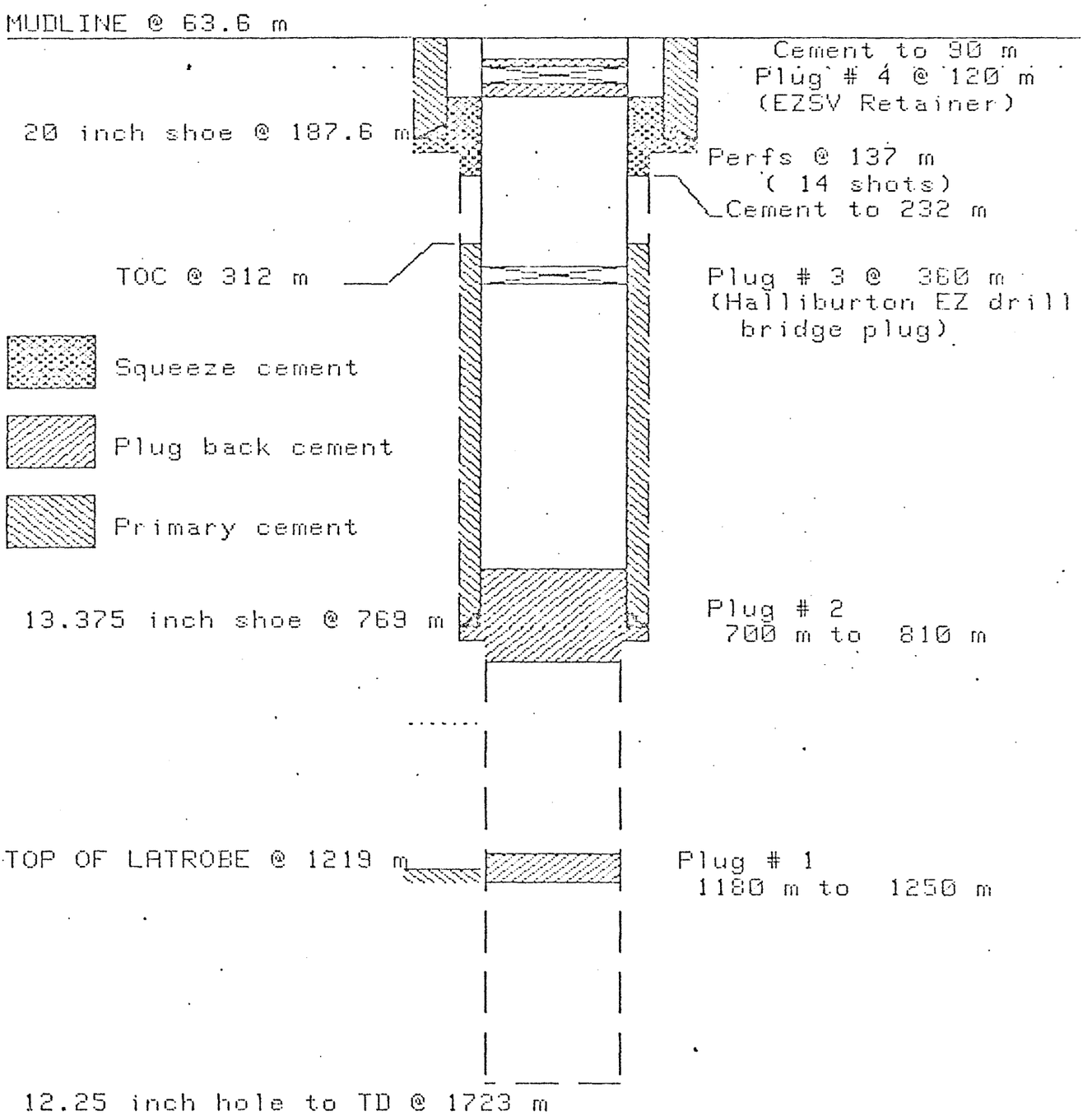
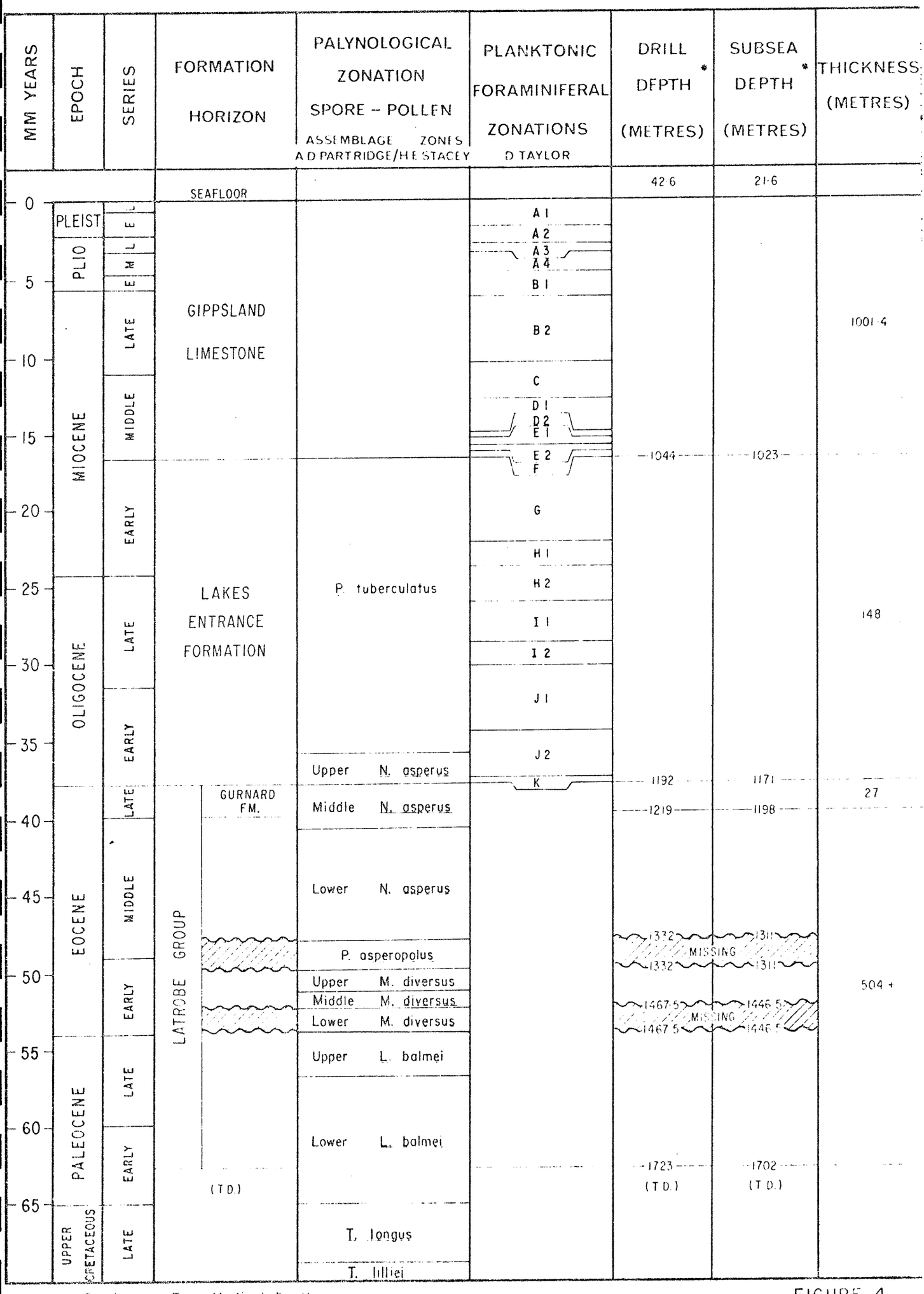


FIGURE 3.

PALMER-1
STRATIGRAPHIC TABLE



* Depths are True Vertical Depths

FIGURE 4

Base Dwg 1107/OP/149

Dwg 2046/01

PALMER-1 Temperature Horner Plot

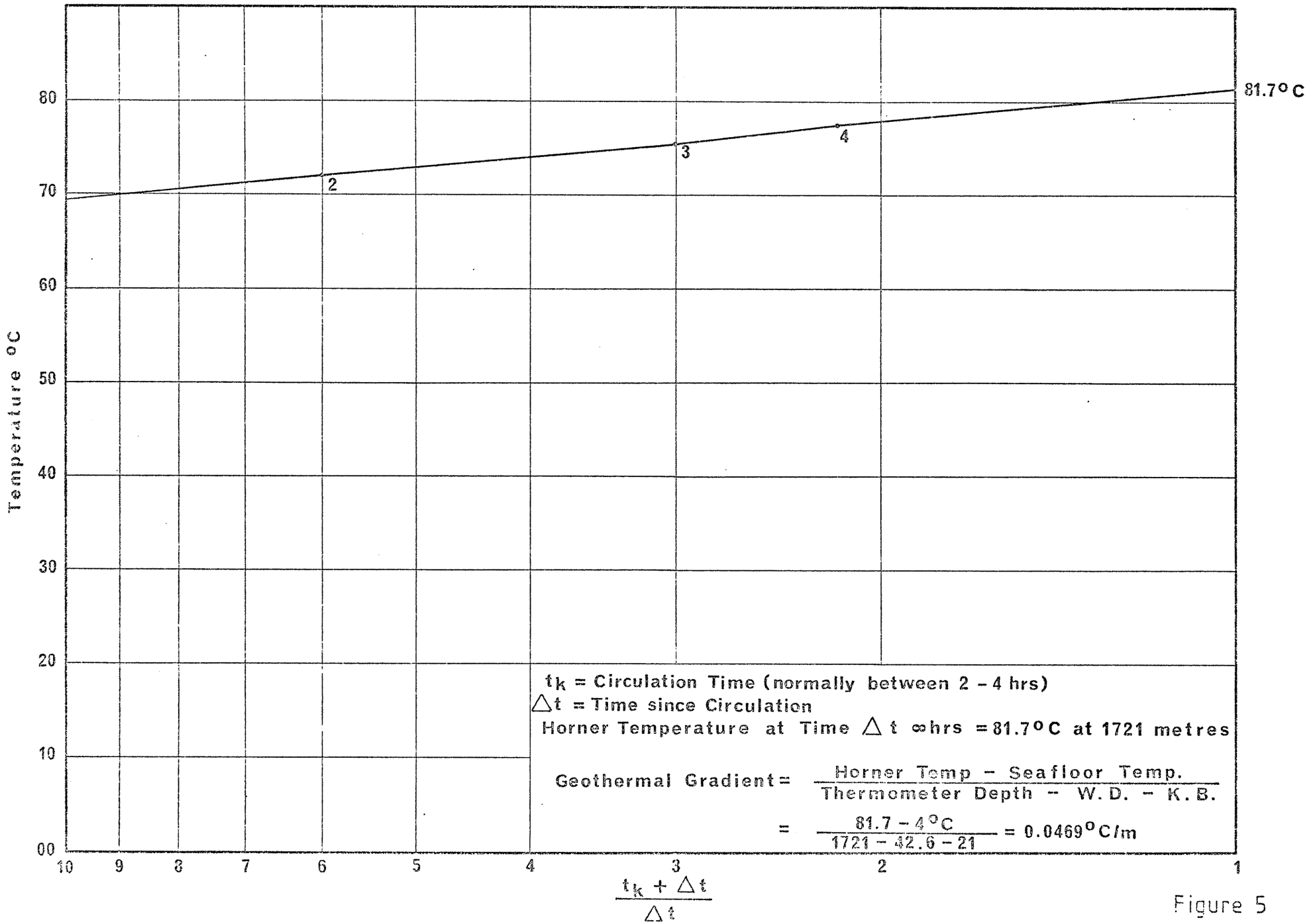


Figure 5

APPENDIX 1

APPENDIX - 1

LITHOLOGICAL DESCRIPTIONS

PALMER - 1

GIPPSLAND BASIN

LITHOLOGICAL DESCRIPTIONS

PALMER - 1

DEPTH	%	DESCRIPTION
200 - 205	100	SANDSTONE: grey, medium grains, moderate to firm, calcareous, carbonaceous flecks. Trace of shell material.
205 - 210	100	SANDSTONE: a:a
210 - 215	100	SANDSTONE: a:a
215 - 220	90	LIMESTONE: loosely packed shell fragments, generall less than 5 mm, original structure visible. Bryozoa most common, overall colour grey to green.
	10	SANDSTONE: calcareous, moderately firm, grey to light grey. Carbonaceous flecks.
220 - 225	75	LIMESTONE: a:a
	25	SANDSTONE: a:a
225 - 230	60	LIMESTONE: loosely packed calcareous grains, becomin finer, most grains 2 - 3mm occasionally forams.
	40	SANDSTONE: coarse calcareous sandstone, carbonaceous flecks prominent, well cemented, occasionally finer sandstone grains. Trace glauconite - light to dark green. Trace 'dirty' quartz grain, well rounded coarse.
230 - 235	50	LIMESTONE: a:a more coarse, bryozoa, brachiopoda, sponge spicules plus fragments of forams
	50	SANDSTONE: coarse calcareous grains, moderate to wel cemented
235 - 240	50	LIMESTONE: a:a - finer grains
	50	SANDSTONE: a:a Trace of glauconite
240 - 245	70	LIMESTONE: a:a bryozoans predominant
	30	SANDSTONE: a:a Trace of glauconite
245 - 250	90	LIMESTONE: a:a
	10	SANDSTONE: a:a
250 - 255	90	LIMESTONE: a:a
	10	SANDSTONE: a:a
255 - 260	50	LIMESTONE: light grey to green, bryozoa prominent, coarse fragments
	50	SANDSTONE: calcareous, coarse grained, well cementec coarse shell fragments, coarse to very coarse sand size
260 - 265	70	LIMESTONE: a:a
	30	SANDSTONE: a:a Trace of glauconite, forams.
265 - 270	90	LIMESTONE: a:a
	10	SANDSTONE: a:a

LITHOLOGICAL DESCRIPTIONS

PALMER - 1

DEPTH	%	DESCRIPTION
270 - 275	80	LIMESTONE: a:a
	20	SANDSTONE: a:a
275 - 280	90	LIMESTONE: light grey - green, loosely packed, bryozoa prominent, also sponge spicules and fragment occasionally forams, fragments coarse to very coarse, 5 mm.
	10	SANDSTONE: light grey, granular calcareous grains, carbonaceous flecks prominent.
280 - 285	50	LIMESTONE: a:a
	50	SANDSTONE: a:a
285 - 290	40	LIMESTONE: a:a
	60	SANDSTONE: a:a Trace of white mica
290 - 295	50	LIMESTONE: a:a
	50	SANDSTONE: a:a
295 - 300	60	LIMESTONE: a:a
	40	SANDSTONE: a:a
300 - 305	60	LIMESTONE: a:a
	40	SANDSTONE: a:a
305 - 310	70	LIMESTONE: a:a
	30	SANDSTONE: a:a Trace of mica, thick lumps 3mm in length, dull yellow, clear.
310 - 315	40	LIMESTONE: a:a
	60	SANDSTONE: a:a
315 - 320	60	LIMESTONE: a:a
	40	SANDSTONE: a:a Trace of mica a:a
320 - 325	50	LIMESTONE: a:a
	50	SANDSTONE: a:a Trace of white mica.
325 - 330	50	LIMESTONE: a:a
	50	SANDSTONE: a:a
330 - 335	40	LIMESTONE: a:a
	60	SANDSTONE: a:a Occasional yellow quartz grains, coarse, well rounded.

LITHOLOGICAL DESCRIPTIONS

PALMER - 1

DEPTH	%	DESCRIPTION
335 - 340	60	LIMESTONE: a:a
	40	SANDSTONE: a:a
340 - 345	90	LIMESTONE: a:a, grains finer.
	10	SANDSTONE: a:a Trace forams, with mica.
345 - 350	80	LIMESTONE: a:a
	20	SANDSTONE: a:a Trace of forams, with white mica.
350 - 355	70	LIMESTONE: loosely packed fossil fragments, bryozoa predominant, overall colour grey-green. Original structure clear in most grains, occasional forams.
	30	SANDSTONE: coarse calcareous grains, well cemented white to grey, cuttings appear granular in coarse grains Trace mica.
355 - 360	80	LIMESTONE: a:a
	20	SANDSTONE: a:a
360 - 365	60	LIMESTONE: a:a
	40	SANDSTONE: a:a
365 - 370	90	LIMESTONE: a:a
	10	SANDSTONE: a:a
370 - 375	90	LIMESTONE: a:a
	10	SANDSTONE: a:a
375 - 380	90	LIMESTONE: overall colour light grey, loosely packed fossil grains, bryozoans predominant.
	10	SANDSTONE: coarse calcareous grains, white to light grey, well cemented.
380 - 385	100	LIMESTONE: a:a Trace SANDSTONE: a:a
385 - 390	50	LIMESTONE: a:a
	50	SANDSTONE: a:a Trace of mica.
390 - 395	80	LIMESTONE: a:a
	20	SANDSTONE: a:a

LITHOLOGICAL DESCRIPTIONS

PALMER - 1

DEPTH	%	DESCRIPTION
395 - 400	90	LIMESTONE: coarse fossil grains, predominantly bryozoa.
	10	SANDSTONE: a:a Trace of white mica.
400 - 405	100	LIMESTONE: loose, coarse fossil fragments Trace SANDSTONE: coarse, calcareous grains.
405 - 410	80	LIMESTONE: a:a
	20	SANDSTONE: a:a Trace of white mica.
410 - 415	80	LIMESTONE: a:a
	20	SANDSTONE: a:a
415 - 420	100	LIMESTONE: loose grains, white to light grey to green. 4 mm length, bryozoa dominant. Trace SANDSTONE: coarse, carbonaceous, calcareous grains.
420 - 425	90	LIMESTONE: a:a
	10	SANDSTONE: a:a
425 - 430	50	LIMESTONE: a:a
	50	SANDSTONE: coarse calcareous grains, occasionally encrusted in pyrite.
430 - 435	50	LIMESTONE: a:a
	50	SANDSTONE: a:a
435 - 440	40	LIMESTONE: a:a
	60	SANDSTONE: a:a
440 - 445	60	LIMESTONE: loose fossil grains.
	40	SANDSTONE: light to dark grey, fine to coarse calcareous grains, carbonaceous flecks, firm to soft
445 - 450	50	LIMESTONE: a:a
	50	SANDSTONE: a:a
450 - 455	60	LIMESTONE: a:a
	40	SANDSTONE: a:a
455 - 460	50	LIMESTONE: a:a
	50	SANDSTONE: a:a
460 - 465	50	LIMESTONE: a:a
	50	SANDSTONE: a:a, some silty material binding fossil grains together.

LITHOLOGICAL DESCRIPTIONS

PALMER - 1

DEPTH	%	DESCRIPTION
465 - 470	30	LIMESTONE: loose fossil fragments
	70	SANDSTONE: coarse calcareous grains, clear, milky, brown. Sub-rounded to well rounded, coarse, 4mm.
470 - 475	40	LIMESTONE: loose grains, smaller, less original structure visible.
	60	SANDSTONE: coarse calcareous to fine calcareous grains.
475 - 480	30	LIMESTONE: a:a
	70	SANDSTONE: a:a
480 - 485	30	LIMESTONE: a:a
	45	CALCAREOUS SANDSTONE: a:a
	25	QUARTZOSE SANDSTONE: a:a
485 - 490	20	LIMESTONE: a:a
	60	CALCAREOUS SANDSTONE: a:a
	20	QUARTZOSE SANDSTONE: a:a
490 - 495	20	LIMESTONE: a:a
	60	CALCAREOUS SANDSTONE: a:a
	20	QUARTZOSE SANDSTONE: a:a
495 - 500	10	LIMESTONE: a:a
	80	CALCAREOUS SANDSTONE: a:a
	10	QUARTZOSE SANDSTONE: a:a
500 - 505	30	LIMESTONE: a:a
	35	CALCAREOUS SANDSTONE: a:a
	35	QUARTZOSE SANDSTONE: a:a
505 - 510	20	LIMESTONE: coarse fossil fragments
	40	CALCAREOUS SANDSTONE: coarse to medium calcareous sandstone, soft to firm.
	40	QUARTZOSE SANDSTONE: coarse, sub to well rounded quartz grains.
510 - 515	20	LIMESTONE: a:a
	40	CALCAREOUS SANDSTONE: a:a
	40	QUARTZOSE SANDSTONE: a:a

LITHOLOGICAL DESCRIPTIONS

PALMER - 1

DEPTH	%	DESCRIPTION
515 - 520	30	LIMESTONE: a:a
	40	CALCAREOUS SANDSTONE: a:a
	30	QUARTZOSE SANDSTONE: a:a
520 - 525	30	LIMESTONE: a:a
	5	CALCAREOUS SANDSTONE: a:a
	65	QUARTZOSE SANDSTONE: about ½ of the grains stained yellow-brown, sub to well rounded, moderately sorted.
525 - 530	20	LIMESTONE: a:a
	80	QUARTZOSE SANDSTONE: grains sub-angular to sub-rounded, medium to coarse grains. Trace CALCAREOUS SANDSTONE.
530 - 535	20	LIMESTONE: a:a
	80	QUARTZOSE SANDSTONE: a:a
535 - 540	10	LIMESTONE: a:a
	90	QUARTZOSE SANDSTONE: loose quartz grains, medium to coarse, sub-angular to well rounded, clear, milky predominantly brown to yellow.
540 - 545	5	LIMESTONE: a:a
	95	QUARTZOSE SANDSTONE: a:a
545 - 550	10	LIMESTONE: a:a
	90	QUARTZOSE SANDSTONE: a:a
550 - 555	5	LIMESTONE: white sub-angular to sub-rounded shell fragments.
	95	QUARTZOSE SANDSTONE: a:a
555 - 560	5	LIMESTONE: a:a
	95	QUARTZOSE SANDSTONE: a:a
560 - 565	100	QUARTZOSE SANDSTONE: a:a Trace LIMESTONE.
565 - 570	5	LIMESTONE: a:a
	95	QUARTZOSE SANDSTONE: a:a
570 - 575	5	LIMESTONE: a:a
	95	QUARTZOSE SANDSTONE: loose sub-angular to sub-rounded quartz grains, predominantly brown - yellow, also clear, milky, frosted, moderately well sorted. Trace of occasionally dark brown to black opaque grains.

LITHOLOGICAL DESCRIPTIONS

PALMER - 1

DEPTH	%	DESCRIPTION
575 - 580	5	LIMESTONE: a:a
	95	QUARTZOSE SANDSTONE: a:a
580 - 585	5	LIMESTONE: a:a
	95	QUARTZOSE SANDSTONE: a:a
585 - 590	10	LIMESTONE: a:a
	90	QUARTZOSE SANDSTONE: a:a Trace CALCAREOUS SANDSTONE
590 - 595	20	LIMESTONE: a:a
	80	QUARTZOSE SANDSTONE: a:a
595 - 600	40	LIMESTONE: coarse fossil fragments
	60	CALCAREOUS SANDSTONE: coarse to very coarse calcareous grains.
600 - 605	10	LIMESTONE: a:a
	90	CALCAREOUS SANDSTONE: a:a
605 - 610	10	LIMESTONE: loose fossil fragments
	90	CALCAREOUS SANDSTONE: coarse fossil fragments well cemented, cuttings have a granular appearance.
610 - 615	5	LIMESTONE: a:a
	95	CALCAREOUS SANDSTONE: a:a
615 - 620	5	LIMESTONE: a:a
	95	CALCAREOUS SANDSTONE: a:a Trace coarse quartz grains (cavings?)
620 - 625	100	CALCAREOUS SANDSTONE: medium to dark grey, soft to firm, calcareous, carbonaceous, granular appearance Trace of fossil fragments Trace of quartz grains
625 - 630	100	CALCAREOUS SANDSTONE: a:a some finer grained cuttings. Trace of fossil fragments Trace of quartz grains
630 - 635	20	LIMESTONE: white fossil fragments, loose, sub-angular to sub-rounded.
	60	CALCAREOUS SANDSTONE: a:a
	20	QUARTZOSE SANDSTONE: loose sub-angular to sub-rounde quartz grains, clear to milky, coarse, moderately well sorted.

LITHOLOGICAL DESCRIPTIONS

PALMER - 1

DEPTH	%	DESCRIPTION
635 - 640	15	LIMESTONE: a:a
	85	QUARTZOSE SANDSTONE: a:a Trace CALCAREOUS SANDSTONE Trace Glauconite
640 - 645	10	LIMESTONE: a:a
	90	QUARTZOSE SANDSTONE: a:a grains loose, clear to frosty, sub-rounded to well-rounded.
645 - 650	100	QUARTZOSE SANDSTONE: a:a no staining of grains Trace LIMESTONE Trace Glauconite
650 - 655	5	LIMESTONE: a:a
	5	CALCAREOUS SANDSTONE: a:a
	90	QUARTZOSE SANDSTONE: a:a grains coarser, occasionall 'dirty' quartz grains, occasionally pyritic grains, some yellow grains.
655 - 660	10	LIMESTONE: a:a
	10	CALCAREOUS SANDSTONE: a:a
	80	QUARTZOSE SANDSTONE: yellow - brown staining more common. Trace Glauconitic volcanic grains.
660 - 665	10	LIMESTONE: a:a
	40	CALCAREOUS SANDSTONE: a:a
	50	QUARTZOSE SANDSTONE: yellow - brown grains prominent.
665 - 670	10	LIMESTONE: a:a
	85	QUARTZOSE SANDSTONE: a:a
	5	CALCAREOUS SANDSTONE: a:a Trace Glauconitic, carbonaceous material.
670 - 675	10	LIMESTONE: a:a
	80	QUARTZOSE SANDSTONE: a:a
	10	CALCAREOUS SANDSTONE: a:a Trace of Glauconite
675 - 680	90	LIMESTONE: a:a
	10	CALCAREOUS SANDSTONE: a:a Trace quartz grains Trace Glauconite
680 - 685	60	LIMESTONE: coarse white fossil fragments
	40	CALCAREOUS SANDSTONE: medium to coarse, grey granular calcarenite. Trace of quartz grains.

LITHOLOGICAL DESCRIPTIONS

PALMER - 1

DEPTH	%	DESCRIPTION
685 - 690	50	LIMESTONE: loose coarse white fossil fragments
	50	CALCAREOUS SANDSTONE: medium to coarse, a:a
690 - 695	60	LIMESTONE: a:a
	30	CALCAREOUS SANDSTONE: a:a
	10	QUARTZOSE SANDSTONE: a:a
695 - 700	30	LIMESTONE: a:a
	60	QUARTZOSE SANDSTONE: a:a
	10	CALCAREOUS SANDSTONE: a:a
700 - 705	30	LIMESTONE: a:a
	60	QUARTZOSE SANDSTONE: a:a
	10	CALCAREOUS SANDSTONE: a:a
705 - 710	60	LIMESTONE: a:a
	35	CALCAREOUS SANDSTONE: a:a
	5	QUARTZOSE SANDSTONE: a:a Trace Glauconite
710 - 715	50	LIMESTONE: fossil fragments predominantly fine, 1 - 2mm.
	50	CALCAREOUS SANDSTONE: finer grained Trace Glauconite
715 - 720	60	LIMESTONE: a:a
	40	CALCAREOUS SANDSTONE: a:a Trace Glauconite Trace Quartz grains
720 - 725	50	LIMESTONE: loose white, subrounded shell material original structure often obscurred, bryozoa common.
	50	CALCAREOUS SANDSTONE: medium grey, calcareous, soft to medium hard, becoming finer now than previously. Trace coarse Quartz grains, Glauconite.
725 - 730	15	LIMESTONE: a:a
	85	CALCAREOUS SANDSTONE: a:a Trace Glauconite Trace Quartz grains
730 - 735	30	LIMESTONE: a:a
	70	CALCAREOUS SANDSTONE: a:a Trace white mica, quartz grains, and glauconite

LITHOLOGICAL DESCRIPTIONS

PALMER - 1

DEPTH	%	DESCRIPTION
735 - 740	60	LIMESTONE: loose generally sub-rounded, white fossil fragments.
	40	CALCAREOUS SANDSTONE: fine - granular, soft to firm, calcareous, carbonaceous flecks. Trace Glauconite, occasionally forams.
740 - 745	60	LIMESTONE: a:a
	40	CALCAREOUS SANDSTONE: a:a Trace Glauconite, occasionally forams.
745 - 750	70	LIMESTONE: a:a
	30	CALCAREOUS SANDSTONE: a:a Trace a:a Trace pyrite, - discrete lumps.
750 - 755	90	LIMESTONE: a:a
	10	CALCAREOUS SANDSTONE: a:a Trace Pyrite Trace Glauconite
755 - 760	80	LIMESTONE: a:a
	20	CALCAREOUS SANDSTONE: a:a Trace Pyrite Trace Glauconite, coarse quartz grains
760 - 765	80	LIMESTONE: a:a but coarser grains
	20	CALCAREOUS SANDSTONE: a:a
765 - 770	45	LIMESTONE: a:a
	55	CALCAREOUS SANDSTONE: a:a Trace Glauconite
770 - 775	80	LIMESTONE: a:a
	20	CALCAREOUS SANDSTONE: a:a Trace quartz grains, pyrite
775 - 780	90	LIMESTONE: a:a
	10	CALCAREOUS SANDSTONE: a:a Trace: a:a, and occasionally forams
780 - 785	95	LIMESTONE: loose, coarse, white fossil fragments
	5	CALCAREOUS SANDSTONE: a:a Trace discrete lumps of pyrite
	786:	13-3/8" CASING POINT

LITHOLOGICAL DESCRIPTIONS

PALMER - 1

DEPTH	%	DESCRIPTION
785 - 790	10	LIMESTONE: coarse, white fossil fragments, generally 2-3 mm, bryozoa common, occasional forams
	90	CALCAREOUS SANDSTONE: ranges from Sandstone to Siltstone, medium grey, moderately firm, carbonaceous flecks prominent, trace coarse quartz grains, white to yellow-brown, sub-angular to well-rounded Trace of cement contamination
790 - 795	30	LIMESTONE: coarse white fragments, most unrecognisabl occasionally forams, bryozoa common.
	70	CALCAREOUS SANDSTONE: a:a
795 - 800	80	LIMESTONE: coarse calcareous grains, to sand sized grains, cemented.
	20	CALCAREOUS SANDSTONE: becoming finer Trace Glauconite
800 - 805	30	LIMESTONE: a:a
	70	CALCAREOUS SANDSTONE: a:a, occasional quartz grains, large forams
805 - 810	50	LIMESTONE: coarse calcareous granules, well cemented into white sub-angular cuttings
	50	CALCAREOUS SANDSTONE: becoming finer grained
810 - 815	60	LIMESTONE: often granular, forams more common
	40	CALCAREOUS SANDSTONE: a:a
815 - 820	70	LIMESTONE: a:a
	30	CALCAREOUS SANDSTONE: Trace quartz grains, glauconite
820 - 825	80	LIMESTONE: a:a
	20	CALCAREOUS SANDSTONE - SILTSTONE
825 - 830	50	LIMESTONE: a:a
	50	CALCAREOUS SANDSTONE - SILTSTONE
830 - 835	50	LIMESTONE: a:a
	50	CALCAREOUS SANDSTONE - SILTSTONE
835 - 840	50	LIMESTONE: a:a
	50	CALCAREOUS SANDSTONE - SILTSTONE
840 - 845	90	LIMESTONE: a:a
	10	CALCAREOUS SANDSTONE - SILTSTONE Trace Glauconite
845 - 850	80	LIMESTONE: a:a
	20	CALCAREOUS SANDSTONE - SILTSTONE Trace Glauconite

LITHOLOGICAL DESCRIPTIONS

PALMER - 1

DEPTH	%	DESCRIPTION
850 - 855	40	LIMESTONE: a:a
	60	CALCAREOUS SANDSTONE - SILTSTONE Trace Glauconite
855 - 860	40	LIMESTONE: Becoming granular
	60	CALCAREOUS SANDSTONE - SILTSTONE: Trace Glauconite Trace Pyrite
860 - 865	40	LIMESTONE: a:a
	60	CALCAREOUS SANDSTONE - SILTSTONE
865 - 870	50	LIMESTONE: a:a
	50	CALCAREOUS SANDSTONE - SILTSTONE
870 - 875	70	LIMESTONE: a:a
	30	CALCAREOUS SANDSTONE - SILTSTONE
875 - 880	30	LIMESTONE: a:a
	70	CALCAREOUS SANDSTONE - SILTSTONE
880 - 885	20	LIMESTONE: a:a
	80	CALCAREOUS SANDSTONE - SILTSTONE
885 - 890	100	CALCAREOUS SILTSTONE - SANDSTONE: very light grey to medium grey, grades from silty to granular, very calcareous, possible calcite aggregates, possible calcite streaks through limestone type cuttings; occasionally very fine grained encrusting pyrite, occasionally forams and shaley material, cuttings blocky to very fine grained grain aggregates, occasionally anhydrite. Occasionally tan dolomitic blocky cuttings; trace glauconite, abundant mineral fluorescence, no H/C fluorescence, no cut or crush cut. NOTE: 1. White cemented cuttings - white matrix extremely calcareous. 2. Medium grey cuttings - contain significant proportion of non-calcareous silty portion.
890 - 895	100	CALCAREOUS SILTSTONE - SANDSTONE: a:a
895 - 900	100	CALCAREOUS SILTSTONE - SANDSTONE: a:a Trace Glauconite
900 - 905	100	CALCAREOUS SILTSTONE - SANDSTONE: a:a
905 - 910	100	CALCAREOUS SILTSTONE - SANDSTONE: a:a Biomicrite fraction included with calcareous siltstone - sandst
910 - 915	100	CALCAREOUS SILTSTONE - SANDSTONE: a:a Including blocky medium grey limestone - siltstone, calcareous fraction still grades to very fine grained to fine grained calcareous sandstone.

LITHOLOGICAL DESCRIPTIONS

PALMER - 1

DEPTH	%	DESCRIPTION
915 - 920	100	CALCAREOUS SILTSTONE - SANDSTONE: a:a
920 - 925	100	CALCAREOUS SILTSTONE - SANDSTONE: a:a
925 - 930	100	CALCAREOUS SILTSTONE - SANDSTONE: a:a Increase in siltstone calcareous fraction, light grey to medium light grey; persistence of biomicrite fraction
930 - 935	100	CALCAREOUS SILTSTONE - SANDSTONE: a:a
935 - 940	100	CALCAREOUS SILTSTONE - SANDSTONE: a:a increased silty fraction
940 - 945	100	CALCAREOUS SILTSTONE - SANDSTONE: Decrease in granular fraction, increase in biomicritic fraction increase in silty fraction.
945 - 950	100	CALCAREOUS SILTSTONE - LIMESTONE: light grey to medium dark grey, firm, blocky, occasional elongated cuttings with some fissility but generally blocky, grades from very fine grained to fine grained grainstone to calcareous siltstone; sporadic occurren of biomicritic cuttings some with silty ground mass, others with very fine grained grainstone matrix; occasionally clear calcite with distinct crystal shape Trace Glauconite
950 - 955	100	CALCAREOUS SILTSTONE - LIMESTONE: a:a
955 - 960	100	CALCAREOUS SILTSTONE - LIMESTONE: a:a
960 - 965	100	CALCAREOUS SILTSTONE - LIMESTONE: a:a
965 - 980	100	CALCAREOUS SILTSTONE - LIMESTONE: a:a
980 - 985	100	CALCAREOUS SILTSTONE: cutting surrounded by a white grey 'fluffy' clay. Trace carbonaceous material
985 - 990	100	CALCAREOUS SILTSTONE: medium grey angular cuttings, soft to firm, calcareous cement, carbonaceous flecki Trace limestone fragments Trace 'fluffy' light grey clay
990 - 995	100	CALCAREOUS SILTSTONE: a:a
995 - 1000	100	CALCAREOUS SILTSTONE: cuttings surrounded by a light grey 'fluffy' clay Occasional trace of Ostracod.
1000 - 1005	100	CALCAREOUS SILTSTONE: cutting becoming difficult to recognise as 'fluffy' clay begins to dominate sample
1005 - 1010	100	CALCAREOUS SILTSTONE: a:a
1010 - 1015	100	CALCAREOUS SILTSTONE: a:a Trace only of 'fluffy' clay Trace of fossil fragments, bryozoa, forams Trace glauconite

LITHOLOGICAL DESCRIPTIONS

PALMER - 1

DEPTH	%	DESCRIPTION
1015 - 1020	100	CALCAREOUS SILTSTONE: a:a Trace glauconite, fossil fragments, carbonaceous material, ostracods
1020 - 1025	100	CALCAREOUS SILTSTONE: a:a Carbonaceous flecking very prominent in 'fluffy' clay
1025 - 1030	100	CALCAREOUS SILTSTONE: a:a clay engulfs cuttings 50% of sample
1030 - 1035	100	CALCAREOUS SILTSTONE: a:a Trace glauconite Trace pyrite
1035 - 1040	100	CALCAREOUS SILTSTONE: a:a
1040 - 1045	100	CALCAREOUS SILTSTONE: a:a Clay now very thick and viscous. Cuttings in clumps. Hard to recogni lithology.
1045 - 1050	100	CALCAREOUS SILTSTONE: a:a
1050 - 1055	100	CALCAREOUS SILTSTONE: medium light grey to medium grey, blocky, occasionally fissile, firm, silty very calcareous, occasional forams and shaley fragmen Trace glauconite Plus: MUDSTONE: light grey gummy soft mass amongst silt-stone cuttings, obviously sloughed from formation; incoherent difficult to ascertain % of lithology. Trace crystalline calcite.
1055 - 1060	100	CALCAREOUS SILTSTONE - MUDSTONE: a:a Trace tan dolomitic blocky cuttings
1060 - 1065	100	CALCAREOUS SILTSTONE - MUDSTONE: a:a
1065 - 1070	100	CALCAREOUS SILTSTONE - MUDSTONE: a:a
1070 - 1075	100	CALCAREOUS SILTSTONE - MUDSTONE: a:a
1075 - 1080	100	CALCAREOUS SILTSTONE - MUDSTONE: a:a
1080 - 1085	100	CALCAREOUS SILTSTONE - MUDSTONE: a:a Note: Increase in Mudstone with depth
1085 - 1090	100	CALCAREOUS SILTSTONE - MUDSTONE: a:a
1090 - 1095	100	CALCAREOUS SILTSTONE - MUDSTONE: a:a
1095 - 1100	100	CALCAREOUS SILTSTONE - MUDSTONE: a:a
1100 - 1105	100	CALCAREOUS SILTSTONE - MUDSTONE: a:a

LITHOLOGICAL DESCRIPTIONS

PALMER - 1

DEPTH	%	DESCRIPTION
1105 - 1110	90	CALCAREOUS SILTSTONE: medium light grey to medium grey; blocky, occasionally fissile; silty, calcareous occasionally forams and shaley material, occasionally carbonaceous flecking.
	10	MUDSTONE: light grey, gummy, soft, incoherent; obviously sloughing from formation, actual percentage of formation difficult to ascertain.
1110 - 1115	90	CALCAREOUS SILTSTONE: a:a
	10	MUDSTONE: a:a Note: Increase in mud-clay content in cuttings
1115 - 1120	90	CALCAREOUS SILTSTONE: a:a
	10	MUDSTONE: a:a Note: Gradual increase in mud-clay content continues
1120 - 1125	90	CALCAREOUS SILTSTONE: a:a
	10	MUDSTONE: a:a
1125 - 1130	90	CALCAREOUS SILTSTONE: a:a
	10	MUDSTONE: a:a
1130 - 1135	90	CALCAREOUS SILTSTONE: a:a
	10	MUDSTONE: a:a Note: Increase in mud-clay trend continues
1135 - 1140	50	CALCAREOUS SILTSTONE: a:a
	50	MUDSTONE: a:a Note: Marked decrease in calcareous siltstone percentage of total lithology
1140 - 1145	50	CALCAREOUS SILTSTONE: a:a
	50	MUDSTONE: a:a
1145 - 1150	50	CALCAREOUS SILTSTONE: a:a
	50	MUDSTONE: a:a
1150 - 1155	50	CALCAREOUS SILTSTONE: a:a
	50	MUDSTONE: a:a
1155 - 1160	50	CALCAREOUS SILTSTONE: a:a
	50	MUDSTONE: a:a
1160 - 1165	50	CALCAREOUS SILTSTONE: a:a
		MUDSTONE: a:a
1165 - 1170	50	CALCAREOUS SILTSTONE: a:a 1170 m : Increase in shale, character of cuttings sharp, fine cuttings with increased fissility abundant mineral fluorescence
	50	MUDSTONE: a:a

LITHOLOGICAL DESCRIPTIONS

PALMER - 1

DEPTH	%	DESCRIPTION
1170 - 1175	50	CALCAREOUS SILTSTONE: a:a
	50	MUDSTONE: a:a Note: Trace of glauconite in siltstone
1175 - 1180	80	CALCAREOUS SILTSTONE: a:a Note: Decrease in clay mud content. Significant increase in glauconite, abundant mineral fluorescence
	20	MUDSTONE: a:a
1180 - 1185	90	CALCAREOUS SILTSTONE: a:a
	10	MUDSTONE: a:a
1185 - 1190	100	CALCAREOUS SILTSTONE: medium light grey to medium grey; blocky; firm; occasionally fissile, silty, calcareous, occasional carbonaceous flecking, glauconite abundant.
1190 - 1195	100	CALCAREOUS SILTSTONE: a:a Abundant Glauconite
1195 - 1200	100	CALCAREOUS SILTSTONE: a:a
1200 - 1205	20	LOOSE QUARTZ: rounded to sub-rounded, well sorted clear grains, no H/C shows
	80	CALCAREOUS SILTSTONE: a:a
1205 - 1210	80	CALCAREOUS SILTSTONE: a:a
	20	LOOSE QUARTZ: a:a No H/C fluorescence, no mineral fluorescence
1210 - 1215	60	CALCAREOUS SILTSTONE: a:a
	40	LOOSE QUARTZ: a:a No H/C fluorsecence, no mineral fluorescence
1215 - 1220	90	LOOSE QUARTZ: rounded to sub-rounded grains, well sorted, clear grains, no H/C fluorescence
	10	CALCAREOUS SILTSTONE: a:a
1220 - 1225	100	LOOSE QUARTZ: clear to opaque grains, fine grained to medium grained, sub-angular to sub-rounded, some sub-angular fragments, appears bimodal in sample and mineral fluorescence, no H/C fluorescence Trace very fine grained pyrite Trace calcite crystals occasionally Trace glauconite
1225 - 1230	100	LOOSE QUARTZ: a:a
1230 - 1235	70	LOOSE QUARTZ: a:a No H/C fluorescence
	30	SHALE: Carbonaceous, medium dark grey to dark grey, fissile to blocky, non calcareous.
1235 - 1240	90	SHALE: a:a
	10	LOOSE QUARTZ: a:a

LITHOLOGICAL DESCRIPTIONS

PALMER - 1

DEPTH	%	DESCRIPTION
1240 - 1245	100	COAL
1245 - 1250	100	COAL
1250 - 1255	80	LOOSE QUARTZ: a:a
	10	SHALE: a:a
	10	COAL
1255 - 1260	90	LOOSE QUARTZ: a:a
	10	COAL
1260 - 1265	95	LOOSE QUARTZ: a:a
	5	COAL
1265 - 1270	100	LOOSE QUARTZ: a:a
1270 - 1275	85	LOOSE QUARTZ: a:a
	15	COAL
1275 - 1280	85	LOOSE QUARTZ: a:a
	15	COAL
1280 - 1285	60	LOOSE QUARTZ: sub-angular to sub-rounded, clear quartz grains,medium grained to fine grained, larger grains often fractured from angular grains; possible oil staining on some grains; some quartz grains, pyrite encrusted; no H/C fluorescence. Trace pyrite aggregates
	40	COAL
1285 - 1290	40	LOOSE QUARTZ: a:a
	60	COAL
1290 - 1295	100	LOOSE QUARTZ: a:a
1295 - 1300	85	LOOSE QUARTZ: a:a
	10	COAL
	5	SHALE - SILTSTONE: medium dark grey to medium light grey, fissile to blocky, non calcareous.
1300 - 1305	50	LOOSE QUARTZ: a:a Trace of volcanogenic sandstone fragments, coarse grained crystaline, white to black with a fine grained brown micaceous matrix. Trace of mica - white Trace possible oil stained quartz grains
	50	COAL
1305 - 1310	20	LOOSE QUARTZ: a:a
	80	COAL

LITHOLOGICAL DESCRIPTIONS

PALMER - 1

DEPTH	%	DESCRIPTION
1310 - 1315	10	LOOSE QUARTZ: a:a
	90	COAL
1315 - 1320	20	LOOSE QUARTZ: a:a
	80	COAL
1320 - 1325	90	LOOSE QUARTZ: a:a
	10	COAL
1325 - 1330	100	LOOSE QUARTZ: sub-angular to sub-rounded; clear quartz grains, medium grained to fine grained, larger grains often fractured, occasionally pyrite very fine grained encrusting some grains; no H/C fluorescence; occasionally mineral fluorescence.
1330 - 1335	100	LOOSE QUARTZ: a:a
1335 - 1340	80	LOOSE QUARTZ: a:a
	10	COAL
	10	SHALE - SILTSTONE: probably cavings
1340 - 1345	100	LOOSE QUARTZ: a:a Scveral quartz grains show som. fluorescence, some grains a 'dirty' white - yellow with very slight cut. Increased number of grains showing fluorescence, mainly mineral fluorescence.
1345 - 1350	100	LOOSE QUARTZ: a:a
1350 - 1355	100	LOOSE QUARTZ: a:a
1355 - 1360	70	LOOSE QUARTZ: a:a
	30	COAL
1360 - 1365	50	LOOSE QUARTZ: a:a
	50	COAL
1365 - 1370	50	LOOSE QUARTZ: a:a
	50	COAL
1370 - 1375	10	LOOSE QUARTZ: a:a
	90	COAL
1375 - 1380	60	LOOSE QUARTZ: a:a
	10	SHALE - SILTSTONE
	30	COAL
1380 - 1385	95	LOOSE QUARTZ: a:a
	5	COAL
1385 - 1390	50	LOOSE QUARTZ: a:a
	50	COAL

LITHOLOGICAL DESCRIPTIONS

PALMER - 1

DEPTH	%	DESCRIPTION
1390 - 1395	10	LOOSE QUARTZ: a:a
	90	COAL Trace siltstone - shale
1395 - 1400	100	COAL
1400 - 1405	100	COAL
1405 - 1410	100	LOOSE QUARTZ: a:a
1410 - 1415	80	COAL
	20	LOOSE QUARTZ: a:a
1415 - 1420	90	COAL
	10	LOOSE QUARTZ: a:a
1420 - 1425	70	LOOSE QUARTZ: a:a Note: increased sorting of quartz grains, fine grained predominence, increased round to sub-rounded grains.
1425 - 1430	80	LOOSE QUARTZ: a:a
	20	COAL
1430 - 1435	80	LOOSE QUARTZ: a:a
	20	COAL
1435 - 1440	90	LOOSE QUARTZ: a:a
	10	COAL
1440 - 1445	100	LOOSE QUARTZ: a:a
1445 - 1450	100	LOOSE QUARTZ: a:a
1450 - 1455	100	LOOSE QUARTZ: a:a
1455 - 1460	100	LOOSE QUARTZ: a:a
1460 - 1465	90	LOOSE QUARTZ: a:a
	10	COAL
1465 - 1470	60	LOOSE QUARTZ: a:a
	40	COAL
1470 - 1475	50	LOOSE QUARTZ: a:a
	50	COAL
1475 - 1480	50	LOOSE QUARTZ: a:a
	50	COAL
1480 - 1485	90	LOOSE QUARTZ: a:a
	10	COAL

LITHOLOGICAL DESCRIPTIONS

PALMER - 1

DEPTH	%	DESCRIPTION
1485 - 1490	100	COAL
1490 - 1495	60	LOOSE QUARTZ: a:a
	40	COAL
1495 - 1500	60	LOOSE QUARTZ: a:a
	40	COAL
1500 - 1505	10	LOOSE QUARTZ: a:a
	90	COAL
1505 - 1510	60	LOOSE QUARTZ: a:a
	40	COAL
1510 - 1515	80	LOOSE QUARTZ: a:a
	20	COAL
1515 - 1520	60	LOOSE QUARTZ: a:a
	40	COAL
1520 - 1525	50	LOOSE QUARTZ: clear to opaque grains, sub-angular to sub-rounded, mainly sub- angular; medium grained to very coarse grained; some grains with very fine grained pyrite encrusting, grades to argillaceous siltstone in place; no fluorescence; no H/C fluoresce no cut.
	10	SILTSTONE - SHALE: medium light grey to tan; fissile to blocky; firm; grades to very fine grained argillaceous Sandstone in places; very fine grained carbonaceous flecking; calcareous; occasional mineral fluorescence, no H/C fluorescence, or cut; appears very carbonaceous in places.
	40	COAL
1525 - 1530	100	COAL
1530 - 1535	50	LOOSE QUARTZ: a:a
	50	COAL
1535 - 1540	90	LOOSE QUARTZ: a:a
	10	COAL
1540 - 1545	60	LOOSE QUARTZ: a:a
	40	COAL
1545 - 1550	30	COAL
	5	SHALE - SILTSTONE
	65	LOOSE QUARTZ: a:a

LITHOLOGICAL DESCRIPTIONS

PALMER - 1

DEPTH	%	DESCRIPTION
1545 - 1550 (Contd.)		Note: Increased angularity of quartz grains. Quartz aggregates present with pyritic cement, noticeable increase in pyrite present in cuttings samples.
1550 - 1555	20	COAL
	80	LOOSE QUARTZ: a:a
1555 - 1560	20	COAL
	80	LOOSE QUARTZ: a:a
1560 - 1565	20	COAL
	10	SHALE - SILTSTONE: slight crush cut from very carbonaceous, very fine grained aggregates.
	70	LOOSE QUARTZ: a:a
1565 - 1570	10	COAL
	5	SHALE - SILTSTONE: a:a
	85	LOOSE QUARTZ: a:a
1570 - 1575	20	COAL
	15	SHALE - SILTSTONE: a:a
	65	LOOSE QUARTZ: a:a
1575 - 1580	100	LOOSE QUARTZ: a:a
1580 - 1585	100	LOOSE QUARTZ: a:a
1585 - 1590	100	LOOSE QUARTZ: a:a
1590 - 1595	90	LOOSE QUARTZ: a:a
	10	COAL
1595 - 1600	100	LOOSE QUARTZ: a:a
1600 - 1605	10	COAL
	90	LOOSE QUARTZ: clear to opaque, medium grained to fine grained to coarse grained, sub-angular to sub-rounded, mainly sub-angular, mainly coarse grained; grades to argillaceous fine grained Sandstone in places with calcareous cement; appearance of occasio fine grained quartz aggregates; mineral fluorescence in quartz aggregate cement; no H/C fluorescence, no cut fluorescence.
1605 - 1610	35	SILTSTONE - SHALE: light grey to medium light grey, occasional glauconite, green fragments, (possibly cavings); fissile to blocky, mainly blocky; calcareo cement, grades to very argillaceous Sandstone in pla Trace very fine grained pyrite
	25	LOOSE QUARTZ: a:a
	40	COAL

LITHOLOGICAL DESCRIPTIONS

PALMER - 1

DEPTH	%	DESCRIPTION
1610 - 1615	50	COAL
	20	SILTSTONE - SHALE: a:a
	30	LOOSE QUARTZ: a:a
1615 - 1620	25	COAL
	15	SILTSTONE - SHALE: a:a
	60	LOOSE QUARTZ: a:a
1620 - 1625	100	LOOSE QUARTZ: a:a
1625 - 1630	100	LOOSE QUARTZ: a:a
1630 - 1635	100	LOOSE QUARTZ: a:a
1635 - 1640	100	LOOSE QUARTZ: a:a
1640 - 1645	100	LOOSE QUARTZ: a:a
1645 - 1650	100	LOOSE QUARTZ: a:a
1650 - 1655	100	LOOSE QUARTZ: a:a
1655 - 1660	100	LOOSE QUARTZ: a:a
1660 - 1665	100	LOOSE QUARTZ: a:a
1665 - 1670	100	LOOSE QUARTZ: a:a
1670 - 1675	100	LOOSE QUARTZ: a:a
1675 - 1680	100	LOOSE QUARTZ: a:a
1680 - 1685	100	LOOSE QUARTZ: a:a Trace Siltstone - Shale mineral fluorescence Trace pyrite, very fine grained, encrusting quartz grains and as pyritic cement.
1685 - 1690	100	LOOSE QUARTZ: a:a
1690 - 1695	90	LOOSE QUARTZ: a:a
	10	COAL
1695 - 1700	90	LOOSE QUARTZ: a:a
	10	COAL Trace of muscovite mica Trace glauconite Trace pyrite
1700 - 1705	100	LOOSE QUARTZ: a:a
1705 - 1710	100	LOOSE QUARTZ: a:a
1715 - 1720	90	LOOSE QUARTZ: a:a
	10	COAL
1720 - 1723	100	LOOSE QUARTZ: a:a

APPENDIX 2

APPENDIX - 2

SIDEWALL CORE DESCRIPTIONS

PALMER - 1

GIPPSLAND BASIN

PAGE 1 OF 1

ATT REC

DATE 12th October 1981

ESSO AUSTRALIA LTD.

SIDEWALL CORE DESCRIPTIONS

IES RUN NO 2 SWC RUN NO 1

WELL PALMER-1

GEOLOGIST S. TWARTZ/R. KEY

SERVICE CO SCHLUMBERGER

NO	DEPTH	cm REC	ROCK TYPE	MODIFIERS	CAL	COLOR	INDUR DEG	GRAIN SIZE	SRTG	RND	DISS CLAY	STAIN	FLOURESCENCE % RK	FLOURESCENCE DISTR	FLOURESCENCE INTEN	FLOURESCENCE COLOR	CUT FLUOR. INTEN	CUT FLUOR. COLOR	CUT RESIDUE QUAN	CUT RESIDUE COLOR	SHOW	PROB PROD	REMARKS - GAS
1a	1	2	3	4	5	6	7	8	9	10	11	12		14	15	16	17	18	19	20	21	22	23
1	1715	3½	Ss	Qtz	-	v.lt. gy.	Fri	fg-grn	m-w	sa sr													
2	1709	3	Ss	Qtz	-	v.lt. gy.	Fri	fg-grn	m-w	sa sr													
3	1690	2½	Ss	Qtz,mica	-	lt.ol. gy.	Frm	vfg.	p-m	sr													
4	1668.5	2½	Sh	mica.arg	v. sl	ol.gy	Frm																
5	1643	3	Ss	Qtz,carb	-	v.lt. gy	Frm	fg	w	sa													
6	1627.5	2½	Sltst	arg,mica	-	m.lt. gy	Frm	vfg		sr													
7	1607	1½	Sltst	Qtz	-	m.lt. gy	Frm	vfg		sr													
8	1602	4	Ss	Qtz,mica	-	lt.gy	Fri	f-mg	m-w	sa sr													
9	1590	2	Ss	Qtz,mica, carb	-	m.gy	Frm	fg	P	sa													
10	1577	2	Ss	Qtz	-	m.lt. gy.	Frm	vfg	W	sr													

FORM R 257 5 72

PAGE 2 OF

ATT REC

DATE 12th October 1981

ESSO AUSTRALIA LTD.

SIDEWALL CORE DESCRIPTIONS

SWC RUN NO 1

IES RUN NO 2

WELL PALMER-1

GEOLOGIST S. TWARTZ/R. KAY

SERVICE CO SCHLUMBERGER

NO. 1a	DEPTH 1	cm REC 2	ROCK TYPE 3	MODIFIERS 4	CAL 5	COLOR 6	INDUR DEG 7	GRAIN SIZE 8	SRTG 9	RND 10	DISS CLAY 11	STAIN 12	FLOURESCENCE % RK	FLOURESCENCE DISTR 14	FLOURESCENCE INTEN 15	FLOURESCENCE COLOR 16	CUT FLUOR. INTEN 17	CUT FLUOR. COLOR 18	CUT RESIDUE QUAN 19	CUT RESIDUE COLOR 20	SHOW 21	PROB PROD 22	REMARKS - GAS 23
11	1565	4	Ss	Qtz, mica	-	lt.gy.	Frm	mg	W	sr													
12	1551	2	Sh	arg,mica	-	m.dk. gy.	Frm																
			Ss	Qtz	-	m.dk. gy.	Frm	fg	m	sa													
13	1545	2½	Sh	arg	-	Dk.gy.	Frm-hd																
14	1524.5	4	Ss/ sltst	Qtz, mica	-	lt.gy	Frm	vf-fg	w	sa													
15	1507	3	Ss/ sltst	Qtz,mica	-	lt.gy	Frm-hd	vfg	w	sa													
16	1502	3	Sltst	mica,qtz	-	m.lt gy.	Frm	vfg		sa													
17	1500	2	Ss	Qtz,mica	-	lt.gy	Fri-frm	vfg	w	sa													
18	1478	3	Ss / Sltst	Qtz,mica	-	wh-m. gy.	Frm	vfg	w	sa													
19	1453	4	Ss	Qtz	-	v.lt. gy.	Fri	m-cg	w	sa													

FORM B 257 3 72

PAGE 3 OF

ATT REC

DATE 12th October 1981

ESSO AUSTRALIA LTD.

SIDEWALL CORE DESCRIPTIONS

IES RUN NO 1 2 SWC RUN NO

SERVICE CO SCHLUMBERGER

GEOLOGIST S. TWARTZ/R. KEY

WELL PALMER-1

NO. 1a	DEPTH 1	cm REC 2	ROCK TYPE 3	MODIFIERS 4	CAL 5	COLOR 6	INDUR DEG 7	GRAIN SIZE 8	SRTG 9	RND 10	DISS CLAY 11	STAIN 12	FLOURESCENCE % RK	FLOURESCENCE DISTR 14	FLOURESCENCE INTEN 15	FLOURESCENCE COLOR 16	CUT FLUOR. INTEN 17	CUT FLUOR. COLOR 18	CUT RESIDUE QUAN 19	CUT RESIDUE COLOR 20	SHOW 21	PROB PROD 22	REMARKS - GAS 23
20	1449	3	Sltst	arg.qtz.	-	brn	frm-hd	fg															
21	1423.5	4½	Ss	qtz,sl.carb	-	lt.gy	Fri	cg	mn	sa													
										sr													
22	1407	4	Ss	qtz	-	m.lt.	Fri	c-	m	a													
						gy.		vcg.		sa													
23	1376	3½	Sh	arg.	-	Brn	hd																
24	1369	2½	Sh	arg.	-	lt.gy	hd																
25	1348.5	3½	Ss	Qtz,sl.carb	-	v.lt.	Fri	cg	mw	sa													
						gy																	
26	1342.5	4	Sh	v.carb,arg	-	brn/	Frm																
						blk																	
27	1331.2	3½	Ss	Qtz	-	yel/	Fri	m-cg	p-m	sa													
						gry.				sr													
28	1300	3	Slt/Sh	Qtz,arg,	-	brn	Frm																
				mica																			
29	1292	3½	Sh	arg,mica	-	brn	Frm																
30	1286	4	Ss	Qtz		m.gy	Fri	m-cg	mw	sr													

FORM B 257 3 72

PAGE 4 OF

ATT REC

DATE 12th October 1981

ESSO AUSTRALIA LTD.

SIDEWALL CORE DESCRIPTIONS

IES RUN NO 2 SWC RUN NO 1

WELL PALMER-1

GEOLOGIST S. TWARTZ/R. KEY

SERVICE CO SCHLUMBERGER

NO.	DEPTH	Cm REC	ROCK TYPE	MODIFIERS	CAL	COLOR	INDUR DEG	GRAIN SIZE	SRTG	RND	DISS CLAY	STAIN	FLOURESCENCE %	FLOURESCENCE DISTR	FLOURESCENCE INTEN	FLOURESCENCE COLOR	CUT FLUOR. INTEN	CUT FLUOR. COLOR	CUT RESIDUE QUAN	CUT RESIDUE COLOR	SHOW	PROB PROD	REMARKS - Gas
1a	1	2	3	4	5	6	7	8	9	10	11	12	RK	14	15	16	17	18	19	20	21	22	23
31	1280	3	Ss	qtz, mica	-	gn-gy	Fri-	vfg	w	sr													
							Frm																
32	1276	3	Sltst	All pyrite	-	gn/	Frm	vfg	w	sa													
						gold																	
33	1267	3	Ss	Qtz,pyr	-	md.gy	Fri	f.cg	p-w	sa													
34	1265	3	Ss	carb,matt	-	dr.gns	Fri	cg-fg	poor	sa													Very clean sand
										sr	Nil											no shows.
35	12645	4	Ss	Pyrite	-	dr.gns	Fri	cg-fg	poor	sa	Nil												Very clean sand
										sr													no shows.
36	1260	3	Ss	Pyrite.mica	-	dr.gns	Fri	fg	Good	sa	Nil												Argillaceous su
				white dry		mdtt				sr													no shows.
						gy																	
37	1257	4	Sltst	micro-mica	sl	md.dk	Frm	Slt															Sl min fluor.
						gy.																	
38	1246	3	Sltst	micro-mica	-	wh.to	Frm	Slt															Banded white
						md.dk																	to md.dk.gy.
						gy.																	
39	1240.5	2½	Sltst	micro-mica	-	md.dk	Hard	Slt															Possible swellin
						gy																	clays.

PAGE 5 OF

ATT REC

DATE 12th October 1981

1

SWC RUN NO 2

IES RUN NO

ESSO AUSTRALIA LTD.

SIDEWALL CORE DESCRIPTIONS

WELL PALMER-1

GEOLOGIST S. TWARTZ/R. KEY

SERVICE CO SCHLUMBERGER

NO.	DEPTH	CM REC	ROCK TYPE	MODIFIERS	CAL	COLOR	INDUR DEG	GRAIN SIZE	SRTG	RND	DISS CLAY	STAIN	FLOURESCENCE				CUT FLUOR.		CUT RESIDUE		SHOW	PROB PROD	REMARKS
													%	DISTR	INTEN	COLOR	INTEN	COLOR	QUAN	COLOR			
1a	1	2	3	4	5	6	7	8	9	10	11	12	RK	14	15	16	17	18	19	20	21	22	23
40	1236.5	3	Ss	slty.matrx	-	Md.lt	Fri -	mg	good	sa													Appears to be
						gy.	loose			sr													argillaceous Ss
41	1233	3	Sltst	micro-mica	-	Md.dk.		Slt															Bounded
				clay		gy.																	
42	1217	3	Ss	Slty.mtrx	-	Md.lt	Fri -	mg.	Poor	sa													Argillaceous
						gy.	loose	fg.		sr													
43	1210	4	Sltst	glauconite	-	gy.gn	Frm-	Slt															abundt glauconi
				abundt			hard																
				micro-mica																			
44	1208	4	Sltst	glauconite	sl	gry.gn	Frm -	Slt															Glauconite
				micro-mica			hard																common-Gurnard.
				Pyrite.																			
45	1206		Sltst	glauconite	sl	gry.gn																	
				pyrite																			
				micro-mica																			
46	1202	4	Sltst	glauconite	sl	gry.gn	Frm -	Slt															
				micro-mica			hard																
				pyrite																			
47	1200	4	Sltst	glauconite	sl	gry.gn	Frm	Slt															
				micro-mica																			

FORM B 257 3 72

PAGE 6 OF

ATT REC

DATE 12th October 1981

ESSO AUSTRALIA LTD.

SIDEWALL CORE DESCRIPTIONS

SWC RUN NO 1

IES RUN NO 2

WELL PALMER-1

GEOLOGIST S. TWARTZ/R. KEY

SERVICE CO SCHLUMBERGER

NO.	DEPTH	cm REC	ROCK TYPE	MODIFIERS	CAL	COLOR	INDUR DEG	GRAIN SIZE	SRTG	RND	DISS CLAY	STAIN	FLOURESCENCE %	FLOURESCENCE DISTR	FLOURESCENCE INTEN	FLOURESCENCE COLOR	CUT FLUOR. INTEN	CUT FLUOR. COLOR	CUT RESIDUE QUAN	CUT RESIDUE COLOR	SHOW	PROB PROD	REMARKS - GAS
1a	1	2	3	4	5	6	7	8	9	10	11	12	BK	14	15	16	17	18	19	20	21	22	23
48	1198	4	Sltst	Pyrite	sl	gry.gn	Frm	Slt															
				glauconite			-hrd																
				micro-mica																			
49	1196	3	Sltst	Glauconite	sl	gry.	Frm	Slt															
						gn.	to hrd																
50	1194	2	Ss	Glauconite	-	lt.gy.	Fri -																
						to.md.	loose																
						lt.gy.																	
51	1192	2	Sltst	mica-wh.	-	yellow	Frm	Slt															
						gry.	-frm																
						to.buff																	
52	1190	4	Sltst	Pyrite		md.dk	Frm.																
				glauc.		gry.																	
53	1188	4	Sltst	pyrite		md.dk	Frm.																
				glauc.		gy.																	
54	1186	4	Sltst	Pyrite		md.dk.	Frm																
				glauc		gy																	
55	1184	4	Sltst	fossil frags		md.dk.	Frm																
				pyrite		gy.																	

FORM B 257 3 82

PAGE 7 OF

ATT REC

DATE 12th October 1981

ESSO AUSTRALIA LTD.

SIDEWALL CORE DESCRIPTIONS

IES RUN NO 2 SWC RUN NO 2

WELL PALMER-1

GEOLOGIST S. TWARTZ/R.KAY

SERVICE CO SCHLUMBERGER

NO.	DEPTH	cm REC	ROCK TYPE	MODIFIERS	CAL	COLOR	INDUR DEG	GRAIN SIZE	SRTG	RND	DISS CLAY	STAIN	FLOURESCENCE % RK	FLOURESCENCE DISTR	FLOURESCENCE INTEN	FLOURESCENCE COLOR	CUT FLUOR. INTEN	CUT FLUOR. COLOR	CUT RESIDUE QUAN	CUT RESIDUE COLOR	SHOW	PROB PROD	REMARKS - GAS
1 a	1	2	3	4	5	6	7	8	9	10	11	12		14	15	16	17	18	19	20	21	22	23
56	1182	4	Sltst	fossil.		mdtt	Frm																
				frags.		gy.																	
				pyrite.																			
57	1180	4	Sltst	interbedded		md.dk	Frm -																
			cly.	clayey coal		gy.to	hrd																
			Coal			md.lt.																	
						gry.																	
58	1178	4	Sltst	glauconite		md.lt.	Hard																
				fossils		gry.	to Frm																
				forams.																			
59	1176	4	Sltst	fossili-		md.lt	Frm																
				ferous		gy.																	
60	1172	4	Sltst	fossili-		md.lt	Frm																
				ferous		gy																	
				pyrite.																			
61	1170	4	Sltst	fossili-		md.lt	Frm																
				ferous pyrite		gy.																	
				glauc.																			
62	1168	4	Sltst	fossili-		md.lt.	Frm																
				ferous		gy.																	
				pyrite.																			

FORM B 257 3 72

PAGE 8 OF

ATT ... REC

DATE 12th October 1981

ESSO AUSTRALIA LTD.

SIDEWALL CORE DESCRIPTIONS

IES RUN NO 2 SWC RUN NO 2

WELL PALMER-1

GEOLOGIST S. TWARTZ/R. KEY

SERVICE CO SCHLUMBERGER

NO.	DEPTH	CR REC	ROCK TYPE	MODIFIERS	CAL	COLOR	INDUR DEG	GRAIN SIZE	SRTG	RND	DISS CLAY	STAIN	FLOURESCENCE %	FLOURESCENCE DISTR	FLOURESCENCE INTEN	FLOURESCENCE COLOR	CUT FLUOR. INTEN	CUT FLUOR. COLOR	CUT RESIDUE QUAN	CUT RESIDUE COLOR	SHOW	PROB PROD	REMARKS - GAS
1a	1	2	3	4	5	6	7	8	9	10	11	12	RK	14	15	16	17	18	19	20	21	22	23
63	1164	4	Sltst	Pyrite		md.lt. gy.to lt.gy. to.buff	Frm to sft.																
64	1160	4	Sltst	fossilif. pyrite		md.lt gy.	Frm to.sft.																
65	1156	4	Sltst			lt.gy.	Frm																
66	1152	4	Sltst	Pyrite		lt.gy	Frm.																
67	1148	4	Sltst			lt.gy.	Frm.																
68	1144	4	Sltst	Glauc.		lt.gy	Frm.																
69	1140	4½	Sltst	fossilif glauc.		lt.gy.	Frm. hrd.																
70	1136	3	Sltst	Pyrite		md.lt. gy.	Frm																
71	1132	3½	Sltst	Pyr.fossilif glauc.		md.gy.	Frm.																
72	1130	4	Sltst	pyr.fossilif carb.		lt.gy.	Frm- hrd.																

FORM B 257 3 72

PAGE 9 OF

ATT REC

DATE 12th October 1981

ESSO AUSTRALIA LTD.

SIDEWALL CORE DESCRIPTIONS

IES RUN NO 2 SWC RUN NO 2

WELL PALMER-1

GEOLOGIST S. TWARTZ/R. KEY

SERVICE CO SCHLUMBERGER

NO.	DEPTH	cm REC	ROCK TYPE	MODIFIERS	CAL	COLOR	INDUR DEG	GRAIN SIZE	SRTG	RND	DISS CLAY	STAIN	FLOURESCENCE				CUT FLUOR.		CUT RESIDUE		SHOW	PROB PROD	REMARKS - GAS
													%	DISTR	INTEN	COLOR	INTEN	COLOR	QUAN	COLOR			
1a	1	2	3	4	5	6	7	8	9	10	11	12	RK	14	15	16	17	18	19	20	21	22	23
73	1118	4½	Sltst			md.gy.	Frm.																
74	1106	4½	Sltst			md.dk. gy.	Frm.																
75	1094	4	Sltst	Pyrite,carb		md.gy.	Frm. - hrd.																
76	1082	4	Sltst & coal band	Pyrite,carb.		lt.gy.	Frm																
77	1070	4	Sltst	Pyrite,mnr. carb.		med.gy	Frm																
78	1058	4	Sltst	sl.fossilif.		med.gy.	Frm																
79	1046	4½	Sltst			lt.gy.	Frm.hd.																
80	1034	5	Sltst	mica,pyr.		med.dk.	Frm																
81	1022	3	Sltst	Pyrite.		med.lt. gy.	Frm																
82	1010	4½	sparse bio-micrite			md.lt. gy.	Frm																

FORM B 257 3 72

PAGE 10 OF

ATT REC

DATE 12th October 1981

ESSO AUSTRALIA LTD.

SIDEWALL CORE DESCRIPTIONS

IES RUN NO 2 SWC RUN NO 2

WELL PALMER-1

GEOLOGIST S. TWARTZ/R. KEY

SERVICE CO SCHLUMBERGER

NO. 1	DEPTH 1	cm REC 2	ROCK TYPE 3	MODIFIERS 4	CAL 5	COLOR 6	INDUR DEG 7	GRAIN SIZE 8	SRTG 9	RND 10	DISS CLAY 11	STAIN 12	FLOURESCENCE % RK	FLOURESCENCE DISTR 14	FLOURESCENCE INTEN 15	FLOURESCENCE COLOR 16	CUT FLUOR. INTEN 17	CUT FLUOR. COLOR 18	CUT RESIDUE QUAN 19	CUT RESIDUE COLOR 20	SHOW 21	PROB PROD 22	REMARKS - GAS 23
83	998	4	Sltst	Pyrite		md.dk. gy.	Frm-hrd.																
84	986	3½	micrite			lt.gy	Frm-hrd.																
85	974	4	Fossil micrite			lt.gy	Frm																
86	962	4	a/a	Pyrite		lt.gy	Frm-hrd.																
87	950	4	bio micrite	Pyrite calcite		lt.gy to md. lt.gy	Frm																
88	938	1½	granu fossil micrite	calcite		wh-lt. gy.	Fri	vfg	good														
89	926	4	fossil micrite gran	calcite		wh-lt. gy	Fri	vfg	good														
90	914	3	fossil micrite			wh-lt. gy.	Fri	vfg	good														

FORM B 257 3 72

PAGE 11 OF

ATT REC

DATE 12th October 1981

ESSO AUSTRALIA LTD.

SIDEWALL CORE DESCRIPTIONS

IES RUN NO 2 SWC RUN NO 2

WELL PALMER-1

GEOLOGIST S. TWARTZ/R. KEY

SERVICE CO SCHLUMBERGER

NO.	DEPTH	cm REC	ROCK TYPE	MODIFIERS	CAL	COLOR	INDUR DEG	GRAIN SIZE	SRTG	RND	DISS CLAY	STAIN	FLOURESCENCE %	FLOURESCENCE DISTR	FLOURESCENCE INTEN	FLOURESCENCE COLOR	CUT FLUOR. INTEN	CUT FLUOR. COLOR	CUT RESIDUE QUAN	CUT RESIDUE COLOR	SHOW	PROB PROD	REMARKS - GAS
1a	1	2	3	4	5	6	7	8	9	10	11	12	RK	14	15	16	17	18	19	20	21	22	23
91	902	4	fossilif			wh.-	Fri	vfg	Good														
			micrite			lt.gy.																	
92	890	3	bio-			wh.	Fri																
			micrite			lt.gy.																	
93	878	3	fossilif			wh.lt.	Fri																
			micrite			gy.																	
94	866	3	fossil			lt.gy.	Fri																
			micrite																				
95	854	4	bio			wh.-	Fri																
			micrite			lt.gy.																	
96	842	4	bio-			wh.-	Fri																
			micrite			lt.gy.																	
97	830	3	bio-			wh.-	Fri.																
			micrite			md.gy.	Frm																
93	818	3	bio-	Pyrite		lt.gy.	Fri																
			micrite			-md.																	
						lt.gy.																	
99	806	3	bio-			lt.gy	Fri																
			micrite			to.buff	Frm																

FORM A 257 3 72

WELL PALMER-1

GEOLOGIST S. TWARTZ/R. KEY

SERVICE CO SCHLUMBERGER

ESSO AUSTRALIA LTD.

SIDEWALL CORE DESCRIPTIONS

IES RUN NO 2 SWC RUN NO 2

PAGE 12 OF

ATT REC

DATE 12th October 1981

FORM # 25' 3 72

NO. 1a	DEPTH 1	REC Cm 2	ROCK TYPE 3	MODIFIERS 4	CAL 5	COLOR 6	INDUR DEG 7	GRAIN SIZE 8	SRTG 9	RND 10	DISS CLAY 11	STAIN 12	FLOURESCENCE % AK	DISTR 14	INTEN 15	COLOR 16	CUT FLUOR. INTEN 17	COLOR 18	CUT RESIDUE QUAN 19	COLOR 20	SHOW 21	PROB PROD 22	REMARKS - GAS 23
100	794	4	bio-		md.	Fri																	
			micrite		lt.gy.	Frm.																	
101	782	3	micrite	Pyrite	lt.gy	Frm	vfg																
						Fri.																	
102	775	3	bio-		lt.gy.	Frm.																	
			micrite																				

APPENDIX 3

APPENDIX - 3

PLANKTONIC & FORAMINIFERAL SEQUENCE

PALMER - 1

GIPPSLAND BASIN

APPENDIX-3

PALMER-1, FORAMINIFERAL BIOSTRATIGRAPHY

by

DAVID TAYLOR (CONSULTANT)

Esso Australia Ltd
Palaeontology Report 1982/16

April 27, 1982.

PART-1

INTERPRETATIVE DATA

Introduction
Explanation of Materials
Summary Table
Data Sheet

INTRODUCTION

by

A.D. Partridge

The analysis of the foraminiferal sequence in Palmer-1 given in this report was made by David Taylor and presented as a "data package" on February 2, 1982.

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

EXPLANATION OF MATERIALS

by

David Taylor

Processed sidewall core samples from Palmer-1 were submitted for examination and delineation of planktonic biostratigraphy; particularly in the "Greensand" and carbonate above the Latrobe Sands. In this well, the highest sample documented was at 775 metres which contained a poorly preserved mid to late Miocene fauna.

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

The interval from 1184 metres to 1140 metres appears to represent an unusually complete Oligocene planktonic foraminiferal sequence with assemblages assignable to Zones J-2, J-1, I-2, I-1 and H-2. The benthonic faunas of this interval demonstrate oxygen depletion at time of depletion with a sporadic dominance of buliminaceans in assemblages akin to those of the New Zealand Whangaroroan Stage. Above the I/H boundary, biostratigraphic designation becomes increasingly difficult because of a combination of the high energy depositional environment and subsequent diagenesis.

PALMER-1 - SUMMARY TABLE

SAMPLE	DEPTH(m)	ZONE	AGE
SWC 51	1192	Indeterminate	-
SWC 52	1190	Indeterminate	-
SWC 53	1153	Indeterminate	-
SWC 54	1186	Indeterminate	-
SWC 55	1184	J-2	Early Oligocene
SWC 56	1182	J-2	Early Oligocene
SWC 57	1180	J-2	Early Oligocene
SWC 58	1178	J-2	Early Oligocene
SWC 59	1176	J-2	Early Oligocene
SWC 60	1172	J-2	Early Oligocene
SWC 61	1170	J-2	late Early Oligocene
SWC 62	1168	J-1	Late Oligocene
SWC 63	1164	J-1	Late Oligocene
SWC 64	1160	I-2	Late Oligocene
SWC 65	1156	I-2	Late Oligocene
SWC 66	1152	I	Late Oligocene
SWC 67	1145	I	Late Oligocene
SWC 68	1144	I	Late Oligocene
SWC 69	1140	H	Late Oligocene - Early Miocene
SWC 70	1136	H	Late Oligocene - Early Miocene
SWC 71	1132	H	Late Oligocene - Early Miocene
SWC 72	1130	H	Late Oligocene - Early Miocene
SWC 73	1118	H	Late Oligocene - Early Miocene
SWC 74	1106	H-1	Early Miocene
SWC 75	1094	H-1	Early Miocene
SWC 76	1082	G	Early Miocene
SWC 77	1070	G	Early Miocene
SWC 78	1058	G/F	late Early Miocene
SWC 79	1046	G/F	late Early Miocene
SWC 80	1034	F	late Early Miocene
SWC 81	1022	F	late Early Miocene
SWC 82	1010	F	late Early Miocene
SWC 83	998	F	late Early Miocene
SWC 84	986	F	late Early Miocene
SWC 85	974	F	late Early Miocene
SWC 86	962	F	late Early Miocene
SWC 87	950	F	late Early Miocene

SAMPLE	DEPTH(m)	ZONE	AGE
SWC 88	938	Indeterminate	-
SWC 89	926	Indeterminate	-
SWC 90	914	Indeterminate	-
SWC 91	902	F	late Early Miocene
SWC 92	890	Indeterminate	-
SWC 93	978	Indeterminate	-
SWC 94	866	Indeterminate	-
SWC 95	854	Indeterminate	-
SWC 96	842	Indeterminate	-
SWC 97	830	Indeterminate	-
SWC 98	818	? D	Middle Miocene
SWC 99	806	Indeterminate	-
SWC100	744	Indeterminate	-
SWC101	782	Indeterminate	-
SWC102	775	Indeterminate	-

MICROPALEONTOLOGICAL DATA SHEET

BASIN: GIPPSLAND ELEVATION: KB: 21 GL: -42.6

WELL NAME: PALMER # 1 TOTAL DEPTH: 1720 metres

AGE		FORAM. ZONULES	HIGHEST DATA					LOWEST DATA				
			Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two W Tim
PLEISTOCENE		A_1										
		A_2										
PLIOCENE		A_3										
		A_4										
MIOCENE	LATE	B_1										
		B_2										
		C										
	MIDDLE	D_1						818	2			
		D_2						818	2			
		E_1										
		E_2										
	EARLY	F	902	2				1058	2	1034	1	
		G	1046	2	1070	1		1082	1			
		H_1	1094	1								
OLIGOCENE	LATE	H_2						1140	1			
		I_1	1144					1152	1			
		I_2	1156	0				1160	1			
	EARLY	J_1	1164	1				1168	1			
		J_2	1170	1				1184	1			
EOCENE		K										
		Pre-K										

COMMENTS: Good early to late Oligocene sequence which appears to be continuous but becomes fuzzy in Zone H-2. See details on cards.

CONFIDENCE RATING:

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

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

DATA RECORDED BY: *PALTECH PTY. LTD.* DATE: February 2nd, 1982.

DATA REVISED BY: DATE:

PART-2

BASIC DATA

Keys to Codes and Abbreviations
Analysis of Samples

KEY TO DATA CODES AND ABBREVIATIONS

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

SWC 51 at 1192 metres:
Lithology: Silty very fine quartz. Sandstone with carb. matter - r. fine to medium and subrounded quartz and dolomite.
Fauna: Arenaceous Benthonics only.

SWC 52 at 1190 metres:
Lithology: Dolomite as aggregations of fine crystals. 5% pelletal glauc.
Fauna: Arenaceous Benthonics and fish fragments only.

SWC 53 at 1188 metres:
Lithology "Greensand" - pellets and lumps of glauc. clay r. dolomite.
Fauna: Calcareous Benthonics and fish fragments only.

SWC 54 at 1186 metres:
Lithology: Calcareous clay with glauc. r. dolomite and quartz.
Fauna: Calcareous Benthonics and indeterminate planks.

SWC 55 at 1184 metres:
Lithology: 70% calc. and glauc. clay - some ang. quartz odolomite
Fauna: Planktonics: Preservation poor.
Globigerina angiporoides angiporoides
Globigerina praebulloides
Globigerina brevis
Benthonics:
Anomalinoides aotea
Anomalinoides vitrinoda
Gyroidinoides
Cibicides
Trifarina
Alabamina
Haplophragmoides
Bathysiphon
Ammodiscus
Ammobaculites
Trochammina
Other Fauna: Echinoid
Count: 500
% Planks: 20%
Environment: Whangaroan Transgressive.

SWC 56 at 1182 metres:

Lithology: Dom. forams, dolomite quartz and r. glauc.

Fauna: Planktonics: Preservation poor - mainly internal moulds

Globigerina brevis
Globigerina angiporoides angiporoides
Globigerina praebulloides
?Globoquadrina tripartita
Globorotalia munda
Globorotalia nana

Benthonics:

Bolivinopsis
Bolivina
Bulimina
Siphouvigerina
Bathysiphon.
Ammodiscus
Cassidulina
Cibicides
Haplophragmoides

Other Fauna: Echinoid, pelecypods, fish fragments.

Count: 1000

% Planks: 10%

Environment: Whangaroan Transgressive.

SWC 57 at 1180 metres:

Lithology: 90% foram, common bit. coal fragments r. cluster pyrite, r. pellets glauc.

Fauna: Planktonics:

Globigerina angiporoides angiporoides
Globigerina praebulloides
Globigerina brevis
Globorotalia gemma
Turborotalids indeterminate.

Benthonics:

Osangularia bengelensis
Cibicides perforatus lobatulus
Pseudoclavulina rudis (very common)
Cibicides pseudoungerianus
Gyroidinoides.
Sphaeroidina bulloides
Anomalinoides aotea
Bolivina smooth wall type dominant.

Siphouvigerina cararionsis
Bathysiphon
Bolivinopsis
Angulogerina otatara
Dominance of: Buliminacea
Other Fauna: Fish fragments, r. echinoid spines.
Count: 1000
% Planks: 30%

Environment: Whangaroan Transgressive
Comments: Preservation poor/recryx.

SWC 58 at 1178 metres:
Lithology: 50% glauc. clay. 50% foram.
Fauna: Planktonics:
Globigerina angiporoides angiporoides
Globigerina brevis
Chiloguembelina
Globorotalia gemma
Globorotalia continuosa
Benthonics:
Bolivinopsis - dominant.
Bathysiphon
Karreriella bradyi
Bolivina (smooth) very common
Cibicides perforatus very common
Brevoralis very common
Siphouvigerina cararіensis dominant.
Gyroidinoides
Astrononion lenticulina
Bulimina truncanella
Angulogerina otatara
Dominance of Buliminacea
Count: 2000
% Planks: 20%

Environment: Whangaroan Transgressive. Similar to J in Wurruk Wurruk in Sale.
Comments: Preservation improving, plank. structures partially destroyed. Approximately 70% is approximately .25mm.

SWC 59 at 1176 metres:
Lithology: 70% Calc. shale, 30% forams.
Fauna: Similar assemblages to SWC's 58 and 60.

SWC 60 at 1172 metres:

Lithology: 50% pell. & glauc. clay. 50% forams, r. pyrite. aggs.

Fauna: Planktonics:

Globigerina angiporoides angiporoides
Globigerina brevis
Globorotalia gemma
Cassigerinella chipolensis
Globorotalia testarugosa

Benthonics:

Bolivina spp. smooth, dominant.
Siphouvigerina can dominant.
Bulimina truncanella common
Angulogerina otatara common
Bolivinopsis cubensis
Karreria bradyi
Cibicides spp. as previous, very common
Dominance of: Buliminacea
Other Fauna: Est. pell. fragments.
Count: 2000
% Planks: 20%

Environment: Whangaroan Transgressive.

Comments: Preservation improving upwards comments as for SWC 58.

SWC 61 at 1170 metres:

Lithology: 90% foram, c. glauc.

Fauna: Planktonics:

Globorotalia testarugosa
Globorotalia gemma
Globigerina angiporoides angiporoides
Turboratalids indeterminate.

Benthonics:

Bolivina anastomosa dominant
Bolivina zedirecta very common
Trifarina bradyi
Cibicides mediocris
Cibicides subhaidingeri
Cibicides perforatus/opacus
Siphouvigerina canariensis
Siphouvigerina probosciadea very common
Angulogerina otatara
Bathysiphon
Gyroidinoides
Cassidulina subglobosa

Dominance of: Buliminacea
Other Fauna: Echinoid sp. common ost.
Environment: Whangaroan Transgressive.
Comments: Preservation sugary but improving, comments as for 58.

SWC 62 at 1168 metres:
Lithology: 90% forams, glauc. as below
Fauna: Planktonics:
Globigerina angiporoides angiporoides
Globigerina euapertura
Globigerina praebulloides
Globorotalia nana
Globorotalia continuosa
Benthonics:
Siphouvigerina dominant.
Bolivina dominant.
As below at 1170 + Notorotalia
Count: 2500
% Planks: 30%

SWC 63 at 1164 metres:
Lithology: 70% forams, 30% glauc. clay marl.
Fauna: Planktonics: Preservation fair-sugary
Globigerina angiporoides angiporoides
Globigerina euapetura
Globigerina praebulloides
Globigerina labiacrasssata
Globorotalia testarogosa
Globorotalia nana
Benthonics: As below at 2170 + Notorotalia
Dominance of: Buliminacea
Other Fauna: Echinoid spines.
Count: 2500
% Planks: 30%

SWC 64 at 1160 metres:
Lithology: 90% forams, r. glauc. marl.
Fanua: Planktonics: Improved preservation from 1164 metres.
Globigerina labiacrassata
Globigerina praebulloides
Globigerina euapertura
Globorotalia opima
Globorotalia nana
Globorotalia testarugosa
Globorotalia extans

Benthonics:
Cassidulina subglobosa
Cassidulina laevigata common
Cibicides lobatulus common
Cibicides vortex
Bolivina (smooth)
Lenticulina
Anomalinoides procolligera
Pullenia
Sphaeroidina
Tritaxia
Other Fauna: Echinoid spines.
Count: 5000
% Planks: 30%

SWC 65 at 1156 metres:
Lithology: 80% forams, 20% green pellets of glauc. clay marl.
Fauna: Planktonics:
Guembelitra
Globorotalia testarugosa
Globorotalia extans
Globorotalia opima
Globorotalia nana
Globigerina euapertura
Globigerina praebulloides
Globigerina labiacrassata
Benthonics:
Bolivina smooth
Bolivina anastomosa
Tritaxia
Angulogerina
Cibicides spp.
Anomalinoides spp.
Sphaeroidina
Pullenia
Count: 5000
% Planks: 30%

SWC 66 at 1152 metres:
Lithology: 90% forams
Fauna: Planktonics:
Globigerina euapertura
Globigerina labiacrassata
Globigerina praebulloides

Globigerina ciperoensis
Globorotalia opima
Globorotalia nana
Other Fauna: Echinoid spines, bryozoa.
Count: 1000
% Planks: 25%

SWC 67 at 1148 metres
Lithology: 60% forams, 30% marls, minor glauc. pellets, Coal quartz.
Fauna: Planktonics:
Globorotalia opima
Globorotalia obesa
Globorotalia continuosa
Globoquadrina venezuelana
Globigerina euapertura
Globigerina praebulloides
Globigerina ciperoensis
Benthonics:
Bolivina
Bulimina
Euuvigerina
Anomalinoides
Cibicides
Agglutinated
Karreria
Other Fauna: ostra; echinoid spines.
Count: 2500
% Planks: 40%

SWC 68 at 1144 metres:
Lithology: As for 1148 metres.
Fauna: Planktonics:
Globigerina euapertura
Globigerina praebulloides
Globigerina ciperoensis
Globigerina labiacrassata
Globorotalia opima
Globorotalia continuosa
Globorotalia obesa
Globoquadrina venezuelana
Benthonics:
As for 1148 metres.
Count: 2500
% Planks: 40%

SWC 69 at 1140 metres:

Lithology: 60% forams, 30% orange lime. calc. siltstone, minor coal, glauc. quartz.

Fauna: Planktonics:

Globigerina woodi connecta
Globigerina woodi woodi
Globigerina praebulloides
Globigerina ciperoensis
Globorotalia continuosa
Globorotalia nana
Mainly small sized specimens of Turborotalids.
Benthonics:
Bolivina anastomosa
Bulimina truncanella
Cassidulina subglobosa
Arenaceous
Cibicides
Anomalinoides
Other Fauna: Echinoid pelecypods.
Count: 1000
% Planks: 40%

SWC 70 at 1136 metres:

Lithology: 90% forams.

Fauna: Planktonics:

Globigerina woodi woodi
Globigerina praebulloides
Globigerina ciperoensis
Globorotalia nana
Globorotalia continuosa
Globoquadrina venezuelana
Globoquadrina dehiscens (s.l.)
Benthonics:
Cibicides lobatulus
Karreria
Bolivina
Bulimina
Cassidulina subglobosa
Other Fauna: Echinoid; pel. fragments.
Count: 2000
% Planks: 40%

SWC 71 at 1132 metres:
Lithology: 70% forams, 20% marls, minor glauc. quartz.
Fauna: Planktonics:
Globigerina woodi woodi
Globigerina praebulloides
Globorotalia continuosa
Globorotalia nana
Benthonics:
Siphouvigerina
Bulimina
Bolivina
Cassidulina subglobosa
Cibicides
Anomalinoides
Other Fauna: Echinoid, pelecypods.
Count: 2500
% Planks: 30%

SWC 72 at 1130 metres:
Lithology: As for 1132 metres.
Fauna: Planktonics:
Globigerina woodi connecta
Globigerina woodi woodi
Globigerina praebulloides
Globorotalia continuosa
Globorotalia nana
Benthonics:
As for 1132 metres.
Other Fauna: As for 1132 metres.
Count: 2500
% Planks: 25%

SWC 73 at 1118 metres:
Lithology: Biogenic debris and forams. Some limestone pyrite.
Fauna: Planktonics:
Globigerina woodi connecta
Globigerina woodi woodi
Globigerina praebulloides
Globorotalia continuosa
Globorotalia nana
Benthonics:
Anomalinoides
Gaudyrina

Textularia
Pseudoclavulina
Cibicides
Karreria.
Anomalinoides
Astrononion
Sphaeroidina
Bolivina
Other Fauna: Everything but fragments.
Count: 2500
% Planks: 20%

Environment: High energy.

SWC 74 at 1106 metres:

Lithology: Biogenic debris and forams.

Fauna: Planktonics:
Similar assemblage to SWC 73 at 1118 metres but increased percentage of Globigerina woodi connecta - Globigerinoides trilobus.
Benthonics:
Similar assemblage to SWC 73 at 1118 metres.
Other Fauna: everything.
% Planks: ?

SWC 75 at 1094 metres:

Lithology: Biogenic debris and forams.

Fauna: Planktonics:
Globigerina woodi connecta - Globigerinoides trilobus
Globigerina woodi woodi
?Catapsydrax dissimilis
Globorotalia nana continuosa
Globorotalia bella
Benthonics:
Siphouvigerina
Bolivina and other bulimina
Anomalinoides
Arenaceous
Other Fauna: Everything, frags.
Count: 2000
% Planks: 20%

SWC 76 at 1082 metres:

Lithology: Biogenic debris and forams.

Fauna: Planktonics:

Globigerinoides trilobus
Globoquadrina dehiscens (s.s.)
Globigerina woodi connecta
Globigerina woodi woodi
Globigerina bulloides
Globigerina ciperoensis
Globorotalia bella
Globorotalia continuosa
Globorotalia nana
Count: 1500
% Planks: 20%

SWC 77 at 1070 metres:

Lithology: 80% calc. shale, 20% forams.

Fauna: Planktonics:

Catapsydrax dissimilis
Globigerina woodi connecta
Globigerina woodi woodi
Globigerina praebulloides
Globorotalia continuosa
Count: 500
% Planks: 20%

SWC 78 at 1058 metres:

Lithology: 85% biogenic calc., very worn and fragmented. 10% pyrite. Some as infilling, minor ang. quartz.

Fauna: Planktonics: Preservation poor. Mainly small sized.

?Globigerinoides bisphericus
Globorotalia bella
Globorotalia continuosa
Globorotalia indeterminate
Globigerina woodi woodi
Globigerina bulloides
Globigerina indeterminate.
Dominance of: 95% of plankton approximately .2mm in size.

Benthonics:

Cibicides dominant with Cibicides lobatus
Textularia
?Ehrenbergina
Gaudyrina convexa
Miliolids - worn after infilled with pyrite.
Anomalinoides
Discorotalia

Other Fauna: Bryozoa - dominant. Echinoid spines, ostracods, gastropods, pelecypods.
Count: 2000
% Planks: 20%

SWC 79 at 1046 metres:
Lithology: Biogenic debris, 10% pyrite.
Fanua: Planktonics:
Globigerina woodi woodi
Globigerinoides trilobus
Globorotalia bella continuosa
Globigerina indeterminate
Globorotalia indeterminate.
Dominance of: 90% of plankton approximately .2mm in size.
Benthonics:
Cibicides brevis
Astrononion
Gyroidinoides.
Miliolids
Ammodiscus
Haplophragmoides.
Bathysiphon
Bolivina
Count: 2000
% Planks: 10%

SWC 80 at 1034 metres:
Lithology: 80% forams, pyrite lim.
Fauna: Planktonics:
Globigerinoides bisphericus
Globigerina woodi woodi
Globigerina bulloides
Globorotalia Indeterminate.
Dominance of: 100% approximately, 2mm.
Benthonics:
Bolivina - Dominant including Bolivina anastomoa Group.
Discorotalia
Cibicides
Anomalinoides including procolligera
Cassidulina subglobosa
Trifarina.
Dominance of: Bolivina
Other Fauna: Echinoid spines, fish fragments.
Count: 3000
% Planks: 20%

SWC 81 at 1022 metres:

Lithology: 90% forams, r. ang. quartz.

Fauna: Planktonics:

Globigerina woodi connecta
Globigerina woodi woodi
Globigerina ciperoensis
Globorotalia bella
Globorotalia continuosa
Dominance of: 90% approximately .2mm
Benthonics:
Bolivina
Bolivina anastomosa
Trifarina
Cibicides vortex
Cibicides opaqus
Cassidulina subglobosa
Cassidulina carinata
Dominance of: Bulimina
Other Fauna: Echinoid spines.
Count: 1000
% Planks: 10%

Comments: Very small residue.

SWC 82 at 1010 metres:

Lithology: 80% biogenic calc. - very worn fragments pyrite often as infill. Very r. glauc.

Fanua: Planktonics: Preservation poor.

Globigerinoides bisphericus
Globigerinoides trilobus
Globigerina woodi connecta
Globigerina woodi woodi
Benthonics:
Cibicides Dominant.
Cassidulina subglobosa
Cassidulina carinata
Bolivina
Count: 500
% Planks: ?

SWC 83 at 998 metres:

Lithology: 80% biogenic micrite, 20% pyrite.

Fauna: Planktonics:

Globigerinoides trilobus

Globigerina woodi connecta
Globigerina woodi woodi
Globigerina bulloides
Globorotalia bella
Globorotalia continuosa
Globorotalia? nana
Dominance of: 80% approximately .2mm
Benthonics:
Sphaeroidina
Cassidulina carinata
Cassidulina subglobosa
Miliolids
Cibicides - dominant.
Siphouvigerina
Other Fauna: Very worn fragments, bryozoa dominant.
Echinoid spines are abundant.
Count: 1000
% Planks: 20%

SWC 84 at 986 metres:

Lithology: As for SWC 83 at 998 metres but pyrite = 10%.

Fauna: Planktonics:
Similar assemblage to SWC 83 at 998 metres.
Benthonics:
Similar assemblage to SWC 83 at 998 metres.

SWC 85 at 974 metres.

Lithology: Biogenic calc. recryx.

Fauna: Planktonics:
Globigerina woodi connecta
Globigerina woodi woodi
Globigerina ciperoensis
Globigerinoides bisphericus
Globigerinoides trilobus
Globorotalia indeterminate.
Benthonics:
Cibicides - dominant.
Sphaeroidina
"Haplophragmoides"
Gaudyrina convexa
Karreria
Miliolids
Other Fauna: Bryozoa - dominant. Ostr.
Count: 500
% Planks: 10%

SWC 86 at 962 metres:

Lithology: Biogenic calcarenite as for SWC 85 at 974 metres with pyrite.

Fauna: Planktonics:
Similar assemblage to SWC 85 at 974 metres.
Benthonics:
Similar assemblage to SWC 85 at 974 metres.

SWC 87 at 950 metres:

Lithology: Recryx. micrite r. ang. quartz.

Fauna: Planktonics:
Globigerinoides bisphericus
Globigerinoides trilobus
Globigerina woodi woodi
Globigerina woodi connecta
Globigerina bulloides
Globigerina indeterminate
Globorotalia indeterminate.
Benthonics:
Cibicides - dominant.
Sphaeroidina
Anomalinoides
Cassidulina
Other fauna: Bryozoa fragments, Echinoid spines.
Count: 1000
% Planks: 10%

SWC 88 at 938 metres:

Lithology: Micrite - almost totally recryx. Fine calcite.

Fauna: Planktonics:
Indeterminate because of diagenesis.
Benthonics:
Cibicides
Otherwise indeterminate.

SWC 89 at 926 metres:

Lithology: Recryx. biogenic calcarenite.

Fauna: Planktonics: Very poor preservation
Globigerina indeterminate.
Benthonics:
Cibicides dominant
Carpentaria rotaliformis (abundant)
Anomalinoides

Astrononion
Textularia
Other fauna: Bryozoa very fragmented. Dominant echinoid spines.
Count: 200
% Planks: ?

SWC 90 at 914 metres:
Lithology: Biogenic calcarenite, recryx. r. pyrite.
Fauna: Planktonics: Poor preservation.
Globigerina indeterminate
Globorotalia indeterminate
Dominance of: 90%, .2mm
Benthonics:
Similar assemblage to SWC 89 at 925 metres. Adds Sphaeroidina
Other Fauna: Bryozoa dominant. (some grey). Echinoid spines, pelecypods.
Count: 2000
% Planks: ?

SWC 91 at 902 metres:
Lithology: Biogenic calcarenite very worn fragments. Recryx. r. pyrite.
Fauna: Planktonics:
Globigerinoides bisphericus
Globigerinoides trilobus
Globigerina indeterminate
Globigerina woodi woodi
Globigerina woodi connecta
Globigerina ciperoensis
Dominance of: 90%, .2mm.
Benthonics:
As for SWC 90 at 914 metres.
Other Fauna: Bryozoa dominant. Echinoid spines, pelecypods.
Count: 2000
% Planks: ?

SWC 92 at 890 metres:
Lithology: 80% biogenic micrite. Lst. recryx. 15% biogenic pyrite.
Fauna: Planktonics: Very, very poor preservation.
N.B. Lithological comments.

Benthonics:
Cibicides
Anomalinoides
Bolivina
Textularia

SWC 93 at 878 metres:

Lithology: 90% very worn fragments. Biogenic calcarenite. r. ang. quartz pyrite.

Fauna: Planktonics: Preservation much poorer than SWC 91 at 902 metres.
Globigerina indeterminate
Globorotalia indeterminate
Benthonics:
Cibicides
Anomalinoides
Other fauna: Bryozoa dominant. Echinoid spines.

SWC 94 at 866 metres:

Lithology: Almost completely recryx. Biogenic calcarenite.

Fauna: Planktonics: Poor preservation because of diagenesis. Indeterminate.
Benthonics:
Cibicides
Gyroidinoides.
Other Fauna: Very worn fragments, "finely ground" bryozoa dominant. Echinoid spines.

Environment: High energy canyon head facies as in Barracouta.

SWC 95 at 854 metres:

Lithology: Recryx. biogenic calcarenite.

Fauna: Planktonics: Poor preservation because of diagenesis.
Benthonics:
Cibicides dominant.
Sphaeroidina
Cassidulina
Other fauna: Bryozoa fragments not as finely ground as at 866 metres. Some grey - dominant echinoid spines.

Environment: High energy canyon head facies as in Barracouta.

SWC 96 at 842 metres:

Lithology: As for SWC 95 at 854 metres.

Fauna: Planktonics: Poor preservation due to diagenesis.
Globigerina indeterminate

Benthonics:
Poor preservation due to diagensis
Other Fauna: Similar to SWC 95 at 854 metres.

SWC 97 at 830 metres:
Lithology: Biomicrite - recryx. fine ground bryozoa and other debris.
Fauna: Planktonics: Very poor preservation indeterminate forms only.
Benthonics:
Cibicides pseudouvigerina + indeterminate.

SWC 98 at 818 metres:
Lithology: Recryx biogenic calcarenite.
Fauna: Planktonics:
Orbulina universa
Globigerina woodi woodi
Globigerina bulloides
Globigerinoides trilobus
Globorotalia indeterminate.
Benthonics:
Cibicides
Heterolepa
Textularia
Other Fauna: Very worn bryozoa dominant. Echinoid spines.

SWC 99 at 806 metres:
Lithology: Biogenic calcarenite with finely ground bryozoa recryx. calcite. r. ang. quartz.
Fauna: Planktonic: Preservation poor, worn.
Globigerina indeterminate.
Benthonics: Preservation poor, worn.
Amphistegina (worn)
Cassidulina subglobosa
Cibicides + indeterminate.
Other Fauna: Bryozoa dominant. Echinoid spines.
Environment: High energy canyon head - Barracouta facies.

SWC 100 at 794 metres:
Lithology: As for SWC 99 at 806 metres.
Fauna: Planktonics: Similar assemblage to SWC 99 at 806 metres.
Benthonics: Similar assemblage to SWC 99 at 806 metres.

SWC 101 at 782 metres:

Lithology: Similar to SWC's 100 (794m) and 99 (806m).

Fauna: Planktonics: Similar assemblage to SWC's 100 (794m) and 99 (806m)

Benthonics: Similar assemblages to SWC's 100 (794m) and 99 (806m)

SWC 102 at 775 metres:

Lithology: Similar to SWC's 99 (806m), 100 (794m) and 101 (782m).

Fauna: Planktonics: Similar assemblage to SWC's 99 (806m), 100 (794m) and 101 (782m).

Benthonics: Similar assemblage to SWC's 99 (806m) 100 (794m) and 101 (782m).

Appendix 4

APPÈNDIX - 4

PALYNOLOGICAL ANALYSIS

PALMER - 1

GIPPSLAND BASIN

PALYNOLOGICAL ANALYSIS OF PALMER-1

GIPPSLAND BASIN

by

HOWARD E. STACY

Esso Australia Ltd

March 10, 1982

Palaeontology Report 1982/9

PART I

INTERPRETATIVE DATA

Introduction

Summary Table

Geological Comments

Comments on Age Zones

Table 1: Interpretative Data

Palynological Data Sheet

INTRODUCTION:

Thirty five (35) sidewall core samples were processed and examined for palynomorphs. Recovery, in general, was poor to fair from most samples. One sample was barren of identifiable microfossils, and the yield from six others so poor that they could not be assigned to a stratigraphic zone with confidence.

Palynological zones and lithologic-facies subdivisions for this well section, from the lower part of the Lakes Entrance Formation to the bottom of the well is summarized below. Results of this palynological study are summarized for the individual samples in Table 1 and the occurrence and distribution of each species is tabulated in the accompanying check charts.

SUMMARY

UNIT/FACIES	ZONE	DEPTH (metres)
Lakes Entrance Fm	*P. tuberculatus*	1106 - 1184
	Upper *N. asperus*	1188 - 1190
1192		
Gurnard Formation	Middle *N. asperus*	1192 - 1236.5
1219		
	Lower *N. asperus*	1260 - 1331.2
Latrobe Group	Upper *M. diversus*	1376
"Coarse Clastics"	Middle *M. diversus*	1449
	UNCONFORMITY	
	Upper *L.balmei*	1478 - 1502
	Lower *L. balmei*	1545 - 1668
		T.D. 1723

GEOLOGICAL REMARKS:

1) Only one major stratigraphic break is evident in this section. That is the hiatus between the Middle M. diversus sediments at 1449 metres and the Upper L. balmei deposits at 1479 metres. Smaller, less obvious disruptions in sedimentation are possible between the lowest Lower N. asperus Zone sidewall core at 1331 metres and the Middle M. diversus Zone sample at 1449 metres.

2) A thin wedge of Upper N. asperus Zone (basal Oligocene to Uppermost Eocene) is shown by the two samples from 1188 metres and 1190 metres. Although not recorded from Perch-1, the lack of identification could easily be accounted for by the wider sidewall core spacing in this earlier well. This Upper N. asperus assemblage probably could not be distinguished from the overlying P. tuberculatus flora on the basis of cutting samples only.

3) It is of interest to note that the sediments with the Upper N. asperus flora (1188 and 1190 metres) are strongly calcareous and are lithologically similar to the overlying Lakes Entrance Formation, rather than the less calcareous Gurnard Formation or facies of Middle N. asperus Zone age which occur below 1192 metres.

4) The original pick, from the electric logs, for the Gurnard Formation (1155 to 1181 metres) is now shown to be too high, based on palynology. This section is entirely within the Oligocene, P. tuberculatus Zone. Based on the highest occurrence of an Eocene flora (the Middle N. asperus Assemblage), the top of the Gurnard is now considered to be at 1192 metres. The base of the Gurnard, selected from electric log and lithologic characters is placed 1219 metres, although the Middle N. asperus flora extends down through 1236.5 metres.

5) Vozzhenikova (al Deflandrea) extensa, the dinoflagellate marker for the Middle N. asperus Zone was identified in the sample from 1192 metres. This compares well with the occurrence of V. extensa reported in core samples from 1143 to 1161 metres (= 3750 to 3808 feet) in Perch-1.

6) Assemblages of undoubted Upper L. balmei Zone age were encountered in the section between 1478 and 1545 metres. Below this, however a generalised L. balmei flora was found in the samples from 1602 to 1668.5 metres, and below this only a poorly developed microflora with an overall Paleocene or older aspect.

DISCUSSION OF ZONES

Lower Lygistepollenites balmei Zone: 1545 to 1668.5 metres. The common occurrence of Lygistepollenites balmei, combined with the presence of Gambierina edwardsii, G. rudata and Australopollis obscurus confirm that these samples are Paleocene or older. The abundance of L. balmei is indicative of the L. balmei Zone, while the absence of any specimens of Cyathidites gigantis, Proteacidites grandis, Verrucosisporites kopukiensis or other species from the Upper part of the zone suggests that these sediments are probably from the Lower part of the L. balmei Zone. Samples below 1668.5 metres were barren of diagnostic fossils.

Upper Lygistepollenites balmei Zone: 1478 to 1502 metres. Abundant specimens of L. balmei continue through this section and the presence, although rare, of Tetracolporites textus suggests that these sediments should be assigned to the Upper part of the L. balmei Zone.

Middle Malvacipollis diversus Zone: 1449 metres.
The single sample from 1376 metres yielded a large, well developed assemblage of Middle M. diversus Zone age. Index species includes Malvacipollis diverus, Banksieacidites arcuatus, Polycolpites esobalteus, Periporopollenites demarcatus and Triporopollenites ambiguus. In addition to the Early Eocene species there was a number of reworked specimens from the L. balmei Zone.

Upper Malvacipollis diversus Zone: 1376 metres.
The presence in this large flora of Proteacidites pachypolus, Myrataceidites tenuis and Santalumidites cainozoicus show that this assemblage is Upper M. diversus Zone or younger. A count of the flora demonstrated that P. pachypolus was much less than 5% of the total assemblage and that Casuarina (H. harrisii) significantly exceeded the amount of Nothofagus pollen, both of which are associated with an Upper M. diversus rather than a P. asperopolus, Zone assemblage.

Lower Nothofagidites asperus Zone: 1260 to 1331.2 metres.
In addition to the occurrence of Areosphaeridium dictyoplokus at 1300 metres and Rhombodinium glabrum at 1285 metres, the scattered presence of Proteacidites asperopolus, P. pachypolus and Nothofagidites falcatus, as well as the absence of Myrataceidites tenuis, place these samples in the Lower Nothofagidites asperus Zone. The sidewall core from 1257 metres yielded a poor N. asperus assemblage, without specific markers that allowed further subdivision.

Middle Nothofagidites asperus Zone: 1192 to 1236.5 metres.
Triorites magnificus is the principal marker for this zone and it occurred in both the 1192 and 1236.5 metre samples. Vozzhenikova? (al Deflandrea) extensa marks a marine influence in this zone at 1192 metres.

Upper Nothofagidites asperus Zone: 1188 to 1190 metres.
The flora from these samples is similar to the overlying P. tuberculatus Zone assemblage, except that no specimens of Cyatheacidites annulatus or Protoellipsodinium simplex are found and several uppermost Eocene dinoflagellates, such as Systematophora placacantha and Phthanoperidinium eocenicum are present.

Proteacidites tuberculatus Zone: 1106 metres.
Regular and consistent occurrence of C. annulatus and P. simplex mark these samples as coming from the P. tuberculatus Zone.

TABLE 1 - INTERPRETATIVE DATA

SUMMARY OF PALAEONTOLOGICAL ANALYSIS, PALMER-1, GIPPSLAND BASIN

SAMPLE	DEPTH METRES	DEPTH FEET	ZONE	AGE	CONFIDENCE RATING	YIELD	SPORE-POLLEN DIVERSITY	DINO. DIVERSITY	COMMENTS
SWC 74	1106	3628.5	P. tuberculatus	Oligocene	1	Poor	Low	Moderate	
SWC 73	1118	3668	P. tuberculatus	Oligocene	1	Fair	Moderate	High	
SWC 72	1130	3707	P. tuberculatus	Oligocene	0	Good	High	Fair	C. annulatus
SWC 68	1144	3753	P. tuberculatus	Oligocene	0	Fair	Low	Moderate	C. annulatus
SWC 65	1156	3792.5	P. tuberculatus	Oligocene	2	Poor	Moderate	Moderate	
SWC 63	1164	3819	P. tuberculatus	Oligocene	2	Poor	Moderate	Moderate	
SWC 61	1170	3838.5	P. tuberculatus	Oligocene	1	Fair	Low	Moderate	
SWC 55	1184	3884.5	P. tuberculatus	Oligocene	0	Fair	Moderate	High	C. annulatus
SWC 53	1188	3897.5	Upper N. asperus	Late Eocene	1	Fair	Moderate	Moderate	
SWC 52	1190	3904	Upper N. asperus	Late Eocene	1	Fair	Low	Moderate	
SWC 51	1192	3911	Middle N. asperus	Late Eocene	0	Good	High	Low	D. extensa, T. magnificus
SWC 42	1217	3993	Indeterminate	-	-	Poor	Low	Low	
SWC 41	1233	4045	Indeterminate	-	-	Very Poor	None	Low	
SWC 40	1236.5	4057	Middle N. asperus	Late Eocene	1	Poor	Moderate	None	T. magnificus
SWC 37	1257	4124	N. asperus	Middle Eocene	2	Poor	Moderate	None	
SWC 36	1260	4134	Lower N. asperus	Middle Eocene	1	Fair	Moderate	None	
SWC 31	1280	4199.5	Lower N. asperus	Middle Eocene	2	Poor	Low	None	
SWC 30	1286	4219	Lower N. asperus	Middle Eocene	1	Fair	Moderate	Moderate	
SWC 28	1300	4265	Lower N. asperus	Middle Eocene	0	Fair	Moderate	Low	A. dictyoplokus
SWC 27	1331.2	4367.5	Lower N. asperus	Middle Eocene	2	Good	Moderate	None	
SWC 25	1348.5	4424	Indeterminate	-	-	Poor	Moderate	None	
SWC 24	1369	4491.5	Indeterminate	-	-	Poor	Moderate	None	
SWC 23	1376	4514.5	Upper M. diversus	Early Eocene	1	Good	high	None	
SWC 21	1423.5	4670	Indeterminate	-	-	Poor	Moderate	None	
SWC 20	1449	4754	Middle M. diversus	Early Eocene	1	Good	High	None	
SWC 18	1478	4849	Upper L. balmei	Late Paleocene	1	Fair	Moderate	None	
SWC 17	1500	4921	Indeterminate	-	-	Very Poor	Low	None	
SWC 16	1502	4928	Upper L. balmei	Late Paleocene	1	Fair	High	None	
SWC 13	1545	5069	Lower L. balmei	Paleocene	2	Fair	High	None	
SWC 8	1602	5256	Lower L. balmei	Paleocene	2	Poor	Low	none	
SWC 7	1607	5272	Lower L. balmei	Paleocene	2	Poor	Moderate	None	
SWC 6	1627.5	5339.5	Lower L. balmei	Paleocene	2	Poor	Moderate	None	
SWC 4	1668.5	5474	Lower L. balmei	Paleocene	2	Poor	Low	None	
SWC 3	1690	5544.5	Indeterminate	-	-	Barren	-	-	
SWC 1	1715	5626.5	Indeterminate	-	-	Poor	Low	None	

PALYNOLOGY DATA SHEET

BASIN: GIPPSLAND ELEVATION: KB: 21 GL: 42.6

WELL NAME: PALMER-1 TOTAL DEPTH: 1723 metres

AGE	PALYNOLOGICAL ZONES	HIGHEST DATA					LOWEST DATA				
		Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
NEOGENE	*T. pleistocenicus*										
	M. lipsis										
	C. bifurcatus										
	T. bellus										
PALEOGENE	*P. tuberculatus*	1106	1				1184	0			
	Upper *N. asperus*	1188	1				1190	1			
	Mid *N. asperus*	1192	0				1236.5	1			
	Lower *N. asperus*	1260	1				1331.2	2	1300	0	
	P. asperopolus										
	Upper *M. diversus*	1376	1				1376	1			
	Mid *M. diversus*	1449	1				1449	1			
	Lower *M. diversus*										
	Upper *L. balmei*	1478	1				1502	1			
	Lower *L. balmei*	1545	2				1668.5	2			
LATE CRETACEOUS	*T. longus*										
	T. lilliei										
	N. senectus										
	U. *T. pachyexinus*										
	L. *T. pachyexinus*										
	C. triplex										
	A. distocarinatus										
EARLY CRET.	*C. paradoxus*										
	C. striatus										
	F. asymmetricus										
	F. wonthaggiensis										
	C. australiensis										
PRE-CRETACEOUS											

COMMENTS: D. extensa = 1192 metres; A. dictyoplokus = 1300 metres

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 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: _____ DATE: _____

DATA REVISED BY: _____ DATE: _____

PART II

BASIC DATA

Table-1: Basic Data

Range Charts

TABLE 1 - BASIC DATA

SUMMARY OF PALAEONTOLOGICAL ANALYSIS, PALMER-1, GIPPSLAND BASIN

SAMPLE	DEPTH METRES	DEPTH FEET	YIELD	SPORE-POLLEN DIVERSITY	DINO. DIVERSITY
SWC 74	1106	3628.5	Poor	Low	Moderate
SWC 73	12118	3668	Fair	Moderate	High
SWC 72	1130	3707	Good	High	Fair
SWC 68	1144	3753	Fair	Low	Moderate
SWC 65	1156	3792.5	Poor	Moderate	Moderate
SWC 63	1164	3819	Poor	Moderate	Moderate
SWC 61	1170	3838.5	Fair	Low	Moderate
SWC 55	1184	3884.5	Fair	Moderate	High
SWC 53	1188	3897.5	Fair	Moderate	Moderate
SWC 52	1190	3904	Fair	Low	Moderate
SWC 51	1192	3911	Good	High	Low
SWC 42	1217	3993	Poor	Low	Low
SWC 41	1233	4045	Very Poor	None	Low
SWC 40	1236.5	4057	Poor	Moderate	None
SWC 37	1257	4124	Poor	Moderate	None
SWC 36	1260	4134	Fair	Moderaste	None
SWC 31	1280	4199.5	Poor	Low	None
SWC 30	1286	4219	Fair	Moderate	Moderate
SWC 28	1300	4265	Fair	Moderate	Low
SWC 27	1331.2	4367.5	Good	Moderate	None
SWC 25	1348.5	4424	Poor	Moderate	None
SWC 24	1369	4491.5	Poor	Moderate	None
SWC 23	1376	4514.5	Good	High	None
SWC 21	1423.5	4670	Poor	Moderate	None
SWC 20	1449	4754	Good	High	None
SWC 18	1478	4849	Fair	Moderate	None
SWC 17	1500	4921	Very Poor	Low	None
SWC 16	1502	4928	Fair	High	None
SWC 13	1545	5069	Fair	High	None
SWC 8	1602	5256	Poor	Low	None
SWC 7	1607	5272	Poor	Moderate	None
SWC 6	1627.5	5339.5	Poor	Moderate	None
SWC 4	1668.5	5474	Poor	Low	None
SWC 3	1690	5544.5	Barren	-	-
SWC 1	1715	5626.5	Poor	Low	None

PE900464

This is an enclosure indicator page.
The enclosure PE900464 is enclosed within the container PE902696 at this location in this document.

The enclosure PE900464 has the following characteristics:

ITEM_BARCODE	= PE900464
CONTAINER_BARCODE	= PE902696
NAME	= Palynological Chart
BASIN	= GIPPSLAND
PERMIT	= VIC/P1
TYPE	= WELL
SUBTYPE	= DIAGRAM
DESCRIPTION	= Palynological Range Chart (Dinoflagellates) for Palmer-1
REMARKS	=
DATE_CREATED	= 10/03/82
DATE_RECEIVED	= 29/07/82
W_NO	= W751
WELL_NAME	= PALMER-1
CONTRACTOR	=
CLIENT_OP_CO	= ESSO AUSTRALIA LIMITED

(Inserted by DNRE - Vic Govt Mines Dept)

PE900465

This is an enclosure indicator page.
The enclosure PE900465 is enclosed within the container PE902696 at this location in this document.

The enclosure PE900465 has the following characteristics:

ITEM_BARCODE	= PE900465
CONTAINER_BARCODE	= PE902696
NAME	= Palynological Chart
BASIN	= GIPPSLAND
PERMIT	= VIC/P1
TYPE	= WELL
SUBTYPE	= DIAGRAM
DESCRIPTION	= Palynological Range Chart (Spores and Pollen) for Palmer-1
REMARKS	=
DATE_CREATED	= 10/03/82
DATE_RECEIVED	= 29/07/82
W_NO	= W751
WELL_NAME	= PALMER-1
CONTRACTOR	=
CLIENT_OP_CO	= ESSO AUSTRALIA LIMITED

(Inserted by DNRE - Vic Govt Mines Dept)

APPENDIX 5

APPENDIX - 5

QUANTITATIVE LOG EVALUATION

PALMER - 1

GIPPSLAND BASIN

PALMER #1

QUANTITATIVE LOG ANALYSIS

Data from drilling history, the mud log, examination of cuttings and sidewall cores, and visual examination of the wireline logs combine to indicate that Palmer #1 was drilled to TD without encountering hydrocarbons. Wireline log data for the interval 1211 - 1700 mKB was therefore processed through a computer log analysis program that assumes 100% water saturation (SW) and calculates clay volume, grain density, porosity, and formation water salinity. A brief outline of this computer log analysis program logic is attached.

LOGS USED FOR ANALYSIS

GR, ILD, CNL, MSFL, and CALIPER. The CNL log was corrected for environmental effects. The LDT log was edited to give probable readings through badhole sections, and to indicate coal sections to the analysis program. Chartbook corrections were attempted for the deep induction values; these indicated negligible correction to derive RT, however it should be pointed out that downhole conditions were not ideal for the induction tool (it only just plotted on the charts) and values may not be reliable.

ANALYSIS PARAMETERS

a	:	0.8
m	:	2
n	:	2
Grain Density Limits	:	2.65 - 2.67 gm. cm^{-3}
Apparent Shale Density	:	2.53 gm. cm^{-3}
Apparent Shale Neutron Porosity	:	38%
Apparent Shale Resistivity	:	15 ohm. m.
Gamma Ray Minimum, Maximum	:	20,130 API units

Apparent shale densities and neutron porosities were derived by crossplotting the edited and corrected LDT and CNL logs.

DISCUSSION

Initial interpretation of the Palmer logs was that the variation in measured deep resistivities between different sands was a product of varying water salinities. It was felt that the almost total absence of mud or cuttings gas during the drilling of the well plus the lack of any cuttings or sidewall core fluorescence or cut precluded any possibility of the well having encountered hydrocarbons. The wireline logs indicate no obvious hydrocarbon, and the explanation of varying deep resistivities being a product of varying water salinities seems reasonable in the light of similar phenomena experienced in nearby wells, and the extensive fresh water flushing known to occur through the Gippsland Basin. However, the results of later geochemical analysis of cuttings which suggested the possibility of free hydrocarbons between 1200 and 1400 mKB, necessitated a further look at the logs.

If hydrocarbons do occur in the sequence penetrated by Palmer then they have to occur in the sand penetrated between 1255m and 1275 mKB, the second major sand encountered below the Lakes Entrance formations. This sand has measured deep resistivity values in the order of 40Ωm, the highest for any sand logged in the well (and hence the lowest "DRYLOG" calculated apparent water salinity - in the order of 500 ppm NaCl eq). This compares with deep resistivity values in the order of 14Ωm (equivalent to a formation water salinity of 2000 ppm NaCl eq) for the sand above (1220 - 1232 mKB). However the SP deflection appears to be similar for both sands. If this measurement (SP) is accepted as being valid, and it must be pointed out that SP recorded on Palmer logs is generally of poor quality and doubtful reliability, then similar formation water salinities are suggested for the two sands. The SP derived salinity is similar to the Rwa derived salinity for the upper sand (1220 - 1232 mKB), but cannot be reconciled with the Rwa derived salinity for the 1255 - 1275 mKB sand. If the SP indicated salinity is fed into the Indonesia shaly sand relationship with the other log values for the 1255 - 1275 mKB sand, an SW value in the order of 50 - 60% is derived. Thus if the SP is considered valid 40 - 50% hydrocarbon saturation is suggested. Unfortunately there are some major inconsistencies involved in such a conclusion. The sand in question has a porosity in the order of 25%, and is described from cuttings as being a medium to fine grained, occasionally coarse grained, clean quartz sandstone. Typical Gippsland experience indicates that this rock should have permeabilities in the order of 0.5 - 1.5 Darcys or more. Such a rock would have an irreducible water saturation of less than 20%, and a transition zone of no more than say, 5m. Therefore, if the sand in question (20m thick) is hydrocarbon filled, the bulk of the sand must be at irreducible SW, ie. less than about 20%. This obviously does not agree with the 50 - 60% SW calculated on the basis of salinity derived from SP. It would seem more likely that the poor quality SP log is unreliable and not giving reasonable values. Hence the initial interpretation of 100% SW and varying formation water salinity is favoured. (Furthermore, it is difficult to envisage the circumstances whereby a hydrocarbon bearing zone could be sufficiently flushed ahead of the bit such that no mud gas and no hydrocarbon fluorescence is detected and yet have free hydrocarbons in the cuttings canned for geochemical analysis!)

RESULTS

A printout of edited log values plus "DRYLOG" calculated values for clay volume, Grain Density, Porosity and Formation Water, Salinity at 0.5m spacings over the interval 1211 - 1700m is attached*. The calculated outputs are also presented (with GR for correlation) in the form of a graphical X-Y depth plot**. It should be noted that no single salinity value should be accepted as valid; however gross salinity trends should be valid.

The net to gross ratio is 62%, assuming 10% porosity as a cutoff value. The average porosity of those units with porosity greater than 10% ("net sand") is 22.5%, whereas the average porosity of those intervals with porosity less than 10% ("non net") is 2.4%. This appears to indicate a clear division into clean net sands and shales and coals. There appear to be very few "shaly sands".

-/3

Calculated formation water salinities show that the entire drilled Latrobe group sequence has been subjected to fresh water flushing. However the salinities do show a range of values between different sands (500 - 3000 ppm NaCl eq. - see Fig. 1) indicating differential flushing between sands within the Latrobe sequence.

T.M. FRANKHAM

APRIL, 1982.

* Table 1

** Well Completion Report - Enclosure 6

PALMER #1

SUMMARY SHEET - POROSITY OF MAJOR SANDS

DEPTHS (mKB)	THICKNESS m	POROSITY RANGE (%)	POROSITY AVERAGE (%)
1219 - 1232	13	18 - 29.8	26.8
1256.5 - 1276	19.5	10 - 32	25.1
1296 - 1304	8	15.2 - 28.3	24.2
1322 - 1328	6	12 - 26.7	20.1
1332 - 1339.5	7.5	17.9 - 25.4	22.3
1345.0 - 1353	8	20.4 - 28.2	25.8
1353 - 1362	9	0 - 25	10.8
1364.5 - 1368	3.5	18.2 - 23.4	21
1372.5 - 1378.0	5.5	10.9 - 24.3	19.1
1379.5 - 1387.5	8	17.8 - 27.3	22.7
1407 - 1410	3	16.2 - 24.6	22.3
1415 - 1421.5	6.5	11 - 31.9	24.2
1424 - 1430.5	6.5	19.6 - 27.5	24.1
1434 - 1448.5	14.5	17.1 - 33.7	24.0
1450 - 1467.5	17.5	12.8 - 25.6	21.9
1470 - 1476.5	6.5	14 - 28.1	23.9
1480 - 1484	4	12.5 - 25.8	21.5
1491.5 - 1498	6.5	17.6 - 26.7	24.7
1511.5 - 1518	6.5	10.1 - 30.8	19.9
1522.5 - 1527.5	5	10.6 - 28.8	18.2
1531.5 - 1540.5	9	21.1 - 29.2	26.0
1556.5 - 1559.0	3.5	14.2 - 29.4	22.6
1561 - 1563.5	2.5	24.7 - 27.8	25.9
1564.5 - 1569.5	5	10.6 - 26.1	21.5
1577.5 - 1583.5	6	11.2 - 26	21.6
1584.5 - 1588	3.5	14.4 - 27.7	24.1
1592 - 1597.5	5.5	11.9 - 26.1	23.4
1599 - 1603	4	20.3 - 26.6	23.8
1614 - 1626.5	12.5	13 - 29.4	22.9
1629 - 1652	23	9.2 - 27.7	22.0
1654 - 1667	13	12 - 26.2	21.0
1669 - 1684	15	9.1 - 26.8	20.9
1687 - 1689.5	2.5	12.6 - 24.3	18.5
1692 - 1700	8	13.7 - 27	21.1

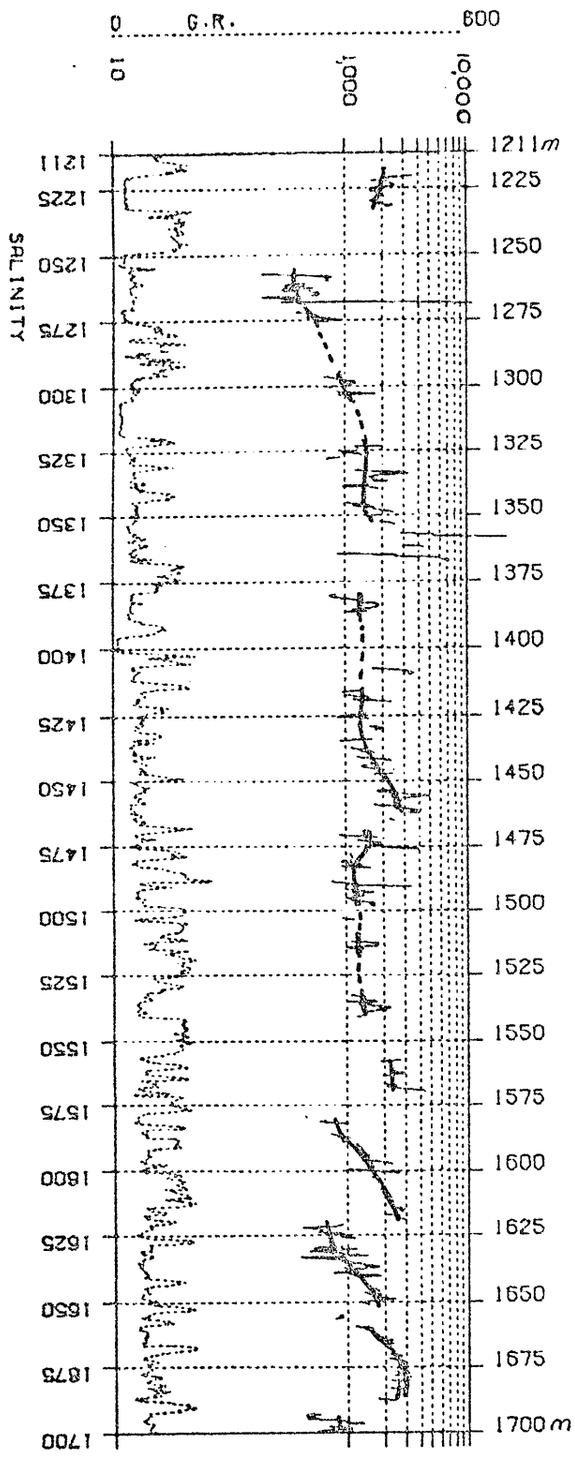
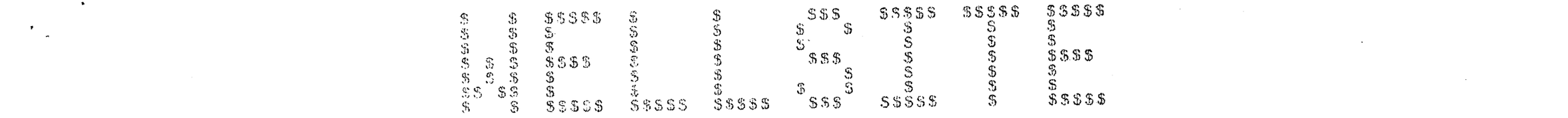


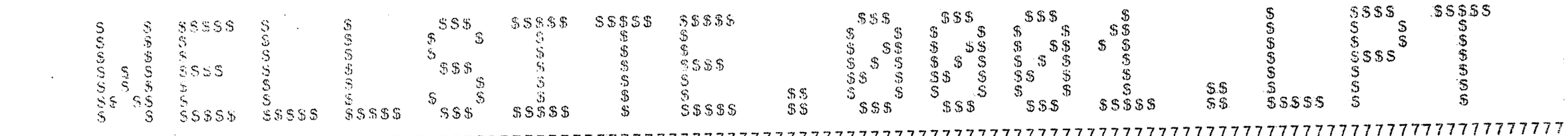
Fig. 1 Plot of calculated salinities on logarithmic scale (10-10000 ppm NaCl eq) with GR (linear scale, 0-600 API units) versus depth. PALMER # 1. (assuming 100% SW)



DEST=WELLSITE USER=WELLSITE QUEUE=LPT DEVICE=@LPB
SEQ=295 QPRI=127 LPP=68 CPL=132 COPIES=1 LIMIT=106
/DELETE

CREATED: 2-MAR-82 8:33:42
ENQUEUED: 2-MAR-82 8:36:58
PRINTING: 2-MAR-82 8:36:58

PATH=:QUEUE:WELLSITE.0001.LPT



AOS REV 3.30

AOS REV 03.30
AOS XLPT REV 03.30

DEPTH	G.R.	R.T.	R.X.O.	FM.DENS.	PHI.N	VCL	RHO.G	POROSITY	SALINITY
1211.000	83.175	4.166	6.651	2.524	.382	.750	*********	.010	*********
1211.500	82.015	4.597	7.747	2.519	.355	.750	*********	.010	*********
1212.000	86.437	5.252	8.846	2.444	.369	.750	*********	.010	*********
1212.500	74.808	5.718	8.346	2.481	.343	.750	*********	.010	*********
1213.000	76.192	6.711	8.986	2.429	.292	.551	2.665	.097	*********
1213.500	84.472	8.300	6.824	2.420	.344	.706	2.654	.089	*********
1214.000	95.212	10.510	8.342	2.409	.355	.704	2.668	.097	*********
1214.500	102.859	12.609	9.151	2.426	.307	.610	2.653	.092	*********
1215.000	121.427	13.622	9.544	2.450	.327	.690	2.668	.074	*********
1215.500	131.840	13.172	10.781	2.431	.364	.750	*********	.010	*********
1216.000	119.164	12.672	11.725	2.416	.337	.670	2.661	.095	*********
1216.500	112.090	12.434	12.732	2.421	.316	.630	2.650	.093	*********
1217.000	131.516	11.493	15.499	2.437	.325	.670	2.660	.082	*********
1217.500	104.563	10.755	11.912	2.443	.322	.670	2.662	.078	*********
1218.000	96.971	10.828	11.645	2.450	.332	.720	2.657	.070	*********
1218.500	107.508	10.243	14.989	2.445	.368	.750	*********	.010	*********
1219.000	72.242	7.882	12.699	2.554	.314	.750	*********	.010	*********
1219.500	36.605	7.674	7.646	2.323	.278	.311	2.669	.181	*********
1220.000	24.020	8.738	7.624	2.228	.277	.137	2.668	.253	3693.337
1220.500	30.230	11.190	6.478	2.241	.288	.193	2.669	.240	2608.439
1221.000	21.972	12.383	5.630	2.229	.284	.158	2.669	.250	2324.227
1221.500	23.368	12.766	5.917	2.200	.283	.111	2.666	.271	2159.522
1222.000	22.433	13.716	5.429	2.189	.307	.162	2.667	.274	1666.229
1222.500	21.606	12.581	5.367	2.190	.275	.075	2.665	.279	2256.182
1223.000	21.356	12.324	4.868	2.170	.255	.012	2.655	.292	2413.952
1223.500	22.965	12.608	4.983	2.194	.251	.027	2.660	.278	2526.275
1224.000	18.404	13.334	4.502	2.185	.251	.000	2.662	.287	2351.386
1224.500	24.478	13.393	5.114	2.183	.289	.101	2.665	.282	1921.188
1225.000	24.985	13.775	5.635	2.177	.308	.145	2.666	.282	1632.381
1225.500	22.094	13.565	5.426	2.210	.283	.119	2.669	.265	2042.977
1226.000	21.165	13.989	5.294	2.202	.308	.191	2.667	.263	1608.709
1226.500	23.010	14.264	5.520	2.219	.285	.147	2.667	.257	1890.172
1227.000	20.970	14.448	6.355	2.234	.285	.169	2.670	.247	1892.653
1227.500	21.949	14.045	5.193	2.238	.276	.158	2.666	.244	2079.401
1228.000	55.084	13.618	5.385	2.208	.281	.106	2.670	.268	2063.300
1228.500	21.405	13.101	5.420	2.170	.308	.133	2.667	.287	1730.723
1229.000	21.810	12.933	4.755	2.185	.301	.136	2.667	.278	1861.769
1229.500	65.238	12.671	4.833	2.168	.327	.177	2.670	.286	1603.724
1230.000	48.892	13.007	4.808	2.189	.310	.164	2.669	.274	1757.977
1230.500	28.655	12.949	4.514	2.178	.279	.079	2.660	.284	2068.530
1231.000	26.777	13.209	5.115	2.160	.288	.062	2.664	.298	1912.743
1231.500	21.485	13.405	4.877	2.203	.246	.018	2.662	.275	2464.840
1232.000	30.430	12.444	5.456	2.188	.276	.095	2.658	.276	2205.294
1232.500	75.018	11.611	4.886	2.432	.350	.729	2.668	.081	*********
1233.000	134.426	12.384	4.551	2.431	.455	.750	*********	.010	*********
1233.500	133.908	14.023	26.575	2.410	.419	.750	*********	.010	*********
1234.000	99.064	16.216	20.307	2.413	.437	.750	*********	.010	*********
1234.500	110.136	15.524	11.656	2.447	.442	.750	*********	.010	*********
1235.000	64.142	18.755	21.119	2.410	.331	.641	2.661	.100	*********
1235.500	103.209	19.469	7.154	2.403	.394	.750	*********	.010	*********
1236.000	122.487	19.949	14.181	2.429	.399	.750	*********	.010	*********
1236.500	125.340	19.562	27.266	2.446	.409	.750	*********	.010	*********
1237.000	121.385	17.783	24.876	2.439	.464	.750	*********	.010	*********
1237.500	108.321	18.243	20.719	2.410	.385	.750	*********	.010	*********
1238.000	126.425	17.116	21.322	2.401	.497	.750	*********	.010	*********
1238.500	120.216	15.433	27.218	2.446	.466	.750	*********	.010	*********

PAUMER #1

DEPTH	G.R.	R.T.	R.X.O.	FM.DENS.	PHI.N	VCL	RHO.G	POROSITY	SALINITY
1239.000	116.732	18.113	25.045	2.417	.485	.750	*********	.010	*********
1239.500	99.414	18.832	26.764	2.441	.536	.750	*********	.010	*********
1240.000	122.414	20.262	18.776	2.431	.400	.750	*********	.010	*********

DEPTH	G.R.	P.T.	R.X.O.	FM.DENS.	PHI.N	VCL	RHO.G	POROSITY	SALINITY
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1240.000	116.[redacted]7	17.[redacted]	[redacted]5.04	[redacted]2.44	[redacted].475	[redacted].790	[redacted]	[redacted].010	[redacted]
1240.500	112.817	17.568	25.028	2.420	.405	.750	**********	.010	**********
1241.000	123.024	16.008	17.769	2.412	.463	.750	**********	.010	**********
1241.500	119.699	15.421	24.656	2.424	.529	.750	**********	.010	**********
1242.000	102.314	15.495	18.758	2.410	.450	.750	**********	.010	**********
1242.500	105.031	16.034	11.702	2.433	.488	.750	**********	.010	**********
1243.000	110.391	16.654	19.671	2.418	.416	.750	**********	.010	**********
1243.500	110.644	15.541	17.995	2.447	.447	.750	**********	.010	**********
1244.000	113.883	17.136	10.714	2.435	.339	.710	2.660	.080	**********
1244.500	112.680	16.639	16.333	2.440	.405	.750	**********	.010	**********
1245.000	131.090	15.447	17.778	2.402	.457	.750	**********	.010	**********
1245.500	114.618	14.958	14.356	2.431	.403	.750	**********	.010	**********
1246.000	118.415	16.801	9.886	2.418	.390	.750	**********	.010	**********
1246.500	115.031	16.664	18.698	2.423	.487	.750	**********	.010	**********
1247.000	102.827	17.469	13.000	2.448	.426	.750	**********	.010	**********
1247.500	113.131	20.463	27.405	1.000	.475	**********	**********	.000	**********
1248.000	98.[redacted]65	36.671	53.733	1.000	.539	**********	**********	.000	**********
1248.500	44.6651	160.404	395.128	1.000	.592	**********	**********	.000	**********
1249.000	16.963	194.710	265.341	1.000	.595	**********	**********	.000	**********
1249.500	14.170	166.591	5.868	1.000	.644	**********	**********	.000	**********
1250.000	18.323	29.173	15.714	1.000	.573	**********	**********	.000	**********
1250.500	20.864	15.169	1.339	1.000	.615	**********	**********	.000	**********
1251.000	22.464	22.079	1.412	1.000	.581	**********	**********	.000	**********
1251.500	22.256	101.627	45.797	1.000	.642	**********	**********	.000	**********
1252.000	13.827	2022.029	21.898	1.000	.679	**********	**********	.000	**********
1252.500	11.891	3022.431	103.285	1.000	.622	**********	**********	.000	**********
1253.000	13.792	1855.389	79.271	1.000	.632	**********	**********	.000	**********
1253.500	17.404	51.462	18.267	1.000	.635	**********	**********	.000	**********
1254.000	48.851	23.762	14.607	1.000	.635	**********	**********	.000	**********
1254.500	75.282	21.470	7.594	1.000	.521	**********	**********	.000	**********
1255.000	27.518	26.012	7.469	1.000	.342	**********	**********	.000	**********
1255.500	24.306	38.989	7.287	1.000	.345	**********	**********	.000	**********
1256.000	29.037	37.474	7.527	2.242	.298	.222	2.669	.237	376.389
1256.500	43.749	37.977	5.594	2.234	.332	.316	2.669	.234	**********
1257.000	44.697	41.002	6.635	2.177	.342	.245	2.668	.274	196.960
1257.500	34.704	47.680	9.562	2.242	.268	.134	2.668	.244	435.000
1258.000	27.756	41.070	8.963	2.316	.229	.151	2.667	.198	756.000
1258.500	34.855	37.720	7.262	2.285	.246	.155	2.664	.216	699.014
1259.000	36.310	36.619	8.579	2.224	.265	.128	2.657	.251	685.068
1259.500	49.035	36.045	9.972	2.282	.243	.164	2.656	.213	725.675
1260.000	54.404	42.061	9.455	2.326	.274	.313	2.665	.178	**********
1260.500	47.640	39.745	11.116	2.333	.252	.251	2.667	.180	481.942
1261.000	36.196	45.550	7.558	2.358	.245	.287	2.663	.160	315.301
1261.500	29.812	42.057	6.109	2.254	.287	.229	2.663	.227	314.104
1262.000	27.758	46.699	6.116	2.217	.260	.071	2.666	.264	539.368
1262.500	30.827	50.182	6.826	2.211	.292	.158	2.667	.260	297.607
1263.000	31.408	46.002	7.259	2.212	.300	.184	2.666	.257	292.264
1263.500	31.358	42.560	6.010	2.190	.288	.103	2.667	.278	458.644
1264.000	34.294	31.782	5.320	2.162	.295	.110	2.656	.290	594.344
1264.500	38.033	31.787	5.241	2.159	.293	.104	2.655	.292	602.534
1265.000	41.723	32.502	5.693	2.164	.292	.117	2.652	.287	569.794
1265.500	37.623	40.590	5.219	2.157	.348	.240	2.664	.285	191.197
1266.000	33.750	41.535	7.152	2.155	.299	.125	2.652	.291	381.757
1266.500	36.359	41.938	6.477	2.214	.298	.189	2.663	.255	334.369
1267.000	35.125	40.055	7.484	2.208	.296	.157	2.668	.263	413.086
1267.500	36.843	49.670	8.984	2.245	.282	.193	2.664	.236	283.798
1268.000	33.971	7.868	9.705	2.289	.230	.127	2.660	.214	5948.152
1268.500	33.359	4.961	6.987	2.315	.228	.141	2.668	.200	11458.930
1269.000	34.355	4.379	6.528	1.000	.260	**********	**********	.000	**********
1269.500	36.469	11.930	8.589	1.000	.491	**********	**********	.000	**********
1270.000	16.874	29.774	4.444	1.000	.365	**********	**********	.000	**********
1270.500	17.191	40.742	5.118	1.000	.304	**********	**********	.000	**********
1271.000									

PALMER #1

DEPTH	G.R.	R.T.	R.X.O.	FM.DENS.	PHI.N	VCL	RHO.G	POROSITY	SALINITY
12271.500	14.913	43.737	5.718	2.125	.308	.060	2.664	.319	410.051
12272.000	21.371	42.472	5.406	2.134	.318	.092	2.669	.313	379.304
12272.500	18.515	36.279	5.277	2.163	.296	.080	2.668	.296	548.039
12273.000	19.246	42.131	6.440	2.170	.271	.020	2.666	.296	594.061
12273.500	23.806	47.280	6.045	2.177	.277	.055	2.665	.289	473.538
12274.000	22.082	40.536	6.109	2.188	.266	.039	2.665	.284	628.846
12274.500	26.105	37.053	5.610	2.182	.250	.015	2.655	.285	753.895
12275.000	31.548	31.303	5.901	2.178	.254	.025	2.654	.286	868.472
12275.500	34.911	36.885	5.697	2.149	.289	.076	2.655	.300	533.272
12276.000	59.849	41.456	4.852	2.422	.308	.582	2.668	.099	*********
12276.500	84.718	36.318	4.969	2.422	.331	.668	2.656	.091	*********
12277.000	73.735	34.747	5.332	2.414	.351	.708	2.661	.093	*********
12277.500	71.041	34.380	5.298	2.417	.371	.750	**********	.010	*********
12278.000	88.746	29.713	11.345	2.418	.382	.750	**********	.010	*********
12278.500	73.254	29.520	6.000	2.418	.348	.704	2.665	.091	*********
12279.000	80.576	22.130	6.372	2.434	.363	.750	**********	.010	*********
12279.500	105.333	20.386	10.498	2.437	.369	.750	**********	.010	*********
12280.000	110.076	15.979	14.209	2.416	.356	.730	2.657	.089	*********
12280.500	114.659	16.739	17.424	2.436	.403	.750	**********	.010	*********
12281.000	84.366	20.949	6.823	2.434	.453	.750	**********	.010	*********
12281.500	29.170	31.268	5.919	2.430	.352	.743	2.654	.080	*********
12282.000	27.955	25.583	4.953	2.427	.315	.612	2.668	.094	*********
12282.500	46.684	21.521	4.758	2.413	.328	.643	2.656	.098	*********
12283.000	116.367	21.536	6.248	1.000	.361	**********	**********	.000	*********
12283.500	126.208	35.367	9.590	1.000	.413	**********	**********	.000	*********
12284.000	80.960	38.885	7.981	1.000	.399	**********	**********	.000	*********
12284.500	82.891	29.117	21.606	2.405	.469	.750	**********	.010	*********
12285.000	61.993	27.471	6.563	2.446	.358	.750	**********	.010	*********
12285.500	78.619	20.838	3.890	2.433	.370	.750	**********	.010	*********
12286.000	96.507	22.030	4.637	2.402	.351	.696	2.655	.100	*********
12286.500	62.234	30.785	4.958	1.000	.517	**********	**********	.000	*********
12287.000	43.188	43.915	6.069	1.000	.537	**********	**********	.000	*********
12287.500	63.058	74.114	302.624	1.000	.516	**********	**********	.000	*********
12288.000	21.290	55.970	35.513	1.000	.615	**********	**********	.000	*********
12288.500	39.010	56.450	145.840	1.000	.569	**********	**********	.000	*********
12289.000	103.587	22.472	294.993	1.000	.490	**********	**********	.000	*********
12289.500	62.544	16.995	17.879	1.000	.391	**********	**********	.000	*********
12290.000	115.837	21.523	8.349	2.409	.398	.750	**********	.010	*********
12290.500	63.481	18.979	7.387	2.439	.311	.635	2.659	.083	*********
12291.000	45.482	19.967	12.239	2.433	.350	.732	2.668	.080	*********
12291.500	66.862	19.012	5.395	2.412	.313	.588	2.663	.104	*********
12292.000	127.464	21.236	6.026	2.427	.417	.750	**********	.010	*********
12292.500	108.724	21.811	18.169	2.448	.410	.750	**********	.010	*********
12293.000	83.933	18.972	27.702	2.435	.359	.750	**********	.010	*********
12293.500	88.843	22.300	13.914	2.442	.355	.750	**********	.010	*********
12294.000	83.988	23.146	8.755	2.439	.329	.682	2.666	.081	*********
12294.500	70.182	24.141	27.341	2.436	.327	.676	2.660	.082	*********

1 PALMER #1

DEPTH	G.R.	R.T.	R.X.O.	FM.DENS.	PHI.N	VCL	RHO.G	POROSITY	SALINITY
12295.000	80.664	26.801	12.691	2.427	.334	.671	2.669	.089	*********
12295.500	95.919	30.240	14.890	2.420	.383	.750	**********	.010	*********
12296.000	50.699	31.601	18.238	2.250	.368	.459	2.666	.212	*********
12296.500	40.850	24.816	12.302	2.163	.310	.170	2.652	.283	654.361
12297.000	49.314	23.868	5.154	2.168	.306	.166	2.651	.281	715.101
12297.500	36.744	22.304	5.349	2.174	.308	.152	2.662	.282	824.848
12298.000	36.997	21.903	5.381	2.186	.289	.135	2.656	.274	962.321
12298.500	30.563	19.793	4.990	2.185	.286	.091	2.667	.282	1195.906
12299.000	32.282	20.692	5.353	2.191	.271	.091	2.656	.274	1204.151
12299.500	37.728	22.566	5.394	2.206	.276	.141	2.653	.260	1004.777
12300.000	31.236	27.673	5.474	2.257	.266	.162	2.666	.232	882.470
12300.500	34.977	31.583	6.471	2.267	.262	.156	2.670	.228	780.767
12301.000	42.565	32.907	9.874	2.298	.244	.205	2.653	.199	742.398
12301.500	46.853	33.051	10.518	2.359	.278	.384	2.664	.152	*********

[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
13300.000	40.[redacted]7	[redacted]21.[redacted]	[redacted]5.7[redacted]	[redacted]23[redacted]	[redacted]94[redacted]	[redacted]7	[redacted]2.[redacted]	[redacted].2[redacted]	[redacted].04[redacted]		
13303.000	33.550	21.134	5.715	2.300	.233	.143	2.664	.207	1747.525		
13303.500	31.994	23.912	8.331	2.256	.285	.209	2.668	.230	887.917		
13304.000	34.420	23.512	6.323	2.250	.284	.211	2.664	.232	889.507		
13304.500	36.827	21.594	5.404	1.000	.289	**********	**********	.000	**********		
13305.000	32.551	23.038	3.374	1.000	.451	**********	**********	.000	**********		
13305.500	17.198	34.943	5.011	1.000	.568	**********	**********	.000	**********		
13306.000	12.799	126.074	1.719	1.000	.634	**********	**********	.000	**********		
13306.500	15.221	56.304	1.017	1.000	.730	**********	**********	.000	**********		
13307.000	12.095	730.558	.995	1.000	.625	**********	**********	.000	**********		
13307.500	13.637	98.706	1.004	1.000	.604	**********	**********	.000	**********		
13308.000	13.832	25.122	1.020	1.000	.641	**********	**********	.000	**********		
13308.500	13.174	14.958	1.011	1.000	.651	**********	**********	.000	**********		
13309.000	15.941	14.376	1.019	1.000	.548	**********	**********	.000	**********		
13309.500	13.430	31.635	1.027	1.000	.625	**********	**********	.000	**********		
13310.000	12.165	192.423	1.020	1.000	.584	**********	**********	.000	**********		
13310.500	13.536	214.744	1.029	1.000	.619	**********	**********	.000	**********		
13311.000	16.409	30.372	1.010	1.000	.590	**********	**********	.000	**********		
13311.500	16.841	8.630	1.014	1.000	.642	**********	**********	.000	**********		
13312.000	16.690	6.646	.995	1.000	.686	**********	**********	.000	**********		
13312.500	15.146	7.691	1.012	1.000	.654	**********	**********	.000	**********		
13313.000	14.906	19.532	1.007	1.000	.619	**********	**********	.000	**********		
13313.500	15.139	71.073	1.006	1.000	.675	**********	**********	.000	**********		
13314.000	13.452	90.762	1.027	1.000	.689	**********	**********	.000	**********		
13314.500	14.422	110.452	1.010	1.000	.652	**********	**********	.000	**********		
13315.000	13.935	130.141	.993	1.000	.622	**********	**********	.000	**********		
13315.500	16.214	149.831	1.002	1.000	.586	**********	**********	.000	**********		
13316.000	14.214	169.520	1.004	1.000	.600	**********	**********	.000	**********		
13316.500	12.002	74.004	1.018	1.000	.641	**********	**********	.000	**********		
13317.000	11.109	65.192	1.021	1.000	.635	**********	**********	.000	**********		
13317.500	10.590	34.395	1.024	1.000	.660	**********	**********	.000	**********		
13318.000	13.008	651.162	1.039	1.000	.677	**********	**********	.000	**********		
13318.500	15.189	1089.197	1.357	1.000	.640	**********	**********	.000	**********		
13319.000	57.269	101.768	1.952	1.000	.591	**********	**********	.000	**********		
13319.500	93.059	20.267	1.665	1.000	.478	**********	**********	.000	**********		
13320.000	83.190	11.658	10.428	1.000	.436	**********	**********	.000	**********		
13320.500	66.107	18.205	22.837	1.000	.590	**********	**********	.000	**********		
13321.000	105.137	33.715	159.478	1.000	.387	**********	**********	.000	**********		
13321.500	108.599	28.097	34.455	1.000	.352	**********	**********	.000	**********		
13322.000	80.905	20.475	26.451	2.374	.363	.674	2.660	.120	**********		
13322.500	32.955	20.720	11.714	2.351	.273	.358	2.663	.159	**********		

1 PALMER #1

DEPTH	G.R.	R.T.	R.X.O.	FM.DENS.	PHI.N	VCL	RHO.G	POROSITY	SALINITY
13323.000	24.582	21.351	11.403	2.319	.218	.122	2.666	.199	2020.542
13323.500	27.279	27.192	8.806	2.300	.234	.146	2.664	.207	1221.463
13324.000	21.844	22.688	7.264	2.262	.253	.137	2.664	.230	1292.567
13324.500	25.451	23.143	7.747	2.376	.257	.350	2.665	.145	**********
13325.000	24.832	20.658	9.167	2.319	.270	.284	2.667	.185	1211.848
13325.500	25.209	19.472	6.663	2.251	.308	.267	2.670	.229	935.754
13326.000	31.654	18.759	6.339	2.251	.279	.186	2.668	.234	1328.051
13326.500	39.460	19.289	8.040	2.276	.273	.217	2.666	.216	1336.673
13327.000	42.126	25.524	8.376	2.341	.283	.361	2.667	.166	**********
13327.500	51.625	26.604	8.345	2.230	.269	.126	2.665	.251	915.209
13328.000	39.835	30.557	6.287	2.198	.275	.120	2.654	.267	688.653
13328.500	38.751	19.972	5.389	1.000	.258	**********	**********	.000	**********
13329.000	29.368	14.328	6.254	1.000	.342	**********	**********	.000	**********
13329.500	34.103	15.330	2.156	1.000	.260	**********	**********	.000	**********
13330.000	53.905	22.508	.139	1.000	.550	**********	**********	.000	**********
13330.500	79.752	33.380	12.011	1.000	.552	**********	**********	.000	**********
13331.000	106.621	28.201	19.711	1.000	.530	**********	**********	.000	**********
13331.500	76.756	23.235	226.383	1.000	.364	**********	**********	.000	**********
13332.000	49.517	19.809	24.390	2.274	.267	.228	2.654	.213	1312.801
13332.500	37.498	19.569	96.980	2.248	.282	.199	2.664	.234	1188.680
13333.000	35.871	19.638	9.288	2.283	.200	.044	2.654	.221	2278.751

1333.500	36.031	18.251	8.409	2.348	.209	.146	2.667	179 2791.690
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1334.500	40.180	15.111	8.323	2.266	.271	.183	2.669	.226 1936.394
1335.000	37.032	15.144	6.709	2.231	.293	.195	2.667	.245 1563.413
1335.500	33.288	16.561	6.372	2.222	.266	.121	2.659	.254 1650.854
1336.000	32.257	16.795	6.688	2.231	.250	.111	2.651	.246 1778.756
1336.500	37.843	16.104	7.174	2.256	.273	.182	2.666	.231 1704.459
1337.000	56.286	13.936	6.031	2.256	.260	.170	2.657	.229 2189.994
1337.500	55.390	14.408	6.150	2.244	.330	.342	2.663	.225 *********
1338.000	50.787	17.135	6.855	2.262	.274	.198	2.665	.226 1547.858
1338.500	33.805	19.137	8.515	2.254	.307	.286	2.664	.224 920.615
1339.000	51.907	17.093	9.553	2.278	.259	.210	2.654	.211 1703.419
1339.500	56.959	16.157	7.831	2.264	.254	.176	2.653	.222 1874.913
1340.000	43.889	15.928	6.630	1.000	.332 *********	*********		.000 *********
1340.500	68.124	17.015	8.948	1.000	.582 *********	*********		.000 *********
1341.000	101.571	17.109	2.381	1.000	.433 *********	*********		.000 *********
1341.500	92.555	10.916	15.832	2.449	.456 .750	*********		.010 *********
1342.000	111.973	11.037	17.590	2.444	.474 .750	*********		.010 *********
1342.500	96.304	11.057	4.059	2.431	.435 .750	*********		.010 *********
1343.000	101.031	13.448	22.867	2.412	.426 .750	*********		.010 *********
1343.500	71.200	17.517	19.682	1.000	.526 *********	*********		.000 *********
1344.000	63.458	19.258	26.809	1.000	.580 *********	*********		.000 *********
1344.500	32.851	20.985	90.585	1.000	.312 *********	*********		.000 *********
1345.000	39.491	15.690	8.388	2.222	.334 .297	2.669		.243 1016.408
1345.500	44.363	13.644	7.656	2.211	.302 .222	2.654		.251 1556.635
1346.000	41.996	14.150	4.988	2.193	.325 .220	2.669		.267 1315.246
1346.500	46.238	13.849	5.833	2.199	.340 .279	2.668		.258 1181.783
1347.000	39.536	13.341	6.085	2.208	.296 .178	2.662		.259 1737.190
1347.500	43.765	13.415	5.539	2.172	.287 .116	2.653		.282 1718.840
1348.000	41.624	12.281	5.539	2.211	.282 .157	2.656		.257 2084.494
1348.500	48.234	13.596	5.641	2.289	.254 .218	2.653		.204 2456.930
1349.000	54.293	13.978	8.532	2.277	.306 .310	2.670		.209 *********
1349.500	59.660	14.298	7.997	2.209	.267 .119	2.654		.260 1879.521
1350.000	39.434	12.196	5.871	2.179	.330 .217	2.666		.275 1527.547
1350.500	41.286	10.350	6.182	2.174	.354 .274	2.669		.274 1631.515

1 PALMER #1

DEPTH	G.R.	R.T.	R.X.O.	FM.DENS.	PHI.N	VCL	RHO.G	POROSITY	SALINITY
1351.000	44.354	10.175	5.748	2.202	.358	.341	2.667	.251	*********
1351.500	35.471	10.186	6.578	2.203	.343	.301	2.666	.253	*********
1352.000	36.367	10.038	5.917	2.192	.342	.273	2.667	.262	1867.005
1352.500	34.593	9.882	5.813	2.182	.307	.154	2.665	.278	2337.951
1353.000	32.316	9.371	5.049	2.185	.307	.152	2.668	.277	2515.062
1353.500	24.552	4.585	5.295	2.260	.152	.000	2.615	.277	2515.062
1354.000	25.350	13.810	5.720	2.554	.054	.049	2.665	.063	*********
1354.500	29.590	20.498	59.824	2.530	.068	.087	2.653	.068	*********
1355.000	27.297	26.317	192.211	2.314	.204	.066	2.668	.207	1739.400
1355.500	31.635	26.543	6.732	2.621	.040	.126	2.665	.016	*********
1356.000	36.038	26.469	1248.238	2.629	.086	.279	2.665	.001	*********
1356.500	41.013	21.060	1478.794	2.422	.302	.571	2.662	.099	*********
1357.000	36.525	11.813	219.630	2.228	.237	.068	2.652	.252	2856.271
1357.500	35.114	7.772	5.508	2.264	.213	.057	2.652	.231	5610.973
1358.000	57.223	7.550	5.856	2.270	.240	.138	2.655	.222	5368.641
1358.500	59.745	9.762	8.285	2.465	.108	.101	2.650	.105	21417.070
1359.000	28.993	17.120	585.252	2.636	.059	.202	2.668	.002	*********
1359.500	28.570	34.261	263.146	2.602	.083	.218	2.667	.021	*********
1360.000	34.677	44.507	770.143	2.506	.108	.133	2.662	.083	*********
1360.500	42.755	44.630	85.624	2.584	.056	.167	2.655	.030	*********
1361.000	54.159	32.900	659.282	2.513	.186	.401	2.653	.055	*********
1361.500	54.090	14.182	1007.348	2.354	.235	.270	2.655	.162	3130.555
1362.000	41.599	10.914	9.887	2.284	.193	.037	2.651	.220	4430.230
1362.500	32.852	12.690	8.577	2.598	.038	.117	2.652	.025	*********
1363.000	32.444	20.647	712.909	2.622	.086	.264	2.665	.005	*********
1363.500	30.821	51.676	1973.218	2.599	.051	.118	2.666	.030	*********
1364.000	29.296	59.321	283.756	2.549	.140	.305	2.664	.045	*********

1364.500	45.413	25.265	562.065	2.275	.267	.231	2.653	.212	843.703
1365.000	30.947	12.240	8.255	2.272	.265	.180	2.668	.222	2641.472
1365.500	42.909	8.288	7.127	2.275	.180	.000	2.646	.222	2641.472
1366.000	66.077	7.998	7.031	2.313	.232	.197	2.652	.191	6053.770
1366.500	50.914	7.707	8.258	2.235	.323	.301	2.664	.234	**********
1367.000	32.164	7.917	5.788	2.291	.209	.091	2.653	.212	6143.090
1367.500	48.655	7.984	8.837	2.306	.181	.042	2.651	.206	7125.324
1368.000	88.843	8.444	8.626	2.313	.279	.326	2.656	.182	**********
1368.500	116.185	8.726	9.672	2.477	.410	.750	**********	.010	**********
1369.000	125.831	9.169	16.336	2.475	.404	.750	**********	.010	**********
1369.500	113.818	8.580	14.109	2.265	.467	.750	**********	.010	**********
1370.000	110.436	7.643	15.539	2.317	.403	.690	2.665	.153	**********
1370.500	103.650	7.773	10.379	2.511	.412	.750	**********	.010	**********
1371.000	114.933	8.856	14.383	2.440	.422	.750	**********	.010	**********
1371.500	121.166	10.153	13.339	2.420	.359	.750	2.654	.085	**********
1372.000	102.867	9.886	14.930	2.386	.402	.750	**********	.010	**********
1372.500	77.973	9.108	11.408	2.223	.306	.247	2.657	.243	2682.463
1373.000	64.392	8.591	7.433	2.316	.334	.485	2.661	.170	**********
1373.500	93.894	7.876	8.982	2.228	.317	.287	2.657	.237	3114.678
1374.000	117.540	8.076	6.347	2.232	.331	.350	2.651	.228	**********
1374.500	114.927	8.613	6.348	2.349	.368	.650	2.656	.136	**********
1375.000	69.909	10.615	8.915	2.294	.393	.614	2.670	.173	**********
1375.500	74.463	12.321	17.973	2.408	.303	.555	2.660	.109	**********
1376.000	26.006	12.087	15.322	2.286	.428	.720	2.656	.169	**********
1376.500	50.609	10.978	18.120	2.208	.457	.671	2.657	.220	**********
1377.000	79.445	11.633	6.676	2.204	.384	.440	2.660	.240	**********
1377.500	73.741	11.409	16.911	2.281	.413	.669	2.656	.176	**********
1378.000	81.925	12.212	6.768	2.250	.458	.743	2.659	.189	**********
1378.500	73.562	11.770	13.569	2.396	.410	.750	**********	.010	**********

1

PALMER #1

DEPTH	G.R.	R.T.	R.X.O.	FM.DENS.	PHI.N	VCL	RHO.G	POROSITY	SALINITY
1379.000	37.495	14.264	8.863	2.457	.318	.679	2.667	.070	**********
1379.500	34.194	17.392	24.088	2.280	.346	.449	2.665	.195	**********
1380.000	51.720	21.002	7.018	2.224	.307	.227	2.666	.247	828.329
1380.500	36.343	21.225	7.063	2.207	.320	.229	2.669	.258	736.452
1381.000	33.591	20.954	6.063	2.213	.310	.224	2.664	.253	800.626
1381.500	32.115	21.502	6.243	2.201	.279	.110	2.663	.269	1067.845
1382.000	41.500	21.673	6.196	2.197	.255	.055	2.655	.273	1225.451
1382.500	34.995	21.302	6.285	2.287	.287	.309	2.655	.199	**********
1383.000	34.330	21.245	6.612	2.247	.264	.131	2.668	.242	1263.670
1383.500	31.953	22.021	7.409	2.257	.204	.009	2.655	.240	1822.942
1384.000	30.755	20.334	8.367	2.317	.187	.058	2.656	.201	1883.438
1384.500	31.866	22.908	9.740	2.285	.174	.000	2.646	.201	1883.438
1385.000	30.538	25.962	10.680	2.277	.197	.036	2.651	.224	1561.248
1385.500	30.982	28.700	8.565	2.289	.236	.120	2.668	.217	1122.654
1386.000	31.497	25.318	8.841	2.252	.206	.005	2.656	.244	1478.475
1386.500	25.005	21.534	8.251	2.277	.278	.236	2.665	.214	1026.344
1387.000	27.151	22.075	7.447	2.322	.287	.345	2.665	.178	**********
1387.500	28.749	26.595	12.095	2.318	.175	.040	2.651	.199	2000.158
1388.000	28.195	45.589	16.705	2.545	.134	.275	2.665	.050	**********
1388.500	30.779	72.371	614.442	2.564	.089	.158	2.670	.050	**********
1389.000	30.258	198.198	47.847	2.617	.113	.335	2.667	.002	**********
1389.500	44.776	128.929	1245.062	2.543	.183	.425	2.663	.038	**********
1390.000	56.464	164.736	71.628	1.000	.345	**********	**********	.000	**********
1390.500	59.696	33.683	35.620	1.000	.375	**********	**********	.000	**********
1391.000	73.248	30.025	47.561	1.000	.414	**********	**********	.000	**********
1391.500	85.098	26.980	9.834	1.000	.273	**********	**********	.000	**********
1392.000	91.250	26.975	295.365	1.000	.348	**********	**********	.000	**********
1392.500	85.973	18.676	14.615	1.000	.401	**********	**********	.000	**********
1393.000	92.509	11.353	12.147	1.000	.618	**********	**********	.000	**********
1393.500	75.287	12.131	11.946	1.000	.530	**********	**********	.000	**********
1394.000	74.226	13.998	25.886	1.000	.316	**********	**********	.000	**********
1394.500	70.553	15.620	15.377	1.000	.389	**********	**********	.000	**********

[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1395.500	10.477	11.226	5.431	1.000	.541	*********	*********	.000	*********								
1396.000	10.455	10.477	16.858	1.000	.620	*********	*********	.000	*********								
1396.500	9.358	8.738	19.698	1.000	.634	*********	*********	.000	*********								
1397.000	9.529	8.938	26.346	1.000	.679	*********	*********	.000	*********								
1397.500	8.833	215.850	1.921	1.000	.629	*********	*********	.000	*********								
1398.000	9.399	76.345	3.013	1.000	.677	*********	*********	.000	*********								
1398.500	10.112	84.566	1.411	1.000	.685	*********	*********	.000	*********								
1399.000	11.225	72.220	1.206	1.000	.608	*********	*********	.000	*********								
1399.500	9.553	70.140	1.058	1.000	.560	*********	*********	.000	*********								
1400.000	10.323	69.879	1.134	1.000	.626	*********	*********	.000	*********								
1400.500	9.478	77.123	1.189	1.000	.572	*********	*********	.000	*********								
1401.000	12.299	139.112	1.216	1.000	.696	*********	*********	.000	*********								
1401.500	63.539	44.906	1.993	1.000	.574	*********	*********	.000	*********								
1402.000	129.431	48.480	15.866	1.000	.425	*********	*********	.000	*********								
1402.500	143.212	34.061	36.858	1.000	.395	*********	*********	.000	*********								
1403.000	130.465	17.669	47.095	2.491	.409	.750	*********	.010	*********								
1403.500	60.291	15.070	13.465	1.000	.561	*********	*********	.000	*********								
1404.000	93.344	10.050	17.055	1.000	.521	*********	*********	.000	*********								
1404.500	110.655	11.943	15.747	1.000	.438	*********	*********	.000	*********								
1405.000	117.559	13.496	67.361	1.000	.613	*********	*********	.000	*********								
1405.500	136.220	16.483	54.920	2.451	.380	.750	*********	.010	*********								
1406.000	121.884	13.457	16.126	2.485	.402	.750	*********	.010	*********								
1406.500	57.631	12.797	21.256	2.445	.386	.750	*********	.010	*********								

1 PALMER #1

DEPTH	G.R.	R.T.	R.X.O.	FM.DENS.	PHI.N	VCL	RHO.G	POROSITY	SALINITY
1407.000	33.109	11.683	17.391	2.342	.285	.379	2.663	.162	*********
1407.500	34.433	11.879	18.440	2.224	.324	.271	2.669	.244	1665.986
1408.000	43.344	10.979	18.552	2.267	.278	.212	2.667	.223	2705.440
1408.500	48.264	9.765	7.152	2.262	.271	.217	2.655	.221	3169.564
1409.000	42.172	9.072	5.982	2.258	.262	.182	2.655	.226	3642.702
1409.500	34.837	8.913	5.018	2.229	.252	.119	2.650	.246	3601.261
1410.000	38.196	9.501	6.101	2.238	.260	.145	2.654	.241	3296.045
1410.500	36.992	9.668	6.583	1.000	.268	*********	*********	.000	*********
1411.000	37.848	9.260	6.513	1.000	.286	*********	*********	.000	*********
1411.500	31.664	9.356	5.883	1.000	.403	*********	*********	.000	*********
1412.000	33.212	8.881	5.586	1.000	.532	*********	*********	.000	*********
1412.500	38.381	8.907	6.892	1.000	.468	*********	*********	.000	*********
1413.000	66.745	11.096	6.468	1.000	.546	*********	*********	.000	*********
1413.500	122.155	14.618	17.410	1.000	.396	*********	*********	.000	*********
1414.000	128.567	10.432	57.744	2.462	.373	.750	*********	.010	*********
1414.500	133.706	16.535	5.037	2.467	.326	.730	2.658	.059	*********
1415.000	73.023	15.915	35.188	2.282	.359	.502	2.660	.189	*********
1415.500	54.765	15.615	20.300	2.221	.297	.216	2.657	.247	1317.927
1416.000	59.903	15.270	19.026	2.217	.307	.243	2.656	.247	1234.937
1416.500	68.737	15.181	18.149	2.153	.345	.241	2.657	.286	920.174
1417.000	54.686	14.445	6.399	2.149	.367	.315	2.651	.281	*********
1417.500	50.214	14.649	5.550	2.182	.341	.289	2.654	.264	959.018
1418.000	52.772	13.378	5.811	2.203	.298	.198	2.654	.258	1509.919
1418.500	42.265	14.207	4.839	2.199	.291	.162	2.656	.264	1556.334
1419.000	45.743	13.387	5.135	2.211	.282	.174	2.650	.254	1678.104
1419.500	41.663	15.557	4.829	2.185	.323	.197	2.670	.274	1138.791
1420.000	43.128	14.320	5.675	2.255	.231	.090	2.653	.234	2341.571
1420.500	35.655	13.885	4.824	2.346	.291	.402	2.664	.159	*********
1421.000	44.220	11.011	4.770	2.115	.318	.101	2.655	.318	1541.828
1421.500	85.674	9.707	5.351	2.407	.296	.535	2.658	.110	*********
1422.000	97.218	9.584	6.073	2.435	.308	.622	2.656	.086	*********
1422.500	81.157	10.661	5.526	2.450	.343	.750	2.657	.068	*********
1423.000	66.379	13.311	5.171	2.420	.319	.623	2.661	.096	*********
1423.500	52.445	12.704	5.505	2.449	.330	.699	2.669	.074	*********
1424.000	57.693	14.246	5.546	2.209	.293	.203	2.651	.253	1481.800
1424.500	53.101	15.644	5.638	2.203	.287	.161	2.656	.261	1407.865
1425.000	44.553	15.684	7.162	2.173	.340	.243	2.665	.275	937.818
1425.500	56.340	14.337	7.328	2.177	.359	.299	2.668	.269	857.307
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[redacted]

1

PALMER #1

DEPTH	G.R.	R.T.	R.X.O.	FM.DENS.	PHI.N	VCL	RHO.G	POROSITY	SALINITY
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
14335.000	71.233	22.780	22.056	2.284	.300	.346	2.652	.197	**********
14335.500	41.367	19.000	20.332	2.302	.373	.574	2.663	.171	**********
14336.000	35.397	16.158	6.957	2.242	.335	.340	2.669	.228	**********
14336.500	35.726	16.622	6.013	2.229	.335	.323	2.666	.236	**********
14337.000	29.955	16.031	16.082	2.234	.319	.270	2.670	.238	1094.887
14337.500	36.912	17.385	6.489	2.219	.305	.214	2.666	.251	1090.884
14338.000	38.996	13.748	6.095	2.213	.304	.193	2.669	.257	1539.858
14338.500	41.687	14.852	5.138	2.215	.312	.217	2.670	.254	1312.588
14339.000	35.965	15.274	5.229	2.219	.276	.145	2.659	.254	1610.230
14339.500	35.940	15.095	6.013	2.217	.268	.125	2.656	.256	1710.112
14340.000	42.985	15.274	6.198	2.241	.323	.309	2.665	.229	**********
14340.500	73.403	13.948	5.479	2.151	.326	.185	2.655	.291	1195.823
14341.000	52.338	13.727	5.225	2.214	.311	.254	2.653	.247	1366.931
14341.500	37.167	13.056	5.206	2.241	.281	.176	2.667	.241	1994.018
14342.000	38.317	12.924	4.787	2.209	.242	.047	2.653	.265	2337.139
14342.500	43.493	12.937	6.344	2.312	.294	.354	2.663	.182	**********
14343.000	50.156	14.545	5.982	2.276	.288	.274	2.661	.211	1629.969
14343.500	58.932	13.555	5.131	2.246	.281	.214	2.656	.231	1833.517
14344.000	55.147	13.956	6.813	2.182	.305	.180	2.654	.272	1398.875
14344.500	45.874	14.315	6.764	2.193	.306	.195	2.657	.265	1355.773
14345.000	50.505	14.197	7.156	2.190	.282	.137	2.651	.269	1591.773
14345.500	47.686	13.656	7.423	2.271	.282	.252	2.659	.214	1870.530
14346.000	54.662	12.523	5.944	2.204	.229	.000	2.652	.271	2536.036
14346.500	60.532	11.374	6.796	2.239	.326	.348	2.651	.224	**********
14347.000	47.052	11.551	4.729	2.249	.264	.166	2.657	.234	2556.634
14347.500	73.215	11.029	9.767	2.091	.311	.044	2.653	.337	1684.037
14348.000	93.732	11.777	7.685	2.256	.351	.431	2.660	.210	**********
14348.500	98.752	11.569	7.930	2.237	.421	.616	2.654	.206	**********
14349.000	123.695	12.717	19.468	2.396	.401	.750	**********	.010	**********
14349.500	98.873	11.162	21.096	2.404	.381	.750	**********	.010	**********
14350.000	82.053	12.758	24.007	2.270	.302	.300	2.663	.213	**********
14350.500	36.511	13.501	5.737	2.229	.330	.310	2.665	.237	**********
14351.000	40.955	14.790	6.001	2.221	.350	.351	2.667	.239	**********
14351.500	49.957	11.932	5.591	2.221	.301	.244	2.651	.243	1791.365
14352.000	54.643	10.681	5.729	2.251	.351	.418	2.662	.214	**********
14352.500	64.772	10.309	7.800	2.243	.233	.087	2.650	.241	3354.459
14353.000	55.241	10.377	9.719	2.291	.295	.320	2.662	.198	**********
14353.500	52.075	11.757	8.054	2.221	.254	.092	2.656	.256	2502.226
14354.000	56.715	13.252	5.737	2.235	.286	.214	2.655	.238	1778.853
14354.500	64.911	13.418	6.320	2.246	.231	.081	2.652	.240	2530.373
14355.000	61.408	12.044	8.773	2.252	.209	.015	2.656	.243	3233.806
14355.500	36.145	11.025	10.194	2.310	.184	.047	2.653	.204	4794.145
14356.000	46.594	10.674	11.010	2.293	.197	.067	2.650	.212	4403.973
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

DEPTH	G.R.	R.T.	R.X.O.	FM.DENS.	PHI.N	VCL	RHO.G	POROSITY	SALINITY
[redacted]	[redacted]	12[redacted]	7.[redacted]	[redacted].2[redacted]	[redacted]23[redacted]	[redacted]06[redacted]	2[redacted]5	.[redacted]	[redacted].5[redacted]
14558.000	59.598	11.748	9.555	2.315	.287	.360	2.653	.178	*********
14558.500	37.370	11.865	11.443	2.300	.319	.398	2.666	.187	*********
14559.000	30.987	11.545	9.194	2.236	.321	.300	2.663	.233	1709.152
14559.500	31.675	12.365	7.535	2.235	.305	.246	2.665	.238	1752.121
14560.000	32.010	11.650	6.267	2.227	.237	.069	2.650	.252	2752.426
14560.500	32.193	11.229	6.643	2.273	.277	.231	2.664	.216	2577.240
14561.000	37.060	10.236	7.931	2.326	.246	.215	2.669	.188	4135.629
14561.500	38.678	10.228	6.412	2.253	.227	.070	2.655	.238	3598.519
14562.000	30.956	9.729	6.863	2.229	.254	.100	2.658	.251	3177.705
14562.500	34.396	10.060	6.393	2.308	.246	.191	2.666	.199	3979.635

1 PALMER #1

DEPTH	G.R.	R.T.	R.X.O.	FM.DENS.	PHI.N	VCL	RHO.G	POROSITY	SALINITY
14563.000	48.715	10.873	7.469	2.410	.230	.321	2.668	.128	*********
14563.500	43.485	12.783	10.808	2.286	.270	.259	2.654	.203	2237.492
14564.000	37.292	12.156	11.538	2.327	.302	.397	2.666	.171	*********
14564.500	39.554	11.440	6.498	2.261	.287	.238	2.664	.223	2296.133
14565.000	42.253	11.846	7.379	2.260	.264	.202	2.652	.222	2461.992
14565.500	55.933	13.406	8.356	2.279	.175	.000	2.644	.222	2461.992
14566.000	57.351	13.652	10.139	2.337	.267	.340	2.653	.166	*********
14566.500	46.404	11.309	9.062	2.212	.352	.340	2.667	.245	*********
14567.000	62.258	9.693	4.815	2.197	.367	.384	2.657	.248	*********
14567.500	93.413	9.361	4.933	2.223	.310	.267	2.654	.240	2380.775
14568.000	139.960	10.250	5.271	2.429	.396	.750	**********	.010	*********
14568.500	116.424	11.541	14.314	2.428	.393	.750	**********	.010	*********
14569.000	112.908	14.136	23.148	2.490	.344	.750	**********	.010	*********
14569.500	89.942	16.606	21.230	2.470	.315	.696	2.662	.060	*********
14570.000	57.374	18.342	19.398	2.353	.348	.584	2.666	.140	*********
14570.500	37.916	16.212	10.352	2.194	.335	.263	2.665	.261	900.916
14571.000	42.776	14.847	4.834	2.160	.356	.267	2.664	.281	868.815
14571.500	44.156	13.813	5.013	2.226	.273	.162	2.654	.247	1819.721
14572.000	72.974	13.904	5.233	2.310	.325	.462	2.652	.173	*********
14572.500	69.529	14.664	5.793	2.247	.317	.331	2.653	.221	*********
14573.000	51.378	14.957	6.942	2.215	.310	.245	2.656	.248	1216.771
14573.500	49.029	14.376	5.824	2.211	.291	.184	2.657	.255	1502.265
14574.000	47.102	14.273	5.190	2.204	.254	.066	2.655	.267	1926.043
14574.500	39.855	13.271	5.589	2.214	.288	.181	2.656	.253	1708.933
14575.000	36.308	13.158	5.634	2.183	.307	.148	2.668	.278	1558.604
14575.500	38.380	12.030	5.557	2.219	.294	.169	2.670	.256	1967.171
14576.000	43.612	9.861	5.009	2.223	.309	.235	2.665	.246	2301.522
14576.500	93.502	9.281	5.824	2.271	.239	.148	2.652	.219	3963.264
14577.000	108.304	10.119	6.385	2.477	.323	.730	2.664	.054	*********
14577.500	115.049	12.832	10.684	2.488	.296	.670	2.663	.052	*********
14578.000	101.604	14.239	17.465	2.431	.426	.750	**********	.010	*********
14578.500	111.399	15.113	18.627	2.448	.349	.750	**********	.010	*********
14579.000	128.342	16.135	26.760	2.480	.339	.750	**********	.010	*********
14579.500	123.090	19.126	26.238	2.484	.339	.750	**********	.010	*********
14580.000	71.769	19.073	27.433	2.380	.326	.571	2.662	.125	*********
14580.500	42.303	20.170	10.896	2.266	.282	.223	2.667	.222	1065.077
14581.000	40.679	24.592	7.744	2.244	.266	.168	2.656	.236	895.941
14581.500	34.658	19.941	9.533	2.251	.275	.176	2.666	.235	1171.968
14582.000	41.386	14.802	6.104	2.236	.288	.194	2.665	.242	1035.686
14582.500	43.633	18.343	6.561	2.214	.266	.115	2.657	.258	1333.070
14583.000	47.985	23.155	6.726	2.250	.275	.214	2.652	.228	909.887
14583.500	86.513	20.970	7.280	2.310	.231	.185	2.654	.194	1576.858
14584.000	94.555	14.972	7.952	2.272	.349	.458	2.658	.198	*********
14584.500	104.571	17.276	23.809	2.438	.360	.750	**********	.010	*********
14585.000	122.219	14.711	19.738	2.502	.319	.750	**********	.010	*********
14585.500	114.203	13.193	16.747	2.483	.337	.750	**********	.010	*********
14586.000	127.555	13.590	19.415	2.495	.352	.750	**********	.010	*********
14586.500	125.309	13.940	19.578	2.488	.335	.750	**********	.010	*********
14587.000	126.736	15.141	18.220	2.497	.329	.750	**********	.010	*********
14587.500	150.679	17.265	21.816	2.493	.291	.670	2.658	.048	*********
14588.000	170.457	18.141	26.053	2.359	.322	.530	2.658	.139	*********

1488.500	161.632	18.191	13.491	2.282	.342	.450	2.660	.192	*********	
1489.000	60.816	18.447	7.573	2.197	.327	.271	2.654	.256	732.702	
1489.500	45.379	18.045	6.052	2.180	.285	.131	2.650	.275	1124.189	
1490.000	55.291	17.877	5.265	2.156	.304	.132	2.655	.292	1004.877	
1490.500	101.381	18.319	4.956	2.384	.183	.180	2.651	.148	3402.614	

1 PALMER #1

DEPTH	G.R.	R.T.	R.X.O.	FM.DENS.	PHI.N	VCL	RHO.G	POROSITY	SALINITY
1491.000	74.623	22.755	31.349	2.492	.191	.377	2.656	.070	*********
1491.500	45.586	23.510	38.734	2.333	.232	.233	2.651	.176	952.275
1492.000	49.609	23.507	23.238	2.215	.251	.082	2.653	.259	1091.383
1492.500	41.053	19.697	6.280	2.208	.249	.071	2.651	.263	1346.061
1493.000	42.653	16.725	6.527	2.213	.247	.066	2.654	.261	1673.194
1493.500	40.809	18.758	5.650	2.219	.257	.109	2.652	.254	1362.295
1494.000	42.980	19.970	5.696	2.223	.245	.069	2.656	.256	1412.214
1494.500	39.023	20.335	6.147	2.221	.259	.113	2.653	.253	1223.863
1495.000	52.839	19.756	6.268	2.224	.283	.199	2.650	.244	997.773
1495.500	55.473	19.579	5.641	2.207	.267	.122	2.651	.260	1175.612
1496.000	53.672	19.656	6.352	2.197	.278	.126	2.655	.267	1090.018
1496.500	50.074	18.960	5.529	2.229	.253	.113	2.653	.248	1392.627
1497.000	50.074	18.153	6.427	2.232	.234	.053	2.655	.252	1707.590
1497.500	54.398	19.216	6.007	2.255	.238	.113	2.653	.233	1568.792
1498.000	63.019	17.874	6.650	2.251	.238	.111	2.651	.234	1699.759
1498.500	83.225	18.474	5.987	1.000	.457	*********	*********	.000	*********
1499.000	120.481	20.404	14.814	1.000	.349	*********	*********	.000	*********
1499.500	123.951	22.219	29.158	2.477	.343	.750	*********	.010	*********
1500.000	127.725	20.635	24.590	2.479	.322	.730	2.666	.053	*********
1500.500	124.310	18.072	22.650	2.378	.336	.610	2.653	.121	*********
1501.000	124.526	17.797	9.432	2.382	.344	.630	2.663	.119	*********
1501.500	115.990	17.476	10.725	2.401	.396	.750	*********	.010	*********
1502.000	120.840	17.785	22.883	2.402	.330	.630	2.656	.105	*********
1502.500	98.432	17.886	16.089	2.363	.332	.573	2.653	.133	*********
1503.000	50.202	16.468	13.453	2.093	.333	.115	2.652	.330	899.970
1503.500	39.925	15.096	6.665	2.156	.314	.161	2.654	.289	1145.767
1504.000	86.374	13.070	8.207	2.304	.291	.343	2.656	.187	*********
1504.500	156.432	13.503	6.412	2.490	.288	.650	2.663	.052	*********
1505.000	122.670	14.514	18.599	2.399	.326	.610	2.659	.109	*********
1505.500	117.815	16.522	10.932	2.379	.303	.510	2.657	.129	*********
1506.000	120.974	15.725	11.348	2.354	.303	.470	2.655	.146	*********
1506.500	124.527	14.720	8.112	2.488	.344	.750	*********	.010	*********
1507.000	117.510	13.793	17.053	2.476	.312	.710	2.652	.054	*********
1507.500	117.969	14.442	18.641	2.482	.277	.610	2.659	.059	*********
1508.000	114.091	15.748	22.308	2.496	.291	.670	2.663	.047	*********
1508.500	113.051	17.805	25.921	2.477	.292	.650	2.654	.058	*********
1509.000	98.933	18.990	23.444	2.350	.296	.441	2.656	.151	*********
1509.500	85.455	16.751	13.857	2.255	.305	.255	2.654	.240	1033.762
1510.000	81.058	14.527	7.616	1.000	.329	*********	*********	.000	*********
1510.500	107.340	15.700	6.001	1.000	.408	*********	*********	.000	*********
1511.000	127.852	15.734	21.461	2.454	.276	.570	2.651	.077	*********
1511.500	95.161	13.406	25.768	2.351	.295	.445	2.652	.149	*********
1512.000	75.296	15.680	10.395	2.237	.302	.263	2.655	.233	1076.491
1512.500	54.914	14.155	6.529	2.219	.266	.137	2.652	.252	1780.170
1513.000	73.815	13.508	6.280	2.198	.268	.109	2.651	.266	1791.251
1513.500	73.545	13.424	6.029	2.257	.271	.207	2.656	.225	1768.966
1514.000	70.530	13.796	5.834	2.330	.319	.300	2.657	.235	999.270
1514.500	61.454	13.965	5.652	2.128	.321	.137	2.654	.308	1231.265
1515.000	84.880	11.628	4.991	2.172	.340	.268	2.654	.271	1357.614
1515.500	130.547	12.654	4.564	2.406	.332	.650	2.650	.101	*********
1516.000	108.128	14.226	17.537	2.393	.313	.570	2.653	.115	*********
1516.500	91.499	17.257	21.873	2.394	.310	.550	2.661	.117	*********
1517.000	113.866	14.676	14.887	2.302	.309	.390	2.659	.185	*********
1517.500	119.417	14.631	7.883	2.346	.395	.730	2.651	.131	*********
1518.000	124.587	14.352	19.259	2.265	.340	.430	2.653	.202	*********
1518.500	135.573	13.353	27.964	2.422	.317	.630	2.653	.093	*********

DEPTH	G.R.	R.T.	R.X.O.	FM.DENS.	PHI.N	VCL	RHO.G	POROSITY	SALINITY
1519.000	144.418	16.919	22.570	2.499	.335	.750	*********	.010	*********
1519.500	133.786	15.032	21.481	2.426	.344	.710	2.660	.085	*********
1520.000	112.071	14.204	11.894	2.430	.419	.750	*********	.010	*********
1520.500	114.542	13.262	6.642	2.444	.363	.750	*********	.010	*********
1521.000	125.585	15.477	25.597	2.508	.354	.750	*********	.010	*********
1521.500	132.019	15.912	21.235	2.514	.349	.750	*********	.010	*********
1522.000	134.160	15.853	21.728	2.462	.314	.690	2.652	.064	*********
1522.500	134.838	16.248	21.041	2.375	.310	.530	2.653	.129	*********
1523.000	116.660	15.759	11.649	2.402	.300	.550	2.650	.111	*********
1523.500	132.452	16.335	11.734	2.366	.292	.450	2.659	.142	*********
1524.000	114.563	16.652	8.840	2.406	.314	.590	2.656	.106	*********
1524.500	107.060	16.004	8.139	2.268	.289	.290	2.650	.211	1260.831
1525.000	124.871	15.356	7.437	2.392	.306	.550	2.651	.117	*********
1525.500	103.563	14.708	6.736	2.322	.301	.410	2.653	.170	*********
1526.000	71.060	14.061	6.034	2.204	.345	.344	2.651	.246	*********
1526.500	73.090	13.413	5.333	2.139	.369	.303	2.652	.288	*********
1527.000	79.831	12.765	4.631	2.245	.347	.404	2.658	.218	*********
1527.500	99.084	12.596	6.234	2.172	.352	.299	2.656	.269	1065.866
1528.000	107.708	14.816	10.126	2.412	.345	.690	2.657	.095	*********
1528.500	114.867	13.916	18.726	2.443	.385	.750	*********	.010	*********
1529.000	121.789	13.603	16.627	2.467	.343	.750	*********	.010	*********
1529.500	118.837	13.832	19.228	2.466	.335	.750	2.661	.059	*********
1530.000	81.810	15.327	20.094	2.408	.395	.750	*********	.010	*********
1530.500	86.917	18.259	10.923	2.429	.242	.428	2.650	.103	*********
1531.000	83.733	24.227	32.957	2.450	.244	.459	2.656	.089	*********
1531.500	63.749	20.083	28.508	2.257	.338	.398	2.659	.211	*********
1532.000	59.921	16.896	9.421	2.176	.373	.363	2.657	.263	*********
1532.500	62.449	13.975	5.205	2.147	.332	.206	2.652	.290	1072.342
1533.000	53.395	13.721	6.205	2.187	.305	.184	2.656	.269	1385.988
1533.500	63.449	14.313	7.523	2.155	.306	.135	2.655	.292	1283.205
1534.000	68.814	14.620	6.034	2.264	.289	.284	2.651	.214	1447.884
1534.500	54.423	14.008	6.653	2.236	.273	.173	2.656	.241	1762.555
1535.000	49.354	14.489	5.780	2.156	.335	.227	2.654	.284	992.714
1535.500	41.731	14.464	5.277	2.192	.276	.118	2.653	.270	1569.694
1536.000	42.104	14.060	7.281	2.207	.321	.241	2.665	.256	1228.691
1536.500	45.510	15.277	5.728	2.240	.249	.112	2.656	.242	1874.178
1537.000	49.570	14.135	6.382	2.241	.233	.069	2.655	.245	2259.462
1537.500	42.896	14.321	7.632	2.221	.263	.128	2.653	.252	1779.840
1538.000	40.762	13.711	7.701	2.214	.247	.069	2.653	.260	2058.514
1538.500	43.680	13.741	7.671	2.182	.266	.075	2.651	.279	1748.266
1539.000	59.574	13.671	10.850	2.179	.304	.180	2.652	.273	1366.087
1539.500	45.530	12.678	6.773	2.220	.334	.312	2.662	.241	*********
1540.000	44.769	11.315	7.127	2.182	.345	.265	2.667	.269	1394.264
1540.500	52.107	11.197	5.016	2.160	.360	.292	2.659	.278	1214.390
1541.000	98.849	11.408	4.092	1.000	.461	*********	*********	.000	*********
1541.500	112.742	13.491	7.861	1.000	.346	*********	*********	.000	*********
1542.000	126.762	15.422	26.762	2.303	.367	.570	2.654	.170	*********
1542.500	127.300	15.597	18.849	2.392	.337	.630	2.660	.112	*********
1543.000	121.750	14.875	17.537	2.448	.306	.630	2.662	.079	*********
1543.500	118.645	14.403	17.487	2.457	.320	.690	2.662	.069	*********
1544.000	126.109	14.076	22.361	2.465	.313	.690	2.655	.063	*********
1544.500	129.746	14.017	20.613	2.466	.331	.730	2.670	.061	*********
1545.000	121.541	15.114	20.901	2.299	.325	.430	2.660	.184	*********
1545.500	131.164	15.818	15.308	2.475	.299	.670	2.653	.058	*********
1546.000	122.567	15.589	23.120	2.435	.292	.570	2.660	.091	*********
1546.500	123.250	14.138	19.615	2.319	.277	.330	2.656	.178	*********

1

PALMER #1

DEPTH	G.R.	R.T.	R.X.O.	FM.DENS.	PHI.N	VCL	RHO.G	POROSITY	SALINITY
1547.000	104.124	13.161	10.245	2.316	.307	.410	2.657	.175	*********
1547.500	126.875	12.286	8.803	2.469	.292	.630	2.658	.065	*********
1548.000	130.526	13.002	11.242	2.482	.267	.590	2.652	.059	*********
1548.500	[illegible]	14.650	[illegible]	[illegible]	.307	.710	[illegible]	[illegible]	[illegible]

DEPTH	G.R.	S.T.	R.X.O.	FM.DENS.	PHI.N	VCL	RHO.G	POROSITY	SALINITY
1545.000	121.464	15.970	21.456	1.000	.355	*********	*********	.000	*********
1545.500	107.785	16.225	22.771	2.434	.459	.750	*********	.010	*********
1550.000	120.784	16.627	24.297	2.413	.335	.670	2.650	.095	*********
1550.500	135.577	16.224	27.495	2.460	.341	.750	*********	.010	*********
1551.000	121.107	15.579	23.113	2.439	.355	.750	*********	.010	*********
1551.500	113.073	15.369	18.118	2.382	.365	.690	2.664	.114	*********
1552.000	115.546	15.376	31.531	2.458	.333	.730	2.661	.065	*********
1552.500	122.379	15.327	25.868	2.463	.328	.730	2.655	.061	*********
1553.000	120.547	15.109	23.186	2.476	.343	.750	*********	.010	*********
1553.500	119.924	15.231	23.229	2.496	.303	.710	2.658	.043	*********
1554.000	107.324	15.868	23.130	2.485	.295	.670	2.657	.052	*********
1554.500	100.097	16.169	23.314	2.523	.293	.730	2.657	.025	*********
1555.000	93.022	17.452	23.754	2.503	.284	.664	2.661	.043	*********
1555.500	87.076	18.430	25.656	2.520	.250	.590	2.661	.038	*********
1556.000	61.181	16.249	30.261	2.471	.254	.514	2.662	.074	*********
1556.500	44.074	14.714	22.505	2.293	.303	.339	2.666	.197	*********
1557.000	52.616	12.700	12.397	2.270	.227	.117	2.650	.222	2760.694
1557.500	66.229	10.831	9.285	2.216	.269	.142	2.652	.253	2366.241
1558.000	57.842	10.192	7.962	2.211	.314	.264	2.651	.247	1932.497
1558.500	74.182	9.290	7.296	2.148	.315	.153	2.653	.294	2026.484
1559.000	113.714	9.926	7.649	2.352	.323	.530	2.653	.142	*********
1559.500	118.606	11.452	11.248	2.494	.311	.730	2.659	.043	*********
1560.000	139.198	14.037	18.048	2.479	.304	.690	2.653	.054	*********
1559.500	99.442	14.507	20.720	2.452	.321	.682	2.663	.072	*********
1561.000	56.514	12.488	17.459	2.212	.309	.252	2.651	.248	1490.612
1561.500	57.590	10.137	8.874	2.185	.352	.322	2.655	.260	*********
1562.000	54.803	8.723	4.838	2.172	.307	.176	2.652	.277	2343.425
1562.500	60.676	8.725	4.885	2.217	.278	.170	2.652	.251	2945.420
1563.000	55.816	9.302	4.570	2.194	.287	.146	2.655	.268	2510.396
1563.500	94.604	9.814	5.281	2.211	.322	.278	2.655	.248	1947.260
1564.000	122.391	11.627	5.697	2.438	.302	.610	2.655	.085	*********
1564.500	129.657	14.021	25.269	2.419	.282	.510	2.661	.106	*********
1565.000	130.007	13.705	21.902	2.269	.366	.510	2.654	.194	*********
1565.500	49.560	11.644	6.947	2.231	.345	.349	2.669	.234	*********
1566.000	59.226	9.277	7.673	2.208	.338	.317	2.656	.247	*********
1566.500	71.768	9.413	5.249	2.195	.316	.231	2.656	.261	2105.554
1567.000	72.979	9.831	5.080	2.257	.291	.262	2.657	.221	2577.711
1567.500	76.578	10.768	7.196	2.274	.315	.374	2.652	.201	*********
1568.000	59.297	10.854	7.240	2.230	.296	.237	2.654	.239	2053.601
1568.500	44.207	10.343	5.668	2.240	.279	.200	2.656	.236	2494.123
1569.000	44.165	10.922	6.290	2.259	.215	.060	2.650	.233	3391.046
1569.500	63.320	12.834	10.904	2.333	.174	.054	2.655	.190	4388.445
1570.000	97.311	14.295	9.264	1.000	.280	*********	*********	.000	*********
1570.500	33.008	17.588	11.939	1.000	.569	*********	*********	.000	*********
1571.000	52.213	24.051	30.926	1.000	.556	*********	*********	.000	*********
1571.500	112.638	32.123	262.003	1.000	.361	*********	*********	.000	*********
1572.000	120.857	25.679	64.211	2.473	.335	.750	*********	.010	*********
1572.500	110.200	19.116	28.407	2.473	.325	.730	2.664	.056	*********
1573.000	103.947	17.896	27.277	2.398	.258	.410	2.656	.125	*********
1573.500	99.711	20.337	14.335	2.444	.237	.425	2.658	.096	*********
1574.000	95.869	20.023	18.336	2.370	.272	.399	2.658	.143	*********
1574.500	102.976	20.076	23.136	2.331	.322	.490	2.652	.158	*********

1 PALMER #1

DEPTH	G.R.	S.T.	R.X.O.	FM.DENS.	PHI.N	VCL	RHO.G	POROSITY	SALINITY
1575.000	101.685	20.360	11.531	1.000	.391	*********	*********	.000	*********
1575.500	114.519	22.608	57.380	2.416	.318	.610	2.664	.100	*********
1576.000	124.211	23.552	40.681	2.505	.330	.750	*********	.010	*********
1576.500	132.067	21.853	27.228	2.480	.339	.750	*********	.010	*********
1577.000	128.509	23.686	23.482	2.449	.326	.690	2.664	.074	*********
1577.500	57.743	24.334	14.701	2.395	.331	.614	2.661	.112	*********
1578.000	57.131	24.213	13.073	2.247	.329	.338	2.655	.223	*********
1578.500	51.485	28.208	7.972	2.208	.370	.386	2.669	.244	*********
1579.000	43.704	25.118	5.771	2.201	.330	.255	2.667	.258	443.117
1579.500	41.205	25.197	4.446	2.224	.323	.275	2.667	.243	449.545

DEPTH	G.R.	R.T.	R.X.O.	FM.DENS.	PHI.N	VCL	RHO.G	POROSITY	SALINITY
1558.000	41.881	27.953	5.588	2.255	.332	.319	2.659	.259	**********
1558.500	43.233	24.591	6.114	2.247	.265	.171	2.656	.234	660.320
1559.000	41.547	24.030	6.144	2.236	.276	.196	2.651	.237	581.395
1559.500	36.204	24.526	5.709	2.209	.306	.187	2.669	.260	641.060
1560.000	39.567	24.251	5.419	2.232	.255	.118	2.655	.247	980.358
1560.500	75.817	19.858	4.552	2.221	.197	.000	2.634	.247	980.358
1561.000	117.639	23.986	6.172	2.396	.242	.370	2.651	.127	**********
1561.500	124.374	24.372	17.800	2.349	.304	.470	2.651	.148	**********
1562.000	114.881	24.999	12.716	2.425	.356	.750	2.652	.082	**********
1562.500	69.385	22.794	29.054	2.271	.362	.489	2.662	.196	**********
1563.000	56.524	22.928	19.443	2.201	.341	.312	2.658	.252	**********
1563.500	48.920	22.978	5.950	2.186	.360	.323	2.665	.262	**********
1564.000	48.572	22.662	6.359	2.180	.299	.160	2.654	.275	720.210
1564.500	59.050	22.507	6.265	2.180	.280	.115	2.650	.277	807.711
1565.000	57.442	22.207	4.782	2.169	.289	.141	2.656	.271	821.809
1565.500	60.417	20.401	5.133	2.215	.272	.147	2.652	.253	1030.682
1566.000	100.277	18.452	5.280	2.379	.234	.310	2.655	.144	**********
1566.500	113.232	19.865	8.192	2.530	.285	.710	2.666	.023	**********
1567.000	110.124	21.919	30.812	2.484	.352	.750	**********	.010	**********
1567.500	114.685	20.225	32.227	2.471	.356	.750	**********	.010	**********
1568.000	107.457	19.596	19.020	2.472	.361	.750	**********	.010	**********
1568.500	107.556	20.356	27.332	2.445	.414	.750	**********	.010	**********
1569.000	109.909	18.131	31.124	2.445	.404	.750	**********	.010	**********
1569.500	115.632	16.055	23.186	2.434	.367	.750	**********	.010	**********
1570.000	72.802	17.080	24.366	2.378	.357	.660	2.663	.118	**********
1570.500	59.752	14.859	17.379	2.240	.316	.321	2.651	.225	**********
1571.000	61.467	14.380	6.547	2.237	.341	.377	2.657	.225	**********
1571.500	58.775	13.868	4.301	2.230	.305	.272	2.651	.235	1309.720
1572.000	58.839	13.755	5.578	2.209	.309	.233	2.656	.252	1308.673
1572.500	59.292	14.130	5.472	2.223	.288	.197	2.655	.246	1496.306
1573.000	64.439	13.715	5.076	2.207	.293	.184	2.656	.257	1481.496
1573.500	59.214	13.910	5.333	2.207	.291	.176	2.656	.258	1482.049
1574.000	51.307	13.648	5.471	2.199	.306	.205	2.657	.261	1356.047
1574.500	47.415	13.306	5.493	2.206	.277	.149	2.651	.259	1692.682
1575.000	48.765	12.312	5.166	2.215	.252	.081	2.654	.259	2212.796
1575.500	69.624	12.399	5.531	2.279	.258	.211	2.653	.211	2370.143
1576.000	91.990	14.721	6.597	1.000	.374	**********	**********	.000	**********
1576.500	85.471	18.202	14.296	1.000	.349	**********	**********	.000	**********
1577.000	52.256	19.109	18.876	2.240	.362	.433	2.662	.219	**********
1577.500	50.514	15.429	20.227	2.220	.313	.278	2.650	.241	1026.725
1578.000	54.529	12.007	5.302	2.230	.299	.254	2.651	.237	1697.171
1578.500	54.303	12.194	8.075	2.199	.271	.112	2.654	.266	1957.401
1579.000	69.669	11.653	5.521	2.250	.238	.111	2.651	.235	2712.232
1579.500	112.176	11.562	6.452	2.286	.266	.250	2.652	.203	2566.632
1580.000	115.039	11.027	9.005	2.241	.326	.350	2.652	.223	**********
1580.500	86.583	10.532	6.842	2.194	.331	.285	2.651	.256	1552.048

1 PALMER #1

DEPTH	G.R.	R.T.	R.X.O.	FM.DENS.	PHI.N	VCL	RHO.G	POROSITY	SALINITY
1603.000	96.932	10.142	5.959	2.197	.316	.239	2.654	.259	1862.510
1603.500	115.820	10.627	6.150	2.360	.416	.750	**********	.010	**********
1604.000	120.517	11.119	13.864	2.443	.370	.750	**********	.010	**********
1604.500	123.957	12.139	16.840	2.454	.390	.750	**********	.010	**********
1605.000	116.086	12.121	16.764	2.446	.352	.750	**********	.010	**********
1605.500	107.625	12.136	16.079	2.477	.353	.750	**********	.010	**********
1606.000	115.556	12.137	17.627	2.502	.370	.750	**********	.010	**********
1606.500	126.227	11.820	19.318	2.489	.372	.750	**********	.010	**********
1607.000	127.029	11.709	19.270	2.492	.388	.750	**********	.010	**********
1607.500	123.917	12.353	17.650	2.390	.287	.484	2.656	.124	**********
1608.000	104.123	13.424	15.625	2.301	.397	.650	2.659	.165	**********
1608.500	106.493	14.533	17.999	2.314	.346	.550	2.653	.166	**********
1609.000	114.147	15.515	31.384	2.339	.352	.590	2.654	.146	**********
1609.500	126.560	14.800	20.436	2.430	.332	.690	2.652	.083	**********
1610.000	125.609	14.149	22.738	2.459	.294	.630	2.650	.070	**********
1610.500	132.530	14.356	20.510	2.444	.360	.750	**********	.010	**********

DEPTH	G.R.	R.T.	R.X.O.	FM.DENS.	PHI.N	VCL	RHO.G	POROSITY	SALINITY
1611.000	116.538	14.259	15.605	.496	.342	.750	**********	.010	**********
1611.500	86.894	13.353	21.843	.401	.419	.750	**********	.010	**********
1612.000	113.714	14.398	17.849	.448	.377	.750	**********	.010	**********
1612.500	140.690	14.8552	21.646	.419	.362	.750	2.663	.087	**********
1613.000	135.436	15.531	23.260	.475	.364	.750	**********	.010	**********
1613.500	120.656	14.594	20.589	.463	.324	.710	2.663	.064	**********
1614.000	64.744	11.874	20.766	.282	.296	.327	2.654	.200	**********
1614.500	53.902	9.264	6.736	.197	.304	.208	2.653	.260	2242.029
1615.000	62.428	8.329	5.137	.209	.286	.166	2.656	.258	2906.543
1615.500	60.172	8.366	5.239	.206	.300	.205	2.655	.255	2681.393
1616.000	88.249	9.352	6.860	.213	.258	.101	2.653	.259	2895.666
1616.500	91.785	10.228	6.297	.339	.326	.513	2.654	.152	**********
1617.000	52.551	9.150	11.228	.182	.314	.216	2.651	.268	2095.324
1617.500	52.271	8.270	4.805	.158	.280	.073	2.652	.294	2701.449
1618.000	53.210	7.358	4.826	.174	.327	.242	2.650	.271	2562.837
1618.500	54.628	7.769	4.934	.171	.307	.175	2.652	.278	2629.376
1619.000	75.222	7.992	5.014	.211	.291	.182	2.657	.255	3008.093
1619.500	106.244	9.359	5.528	.190	.406	.490	2.656	.244	**********
1620.000	97.728	14.004	7.387	.336	.312	.467	2.653	.157	**********
1620.500	81.419	19.220	23.975	.342	.282	.378	2.659	.161	**********
1621.000	64.002	20.536	12.436	.231	.285	.201	2.656	.241	894.478
1621.500	59.362	19.848	6.256	.233	.293	.238	2.653	.236	844.538
1622.000	60.872	22.133	5.212	.163	.347	.273	2.654	.276	426.856
1622.500	64.907	22.060	4.729	.239	.307	.289	2.653	.229	588.039
1623.000	54.799	23.469	6.076	.260	.290	.276	2.651	.217	629.490
1623.500	46.218	27.735	6.341	.244	.283	.218	2.656	.232	564.242
1624.000	46.994	28.155	7.282	.254	.235	.105	2.652	.233	940.550
1624.500	44.044	28.577	6.383	.250	.249	.139	2.653	.233	799.536
1625.000	38.657	25.758	7.192	.262	.253	.170	2.653	.224	873.950
1625.500	47.625	28.555	6.486	.285	.237	.171	2.650	.209	866.882
1626.000	55.875	27.877	10.301	.324	.219	.166	2.657	.188	1144.560
1626.500	128.586	26.522	12.785	.384	.279	.450	2.656	.130	**********
1627.000	158.353	25.664	9.622	.465	.286	.610	2.656	.069	**********
1627.500	137.745	22.639	18.401	.464	.316	.690	2.663	.065	**********
1628.000	133.493	22.537	27.205	.514	.312	.750	**********	.010	**********
1628.500	62.193	24.187	20.523	.452	.285	.564	2.670	.083	**********
1629.000	62.017	22.856	24.062	.222	.266	.142	2.652	.250	916.136
1629.500	63.156	27.553	8.111	.277	.281	.272	2.655	.208	526.480
1630.000	64.817	21.970	8.059	.206	.247	.047	2.656	.268	1158.835
1630.500	63.328	28.471	5.775	.271	.232	.274	2.651	.210	475.287

1 PALISER #1

DEPTH	G.R.	R.T.	R.X.O.	FM.DENS.	PHI.N	VCL	RHO.G	POROSITY	SALINITY
1631.000	44.612	29.357	9.623	2.226	.281	.184	2.655	.245	554.414
1631.500	89.448	33.328	13.814	2.253	.248	.148	2.650	.230	636.153
1632.000	47.319	27.857	9.140	2.270	.244	.148	2.656	.221	879.736
1632.500	67.158	25.191	7.417	2.278	.201	.049	2.652	.223	1457.071
1633.000	55.750	29.959	7.602	2.273	.290	.296	2.653	.208	403.601
1633.500	56.121	30.039	9.350	2.231	.257	.134	2.651	.244	690.568
1634.000	45.158	27.138	9.942	2.253	.253	.109	2.655	.248	852.198
1634.500	48.155	25.338	16.947	2.246	.258	.156	2.653	.235	854.986
1635.000	47.505	23.536	9.134	2.227	.268	.150	2.654	.247	871.264
1635.500	58.401	23.001	11.792	2.230	.232	.047	2.655	.253	1238.174
1636.000	48.797	21.999	12.545	2.269	.225	.102	2.653	.224	1406.888
1636.500	48.875	21.047	10.466	2.292	.203	.077	2.652	.212	1804.224
1637.000	60.123	20.605	9.709	2.312	.215	.136	2.655	.197	1762.443
1637.500	49.253	19.731	10.051	2.249	.287	.239	2.656	.228	908.112
1638.000	49.520	20.099	8.259	2.243	.240	.088	2.656	.243	1388.800
1638.500	52.334	14.720	7.946	2.278	.263	.214	2.657	.212	1175.206
1639.000	54.905	13.042	6.699	2.214	.318	.277	2.653	.245	757.979
1639.500	54.379	15.177	5.269	2.204	.294	.198	2.650	.256	1224.163
1640.000	53.032	15.561	6.576	2.249	.242	.108	2.655	.237	1860.950
1640.500	51.175	15.817	7.463	2.245	.289	.243	2.654	.229	1231.731
1641.000	57.023	16.727	6.217	2.255	.283	.237	2.657	.224	1218.168
1641.500	62.270	16.792	8.217	2.432	.242	.404	2.665	.107	**********

1642.000	101.276	16.744	9.575	2.442	.251	.399	2.660	.100 *********
1642.500	120.855	17.367	6.754	2.430	.286	.550	2.655	.094 *********
1643.000	108.013	15.953	7.306	2.430	.300	.590	2.656	.092 *********
1643.500	90.971	15.253	6.892	2.267	.313	.345	2.657	.209 *********
1644.000	75.692	14.013	7.035	2.241	.313	.306	2.654	.227 *********
1644.500	59.607	13.847	6.091	2.235	.339	.360	2.660	.228 *********
1645.000	60.163	13.852	5.981	2.154	.289	.234	2.651	.235 1463.987
1645.500	55.122	14.149	6.352	2.247	.268	.179	2.655	.233 1735.377
1646.000	55.683	14.542	6.156	2.233	.257	.126	2.654	.245 1778.668
1646.500	60.383	15.308	6.251	2.226	.281	.190	2.653	.244 1371.827
1647.000	49.450	15.546	7.167	2.277	.337	.148	2.653	.216 1835.729
1647.500	50.780	17.202	9.412	2.261	.232	.140	2.652	.215 1815.651
1648.000	45.813	16.157	8.953	2.250	.246	.135	2.650	.233 1456.612
1648.500	43.070	16.706	7.836	2.236	.218	.030	2.651	.249 1905.335
1649.000	58.755	16.674	8.830	2.292	.193	.052	2.651	.214 2484.100
1649.500	71.262	16.335	7.833	2.239	.232	.066	2.654	.246 1825.428
1650.000	66.150	18.581	6.000	2.339	.265	.160	2.655	.239 1242.104
1650.500	56.955	17.326	6.608	2.186	.273	.096	2.653	.275 1227.406
1651.000	57.551	16.318	5.283	2.189	.261	.061	2.655	.277 1438.802
1651.500	74.871	15.878	5.150	2.208	.264	.099	2.656	.263 1487.991
1652.000	116.516	16.276	5.903	2.393	.309	.550	2.658	.117 *********
1652.500	130.066	17.414	11.411	2.523	.333	.750 *********		.010 *********
1653.000	139.959	18.296	22.899	2.511	.334	.750 *********		.010 *********
1653.500	124.863	18.758	21.406	2.452	.346	.750 *********		.010 *********
1654.000	87.808	19.081	28.586	2.338	.293	.416	2.652	.160 *********
1654.500	65.561	19.756	10.061	2.283	.318	.383	2.658	.197 *********
1655.000	59.934	18.147	9.453	2.255	.300	.283	2.657	.221 899.834
1655.500	62.398	19.337	7.301	2.208	.296	.205	2.652	.254 855.504
1656.000	47.072	19.907	6.757	2.260	.291	.246	2.665	.223 891.387
1656.500	53.447	18.938	9.610	2.232	.307	.264	2.658	.237 792.999
1657.000	82.934	19.601	6.214	2.373	.263	.392	2.651	.139 *********
1657.500	91.667	20.345	6.638	2.399	.268	.452	2.651	.120 *********
1658.000	95.108	23.122	11.380	2.313	.303	.403	2.653	.176 *********
1658.500	102.131	20.854	14.974	2.376	.329	.587	2.652	.124 *********

1 PALMER #1

DEPTH	G.R.	R.T.	R.X.O.	FM.DENS.	PHI.N	VCL	RHO.G	POROSITY	SALINITY
1659.000	57.309	18.584	9.539	2.329	.273	.339	2.654	.171	*********
1659.500	42.708	16.579	6.219	2.215	.291	.186	2.657	.253	1148.999
1660.000	44.438	15.237	7.266	2.216	.277	.162	2.653	.252	1403.909
1660.500	45.842	15.026	5.941	2.225	.263	.135	2.653	.249	1599.075
1661.000	40.838	15.404	5.755	2.205	.275	.129	2.655	.262	1412.455
1661.500	55.822	15.242	6.468	2.238	.259	.146	2.653	.240	1641.239
1662.000	66.194	16.312	6.273	2.355	.253	.329	2.653	.156	*********
1662.500	61.403	15.599	17.546	2.273	.251	.185	2.651	.216	1695.771
1663.000	55.782	16.356	6.842	2.248	.247	.125	2.654	.236	1601.292
1663.500	54.538	15.755	7.594	2.248	.234	.087	2.654	.239	1895.260
1664.000	53.628	15.416	6.881	2.275	.250	.186	2.651	.214	1794.042
1664.500	52.578	15.043	7.271	2.231	.255	.116	2.655	.247	1708.290
1665.000	54.872	14.082	6.654	2.252	.222	.057	2.654	.239	2327.027
1665.500	55.098	13.867	6.240	2.271	.251	.168	2.656	.220	2070.397
1666.000	50.855	15.186	7.145	2.239	.233	.060	2.656	.247	2312.833
1666.500	48.502	12.877	7.101	2.240	.245	.100	2.655	.243	2224.334
1667.000	45.124	12.820	6.780	2.394	.229	.323	2.654	.133	*********
1667.500	132.527	13.414	4.997	2.467	.301	.650	2.662	.066	*********
1668.000	143.025	14.579	20.427	2.525	.345	.750 *********		.010	*********
1668.500	136.573	15.434	25.330	2.473	.324	.730	2.660	.056	*********
1669.000	105.445	14.525	26.536	2.352	.276	.410	2.652	.145	*********
1669.500	88.358	13.842	11.596	2.297	.303	.365	2.658	.189	*********
1670.000	77.648	11.383	8.001	2.246	.271	.199	2.651	.231	2209.801
1670.500	65.378	10.922	5.609	2.248	.274	.199	2.656	.231	2320.488
1671.000	69.227	10.573	6.761	2.233	.238	.086	2.650	.246	2816.837
1671.500	47.539	11.497	6.317	2.242	.239	.091	2.654	.242	2619.420
1672.000	47.632	11.258	6.472	2.204	.259	.092	2.652	.264	2224.239
						.208	2.657	.200	2618.894

[redacted]

[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1673.000	73.555	12.712	7.520	2.329	.232	.227	2.651	.178	3003.626								
1673.500	61.525	14.338	8.686	2.369	.244	.317	2.657	.149	*********								
1674.000	54.270	13.691	11.090	2.326	.238	.232	2.655	.181	2578.011								
1674.500	49.942	11.620	9.298	2.277	.232	.124	2.656	.219	2873.812								
1675.000	53.521	10.959	6.266	2.276	.260	.219	2.651	.211	2641.831								
1675.500	53.127	10.087	7.821	2.229	.275	.172	2.654	.244	2457.203								
1676.000	52.719	9.910	5.708	2.264	.256	.188	2.650	.221	2989.487								
1676.500	52.347	9.895	6.863	2.250	.253	.149	2.653	.233	2989.846								
1677.000	55.029	10.205	5.904	2.272	.291	.298	2.652	.208	2371.797								
1677.500	56.319	10.329	7.489	2.257	.231	.097	2.652	.232	3187.543								
1678.000	43.573	10.391	6.956	2.243	.261	.154	2.655	.237	2631.468								
1678.500	70.965	10.075	6.494	2.196	.268	.103	2.652	.268	2386.311								
1679.000	81.180	10.331	5.563	2.264	.227	.096	2.653	.228	3312.928								
1679.500	66.605	11.733	5.793	2.355	.253	.322	2.655	.157	*********								
1680.000	50.706	14.278	14.289	2.313	.182	.050	2.652	.202	3309.889								
1680.500	58.322	13.467	7.306	2.261	.238	.128	2.651	.227	2246.098								
1681.000	52.867	11.936	7.950	2.269	.235	.119	2.656	.225	2726.410								
1681.500	55.819	10.876	6.953	2.277	.231	.137	2.651	.217	3153.224								
1682.000	55.016	10.220	7.304	2.275	.242	.151	2.656	.218	3221.352								
1682.500	57.074	11.951	7.801	2.444	.259	.490	2.658	.091	*********								
1683.000	63.869	12.808	22.016	2.345	.234	.259	2.651	.166	3079.814								
1683.500	57.257	13.708	13.532	2.292	.244	.199	2.652	.203	2243.369								
1684.000	55.351	11.630	9.623	2.292	.230	.152	2.654	.207	3047.724								
1684.500	93.265	13.277	8.425	2.535	.283	.726	2.653	.017	*********								
1685.000	71.858	14.281	13.328	2.453	.275	.552	2.659	.081	*********								
1685.500	55.538	17.557	21.892	2.472	.214	.414	2.653	.078	*********								
1686.000	78.230	17.205	19.765	2.445	.276	.529	2.666	.089	*********								
1686.500	52.204	17.061	20.481	2.448	.317	.673	2.655	.074	*********								

1 PALMER #1

DEPTH	G.R.	R.T.	R.X.O.	FM.DENS.	PHI.N	VCL	RHO.G	POROSITY	SALINITY
1687.000	38.520	14.843	12.860	2.310	.315	.408	2.665	.180	*********
1687.500	33.569	14.079	10.640	2.243	.270	.143	2.668	.243	1757.674
1688.000	44.032	14.506	5.596	2.271	.210	.059	2.653	.227	2458.109
1688.500	63.928	17.627	8.374	2.386	.293	.492	2.657	.126	*********
1689.000	103.829	17.079	36.131	2.287	.290	.310	2.658	.200	*********
1689.500	128.604	18.638	6.483	2.378	.276	.430	2.655	.135	*********
1690.000	127.907	16.196	21.108	2.456	.348	.750	*********	.010	*********
1690.500	125.535	20.442	12.418	1.000	.474	*********	*********	.000	*********
1691.000	142.049	22.104	42.188	2.486	.356	.750	*********	.010	*********
1691.500	109.670	20.713	33.127	2.676	.341	.750	*********	.010	*********
1692.000	113.143	21.788	13.325	2.357	.346	.590	2.663	.137	*********
1692.500	58.655	21.535	7.880	2.255	.312	.331	2.653	.216	*********
1693.000	60.677	31.704	5.825	2.198	.289	.170	2.651	.262	450.018
1693.500	62.111	53.662	5.773	2.204	.267	.103	2.655	.265	565.530
1694.000	60.352	32.723	8.084	2.203	.288	.167	2.654	.260	442.435
1694.500	57.153	32.654	6.004	2.220	.272	.158	2.651	.250	508.209
1695.000	53.375	28.477	6.978	2.201	.299	.203	2.652	.258	457.996
1695.500	47.559	31.316	6.128	2.204	.233	.013	2.652	.270	835.225
1696.000	53.172	31.655	8.584	2.261	.209	.042	2.652	.233	1017.979
1696.500	52.572	33.750	10.149	2.322	.206	.136	2.653	.190	964.099
1697.000	54.893	32.458	14.055	2.316	.183	.048	2.655	.201	1319.094
1697.500	57.815	32.822	15.272	2.373	.242	.335	2.650	.143	*********
1698.000	60.705	35.208	18.104	2.252	.275	.210	2.656	.228	653.633
1698.500	61.550	20.666	7.286	2.270	.236	.139	2.652	.221	1059.247
1699.000	59.372	26.599	6.727	2.374	.229	.282	2.656	.149	1031.843
1699.500	67.845	34.914	11.751	2.349	.224	.235	2.653	.166	548.567
1700.000	67.239	40.505	10.359	2.378	.272	.409	2.660	.138	*********

APPENDIX 6

APPENDIX - 6

GEOCHEMICAL REPORT

PALMER - 1

GIPPSLAND BASIN

GEOCHEMICAL REPORT

PALMER-1, GIPPSLAND BASIN VICTORIA

by

J.K. Emmett & B.J. Burns

Esso Australia Ltd

Geochemical Report

June 1982

0133L

C O N T E N T S

INTRODUCTION:

Samples of canned cuttings and sidewall cores from Palmer-1, Gippsland Basin were collected and submitted for various geochemical analyses. Light hydrocarbon (C_{1-4}) gases were determined, by Esso Australia, on alternate canned cuttings (composited over 15 metre intervals) from 200 metres down to 1723 metres (T.D). Between 830 metres and 1715 metres, canned cuttings from succeeding alternate 15 metre intervals were analysed for both Total C_{1-4} and gasoline range (C_{4-7}) hydrocarbons by Exxon's Research Laboratory (EPRCO), Houston. Selected sidewall cores samples were analysed for Total Organic Carbon (TOC) and by Rock-Eval Pyrolysis. Selected cuttings samples were hand-picked for C_{15+} liquid and gas chromatography. Vitrinite Reflectance ($\bar{R}_{o\ max}$) measurements on both cuttings and sidewall core samples were performed by Professor A.C. Cook of Wollongong.

DISCUSSION OF RESULTS:

The detailed C_{1-4} and C_{4-7} analysis data are listed in Appendices 1, 2 and 3 but are more conveniently displayed in Figures, 1, 2 and 3. As can be seen by referring to Figures 1 and 2, similar data covering the same depth range have been obtained by both Esso Australia and Exxon's laboratory. The results are in fairly good agreement and the same trends are obvious from both plots.

The C_{1-4} gas content is uniformly quite low down to approximately 1220 metres, generally ranging from a few ppm up to a few hundred ppm. At 1220 metres there is a considerable increase, usually in the range 1000 to 20,000 ppm (maximum reading 26,439 ppm at 1595 metres), and this type of total C_{1-4} gas value remains fairly

uniform down to T.D. The marked increase in C_{1-4} gas content coincides with penetration of the Latrobe Group sediments, the upper boundary of which occurs at 1190 metres, with the top of coarse clastics being at 1219 metres.

The % wet gas (C_{2+}) shows some variation down the hole. Down to about 750 metres the C_{2+} fraction is usually less than 10%; between 750 metres and 1150 metres it varies between 10 and 50%, climbing above 50% between about 950 metres and 1020 metres. From 1150 metres down to about 1310 metres the "wet gas" fraction is consistently above 50% (maximum value 75.86% at 1220-1235 metres). From 1310 metres down to 1723 metres (T.D) it is uniformly in the range 30-45%. The substantial amount of wet gas components concentrated in the Latrobe Group sediments in the 100 metre section below the top of coarse clastics may be due to either the substantial amount of coal and coaly sediments in the section, or to migration and concentration of these hydrocarbons in this zone, or a combination of both. At this point it is noteworthy that the Latrobe Group sediments penetrated in Palmer-1 consist predominantly of either quartz-rich sands, or coals, with few interbedded shales. Percolation and migration of sourced hydrocarbons throughout this type of sequence could proceed without difficulty, explaining the relatively uniform total C_{1-4} and C_{2+} hydrocarbon distributions observed below about 1300 metres.

The C_{4-7} gasoline range hydrocarbon log (Figure 3) shows a similar trend to the C_{1-4} gas log. There is a significant increase beneath the top of reservoir-grade coarse clastics occurring at 1219 metres in the Latrobe Group sediments. Values below the top of the coarse clastics generally range between 38,000 PPB and 181,000 PPB, compared with up to only 520 PPB in the overlying Lakes Entrance Formation and Gippsland Limestone.

The C_{1-4} cuttings gas and C_{4-7} gasoline range hydrocarbon logs indicate that the Latrobe Group sediments have the best potential to source both oil and gas. However, as noted above the relative lack of source rock-grade shales and siltstones seen in the cuttings from the Latrobe Group sediments, means that the C_{1-4} and C_{4-7} hydrocarbons detected were probably sourced predominantly from coals. As the source rock potential of coals still requires some clarification, care should be taken not to misconstrue the naturally high cuttings gas and gasoline range hydrocarbon analyses expected to be associated with coaly sequences, to necessarily mean significant source rock potential.

Fourteen selected sidewall core samples were analysed for Total Organic Carbon (TOC) and the results are presented in Table 1 and shown on Figure 3. The Lakes Entrance Formation sediments have low TOC values (average TOC = 0.29%) and a poor source rock potential. A very good source potential is again indicated for the Latrobe Group sediments, which generally have high TOC values, with the average TOC ranging from 2.36% (if coaly samples are omitted) up to 5.72% (including coals).

Vitrinite Reflectance ($\bar{R}_{o\ max}$) measurements performed on a number of sidewall core and cuttings samples are listed in Table 2 and plotted against depth in Figure 4. Exinite macerals are common to abundant in most of the Latrobe Group samples confirming a very good oil and gas potential. Some bituminite maceral and/or bitumen-like material is also present in a few samples. However, according to Professor Cook the bituminite is not the type that is associated with residual or biodegraded oils. The abundant presence of the micrinite maceral in some samples is evidence to suggest that some low molecular weight hydrocarbon generation has occurred. Figure 4 shows that most of the data points form a straight line gradient,

indicating that there are no major maturation breaks occurring in Palmer-1. Taking $\bar{R}_{o\ max}$ = 0.65 as the top of the maturity window for significant oil and gas generation, then $\bar{R}_{o\ max}$ measurements in the vicinity of 0.5% at TD indicates present day immaturity.

The same samples which were prepared and analysed for TOC were also analysed using Rock-Eval pyrolysis. The results are presented in Table 3. S_1 is a measure of the hydrocarbons freely present in the rock and represents present oil potential. S_2 represents the hydrocarbons released mainly by the cracking of kerogens, and indicates the quantity of hydrocarbons which could be obtained after further maturation. The S_2 value together with the TOC value is used for calculating the Hydrogen Index (HI), (which has a close correlation to the H/C atomic ratio given by elemental analysis of the kerogen). S_3 is a measure of the CO_2 released by kerogen pyrolysis. S_3, again with the TOC value, is used for calculating the Oxygen Index (OI) which can be related to the O/C atomic ratio given by kerogen elemental analysis. T_{max} is the temperature corresponding to the maximum rate of kerogen cracking, and gives information about the degree of maturation of organic matter.

Figure 5 is a plot of HI versus OI for Palmer-1 Rock-Eval data. The kerogen type I, II and III fields delineated on this plot are equivalent to those using elemental atomic ratios of kerogen i.e. Type I is relatively hydrogen-rich algal and amorphous kerogen, and is a good oil source; Type II is less hydrogen rich amorphous and herbaceous kerogen, and may source both oil and/or gas; Type III is hydrogen-poor woody and inertinite (coaly) organic matter which is usually regarded as being gas prone. As can be seen in Figure 5 the majority of the Latrobe Group data points are spread over Type III with 3 or 4 points in Type II and one value (from 1342.5 metres) in

Type I. This again confirms that the latrobe Group sediments have good potential to source both oil and gas. The three samples from the Lakes Entrance Formation have low TOC values and plot in Type III indicating a poor potential to source gas.

Figure 6 (Estimated Thermal Maturation Plot) and Figure 7 (Rock-Eval Pyrolysis Geochemical Combination Log) illustrate clearly that the Latrobe Group sediments have very good hydrocarbon source potential but are presently immature.

The C_{15+} Liquid Chromatography results from selected canned cuttings are listed in Table 4. All five samples are from the Tertiary Latrobe Group sediments, and are very rich in total extract. Table 4 shows that each sample contains large quantities of asphaltenes and non hydrocarbon material, typical of extracts from immature coaly sediments. The hydrocarbon contents are however, significant enough to indicate a very good source rock potential. The corresponding C_{15+} saturate chromatograms are presented in Figures 8, 9, 10, 11 and 12. On the whole the chromatograms exhibit typical features of immature, dominantly terrestrial organic matter gradually becoming more mature with increasing depth. This is indicated by the odd-over-even predominance of high molecular weight waxy n-alkanes, significant pristane (a)/phytane (b) ratios, and the presence of an unresolved hump of sterane/triterpane compounds, also in the high molecular weight region.

It was initially thought that the concentration of high rating parameters (i.e. high TOC; very good hydrocarbon source potential (S_2); "oil type" hydrocarbon expected to be generated (S_2/S_3), and high values for the "Approximate Extractable Hydrocarbons" (S_1)), particularly in the zone below the top of coarse reservoir

grade clastics, may be cause for speculation for the existence of residual oil, but this trend may also be attributed to the presence of oil-prone material in the coal-rich sequence. The combined geochemical evidence favours this latter interpretation.

CONCLUSIONS:

1) The entire section penetrated is immature.

2) The Tertiary Latrobe Group sediments have a very good potential to be a source for both oil and gas.

3) Interpretation of some of the source rock analyses in Palmer-1 must take into consideration the effects of the coal-rich nature of the Latrobe Group sequence.

4) The anomalously rich Rock-Eval data in the top part of the Latrobe coarse clastics are believed to be due to the unusual richness of the interbedded coals rather than to any residual oil in the sands.

TABLE-1:

TOTAL ORGANIC CARBON REPORT

BASIN - GIPPSLAND
WELL - PALMER 1

SAMPLE NO.	DEPTH	AGE	FORMATION	AN	TOC%	AN	TOC%	AN	TOC%	DESCRIPTION
72282 P	1034.00	OLIGOCENE	LAKES ENTRANCE	1	.36					LT GY SILT 32% CO3
72282 K	1106.00	OLIGOCENE	LAKES ENTRANCE	1	.31					LT GY CLAY 26% CO3
72282 O	1136.00	OLIGOCENE	LAKES ENTRANCE	1	.19					LT GY CLAY 55% CO3
*** DEPTH :	.00 TO 1136.00	***	AVERAGE TOC % = .29 ***							
72282 Q	1190.00	EOCENE	LATROBE GROUP	1	.48					LT GY CLAY GLAUC 40% CO3
72282 L	1233.00	EOCENE	LATROBE GROUP	1	9.00					MED BR CLAY MICA
72282 M	1257.00	EOCENE	LATROBE GROUP	1	13.23					MED BR CLAY MICA
72282 N	1292.00	EOCENE	LATROBE GROUP	1	12.69					DK BR CLAY COALY
72282 T	1300.00	EOCENE	LATROBE GROUP	1	6.92					MED BR SILT MICA
72282 S	1342.50	EOCENE	LATROBE GROUP	1	11.45					DK BR SILT COALY
72283 D	1369.00	EOCENE	LATROBE GROUP	1	.25					LT GY CHERT
72282 R	1376.00	EOCENE	LATROBE GROUP	1	4.83					MED BR SILT MICA COALY
72283 A	1545.00	PALEOCENE	LATROBE GROUP	1	1.54					LT BR GY SHALE
72283 B	1551.00	PALEOCENE	LATROBE GROUP	1	1.21					WHITE SAND+ BR CLAY MICA
72283 C	1668.50	PALEOCENE	LATROBE GROUP	1	1.32					LT BR SLTST+ CLAY MIC PY
*** DEPTH :	1190.00 TO 1668.50	***	AVERAGE TOC % = 5.72 ***							

TABLE-2:

VITRINITE REFLECTANCE REPORT

BASIN - GIPPSLAND
WELL - PALMER 1

SAMPLE NO.	DEPTH	AGE	FORMATION	AN	MAX. RO	FLUOR. COLOUR	NO.CNTS.	MACERAL TYPE
72381 A	1082.00	OLIGOCENE	LAKES ENTRANCE	5	.41	GRN-YELL\BRN	20	EXINITE ABUNDANT(SPOR)
72381 B	1217.00	EOCENE	LATROBE GROUP	5	.40	GRN-YELL	7	SPARSE V,V>E=I RARE SPOR
72381 C	1220.00	EOCENE	LATROBE GROUP	5	.33	OR (RARE)	3	RARE E,V.RARE V
72381 D	1225.00	EOCENE	LATROBE GROUP	5	.00	YELL	0	V.RARE ?DINO,?BITUMEN,?T
72283 I	1243.00	EOCENE	LATROBE GROUP	5	.42	GR YELL OR	23	79%V,20%,1%
72381 F	1255.00	EOCENE	LATROBE GROUP	5	.41	YELL-OR	20	V>E>>T,EXINITE ABUNDANT
72381 E	1260.00	EOCENE	LATROBE GROUP	5	.43		20	AS ABOVE,RESINITE/BITUME
72281 P	1310.00	EOCENE	LATROBE GROUP	5	.48	GRN-YELL-OR	14	E ABUNDANT
72283 G	1365.00	EOCENE	LATROBE GROUP	5	.45	GR YELL OR	25	70% COAL(10-15% E) 30%SS
72381 R	1370.00	EOCENE	LATROBE GROUP	5	.46	GRN-DULL OR	14	E ABUNDANT,
72281 S	1400.00	EOCENE	LATROBE GROUP	5	.47	GRN-DULL OR	10	E ABUNDANT
72283 H	1413.00	EOCENE	LATROBE GROUP	5	.46		25	10-15%E 1%I 80%V
72381 F	1470.00	EOCENE	LATROBE GROUP	5	.49	YELL-OR	20	I>E=V
72283 I	1473.00	PALEOCENE	LATROBE GROUP	5	.48	GR-YELL OR	27	7%E 2%I 90%V
72381 G	1475.00	PALEOCENE	LATROBE GROUP	5	.49	GRN-YELL-OR	21	90%V,2%I,7%E;BITUMINITE-
72283 J	1528.00	PALEOCENE	LATROBE GROUP	5	.50	YELL OR	26	10%E 3%I 87%V
72283 K	1573.00	PALEOCENE	LATROBE GROUP	5	.51	YELL OR	25	5-10%E 3-5%I 80-85%V
72283 L	1618.00	PALEOCENE	LATROBE GROUP	5	.47	YELL OR	33	5-8%E 2%I 90%V
72313 P	1690.00	PALEOCENE	LATROBE GROUP	5	.39		20	V COMMON,I+E ABSENT
72381 H	1709.00	PALEOCENE	LATROBE GROUP	5	.40	YELL	2	RARE V>I>E
72283 M	1718.00	PALEOCENE	LATROBE GROUP	5	.50	YELL OR	8	RARE 5%E 1%I 94%V

Table 3 - Rock-Eval Results, Palmer-1, Gippsland Basin

NO.	EPR NO.	DEPTH (M)	SAMPLE TYPE	TOC	S1 MG/GRM	S2 MG/GRM	S3 MG/GRM	HI	OI	TF RATIO S1/S1+S2	T-MAX DEG C	COMMENTS
1	75226A	1033.99	SIDEWALL CORE	0.40	0.05	0.54	0.46	135	115	0.09	0	
2	75226B	1106.01	SIDEWALL CORE	0.33	0.55	1.03	0.07	312	21	0.35	0	
3	75226C	1136.00	SIDEWALL CORE	0.27	0.19	0.97	0.36	360	133	0.16	0	
4	75226D	1190.01	SIDEWALL CORE	0.60	0.07	0.54	0.38	67	47	0.12	0	
5	~ 75226E	1232.99	SIDEWALL CORE	9.00	1.03	42.47	1.79	472	20	0.02	412	
6	~ 75226F	1257.01	SIDEWALL CORE	12.20	2.06	78.57	4.49	644	37	0.03	413	
7	~ 75226G	1292.00	SIDEWALL CORE	12.70	2.31	106.12	5.20	835	41	0.02	403	
8	~ 75226H	1299.99	SIDEWALL CORE	6.92	0.69	30.17	1.16	436	17	0.02	419	
9	~ 75226I	1342.51	SIDEWALL CORE	11.46	2.32	150.01	4.18	1309	36	0.02	407	
10	75226J	1368.99	SIDEWALL CORE	0.25	0.18	0.66	0.67	264	268	0.21	415	
11	75226K	1376.01	SIDEWALL CORE	4.83	0.58	18.68	0.96	387	20	0.03	429	
12	75226L	1544.99	SIDEWALL CORE	1.54	0.29	4.86	0.48	315	31	0.06	429	
13	75226M	1550.99	SIDEWALL CORE	1.21	0.31	2.47	0.59	204	49	0.11	429	
14	75226N	1668.50	SIDEWALL CORE	1.32	0.30	3.99	0.50	302	38	0.07	432	

TABLE-4

DEPTH IN METRES	TOTAL EXTRACT (ppm)	HC's (ppm)	NON HC's (ppm)	SULPHUR (ppm)	E X T R A C T %				
					SATS	AROM.	N.S.O	ASPH.	SULPHUR
1235-50	41,987	2,315	39,672	-	0.4	5.1	5.1	89.3	-
1360-85	94,336	13,572	80,764	-	1.3	13.1	11.4	74.3	-
1400-15	73,395	11,940	61,455	-	1.7	14.6	14.3	69.4	-
1550-65	30,726	4,885	25,842	-	1.5	14.4	15.4	68.7	-
1610-25	22,793	3,414	19,379	-	1.4	13.6	12.9	72.1	-

PE601382

This is an enclosure indicator page.
The enclosure PE601382 is enclosed within the container PE902696 at this location in this document.

The enclosure PE601382 has the following characteristics:

ITEM_BARCODE	= PE601382
CONTAINER_BARCODE	= PE902696
NAME	= C1-4 Cuttings Gas Log
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= WELL_LOG
DESCRIPTION	= C1-4 Cuttings Gas Log
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	=
W_NO	= W751
WELL_NAME	= Palmer-1
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE601383

This is an enclosure indicator page.
The enclosure PE601383 is enclosed within the container PE902696 at this location in this document.

The enclosure PE601383 has the following characteristics:

ITEM_BARCODE	= PE601383
CONTAINER_BARCODE	= PE902696
NAME	= C1-4 Cuttings Gas Log
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= WELL_LOG
DESCRIPTION	= C1-4 Cuttings Gas Log
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	=
W_NO	= W751
WELL_NAME	= Palmer-1
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE601384

This is an enclosure indicator page.
The enclosure PE601384 is enclosed within the container PE902696 at this location in this document.

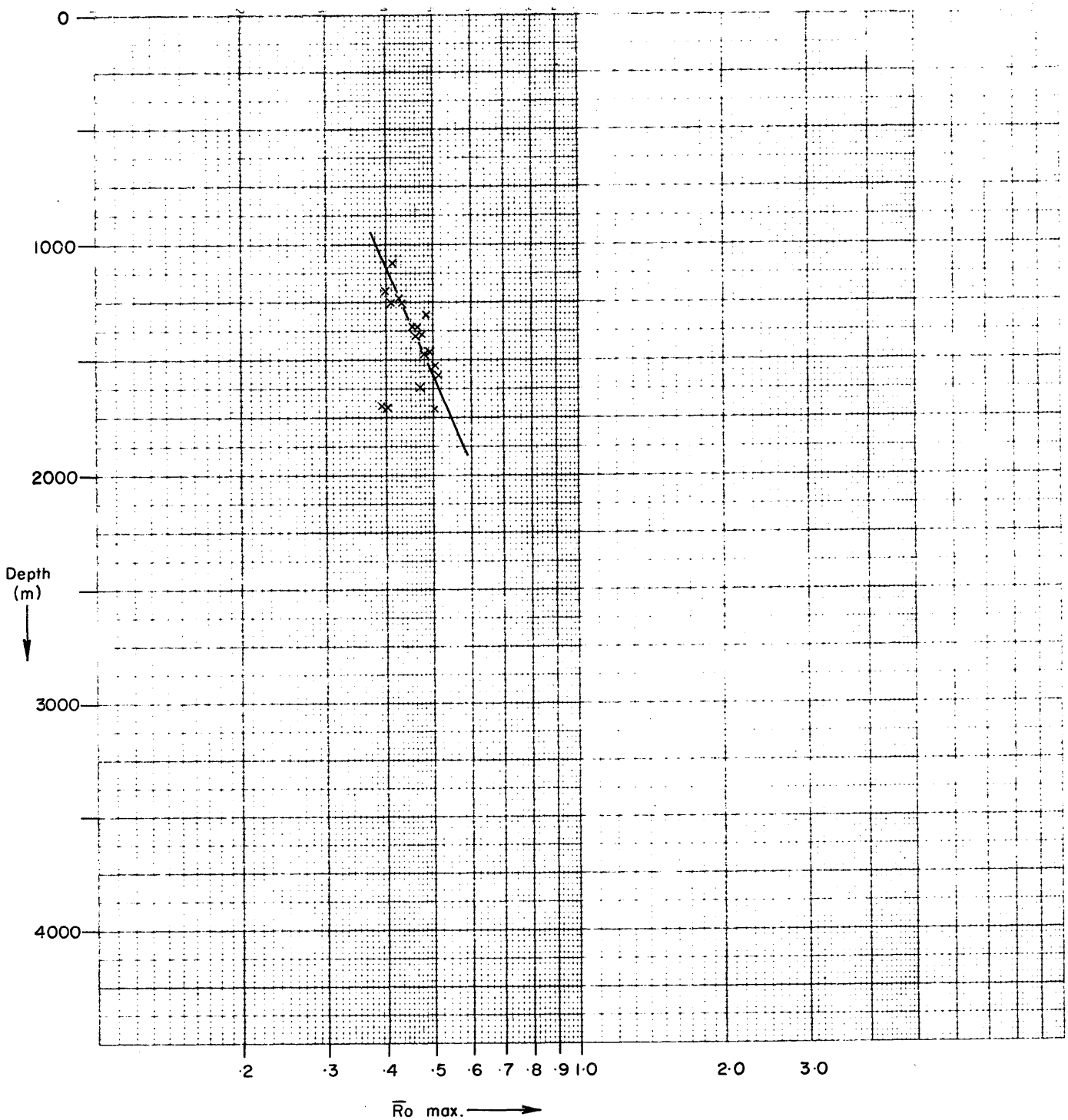
The enclosure PE601384 has the following characteristics:

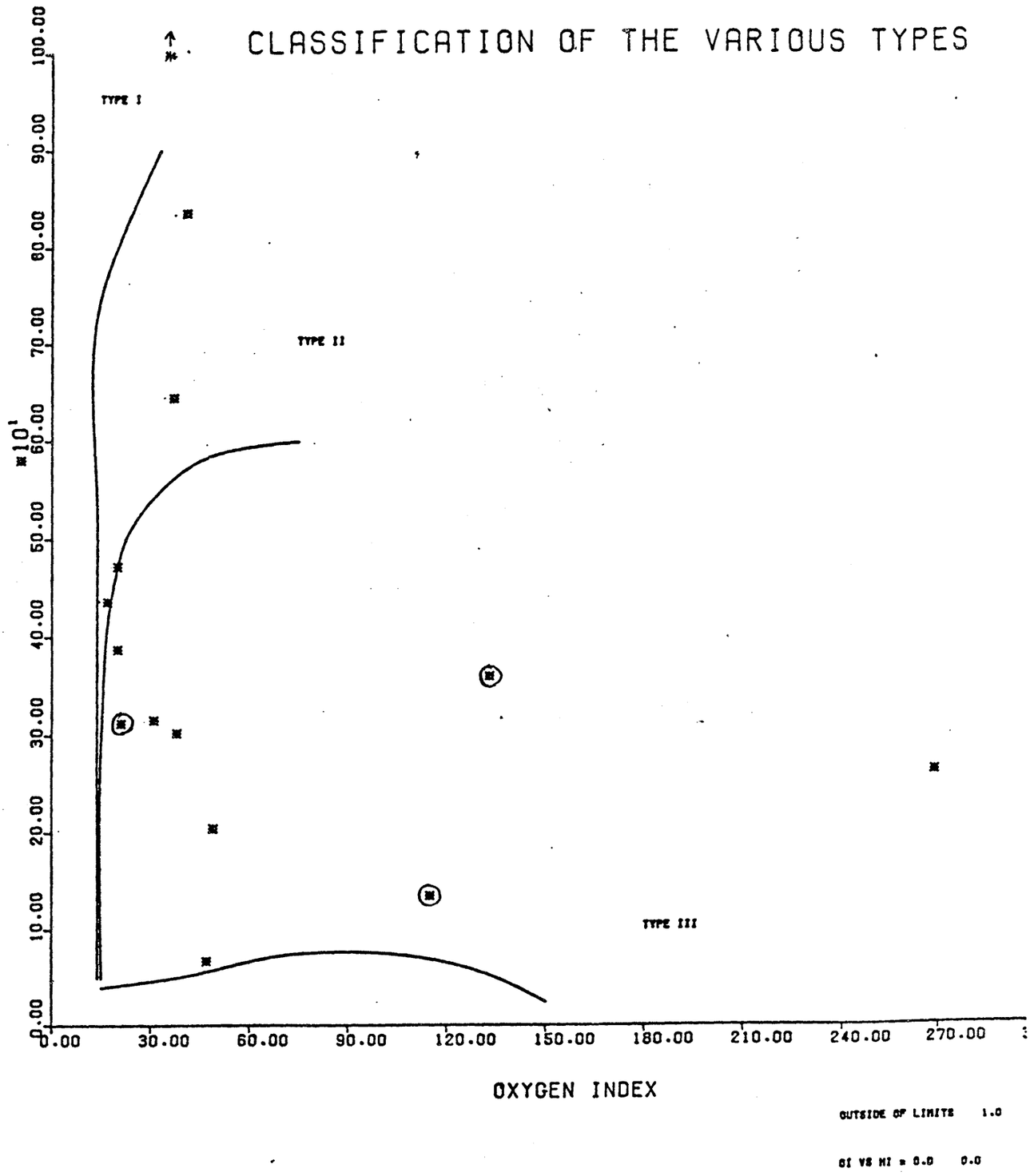
ITEM_BARCODE	= PE601384
CONTAINER_BARCODE	= PE902696
NAME	= Geochemical Log
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= WELL_LOG
DESCRIPTION	= Geochemical Log
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	=
W_NO	= W751
WELL_NAME	= Palmer-1
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PALMER-1

VITRINITE REFLECTANCE vs DEPTH





PALMER NO.1

Fig. 5

Lakes Entrance Formation
Latrobe Group

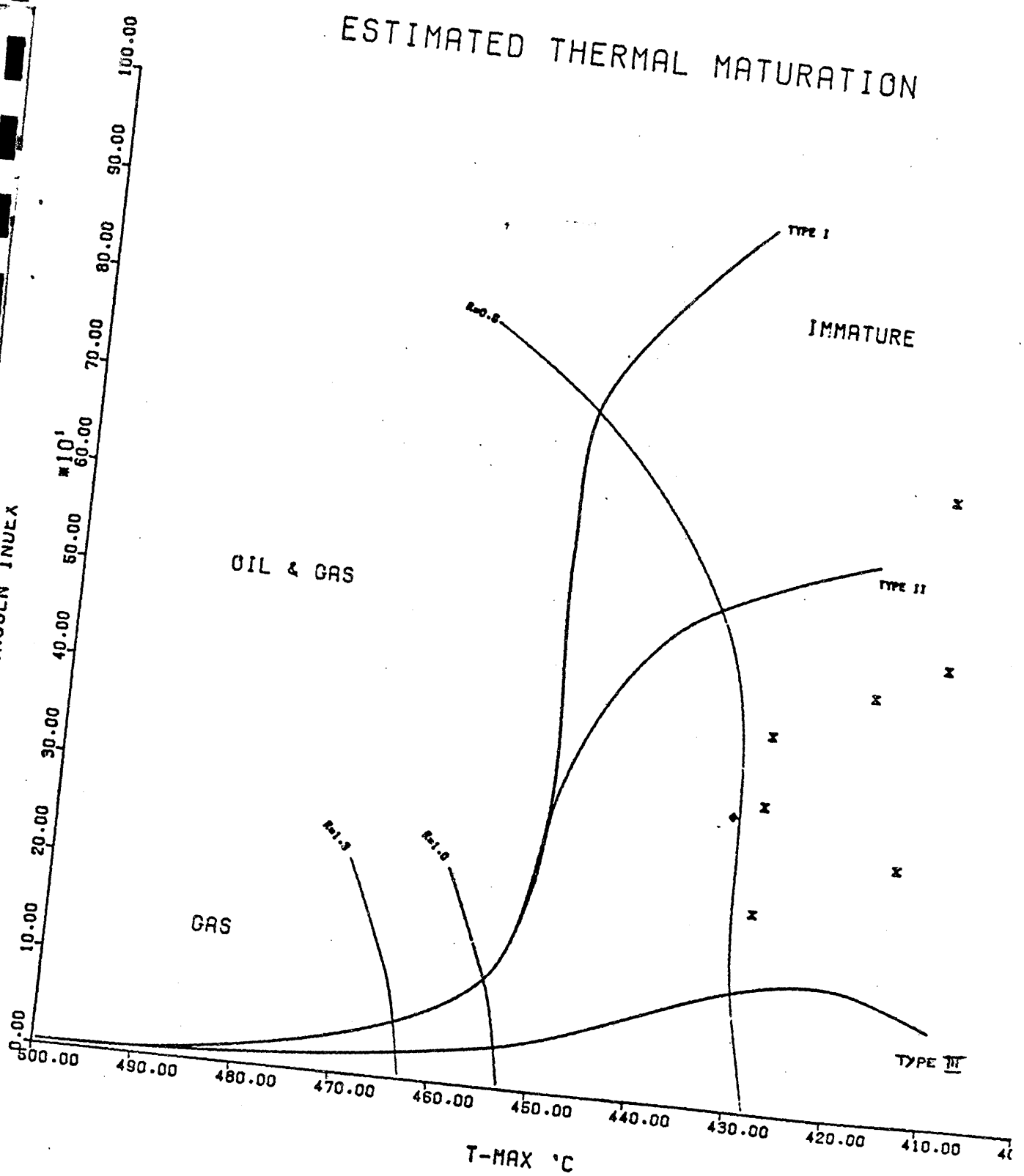
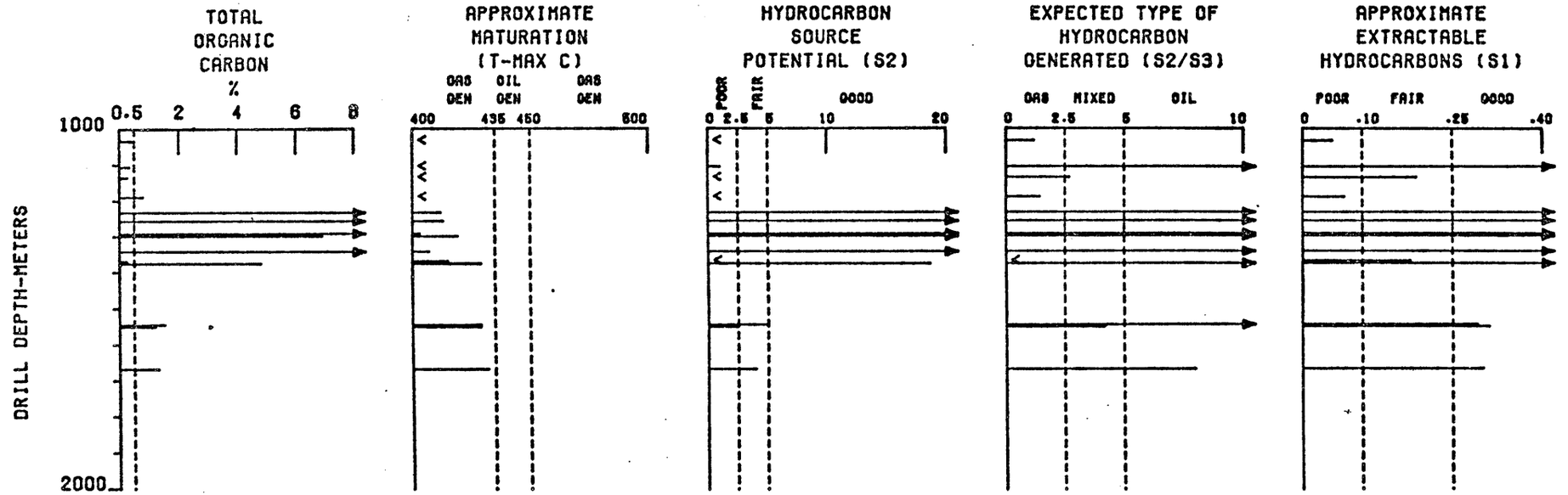

ESTIMATED THERMAL MATURATION
HYDROGEN INDEX
*10¹
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
OIL & GAS
GAS
IMMATURE
TYPE I
TYPE II
TYPE III
Ro=0.6
Ro=1.3
Ro=1.0
500.00
490.00
480.00
470.00
460.00
450.00
440.00
430.00
420.00
410.00
T-MAX °C
PALMER NO.1

Fig. 6



EPRCo. Rock-Eval Pyrolysis

Geochemical Log - PALMER NO.1

Fig. 7

C_{15+} Paraffin-Naphthene Hydrocarbon

GeoChem Sample No. E492-016

Exxon Identification No. 75207

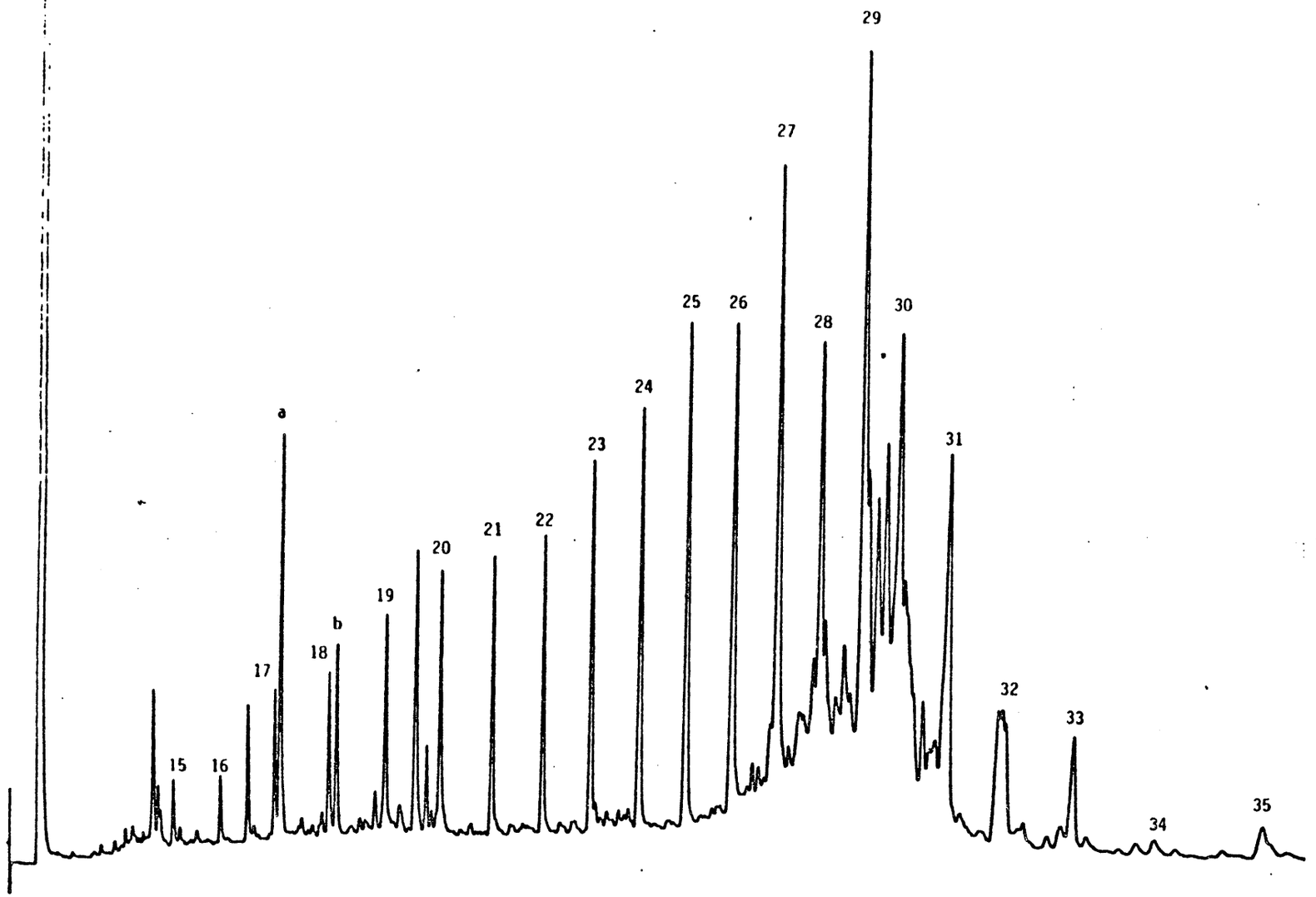


Fig. 8 Palmer-1 Cuttings, 1235-1250 meters

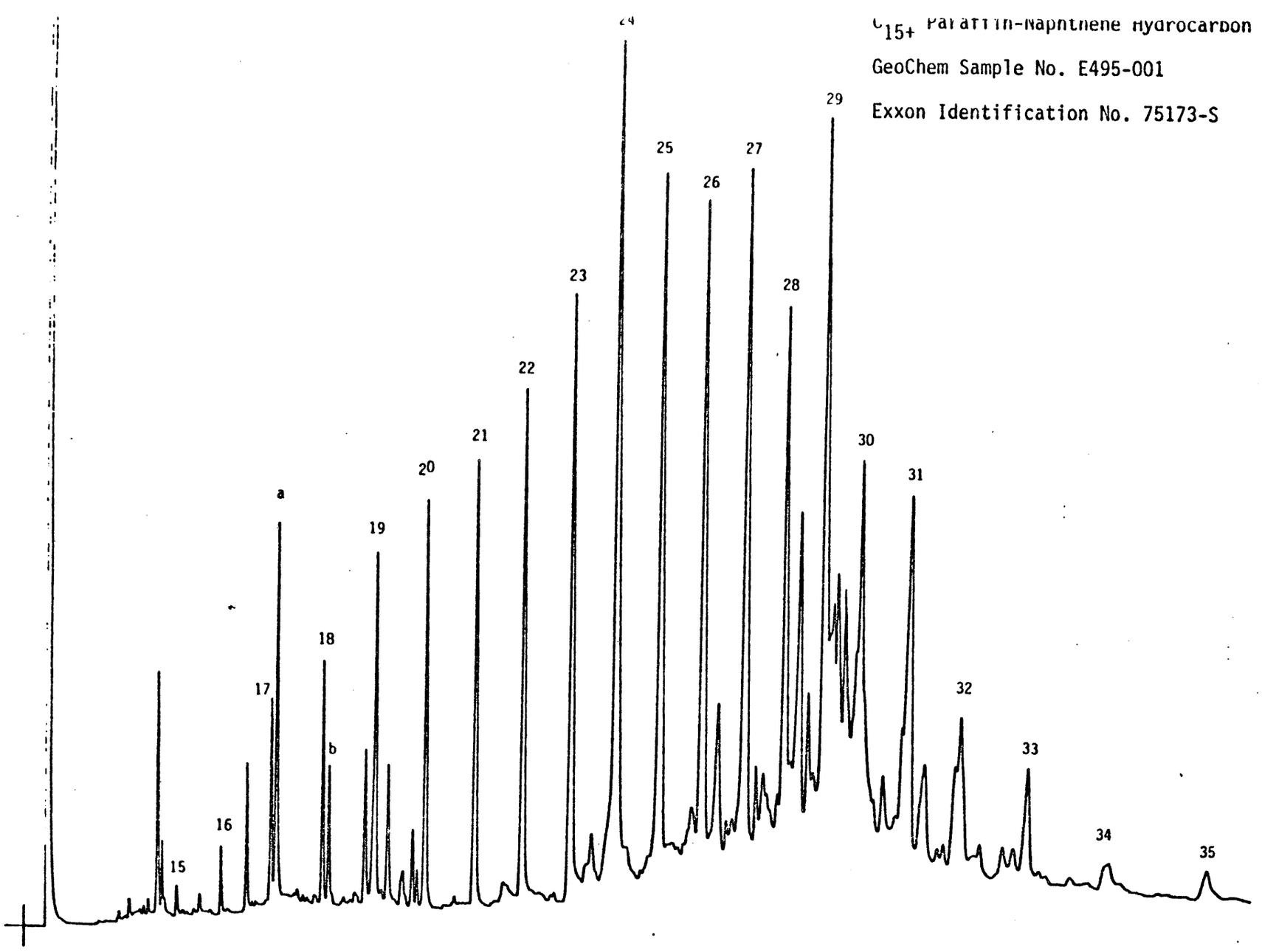


Fig. 9 Palmer-1 Cuttings, 1370-1385 meters

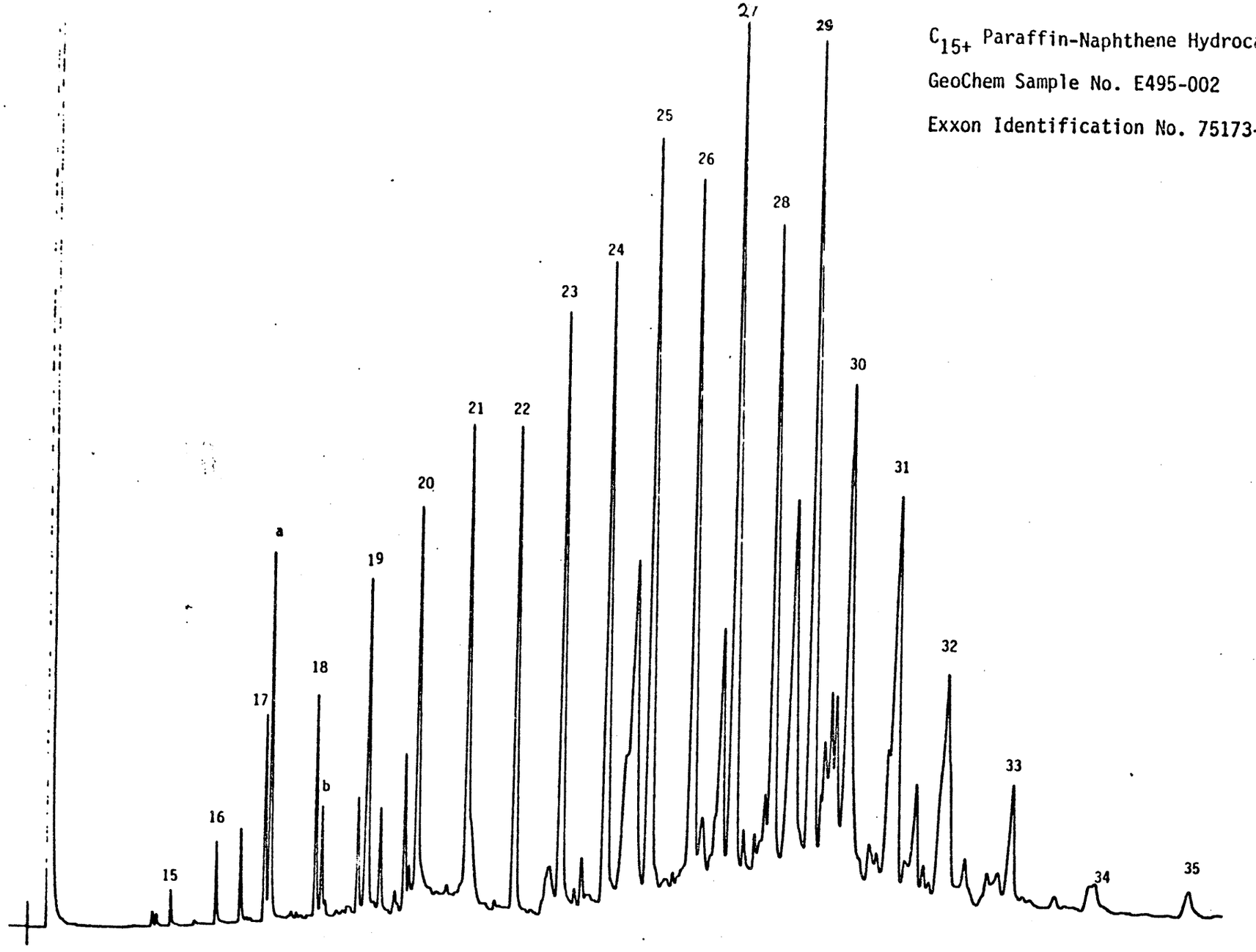


Fig. 10 Palmer-1 Cuttings, 1400-1415 meters

C_{15+} Paraffin-Naphthene Hydrocarbon

GeoChem Sample No. E495-003

Exxon Identification No. 75174-E

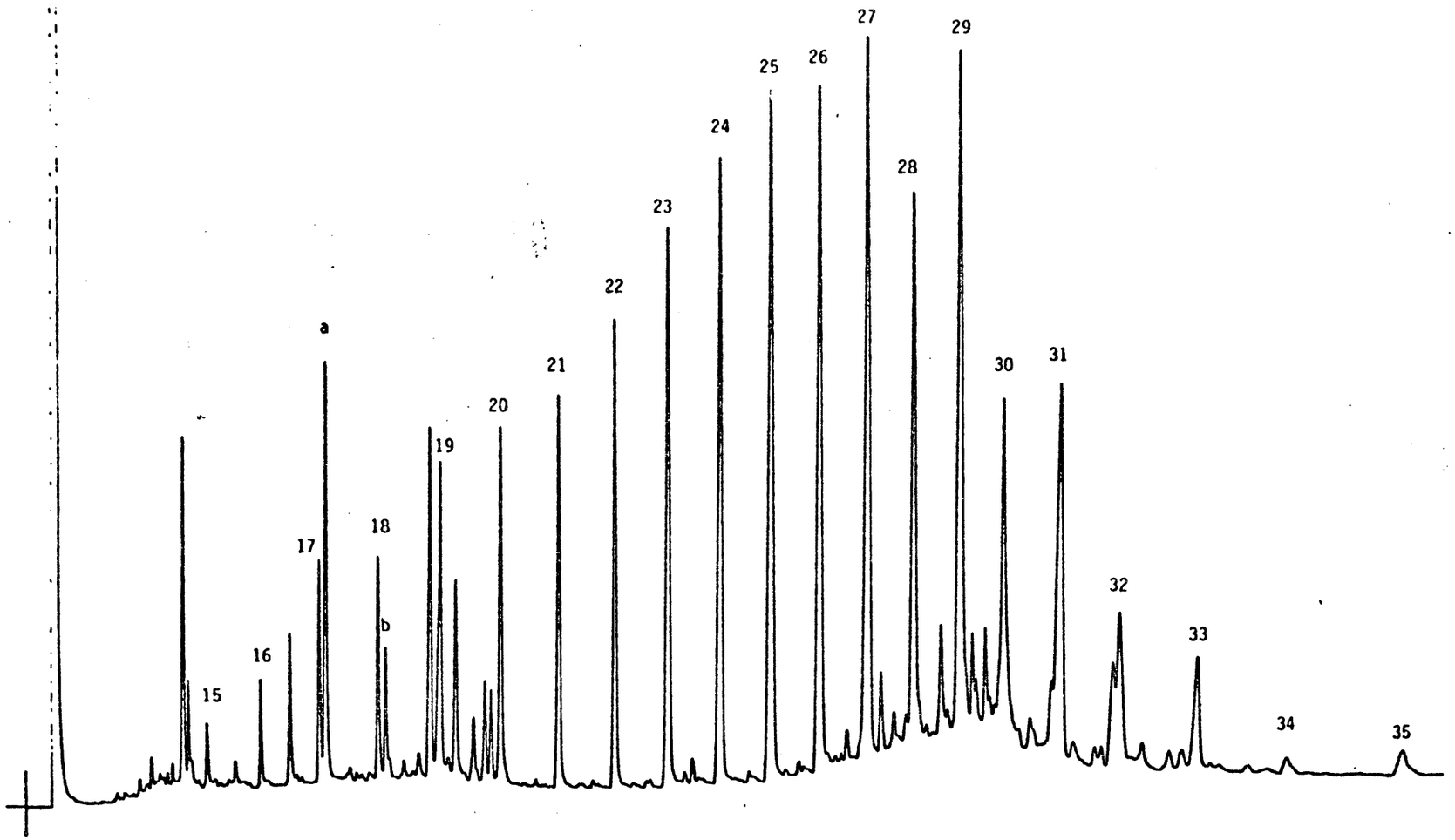


Fig. 11 Palmer-1 Cuttings, 1550-1565 meters

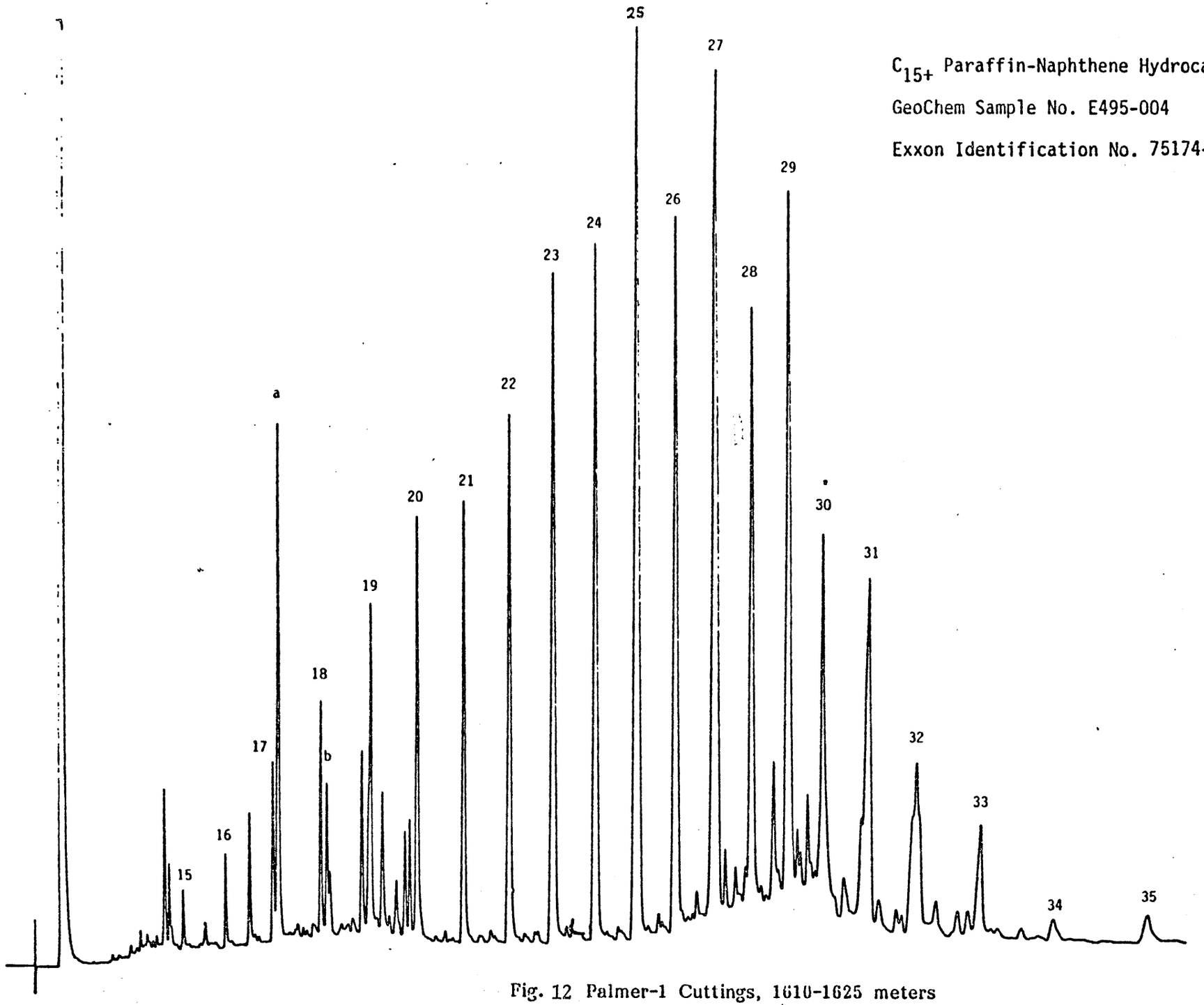


Fig. 12 Palmer-1 Cuttings, 1610-1625 meters

ESSO AUSTRALIA LTD.

APPENDIX-1:

C1-C4 HYDROCARBON ANALYSES

REPORT A - HEADSPACE GAS

BASIN - GIPPSLAND
WELL - PALMER 1

SAMPLE NO.	DEPTH	GAS CONCENTRATION (VOLUME GAS PER MILLION VOLUMES CUTTINGS)							GAS COMPOSITION (PERCENT)								
		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
72280 A	230.00	3	0	0	0	0	0	3	.00	100.	0.	0.	0.	0.	0.	0.	0.	0.
72280 B	280.00	2	0	0	0	0	0	2	.00	100.	0.	0.	0.	0.	0.	0.	0.	0.
72280 C	330.00	0	0	0	0	0	0	0	.00	0.	0.	0.	0.	0.	0.	0.	0.	0.
72280 D	380.00	0	0	0	0	0	0	0	.00	0.	0.	0.	0.	0.	0.	0.	0.	0.
72280 E	430.00	2	0	0	0	0	0	2	.00	100.	0.	0.	0.	0.	0.	0.	0.	0.
72280 F	480.00	1	0	0	0	0	0	1	.00	100.	0.	0.	0.	0.	0.	0.	0.	0.
72280 G	520.00	1	0	0	0	0	0	1	.00	100.	0.	0.	0.	0.	0.	0.	0.	0.
72280 H	550.00	3	0	0	0	0	0	3	.00	100.	0.	0.	0.	0.	0.	0.	0.	0.
72280 I	595.00	2	0	0	0	0	0	2	.00	100.	0.	0.	0.	0.	0.	0.	0.	0.
72280 J	625.00	1	0	0	0	0	0	1	.00	100.	0.	0.	0.	0.	0.	0.	0.	0.
72280 K	655.00	4	0	0	0	0	0	4	.00	100.	0.	0.	0.	0.	0.	0.	0.	0.
72280 L	685.00	2	0	0	0	0	0	2	.00	100.	0.	0.	0.	0.	0.	0.	0.	0.
72280 M	715.00	1	0	0	0	0	0	1	.00	100.	0.	0.	0.	0.	0.	0.	0.	0.
72280 N	745.00	1	0	0	0	0	0	1	.00	100.	0.	0.	0.	0.	0.	0.	0.	0.
72280 O	765.00	2	0	1	0	0	1	3	33.33	67.	0.	33.	0.	0.	0.	100.	0.	0.
72280 P	805.00	47	5	2	0	0	7	54	12.96	87.	9.	4.	0.	0.	71.	29.	0.	0.
72280 Q	815.00	2	0	0	0	0	0	2	.00	100.	0.	0.	0.	0.	0.	0.	0.	0.
72280 R	845.00	34	3	0	0	0	3	37	8.11	92.	8.	0.	0.	0.	100.	0.	0.	0.
72281 A	875.00	33	4	1	0	0	5	38	13.16	87.	11.	3.	0.	0.	80.	20.	0.	0.
72281 B	905.00	34	4	3	2	1	10	44	22.73	77.	9.	7.	5.	2.	40.	30.	20.	10.
72281 C	935.00	33	7	8	6	4	25	58	43.10	57.	12.	14.	10.	7.	28.	32.	24.	16.
72281 D	965.00	23	4	12	6	4	26	49	53.06	47.	8.	24.	12.	8.	15.	46.	23.	15.
72281 E	980.00	0	0	0	0	0	0	0	.00	0.	0.	0.	0.	0.	0.	0.	0.	0.
72281 F	995.00	49	14	9	8	6	37	86	43.02	57.	16.	10.	9.	7.	38.	24.	22.	16.
72281 G	1025.00	43	7	7	6	5	25	68	36.76	63.	10.	10.	9.	7.	28.	28.	24.	20.
72281 H	1055.00	200	36	20	11	8	75	275	27.27	73.	13.	7.	4.	3.	48.	27.	15.	11.
72281 I	1100.00	229	29	14	7	5	55	284	19.37	81.	10.	5.	2.	2.	53.	25.	13.	9.
72281 J	1130.00	51	10	24	8	5	47	98	47.96	52.	10.	24.	8.	5.	21.	51.	17.	11.
72281 K	1160.00	45	7	19	5	4	35	80	43.75	56.	9.	24.	6.	5.	20.	54.	14.	11.
72281 L	1190.00	38	8	12	7	5	32	70	45.71	54.	11.	17.	10.	7.	25.	38.	22.	16.
72281 M	1220.00	46	16	24	7	6	53	99	53.54	46.	16.	24.	7.	6.	30.	45.	13.	11.
72281 N	1250.00	1171	157	94	19	16	286	1457	19.63	80.	11.	6.	1.	1.	55.	33.	7.	6.
72281 O	1280.00	691	94	54	10	10	168	859	19.56	80.	11.	6.	1.	1.	56.	32.	6.	6.
72281 P	1310.00	9502	886	342	43	30	1301	10803	12.04	88.	8.	3.	0.	0.	68.	26.	3.	2.
72281 Q	1340.00	3399	411	175	28	25	639	4038	15.82	84.	10.	4.	1.	1.	64.	27.	4.	4.
72281 R	1370.00	3651	436	188	26	19	669	4320	15.49	85.	10.	4.	1.	0.	65.	28.	4.	3.
72281 S	1400.00	8969	642	243	32	21	938	9907	9.47	91.	6.	2.	0.	0.	68.	26.	3.	2.
72281 T	1430.00	6627	659	262	37	26	984	7611	12.93	87.	9.	3.	0.	0.	67.	27.	4.	3.
72282 A	1460.00	15214	1350	542	69	54	2015	17229	11.70	88.	8.	3.	0.	0.	67.	27.	3.	3.
72282 B	1490.00	10182	1004	435	58	45	1542	11724	13.15	87.	9.	4.	0.	0.	65.	28.	4.	3.
72282 C	1520.00	12995	1570	622	75	55	2322	15317	15.16	85.	10.	4.	0.	0.	68.	27.	3.	2.
72282 D	1550.00	2646	331	132	19	15	497	3143	15.81	84.	11.	4.	1.	0.	67.	27.	4.	3.
72282 E	1580.00	3529	395	185	27	24	631	4160	15.17	85.	9.	4.	1.	1.	63.	29.	4.	4.
72282 F	1610.00	6405	535	204	26	18	783	7188	10.89	89.	7.	3.	0.	0.	68.	26.	3.	2.
72282 G	1640.00	2627	370	161	22	17	570	3197	17.83	82.	12.	5.	1.	1.	65.	28.	4.	3.
72282 H	1670.00	3165	410	178	23	16	627	3792	16.53	83.	11.	5.	1.	0.	65.	28.	4.	3.
72282 I	1700.00	1696	257	118	17	12	404	2100	19.24	81.	12.	6.	1.	1.	64.	29.	4.	3.

ESSO AUSTRALIA LTD.

APPENDIX-1:

C1-C4 HYDROCARBON ANALYSES

REPORT A - HEADSPACE GAS

BASIN - GIPPSLAND
WELL - PALMER 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
72282 J	1723.00	3483	468	191	25	17	701	4184	16.75	83.	11.	5.	1.	0.	67.	27.	4.	2.

APPENDIX-2

PALMER-1, AUSTRALIA — CUTTINGS GAS SUMMARY (BLENDER AND CAN) — 25 NOV

SPL NO	REG	DEPTH	- - BLENDER GAS ONLY - - WET **	TOTAL **	WET/TOTAL PERCENT	- - - CAN GAS ONLY - - - WET **	TOTAL **	WET/TOTAL PERCENT	-- SUM OF BLENDER + CAN -- WET **	TOTAL **	WET/TOTAL PERCENT
75173A	0	565	14.13	179.30	7.8806	0.10	5.03	1.9880	14.23	184.33	7.7198
75173B	0	830	13.45	48.42	27.7778	3.26	20.16	16.1706	16.71	68.58	24.3657
75173C	0	860	17.90	101.23	17.6825	5.51	28.32	19.4562	23.41	129.55	18.0702
75173D	0	890	20.97	73.05	28.7063	16.41	80.23	20.4537	37.38	153.28	24.3867
75173E	0	920	14.65	333.08	4.3983	14.72	34.45	42.7286	29.37	367.53	7.9911
75173F	0	950	27.93	124.65	22.4067	6.85	12.47	54.9318	34.78	137.12	25.3646
75173G	0	1010	52.77	89.97	58.6529	37.72	66.42	56.7901	90.49	156.39	57.8617
75173H	0	1040	73.67	176.34	41.7772	22.56	70.42	32.0363	96.23	246.76	38.9974
75173I	0	1070	73.25	175.92	41.6382	130.65	490.13	26.6562	203.90	666.05	30.6133
75173J	0	1115	26.10	75.20	34.7074	30.19	99.14	30.4519	56.29	174.34	32.2875
75173K	0	1145	36.84	84.46	43.6183	38.32	124.03	30.8957	75.16	208.49	36.0497
75173L	0	1175	115.90	188.81	61.3845	67.76	132.35	51.1976	183.66	321.16	57.1864
75173M	0	1205	173.80	254.15	68.3848	53.13	70.14	75.7485	226.93	324.29	69.9775
75173N	0	1235	3568.46	4413.64	80.8507	352.06	754.15	46.6830	3920.52	5167.79	75.8645
75173O	0	1265	1256.16	1678.75	74.8271	128.14	377.65	33.9309	1384.30	2056.40	67.3167
75173P	0	1295	3303.06	4791.06	68.9421	247.19	879.26	28.1134	3550.25	5670.32	62.6111
75173Q	0	1325	2433.60	4243.01	57.3555	1075.50	4586.01	23.4517	3509.10	8829.02	39.7450
75173R	0	1355	1938.00	4080.72	47.4916	1215.70	4322.64	28.1240	3153.70	8403.36	37.5290
75173S	0	1385	2251.02	4536.59	49.6192	816.50	4104.27	19.8939	3067.52	8640.86	35.5002
75173T	0	1415	3674.52	7364.76	49.8933	1386.68	9333.62	14.8568	5061.19	16698.38	-30.3095
75174A	0	1445	2252.30	3418.89	65.8781	1182.78	6095.06	19.4055	3435.08	9513.95	36.1057
75174B	0	1475	3485.93	7176.17	48.5765	2272.28	12959.42	17.5338	5758.20	20135.59	28.5971
75174C	0	1505	2440.37	4630.71	52.6997	637.88	2475.18	25.7710	3078.25	7105.89	43.3197
75174D	0	1535	2229.79	5086.75	43.8352	796.08	3842.88	20.7157	3025.87	8929.63	33.8857
75174E	0	1565	3072.57	5341.77	57.5197	1049.70	5028.14	20.8765	4122.27	10369.91	39.7522
75174F	0	1595	6768.72	12899.28	52.4736	2161.30	13540.12	15.9622	8930.01	26439.39	33.7754
75174G	0	1625	3391.65	5772.45	58.7558	1607.93	6061.21	26.5282	4999.58	11833.65	42.2488
75174H	0	1655	965.17	1950.97	49.4713	631.54	2202.21	28.6775	1596.71	4153.18	38.4455
75174I	0	1685	913.57	1676.17	54.5034	1032.49	3336.49	30.9454	1946.06	5012.66	38.8229
75174J	0	1715	1605.79	3279.79	48.9601	1488.29	4802.94	30.9870	3094.08	8082.73	38.2801

B = CUTTINGS NOT ANALYZED *C* = AIR SPACE GAS NOT RUN *BC* = NO ANALYSES RU

CUTTINGS GAS SUMMARY

SAMPLE NO.	DEPTH	TOTAL C1-C4	% WET	% C3+	C3+/C1	C2/C1
75173A	565	184.	8.	3.	0.03	0.05
75173B	830	69.	24.	10.	0.13	0.19
75173C	860	130.	17.	6.	0.08	0.14
75173D	890	153.	24.	9.	0.12	0.20
75173E	920	368.	8.	4.	0.05	0.04
75173F	950	137.	25.	15.	0.20	0.14
75173G	1010	156.	58.	39.	0.93	0.44
75173H	1040	247.	40.	26.	0.41	0.22
75173I	1070	666.	31.	18.	0.26	0.18
75173J	1115	174.	31.	18.	0.28	0.20
75173K	1145	208.	36.	23.	0.36	0.20
75173L	1175	321.	56.	43.	1.01	0.31
75173M	1205	324.	71.	63.	2.10	0.26
75173N	1235	5168.	76.	62.	2.56	0.58
75173O	1265	2056.	67.	50.	1.55	0.51
75173P	1295	5670.	63.	49.	1.29	0.39
75173Q	1325	8829.	40.	19.	0.31	0.35
75173R	1355	8403.	37.	20.	0.33	0.28
75173S	1385	8641.	35.	18.	0.29	0.26
75173T	1415	16698.	31.	17.	0.23	0.20
75174A	1445	9514.	36.	18.	0.28	0.28
75174B	1475	20136.	27.	12.	0.18	0.22
75174C	1505	7106.	43.	22.	0.40	0.36
75174D	1535	8930.	34.	19.	0.29	0.23
75174E	1565	10370.	40.	21.	0.35	0.31
75174F	1595	26439.	34.	17.	0.25	0.26
75174G	1625	11834.	42.	24.	0.42	0.31
75174H	1655	4153.	40.	24.	0.37	0.25
75174I	1685	5013.	39.	21.	0.34	0.29
75174J	1715	8083.	38.	21.	0.34	0.28

APPENDIX-3

03 DEC 81.

75173A PALMER-1, 565 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	5.8	1.17
ETHANE	0.0		1T2-DMCP	10.2	2.06
PROPANE	0.0		3-EPENT	0.0	0.00
IBUTANE	21.1	4.28	224-TMP	0.0	0.00
NBUTANE	28.7	5.82	NHEPTANE	48.3	9.79
IPENTANE	30.2	6.12	1C2-DMCP	0.0	0.00
NPENTANE	34.4	6.96	MCH	117.9	23.87
22-DMB	0.0	0.00			
CPENTANE	1.7	0.35			
23-DMB	1.9	0.38			
2-MP	17.0	3.45			
3-MP	12.9	2.62			
NHEXANE	54.8	11.10			
MCP	35.1	7.11			
22-DMP	0.0	0.00			
24-DMP	0.0	0.00			
223-TMB	0.0	0.00			
CHEXANE	34.8	7.05			
33-DMP ,	0.0	0.00			
11-DMCP	13.7	2.77			
2-MHEX ,	0.0	0.00			
23-DMP ,	5.2	1.05			
3-MHEX ,	13.0	2.63			
1C3-DMCP	7.1	1.43			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	494.		C1/C2	2.86
GASOLINE	494.		A /D2	7.94
NAPHTHENES	226.	45.81	C1/D2	12.80
C6-7	346.	70.02	CH/MCP	0.99
			PENT/IPENT,	1.14

	PPB	NORM PERCENT
MCP	35.1	18.7
CH	34.8	18.5
MCH	117.9	62.8
TOTAL	187.8	100.0

PARAFFIN INDEX 1	1.158
PARAFFIN INDEX 2	18.888

03 DEC 81

75173B PALMER-1, 830 METERS

	TOTAL PPB	NORM 'PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	0.0	0.00
ETHANE	0.0		1T2-DMCP	0.0	0.00
PROPANE	0.0		3-EPENT	0.0	0.00
IBUTANE	0.0	0.00	224-TMP	0.0	0.00
NBUTANE	0.0	0.00	NHEPTANE	0.0	0.00
IPENTANE	0.0	0.00	1C2-DMCP	0.0	0.00
NPENTANE	0.0	0.00	MCH	0.0	0.00
22-DMB	0.0	0.00			
CPENTANE	0.0	0.00			
23-DMB	0.0	0.00			
2-MP	0.0	0.00			
3-MP	0.0	0.00			
NHEXANE	0.0	0.00			
MCP	0.0	0.00			
22-DMP	0.0	0.00			
24-DMP	0.0	0.00			
223-TMB	0.0	0.00			
CHEXANE	0.0	0.00			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	0.0	0.00			
23-DMP ,	0.0	0.00			
3-MHEX ,	0.0	0.00			
1C3-DMCP	0.0	0.00			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS
ALL COMP	0.		C1/C2 999.99
GASOLINE	0.		A /D2 999.99
NAPHTHENES	0.	0.00	C1/D2 999.99
C6-7	0.	0.00	CH/MCP 999.99
			PENT/IPENT, 999.99

	PPB	NORM PERCENT
MCP	0.0	0.0
CH	0.0	0.0
MCH	0.0	0.0
TOTAL	0.0	0.0

PARAFFIN INDEX 1	0.000
PARAFFIN INDEX 2	0.000

03 DEC 81

75173D PALMER-1, 890 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	0.0	0.00
ETHANE	0.0		1T2-DMCP	0.0	0.00
PROPANE	0.0		3-EPENT	0.0	0.00
IBUTANE	0.0	0.00	224-TMP	0.0	0.00
NBUTANE	0.0	0.00	NHEPTANE	0.0	0.00
IPENTANE	0.0	0.00	1C2-DMCP	0.0	0.00
NPENTANE	0.0	0.00	MCH	0.0	0.00
22-DMB	0.0	0.00			
CPENTANE	0.0	0.00			
23-DMB	0.0	0.00			
2-MP	0.0	0.00			
3-MP	0.0	0.00			
NHEXANE	0.0	0.00			
MCP	0.0	0.00			
22-DMP	0.0	0.00			
24-DMP	0.0	0.00			
223-TMB	0.0	0.00			
CHEXANE	0.0	0.00			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	0.0	0.00			
23-DMP ,	0.0	0.00			
3-MHEX ,	0.0	0.00			
1C3-DMCP	0.0	0.00			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS
ALL COMP	0.		C1/C2 999.99
GASOLINE	0.		A /D2 999.99
NAPHTHENES	0.	0.00	C1/D2 999.99
C6-7	0.	0.00	CH/MCP 999.99
			PENT/1PENT, 999.99

	PPB	NORM PERCENT
MCP	0.0	0.0
CH	0.0	0.0
MCH	0.0	0.0
TOTAL	0.0	0.0

PARAFFIN INDEX 1	0.000
PARAFFIN INDEX 2	0.000

03 DEC 81

75173F PALMER-1, 950 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	0.0	0.00
ETHANE	0.0		1T2-DMCP	0.0	0.00
PROPANE	0.0		3-EPENT	0.0	0.00
IBUTANE	0.0	0.00	224-TMP	0.0	0.00
NBUTANE	0.0	0.00	NHEPTANE	0.0	0.00
IPENTANE	0.0	0.00	1C2-DMCP	0.0	0.00
NPENTANE	0.0	0.00	MCH	0.0	0.00
22-DMB	0.0	0.00			
CPENTANE	0.0	0.00			
23-DMB	0.0	0.00			
2-MP	0.0	0.00			
3-MP	0.0	0.00			
NHEXANE	0.0	0.00			
MCP	0.0	0.00			
22-DMP	0.0	0.00			
24-DMP	0.0	0.00			
223-TMB	0.0	0.00			
CHEXANE	0.0	0.00			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	0.0	0.00			
23-DMP ,	0.0	0.00			
3-MHEX ,	0.0	0.00			
1C3-DMCP	0.0	0.00			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS
ALL COMP	0.		C1/C2 999.99
GASOLINE	0.		A /D2 999.99
NAPHTHENES	0.	0.00	C1/D2 999.99
C6-7	0.	0.00	CH/MCP 999.99
			PENT/IPENT, 999.99

	PPB	NORM PERCENT
MCP	0.0	0.0
CH	0.0	0.0
MCH	0.0	0.0
TOTAL	0.0	0.0

PARAFFIN INDEX 1	0.000
PARAFFIN INDEX 2	0.000

03 DEC 81

751736 PALMER-1, 1010 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	8.0	1.53
ETHANE	0.0		1T2-DMCP	9.2	1.76
PROPANE	0.0		3-EPENT	0.0	0.00
IBUTANE	24.2	4.64	224-TMP	0.0	0.00
NBUTANE	32.1	6.15	NHEPTANE	25.1	4.80
IPENTANE	123.7	23.67	1C2-DMCP	0.0	0.00
NPENTANE	41.7	7.99	MCH	33.3	6.37
22-DMB	1.7	0.33			
CPENTANE	0.0	0.00			
23-DMB	6.4	1.22			
2-MP	59.7	11.42			
3-MP	25.8	4.95			
NHEXANE	39.3	7.52			
MCP	41.3	7.90			
22-DMP	0.0	0.00			
24-DMP	2.5	0.48			
223-TMB	0.0	0.00			
CHEXANE	4.1	0.79			
33-DMP ,	0.0	0.00			
11-DMCP	16.7	3.20			
2-MHEX ,	0.0	0.00			
23-DMP ,	5.2	1.00			
3-MHEX ,	10.6	2.04			
1C3-DMCP	11.6	2.23			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	522.		C1/C2	0.77
GASOLINE	522.		A /D2	6.05
NAPHTHENES	124.	23.77	C1/D2	5.09
C6-7	207.	39.62	CH/MCP	0.10
			PENT/IPENT,	0.34

	PPB	NORM PERCENT
MCP	41.3	52.5
CH	4.1	5.2
MCH	33.3	42.3
TOTAL	78.7	100.0

PARAFFIN INDEX 1	0.950
PARAFFIN INDEX 2	20.244

03 DEC 81

75173H PALMER-1, 1040 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	0.0	0.00
ETHANE	0.0		1T2-DMCP	0.0	0.00
PROPANE	0.0		3-EPENT	0.0	0.00
IBUTANE	18.6	7.94	224-TMP	0.0	0.00
NBUTANE	23.2	9.88	NHEPTANE	9.6	4.08
IPENTANE	59.1	25.17	1C2-DMCP	0.0	0.00
NPENTANE	30.2	12.86	MCH	0.0	0.00
22-DMB	0.0	0.00			
CPENTANE	0.0	0.00			
23-DMB	1.5	0.65			
2-MP	29.4	12.54			
3-MP	11.7	4.99			
NHEXANE	25.3	10.79			
MCP	15.3	6.51			
22-DMP	0.0	0.00			
24-DMP	0.0	0.00			
223-TMB	0.0	0.00			
CHEXANE	8.2	3.50			
33-DMP ,	0.0	0.00			
11-DMCP	2.6	1.10			
2-MHEX ,	0.0	0.00			
23-DMP ,	0.0	0.00			
3-MHEX ,	0.0	0.00			
1C3-DMCP	0.0	0.00			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	235.		C1/C2	0.71
GASOLINE	235.		A /D2	999.99
NAPHTHENES	26.	11.11	C1/D2	999.99
C6-7	61.	25.98	CH/MCP	0.54
			PENT/IPENT,	0.51

	PPB	NORM PERCENT
MCP	15.3	65.0
CH	8.2	35.0
MCH	0.0	0.0
TOTAL	23.5	100.0

PARAFFIN INDEX 1	0.000
PARAFFIN INDEX 2	47.033

03 DEC 81

75173J PALMER-1, 1115 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCEN
METHANE	0.0		1T3-DMCP	0.0	0.00
ETHANE	0.0		1T2-DMCP	0.0	0.00
PROPANE	0.0		3-EPENT	0.0	0.00
IBUTANE	0.0	0.00	224-TMP	0.0	0.00
NBUTANE	0.0	0.00	NHEPTANE	0.0	0.00
IPENTANE	0.0	0.00	1C2-DMCP	0.0	0.00
NPENTANE	0.0	0.00	MCH	0.0	0.00
22-DMB	0.0	0.00			
CPENTANE	0.0	0.00			
23-DMB	0.0	0.00			
2-MP	0.0	0.00			
3-MP	0.0	0.00			
NHEXANE	0.0	0.00			
MCP	0.0	0.00			
22-DMP	0.0	0.00			
24-DMP	0.0	0.00			
223-TMB	0.0	0.00			
CHEXANE	0.0	0.00			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	0.0	0.00			
23-DMP ,	0.0	0.00			
3-MHEX ,	0.0	0.00			
1C3-DMCP	0.0	0.00			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS
ALL COMP	0.		C1/C2 999.99
GASOLINE	0.		A /D2 999.99
NAPHTHENES	0.	0.00	C1/D2 999.99
C6-7	0.	0.00	CH/MCP 999.99
			PENT/IPENT, 999.99

	PPB	NORM PERCENT
MCP	0.0	0.0
CH	0.0	0.0
MCH	0.0	0.0
TOTAL	0.0	0.0

PARAFFIN INDEX 1	0.000
PARAFFIN INDEX 2	0.000

03 DEC 81

75173L PALMER-1, 1175 METERS

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	0.0	0.00
NBUTANE	0.0	0.00
IPENTANE	0.0	0.00
NPENTANE	0.0	0.00
22-DMB	0.0	0.00
CPENTANE	0.0	0.00
23-DMB	0.0	0.00
2-MP	0.0	0.00
3-MP	0.0	0.00
NHEXANE	0.0	0.00
MCP	0.0	0.00
22-DMP	0.0	0.00
24-DMP	0.0	0.00
223-TMB	0.0	0.00
CHEXANE	0.0	0.00
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	0.0	0.00
23-DMP ,	0.0	0.00
3-MHEX ,	0.0	0.00
1C3-DMCP	0.0	0.00
1T3-DMCP	0.0	0.00
1T2-DMCP	0.0	0.00
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	0.0	0.00
1C2-DMCP	0.0	0.00
MCH	0.0	0.00

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	0.		C1/C2	999.99
GASOLINE	0.		A /D2	999.99
NAPHTHENES	0.	0.00	C1/D2	999.99
C6-7	0.	0.00	CH/MCP	999.99
			PENT/IPENT,	999.99

	PPB	NORM PERCENT
MCP	0.0	0.0
CH	0.0	0.0
MCH	0.0	0.0
TOTAL	0.0	0.0

PARAFFIN INDEX 1	0.000
PARAFFIN INDEX 2	0.000

03 DEC 81

75173M PALMER-1, 1205 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCEN
METHANE	0.0		1T3-DMCP	4.6	0.91
ETHANE	0.0		1T2-DMCP	10.5	2.08
PROPANE	0.0		3-EPENT	0.0	0.00
IBUTANE	9.3	1.84	224-TMP	0.0	0.00
NBUTANE	30.6	6.07	NHEPTANE	55.4	11.00
IPENTANE	67.5	13.40	1C2-DMCP	0.0	0.00
NPENTANE	66.1	13.13	MCH	41.1	8.16
22-DMB	0.0	0.00			
CPENTANE	3.3	0.65			
23-DMB	3.7	0.74			
2-MP	41.4	8.22			
3-MP	16.9	3.36			
NHEXANE	47.2	9.37			
MCP	49.2	9.76			
22-DMP	0.0	0.00			
24-DMP	0.0	0.00			
223-TMB	0.0	0.00			
CHEXANE	22.6	4.48			
33-DMP ,	0.0	0.00			
11-DMCP	11.5	2.28			
2-MHEX ,	0.0	0.00			
23-DMP ,	6.5	1.28			
3-MHEX ,	8.1	1.60			
1C3-DMCP	8.4	1.67			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	504.		C1/C2	1.03
GASOLINE	504.		A /D2	12.74
NAPHTHENES	151.	29.99	C1/D2	9.33
C6-7	265.	52.60	CH/MCP	0.46
			PENT/IPENT,	0.98

	PPB	NORM PERCENT
MCP	49.2	43.6
CH	22.6	20.0
MCH	41.1	36.4
TOTAL	112.9	100.0

PARAFFIN INDEX 1	0.832
PARAFFIN INDEX 2	32.865

03 DEC 81

75173N PALMER-1, 1235 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	850.0	1.96
ETHANE	0.0		1T2-DMCP	1289.0	2.98
PROPANE	3129.6		3-EPENT	0.0	0.00
IBUTANE	2271.8	5.25	224-TMP	0.0	0.00
NBUTANE	3576.3	8.26	NHEPTANE	1673.3	3.86
IPENTANE	5575.8	12.88	1C2-DMCP	115.1	0.27
NPENTANE	4569.5	10.55	MCH	4223.0	9.75
22-DMB	182.5	0.42			
CPENTANE	497.2	1.15			
23-DMB	568.9	1.31			
2-MP	3213.9	7.42			
3-MP	1661.5	3.84			
NHEXANE	3132.2	7.23			
MCP	4395.9	10.15			
22-DMP	0.0	0.00			
24-DMP	110.6	0.26			
223-TMB	27.1	0.06			
CHEXANE	2344.1	5.41			
33-DMP ,	0.0	0.00			
1 1-DMCP	634.2	1.46			
2-MHEX ,	0.0	0.00			
23-DMP ,	619.2	1.43			
3-MHEX ,	705.5	1.63			
1C3-DMCP	1059.7	2.45			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	46426.		C1/C2	0.93
GASOLINE	43296.		A /D2	6.81
NAPHTHENES	15408.	35.59	C1/D2	10.21
C6-7	21179.	48.92	CH/MCP	0.53
			PENT/IPENT,	0.82

	PPB	NORM PERCENT
MCP	4395.9	40.1
CH	2344.1	21.4
MCH	4223.0	38.5
TOTAL	10963.0	100.0

PARAFFIN INDEX 1	0.419
PARAFFIN INDEX 2	12.489

03 DEC 81

75173P PALMER-1, 1295 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	2077.0	1.56
ETHANE	0.0		1T2-DMCP	3754.0	2.83
PROPANE	2409.6		3-EPENT	0.0	0.00
IBUTANE	6208.6	4.68	224-TMP	0.0	0.00
NBUTANE	9387.1	7.07	NHEPTANE	2974.9	2.24
IPENTANE	21114.1	15.90	1C2-DMCP	318.9	0.24
NPENTANE	15800.6	11.90	MCH	12116.8	9.13
22-DMB	718.3	0.54			
CPENTANE	1750.1	1.32			
23-DMB	2103.6	1.58			
2-MP	10625.3	8.00			
3-MP	5492.7	4.14			
NHEXANE	8831.5	6.65			
MCP	13627.5	10.26			
22-DMP	0.0	0.00			
24-DMP	227.2	0.17			
223-TMB	74.7	0.06			
CHEXANE	8661.5	6.52			
33-DMP ,	0.0	0.00			
11-DMCP	1171.8	0.88			
2-MHEX ,	0.0	0.00			
23-DMP ,	1630.0	1.23			
3-MHEX ,	1472.2	1.11			
1C3-DMCP	2639.4	1.99			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	135187.		C1/C2	0.98
GASOLINE	132778.		A /D2	8.02
NAPHTHENES	46117.	34.73	C1/D2	14.91
C6-7	59578.	44.87	CH/MCP	0.64
			PENT/IPENT,	0.75

	PPB	NORM PERCENT
MCP	13627.5	39.6
CH	8661.5	25.2
MCH	12116.8	35.2
TOTAL	34405.8	100.0

PARAFFIN INDEX 1	0.312
PARAFFIN INDEX 2	8.151

03 DEC 81

75173R PALMER-1, 1355 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	523.9	1.33
ETHANE	0.0		1T2-DMCP	860.4	2.26
PROPANE	1975.5		3-EPENT	0.0	0.00
IBUTANE	2827.4	7.43	224-TMP	0.0	0.00
NBUTANE	2331.1	6.12	NHEPTANE	1364.2	3.58
IPENTANE	6432.1	16.90	1C2-DMCP	74.3	0.20
NPENTANE	4889.6	12.84	MCH	3121.2	8.20
22-DMB	123.2	0.32			
CPENTANE	640.9	1.68			
23-DMB	554.8	1.46			
2-MP	2789.4	7.33			
3-MP	1408.7	3.70			
NHEXANE	2407.5	6.32			
MCP	3500.0	9.19			
22-DMP	0.0	0.00			
24-DMP	94.6	0.25			
223-TMB	17.8	0.05			
CHEXANE	2068.8	5.43			
33-DMP ,	0.0	0.00			
11-DMCP	396.8	1.04			
2-MHEX ,	0.0	0.00			
23-DMP ,	523.3	1.37			
3-MHEX ,	485.6	1.28			
1C3-DMCP	635.4	1.67			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	40046.		C1/C2	1.00
GASOLINE	38071.		A /D2	7.77
NAPHTHENES	11822.	31.05	C1/D2	11.51
C6-7	16074.	42.22	CH/MCP	0.59
			PENT/IPENT,	0.76

	PPB	NORM PERCENT
MCP	3500.0	40.3
CH	2068.8	23.8
MCH	3121.2	35.9
TOTAL	8690.0	100.0

PARAFFIN INDEX 1	0.437
PARAFFIN INDEX 2	13.670

03 DEC 81

75173T PALMER-1, 1415 METERS

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	2113.8	
IBUTANE	20699.0	20.09
NBUTANE	5479.6	5.32
IPENTANE	18670.7	18.12
NPENTANE	12537.3	12.17
22-DMB	149.6	0.15
CPENTANE	2022.8	1.96
23-DMB	1472.3	1.43
2-MP	7101.7	6.89
3-MP	3384.1	3.28
NHEXANE	5277.2	5.12
MCP	7775.3	7.55
22-DMP	0.0	0.00
24-DMP	287.5	0.28
223-TMB	17.4	0.02
CHEXANE	3579.4	3.47
33-DMP ,	0.0	0.00
11-DMCP	780.8	0.76
2-MHEX ,	0.0	0.00
23-DMP ,	1401.1	1.36
3-MHEX ,	1084.6	1.05
1C3-DMCP	1172.2	1.14
1T3-DMCP	997.3	0.97
1T2-DMCP	1311.2	1.27
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	3910.5	3.80
1C2-DMCP	125.0	0.12
MCH	3793.1	3.68

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	105143.		C1/C2	0.72
GASOLINE	103029.		A /D2	8.47
NAPHTHENES	21557.	20.92	C1/D2	7.52
C6-7	31513.	30.59	CH/MCP	0.46
			PENT/IPENT,	0.67

	PPB	NORM PERCENT
MCP	7775.3	51.3
CH	3579.4	23.6
MCH	3793.1	25.0
TOTAL	15147.8	100.0

PARAFFIN INDEX 1	0.536
PARAFFIN INDEX 2	21.689

03 DEC 81

75174B PALMER-1, 1475 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCEN
METHANE	0.0		1T3-DMCP	116.7	0.26
ETHANE	3486.3		1T2-DMCP	117.6	0.26
PROPANE	18192.3		3-EPENT	0.0	0.00
IBUTANE	12153.6	27.00	224-TMP	0.0	0.00
NBUTANE	11545.6	25.65	NHEPTANE	531.5	1.19
IPENTANE	7464.9	16.58	1C2-DMCP	0.0	0.00
NPENTANE	4808.7	10.68	MCH	156.5	0.35
22-DMB	21.2	0.05			
CPENTANE	1469.3	3.26			
23-DMB	167.5	0.37			
2-MP	1559.3	3.46			
3-MP	973.3	2.16			
NHEXANE	1352.7	3.00			
MCP	1438.1	3.19			
22-DMP	0.0	0.00			
24-DMP	77.6	0.17			
223-TMB	2.3	0.01			
CHEXANE	312.0	0.69			
33-DMP	0.0	0.00			
11-DMCP	185.7	0.41			
2-MHEX	0.0	0.00			
23-DMP	238.1	0.53			
3-MHEX	198.3	0.44			
1C3-DMCP	127.5	0.28			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	66696.		C1/C2	0.36
GASOLINE	45018.		A /D2	9.50
NAPHTHENES	3923.	8.72	C1/D2	3.30
C6-7	4854.	10.78	CH/MCP	0.22
			PENT/IPENT,	0.64

	PPB	NORM PERCENT
MCP	1438.1	75.4
CH	312.0	16.4
MCH	156.5	8.2
TOTAL	1906.6	100.0

PARAFFIN INDEX 1	1.061
PARAFFIN INDEX 2	26.791

03 DEC 81

75174D PALMER-1, 1535 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCEN
METHANE	0.0		1T3-DMCP	263.3	0.49
ETHANE	5508.8		1T2-DMCP	180.3	0.33
PROPANE	21162.5		3-EPENT	0.0	0.00
IBUTANE	13145.9	24.28	224-TMP	0.0	0.00
NBUTANE	14870.2	27.47	NHEPTANE	713.1	1.32
IPENTANE	9103.9	16.82	1C2-DMCP	14.4	0.03
NPENTANE	5251.2	9.70	MCH	381.1	0.70
22-DMB	38.7	0.07			
CPENTANE	1558.7	2.88			
23-DMB	238.5	0.44			
2-MP	1949.3	3.60			
3-MP	1089.5	2.01			
NHEXANE	1521.7	2.81			
MCP	2088.7	3.86			
22-DMP	0.0	0.00			
24-DMP	99.0	0.18			
223-TMB	2.4	0.00			
CHEXANE	568.2	1.05			
33-DMP ,	0.0	0.00			
11-DMCP	240.2	0.44			
2-MHEX ,	0.0	0.00			
23-DMP ,	329.3	0.61			
3-MHEX ,	245.2	0.45			
1C3-DMCP	244.3	0.45			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	80808.		C1/C2	0.43
GASOLINE	54137.		A /D2	9.12
NAPHTHENES	5539.	10.23	C1/D2	4.85
C6-7	6891.	12.73	CH/MCP	0.27
			PENT/IPENT,	0.58

	PPB	NORM PERCENT
MCP	2088.7	68.8
CH	568.2	18.7
MCH	381.1	12.5
TOTAL	3038.0	100.0

PARAFFIN INDEX 1	0.706
PARAFFIN INDEX 2	22.531

03 DEC 81

75174F PALMER-1, 1595 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCEN
METHANE	0.0		1T3-DMCP	0.0	0.00
ETHANE	0.0		1T2-DMCP	0.0	0.00
PROPANE	0.0		3-EPENT	0.0	0.00
IBUTANE	0.0	0.00	224-TMP	0.0	0.00
NBUTANE	0.0	0.00	NHEPTANE	0.0	0.00
IPENTANE	0.0	0.00	1C2-DMCP	0.0	0.00
NPENTANE	0.0	0.00	MCH	0.0	0.00
22-DMB	0.0	0.00			
CPENTANE	0.0	0.00			
23-DMB	0.0	0.00			
2-MP	0.0	0.00			
3-MP	0.0	0.00			
NHEXANE	0.0	0.00			
MCP	0.0	0.00			
22-DMP	0.0	0.00			
24-DMP	0.0	0.00			
223-TMB	0.0	0.00			
CHEXANE	0.0	0.00			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	0.0	0.00			
23-DMP ,	0.0	0.00			
3-MHEX ,	0.0	0.00			
1C3-DMCP	0.0	0.00			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS
ALL COMP	0.		C1/C2 999.99
GASOLINE	0.		A /D2 999.99
NAPHTHENES	0.	0.00	C1/D2 999.99
C6-7	0.	0.00	CH/MCP 999.99
			PENT/IPENT, 999.99

	PPB	NORM PERCENT
MCP	0.0	0.0
CH	0.0	0.0
MCH	0.0	0.0
TOTAL	0.0	0.0

PARAFFIN INDEX 1 0.000
PARAFFIN INDEX 2 0.000

03 DEC 81

75174H PALMER-1, 1655 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	0.0	0.00
ETHANE	0.0		1T2-DMCP	0.0	0.00
PROPANE	0.0		3-EPENT	0.0	0.00
IBUTANE	369.7	30.74	224-TMP	0.0	0.00
NBUTANE	226.3	18.81	NHEPTANE	11.0	0.92
IPENTANE	263.6	21.92	1C2-DMCP	0.0	0.00
NPENTANE	125.0	10.39	MCH	0.0	0.00
22-DMB	92.3	7.67			
CPENTANE	8.3	0.69			
23-DMB	4.0	0.33			
2-MP	28.8	2.39			
3-MP	13.7	1.14			
NHEXANE	31.2	2.59			
MCP	24.2	2.01			
22-DMP	0.0	0.00			
24-DMP	0.0	0.00			
223-TMB	0.0	0.00			
CHEXANE	4.8	0.40			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	0.0	0.00			
23-DMP ,	0.0	0.00			
3-MHEX ,	0.0	0.00			
1C3-DMCP	0.0	0.00			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	1203.		C1/C2	0.20
GASOLINE	1203.		A /D2	999.99
NAPHTHENES	37.	3.10	C1/D2	999.99
C6-7	71.	5.91	CH/MCP	0.20
			PENT/IPENT,	0.47

	PPB	NORM PERCENT
MCP	24.2	83.5
CH	4.8	16.5
MCH	0.0	0.0
TOTAL	29.0	100.0

PARAFFIN INDEX 1	0.000
PARAFFIN INDEX 2	69.659

03 DEC 81

75174J PALMER-1, 1715 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCEN
METHANE	0.0		1T3-DMCP	1449.2	0.80
ETHANE	0.0		1T2-DMCP	2575.4	1.42
PROPANE	29175.0		3-EPENT	0.0	0.00
IBUTANE	26299.9	14.50	224-TMP	0.0	0.00
NBUTANE	33423.8	18.43	NHEPTANE	5219.3	2.88
IPENTANE	25539.9	14.08	1C2-DMCP	189.8	0.10
NPENTANE	18949.9	10.45	MCH	9414.4	5.19
22-DMB	515.1	0.28			
CPENTANE	2297.9	1.27			
23-DMB	2302.3	1.27			
2-MP	12061.9	6.65			
3-MP	5709.4	3.15			
NHEXANE	10396.7	5.73			
MCP	10865.2	5.99			
22-DMP	0.0	0.00			
24-DMP	442.7	0.24			
223-TMB	72.7	0.04			
CHEXANE	6528.8	3.60			
33-DMP ,	0.0	0.00			
11-DMCP	1615.3	0.89			
2-MHEX ,	0.0	0.00			
23-DMP ,	2005.9	1.11			
3-MHEX ,	1880.3	1.04			
1C3-DMCP	1645.9	0.91			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	210577.		C1/C2	1.05
GASOLINE	181402.		A /D2	8.30
NAPHTHENES	36582.	20.17	C1/D2	9.34
C6-7	54302.	29.93	CH/MCP	0.60
			PENT/IPENT,	0.74

	PPB	NORM PERCENT
MCP	10865.2	40.5
CH	6528.8	24.4
MCH	9414.4	35.1
TOTAL	26808.4	100.0

PARAFFIN INDEX 1	0.616
PARAFFIN INDEX 2	16.142

APPENDIX 7

APPENDIX-7

ORGANIC PETROLOGY

PALMER - 1

GIPPSLAND BASIN

PALMER No. 1

UW No.	Esso No.	Depth m	$\bar{R}_{v}$ max %	Range R_{v} max %	N	Exinite fluorescence (Remarks)
12505	BS/P1	1243 Ctgs	0.42	0.35-0.52	23	Abundant exinite, sporinite and cutinite greenish yellow to orange, fluorinite green, resinite yellow to dull orange, suberinite green, liptodetrinite yellow to orange. (Coal, clarite with rare shaly coal claystone, and sandstone. Rare semifusinite present but most of the inertinite is fungal in origin. Approx. 79% V, 20% E, 1% I. Exinite macerals, suberinite>resinite+fluorinite>cutinite=sporinite=liptodetrinite. Medium intensity brown fluorescence from much of the vitrinite. Micrinite is present. Suberinite fluorescence is relatively intense. Exinite fluorescence suggests that the sample is immature, but the presence of micrinite implies the possibility of some hydrocarbon generation.)
12506	BS/P3	1310 Ctgs	0.46	0.42-0.54	20	Exinite abundant, sporinite yellow to orange, cutinite, green to dull orange, fluorinite/resinite, green to dull orange, liptodetrinite, green to orange, suberinite orange to red brown. (Coal with rare sandstone and siltstone. Clarite is the most abundant microlithotype followed by vitrite. Approx 10% E, 1% I, chiefly sclerotinite, the remainder being vitrinite. Latrobe thick seam type. Sparse pyrite. 30% of the grains had been markedly heat altered during sample drying. The remaining grains may also have been affected.)
12507	BS/P3	1365 Ctgs	0.45	0.37-0.53	25	Abundant exinite similar to that in 12506. (Coal 70%, sandstone 30%. Similar to 12506 but exinite more abundant, 10-15%.)
12508	BS/P4	1413 Ctgs	0.46	0.40-0.54	25	Exinite abundant, sporinite yellow to orange, cutinite green to yellow, fluorinite/resinite, green to brown, bituminite dull orange to brown, suberinite dull orange. (Coal with minor sandstone. Clarite is the dominant coal type, with two main sub-types. One contains 5-15% E and is related to vitrites, the other contains up to 80% E and abundant bituminite. Some bituminite-rich liptite is also present. Sporinite=bituminite=liptodetrinite=fluorinite/resinite>suberinite=cutinite. Rare pyrite. Approx. 10-15% E, 1% I, 80% V.)

PALMER No. 1

UW No.	Esso No.	Depth m	$\bar{R}_v$ max %	Range R_v max %	N	Exinite fluorescence (Remarks)
12509	BS/P5	1473 Ctgs	0.48	0.37-0.61	27	Abundant exinite, sporinite and cutinite greenish yellow to orange, fluorinite green, resinite yellow to dull orange, suberinite orange to brown, liptodetrinite yellow to orange. (Coal, clarite with rare shaly coal claystone, and common sandstone. Rare semifusinite present but most of the inertinite is fungal in origin. Rare grains of coal contain semifusinite, duroclarite and durite. The presence of ?sclerotinite in the duroclarite suggests an affinity with the "Latrobe thin seam" facies. Micrinite is abundant. Exinite is less abundant than in the previous sample and bituminite is much less common. Approx. 7% E, 2% I, 90% V.)
12510	BS/P6	1528 Ctgs	0.50	0.38-0.59	26	Exinite abundant, sporinite yellow to orange, cutinite yellow to dull orange, suberinite dull orange, liptodetrinite and resinite green to dull orange. (Sandstone and coal with rare siltstone and claystone. D.o.m. is very rare in the sandstone. Coal dominantly clarite, with some shaly coal and clarodurite and duroclarite. The inertinite rich coals are similar to the "Latrobe thin seam" facies. Some of the vitrinite contains open lumens with strong green fluorescence. This does not resemble fluorinite but could be a petroleum. Approx. 10% E, 3% I, 87% V in the coals. Sporinite=liptodetrinite>resinite/fluorinite>suberinite. Much of the vitrinite shows red brown fluorescence.)
12511	BS/P7	1573 Ctgs	0.51	0.40-0.72	25	Exinite abundant, sporinite yellow to dull orange, cutinite, resinite yellow to dull brown. (Coal and sandstone with rare claystone and siltstone. D.o.m. absent in the sandstone. Coals dominated by clarite but with common shaly coal and rare duroclarite and clarodurite. Coals approx. 5-10% E, 3-5% I, 80-85% V. D.o.m. common in the finer clastics, V=I>E. In whole sample sporinite>liptodetrinite>resinite> suberinite. Much of the vitrinite fluoresces a dull red brown. The inertinite rich coals appear to lack sclerotinite and may represent the "Lower Eastern View" facies. Massive pyrite is common.)

PALMER No. 1

UW No.	Esso No.	Depth m	$\bar{R}_v$ max %	Range R_v max %	N	Exinite fluorescence (Remarks)
12512	BS/P8	1618 Ctgs	0.47	0.36-0.66	33	Similar to some of the shallower samples. (Sandstone, coal and rare finer clastics. The reflectance data includes a large number of low readings which suggests cavings. The sandstone population includes a lithology not seen in the shallower samples and this makes it probable that the extent of contamination is limited. Silty sandstones are present and these contain abundant I, V and E. Some possible fluorescing bitumens are present in these fine-grained sandstones. The coals are dominated by clarite and contain approx. 5-8 % E, 2% I and 90% V. Sporinite=liptodetrinite> resinite>suberinite>cutinite>bituminite. Grains of massive pyrite are present.)
12513	BS/P9	1718 Ctgs	0.50	0.40-0.58	8	Sporinite yellow to orange, see comments. (The sample has been dried at a high temperature and relatively few grains could be used for either reflectance or fluorescence observations. Sandstone is much more abundant than coal, siltstone and claystone are present in small amounts. D.o.m. is rare comprising I and V. The coals are chiefly clarites. Exinite is common to abundant in the coals, approx. 5% E, 1% I and 94% V.)

PALMER - 1 ?

WRONG DEPTH.

B

UW No.	Esso No.	Depth m	$\bar{R}_v$ max %	Range R_v max %	N	Exinite fluorescence (Remarks)
12501	BS/B1	1875.5 SWC	0.45	0.40-0.52	6	Rare sporinite and ?dinoflagellates, yellow to orange. (Silty, fossiliferous sandstone with d.o.m. rare, V=E>I. Some coal intraclasts are present but the vitrinite reflectance in these appears to be similar to that of phytoclasts. Pyrite abundant.)
12502	BS/B2	2009.8 SWC	0.49	0.41-0.57	20	Exinite abundant, resinite and fluorinite green to orange, sporinite orange, cutinite orange to dull orange, suberinite green. (Coal, approx. 94% V, 5% E, 1% I. Most of the inertinite is of fungal origin. The vitrinite has a very compact texture and much of it shows weak red brown fluorescence. Micrinite is a widespread minor component. Pyrite is common in some layers. Exinite reflectance ranges from 0.06% to 0.24%, and inertinite reflectance from 0.66% to 0.88%. The coal is similar in type to the Latrobe Valley thick seams but contains more telovitrinite than is normal for coals of this type.)
12503	BS/B3	2204.9 SWC	0.62	0.54-0.68	23	Exinite common, sporinite and cutinite yellow to orange, rare green fluorinite. (Coal, approx. 60% V, 38% I, 1-2% E. The coal consists dominantly of duroclarite and fusite, with semifusinite and fusinite dominant over inertodetrinite. Pyrite locally abundant. Micrinite common. The coal is similar in type to that typically found in the older parts of the Latrobe Group sequence.)
12504	BS/B4	2353.5 SWC	0.55	0.46-0.58	20	Exinite abundant in shaly coal, rare in clean coal, sporinite and cutinite yellow to dull orange. (Coal and shaly coal, aprrox. 60% V, 37% clay, 3% E. The vitrinite contains some micrinite and shows dull greenish brown fluorescence in the cell lumens. Inertinite is virtually absent in this sample, but telocollinite is abundant. This coal type usually occurs above the type found in 12503, but the restricted nature of the present sampling may be the cause of the this unusual stratigraphic type sequence.)

PALMER-1 ?

WRONG DEPTH

S

UW No.	Esso No.	Depth m	$\bar{R}_{v\,max}$ %	Range $R_{v\,max}$ %	N	Exinite fluorescence (Remarks)
12497	BS/S1	2745 Ctgs	0.61	0.51-0.84	35	Exinite abundant, chiefly sporinite and liptodetrinite, orange. (Coal approx. 50%, the remainder dominated by siltstone and claystone. Coal contain abundant telocollinite and significant amounts of inertinite with rare grains of inertinite-rich coal being present. Exinite comprises approx. 5% of the coals. D.o.m. is abundant, I>E=V, E approx 2-5% on average. Micrinite and pyrite are present. The relatively large range in the vitrinite reflectance values may be due to the presence of cavings and the difficulty of making lithological distinctions.)
12498	BS/S2	3025 Ctgs	0.70	0.50-0.83	15	Exinite rare, sporinite, orange. (Claystone> siltstone>sandstone>massive carbonate>coal. Coal sparse and consists of massive telocollinite. D.o.m. common V=I>>E. Pyrite rare, carbonates abundant. Small grains of detrital iron oxides present. The relatively large range in the vitrinite reflectance values may be due to the presence of cavings and the difficulty of making lithological distinctions.)
12499	BS/S3	3175 Ctgs	0.75	0.54-0.87	22	No exinite in the majority of grains, dull orange cutinite noted in one grain. Rare grains with abundant bright orange sporinite are probably cavings. (Sandstone with d.o.m. rare to absent is the dominant lithology. Claystone, siltstone, rare coal and carbonate are also present. D.o.m. is common in the finer clastics, V>>I>>E. Iron oxides are present as detrital grains, some pyrite also present. Some of the lower vitrinite reflectance values may be from cavings.)
12500	BS/S4	3285 Ctgs	0.78	0.57-0.93	20	Exinite present in rare grains which appear to be cavings. (Siltstone>claystone=sandstone> coal=carbonate. D.o.m. rare to absent in the sandstones but common to abundant in the finer clastics. Carbonate is predominantly siderite and is associated, in part with sandstone. Iron oxides are present, especially as rims on the grains of carbonates. Some of the vitrinite reflectances are probably from a cavings population. The separation of cavings is difficult due to the relatively monotonous lithologies of the sequence. V>>I, ?no E.)

APPENDIX 8

APPENDIX - 8

VELOCITY SURVEY REPORT

PALMER - 1

GIPPSLAND BASIN

VELOCITY SURVEY

Well .....PALMER #1.....

Basin .....GIPPSLAND.....

INTRODUCTION

Esso personnel .....DAVID.LEE.....

Contractor .....SCHLUMBERGER.....

Supplied (1) Instruments.
(2) Personnel

Seismic Observer ...MICHAEL.AW.....

Marine Shooter .....N/A.....

Navigation .....N/A.....

(3) Licenced Shooting Boat

Name .....N/A.....

Date Loaded .....

Date Released .....

Agent .....

(4) Seismic Source

Air Gun

Gas Pressures ....2000.psi.....

Oxygen .....N/A.....psi

Propane .....N/A.....psi

Personnel and Instruments

assembled at .LONGFORD..... Date ....7.10.81.....

Boarded (rig) SOUTHERN.CROSS..... Date ....7.10.81.....

Date of survey .....10.10.81.....

Casing Depth .....

T.D. when shot .....1723m KB.....

water depth .....42.6.....metres

SURVEY PROCEDURE

Weather: Wind .....MODERATE.....

Swell .....MODERATE - HGIH.....

Sea .....ROUGH.....

Rig Movement .MODERATE.....

Rig Noise ....MODERATE - LOW.....

Hydrophones : Number ....1....

Depth below seal level....12.2.... metres

Position ....BELOW AIR GUN....

....

Air Gun : number of shots per level ....3....

gun depth ....7.62.... metres

Well phone positioning :

No. of depths ....11....

Time : first shot ....1215 hrs....

last shot ....1600 hrs....

Total rig time ....3 hrs 45 mins....

RESULTS

Quality of results (good ....

(fair ....25....

(poor ....

(not used ....8....

Comparison of Interval Times with Sonic Log

/ / average ....9.49.... microsec/metre

/ / max ....23.68.... microsec/metre

CONCLUSION

Reliability of T-D curve ....FAIR....

COMMENTS This survey was to have been a comparison survey between Schlumberger and Velocity Data Pty. Ltd. Due to strikes on production platforms in the area, Velocity Data were unable to mobilize their instruments for this survey. Therefore Schlumberger were the only contractors on board the Southern Cross.

Possible faults with the Schlumberger system are: due to computor picking the gain on each record it may happen that by raising the gain to minimize noise, the signal can be lost also. No raw field records are produced for checking the system.

On this survey there was no hydrophone in the moonpool for calculating accurate offset.

The eleventh level results were not used due to casing bond problems.

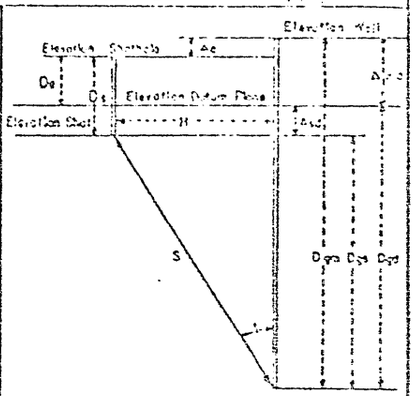
Shothole Information: Elevation, Distance & Direction from Well

Shot Depth 7.62m
Offset 47.5m

Company: ESSO EXPLORATION AUSTRALIA INC.
Well: PALMER #1
Elevation (Derrick Floor): 21mKB
Total Depth: 1723 mKB

LOCATION
Coordinates: 38°33'49.33" S 147°19'46.85" E
Section, Township, Range:
County / Area or Field: GIPPSLAND
DATUM: Mean Sea Level

Record Number	Shot Number	Time of Shot	Dgm	Ds	tus	tr	T Reading	T Clarity	T Grade	Dgs	H	TAN I	Cos I	Tgs	Δsd	Δsd/V	Tgd	Tgd Average	Dgd	ΔDgd	ΔTgd	VI Interval Velocity	Va Average Velocity
76	10	1458	400	7.62		NR	0.81		F	371.4	47.5	0.1279	0.992	0.179	7.62	5	0.184	0.184	379				
79									"											400	0.156	2564	2060
61	9	1438	800	"		"	0.336		"	771.4	"	0.0616	0.998	0.335	"	"	0.340	0.340	779				
64									"											200	0.073	2740	2291
66									"														
52	8	1426	1000	"		"	0.409		"	971.4	"	0.0489	0.999	0.409	"	"	0.414	0.414	979				
55									"											122	0.049	2490	2365
57									"														
44	7	1414	1122	"		"	0.459		"	1093.4	"	0.0434	"	0.458	"	"	0.463	0.463	1101				
47									"											58	0.022	2636	2378
50									"														
40	6	1404	1180	"		"	0.481		"	1151.4	"	0.0413	"	0.480	"	"	0.485	0.485	1159				
42									"											38	0.015	2533	2390
43									"														
37	5	1353	1218	"		"	0.496		"	1189.4	"	0.0399	"	0.495	"	"	0.500	0.500	1197				
38									"											82	0.029	2828	2394
39									"														
33	4	1342	1300	"		"	0.525		"	1271.4	"	0.0374	"	0.524	"	"	0.529	0.529	1279				
35									"											150	0.051	2941	2418
27	3	1330	1450	"		"	0.576		"	1421.4	"	0.0334	"	0.575	"	"	0.580	0.580	1429				
29									"											150	0.048	3125	2464
9	2	1319	1600	"		"	0.623		"	1571.4	"	0.0302	1.000	0.623	"	"	0.628	0.628	1579				
23									"											119.8	0.036	3328	2514
6	1	1251	1719.8	"		"	0.659		"	1691.2	"	0.0281	"	0.659	"	"	0.664	0.664	1698.8				
8																							2558



Dgm = Geophone depth measured from well elevation
Dgs = " " " " shot "
Dgd = " " " " datum "
Ds = Depth of shot
De = Shothole elevation to datum plane
H = Horizontal distance from well to shotpoint
S = Straight line travel path from shot to well geophone
tus = Uphole time at shotpoint
T = Observed time from shotpoint to well geophone
tr = " " " to reference geophone
Δe = Difference in elevation between well & shotpoint.
Δsd = " " " " shot & datum plane
Δsd = De - Ds
Dgs = Dgm - Dsd Δe ; tgs = $\frac{H}{D_{gs}}$
Tgs = cos I T = Vert. travel time from shot ⌀ to geophone
Tgd = $T_{gs} \pm \frac{\Delta sd}{V}$ " " " " datum plane "
Dgd = Dgm - Δsd
VI = Interval velocity = $\frac{\Delta D_{gd}}{\Delta T_{gd}}$
Va = Average = $\frac{\Sigma\, \Delta L}{T_{gd}}$

Surveyed by: Schlumberger
Date: 10/10/81

20" @ 187.6m
13 3/8" @ 769m
Casing Record

VELOCITY SURVEY ERROR CHECK

PALMER #1

Depth rel.S.L. (m)	Av. Vertical Travel Time (check shots)	Ti Check Shots (sec.)	Ti Sonic Log (sec.)	△ (Millisecs.) Ti Check — Ti Sonic	Depth Interval (m.)	Erro (Micros per m
379	0.184	0.156	0.152	4.0	400	10.00
779	0.340					
779	0.340	0.073	.0698	3.2	200	16.00
979	0.414					
979	0.414	0.049	.0481	0.9	122	7.38
1101	0.463					
1101	0.463	0.022	.0218	0.2	58	3.45
1159	0.485					
1159	0.485	0.015	.0141	0.9	38	23.68
1197	0.500					
1197	0.500	0.029	.0291	-0.1	82	1.22
1279	0.529					
1279	0.529	0.051	.0515	-0.5	150	3.33
1429	0.580					
1429	0.580	0.048	.0457	2.3	150	15.33
1579	0.628					
1579	0.628	0.036	.0354	0.6	119.8	5.01
1698.8	0.664					

VELOCITY SURVEY ERROR CHECK

PALMER #1

Depth Rel.S.L. (m)	Av. Vertical Travel Time (check shots)	Ti Check Shots (sec.)	Ti Sonic Log (sec.)	△ (Millisecs.) Ti Check — Ti Sonic	Depth Interval (m.)	Error (Microsec per m.)
379	0.184	0.156	0.152	4.0	400	10.00
779	0.340					
779	0.340	0.073	.0698	3.2	200	16.00
979	0.414					
979	0.414	0.049	.0481	0.9	122	7.38
1101	0.463					
1101	0.463	0.022	.0218	0.2	58	3.45
1159	0.485					
1159	0.485	0.015	.0141	0.9	38	23.68
1197	0.500					
1197	0.500	0.029	.0291	-0.1	82	1.22
1279	0.529					
1279	0.529	0.051	.0515	-0.5	150	3.33
1429	0.580					
1429	0.580	0.048	.0457	2.3	150	15.33
1579	0.628					
1579	0.628	0.036	.0354	0.6	119.8	5.01
1698.8	0.664					

ENCLOSURES

PE902700

This is an enclosure indicator page.
The enclosure PE902700 is enclosed within the container PE902696 at this location in this document.

The enclosure PE902700 has the following characteristics:

ITEM_BARCODE	= PE902700
CONTAINER_BARCODE	= PE902696
NAME	= Depth Structure Map Top of Latrobe Group
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= SEISMIC
SUBTYPE	= HRZN_CONTR_MAP
DESCRIPTION	= Depth Structure Map Top of Latrobe Group
REMARKS	=
DATE_CREATED	= 1/05/82
DATE_RECEIVED	= 29/07/82
W_NO	= W751
WELL_NAME	= Palmer-1
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE902699

This is an enclosure indicator page.
The enclosure PE902699 is enclosed within the container PE902696 at this location in this document.

The enclosure PE902699 has the following characteristics:

ITEM_BARCODE	= PE902699
CONTAINER_BARCODE	= PE902696
NAME	= Geological Cross Section A-A'
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= CROSS_SECTION
DESCRIPTION	= Geological Cross Section A-A'
REMARKS	=
DATE_CREATED	= 1/03/82
DATE_RECEIVED	= 29/07/82
W_NO	= W751
WELL_NAME	= Palmer-1
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE601387

This is an enclosure indicator page.
The enclosure PE601387 is enclosed within the container PE902696 at this location in this document.

The enclosure PE601387 has the following characteristics:

ITEM_BARCODE	= PE601387
CONTAINER_BARCODE	= PE902696
NAME	= Well Completion Log
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= COMPLETION_LOG
DESCRIPTION	= Well Completion Log
REMARKS	=
DATE_CREATED	= 14/10/81
DATE_RECEIVED	= 29/07/82
W_NO	= W751
WELL_NAME	= Palmer-1
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE601386

This is an enclosure indicator page.
The enclosure PE601386 is enclosed within the container PE902696 at this location in this document.

The enclosure PE601386 has the following characteristics:

ITEM_BARCODE	= PE601386
CONTAINER_BARCODE	= PE902696
NAME	= Seismic Quicklook Field log
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= WELL_LOG
DESCRIPTION	= Seismic Quicklook Field log
REMARKS	=
DATE_CREATED	= 10/10/81
DATE_RECEIVED	= 29/07/82
W_NO	= W751
WELL_NAME	= Palmer-1
CONTRACTOR	= SCHLUMBERGER
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE902697

This is an enclosure indicator page.
The enclosure PE902697 is enclosed within the container PE902696 at this location in this document.

The enclosure PE902697 has the following characteristics:

ITEM_BARCODE	= PE902697
CONTAINER_BARCODE	= PE902696
NAME	= Sonic Calibration Curve
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= VELOCITY_CHART
DESCRIPTION	= Sonic Calibration Curve
REMARKS	=
DATE_CREATED	= 1/05/82
DATE_RECEIVED	= 29/07/82
W_NO	= W751
WELL_NAME	= Palmer-1
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE902698

This is an enclosure indicator page.
The enclosure PE902698 is enclosed within the container PE902696 at this location in this document.

The enclosure PE902698 has the following characteristics:

ITEM_BARCODE	= PE902698
CONTAINER_BARCODE	= PE902696
NAME	= Time Depth Curve
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= VELOCITY_CHART
DESCRIPTION	= Time Depth Curve
REMARKS	=
DATE_CREATED	= 27/10/81
DATE_RECEIVED	= 29/07/82
W_NO	= W751
WELL_NAME	= Palmer-1
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE601385

This is an enclosure indicator page.
The enclosure PE601385 is enclosed within the container PE902696 at this location in this document.

The enclosure PE601385 has the following characteristics:

ITEM_BARCODE	= PE601385
CONTAINER_BARCODE	= PE902696
NAME	= Porosity/VCL/NACL
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= WELL_LOG
DESCRIPTION	= Porosity/VCL/NACL
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	= 29/07/82
W_NO	= W751
WELL_NAME	= Palmer-1
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)