VOLUME I

W803

[redacted]

PHILLIPS
PETROLEUM
66

PHILLIPS AUSTRALIAN OIL COMPANY
PERTH, WESTERN AUSTRALIA

WELL COMPLETION REPORT

HERMES NO. 1

PERMIT VIC/P18

VICTORIA

W803

23 SEP 1983

By

PHILLIPS AUSTRALIAN OIL COMPANY

Perth, Australia

August, 1983

CONTENTS

* Interpretative and confidential data

LIST OF FIGURES

LIST OF TABLES

* Interpretative and confidential data

LIST OF ENCLOSURES

ENCLOSURE

LIST OF APPENDICES

APPENDIX

LIST OF ADDENDA

ADDENDA

* Interpretative and confidential data

SUMMARY

Drilling

The Hermes No. 1 well was drilled from the semi-submersible drilling unit Diamond M "Epoch" in a water depth of 85 metres. The well was drilled to a total depth of 4565 metres* and tested within 95 days.

The Diamond M "Epoch" arrived on location at 1754 hours on February 13, 1983. The well was spudded at 0650 hours on February 15. A 36 inch hole was drilled to 166 metres. Hole bridging and stuck pipe were experienced while drilling this part of the hole. While running the 30 inch conductor, fill was encountered at 113 metres. Attempts were made to wash the conductor down. The attempts failed after the conductor reached 129 metres. The 30 inch conductor was pulled back out of the hole and laid down. The hole was then re-drilled and cleaned to 166 metres. The 30 inch conductor was run and cemented with the casing shoe at 162.5 metres with no problems.

A 26 inch hole was drilled to 364 metres. No problems were encountered during this part of the hole. The 20 inch conductor with 16-3/4 inch wellhead was run and cemented with the casing shoe at 351.1 metres.

The 16-3/4 inch blowout preventer stack was run on the 18-5/8 inch marine riser. After latching on to the 16-3/4 inch wellhead and successfully testing the stack, a 17-1/2 inch hole was drilled with a 14-3/4 inch bit and a 17-1/2 inch underreamer. A formation leak-off test was performed after drilling 3 metres of new hole. The test indicated that formation leak-off occurred at an equivalent mud weight of 13.5 ppg. The 17-1/2 inch hole was drilled to 1112 metres. The electric logs (Dual Induction, Sonic Long Space, Gamma Ray and Caliper) were run. The 13-3/8 inch surface casing was run and cemented with the casing shoe at 1104.8 metres.

*All depths quoted are below rotary kelly bushing located 23 metres above mean sea level.

A 12-1/4 inch bottom hole assembly was made up and run in the hole. A formation leak-off test was performed after drilling 4 metres of new 12-1/4 inch hole below the 13-3/8 inch casing shoe. The test indicated that the formation could withstand an equivalent mud weight of 14.5 ppg. The 12-1/4 inch hole was drilled on to 1344 metres with a conventional Smith SDS bit. At 1344 metres, the bit was changed to an American Coldset stratapax bit. The bit drilled to 1346 metres (2 metres) when the total matrix of the bit washed or twisted off. Several trips were required to crush and fish the bit matrix out of the hole. (Testing later revealed the bit to be defective).

Drilling of the 12-1/4 inch hole was continued with conventional bits to 1846 metres. During this part of the hole, numerous wash outs in the drillcollars and vibrations in the riser occurred. It is believed that these problems were caused by vibrations in the drilling string, originating from an unknown source. Steps were taken to solve these problems. A 12-1/4 inch turbo drill with a diamond bit was run in the hole. The turbine drilled to 1943 metres with no vibration problems or washouts. At this point, conventional 12-1/4 inch bits were run back in the hole and drilling continued to 2589 metres with no problems. Electric logs were run and selective side wall cores were shot. The 9-5/8 inch casing was run and cemented with the casing shoe at 2562.3 metres.

During the displacement of the cement from the 9-5/8 inch casing, (approximately 0130 hours on March 19), the Epoch listed 4-1/2 degrees forward and 5 degrees starboard. The general alarm was sounded. The Epoch was brought back to a stable condition by 0230 hours by shifting ballast. The cause of the list was undetermined at this time. At 0810 hours, the Epoch again listed 4-1/2 degrees forward and 5 degrees starboard. The alarm was sounded and the rig was brought back to a stable condition. The decision was made to evacuate all non essential personnel by helicopter until the cause could be found and corrected.

The source of the problem was found to be a faulty 16 inch ballast header valve. The valve was repaired, tested and inspected by an American Bureau of Shipping representative. Approval was then given to return the personnel to the rig.

An 8-1/2 inch bottom hole assembly was made up and run in the hole. The cement plug, float collar and float shoe were drilled to 2562 metres. Due to excessive rig heave, a decision was made to cancel the leak-off test and drill ahead. An 8-1/2 inch hole was drilled to 3726 metres. Intermediate electric logs were run and an 8-1/2 inch hole was drilled on to 4060 metres. (The mud was gas cut from 9.1 ppg to 8.8 ppg in several places). The weather deteriorated at 4060 metres. Ten stands were pulled and the weather deteriorated further which prevented pulling back into the 9-5/8 inch shoe. The drill pipe was hung off in the wellhead with the bit at 3874 metres. Twenty-seven hours were lost waiting on weather.

After the weather abated, the drill pipe was retrieved and found to be stuck. After 9-1/2 hours of working, the drill pipe came free. The 8-1/2 inch hole was continued to 4,462 metres. Electric logs were run, selective side wall cores were shot and a velocity survey was run.

A decision was made to drill deeper. The 8-1/2 inch hole was continued to 4565 metres (Total Depth). Electric logs were run and selective side wall cores were shot. A full string of seven inch casing was run and cemented with the shoe at 4547 metres. The BOP was pulled. The 5 inch upper and middle pipe rams were changed out to 3-1/2 inch rams. The BOP was stump tested and re-run back to the wellhead and tested again.

A 6 inch bottom hole assembly was made up and run in the hole. The D.V. cementing collar was tagged at 2545 metres and drilled out. Next, the CBL-VDL-GR-CCL logs were run from 4493 metres to 2520 metres. The cement bond log showed excellent bond throughout the intended drillstem test intervals. A 6 inch bit with a 7 inch casing scraper was run in the hole. Cement was tagged at 4505 metres and drilled out to 4517 metres. The 7 inch casing was perforated from 4415 metres to 4425 metres, 4427 metres to 4431 metres and 4432 metres to 4442 metres with four shots per foot. The drillstem test tools were made up and run in the hole to perform DST No. 1.

DST No. 1 was conducted May 3 through May 6. After the test, the tools were pulled out of the hole. It was discovered that 7.3 metres of the DST tools had been left in the hole. The pin on the Big John Jars had broken off when attempting to unseat the packer. The remaining DST tools were fished out of the hole. An EZSV squeeze packer was set at 4411 metres and a squeeze job was attempted. The squeeze job was aborted after no injection could be established into the formation. Cement was placed on top of the packer.

The 7 inch casing was perforated from 4383 metres to 4388 metres and from 4400 metres to 4403 metres with four shots per foot. The DST tools were made up and run in the hole to conduct DST No. 2.

DST No. 2 was conducted May 10 through 11. After the test, the tools were pulled out of the hole. FIT No. 1 was conducted at 4232 metres and FIT No. 2 was conducted at 3567 metres. The wireline parted and FIT No. 2 was lost in the hole. The tool was successfully fished out. FIT No. 1 was re-run across the 4230 metre to 4232 metre interval. The second run was considered to be a mis-run because of channelling from the original FIT No. 1 perforations.

Preparations were made to plug the well. Two balanced cement plugs were placed from 4411 metres to 4160 metres and from 3630 metres to 3500 metres, covering all perforations with cement. A second EZSV packer was set at 3490 metres and another balanced plug was set from 3490 metres to 3358 metres. The 7 inch casing was cut at 251 metres, and the 9-5/8 inch casing was cut at 194 metres. Both casing hangers and several joints of casing were recovered. A balanced cement plug was set from 290 metres to 126 metres.

The BOP stack and riser were pulled and recovered. An explosive charge was detonated 9 metres below the 16-3/4 inch wellhead. The 16-3/4 inch wellhead with a 20 inch casing stub, a 30 inch casing stub and a 13-3/8 inch casing stub were recovered.

The anchors were pulled and the "Epoch" departed the Hermes No. 1 location at 1930 hours EST May 19, 1983.

Geological

The Hermes No. 1 well was located on a seismically defined intra-Latrobe anticlinal anomaly developed on the upthrown side of a northwest-southeast trending fault. The anomaly occurs as a deeper separate culmination developed on the eastern arm of the Kingfish structure. The well was designed to test three postulated intra-Latrobe target horizons.

Sediments penetrated by Hermes No. 1 range from Recent to Upper Cretaceous (Campanian) in age. The youngest of these extend from the seafloor to 306 metres and include unnamed sands and calcarenites of Miocene to Recent age. The section from 306 metres to 1878 metres consists of interbedded massive calcarenite and marl of the Mid-to-Late Miocene Gippsland Limestone. The underlying Lakes Entrance Formation of Early Oligocene to Mid-Miocene age consists of calcareous claystone to 2162 metres and calcareous siltstone from 2162 metres to the base of the formation at 2502 metres. A regional unconformity at 2475 metres corresponding to the "Cobia Event" separates the Oligocene and Miocene sediments.

The Top Latrobe Group occurs at 2502 metres and is marked by a lithologic change from siltstones of the lower Lakes Entrance Formation to fine grained sandstones of the conformably-underlying Colquhoun Formation. An unconformity occurs at 2508 metres which separates the Colquhoun Formation from the underlying Flounder Formation, a fine-grained silty sandstone of estuarine origin. Together, the Colquhoun-Flounder Formations comprise the Eocene section at Hermes No. 1, and constitute the interval 2502 metres to 2544 metres.

The Paleocene section is characterized by dominantly coarse grained sandstones of near-shore beach/barrier environments interbedded with finer-grained back/barrier, lagoonal and coastal plain facies. This interval occurs between 2544 metres and 2881 metres. Known as the Latrobe Clastics, it is bounded above and below by unconformities.

The Upper Cretaceous Maastrichtian rocks at Hermes No. 1 extend from 2881 metres to the Campanian boundary at 3587 metres. The section from 2881 metres to 3150 metres includes thinly-interbedded sandstones, siltstones and claystones of back barrier/lagoonal origin. Below 3150 metres the section is dominated by numerous 1-to-3 metre thick coal seams interbedded with carbonaceous siltstones, shales and sandstones. These coal measures extend to 4375 metres.

A tight immature sandstone of upper fluvial plain-to-alluvial fan origin occupies the section from 4375 metres to 4442 metres, underlain by lower fluvial plain silts, shales and coals. The well reached total depth within the Campanian at 4565 metres.

Numerous hydrocarbon shows occurred within the Paleocene and Cretaceous intra-Latrobe section. Shows were mainly cut fluorescence with locally minor-to-moderate pinpoint to patchy primary fluorescence. In general the shows increased in frequency and intensity with depth, with an accompanying rise in total gas. This reflects an increase in source rock maturity as evidenced from geochemical analysis and vitrinite reflectance data.

The strongest shows occurred in the sandstone interval between 4375 metres and 4442 metres. Wireline log analysis further indicated the presence of hydrocarbons. Two drillstem tests within the interval failed to recover significant hydrocarbons, returning instead, fresh water with small amounts of oil emulsion and dry methane-rich gas. Formation interval tests were also conducted within two thin sandstone horizons within the coal measures. These likewise recovered water and dry gas with minor amounts of a condensate-like oil emulsion occurring only in F.I.T.-1.

Post-drilling analysis reveals a close agreement between predicted seismic depth and actual drill depths, and confirms the validity of the original structural analysis. Geochemistry indicates rich source rocks within the coal measures which reach maturity below approximately 4000 metres. Ample reservoirs are provided by the thick stacked beach-barrier sands of the Latrobe Clastics.

The absence of a substantial hydrocarbon accumulation at Hermes No. 1 is attributed to the lack of an adequate sealing unit within the Latrobe Clastics and to the poor reservoir development within the coal measure sequence. Upward migrating hydrocarbons have probably travelled unobstructed to the Top Latrobe unconformity where, due to lack of structural closure, they have moved laterally up-dip to the Kingfish structure. Poor fault seal may also have provided avenues for upward hydrocarbon migration and escape.

The presence of fresh, probably connate water and over-pressuring of the deep sands below 4375 metres demonstrate that the reservoir is hydrodynamically sealed, thus precluding displacement of formation water by upward-migrating hydrocarbons. Poor reservoir qualities further inhibit the production of hydrocarbons from these sands.

INTRODUCTION

Hermes No. 1 was the third well to be drilled in offshore Exploration Permit Vic/P18 in the Bass Strait off the southeastern coast of Victoria, Australia. This permit is held by a group consisting of Phillips Australian Oil Company (Operator), Mount Isa Mines Limited, and Lend Lease Petroleum Limited.

Hermes No. 1 was located at Latitude 38 degrees 36 minutes 08.0173 seconds South and Longitude 148 degrees 17 minutes 54.2774 seconds East (Figure 1). Drilling was performed from the semi-submersible drilling unit Diamond M "Epoch" in 85 metres of water.

figure 1 to follow

PE905102

This is an enclosure indicator page.
The enclosure PE905102 is enclosed within the container PE902581 at this location in this document.

The enclosure PE905102 has the following characteristics:

ITEM_BARCODE =	PE905102
CONTAINER_BARCODE =	PE902581
NAME =	Permit Vic/P18 Location Map
BASIN =	GIPPSLAND
PERMIT =	VIC/P18
TYPE =	GENERAL
SUBTYPE =	PROSPECT_MAP
DESCRIPTION =	Gippsland Basin Permit Vic/P18 Location Map showing various gas and oil fields. Figure 1 of WCR volume 1.
REMARKS =	
DATE_CREATED =	31/08/1983
DATE_RECEIVED =	23/09/1983
W_NO =	W803
WELL_NAME =	Hermes-1
CONTRACTOR =	
CLIENT_OP_CO =	Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)

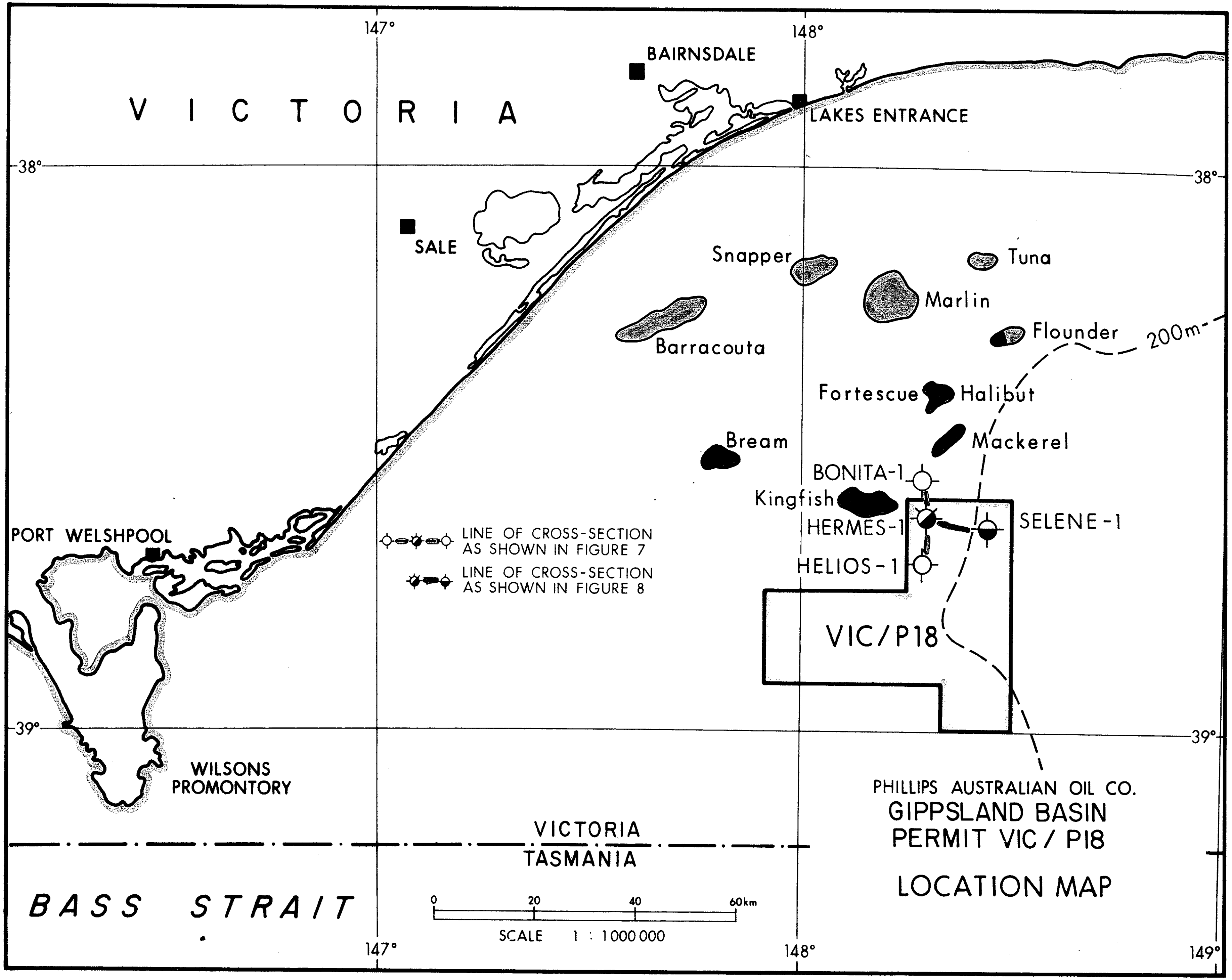


FIGURE 1

A-5405-3

WELL HISTORY

The following provides details on the operational parameters of Hermes No. 1.

General Data

Well Name	: Hermes No. 1
Name and Address of Operator	: Phillips Australian Oil Company 23rd floor, City Centre Tower 44 St. George's Terrace PERTH. W.A. 6000. (G.P.O. Box 2066W PERTH. W.A. 6001.)
Co-venturer Parties' Names and Addresses	: Lend Lease Petroleum Limited Australia Square Tower, Level 38, SYDNEY. N.S.W. 2000 Mount Isa Mines Limited 15th floor, 160 Ann Street BRISBANE, QLD. 4000.
Exploration Permit	: VIC/P18
District	: Gippsland Basin, Victoria
Location	: Lat. 38 degrees 36 min 08.0173 sec South Long. 148 degrees 17 min 54.2774 sec East
Elevations	: Water depth 85 metres (279 feet) R/T to seabed 108 metres (354 feet)
Total Depth	: 4565 metres (14,977 feet) RKB
Status	: Plugged and Abandoned

DRILLING DATA

Name and Address of Drilling Contractor	:	Diamond "M" Marine Company 2121 Sage Road, Suite 200 P.O. Box 22738 Houston, Texas 770727 U.S.A.
Drilling Vessel	:	Diamond M "Epoch" Semi-Submersible Drilling Unit Length : 290 feet Beam : 200 feet Lower Hull Beam : 35 feet Lower Hull Depth : 25 feet Lightship Displacement :7754 long tons
Operating Depth	:	30,000 feet in 1,200 feet of water
Position System	:	Honeywell RS-505 Acoustic Position and Riser Angle indicator
Heave Compensator	:	Vetco 400-20D with 400,000 lbs capacity - 20' stroke
Riser Tensioning	:	6ea - Western Gear 80,000 lbs - 50' stroke
Guide Line Tensioning	:	4 ea - Western Gear 16,000 lbs - 40' stroke
Slip Joint	:	Vetco X-52 with MR-4B connectors - 40' stroke
Riser	:	Vetco X-52 18-5/8" x 5/8" wall MR-4B connectors
Diverter	:	Regan Model KFDH-3
B.O.P.	:	16-3/4" - 10,000 lbs working pressure - H2S Trimmed/Vetco Ball Joint with MR-4B connector/C.I.W. Riser connector/Two Hydril annular preventers/Two-double "U" Cameron Ram preventors

B.O.P. Control System	:	Koomey with Acoustic Back-up
Choke Manifold	:	10,000 lbs working pressure - H2S trimmed with Cameron type F Gate valves/Two adjustable chokes and one remote operated Swaco Super Choke.
Pumps	:	Two Oilwell 1700 PT Triplex pumps with pulsation dampeners. Each driven by two GE-752 DC motors. Mud Pumps to be charged by two 6 x 8 centrifugal pumps.
Drawworks	:	Oilwell E-3000 driven by two GE 752 DC motors, with Baylor 7838 electric brake and Crown-O-Matic.
Power	:	Two EMD 16E-9 Diesel Engines, 3070 Hp. Each driving EMD 2000 KW AC Generators. One EMD 16E-8 Diesel Engine, 2200 Hp, driving EMD 1500 KW AC Generator.
Storage	:	Sack storage 3,500 sacks
		Bulk tanks 10,000 cu. ft.
		Mud tanks 1,594 BBLS
		Fuel 6,400 BBLS
		Drillwater 15,842 BBLS
		Potable water 755 BBLS
		Mud volume active 660 BBLS
		Mud volume reserve 681 BBLS
		Helifuel 3 ea 5,000 litres

TIME ANALYSIS

Significant Times and Dates

	Hours	Date
Departed Selene No. 1 loation	1520	13th February, 1983
Arrived at Hermes No. 1 Location	1754	13th February, 1983
Spud Hermes No. 1	0650	15th February, 1983
TD	1800	20th April, 1983
Depart Location	1930	19th May, 1983

Time Breakdown from transfer from Selene No. 1, till departure from Location

	Hours	%
Drilling	639.0	27.98
Reaming/Hole Opening	16.5	0.72
Cond. mud and circ.	132.0	5.78
Trips and making up BHA	617.0	27.01
Dev Survey	5.5	0.24
BOP Run/Retrieve	43.0	1.88
BOP Testing	55.0	2.41
Surface Equip. Test	2.0	0.09
Logging	123.5	5.41
Cementing	24.0	1.05
DST/Leak off test	160.5	7.03
Repairs mechanical	74.0	3.24
Fishing	39.5	1.73
Delays	5.5	0.24
Weather delays	87.0	3.81
Move and positioning	4.0	0.18
Casing	106.5	4.66
Velocity survey	4.5	0.20
Anchoring	91.0	3.98
Other	54.0	2.36
	2284.0	100.00

WELL COMPLETION RECORDS

Included as Tables 1-6 are details concerning the drilling and testing of Hermes No. 1. Enclosure No. 1 is the operational summary for Hermes No. 1. A summary of daily operations is given in Appendix No. 2. A detailed report on the Hermes No. 1 drillstem test is included as Addendum 5.

Table 1

Hermes No. 1

Totco Survey Summary

Depth m (ft) RKB	Vertical Deviation - Degrees
135.0 (443)	0.50
166.4 (546)	0.50
264.3 (867)	0.50
359.7 (1,180)	0.75
519.7 (1,705)	0.75
815.0 (2,674)	0.25
1112.2 (3,649)	1.00
1298.5 (4,260)	2.00
1344.5 (4,411)	1.50
1640.8 (5,383)	2.75
1788.9 (5,869)	1.25
1916.9 (6,289)	0.75
2489.9 (8,169)	1.50
2590.2 (8,498)	1.75
3198.9 (10,495)	1.25
3493.7 (11,462)	1.25
3729.9 (12,224)	1.00
3958.5 (12,987)	0.75
4146.9 (13,605)	0.75
4282.8 (14,051)	0.75
4461.7 (14,638)	1.00
4565.0 (14,977)	2.00

le

Hermes No. 1 - Casing and Cement

Elevations
RKB to MSL 23 metres (75 ft.) RKB to seabed 109 metres (358 feet)

Casing						Cement				
Date	Size	Weight	Grade & Coupling	Amount Run	Depth Set (RKB)	Cuft Slurry	Class/Type	Slurry Weight	TOC	Additives
18.2.83	30"	1" wall	Vetco Squnch	57.19m	162.46m	1725	Class G/Neat mixed with seawater	15.8 PPG	seabed	Nil
19.2.83	20"	133 lb/ft	X-56 Cameron JV Type LW	246.58m	351.12m	Lead 1560	Class G/Neat mixed with drillwater	12.8 PPG	seabed	2.5% gel-water
						Tail 575	Class G/Neat mixed with seawater	15.8 PPG		Nil
24.2.83	13-3/8"	72 lb/ft	N-80 Buttress	998.53m	1104.81m	Lead 2716	Class G/Neat mixed with drillwater	12.8 PPG	327.0m	2.5% gel-water & 0.5% CFR-2
						Tail 575	Class G/Neat mixed with drillwater	15.8 PPG		0.1% HR-6L 3.7
18.3.83	9-5/8"	47 lb/ft	S-95/L-80 Buttress	2456.21m	2562.33m	Lead 2520	Class G/Neat mixed with drillwater	12.8 PPG	1013.0m	2.5% gel - water, 0.5% CFR-2
						Tail 575	Class G/Neat mixed with drillwater	15.8 PPG		0.5% CFR-2 0.8% Halad 22A 0.01% HR6L
25.4.83	7"	29 lb/ft	N-80/S-95 Buttress	4441.48m	4547.17m	1st stage lead 649	Class G/Neat mixed with drillwater	16.0 PPG	3140.0m	0.6% Halad 22A 0.74% CFR-2 0.46% HR-12
						1st stage tail 1006	Class G/Neat mixed with drillwater	15.2 PPG		50% Silica Flour 0.8% Halad 22A 1.0% CFR-2 0.6% HR-12
						2nd stage Lead 288	Class G/Neat mixed with drillwater	15.8 PPG	1950m	0.8% Halad 22A 0.5% CFR-2 0.01% HR6L

Table 3

Hermes No. 1

Leak Off Test

	Bbls Pumped	Leak Off Pressure	Bbls bled Back	Mud Wt. (ppg)	EMW (ppg)
20" shoe	1.25	295	0.25	8.6	13.5
13-3/8" shoe	1.25	980 (no leak off)	1.25	9.3	14.5
9-5/8" shoe	cancelled	due to	excessive	rig heave	

COMPANY	CONTRACTOR		COUNTY	STATE
Phillips Australian Oil Company [redacted]	Diamond M Marine Co [redacted]	TABLE 4		Vi[redacted]ria [redacted]str[redacted]

LEASE	WELL NO.	SEC.	TOWNSHIP	RANGE	BLOCK	FIELD
Permit Vic/P18	Hermes No. 1				Vic/P18	Bass Strait

TOOL PUSHER	DRILL PIPE 5" Grade E & S - 135	DRAW WORKS Oilwell E-3000	
DAY DRILLER	TOOL JOINT MAKE — SIZE 4½ TYPE 1F	POWER Electric H P	UNDER SURF
EVENING DRILLER	DRILL COLLAR NO 20 O.D 7¾ I D 2 13/16 LENGTH 30'	PUMP NO. 1 MAKE Oilwell MODEL A 1700 PT STROKE	INT DATE 0650 hour 15 Feb. 1983
MORNING DRILLER	DRILL COLLAR NO 30 O.D 6½ I D 2 13/16 LENGTH 30'	PUMP NO 2 MAKE Oilwell MODEL A 1700 PT STROKE	T D DATE 1800 hour 20th April 1983

BIT NO	BIT SIZE	BIT MFGR.	BIT TYPE	SERIAL NO. OF BIT	JET SIZE			DEPTH OUT	FTGE	HOURS RUN	ACC. HOURS	FT/HR	WEIGHT 1000 LBS.	ROTARY R.P.M	VERT. DEV.	PUMP PRESS	PUMPS			MUD		DULL CODE			REMARKS FORMATION, CIRC. FLUID, ETC.	DATE
					1	2	3										No.	Liner	SPM	Wt	Vis	T	B	G		
1RR	26"	HTC	OSC 3AJ	JL 117	28	28	28	546	189	3.5	3.5	54	0/5	75/100	½°	1000	½	6.5	200	8.6	SW	2	3	I	Used on Selene	18/2
1	36"	Hole opener			22	22	22	New Servco cutters					0/5	75/100	½°	1000	½	6.5	200	8.6	SW	Both can be RR				18/2
1RR	26"	HTC	OSC 3AJ	JL 117	28	28	28	1195	649	6.5	10.0	100	0/10	75	3/4°	1000	½	6.5	200	8.6	SW	2	4	I	Sand, Soft LS	19/2
2	14¾	STC	DSJ	MA 4830	24	24	24	2968	1773	21.0	31.0	84	25/40	110	¼°	2300	½	6.5	220	9.5	31	3	5	I	L-stone, Marl	21/2
3	14¾"	STC	DSJ	MA 4814	24	24	24	3649	681	21.5	52.5	31.7	30/50	110	1°	2500	½	6.5	220	9.5	15	3	4	I	Marl	23/2
4	12¼"	Smith SDT	SDT	XA 1459	14	14	14	4276	627	18.0	70.5	35	40/45	110	2°	3000	½	6.5	150	9.3	36	4	5	I	Broken teeth Limestone	25/2
5	12¼"	Smith	SDS	CH 4958	14	14	14	4411	135	10.5	81.0	12.9	30/45	100	1½°	3000	½	6.5	150	9.2	38	2	2	I	Drill with bumper subs	28/2
6	12¼"	ACC	Wild-cat II	22186	15	15	15	4416	5	[illegible]	81.5	10	15/20	110	-	3000	½	6.5	145	9.1	37				Head broke off	1/3
7	12⅛"	Servco	Junk-mill	703820	o p	e	n	4416	0	2.5	84.6	0	15/40	30	-	2000	½	6.5	200	9.1	36	50% used				2/3
RR 7	12⅛	Servco	Junk mill	703820	o p	e	n	4416	0	4.5	88.5	0	15/40	30	-	2000	½	6.5	200	9.0	38	100% used				3/3
8	12¼"	Smith	SDGH	CK 2580	14	14	14	4421	5	3	91.5	1.7	25/50	60/100	-	3000	½	6.5	145	9.0	38	6	2	I	Recovered junk	3/3
9	12¼"	Smith	SDS	CH 5095	14	14	14	4433	12	3	94.5	4	25/50	60/100	-	3000	½	6.5	145	9.0	38	3	1	I	Recovered junk	3/3
10	12¼"	Smith	SDS	CH 3744	14	14	14	4656	223	9	103.5	24.8	40/45	100	-	3000	½	6.5	140	9.3	33	3	2	I	Drillcollar wash out	4/3
11	12¼"	Smith	SDS	CL 1468	14	14	14	4919	263	8.5	112	30.9	60	90	-	3000	½	6.5	140	9.3	34	3	2	I	23 teeth broken DC Wash out	4/3
12	12¼"	Smith	SDT	CP 5606	14	14	14	4919	0	0	112	0	Never rotated - DC Washed out on circulation													5/3
13	12¼"	Smith	A1	AT 5579	12	15	15	5041	122	11.5	123.5	10.6	40	80	-	3000	½	6.5	138	9.1	34	1	1	I	DC Wash out	6/3
14	12¼"	Smith	SDS	CH 4968	14	14	14	5383	342	17	140.5	20.1	50	135	2¼°	3000	½	6.5	142	9.3	33	3	5	I	Excessive vibration	7/3
RR 12	12¼"	Smith	SDT	CP 5606	14	14	14	5680	297	15	155.5	19.8	60/50	135/140	-	3000	½	6.5	142	9.2	35	6	4	out 1/8	Washed out DC	8/3
15	12¼"	Smith	SDGH	XB 3177	14	14	14	5884	204	11.5	167.0	17.7	50/60	140/60	1¼°	3000	½	6.5	140	9.3	37	2	2	1/8	Washed out DC	9/3
16	12¼"	Smith	SDS	CH 4877	14	14	14	6054	170	6.5	173.5	26.2	60	120	1¼°	3000	½	6.5	140	9.3	35	2	2	I	13 broken teeth W.O. Hydril sub	11/3
RR15	12¼"	Smith	SDGH	XB 3177	14	14	14	6057	3	1.0	174.5	3.0	20	90	1¼°	3000	½	6.5	140	9.3	35	2	2	1/8	Recover 13 broken teeth	12/3

SMITH REPRESENTATIVE ____________ PHONE ____________

TABLE 4 (continued)

[redacted] LEASE [redacted] NO. [redacted] SEC. [redacted] TOW[redacted] R[redacted] K [redacted] D [redacted]

TOOL PUSHER		DRILL PIPE		DRAW WORKS	
DAY DRILLER		TOOL JOINT	MAKE / SIZE / TYPE	POWER / H.P.	UNDER SURF
EVENING DRILLER		DRILL COLLAR	NO / O.D / I.D / LENGTH	PUMP NO. 1 — MAKE / MODEL / STROKE	INT DATE
MORNING DRILLER		DRILL COLLAR	NO / O.D / I.D / LENGTH	PUMP NO 2 — MAKE / MODEL / STROKE	T.D. DATE

BIT NO	BIT SIZE	BIT MFGR.	BIT TYPE	SERIAL NO. OF BIT	JET SIZE 1	JET SIZE 2	JET SIZE 3	DEPTH OUT	FTGE	HOURS RUN	ACC. HOURS	FT/HR	WEIGHT 1000 LBS.	ROTARY R.P.M	VERT. DEV.	PUMP PRESS	PUMPS No.	PUMPS Liner	PUMPS SPM	MUD Wt	MUD Vis	DULL CODE T	DULL CODE B	DULL CODE G	REMARKS FORMATION, CIRC. FLUID, ETC.	DATE
17	12¼"	Diamax	MS5	212-10		Nil		6349	292	16.0	190.5	18.25	20/45	Turbine 40	¾°	3100	½	6.5	135	9.2	36				98% recovery	13/3
18	12¼"	Diamax	ADS2	210-23		Nil		6373	24	2.5	193.0	9.6	5/30	Turbine	¾°	3100	½	6.5	135	9.2	37				mint condition	14/3
19	12¼"	Smith	SDT	CP7322	14	14	14	8169	1796	33.5	226.5	53.6	55	130	1½°	3000	½	6.5	140	9.5	51	3	7	I	one cone locked up	14/3
20	12¼"	Smith	SDT	CP6430	14	14	14	8498	329	9.5	236.0	34.6	30/55	110/130	¾°	3000	½	6.5	139	9.8	45	4	1	⅜"	Out of gauge	16/3
RR 20	12¼"	Smith	SDT	CP6430	14	14	14	8498	0		Wiper trip						½	6.5	139	9.8	45	4	1	⅜"		18/3
21	8½"	Smith	F2	XA9598	10	10	10	10495	1997	64.0	300.0	31.2	40/45	70	1¼°	2900	½	6.5	77	9.2	46	6	6	¼"	Out of gauge	21/3
22	8½"	Smith	F3	XA7761	10	10	10	11462	967	58.0	358.0	16.7	45	70	1¼°	2900	1	6.5	76	9.2	44	5	8	¼"	Out of gauge	26/3
23	8½"	Smith	F3	XA8790	10	10	10	12224	762	49.0	407.0	15.6	45	50	1°	2900	1	6.5	76	9.1	44	4	4	⅛"	Under gauge	29/3
24	8½"	Smith	F3	SB1658	10	10	10	12987	763	48.5	455.5	15.7	40/45	50	¾°	2800	1	6.5	76	9.1	40	5	4	⅛"	Under gauge	1/4
25	8½"	Smith	F3	XB6013	10	10	10	13605	618	50.5	506.0	12.4	40/50	50	¾°	2700	1	6.5	70	9.8	44	5	4	⅛"	Under gauge	4/4
26	8½"	Smith	F4	CE2947	10	10	10	14051	446	50.0	556.0	8.9	45	50	¾°	2650	2	6.5	72	9.7	46	3	3		In gauge	9/4
27	8½"	Smith	F3	XB2238	10	10	10	14638	578	46.5	602.5	12.4	45/48	50	1°	2650	2	6.5	74	9.8	46	5	5	⅛"	Under gauge	12/4
28	8½"	Smith	F3	XB5998	9	9	9	14977	339	36.0	638.5	9.4	45	50	2°	2900	2	6.5	61	10.1	45	6	6	⅛"	32 teeth missing	19/4
29	6"	Smith	FDT	BX9567		Out		8343	Nil	Nil	-	-	3/5	35	2°	2500	1	6.5	52	10.1	42		New		Drill DV collar used w/csg scraper	29/4

SMITH REPRESENTATIVE ______________________ PHONE __________

Compliments of SMITH TOOL

P.O. BOX C19511 • IRVINE, CALIF. 92713-9511
DIVISION OF SMITH INTERNATIONAL, INC.

Table 5

Hermes No. 1

Perforating Record

Date	Size of Casing	Perforations		No. of Metres Perforated	No. of Shots/ft.	Gun Dia.	Gun Type	Company
		From	To					
1.5.83	7", 29 lb/ft, N-80/S-95 Buttress	4415m 4427m 4432m	4425m 4431m 4442m	10m 4m 10m	4	4"	Casing	Schlumberger
1.9.83	7", 29 lb/ft, N-80/S-95 Butress	4383m 4400m	4388m 4403m	5m 3m	4	4"	Casing	Schlumberger

Table 6
Hermes No. 1
FIT Record

	FIT No. 1	FIT No. 2
Interval Tested:	4231.5 metres	3568.9 metres
Date:	May 12, 1983	May 12, 1983
Recovery:		
Gas	59.1 cu. ft.	33.3 cu. ft.
Water	1500 cc	5660 cc
Oil Emulsion	800 cc	0
GOR	11,728 SCFPB	Infinite
Fluid Characteristics		
C1	85.91%	33.72%
C2	7.96%	7.00%
C3	3.54%	2.51%
IC4	0.49%	0.32%
NC4	0.98%	0.45%
IC5	0.26%	0.14%
NC5	0.26%	
Hexanes	0.13%	
Heptanes Plus	0.08%	
CO2	0.05%	Nil
N2	0.33%	
Gravity (Gas)	0.665%	
Viscosity	0.0331@ 7000psig	
Molecular Weight	19.283%	
Water	Brown colour like drilling mud	Brown colour like drilling mud
Resistivity	0.451 @ 59°F	0.39 @ 65°F
Chlorides	8500 PPM	10,000 PPM
NACL Concentration	17,000 PPM	17,000 PPM
Oil Emulsion	Amber yellow like condensate	Nil
Gravity (Fluid)	50° API @ 68°F	Nil
Temperature	280°F	Nil
Pressure Data:	Nil (instrument malfunction)	5124 psi (both shots fired chamber full)
Segregated Sample:	Yes (Report Attached as Appendix No. 12)	No

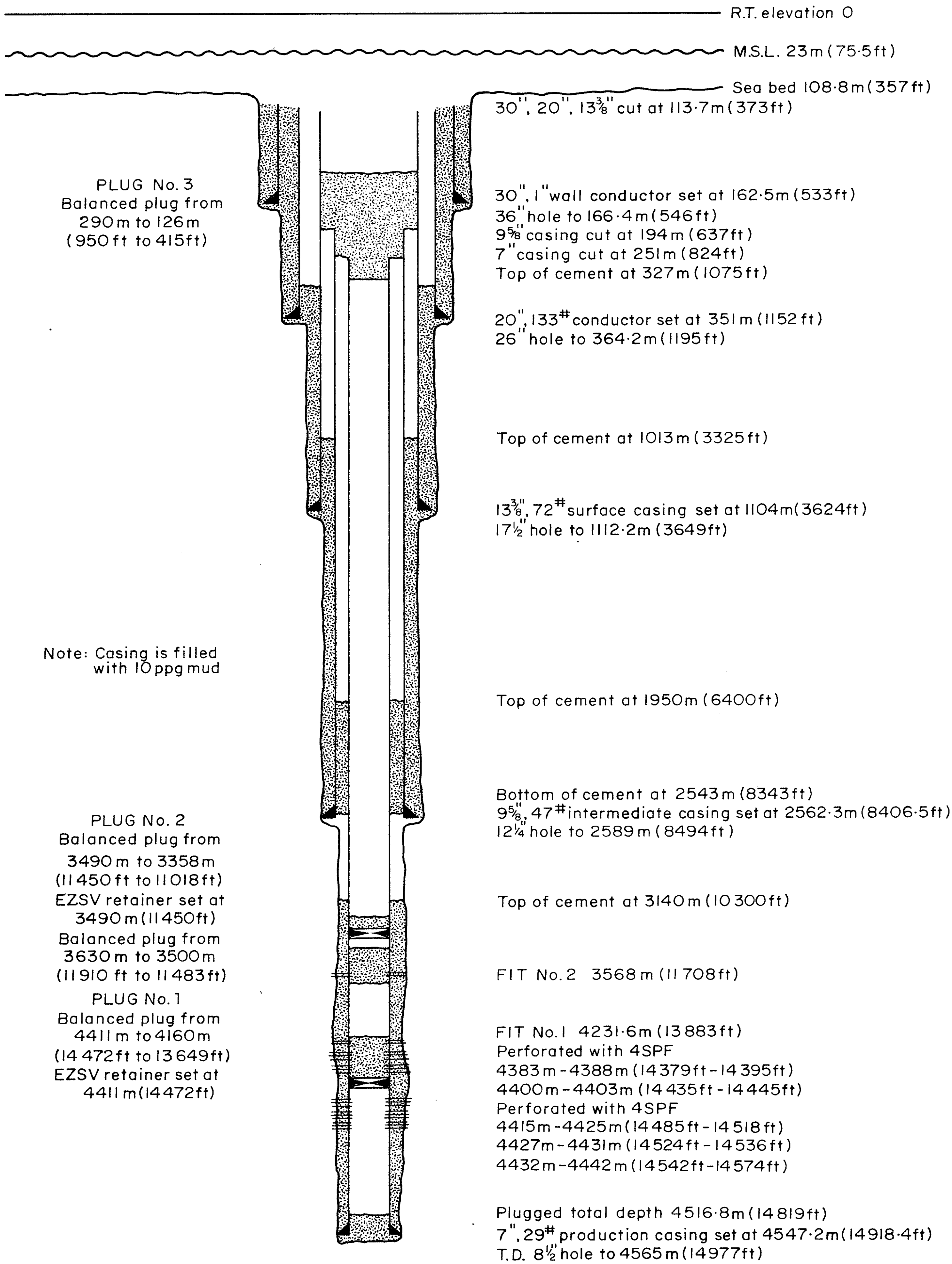
DRILLING FLUIDS

The hole was spudded using sea water, periodically flushing with high viscosity pills. A seawater gel/polymer mud was used from 364.2 metres to T.D. Dextrid Drispac and Monpac were added to maintain the API filtrate within the programmed specifications. Soltex and Torque Trim were added to control torque problems. Mud properties, materials and cost are given in Tables 7-9.

ABANDONMENT STATUS

Table 10 contains the plug information and Figure 2 shows the abandonment status for the Hermes No. 1 well.

HERMES No.1 - ABANDONMENT STATUS



A-5931 **Figure 2**

Table 7

Hermes No. 1

Mud Properties

Depth (metres)	Hole (inches)	Temperature (°C)	Weight (PPG)	Viscosity (Seconds)	PV	YP	PH
166	36	-	8.6	100+	-	-	-
166	36	-	12.0	54	20	20	-
166	36	-	8.6	200+	-	-	-
364	26	-	9.6	100+	-	-	-
628	17-1/2	32	9.2	34	5	11	8.5
890	17-1/2	33	9.5	31	8	8	8.3
1000	17-1/2	35	9.2+	38	8	8	9.5
1112	17-1/2	37	9.6	37	8	8	9.0
1134	12-1/4	35	9.3	35	8	5	9.5
1272	12-1/4	37	9.3+	36	8	7	9.5
1344	12-1/4	-	9.2+	37	8	6	10.0
1345	12-1/4	-	9.2	34	7	5	10.0
1348	12-1/4	36	9.2	38	7	5	9.5
1419	12-1/4	31	9.3	33	5	5	9.5
1497	12-1/4	31	9.3	34	6	6	9.5
1536	12-1/4	33	9.2	34	6	6	10.5
1640	12-1/4	35	9.3	33	6	4	10.5
1730	12-1/4	43	9.2	36	8	5	10.0
1736	12-1/4	35	9.2	36	8	5	10.0
1793	12-1/4	37	9.3	37	9	7	10.5
1845	12-1/4	36	9.3	35	7	4	10.5
1877	12-1/4	39	9.3	35	7	4	10.0
1941	12-1/4	42	9.2	37	8	5	9.5
2088	12-1/4	46	9.3	48	12	17	10.0
2289	12-1/4	47	9.3	46	13	15	9.5
2491	12-1/4	52	9.5	51	13	19	9.0
2590	12-1/4	49	9.8	45	12	13	9.0
2676	8-1/2	33	9.1	40	10	9	9.0
2752	8-1/2	37	9.1+	38	10	8	9.0

Table 7
(continued)

Depth (metres)	Hole (inches)	Temperature (°C)	Weight (PPG)	Viscosity (Seconds)	PV	YP	PH
2906	8-1/2	40	9.2	43	13	12	10.0
2984	8-1/2	41	9.2	48	17	16	10.5
3115	8-1/2	41	9.2	45	17	16	10.0
3174	8-1/2	42	9.2	46	16	14	10.0
3231	8-1/2	42	9.2	41	13	12	10.0
3295	8-1/2	43	9.2	44	14	13	10.0
3349	8-1/2	43	9.1+	44	15	13	10.0
3432	8-1/2	43	9.2	45	16	15	10.5
3511	8-1/2	49	9.2	49	20	16	10.0
3627	8-1/2	48	9.1	45	15	10	10.5
3725	8-1/2	44	9.1+	44	15	13	10.5
3805	8-1/2	46	9.1	41	13	10	10.5
3919	8-1/2	46	9.1+	40	13	8	10.0
3961	8-1/2	40	9.1+	41	13	9	10.0
4041	8-1/2	45	9.7	43	17	8	10.0
4059	8-1/2	42	9.7	42	20	13	10.0
4072	8-1/2	44	9.8	45	17	19	10.0
4147	8-1/2	60	9.8	44	12	21	10.0
4180	8-1/2	56	9.8	43	13	23	10.0
4209	8-1/2	55	9.8	43	11	22	10.0
4283	8-1/2	-	9.7	46	18	28	10.5
4319	8-1/2	49	9.7	42	13	20	10.0
4351	8-1/2	50	9.7	39	11	16	10.0
4451	8-1/2	55	9.8+	39	12	14	9.5
4461	8-1/2	54	9.8+	46	16	17	10.5
4461	8-1/2	38	10.0	38	12	12	10.0
4504	8-1/2	48	10.1	45	16	16	9.5
4532	8-1/2	48	10.1	42	14	14	10.0
4565	8-1/2	52	10.1+	45	17	16	10.0
4565	8-1/2	-	10.1	46	16	15	10.0
4565	7	-	10.1	45	16	14	10.0
4565	7	-	10.1	43	17	13	10.0
4565	7	-	10.1	42	13	9	10.5

Table 8

Hermes No. 1

Mud Materials

Type	Unit	Quantity
Al Stearate	25 kg	8
Aquagel (bulk)	100 lbs	1975
Aquagel (sacks)	100 lbs	155
Baracarb	25 kg	4
Calcium chloride	25 kg	50
Caustic soda	70 kg	256
Dextrid	50 lbs	73
Desco	25 lbs	261
Lime	25 kg	3
Monpac Ultralo	50 lbs	28
Drispac	50 lbs	646
Drispac Superlo	50 lbs	51
Potassium chloride	50 kg	37
Pac-R	50 lbs	15
Q-Broxin	25 kg	32
Sodium ~~Bicar~~bonate	40 kg	4
Soda Ash	40 kg	226
Sodium chloride	50 kg	35
Torq Trim	55 gal	3
Soltex	50 lbs	389
XC Polymer	50 lbs	4
Zinc carbonate	-	31
Baroid (Bulk)	100 lbs	7,200
Mud Chemicals	BBL	1,064
Fresh water	BBL	6,555
Sea Water	BBL	17,030
Total Mud made	BBL	24,449

Table 9

Hermes No. 1

Mud Cost

Interval	Hole Size		Cost A$
Seabed to 166.4m	36"		15,290.76
166.4m to 364.2m	26"		10,989.52
364.2m to 1112.2m	17-1/2"		15,507.19
1112.2m to 2589.0m	12-1/4"		88,155.13
2589.0 to 4565.0m	8-1/2"		90,706.69
Testing	7" Casing		18,727.20
		TOTAL:	$239,376.49

Table 10

Hermes No. 1

Plug Record

Date	Size of Casing	Retainer		Cement Plug						
		Type	Set	Slurry Cu. Ft	Class/ Type	Slurry Weight	Additives	From	To	Company
7.5.83	7", 29lb/ft, N-80/ S-95 Buttress	EZSV	4411m (14,472 ft.)	Nil	Nil	Nil	Nil	Nil	Nil	Nil
13.5.83	7", 29lb/ft, N-80/ S-95 Buttress	Nil		173	G/Neat	15.8	1.0% CFR-2 1.0% HR-12	4411m (14,472')	4160m (13,648')	Halli- burton
13.5.83	7", 29lb/ft, N-80/ S-95 Buttress	Nil		89	G/Neat	15.8	1.0% CFR-2 1.0% HR-12	3630m (11,910')	3500m (11,483')	Halli- burton
13.5.83	7", 29lb/ft, N-80/ S-95 Buttress	EZSV	3490m (11,450 ft.)	Nil	Nil	Nil	Nil	Nil	Nil	Nil
13.5.83	7", 29lb/ft, N-80/ S-95 Buttress	Nil		92	G/Neat	15.8	1.0% CFR-2 1.0% HR-12	3490m (11,450')	3358m (11,018')	Halli- burton
14.5.83	7", 9-5/8" & 13-3/8"	Nil		288	G/Neat	15.8	Nil	290m (950')	126m (415')	Halli- burton

GEOLOGY

SUMMARY OF PREVIOUS INVESTIGATIONS

Offshore exploration began in the 1950's when the Bureau of Mineral Resources conducted regional gravity and aeromagnetic surveys over limited onshore and offshore areas. The main exploration effort began in 1960 when Broken Hill Proprietary Limited (BHP) through its subsidiary, Hematite Petroleum Limited, applied for an exploration permit over the major portion of the offshore Gippsland Basin. This was Permit Vic/Pl.

Results of regional aeromagnetic and reconnaissance seismic surveys were so encouraging that by May 1964 Esso Australia Limited and Hematite Petroleum Limited had concluded an agreement for the joint exploration of the offshore Gippsland Basin.

On June 5, 1965, Barracouta No. 1, the first offshore Gippsland Basin well was abandoned as a gas discovery. To date more than 100 exploration and step-out wells have been drilled in the offshore Gippsland Basin. Twelve oil and gas fields have been declared commercial by Esso-BHP since 1965 with recoverable reserves of approximately 3.6 billion barrels of oil and 8 trillion cubic feet of gas.

Two wells were drilled by Esso/BHP during 1972/73 within the area now occupied by Permit Vic/P18. These were Pike No. 1 and Moray No. 1, which were both plugged and abandoned as dry holes. A number of seismic surveys were also conducted by Esso/BHP within the area, mainly over the period 1968 to 1974.

Following the second mandatory relinquishment of a portion of Permit Vic/P1, Phillips Australian Oil Company and co-venturers were granted Exploration Permit Vic/P18 on September 2, 1981. A 2,303 kilometre seismic survey was recorded in November/December, 1981 with processing completed by early April, 1982.

Drilling in Vic/P18 commenced on October 28, 1982 with the spudding of Helios No. 1, drilled to a total depth of 3500 metres and plugged and abandoned as a dry hole on December 22, 1982. Helios No. 1 was a test of a Top Latrobe anomaly. The well encountered minor hydrocarbon shows at the top of the Latrobe Group in estuarine silts and silty sands of unusually thick Colquhoun/Flounder Formations. This non-reservoir section extended to below the mapped closure.

Selene No. 1, the second well drilled in Permit Vic/P18, was spudded on December 27, 1982. Selene No. 1 was drilled to a total depth of 3539 metres and plugged and abandoned as a dry hole with marginal hydrocarbon shows on February 13, 1983. The primary objective in the well was an intra-Latrobe structural-stratigraphic anomaly which proved to be a thinly-interbedded sand/shale/siltstone interval. The interval lacked a significant sealing unit.

REGIONAL GEOLOGY

The development of the Gippsland Basin can be attributed to two separate phases of continental rifting and separation, firstly that of the Lord Howe Rise and New Zealand land mass from eastern Australia in Late Jurassic - Late Cretaceous time and secondly that of Antarctica from southern Australia in Late Cretaceous - Early Eocene time. Both phases are part of the fragmentation of Eastern Gondwanaland.

The Gippsland Basin developed as a consequence of a divergent wrench shear associated with early rifting, as did also the en-echelon Bass, Torquay and Otway Basins. These wrench shear zones developed in narrow linear rift basins linking the main extensional rift around the southern and eastern margins of the Australian continental plate. The first major unconformity in the Gippsland Basin occurs at the base Upper Jurassic and is related to the onset of rifting between southeastern Australia and the Lord Howe Rise microcontinent. The Tasman Sea breakup unconformity is the second major unconformity in the Gippsland Basin and can be correlated with the top of the Strzelecki Group sediments (Figure 3).

With continued divergent wrench motion between southeastern Australia and Tasmania during the Late Cretaceous to Eocene, second-order left-lateral wrench motion along northwest-southeast extensional faults (tension gashes) became the loci for wrench-induced anticlines along pre-existing faults. With continued opening of the Tasman Sea most of the extensional faults were downthrown to the northeast (Figure 4).

figure 3 to follow

PE905103

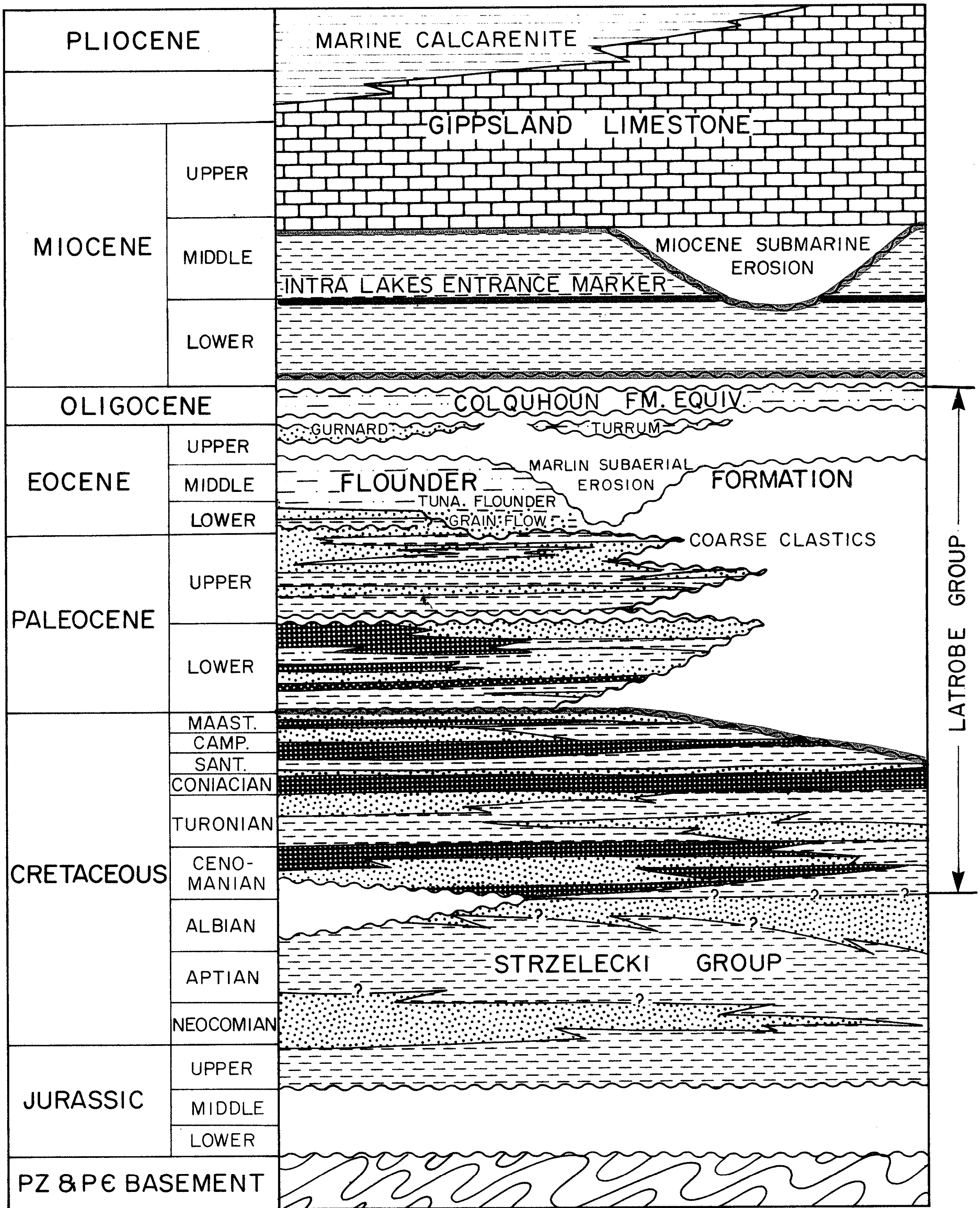
This is an enclosure indicator page.
The enclosure PE905103 is enclosed within the container PE902581 at this location in this document.

The enclosure PE905103 has the following characteristics:

ITEM_BARCODE = PE905103
CONTAINER_BARCODE = PE902581
NAME = Stratigraphic Section Gipplsand Basin
BASIN = GIPPSLAND
PERMIT = VIC/P18
TYPE = WELL
SUBTYPE = STRAT_COLUMN
DESCRIPTION = Hermes-1 Stratigraphic Section, Gippsland Basin with seismic mapping horizons. Figure 3 of WCR volume 1.
REMARKS =
DATE_CREATED = 31/08/1983
DATE_RECEIVED = 23/09/1983
W_NO = W803
WELL_NAME = Hermes-1
CONTRACTOR =
CLIENT_OP_CO = Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)

STRATIGRAPHIC SECTION GIPPSLAND BASIN



SEISMIC MAPPING HORIZONS ——

A-5546
FIGURE 3

During this period, fluvial-paralic clastics and coals of the Latrobe Group were deposited in the Gippsland Basin. An unconformity and/or transgressive sequence at the top of the Late Cretaceous may be related to the onset of rifting in the Southern Ocean. An unconformity at the top of the Latrobe coarse clastic sequence is related to the breakup of Antarctica from Australia in latest Early Eocene time.

During Mid-Eocene time there was a change from divergent to convergent wrench motion along the Gippsland-Otway trend. The mechanisms of this change are not fully understood since the relative over-riding motion between Australia and Antarctica appears to be extensional. Divergent wrench motion between Tasmania and Australia at this time may, however, have been related to incipient movement along fracture zones in the Tasman Sea.

The consequences of the change from divergent to convergent wrench motion were expressed along the northern rift shoulder of the basin. A series of compressional wrench-induced anticlines developed on the northern rift shoulder at a new orientation to the pre-existing wrench anticlinal fabric. This new system developed in an eastnortheast-west-southwest direction and largely grew where listric basin-bounding faults in the northern rift shoulder were able to move in a horizontal fashion. That is, they were reactivated to become wrench faults. Convergent wrenching has continued right up to the present day.

figure 4 to follow

PE905104

This is an enclosure indicator page.
The enclosure PE905104 is enclosed within the container PE902581 at this location in this document.

The enclosure PE905104 has the following characteristics:

ITEM_BARCODE =	PE905104
CONTAINER_BARCODE =	PE902581
NAME =	Structural Trends and Location Map
BASIN =	GIPPSLAND
PERMIT =	VIC/P18
TYPE =	GENERAL
SUBTYPE =	GEOL_MAP
DESCRIPTION =	Hermes-1 Structural Trends and Location Map. Figure 4 of WCR volume 1.
REMARKS =	
DATE_CREATED =	31/08/1983
DATE_RECEIVED =	23/09/1983
W_NO =	W803
WELL_NAME =	Hermes-1
CONTRACTOR =	
CLIENT_OP_CO =	Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)

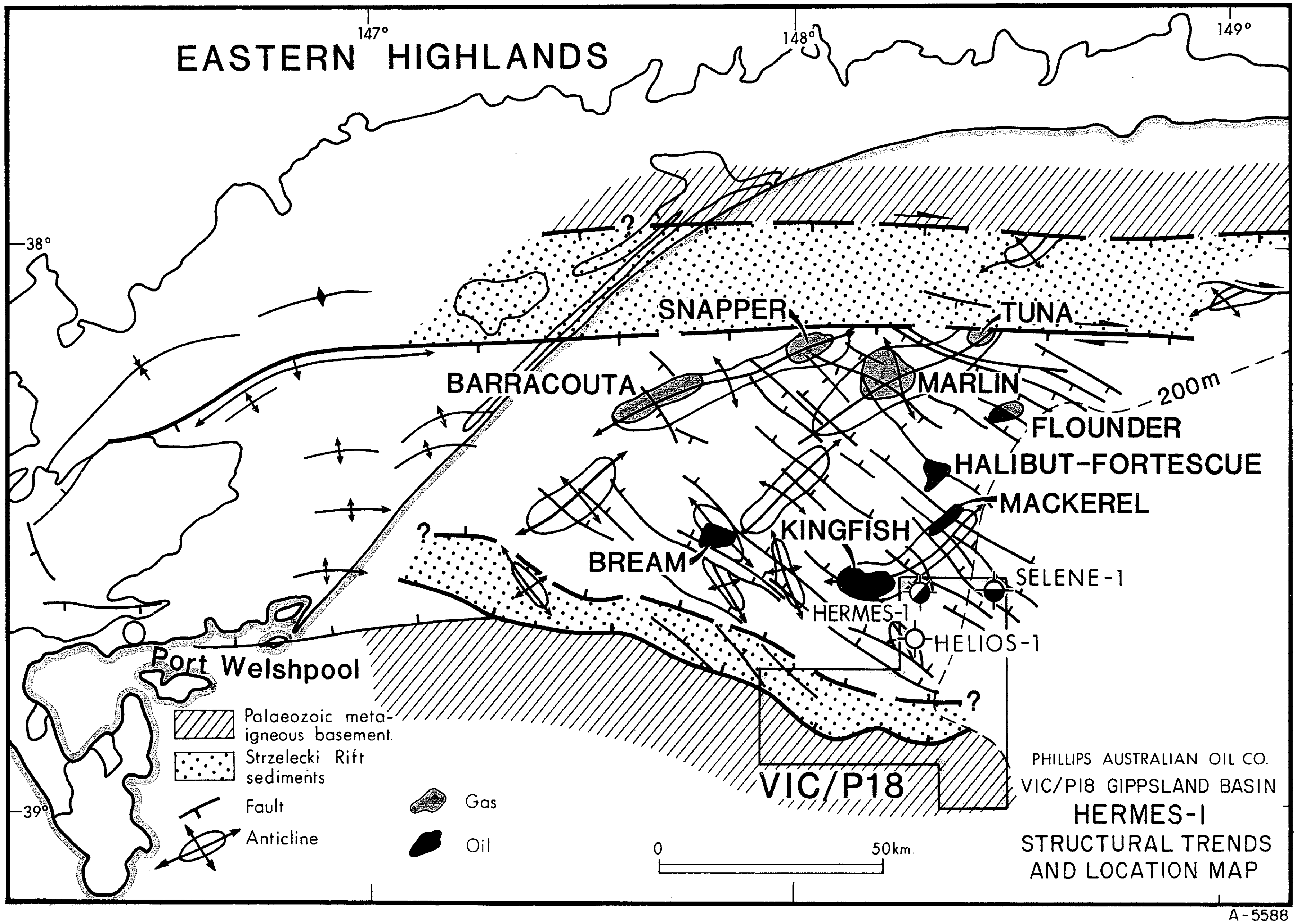

EASTERN HIGHLANDS
147°
148°
149°
38°
39°
SNAPPER
TUNA
BARRACOUTA
MARLIN
200m
FLOUNDER
HALIBUT-FORTESCUE
MACKEREL
KINGFISH
BREAM
SELENE-1
HERMES-1
HELIOS-1
Port Welshpool
VIC/P18
Palaeozoic meta-igneous basement.
Strzelecki Rift sediments
Fault
Anticline
Gas
Oil
0
50km.
PHILLIPS AUSTRALIAN OIL CO.
VIC/P18 GIPPSLAND BASIN
HERMES-1
STRUCTURAL TRENDS AND LOCATION MAP
A-5588

FIGURE 4

STRATIGRAPHY

The stratigraphic section penetrated in Hermes No. 1 extends from Recent to Upper Cretaceous (Campanian) in age. Anticipated versus actual stratigraphic sections are shown in Figure 5. Formation names, lithology and ages are shown in Figure 6.

Formation tops and ages are based upon lithological, micropaleontological, and palynological studies of sidewall cores, core chips and drill cuttings, in conjuction with wireline log characteristics and correlation with the nearby Helios No. 1, Selene No. 1 and Bonita No. 1 wells (Figures 7 and 8). Sampling commenced at 365 metres. All depths were recorded from the Rotary Kelly Bushing 23 metres above mean sea level. Ages for the Mid-to-Late Tertiary are based on micropaleontological data (Enclosure 2), whereas those for the Early Tertiary and Late Cretaceous are based on palynological (spore-pollen and dinoflagellate) data (Appendices 3 and 4).

The stratigraphy of Hermes No. 1 generally reflects an overall transgression interrupted by episodic regressive pulses. Sands and shales in the lowermost portions of Hermes No. 1 represent upper fluvial plain to alluvial fan deposits. These intra-Latrobe sediments are overlain by a thick sequence of thinly-interbedded sands, shales and coals representing the lower fluvial plain. The coal measures are, in turn, overlain by thick sands and interbedded shales and siltstones deposited in strandline/barrier island and proximal back-barrier environments. Continuing up-section the rocks become fine-grained, representing nearshore marginal marine and estuarine environments at the top of the Latrobe Group. The transgressive theme continued with deposition of marine shales of the Lakes Entrance Formation and calcarenites of the Gippsland Limestone.

figure 5 and 6 to follow

PE905105

This is an enclosure indicator page.
The enclosure PE905105 is enclosed within the container PE902581 at this location in this document.

The enclosure PE905105 has the following characteristics:

ITEM_BARCODE =	PE905105
CONTAINER_BARCODE =	PE902581
NAME =	Anticipated vs Actual Stratigraphy
BASIN =	GIPPSLAND
PERMIT =	VIC/P18
TYPE =	WELL
SUBTYPE =	STRAT_COLUMN
DESCRIPTION =	Hermes-1 Anticipated Stratigraphy verses Actual Stratigraphy. Figure 5 of WCR volume 1.
REMARKS =	
DATE_CREATED =	31/08/1983
DATE_RECEIVED =	23/09/1983
W_NO =	W803
WELL_NAME =	Hermes-1
CONTRACTOR =	
CLIENT_OP_CO =	Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)

HERMES-1

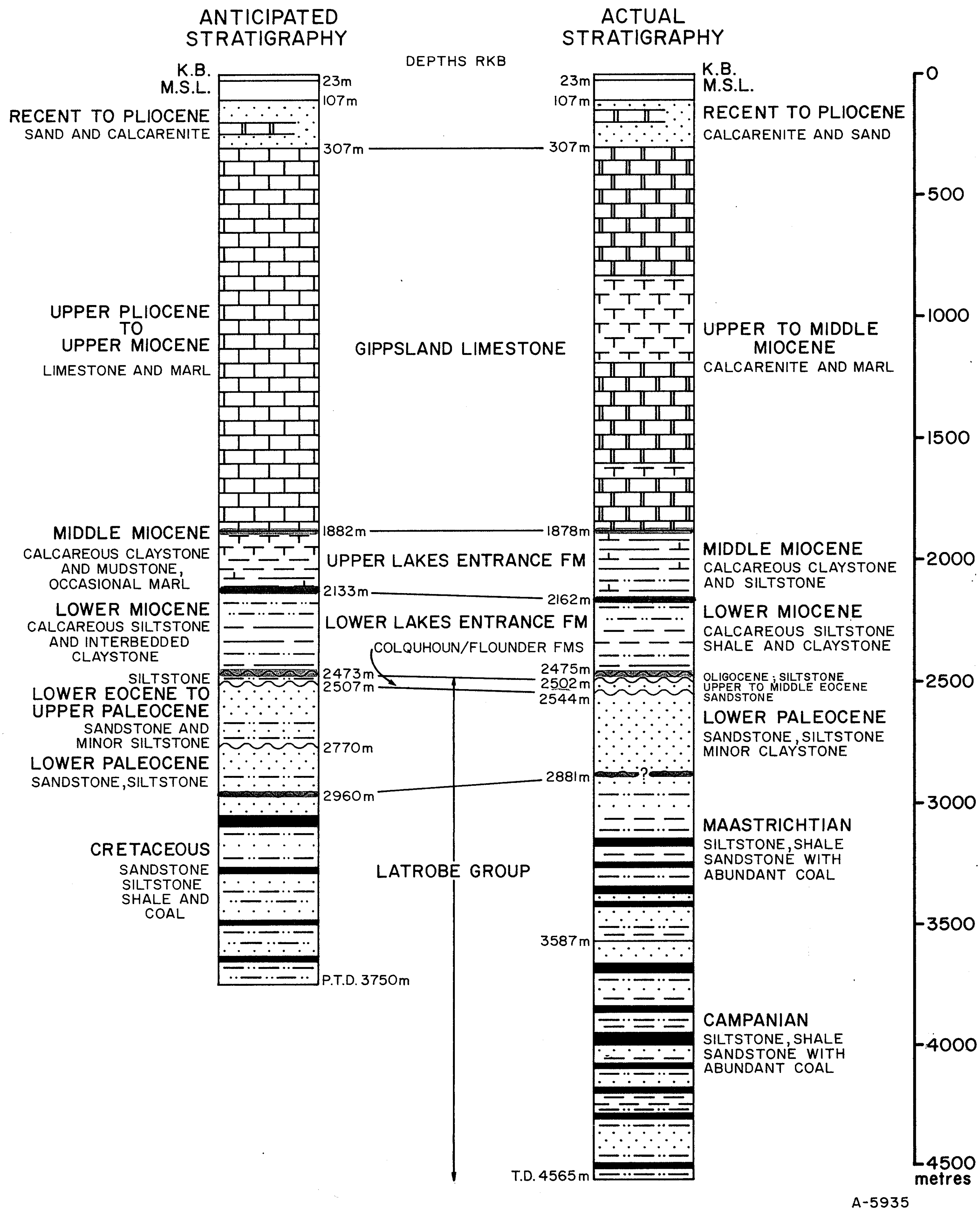


FIGURE 5

PE905106

This is an enclosure indicator page.
The enclosure PE905106 is enclosed within the container PE902581 at this location in this document.

The enclosure PE905106 has the following characteristics:

ITEM_BARCODE =	PE905106
CONTAINER_BARCODE =	PE902581
NAME =	Hermes-1 Stratigraphic Table
BASIN =	GIPPSLAND
PERMIT =	VIC/P18
TYPE =	WELL
SUBTYPE =	STRAT_COLUMN
DESCRIPTION =	Hermes-1 Stratigraphic Table. Figure 6 from WCR volume 1.
REMARKS =	
DATE_CREATED =	31/08/1983
DATE_RECEIVED =	23/09/1983
W_NO =	W803
WELL_NAME =	Hermes-1
CONTRACTOR =	
CLIENT_OP_CO =	Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)

STRATIGRAPHIC TABLE - HERMES-1

AGE	PERIOD		EPOCH / SERIES		MILLION YEARS
CENOZOIC	QUATERNARY		PLEISTOCENE / HOLOCENE		1·6
CENOZOIC	TERTIARY	NEOGENE	PLIOCENE	LATE	3
CENOZOIC	TERTIARY	NEOGENE	PLIOCENE	EARLY	5
CENOZOIC	TERTIARY	NEOGENE	MIOCENE	LATE	10·4
CENOZOIC	TERTIARY	NEOGENE	MIOCENE	MIDDLE	15
CENOZOIC	TERTIARY	NEOGENE	MIOCENE	EARLY	24
CENOZOIC	TERTIARY	PALEOGENE	OLIGOCENE	LATE	32
CENOZOIC	TERTIARY	PALEOGENE	OLIGOCENE	EARLY	37
CENOZOIC	TERTIARY	PALEOGENE	EOCENE	LATE	40
CENOZOIC	TERTIARY	PALEOGENE	EOCENE	MIDDLE	49
CENOZOIC	TERTIARY	PALEOGENE	EOCENE	EARLY	55
CENOZOIC	TERTIARY	PALEOGENE	PALEOCENE	LATE	58
CENOZOIC	TERTIARY	PALEOGENE	PALEOCENE	EARLY	65
MESOZOIC	UPPER CRETACEOUS		MAASTRICHTIAN		69
MESOZOIC	UPPER CRETACEOUS		CAMPANIAN		77
MESOZOIC	UPPER CRETACEOUS		SANTONIAN		83
MESOZOIC	UPPER CRETACEOUS		CONIACIAN		88

FORMATION OR FORMATION EQUIV.	LITHOLOGY	METRES (BELOW R.K.B.)	THICKNESS (m)
		84	
UNNAMED MARINE CALCARENITE	SAND AND CALCARENITE		223
		307	
GIPPSLAND LIMESTONE	CALCARENITE AND MARL		1571
		1878	
LAKES ENTRANCE FM	SLTST, CLYST, SHALE, MARL		284
? ?	? ? 1·5 m.y. ? ?	2162	
		2162	?
LAKES ENTRANCE FM	SILTSTONE CALCAREOUS CLAYSTONE SHALE AND MARL		313
		2475	
"COBIA EVENT" 12 m.y.			
		2475	
LAKES ENTRANCE FM (LATROBE GP)	SST, SLTST, CALC. CLYST		27
		2502	
COLQUHOUN FM (LATROBE GP)			6
		2508	
8 m.y.			
		2508	
FLOUNDER FM (LATROBE GP)	SANDSTONE, SILTSTONE		36
		2544	
10 m.y.			
		2544	
LATROBE GROUP	SANDSTONE AND SILTSTONE		337
? ?		2881	
LATROBE GROUP	SANDSTONE, SILTSTONE, CLAYSTONE, SHALE AND COAL		706
		3587	
LATROBE GROUP			978
		T.D. 4565	

A-5939

FIGURE 6

A major hiatus exists between Early Paleocene and Mid-Eocene strata which represents the "Southern Ocean Rift Onset". This is the final rifting phase between Australia and Antarctica preceding continental breakup and sea floor spreading. The rifting created a drop in sea level causing non-deposition and/or erosion in the Hermes No. 1 area. A significant hiatus also exists between the Mid-Eocene and latest Eocene (Figure 6). This was related to global eustatic changes resulting in marine transgressions and regressions all related to the continued separation of Australia from Antarctica. One final major hiatus exists between the earliest Oligocene and Early Miocene. This unconformity referred to as the "Cobia Event" (Taylor, 1983), is related to the final opening of a deep sea way between Australia and Antarctica, creating a major eustatic sea level low. A possible hiatus separates the Early Miocene and the Mid-Miocene, however, paleontological data is sparse and the presence of the unconformity is questionable.

Brief descriptions of the stratigraphic units penetrated are presented below. Detailed lithologic descriptions of cuttings and sidewall cores are given in Appendices 5 and 6 respectively, and also on the Geologist's Litholog (Enclosure 3) and Geoservices Mud Log (Enclosure 4). A detailed summary of stratigraphic interpretations for Hermes No. 1 is presented on the Well Composite Log (Enclosure 5). Petrographic descriptions of sediments from the Upper Cretaceous sequence are presented in Appendix 6.

figure 7 and 8 to follow

PE905107

This is an enclosure indicator page.
The enclosure PE905107 is enclosed within the container PE902581 at this location in this document.

The enclosure PE905107 has the following characteristics:

ITEM_BARCODE = PE905107
CONTAINER_BARCODE = PE902581
NAME = Cross-Section along Line GP81-67
BASIN = GIPPSLAND
PERMIT = VIC/P18
TYPE = WELL
SUBTYPE = CROSS_SECTION
DESCRIPTION = Generalized Geologic Cross-Section along Seismic Line GP81-67. Figure 7 of WCR volume 1.
REMARKS =
DATE_CREATED = 31/08/1983
DATE_RECEIVED = 23/09/1983
W_NO = W803
WELL_NAME = Hermes-1
CONTRACTOR =
CLIENT_OP_CO = Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)

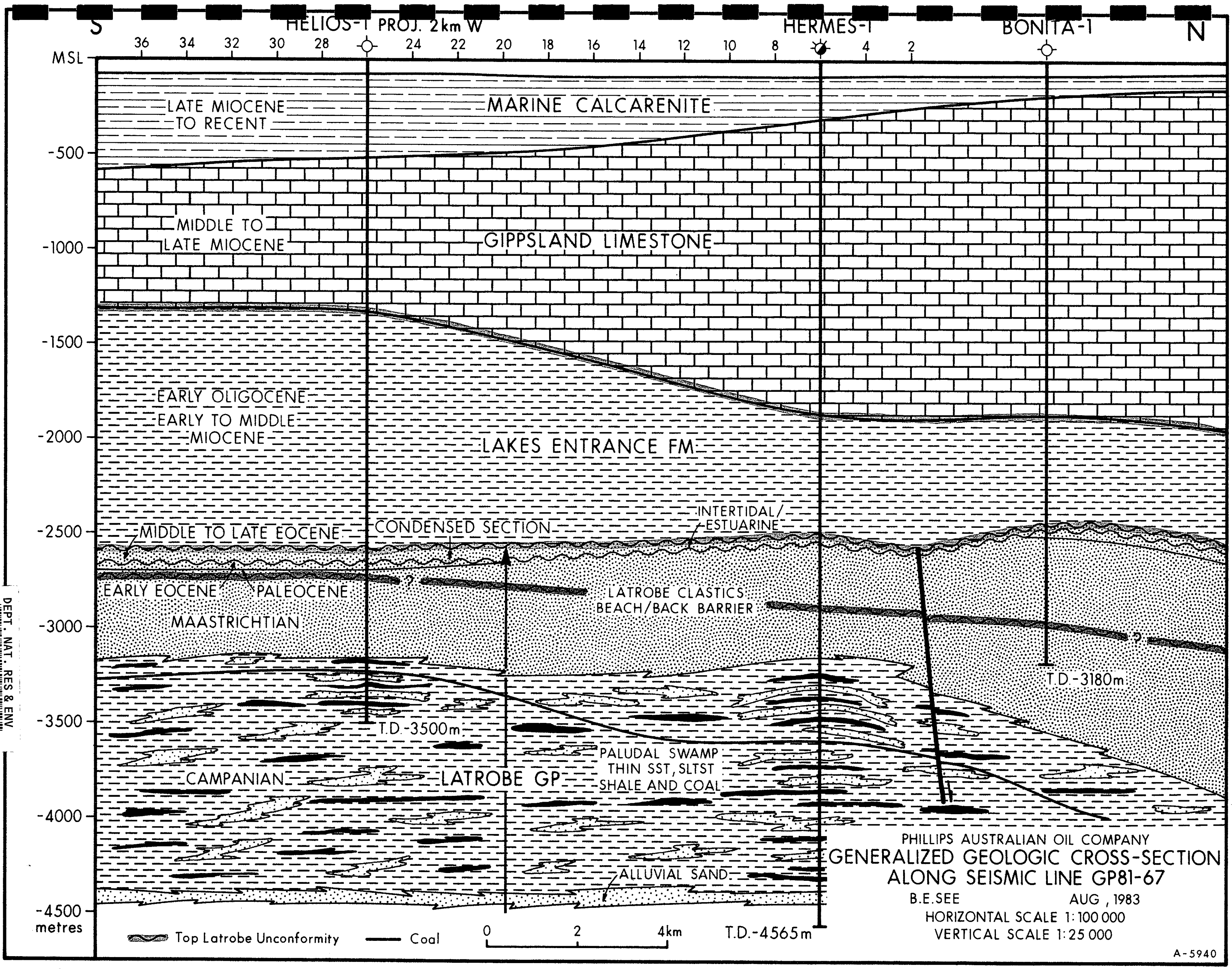

S
HELIOS-1 PROJ. 2km W
HERMES-1
BONITA-1
N
36 34 32 30 28 24 22 20 18 16 14 12 10 8 4 2
MSL
-500
-1000
-1500
-2000
-2500
-3000
-3500
-4000
-4500
metres
LATE MIOCENE TO RECENT
MARINE CALCARENITE
MIDDLE TO LATE MIOCENE
GIPPSLAND LIMESTONE
EARLY OLIGOCENE
EARLY TO MIDDLE MIOCENE
LAKES ENTRANCE FM
MIDDLE TO LATE EOCENE
CONDENSED SECTION
INTERTIDAL/ ESTUARINE
EARLY EOCENE
PALEOCENE
LATROBE CLASTICS BEACH/BACK BARRIER
MAASTRICHTIAN
T.D.-3180m
T.D.-3500m
PALUDAL SWAMP THIN SST, SLTST SHALE AND COAL
CAMPANIAN
LATROBE GP
ALLUVIAL SAND
T.D.-4565m
Top Latrobe Unconformity
Coal
0 2 4km
PHILLIPS AUSTRALIAN OIL COMPANY
GENERALIZED GEOLOGIC CROSS-SECTION ALONG SEISMIC LINE GP81-67
B.E.SEE
AUG, 1983
HORIZONTAL SCALE 1:100 000
VERTICAL SCALE 1:25 000
A-5940

FIGURE 7

PE905108

This is an enclosure indicator page.
The enclosure PE905108 is enclosed within the container PE902581 at this location in this document.

The enclosure PE905108 has the following characteristics:

ITEM_BARCODE =	PE905108
CONTAINER_BARCODE =	PE902581
NAME =	Cross-Section along lines GP81-91, GP81-06
BASIN =	GIPPSLAND
PERMIT =	VIC/P18
TYPE =	WELL
SUBTYPE =	CROSS_SECTION
DESCRIPTION =	Generalized Geologic Cross-Section North along Seismic Line GP81-91 Thence West along Seismic Line GP81-06. Figure 8 of WCR volume 1.
REMARKS =	
DATE_CREATED =	31/08/1983
DATE_RECEIVED =	23/09/1983
W_NO =	W803
WELL_NAME =	Hermes-1
CONTRACTOR =	
CLIENT_OP_CO =	Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)

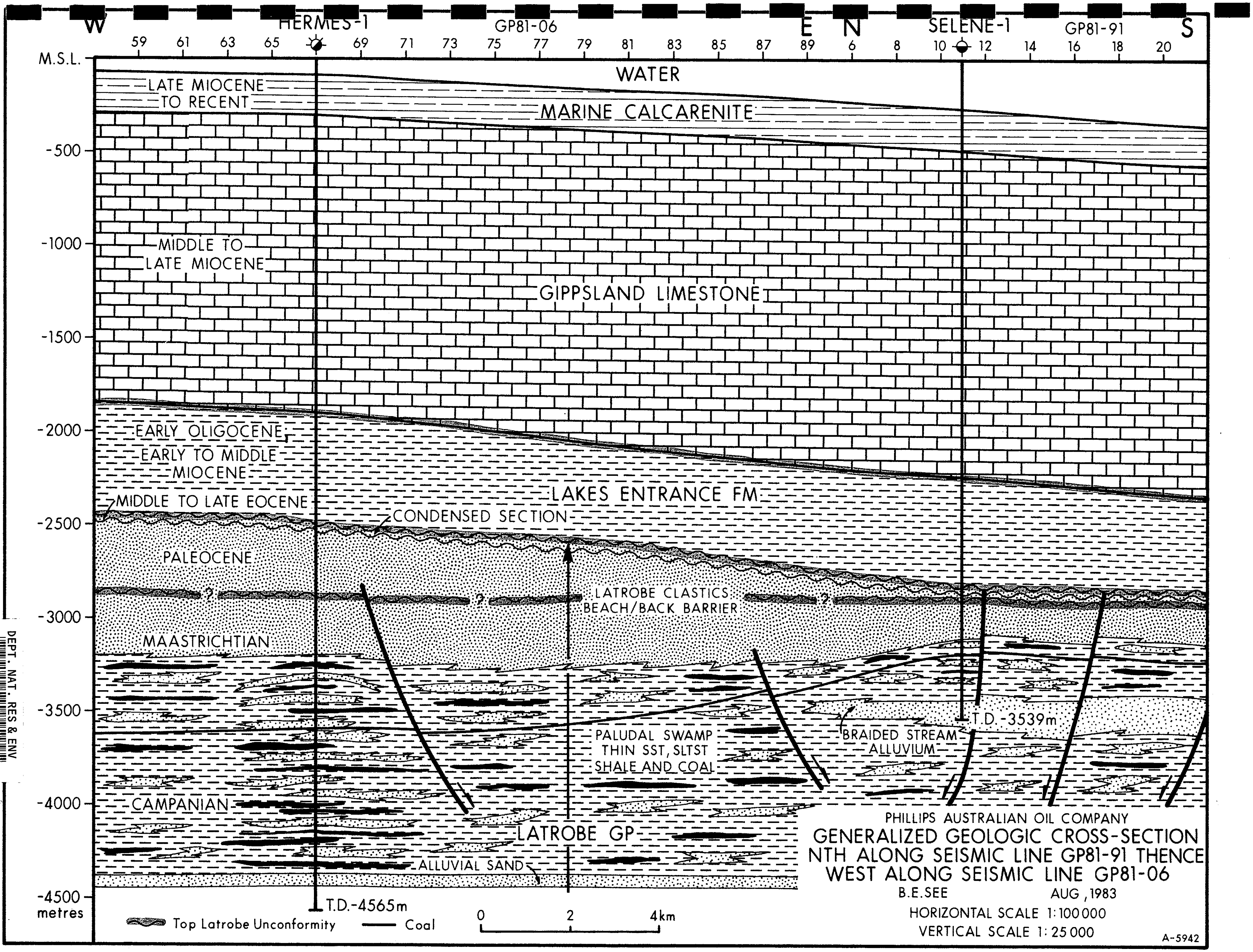

W
HERMES-1
GP81-06
E N
SELENE-1
GP81-91
S
59 61 63 65 69 71 73 75 77 79 81 83 85 87 89 6 8 10 12 14 16 18 20
M.S.L.
-500
-1000
-1500
-2000
-2500
-3000
-3500
-4000
-4500
metres
WATER
LATE MIOCENE TO RECENT
MARINE CALCARENITE
MIDDLE TO LATE MIOCENE
GIPPSLAND LIMESTONE
EARLY OLIGOCENE, EARLY TO MIDDLE MIOCENE
LAKES ENTRANCE FM
MIDDLE TO LATE EOCENE
CONDENSED SECTION
PALEOCENE
?
LATROBE CLASTICS BEACH/BACK BARRIER
MAASTRICHTIAN
PALUDAL SWAMP THIN SST, SLTST SHALE AND COAL
BRAIDED STREAM ALLUVIUM
T.D.-3539m
CAMPANIAN
LATROBE GP
ALLUVIAL SAND
T.D.-4565m
Top Latrobe Unconformity
Coal
0 2 4km
PHILLIPS AUSTRALIAN OIL COMPANY
GENERALIZED GEOLOGIC CROSS-SECTION
NTH ALONG SEISMIC LINE GP81-91 THENCE
WEST ALONG SEISMIC LINE GP81-06
B.E.SEE
AUG, 1983
HORIZONTAL SCALE 1:100 000
VERTICAL SCALE 1: 25 000
A-5942

FIGURE 8

Tertiary

Middle-to-Late Miocene : Gippsland Limestone
306m - 1878m (1572m)

The top of the Gippsland Limestone at 306 metres is estimated from seismic data. Lithologic data is not available as samples were not collected above 365 metres, however, a post-drilling seismic velocity survey is in agreement with the above depth.

The Gippsland Limestone consists of interbedded calcarenite and marl comprising three gross lithologic units. The interval from 365 metres to 840 metres consists primarily of calcarenite, white to light grey, fine-to-medium grained, moderate-to-well sorted, soft to moderately hard with locally abundant calcitic plates and fossil fragments. Marl occurs as interbeds throughout the interval and increases with depth. From 840 metres to 1185 metres the section is predominately marl, light grey to light greenish grey, homogenous, soft and very sticky. Calcarenite predominates from 1185 metres to the base of the Gippsland Limestone with minor locally-interbedded marl.

The carbonate depositional environment was probably upper continental slope to shelf edge and indicates continual shallowing of water depths from some 400 metres to 200 metres.

The base of the Gippsland Limestone is readily picked on electric logs as a marked increase in sonic travel time and decrease in resistivity.

Early Oligocene to Mid-Miocene : Lakes Entrance Formation
1878m - 2502m (624m)

This fine-grained clastic unit can be split into two general lithologic divisions. The uppermost unit from 1878 metres to 2162 metres consists of light-to-dark grey, firm to soft, homogeneous, calcareous claystone with locally abundant carbonaceous matter and interbedded with minor siltstone. From 2162 metres to 2502 metres the formation is predominately dark grey calcareous siltstone with an argillaceous matrix, interbedded with dark grey to black calcareous shale and minor claystone. The siltstone becomes coarser towards the base of the unit with an increasing sandy component. Pyrite also becomes common to locally abundant below 2380 metres.

The upper Lakes Entrance sediments, above 2162 metres, were deposited on the continental shelf in estimated water depths of 200 metres to 400 metres. The lower Lakes Entrance Formation however, was deposited in a shallower, higher energy, shelfal environment in water depths less than 100 metres. This is evidenced by the increase in siltstone and sandy siltstone with depth.

The lower Lakes Entrance Formation is differentiated on electric logs from the Upper Lakes Entrance Formation by a decrease in sonic travel time and an increase in resistivity coupled with a more serrated log appearance.

The lithologic boundary between the upper and lower Lakes Entrance Formation at 2162 metres corresponds to a regional seismic marker and may represent an unconformity between the Early Miocene and Mid-Miocene. Lack of sufficient paleontological data precludes positive identification of the hiatus. A major hiatus known as the "Cobia Event" occurs at 2475 metres and represents an erosional break between the earliest Oligocene and the Early Miocene. This hiatus represents a marine regression of some 12 million years.

Late Eocene : Latrobe Group - Colquhoun Formation
2502m - 2508m (6m)

The Colquhoun Formation consists of a white to light grey, very fine-grained sandstone with a very silty-to-argillaceous matrix. Lithologically it is differentiated from the overlying Lakes Entance Formation by the increase in sand content from a sandy siltstone to a silty sandstone, and by the important increase in glauconite. On electric logs the Colquhoun Formation is characterized by a decrease in sonic travel time and an increase in resistivity.

The Colquhoun Formation is conformable with the overlying Lakes Entrance Formation. Planktonic foraminiferal assemblages are similar in both formations apart from Globigerina linaperta in the Colquhoun Formation at 2505 metres and Globigerina brevis at 2499 metres. The former represents the earliest Eocene while the latter is an Oligocene indicator. Paleontological studies indicate that the environment of deposition was near-shore marine on the inner continental shelf platform.

Mid-Eocene : Latrobe Group - Flounder Formation
2508m - 2544m (36m)

The Flounder Formation is comprised of glauconitic silty sandstone and minor interbedded siltstone similar to the overlying Colquhoun Formation. It is distinguished from the Colquhoun Formation by its fauna, primarily arenaceous, benthonic foraminifera.

Environmentally the Flounder Formation was near-shore marine to estuarine. Some coarse sand grains within the silty fine-grained sandstone exhibit frosting and pitting and indicate reworking of older eolian sediments.

A hiatus of some 8 million years separates the Flounder Formation from the overlying Colquhoun Formation. Paleontological studies indicate the presence of a 10 million year hiatus at the base of the Flounder Formation between Paleocene and Eocene sediments. The absence of planktonic faunas ~~in samples between 2575 metres and 2541 metres~~ makes this assumption speculative (see Appendix 3).

Early Paleocene : Latrobe Group - Latrobe Clastics
2544m - 2881m (337m)

The Latrobe Clastics are characterized by sandstones exhibiting an increase in grain size from the overlying very fine grained silty sandstone. This sequence represents multiple environments of deposition ranging from beach/barrier to back-barrier lagoonal and coastal plain or lower fluvial plain. Sands in the upper portion of the Latrobe Clastics are fine-to-medium grained becoming very coarse grained at 2586 metres. These coarse grained sandstones are characteristic of the unit. They are white to light grey, subangular to subrounded, with a moderate-to-high sphericity, well sorted, unconsolidated, and exhibit excellent visual porosity. Glauconite is common. Individual sand grains may be frosted, pitted and exhibit impact fracturing, representing an eolian dunal facies associated with a beach/barrier environment. Carbonaceous finer-grained sandstones and sandy siltstones represent interbedded back-barrier lagoonal and/or estuarine facies.

The major beach system in the Latrobe Clastics occurs between 2586 metres and 2645 metres. It is characterized by a series of stacked coarsening upward sand bodies, each identified on the gamma-ray log by an upward decrease in API units. The clean, porous nature of these beach-barrier sands is reflected on the neutron/density log by a crossover at 2682 metres giving a wide sandstone separation (neutron to the right, density to the left). Resistivity within these water wet sands is much lower than in the overlying silty formations. Dunal facies associated with the beach/barrier sands are recognized on the dipmeter log by high angle sedimentary dips greater than 20°.

From 2680 metres to 2765 metres the section is dominated by a series of stacked fining-upward sands with intervening siltstones and claystones. These are represented on the gamma ray log as a series of upward increasing API units. They probably represent small point bars deposited by meandering creeks and streams which drained the lower fluvial plain and emptied into back barrier lagoons (refer to dipmeter interpretation, Appendix 7).

Two coarsening-upward beach sands with associated dunal facies occupy the section from 2765 metres to 2881 metres. These clean sands have good reservoir properties and exhibit a distinctive cross-over on the neutron-density log similar to the overlying massive beach sands. A 27 metre interval of interbedded coals, claystones and thin sandstones separates the two sands.

The Paleocene age for these sediments was established on the basis of paleontology and palynology. A poorly preserved planktonic fauna described as representing the Mid-Paleocene (see Appendix 3, page 3), was identified at 2575 metres. As accepted stratigraphic nomenclature in the Gippsland Basin includes only Early-and-Late Paleocene, this assemblage is taken to represent the late Early Paleocene, probably the Montian Stage. The *Lygistepollenites balmei* spore-pollen zone is identified in samples from 2562 metres to 2582 metres further substantiating the Paleocene age (Appendix 4).

Cretaceous

Maastrichtian : Latrobe Group - Beach/Back Barrier/Lagoonal Sediments 2881m - 3150m (269m)

The Top Maastrichtian boundary is placed at 2881 metres. The Tricolpites longus spore-pollen zone differentiates the Maastrichtian from the Tricolpites lillei spore-pollen zone of the underlying Campanian. The Tricolpites longus zone continues into the Paleocene. The spore-pollen zones used to identify the Top Maastrichtian are described in Appendix 4. The Paleocene/Maastrichtian boundary is possibly marked by an angular unconformity as evidenced by dipmeter analysis (Appendix 7). Palynological data, however, are not adequate to further substantiate the hiatus.

The interval from 2881 metres to the bottom of the unit at 3150 metres is characterized by thinly interbedded sandstones, siltstones and claystones. Individual sands are medium-to-coarse grained and occur as interbeds less than 10 metres thick. The section is dominantly silty and carbonaceous and represents back barrier/lagoonal environments.

Sediments in this interval include sandstone, siltstone, claystone and minor coal. The sandstones are generally light-to-dark grey, fine-to-coarse grained, occasionally pebbly, poor-to-moderately well sorted, poorly cemented, locally very silty, and very carbonaceous in part. The siltstones are dark grey to black, firm to hard, non-calcareous, carbonaceous, argillaceous, and pyritic. The claystones are silty and commonly very carbonaceous; together with the coals they comprise a very minor portion of the interval. Subtle lithologic differences including an overall decrease in grain size and the disappearance of glauconite distinguish this interval from the overlying Paleocene.

Maastrichtian to Campanian : Latrobe Group - Coal Measures
3150m - 4373m (1223m)

This section is characterized by numerous 1-3 metre thick coal seams thinly interbedded with sandstones and carbonaceous siltstones and shales. The sands are generally light grey with very fine-to-medium grained and medium-to-very coarse grained varieties. They are fair-to-poorly sorted, generally unconsolidated but locally dolomitic cemented, with a silty-to-argillaceous matrix and locally abundant pyrite. The siltstones and shales are brown to black, firm to hard, very carbonaceous and pyritic.

These rocks were deposited primarily in paludal/swamp environments of the lower fluvial plain. Interbedded lagoonal silts and shales indicate an oscillating coastline. The sands generally consist of small point-bar deposits.

This sequence is distinguished from the overlying sequence by the abundance of coal seams and the absence of thick sandstones. The very highly carbonaceous nature of these rocks provide excellent hydrocarbon source potential. This thick, monotonous, tight section could act as a sealing unit for underlying sands.

The Maastrichtian-Campanian boundary occurs at 3587 metres.

<u>Campanian : Latrobe Group - Deep Alluvials</u>
<u>4373m - 4442m (69m)</u>

This interval is comprised of immature dirty sandstones and coarse siltstones (Appendix 8). The sandstones are lithic feldspathic arenites composed of reworked siltstone and shale lithic fragments, microcline, and quartz, fine-to-coarse grained, angular to subrounded, and poorly sorted. They are locally clean and porous but dominantly contain abundant silt and clay (as illite and kaolinite) in the matrix. Local carbonate cement and quartz overgrowths serve to further decrease the porosity. As a result the average porosity over the interval is less than 10%.

The angularity of grains, and the presence of lithic clasts and unaltered feldspar grains indicate that these rocks are very immature, and were deposited near the source area. The environment of deposition was probably alluvial fan with upper fluvial plain braided stream deposits represented by the cleaner sand zones.

Characteristic electric log responses through the zone were masked by poor hole conditions which rendered the neutron/density log very poor to worthless. The resistivity log was affected by the presence of small amounts of hydrocarbons throughout the interval. The gamma-ray log exhibits a blocky shape through the individual sands and implies channel deposition.

Campanian : Latrobe Group - Lower Fluvial Plain
4442m - 4565m (T.D.) (123m)

This interval is comprised dominantly of siltstone with minor interbedded sandstone and coal. The siltstone is grey to brown, firm to hard, very argillaceous, carbonaceous and sandy in part. The sandstones are very fine-to-medium grained, subangular to subrounded, poorly sorted, silty, with local calcareous cement and poor visual porosity.

Although the coals account for a smaller portion of this interval than in the coal measures above 3150 metres, they indicate a similar lower fluvial plain environment of deposition. The well bottomed in the Campanian Tricolporites lillei spore-pollen zone at 4565 metres.

WELL CORRELATION

A comparison of the stratigraphy of Hermes No. 1 with that of Helios No. 1 and Selene No. 1 is illustrated in Figure 9 and Table 11. Helios No. 1, located 10.6 kilometres to the south-southwest, is the closest well within Vic/P18 to the Hermes No. 1 location. Selene No. 1, also located in Vic/P18, is 11.25 kilometres southeast of Hermes No. 1 (see Location Map, Figure 1).

Most of the units penetrated in Hermes No. 1 occur in the other two wells, however a number of stratigraphic differences are evident. The following comparisons can be made:

a) The Gippsland Limestone and overlying sediments are significantly thicker in Hermes No. 1 (1794 metres) and Selene No. 1 (1981 metres) than in Helios No. 1 (1245 metres). This is related to regional tilting, presumed to be associated with Australian continental breakup from Antarctica, causing relative subsidence in the vicinity of Hermes No. 1 and Selene No. 1, and uplift in the Helios No. 1 area to the southwest.

b) The Lakes Entrance Formation (above the "Cobia Event" unconformity) is significantly thicker in Helios No. 1 (1235 metres) than in Hermes No. 1 (597 metres) and Selene No. 1 (573 metres). This is again considered to be related to regional tilting associated with the Australia and Antarctica continental breakup, causing uplift in the Hermes and Selene areas and subsidence in the Helios area. The majority of the tilting occurred before or during deposition of the upper Lakes Entrance Formation during Middle Miocene time.

figure 9 to follow

PE905109

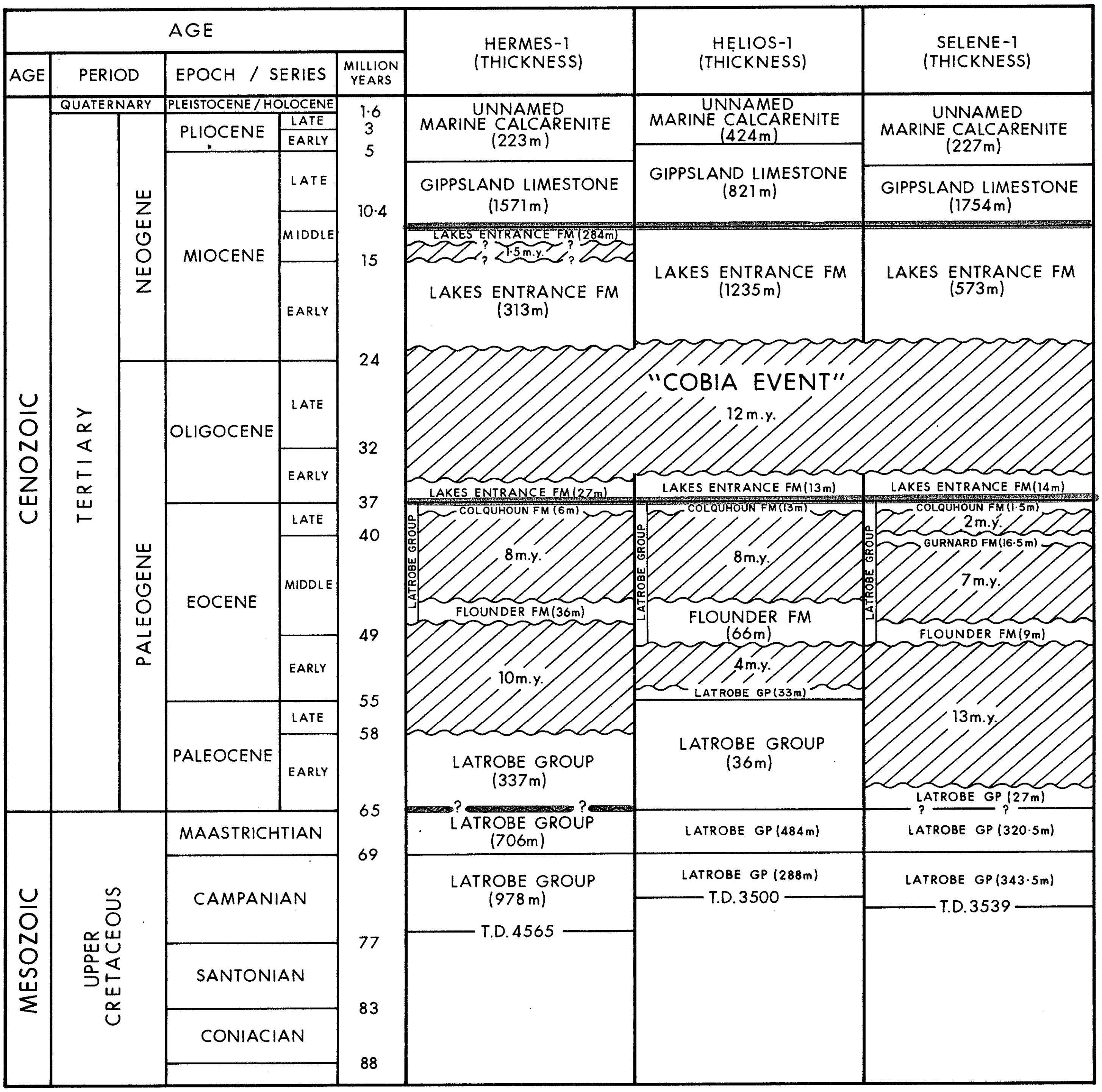
This is an enclosure indicator page.
The enclosure PE905109 is enclosed within the container PE902581 at this location in this document.

The enclosure PE905109 has the following characteristics:

ITEM_BARCODE = PE905109
CONTAINER_BARCODE = PE902581
NAME = Stratigraphic Comparison Table
BASIN = GIPPSLAND
PERMIT = VIC/P18
TYPE = WELL
SUBTYPE = STRAT_COLUMN
DESCRIPTION = Stratigraphic Comparison between Hermes-1, Helios-1 and Selene-1. Figure 9 of WCR volume 1.
REMARKS =
DATE_CREATED = 31/08/1983
DATE_RECEIVED = 23/09/1983
W_NO = W803
WELL_NAME = Hermes-1
CONTRACTOR =
CLIENT_OP_CO = Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)

STRATIGRAPHIC COMPARISON: HERMES-1, HELIOS-1, SELENE-1



A-5937

FIGURE 9

TABLE 11 : CORRELATION WITH HELIOS NO. 1 AND SELENE NO. 1

HORIZON TOPS	HERMES NO. 1 DEPTH (METRES)	HELIOS NO. 1 DEPTH (METRES)	SELENE NO. 1 DEPTH (METRES)
MARINE CALCARENITE	84 metres	87 metres	253 metres
GIPPSLAND LIMESTONE	307 metres	511 metres	480 metres
UPPER LAKES ENTRANCE FM	1878 metres	1332 metres	2234 metres
INTRA LAKES ENTRANCE FM	2162 metres	2142 metres	2463 metres
COLQUHOUN FM	2502 metres	2580 metres	2821 metres
GURNARD FM	GURNARD FORMATION NOT PRESENT	GURNARD FORMATION NOT PRESENT	2822.5 metres
FLOUNDER FM	2508 metres	2593 metres	2839 metres
LATROBE CLASTICS	2544 metres	2659 metres	2848 metres
MAASTRICHTIAN	2881 metres	2728 metres	2875 metres
CAMPANIAN	3587 metres	3212 metres	3195.5 metres

c) The 12 million year Late Oligocene hiatus known as the "Cobia Event" occurs in all three wells.

d) Basal Lakes Entrance sediments below the "Cobia Event" unconformity grade conformably into the Colquhoun Formation in all three wells. The interval to the base Colquhoun unconformity is 33 metres thick in Hermes No. 1, 26 metres in Helios No. 1 and 15.5 metres in Selene No. 1. The sediments are Late Eocene to Early Oligocene intertidal/estuarine silts and reworked sands. These sediments probably represent the final infilling of a northwest-southeast trending trough created earlier in Eocene time by major uplift to the northeast of the permit area.

e) An unconformity occurs beneath the Colquhoun Formation in all three wells. The hiatus spans 8 million years in Hermes No. 1 and Helios No. 1 and directly overlies Flounder Formation sediments. In Selene No. 1 however, sediments of the Gurnard Formation intervene between the Colquhoun and Flounder Formations, bounded above and below by 2 and 7 million year hiatuses respectively. These intertidal/estuarine sediments are absent in Hermes No. 1 and Helios No. 1.

f) The Flounder Formation is thicker in Helios No. 1 (66 metres) than in Hermes No. 1 (36 metres) and Selene No. 1 (9 metres). This is due to Middle Eocene uplift to the northeast of the permit area along a northwest-southeasterly trend.

An embayment formed to the southwest of this uplift, over a major portion of the permit area, and received estuarine sediments of the Flounder Formation. Helios No. 1, centrally located within the embayment, displays the greatest thickness of sediments. Hermes No. 1, located in the northwestern extremity of the embayment, accumulated a moderate thickness of Flounder sediments, whereas Selene No. 1 on the flank of the uplift received the least sediments.

g) A major unconformity occurs beneath the Flounder Formation in all three wells. This unconformity marks the beginning of the "Southern Ocean Break-up" caused by the separation of Australia from Antarctica.

h) Hermes No. 1 penetrated 337 metres of Paleocene sediments above the Top Maastrichtian while Helios No. 1 and Selene No. 1 penetrated only 69 and 27 metres respectively. During the Early Paleocene Hermes No. 1 and Selene No. 1 were located closer to the roughly east-west trending paleoshoreline and thus received a greater influx of sediments while Helios No. 1, located further offshore, received a reduced sediment supply. A marine regression, which created the unconformity mentioned in g) above, crossed the permit area in the Late Paleocene. Selene No. 1 was the first of the three locations to be affected by the regression and was therefore subjected to deeper erosion of the Paleocene section than at Hermes No. 1. Marginal marine conditions endured in the Helios area throughout the Paleocene, becoming a washover-lagoonal environment during the Early Eocene. This heralded the gradual regressive phase prior to the onset of subaerial erosion conditions of the Top Latrobe Clastics unconformity.

i) All three wells have excellent reservoir sands beneath the Top Latrobe Clastics unconformity.

j) All three wells penetrated thick paludal swamp deposits of Upper Cretaceous age.

k) Selene No. 1 terminates in Campanian braided-stream sediments. Hermes No. 1 and Helios No. 1 terminate in Campanian paludal swamp sediments of the lower fluvial plain.

SEISMIC MARKER IDENTIFICATION

A well velocity survey was conducted at Hermes No. 1 upon completion of drilling (Addendum 3). The synthetic seismogram for Hermes No. 1 is illustrated in Addendum 4. The resultant well velocity log was used to relate the main seismic mapping horizons to stratigraphy as shown in Table 12 below. Drill depths to marker horizons were in close agreement with seismically-predicted depths, with less than 2% error. Enclosure 6 is the seismic time-depth curve for Hermes No. 1.

SEISMIC HORIZON	TWO-WAY TIME (SECS)	DEPTH (M) RKB	PRE-DRILL ESTIMATED DEPTH (MRKB)
BASE GIPPSLAND LIMESTONE (BLUE HORIZON)	1.275	1878	1882
INTRA-LAKES ENTRANCE FM (PURPLE HORIZON)	1.465	2162	2133
TOP LATROBE GROUP (ORANGE HORIZON)	1.688	2502	2473
INTRA-PALEOCENE (YELLOW HORIZON)	1.843	2768	2770
NEAR TOP MAASTRICHTIAN (BROWN HORIZON)	1.928	2943	2960
NEAR BASE MAASTRICHTIAN (GREEN HORIZON)	2.205	3488	3461

TABLE 12 : TWO-WAY TIMES TO SEISMIC MARKERS WITH ACTUAL DRILL DEPTHS AND ESTIMATED PRE-DRILL DEPTHS

STRUCTURE

The Hermes No. 1 well was located on a seismically-defined intra-Latrobe structural anomaly. The structure is a fault-closed anticline developed on the upthrown side of a northwest-southeast trending fault. It occurs as a deeper, separate structural culmination on the eastern arm of the younger Kingfish structure. Structural growth originated during the Upper Cretaceous with northeastern dip closure possibly caused by synthetic wrench movement along the fault. Intermittent growth of the structure appears to have continued until the end of the Cretaceous.

Time mapping of data from a 1-kilometre seismic grid indicated a south-eastward plunging nose at the Top Latrobe Group level which lacked structural closure (Figure 10). Three intra-Latrobe horizons corresponding to the yellow, brown and green seismic markers were subsequently mapped with closure. Two-way time seismic maps were converted to depth maps using smoothed stacking velocities. Time-depth conversion resulted in attenuation of the structure into a north-south trending anticlinal feature with some closure independent of faulting.

Hermes No. 1 was located at the intersection of seismic lines GP81-06 and GP81-67. Figures 11 and 12 illustrate the mapped horizons in cross-section. Time and depth maps for the three targeted horizons are illustrated in Figures 13 through 18.

The close agreement between predicted seismic depths and actual drill depths confirms the validity of the original structural analysis.

figures 10 - 18 to follow

PE905110

This is an enclosure indicator page.
The enclosure PE905110 is enclosed within the container PE902581 at this location in this document.

The enclosure PE905110 has the following characteristics:

ITEM_BARCODE =	PE905110
CONTAINER_BARCODE =	PE902581
NAME =	Hermes-1 Top Latrobe Group
BASIN =	GIPPSLAND
PERMIT =	VIC/P18
TYPE =	SEISMIC
SUBTYPE =	HRZN_CONTR_MAP
DESCRIPTION =	Hermes-1 Top Latrobe Group, Two way seismic time contour map. Figure 10 of WCR volume 1.
REMARKS =	
DATE_CREATED =	31/10/1982
DATE_RECEIVED =	23/09/1983
W_NO =	W803
WELL_NAME =	Hermes-1
CONTRACTOR =	
CLIENT_OP_CO =	Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)

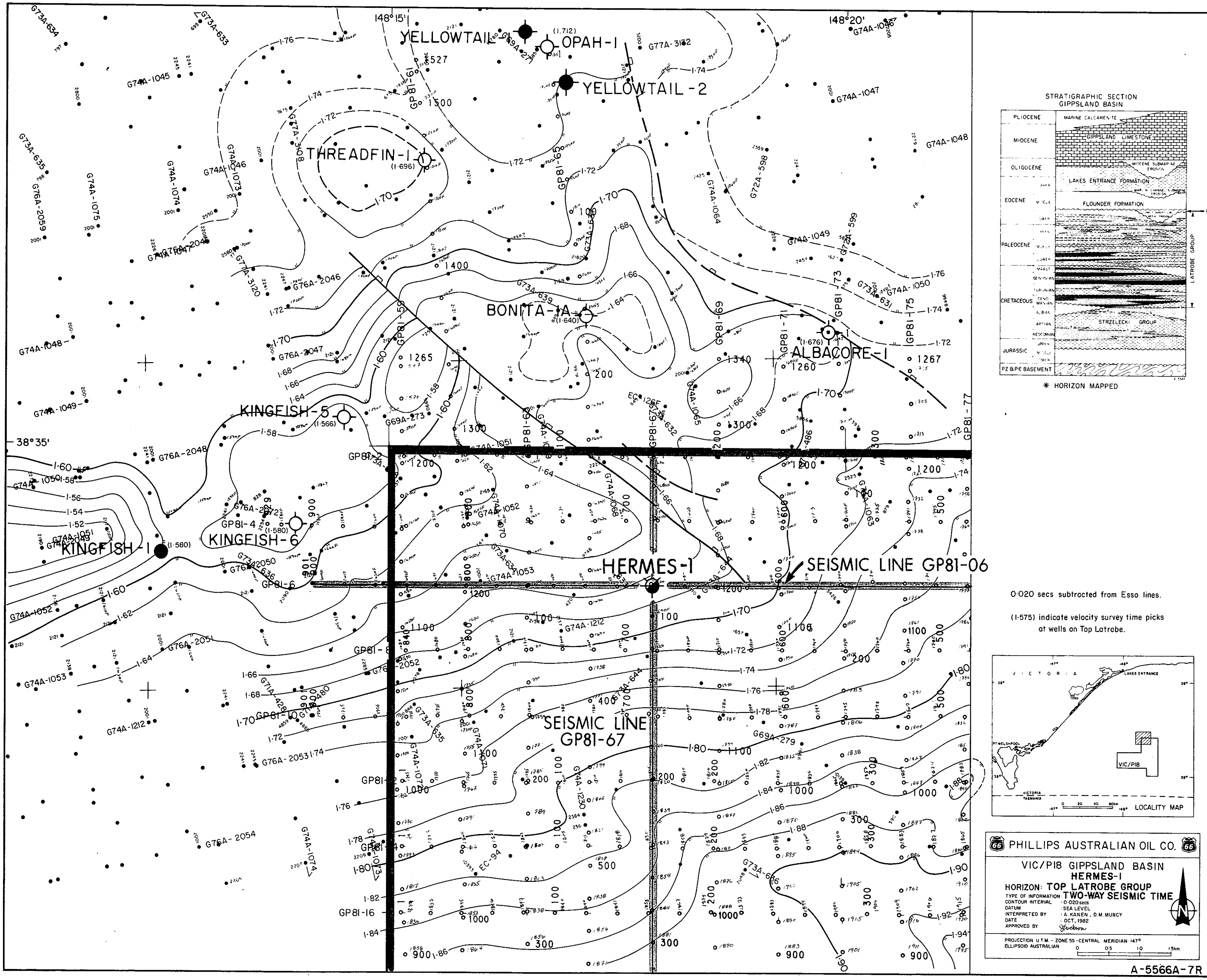

YELLOWTAIL-1
OPAH-1
YELLOWTAIL-2
THREADFIN-1
(1.696)
BONITA-1A
(1.640)
ALBACORE-1
(1.676)
KINGFISH-5
(1.566)
KINGFISH-6
(1.580)
KINGFISH-1
(1.580)
HERMES-1
SEISMIC LINE GP81-06
SEISMIC LINE GP81-67
148°15'
148°20'
38°35'
STRATIGRAPHIC SECTION
GIPPSLAND BASIN
PLIOCENE
MIOCENE
OLIGOCENE
EOCENE
PALEOCENE
CRETACEOUS
JURASSIC
PZ & PE BASEMENT
MARINE CALCARENITE
GIPPSLAND LIMESTONE
LAKES ENTRANCE FORMATION
FLOUNDER FORMATION
STRZELECKI GROUP
LATROBE GROUP
* HORIZON MAPPED
0·020 secs subtracted from Esso lines.
(1·575) indicate velocity survey time picks at wells on Top Latrobe.
VICTORIA
LAKES ENTRANCE
VIC/P18
LOCALITY MAP
PHILLIPS AUSTRALIAN OIL CO.
VIC/P18 GIPPSLAND BASIN
HERMES-1
HORIZON: TOP LATROBE GROUP
TYPE OF INFORMATION: TWO-WAY SEISMIC TIME
CONTOUR INTERVAL: 0·020 secs
DATUM: SEA LEVEL
INTERPRETED BY: A. KANEN, D.M. MUNCY
DATE: OCT, 1982
APPROVED BY
PROJECTION U.T.M. - ZONE 55 - CENTRAL MERIDIAN 147°
ELLIPSOID AUSTRALIAN
A-5566A-7R

FIGURE 10

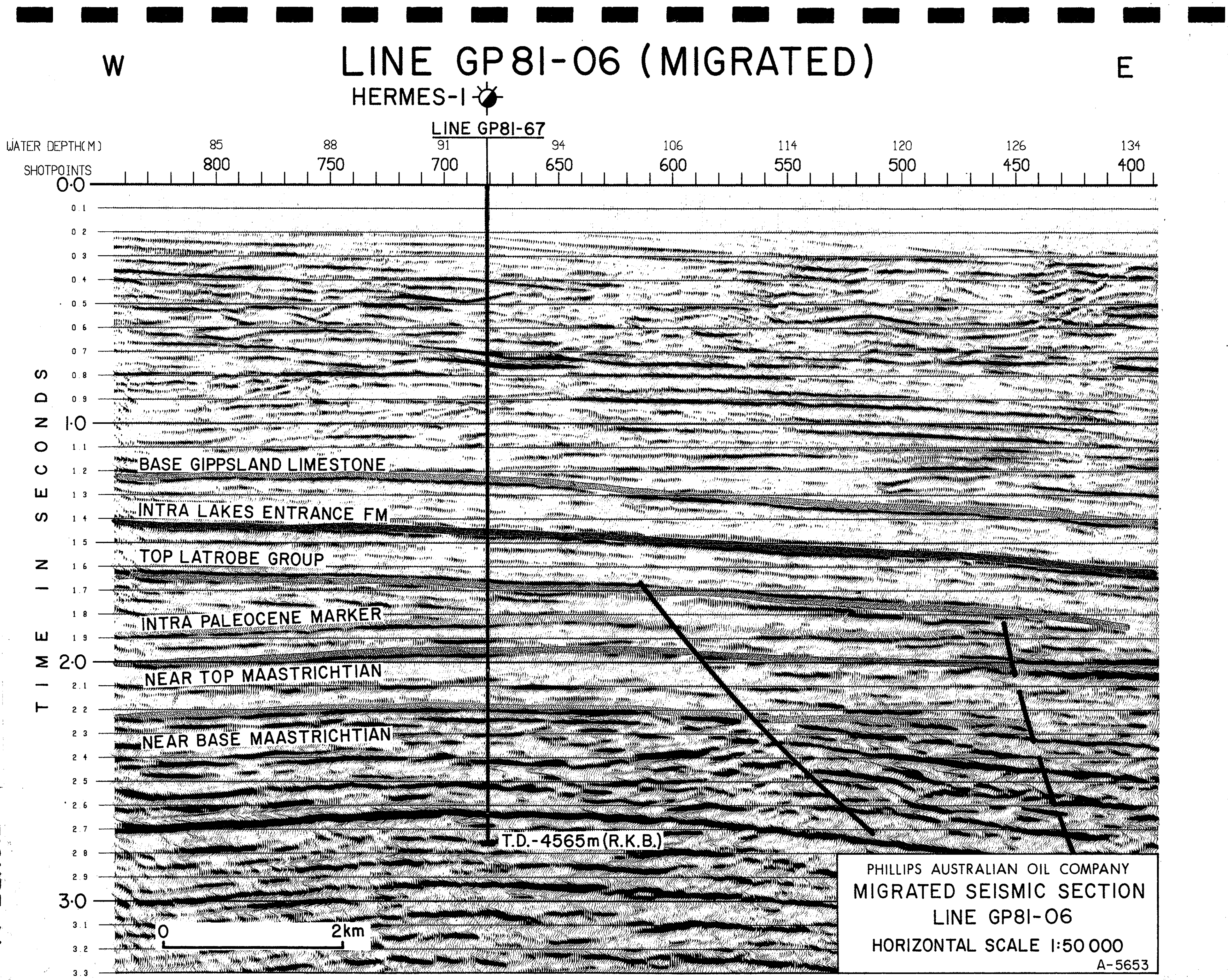
PE905111

This is an enclosure indicator page.
The enclosure PE905111 is enclosed within the container PE902581 at this location in this document.

The enclosure PE905111 has the following characteristics:

ITEM_BARCODE =	PE905111
CONTAINER_BARCODE =	PE902581
NAME =	Hermes-1 Line GP81-06 (Migrated)
BASIN =	GIPPSLAND
PERMIT =	VIC/P18
TYPE =	SEISMIC
SUBTYPE =	SECTION
DESCRIPTION =	Hermes-1 Migrated Seismic Section Line GP81-06 (East-West). Figure 11 of WCR volume 1.
REMARKS =	
DATE_CREATED =	31/08/1983
DATE_RECEIVED =	23/09/1983
W_NO =	W803
WELL_NAME =	Hermes-1
CONTRACTOR =	
CLIENT_OP_CO =	Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)



W
LINE GP81-06 (MIGRATED)
E
HERMES-1
LINE GP81-67
WATER DEPTH(M)
85
88
91
94
106
114
120
126
134
SHOTPOINTS
800
750
700
650
600
550
500
450
400
TIME IN SECONDS
0·0
1·0
2·0
3·0
BASE GIPPSLAND LIMESTONE
INTRA LAKES ENTRANCE FM
TOP LATROBE GROUP
INTRA PALEOCENE MARKER
NEAR TOP MAASTRICHTIAN
NEAR BASE MAASTRICHTIAN
T.D.-4565m (R.K.B.)
0
2km
PHILLIPS AUSTRALIAN OIL COMPANY
MIGRATED SEISMIC SECTION
LINE GP81-06
HORIZONTAL SCALE 1:50 000
A-5653

FIGURE 11

PE905112

This is an enclosure indicator page.
The enclosure PE905112 is enclosed within the container PE902581 at this location in this document.

The enclosure PE905112 has the following characteristics:

ITEM_BARCODE = PE905112
CONTAINER_BARCODE = PE902581
NAME = Hermes-1 Line GP81-67 (Migrated)
BASIN = GIPPSLAND
PERMIT = VIC/P18
TYPE = SEISMIC
SUBTYPE = SECTION
DESCRIPTION = Hermes-1 Migrated Seismic Section Line GP81-67 (North-South). Figure 11 of WCR volume 1.
REMARKS =
DATE_CREATED = 31/08/1983
DATE_RECEIVED = 23/09/1983
W_NO = W803
WELL_NAME = Hermes-1
CONTRACTOR =
CLIENT_OP_CO = Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)

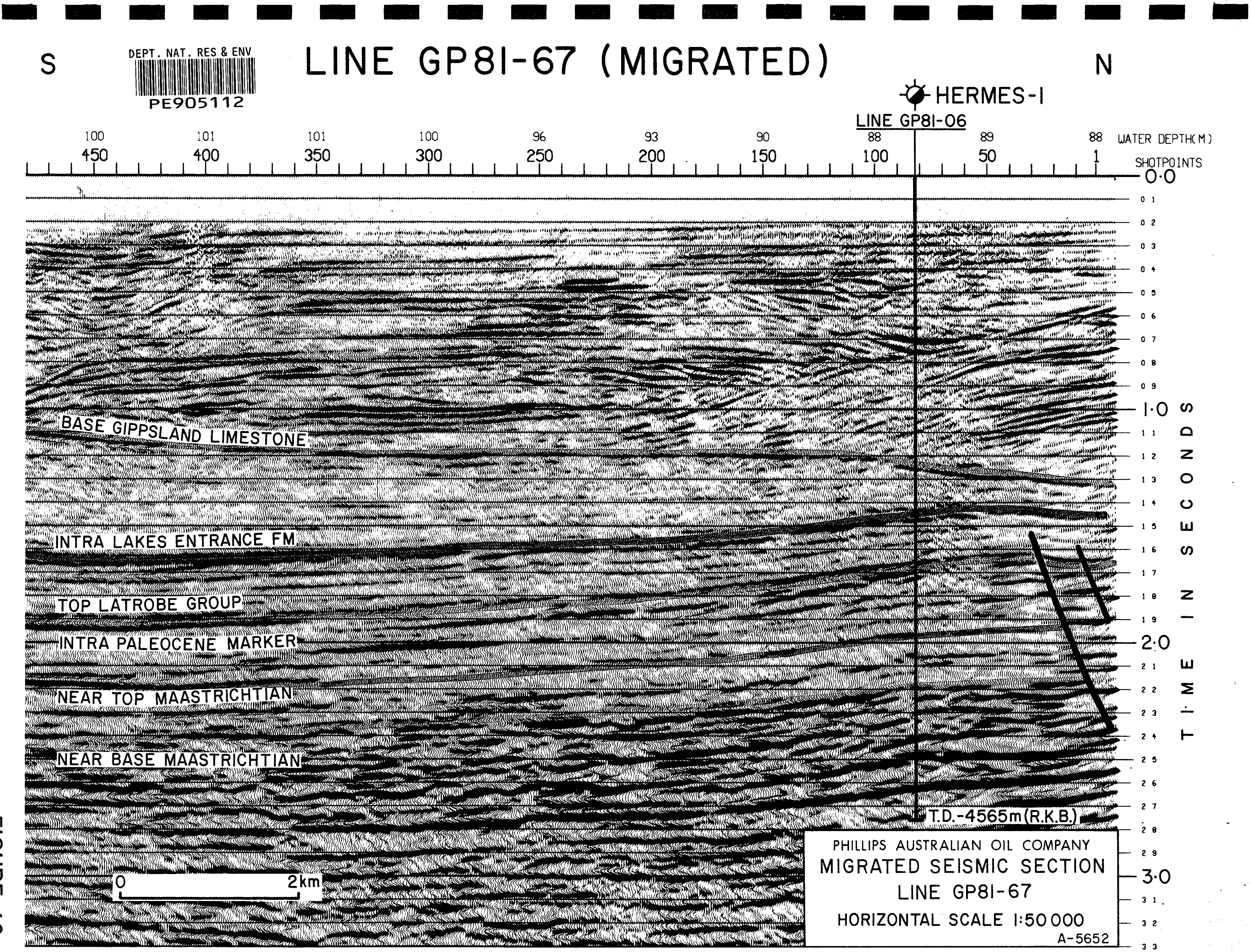

S
LINE GP81-67 (MIGRATED)
N
HERMES-1
LINE GP81-06
100 101 101 100 96 93 90 88 89 88 WATER DEPTH(M)
450 400 350 300 250 200 150 100 50 1
SHOTPOINTS
0·0
1·0
2·0
3·0
TIME IN SECONDS
BASE GIPPSLAND LIMESTONE
INTRA LAKES ENTRANCE FM
TOP LATROBE GROUP
INTRA PALEOCENE MARKER
NEAR TOP MAASTRICHTIAN
NEAR BASE MAASTRICHTIAN
T.D.-4565m(R.K.B.)
0
2km
PHILLIPS AUSTRALIAN OIL COMPANY
MIGRATED SEISMIC SECTION
LINE GP81-67
HORIZONTAL SCALE 1:50 000
A-5652

FIGURE 12

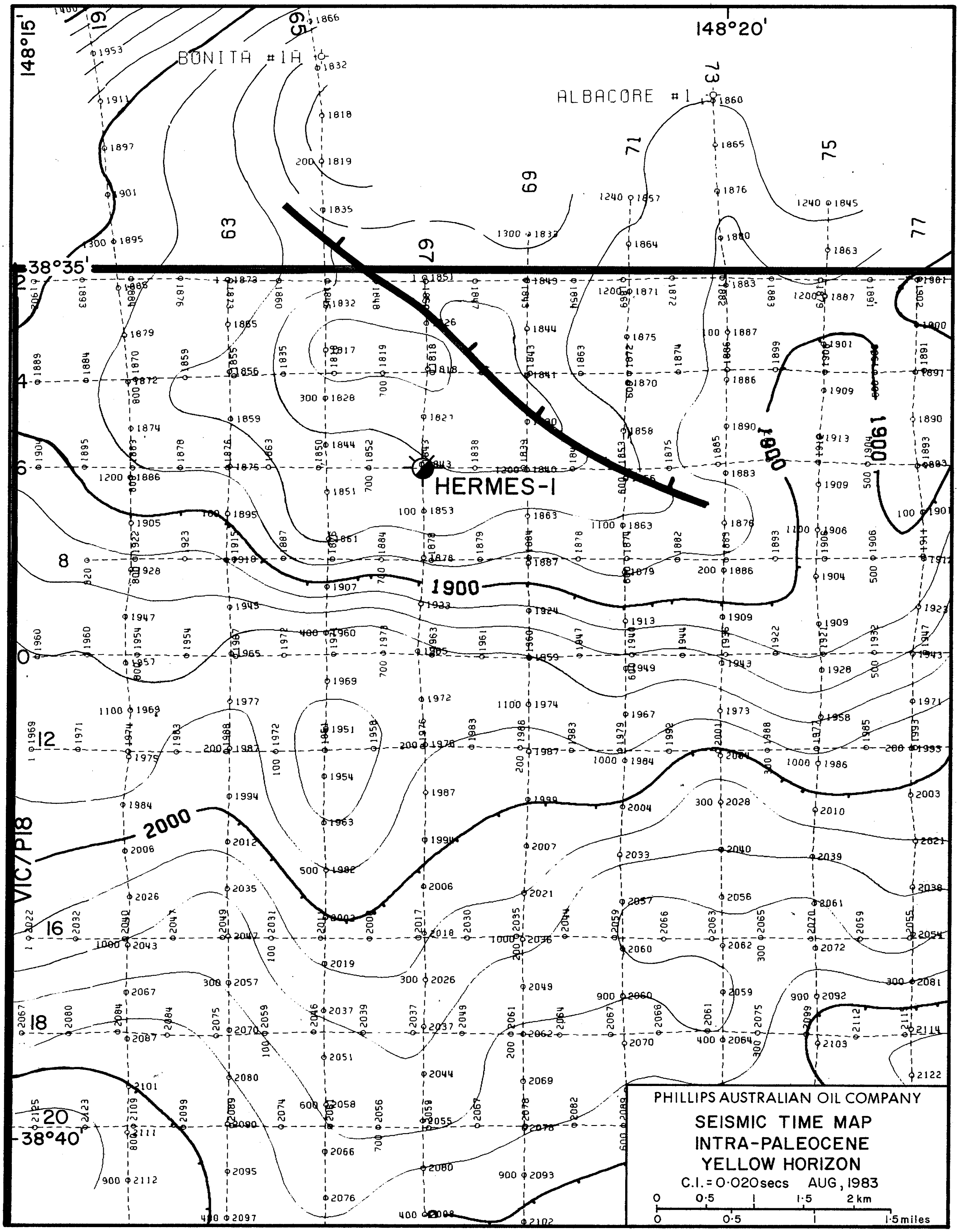
PE905113

This is an enclosure indicator page.
The enclosure PE905113 is enclosed within the container PE902581 at this location in this document.

The enclosure PE905113 has the following characteristics:

```
      ITEM_BARCODE = PE905113
 CONTAINER_BARCODE = PE902581
              NAME = Seismic Time Map Intra-Paleocene
             BASIN = GIPPSLAND
            PERMIT = VIC/P18
              TYPE = SEISMIC
           SUBTYPE = HRZN_CONTR_MAP
       DESCRIPTION = Hermes-1 Seismic Time Map
                     Intra-Paleocene Yellow Horizon
                     (C.I.=0.020 secs). Figure 13 of WCR
                     volume 1.
           REMARKS =
      DATE_CREATED = 31/08/1983
     DATE_RECEIVED = 23/09/1983
              W_NO = W803
         WELL_NAME = Hermes-1
        CONTRACTOR =
      CLIENT_OP_CO = Phillips Australian Oil Company
```

(Inserted by DNRE - Vic Govt Mines Dept)



A-5961

FIGURE 13

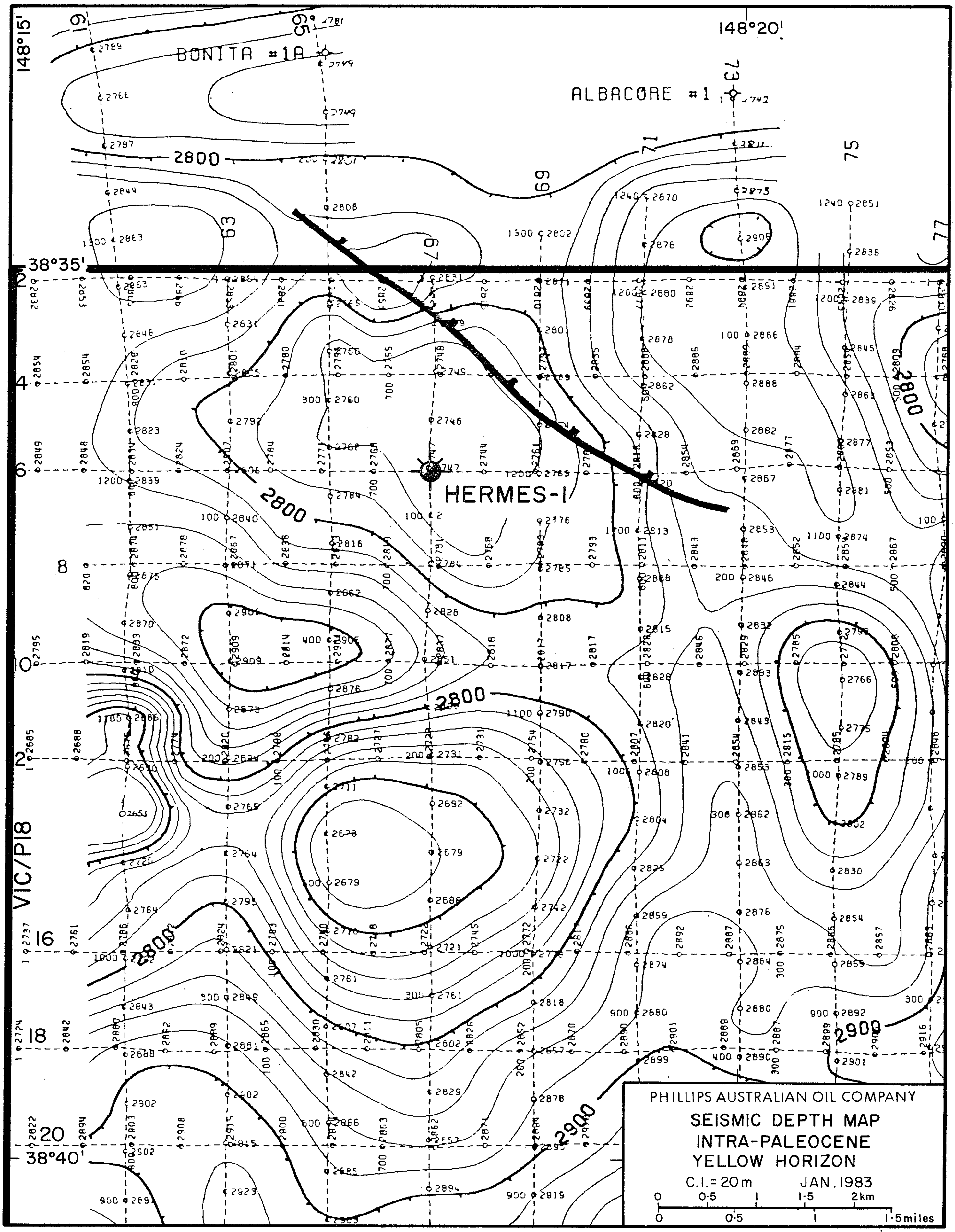
PE905114

This is an enclosure indicator page.
The enclosure PE905114 is enclosed within the container PE902581 at this location in this document.

The enclosure PE905114 has the following characteristics:

ITEM_BARCODE = PE905114
CONTAINER_BARCODE = PE902581
NAME = Seismic Depth Map Intra-Paleocene
BASIN = GIPPSLAND
PERMIT = VIC/P18
TYPE = SEISMIC
SUBTYPE = HRZN_CONTR_MAP
DESCRIPTION = Hermes-1 Seismic Depth Map Intra-Paleocene Yellow Horizon (C.I.=20 m). Figure 14 of WCR volume 1.
REMARKS =
DATE_CREATED = 31/01/1983
DATE_RECEIVED = 23/09/1983
W_NO = W803
WELL_NAME = Hermes-1
CONTRACTOR =
CLIENT_OP_CO = Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)



148°15'
148°20'
38°35'
38°40'
BONITA #1A
ALBACORE #1
HERMES-1
VIC/P18
2800
2900
PHILLIPS AUSTRALIAN OIL COMPANY
SEISMIC DEPTH MAP
INTRA-PALEOCENE
YELLOW HORIZON
C.I. = 20 m
JAN. 1983
0 0·5 1 1·5 2 km
0 0·5 1 1·5 miles
A-5760

FIGURE 14

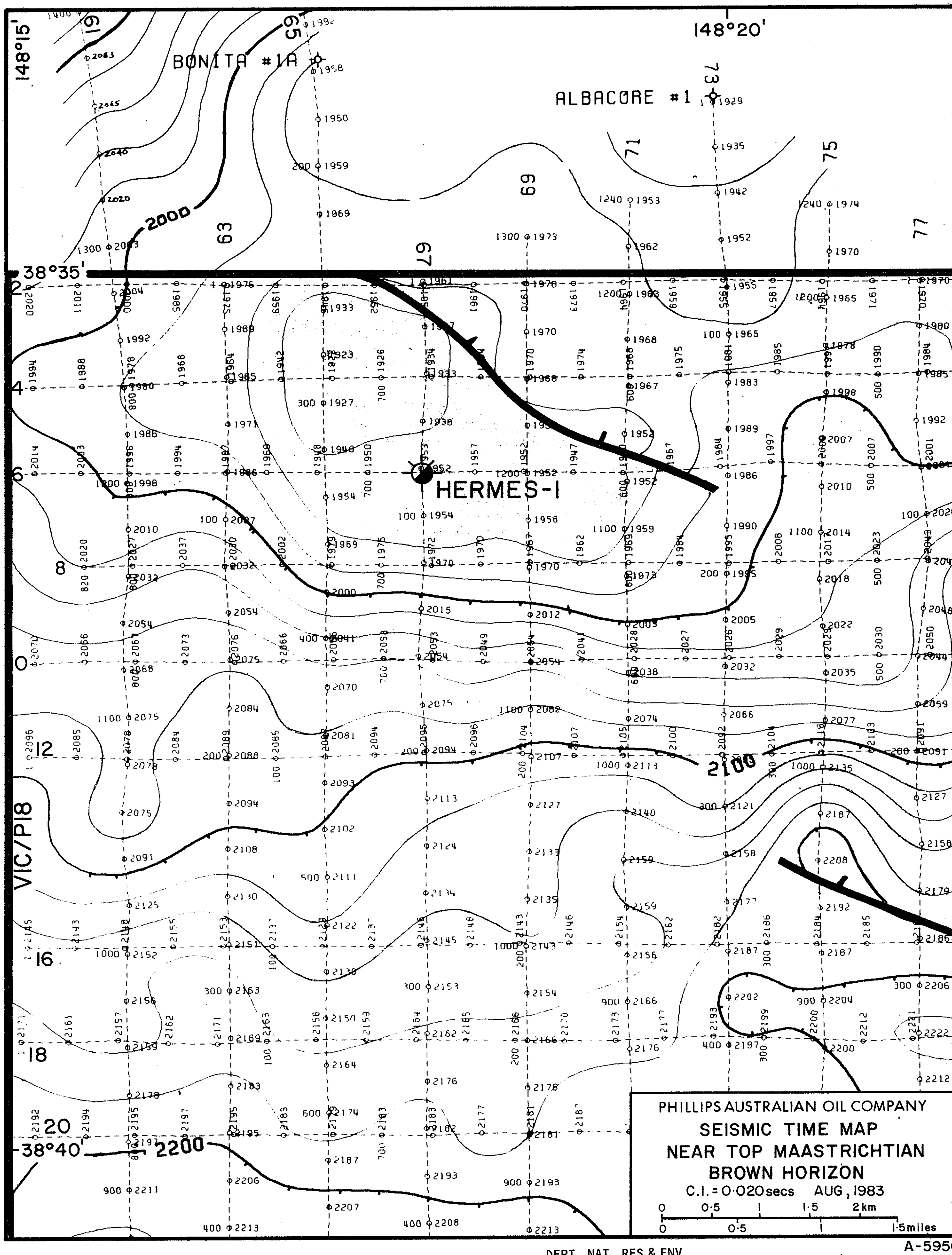
PE905115

This is an enclosure indicator page.
The enclosure PE905115 is enclosed within the container PE902581 at this location in this document.

The enclosure PE905115 has the following characteristics:

```
     ITEM_BARCODE = PE905115
CONTAINER_BARCODE = PE902581
             NAME = Seismic Time Map Near Top Maastrichtian
            BASIN = GIPPSLAND
           PERMIT = VIC/P18
             TYPE = SEISMIC
          SUBTYPE = HRZN_CONTR_MAP
      DESCRIPTION = Hermes-1 Seismic Time Map Near Top
                    Maastrichtian Brown Horizon (C.I.=0.020
                    secs). Figure 15 of WCR volume 1.
          REMARKS =
     DATE_CREATED = 31/08/1983
    DATE_RECEIVED = 23/09/1983
             W_NO = W803
        WELL_NAME = Hermes-1
       CONTRACTOR =
     CLIENT_OP_CO = Phillips Australian Oil Company
```

(Inserted by DNRE - Vic Govt Mines Dept)



DEPT. NAT. RES & ENV

PE905115

FIGURE 15

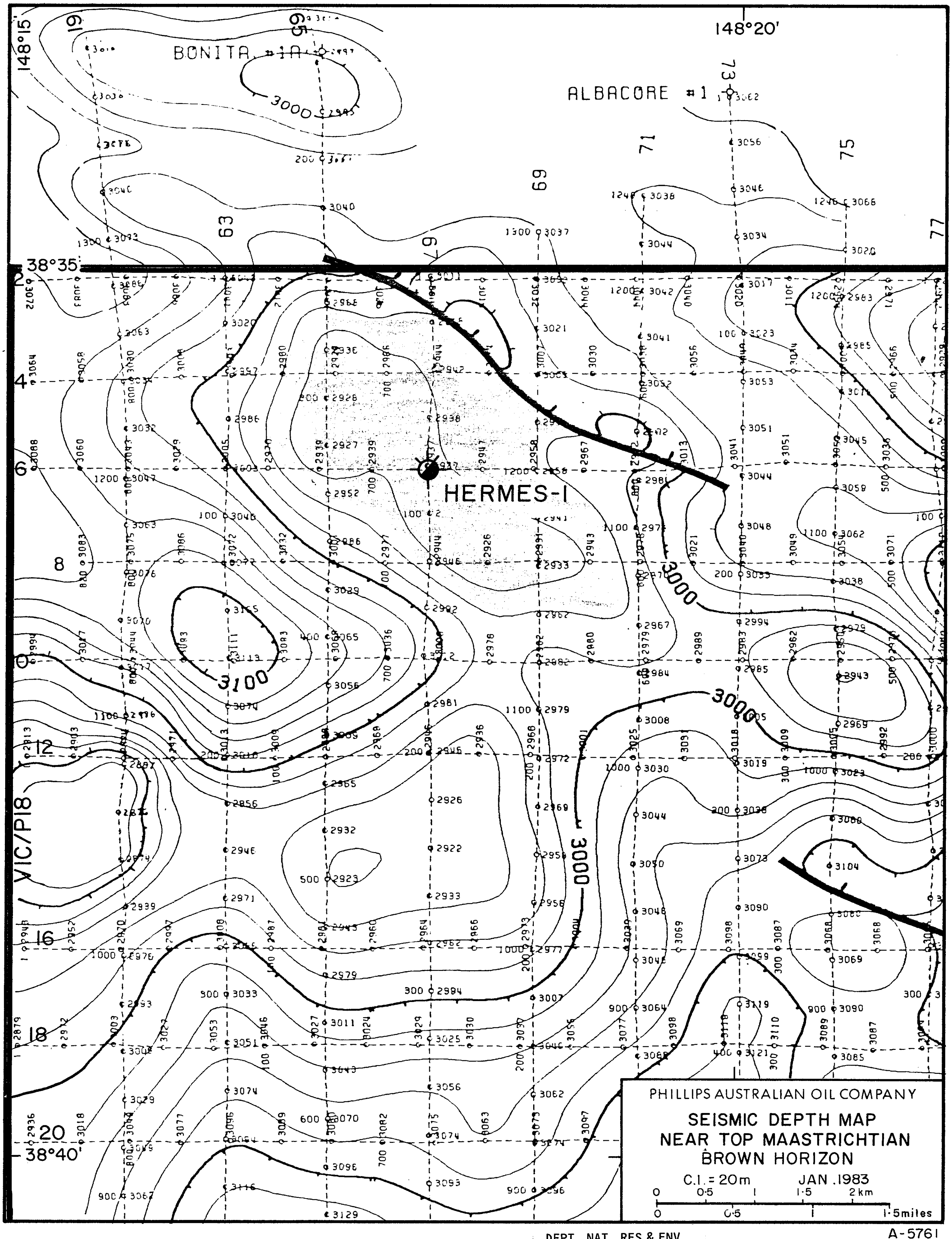
PE905116

This is an enclosure indicator page.
The enclosure PE905116 is enclosed within the container PE902581 at this location in this document.

The enclosure PE905116 has the following characteristics:

ITEM_BARCODE = PE905116
CONTAINER_BARCODE = PE902581
NAME = Seismic Depth Map Near Top Maastrichtian
BASIN = GIPPSLAND
PERMIT = VIC/P18
TYPE = SEISMIC
SUBTYPE = HRZN_CONTR_MAP
DESCRIPTION = Hermes-1 Seismic Depth Map Near Top Maastrichtian Brown Horizon (C.I.=20 m). Figure 16 of WCR volume 1.
REMARKS =
DATE_CREATED = 31/01/1983
DATE_RECEIVED = 23/09/1983
W_NO = W803
WELL_NAME = Hermes-1
CONTRACTOR =
CLIENT_OP_CO = Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)



148°15'
148°20'
38°35'
38°40'
BONITA #1A
ALBACORE #1
HERMES-1
VIC/P18
3000
3100
PHILLIPS AUSTRALIAN OIL COMPANY
SEISMIC DEPTH MAP
NEAR TOP MAASTRICHTIAN
BROWN HORIZON
C.I. = 20m
JAN. 1983
0 0.5 1 1.5 2 km
0 0.5 1 1.5 miles
A-5761

FIGURE 16

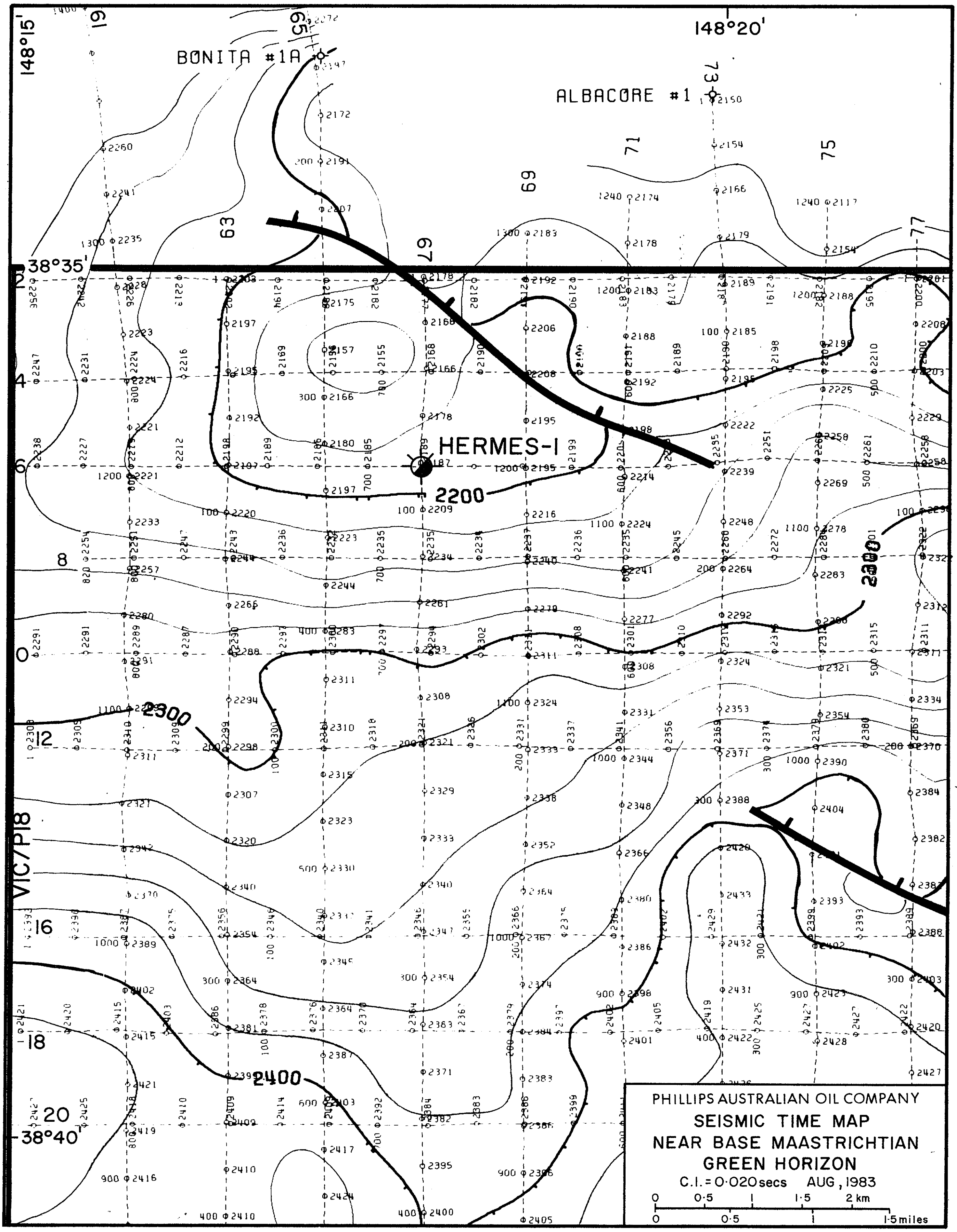
PE905117

This is an enclosure indicator page.
The enclosure PE905117 is enclosed within the container PE902581 at this location in this document.

The enclosure PE905117 has the following characteristics:

ITEM_BARCODE =	PE905117
CONTAINER_BARCODE =	PE902581
NAME =	Seismic Time Map Near Base Maastrichtian
BASIN =	GIPPSLAND
PERMIT =	VIC/P18
TYPE =	SEISMIC
SUBTYPE =	HRZN_CONTR_MAP
DESCRIPTION =	Hermes-1 Seismic Time Map Near Base Maastrichtian Green Horizon (C.I.=0.020 secs). Figure 17 of WCR volume 1.
REMARKS =	
DATE_CREATED =	31/08/1983
DATE_RECEIVED =	23/09/1983
W_NO =	W803
WELL_NAME =	Hermes-1
CONTRACTOR =	
CLIENT_OP_CO =	Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)



PHILLIPS AUSTRALIAN OIL COMPANY
SEISMIC TIME MAP
NEAR BASE MAASTRICHTIAN
GREEN HORIZON
C.I. = 0·020 secs AUG, 1983
0 0·5 1 1·5 2 km
0 0·5 1 1·5 miles

A-5955

FIGURE 17

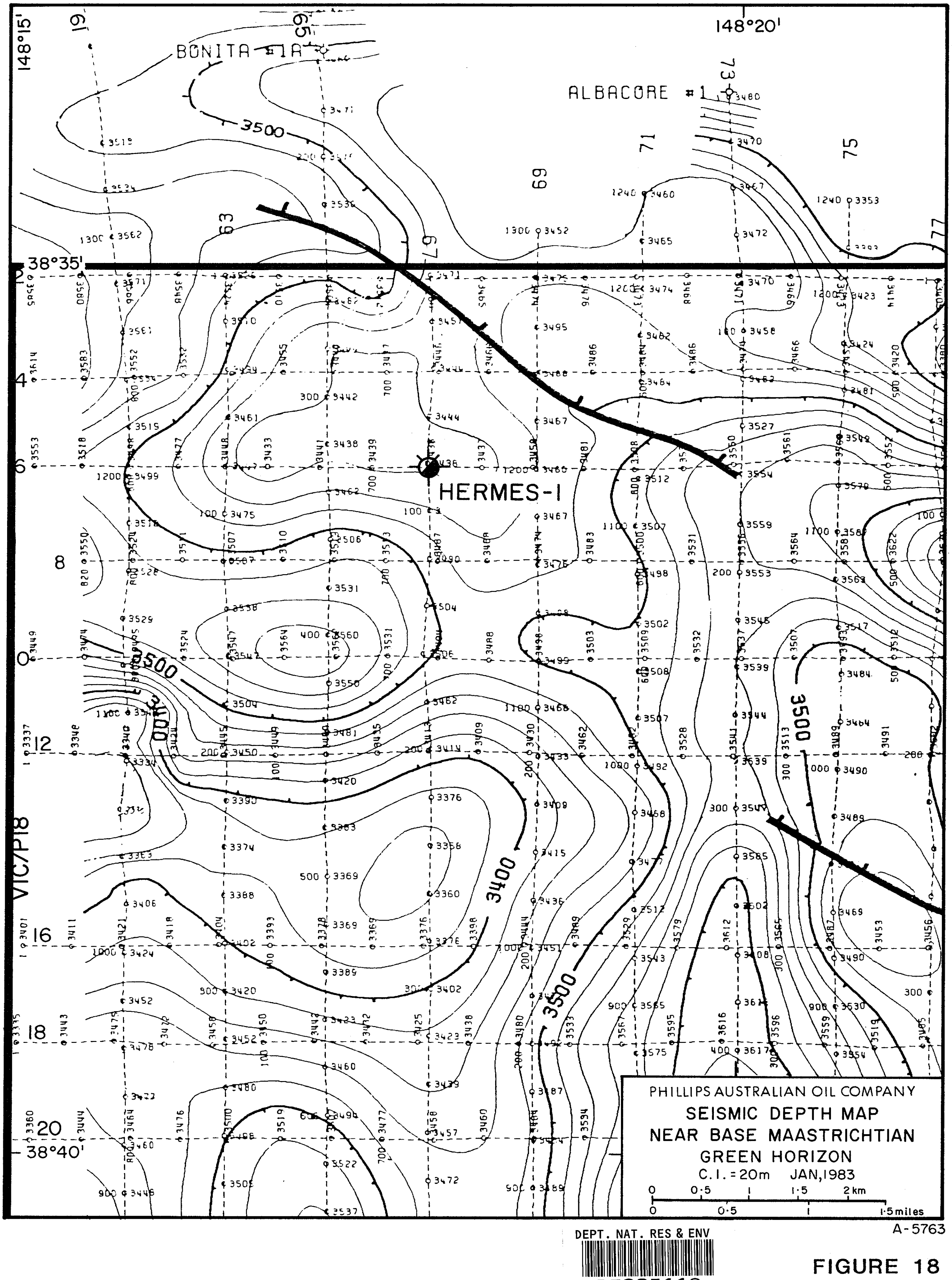
PE905118

This is an enclosure indicator page.
The enclosure PE905118 is enclosed within the container PE902581 at this location in this document.

The enclosure PE905118 has the following characteristics:

ITEM_BARCODE =	PE905118
CONTAINER_BARCODE =	PE902581
NAME =	Seismic Depth Map Near Base Maastrichtian
BASIN =	GIPPSLAND
PERMIT =	VIC/P18
TYPE =	SEISMIC
SUBTYPE =	HRZN_CONTR_MAP
DESCRIPTION =	Hermes-1 Seismic Depth Map Near Base Maastrichtian Green Horizon (C.I.=20 m). Figure 18 of WCR volume 1.
REMARKS =	
DATE_CREATED =	31/01/1983
DATE_RECEIVED =	23/09/1983
W_NO =	W803
WELL_NAME =	Hermes-1
CONTRACTOR =	
CLIENT_OP_CO =	Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)



148°15'
148°20'
38°35'
38°40'
BONITA #1A
ALBACORE #1
HERMES-1
VIC/P18
3500
3400
PHILLIPS AUSTRALIAN OIL COMPANY
SEISMIC DEPTH MAP
NEAR BASE MAASTRICHTIAN
GREEN HORIZON
C.I. = 20m JAN,1983
A-5763

FIGURE 18

RELEVANCE TO THE OCCURRENCE OF HYDROCARBONS

Hydrocarbon Indicators

Hydrocarbon indicators were monitored throughout the drilling of Hermes No. 1. Cuttings samples were examined under black-light for primary fluorescence and tested under solvent for cut fluorescence. A continuous record of gas-in-mud readings was maintained by Geoservices Inc. Total gas determinations and chromatographic analysis was conducted using a flame ionization detector with a gas chromatograph as backup.

Numerous hydrocarbon shows occurred in Hermes No. 1 within the intra-Latrobe Group. Most shows involve cut fluorescence with either very minor pinpoint primary fluorescence or more commonly no primary fluorescence at all. This phenomenon of cut fluorescence without significant associated primary fluorescence was also observed in Selene No. 1 where core analysis and RFT results indicated the presence of trace amounts of hydrocarbons. Similar shows in Hermes No. 1 are considered to indicate the presence of low concentrations of migrated hydrocarbons. An increase in observed primary fluorescence and gas chromatograph readings occurs with depth, indicating increasing maturity of source rocks, including coals, and local reservoiring of hydrocarbons in adjacent thin sand bodies. High gas readings, where present, were associated with thin sandstones within the coal measures. Gas analysis indicates methane-rich gas possibly generated locally from the coals.

Below 4375 metres, a marked increase in gas readings and in the amount of primary fluorescence corresponded with a thick sandstone sequence, constituting the most significant show in Hermes No. 1. This zone was ultimately tested for hydrocarbons through drillstem tests 1 and 2 (Addendum 5).

Shows observed during drilling from cuttings and sidewall cores are described as follows:

INTERVAL (METRES)	DESCRIPTION
2730 - 2745	White-to-bright white streaming cut fluorescence with slight petroliferous odour; .009 - .019% C_1.
2755 - 2775	Strong-to-moderate white streaming cut fluorescence; Tr - .007% C_1.
2855 - 2925	Faint white streaming cut fluorescence; .01 - .05% C_1, Tr. - .03% C_2, 0.0 - 0.3% C_3.
3005 - 3020	Faint light blue cut fluorescence; Tr. - .02% C_1, Tr. - .016% C_2, Tr. - .003% C_3.
3185 - 3320	Faint streaming-to-bleeding yellow cut fluorescence occurs in 60% of the samples; pale blue fluorescence occurs in SWC at 3217 metres, Tr. - 0.6% C_1, Tr. C_2, Tr. C_3.
3320 - 3435	No shows in cuttings but yellow pinpoint fluorescence with associated minor streaming cut fluorescence was observed in SWC at 3368 metres.
3435 - 3640	Slow-to-instant pale yellow streaming cut fluorescence occurs in 70% of the samples; .01 - 3.3% C_1, minor pinpoint fluorescence was observed in 3 SWC's (sandstone) and 1 SWC (coal), Tr. - .6% C_2, Tr. - .2% C_3, Tr. - .02% C_4.

INTERVAL (METRES)	DESCRIPTION
3640 - 3865	Bright-to-dull minor-to-moderate yellow-to-green-to-white pinpoint fluoresence in 40% of the samples, with pale-to-bright slow-to-instant yellow streaming cut fluorescence in 80% of the samples (all samples exhibiting primary pinpoint fluorescence also cut), some fluorescence is associated with resinous matter from coals. SWC's throughout the interval also exhibit primary and cut fluorescence with some petroliferous odour; .09 - 1.45% C_1, Tr. - .49% C_2, Tr. C_3.
3870 - 4265	Faint-to-bright slow-to-instant streaming-to-bleeding yellow cut fluorescence in 75% of the samples; no primary hydrocarbon fluorescence was reported in cuttings, but locally minor-to-abundant mineral fluorescence (dolomitic cement) exists. Primary fluorescence was observed in numerous SWC's as faint light green pinpoint to patchy with minor crush cut and slight odour; .01 - 75% C_1, Tr. - .8% C_2, Tr. - .4% C_3, 0.0 - 0.4% C_4, highest gas (above 5% C_1) at 3950 - 3965 metres, 3975 - 3980 metres, 4055 - 4100 metres, 4140 - 4145 metres.

INTERVAL (METRES)	DESCRIPTION
4265 - 4375	Very minor-to-moderate pinpoint fluorescence occurs in all cuttings samples with minor-to-moderate slow streaming yellow cut fluorescence in 70% of the samples. SWC's exhibit faint green primary fluorescence with white-to-yellow cut and slight-to-moderate odour; .85 - 15.5% C_1, .025 - 1.75% C_2, Tr. - .70% C_3, 0.0 - .24% C_4, highest gas readings (above 5% C_1) at 4265 - 4285 metres and 4335 - 4360 metres.
4375 - 4565	Pinpoint-to-patchy yellow-green-gold to white fluorescence occurs in every cuttings sample and most sidewall cores with associated slow-to-instant dull-to-bright yellow cut fluorescence and slight-to-moderate petroliferous odour, minor-to-moderate brown staining is reported in cuttings below 4460 metres; .2 - 35% C_1, .06 - 5.7% C_2, .02 - .85% C_3, .006 - .9% C_4, highest gas readings (above 5% C_1) at 4375 - 4440 metres, 4460 - 4465 metres, 4475 - 4565 metres (T.D.)

INTERVAL (METRES)	DESCRIPTION
	This interval exhibits the strongest hydrocarbon shows in Hermes No. 1, highlighted by the ubiquitous primary fluorescence. This occurs generally as moderate pinpoint fluorescence but locally increases to patchy fluorescence through the intervals 4405 - 4440 metres and 4505 - 4525 metres. The increase in primary fluorescence is also accompanied by a change from minor streaming yellow cut fluorescence to instant bright yellow cut fluorescence.

--00--

Computer processed wireline log interpretations (Appendix 9, Enclosure 7) further indicated the presence of hydrocarbons throughout multiple intra-Latrobe intervals, resulting in a testing program including two drillstem tests and three formation interval tests (see Addendum 5 for a detailed summary of the DST program).

The drillstem tests performed in Hermes No. 1 tested sands in the gross interval 4415 metres to 4442 metres. DST-1 tested three sections, 4415 to 4425 metres, 4427 to 4431 metres and 4432 to 4442 metres through perforations (4 shots per foot). The well flowed fresh formation water at about 2 BPH and slugged water and gas. The slugs could not be measured as the well was not flowing to the separator. Rw was measured at 0.962 ohm-m at 69.5°F with 2000 ppm chloride content. Permeability was calculated at .04 MD using an optimistic flow rate of 125 BPD.

DST-2 tested the intervals 4383 to 4388 metres and 4400 to 4403 metres. The well flowed water with small amounts of oil emulsion and gas. Fluid flow rate was estimated to 145 BPD through a .25 inch choke. Gas flowed at rates of 140 - 450 MCFPD. Fluid was brackish water with minor condensate-like oil emulsion. Rw measured .79 at 66°F with 4000 ppm chloride content. Permeability was calculated at .116 MD.

Recovered gas analyses reveals a methane-rich gas with approximately 80% C_1, 10% C_2 and C_3, and 7% CO_2.

Three F.I.T.'s were run to evaluate sand intervals at 4230 to 4232 metres and 3567 to 3571 metres. F.I.T.-1 perforated at 4231.5 metres and recovered 59.1 cu.ft. of gas, 1500 cc of brownish water, and 800 cc of amber-yellow, condensate-like oil emulsion. Rw was .457 at 59°F with 8500 ppm chlorides. No pressure readings were taken due to instrument failure. Recorded gas from F.I.T.-1 was methane-rich with approximately 86% C_1, 11.5% C_2 and C_3, and less than 2.5% C_4 - C_7. Nitrogen and carbon dioxide accounted for only .38% of the total (Appendix 12).

F.I.T.-2 perforated at 3568.9 metres and recovered 33.3 cu.ft. of gas and 5660 cc of brownish water. No liquid hydrocarbons were recovered. Rw was .390 at 65°F with 10000 ppm chlorides. Formation pressure was 5124 p.s.i. Gas analyses wre not obtained from F.I.T.-2.

F.I.T.-3 was run to test the formation pressure in the sand interval tested by F.I.T.-1. The test was a failure as it recovered 100% drilling mud with no gas and no pressure reading. The failure is believed to have resulted from poor cement bonding due to the proximity of the F.I.T.-1 perforation only 0.5 metres above the F.I.T.-3 perforation.

RESERVOIR ROCK CHARACTERISTICS

Potential reservoir rocks in Hermes No. 1 are divided into three zones for characterization. The uppermost zone extends from the Top Latrobe Coarse Clastics at 2544 metres to the top of the coal measures at 3150 metres. Sands range in thickness from 3 to 60 metres, the thickest representing stacked beach/barrier/dunal systems. Thinner sands represent tidal channels and back-barrier point bars developed on the coastal plain. The thick beach/barrier sands have the best reservoir characteristics in Hermes No. 1. They are comprised of coarse-to-very coarse grained poorly sorted sand with a very minor silty to argillaceous matrix. They are poorly cemented to unconsolidated and have good-to-excellent visual porosities as described from sidewall cores. Log-interpreted porosities average over 20%. Sands in this zone were 100% water saturated.

The central zone extends from 3150 to 4375 metres and comprises the coal measures. Sands are generally thin ranging from 2 metres to a maximum of about 8 metres. These sands are point bar, crevasse splay and channel fill in origin. Log-indicated porosities are fair to poor, averaging less than 15%. A number of these sands had lower than average water saturations, two of which produced gas and some condensate in wireline tests.

The lowermost sand zone tested by DST's-1 and -2, extends from 4375 to 4442 metres. The zone is predominantly sandstone with interbedded siltstones, and is of alluvial fan-to-upper fluvial plain origin. Thin section analysis from sidewall cores within the zone reveals the sands are very immature clay-and-silt choked feldspathic quartz arenites with some secondary dolomitic cement. Visual porosities are very low, averaging about 8%. Due to the extreme rugosity of the hole in this zone the density/neutron log was useless, necessitating that porosities be estimated from the sonic log. The clay matrix affected the sonic response resulting in erroneously high porosity readings.

Water saturations in the lowermost sands were initially calculated using an Rw of .065 ohm-m at 93°C, and indicated 21 metres of net pay within the lowermost sand zone. This Rw had been found to be appropriate for the intra-Latrobe section at Helios No. 1 and Selene No. 1. Formation water recovered in DST-1 was fresh however, with a measured Rw of 0.962 ohm-m at 69.5°F. Water saturations calculated using the new measured Rw were significantly higher than originally calculated.

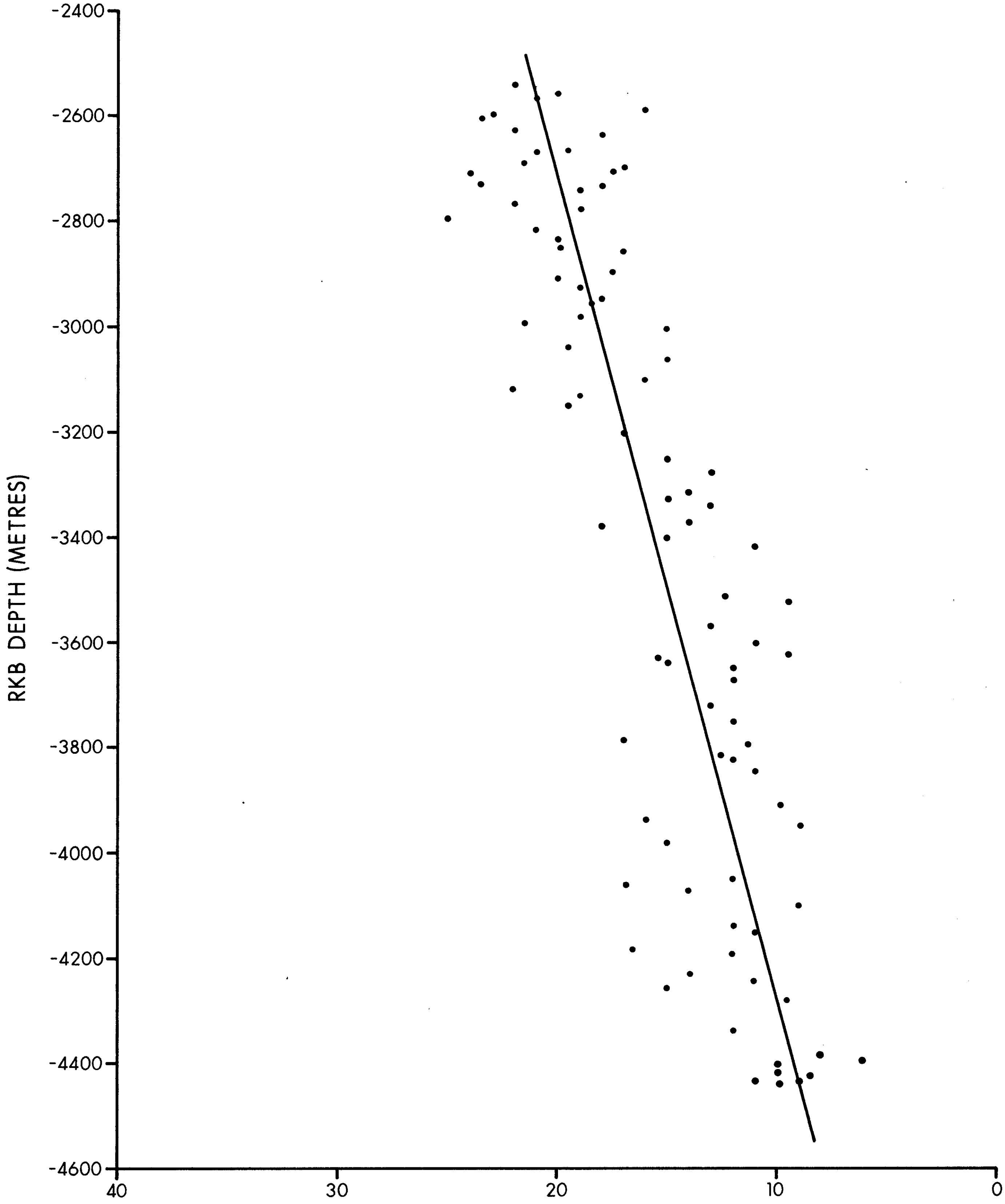
Permeabilities were calculated from drillstem test flow rates in the lowermost sands. DST-1 indicated a permeability of .04 millidarcies using an optimistic flow rate of 125 BPD. Permeability was calculated from DST-2 to be .116 millidarcies.

Log-interpreted porosities and water saturations are summarized in Table 13. Variable Rw values were used to reflect fresher formation water with depth. Values shown in brackets were original water saturations calculated using Rw of .065 ohmm at 93°C. The relationship between porosity and depth for Hermes No. 1 is illustrated in Figure 19.

INTERVAL (METRES)	THICKNESS (METRES)	CALCULATED AVG. Ø (%)	AVERAGE SW (%)	COMMENTS
LATROBE COARSE CLASTICS				
2550 - 2566	16	19	100	Section is water saturated and non-prospective
2587 - 2644	57	22	100	
2766 - 2783	17	20	100	
2810 - 2852	42	20	100	
2947 - 2981	34	17	100	
3115 - 3125	10	22	100	
COAL MEASURES				
3567 - 3571	4	13	55 (42)	FIT # 2 at 3569.0
3821 - 3832	11	12	85 (46)	
4230 - 4233	3	12	70 (37)	FIT # 1 at 4231.5
DEEP ALLUVIALS				
4383 - 4388	5	9	69 (27)	DST-2 Perf. Interval
4400 - 4403	3	12	65 (23)	DST-2 Perf. Interval
4415 - 4425	10	10	70 (37)	DST-1 Perf. Interval

TABLE 13 : SUMMARY OF POTENTIAL RESERVOIRS (SELECTED EXAMPLES)

SANDSTONE POROSITY Vs DEPTH
HERMES-1



POROSITY FROM COMPUTER CROSS PLOT OF WIRELINE LOG DATA

A-5936

FIGURE 19

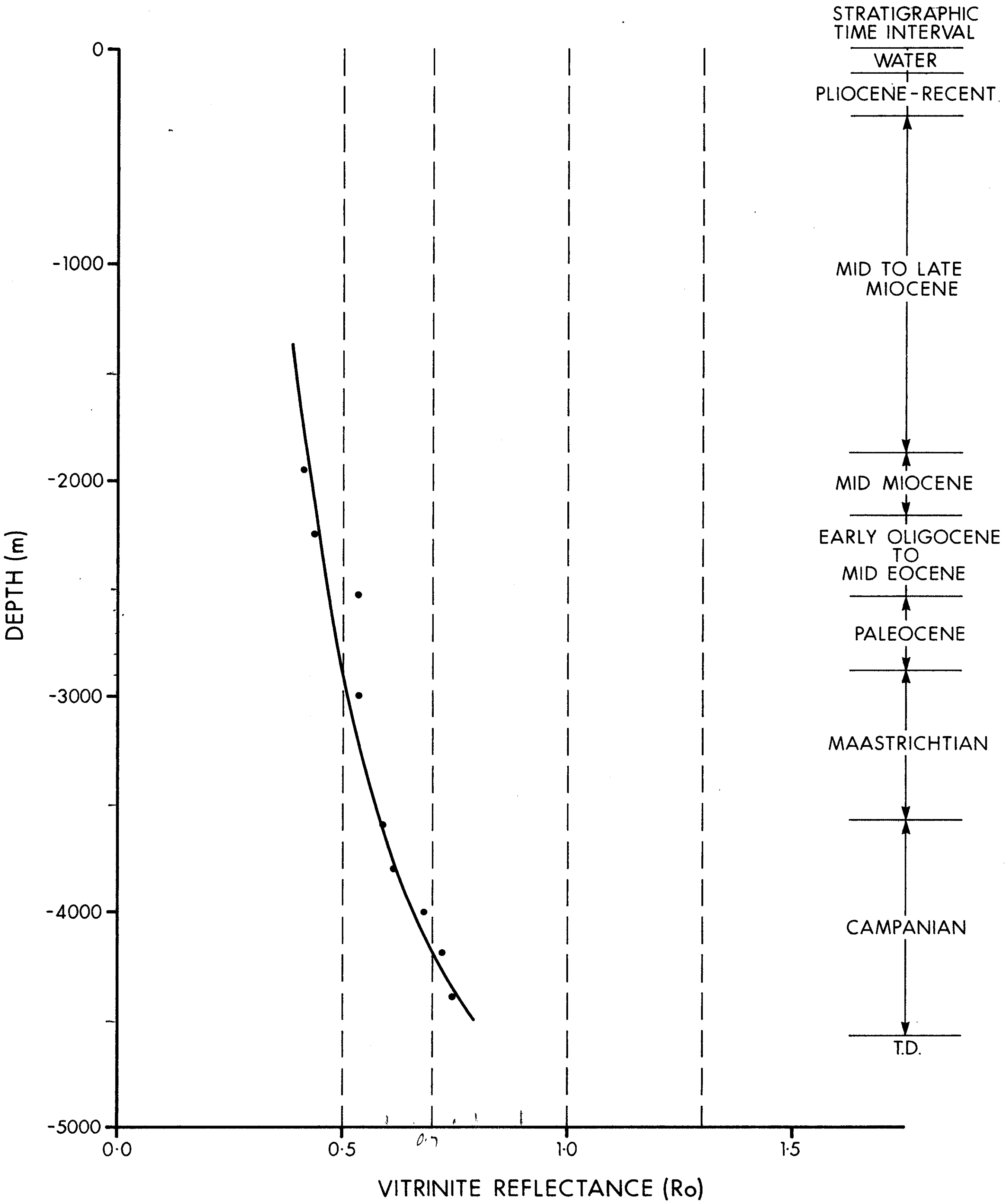
SOURCE ROCK POTENTIAL

Potential source rocks were encountered throughout much of the Latrobe Group section. These consisted of dark brown to black very carbonaceous siltstones, claystones, shales and coals as evidenced from cuttings and sidewall core examinations. Source rock and maturity characterizations of these rocks were made by headspace cuttings gas analysis over the interval 2400 metres (within lower Lakes Entrance) to 4565 metres (T.D.). Complete source rock evaluation including total organic carbon (T.O.C.) determination and Rock-eval pyrolysis was performed on cuttings from 3400 metres to T.D. by Analabs Inc. (Appendix 10).

Light hydrocarbon (C_1 - C_7) data indicate that rocks within the interval 2400 to 2700 metres have low light hydrocarbon contents and hence poor hydrocarbon generating characteristics. Rocks within the interval 2700 to 3390 metres have higher light hydrocarbon contents and moderate source rock potential. Rocks within the interval 3390 to 4565 metres (T.D.) appear to have excellent source rock characteristics. Total organic carbon averages about 6% over this interval and the high hydrogen index (generally >200 mg HC/g TOC) indicates oil proneness. These excellent source rocks are contained within the thick coal measures in Hermes No. 1.

Maturity data including iC_4/nC_4 ratios, Tmax, production index from Analabs, and vitrinite reflectance data prepared by the Exploration Projects Section of Phillips Petroleum Company (Figure 20 and Appendix 11), indicate that source rocks above about 3800 metres are immature to very marginally mature. From 3800 to approximately 4000 metres the section becomes marginally mature with vitrinite reflectance ranging from .6% to .7%. Below 4000 metres to T.D. the section is within the mature oil-generating window. This is apparent from the drop in iC_4/nC_4 ratio to below 1, an increase in the production index to over .1, Tmax above 440°C and vitrinite reflectance greater than .7% Ro.

VITRINITE REFLECTANCE Vs DEPTH
HERMES-1



A-5934

FIGURE 20

The increase in primary fluorescence is most noticeable in cuttings and sidewall cores from within the mature zone. This indicates that hydrocarbons encountered in Hermes No. 1 probably represent in situ hydrocarbons undergoing primary generation. An exception to this may occur higher in the hole between 2530 metres and 3209 metres. Ratios of iC_4/nC_4 are anomalously low (indicating maturity) for this otherwise apparently immature section. Shows within this interval occur between 2730 metres and 3020 metres (see description of shows this report). These shows may indicate the presence of residual mature hydrocarbons which have migrated through this stratigraphic interval. It is significant that the shows were different from those deeper in the section, giving a white to white-blue cut as opposed to the more typical yellow cut fluorescence seen at depth.

The average geothermal gradient at Hermes No. 1 is 3.01°C/100 metres assuming a seafloor temperature of 15.5°C (Figure 21). Extrapolated bottom hole temperature is 152°C measured at 4557 metres. The temperature at the Top Latrobe Group at 2502 metres is 79°C as measured from the real temperature plot in Figure 21.

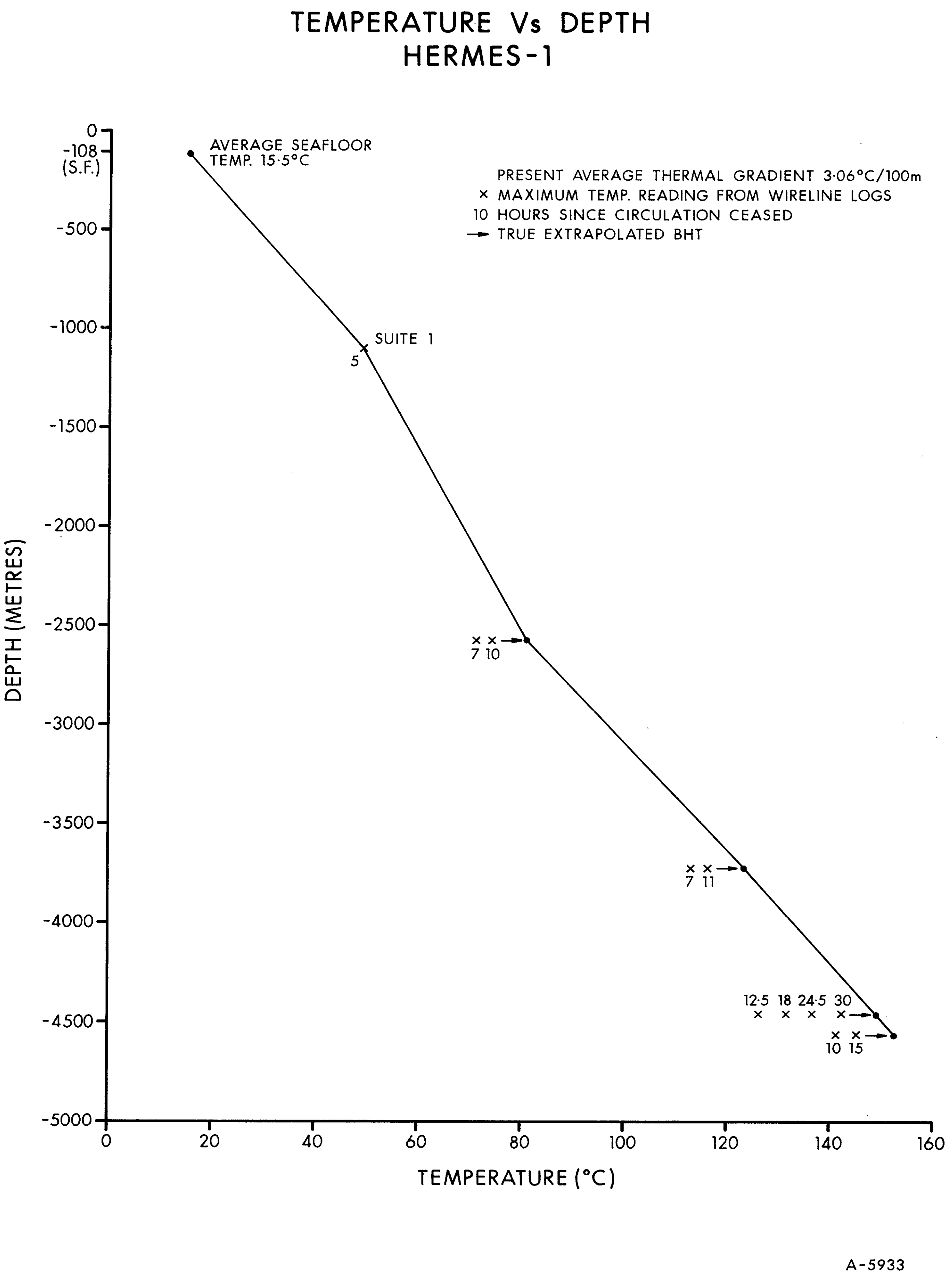

TEMPERATURE Vs DEPTH
HERMES-1
AVERAGE SEAFLOOR
TEMP. 15·5°C
PRESENT AVERAGE THERMAL GRADIENT 3·06°C/100m
× MAXIMUM TEMP. READING FROM WIRELINE LOGS
10 HOURS SINCE CIRCULATION CEASED
→ TRUE EXTRAPOLATED BHT
SUITE 1
5
7 10
7 11
12·5 18 24·5 30
10 15
0
-108
(S.F.)
-500
-1000
-1500
-2000
-2500
-3000
-3500
-4000
-4500
-5000
DEPTH (METRES)
0
20
40
60
80
100
120
140
160
TEMPERATURE (°C)
A-5933

FIGURE 21

SUMMARY OF HYDROCARBON SIGNIFICANCE

The lack of a significant intra-Latrobe seal above the coal measures means that closure must exist at the Top Latrobe Unconformity to allow trapping beneath the Upper Latrobe Group/Lakes Entrance Formation seal. Sands within the coal measures with the required thickness and reservoir characteristics to trap significant hydrocarbon accumulations are not developed. The lowermost sands at Hermes No. 1 exhibit poor reservoir qualities. Although the possibility exists that they may clean up laterally, tentative correlations to deep sands in Volador No. 1 and Barracouta No. 1 indicate similar problems with porosity and permeability.

The close agreement between predicted seismic depths and actual drill depths confirms the validity of the original structural analysis. Synthetic seismic depths to the seismic yellow (2770 metres) and brown (2943 metres) target horizons place them within the thick interval of interbedded beach/barrier sands and back-barrier sands and clays. No significant sealing units exist above sands within the interval. The minor shows occurring between 2730 and 3020 metres which possibly represent mature residual hydrocarbons indicate that hydrocarbons have migrated through the section. Due to the lack of a sealing unit these hydrocarbons have probably moved upward to the Top Latrobe Coarse Clastics Unconformity and accumulated in the nearby Kingfish structure at that level. Poor fault seal may have provided avenues for upward hydrocarbon migration and escape.

Sands within the coal measures (3150 to 4373 metres) are too thin and probably too discontinuous to act as significant reservoirs. This section, which includes the seismic green target horizon (3488 metres) is a gross sealing unit to the underlying sandstones. Geochemical analyses indicate that siltstones, shales and coals in this section are excellent source rocks with very high total organic carbon content. These rocks are early mature (Ro between .5 and .6) throughout most of the section and reach maturity (Ro >.7) below 4000 metres.

The dominantly sandy interval from 4373 metres to 4442 metres lies within the oil generating window (Ro >.7%). The presence of coals, carbonaceous silts and shales below the sands indicate source rocks are favourably situated to supply significant hydrocarbons. Although porosity and permeability are poor, higher concentrations of hydrocarbons were to be expected. The presence of fresh, probably connate water and overpressuring of the sands demonstrate that the reservoir is hydrodynamically sealed thus precluding displacement of formation water by upward-migrating hydrocarbons.

CONTRIBUTIONS TO GEOLOGICAL KNOWLEDGE

1) The "Cobia Event" unconformity occurs at 2475 metres and represents the final opening of the deep sea way between Australia and Antarctica.

2) Oligocene sediments occur in Hermes No. 1 as the Basal Lakes Entrance Formation, between the overlying "Cobia Event" unconformity and the underlying Colquhoun Formation.

3) The Colquhoun Formation is of Late Eocene age at Hermes No. 1 and is conformable with the overlying Oligocene sediments. The Colquhoun Formation represents deposition in a near-shore marine or inner continental shelf platform environment.

4) The Gurnard Formation, present in Selene No. 1, is absent at Hermes No. 1.

5) The Flounder Formation of Mid-Eocene age reflects sedimentation in a near-shore marine to estuarine environment as evidenced by its primarily arenaceous, benthonic foraminifera.

6) Major unconformities bound the Flounder Formation and reflect the unstable nature of the region during the Eocene due to the continuing separation of Australia from Antarctica.

7) The Paleocene at Hermes No. 1 is 337 metres thick and reflects the general thickening trend of the Paleocene from southeast to northwest (i.e. from the Selene No. 1 area to the Kingfish area). The Paleocene interval is occupied by the Latrobe Clastics, a series of alternating beach/barrier and back barrier-lagoonal deposits. This interval is characterized by thick coarsening-upward sandstones of the beach/barrier environment, with associated dunal facies. These sands form the best potential reservoirs at Hermes No. 1.

8) An apparent unconformity separates the Paleocene and Upper Cretaceous (Maastrichtian) sections as evidenced by a marked dip reversal on the dipmeter.

9) A thick sequence of paludal swamp coal measures occurs between 3150 metres and 4375 metres. These rocks are Upper Cretaceous age and straddle the apparently conformable Maastrichtian-Campanian boundary at 3587 metres.

10) A sand-dominated sequence occurs between 4375 metres and 4442 metres. These sands are tight with low porosity and permeability, however, they may clean up laterally and have significant exploration potential.

APPENDIX NO. 1

GOVERNMENT APPROVALS

DEPARTMENT OF MINERALS AND ENERGY

PRINCES GATE EAST 151 FLINDERS STREET MELBOURNE, VIC. 3000

TELEPHONE: (03) 653 9200 TELEX: MINERG AA 36595

Our Ref. KW/ML
Your Ref.
Contact
Ext. 335

17 January 1983

Mr O J Koop
Manager
Phillips Australian Oil Company
23rd Floor
City Centre Tower
44 St. Georges Terrace
PERTH WA 6000

Dear Sir

PETROLEUM (SUBMERGED LANDS) ACT 1967
CONSENT TO DRILL HERMES-1

You are advised that under Clause 3 of the Direction as to Drilling Operations, Designated Authority approval has been granted to your request to drill the new field wildcat Hermes-1 in VIC/P18 using the semi-submersible drilling vessel "Diamond M Epoch". This approval is subject to the following conditions -

1 Your Company shall avoid the use of pennant lines and anchor buoys and rely on chain chaser techniques for anchor retreival. Alternatively, rig anchor marker buoys, if deployed, shall carry warning lights the characteristics of which shall satisfy the Commonwealth Department of Transport and Construction.

2 A preliminary abandonment programme shall be submitted to the Designated Authority at least one week prior to the submission of the detailed (post final logs) abandonment programme.

3 Phillips Australian Oil Company keeps the Australian Coastal Surveillance Centre, Canberra, informed of the movements of the drilling vessel.

4 Daily tour sheets are to be lodged weekly with the Designated Authority.

Yours faithfully

J L LePage
DIRECTOR
OIL & GAS DIVISION

DEPARTMENT OF MINERALS AND ENERGY
PRINCES GATE EAST 151 FLINDERS STREET MELBOURNE, VIC. 3000
TELEPHONE: (03) 653 9200 TELEX: MINERG AA 36595

Our Ref. KW/bk
Your Ref.
Contact
Ext.

7th April 1983.

Mr. O.S.Koop,
Manager,
Phillips Australian Oil Company,
23rd floor
City Centre Tower,
44 St.Georges Terrace
PERTH W.A.

Dear Sir,

PETROLEUM (SUBMERGED LANDS) ACT, 1967
DEEPENING OF WELL - HERMES-1

I refer to your telex of 29 March 1983 and wish to advise that Designated Authority approval has been obtained to deepen the HERMES- 1 exploration well from a TD of 3750 metres to a new TD of 4300 metres.

Yours faithfully,

I. Fraser
ACTING DIRECTOR
OIL & GAS DIVISION.

APPENDIX NO. 2

DAILY DRILLING SUMMARY

DAILY DRILLING SUMMARY

(Covers previous 24 hour period to 0800 hours on report date)

Date	Total Depth (metres RKB)	Work Performed
14th February, 1983		The rig was released from Selene No. 1 at 1520 hours on 13th February, 1983, and towed to the Hermes No. 1 location. Primary anchor No. 7 was dropped at 1745 hours. The workboats ran primary anchors Nos. 2, 3, 4, 5 and 6.
15th February, 1983	126m	The workboats ran primary anchors Nos. 1 and 8 and re-ran primary anchor No. 2. Piggy back anchors were run on all primary anchors. The anchors were storm tested to 375,000 lbs. Made up 36 inch bottom hole assembly and spudded well at 0650 hours. Drilled from 109 metres (seabed) to 126 metres.
16th February, 1983	166m	Drilled from 126 metres to 166 metres. Experienced hole bridging and stuck drill pipe in this part of the hole. Displaced hole with 12 ppg mud and started running 30 inch casing. (Note: deviation survey 0.5° at 166 metres).
17th February, 1983	166m	Ran in hole with 30 inch casing. Tagged fill at 113 metres. Washed casing down to 129 metres. Slow progress. Pulled out of hole with casing. Ran in hole with 36 inch bottom hole assembly. Washed and reamed to 166 metres. Displaced hole with 8.6 ppg mud 200+ sec. viscosity.
18th February, 1983	166m	Pulled out of hole. Waited for one hour. Ran in hole and tagged bottom. No fill. Pulled out of hole. Rigged up and ran four joints of 30 inch

Date	Total Depth (metres RKB)	Work Performed
18th February, 1983 (continued)		casing. Cemented casing with 1500 sacks of class "G" neat cement mixed at 15.8 ppg (casing shoe at 163 metres).
19th February, 1983	360m	Ran in hole with 26 inch bottom hole assembly. Tagged cement at 152 metres. Drilled from 152 metres to 360 metres. Deviation 0.75° at 360 metres. Displaced hole with high viscosity 9.6 ppg mud. Made a short trip to the 30 inch shoe and back to bottom. No fill. Pulled out of hole.
20th February, 1983	360m	Rigged up and ran 20 joints of 20 inch casing and 16-3/4 inch wellhead. Ran in hole with stinger. Mixed and pumped 388 sacks of class "G" cement. A high pressure nipple on the cementing unit manifold cut out. Aborted cement job. Circulated out cement with rig pumps. Repaired pump. Mixed and pumped 800 sacks of class "G" neat cement mixed at 12.8 ppg with 2.5% prehydrated gel. Mixed and pumped 500 sacks of class "G" neat cement mixed at 15.8 ppg. Good returns were observed throughout job. Pulled out of hole with stinger and started running BOP.
21st February, 1983	425m	Finished running BOP. Tested to PAOC's specifications. Okay. Ran in hole with 14-3/4 inch bit and 17-1/2 inch underreamer. Tagged float collar at 338 metres. Drilled from 338 metres to 369 metres. Pulled to 20 inch shoe and performed formation leak-off test. Equivalent mud weight of 13.5 ppg. Drilled and underreamed

Date	Total Depth (metres RKB)	Work Performed
		from 364 metres to 425 metres
22nd February, 1983	905m	Drilled and underreamed from 425 metres to 905 metres. Deviation 0.25° at 815 metres. Started pulling out of hole for bit and underreamer change.
23rd February, 1983	1112m	Ran in hole with new bit and cutters. Drilled and underreamed from 905 metres to 1112 metres.
24th February, 1983	1112m	Conditioned hole for logs and pulled out of hole. Ran dual induction, sonic long space gamma ray and caliper logs from 1109 metres to 20 inch shoe at 351 metres. Rigged up and started running 13-3/8 inch casing.
25th February, 1983	1112m	Finished running 13-3/8 inch casing. Shoe at 1104.8 metres. Cemented casing with 1400 sacks of class "G" neat cement mixed at 12.8 ppg (lead) and 500 sacks class "G" neat cement mixed at 15.8 ppg (tail). Tested BOP stack to PAOC's specifications.
26th February, 1983	1269	Ran in hole and drilled a 12-1/4 inch hole to 1116 metres. Pulled to shoe and performed a formation limit test to an equivalent mud weight of 14.5 ppg. No leak-off occurred. Drilled ahead to 1269 metres.
27th February, 1983	1303m	Drilled from 1296 metres to 1303 metres. Tripped for stratapax bit. (Note: 14.5 hours were spent trying to repair the olmsted valve on the

Date	Total Depth (metres RKB)	Work Performed
27th February, 1983 (continued)		motion compensator). Ran in hole to 784 metres.
28th February, 1983	1331m	Compensator was still non-functional. Pulled out of hole with stratapax bit and ran in hole with Smith SDS bit. Drilled from 1303 metres to 1331 metres.
1st March, 1983	1346m	Drilled from 1331 metres to 1344 metres. Repaired motion compensator. Tripped for stratapax bit. Drilled from 1344 metres to 1346 metres. Lost 1500 psi pump pressure. Started pulling out of hole checking string.
2nd March, 1983	1346m	Finished pulling out of hole. Found total matrix of stratapax bit washed and twisted off. Ran in hole with 11" reverse circulating basket. Recovered four small pieces of junk, ran in hole with junk mill and two junk subs. Crushed matrix of bit and recovered 16 lbs of junk. Ran in hole with junk mill and subs.
3rd March, 1983	1351m	Milled on junk at 1346 metres. Pulled out of hole and re-covered 35 lbs junk. Ran in hole with Smith SDGH bit and attempted to drill from 1346 metres to 1347 metres. Pulled out of hole and recovered 64 lbs of junk. Ran in hole with Smith SDS bit and drilled from 1347 metres to 1351 metres at 2.4 metres per hour. Started pulling out of hole.
4th March, 1983	1442m	Recovered 27 lbs of junk. Ran

Date	Total Depth (metres RKB)	Work Performed
4th March, 1983 (continued)		in hole with a new Smith SDS bit and drilled from 1351 metres to 1420 metres. Pumps lost 400 psi. Pulled out of hole. Found washout in the ninth drillcollar below the heavy weight drillpipe. Recovered 10 lbs of junk (total 176 lbs). Ran in hole with a new Smith SDS bit and drilled to 1442 metres. Drilled to 1500 metres. Pumps lost 300 psi and gained 9 strokes per minute. Pulled out of hole. Found washout between
5th March, 1983	1500m	the 18th and 19th drillcollars above the bit. Ran in hole with new bottom hole assembly to 1500 metres. Broke circulation with 2400 psi and 140 strokes per minute. Pumps lost 50 psi and 3 spm. Pulled out of hole. Found washout in box of 18th drillcollar up from bit. Started testing BOP stack.
6th March, 1983	1518m	Tested BOP stack to PAOC's specifications. Ran in hole with bottom hole assembly. Drilco inspected all connections. Found a cracked pin on the 7th drillcollar up from the bit and cracks in the pin of a stabilizer on the 12th drillcollar up from the bit. Drilled from 1500 metres to 1518 metres. (Time changed - clocks turned back one hour).
7th March, 1983	1572m	Drilled to 1537 metres. Pumps lost 200 psi and gained 4 strokes per minute. Pulled out of hole. Found washout in the box of the first drillcollar up from the bit. Ran in hole with

Date	Total Depth (metres RKB)	Work Performed
7th March, 1983 (continued)		a new bottom hole assembly. Drilco checked all connections (no defects). Drilled to 1572 metres.
8th March, 1983	1648m	Drilled to 1641 metres. Noticed excessive vibration in the riser. Checked inclination of stack and riser (both 0.5°). Tried to re-position rig. Inclination after re-position was riser 0.5° and stack 0.75°. Pulled out of hole. Noticed drillpipe had been rubbing in stack connector. Ran in hole with test plug and tested connector to 2500 psi (okay). Ran in hole to 1641 metres. Drilled to 1648 metres. Riser still vibrating but not as bad as earlier.
9th March, 1983	1732m	Drilled to 1732 metres. Still experienced vibration. Pumps lost 225 psi and gained 4 strokes per minute. Pulled out of hole. Found washout in the box of the 6th drillcollar above the bit. Also found the pin on the stabilizer above the cracked drillcollar was fluid-washed and the stabilizer sleeve cracked. Ran test plug and tested BOP stack to PAOC's specifications (okay). Started in hole with bottom hole assembly. Each joint was inspected by Drilco. Found a crack in the box of the first drillcollar above the bit. Continued running in hole with bottom hole assembly.
10th March, 1983	1783m	Ran in hole to 1731 metres conducting magnetic particle inspection on each connection.

Date	Total Depth (metres RKB)	Work Performed
10th March, 1983 (continued)		Inspection revealed a crack in the box of the first drill-collar above the bit, a crack in the box of the ninth drill-collar above the bit, and a hairline crack in the stabilizer sleeve. Replaced defective drillcollars. (Due to weather conditions of 65 m.p.h. winds and 35 ft. seas, work was intermittent during inspection).
		Drilled to 1783 metres with Smith SDGH bit. Riser vibrated when torque on the rotary built to 300 amps. (Unable to keep torque down by stopping and re-starting rotary as before. When bit was pulled off the bottom the average torque was 50 amps and no vibration was observed in the riser.
11th March, 1983	1795m	Drilled to 1793 metres. Conducted wireline survey at 1789 metres which indicated a vertical deviation of 1.25°. Experienced a 200 psi loss in circulating pressure with a 4 strokes per minute gain on the pumps. All surface equipment was checked and found to be okay. Pulled out of hole looking for washouts in the drill string. Found a crack in the box of the eighth drillcollar up from the bit. Ran in hole with new Smith SDS bit and new bottom hole assembly. Conducted a magnetic particle inspection of all connections while running in hole. Inspection revealed a crack in the box of the thirteenth drillcollar. Replaced defective drillcollar.

Date	Total Depth (metres RKB)	Work Performed
11th March, 1983 (continued)		Drilled to 1795 metres. Vibration was still noted in the riser; vibration was not as severe as earlier.
12th March, 1983	1846m	Drilled to 1845 metres and experienced a 300 psi loss in circulating pressure along with a 2 strokes per minute gain in the mud pumps. Checked surface equipment and all checked okay. Pulled out of hole looking for washouts in the drill string. Found crack in box of Hydril sub between first and second joints of Hevi-Wate drillpipe. Pulled out of hole performing a magnetic particle inspection on each connection. Connectors okay. Laid down stabilizers and shock sub. Bit had thirteen broken teeth. Ran in hole to 1821 metres with re-run bit and junk sub. Reamed and re-reamed from 1821 to 1845 metres. Worked junk sub and drilled from 1845 to 1846 metres. Pulled out of hole to change bottom hole assembly and bit. Recovered all broken teeth from previous bit.
13th March, 1983	1914m	Made up turbine drill and tested for operation. Made up new bottom hole assembly and ran in hole to 1825 metres. (During this period the mud pumps were being changed to 6 inch liners. However, it was found that one of the liner gaskets was inadvertently disposed of and the mud pumps were re-dressed back to 6-1/2 inch liners.) Ran in hole and reamed from 1825 to 1846 metres with no resistance. Drilled to

Date	Total Depth (metres RKB)	Work Performed
13th March, 1983 (continued)		1914 metres.
14th March, 1983	1943m	Drilled to 1935 metres with turbine drill and Diamax MS-5 bit. No vibration in the drill string or riser was observed while drilling with the turbine drill. Pulled out of hole for bit change and ran back in hole with turbine drill and Diamax ADS-2 bit. Drilled to 1943 metres with no vibration problems. Rate of penetration was below normal. Pulled out of hole to change bit and bottom hole assembly. Ran in hole with Smith SDT conventional bit.
15th March, 1983	2345m	Drilled with conventional bit to 2114 metres. No problems were encountered. Made short trip and then continued drilling to 2345 metres.
16th March, 1983	2506m	Drilled to 2490 metres. Conducted a deviation survey at 2490 metres which indicated hole deviation was 1.5°. Pulled out of hole for new bit and ran in hole with Smith SDT bit. Drilled to 2506 metres.
17th March, 1983	2590m	Drilled from 2505 metres to 2580 metres at which time bottoms were circulated up for geological evaluation. Continued drilling to 2590 metres and then circulated and made a short trip to 1840 metres. Ran back in hole and hit a bridge at 2576 metres. Reamed from 2576 metres to 3577 metres. Circulated and conditioned mud for electric logging. An inclination survey at 2590 metres showed a vertical deviation of

Date	Total Depth (metres RKB)	Work Performed
17th March, 1983 (continued)		1.75°. Pulled out of hole and rigged up Schlumberger. Ran DIL/SLS/GR logs from 2576 metres to 1104 metres.
18th March, 1983	2590m	Logged hole with LDL/CNL/GR tools from 2476 metres to 2250 metres. Logged with HDT/CAL tools from 2576 metres to 13-3/8 inch casing shoe. Shot and retrieved thirty sidewall cores: twenty-nine recoveries; one empty. Ran in hole and reamed from 2577 metres to 2578 metres. Circulated and conditioned mud to run casing. Rigged up to run 9-5/8 inch casing.
19th March, 1983	2590m	Ran 2456 metres of 9-5/8 inch 47 lbs per foot grade S-95 and L-80 casing. Cemented casing with 1050 sacks of class "G" cement with 3.7% pre-hydrated gel and 0.5% CFR-2 at 12 ppg followed with a tail slurry of 500 sacks class "G" cement with 0.8% Halad-22A 0.5% CFR-2 and 0.01% HR-6L at 15.8 ppg. At approximately 0130 hours the Epoch listed 4 degrees forward, 4 degrees starboard. The list increased 4-1/2 degrees forward, 5 degrees starboard and the general alarm was sounded.
19th March, 1983 (continued)	2590m	The Epoch was brought back to a stable condition at 0230 hours by shifting ballast. The cause of the list was not determined.
20th March, 1983	2590m	The Epoch again listed 4-1/2° starboard, 5° forward. General alarm was sounded at 0810 hours. The rig was brought back on trim at 0830 hours.

Date	Total Depth (metres RKB)	Work Performed
20th March, 1983 (continued)		The cause of the list was unknown and it was decided to evacuate all non-essential personnel by helicopter until the cause could be found and corrected. The 16 inch ballast header valve was found to be faulty. The valve was repaired and tested by 2130 hours. All other valves were checked.
21st March, 1983	2590m	An A.B.S. representative arrived and approved the repairs, checked other valves, and function-tested the ballast control system. Approval was given to return the personnel to the rig.
22nd March, 1983	2590m	Ran in hole and tagged cementing plug at 2533 metres. The weather deteriorated and drilling operations were suspended. The drill string was hung off and the riser was displaced with sea water. Thirteen hours were lost waiting on weather.
23rd March, 1983	2590m	Ran in hole and pulled hang-off tool. Ran back in hole to tag cementing plug. Drilled cement collar and shoe to 2562 metres. The leak-off test was cancelled due to excessive rig heave. Drilled to 2752 metres and circulated bottoms up for geological analysis. Continued drilling to 2797 metres.
24th March, 1983	3020m	Drilled an 8-1/2 inch hole from 1797 metres to 3020 metres.
25th March, 1983	3199m	Drilled from 3020 metres to 3199 metres.
26th March, 1983	3260m	Tripped for a new bit. Deviation at 3199 metres was 1.25°.

Date	Total Depth (metres RKB)	Work Performed
26th March, 1983 (continued)		Drilled from 3199 metres to 3260 metres.
27th March, 1983	3368m	Drilled from 3260 metres to 3368 metres.
28th March, 1983	3491m	Drilled from 3368 metres to 3491 metres.
29th March, 1983	3550m	Drilled from 3491 metres to 3494 metres. Torque increased. Tripped for new bit. Deviation at 3494 metres was 1.25°. Drilled from 3494 metres to 3550 metres.
30th March, 1983	3660m	Drilled from 3550 metres to 3660 metres.
31st March, 1983	3726m	Drilled an 8-1/2" hole from 3660 metres to 3726 metres. Circulated and conditioned hole for logs.
1st April, 1983	3731m	Measured out of hole. Depth correction to 3729 metres. Rigged up Schlumberger and logged open hole. Run No. 1 - DIL/Sonic from 3722 metres to 2559 metres. Run No. 2 - LDL/CNL/GR from 3722 metres to 2559 metres. Tested BOP's to PAOC's specifications. Okay. Ran in hole and drilled from 3729 metres to 3731 metres.
2nd April, 1983	3850m	Drilled from 3731 metres to 3850 metres.
3rd April, 1983	3958m	Drilled from 3850 metres to 3958 metres.
4th April, 1983	3982m	Tripped for bit change. Drilled from 3958 metres to 3982 metres. Gas was cutting mud from 9.1 to 8.8 ppg. Increased mud weight from 9.1

Date	Total Depth (metres RKB)	Work Performed
4th April, 1983 (continued)		ppg to 9.4 ppg.
5th April, 1983	4060m	Drilled from 3958 metres to 4060 metres; increasing mud weight to 9.7 ppg. Weather started deteriorating. Made a short trip to 3415 metres and ran back to bottom. Circulated bottoms up. Mud gas-cut temporarily from 9.7 to 9.6 ppg.
6th April, 1983	4060m	Pulled 10 stands. Weather prevented pulling back further to 9-5/8" casing shoe. Ran in hole with hang-off tool and hung off in wellhead with bit at 3874 metres, circulating. Weather further deteriorated. Pulled out of hole with landing string and waited on weather. (19 hours lost waiting on weather).
7th April, 1983	4060m	Eight and one half hours were lost due to weather. Ran in hole with landing string and engaged hang-off tool. Started pulling out of hole. The drill string became stuck after moving up 1.5 metres. Worked pipe 9.5 hours before it became free. Continued pulling out of hole to 9-5/8 inch shoe.
8th April, 1983	4103m	Continued pulling out of hole to 9-5/8 inch shoe. Waited on weather for six hours. Ran in hole and drilled an 8-1/2 inch hole from 4060 metres to 4103 metres.
9th April, 1983	4147m	Drilled from 4103 metres to 4147 metres. Tripped for bit change. Tested BOP's to PAOC's

Date	Total Depth (metres RKB)	Work Performed
		specifications.
10th April, 1983	4204m	Drilled from 4147 metres to 4204 metres.
11th April, 1983	4264m	Drilled from 4204 metres to 4264 metres.
12th April, 1983	4283m	Drilled from 4264 metres to 4283 metres. Tripped for bit change.
13th April, 1983	4362m	Drilled from 4283 metres to 4362 metres.
14th April, 1983	4459m	Drilled an 8-1/2" hole from 4262 metres to 4459 metres.
15th April, 1983	4462m	Drilled from 4459 metres to 4462 metres. Conditioned hole for logs and pulled out of hole. Rigged up and ran log No. 1, DIL-SLF-GR, from 4461 metres to 3710 metres.
16th April, 1983	4462m	Ran log No. 2, LDL-CNL-GR, from 4461 metres to 3710 metres. Ran log run No. 3, DLL-MSFL, from 4461 metres to 3550 metres. Ran log run No. 4, HDT, from 4459 metres to 2559 metres. Ran sidewall core run No. 1 from 4457 metres to 3382 metres. Shot 51 shots and pulled out of hole.
17th April, 1983	4462m	Recovered 42 samples. Ran sidewall core run No. 2 from 3368 metres to 2573 metres. Recovered 37 samples out of 51 shots. Rigged up and started running velocity survey.
18th April, 1983	4462m	Completed velocity survey. Tested BOP's to PAOC's specifications. Ran in hole with open-ended drill pipe to 9-5/8" casing shoe. Circulated out gas cut mud. Raised mud weight to 10.0 ppg.

Date	Total Depth (metres RKB)	Work Performed
19th April, 1983	4465m	Pulled out of hole with open-end drill pipe and ran in hole with 8-1/2" bottom hole assembly. Drilled from 4462 metres to 4465 metres.
20th April, 1983	4542m	Drilled from 4465 metres to 4542 metres.
21st April, 1983	4565m	Drilled an 8-1/2" hole from 4542 metres to 4565 metres. Conditioned hole for logs and started pulling out of hole.
22nd April, 1983	4565m	Finished pulling out of hole. Rigged up Schlumberger and ran log run No. 1, DIL-BHC-GR, from 4559 metres to 4275 metres. Ran log run No. 2, HDT-caliper, from 4559 metres to 2562 metres. Ran sidewall core No. 1 from 4558 metres to 3217 metres. Shot 51 selective shots. Rigged down Schlumberger. Ran in hole with bottom hole assembly.
23rd April, 1983	4565m	Finished running in hole to 4565 metres. Conditioned hole for 7 inch casing. Pulled out of hole. Ran in hole and pulled wear bushing.
24th April, 1983	4565m	Attempted to make up 7 inch running tool. Threads were defective on running tool. Sent running tool to shore to be machined. Ran in hole and set wear bushing. Ran in hole with bottom hole assembly. Conditioned mud and pulled out of hole. Ran in hole and pulled wear bushing. Rigged up to run 7 inch casing.

Date	Total Depth (metres RKB)	Work Performed
25th April, 1983	4565m	Made up 7 inch running tool on casing hanger. Started running 7 inch casing.
26th April, 1983	4565m	Finished running casing with the shoe at 4547 metres. Cemented casing in two stages. The first stage consisted of 550 sacks of class "G" neat cement mixed at 16.0 ppg followed by 585 sacks of class "G" neat cement with 50% Silica flour mixed at 15.2 ppg. The second stage consisted of 250 sacks of class "G" neat cement mixed at 15.8 ppg. Pulled out of hole with landing string. Ran in hole and flushed wellhead. Pulled out of hole. Ran in hole with seal assembly. Set and tested same. Okay.
27th April, 1983	4565m	Pulled out of hole with seal assembly running tool. Laid down 5 inch drill pipe and the 8-1/2 inch bottom hole assembly out of derrick. Started pulling the riser and BOP stack.
28th April, 1983	4565m	Continued pulling the riser and BOP stack. Changed out upper and middle 5 inch pipe rams to 3-1/2 inch rams. Stump tested BOP. Started running riser and BOP back to wellhead.
29th April, 1983	4565m	Finished running BOP and riser. Tested BOP to PAOC's specifications. Started picking up 6 inch bottom hole assembly on 3-1/2" drill pipe and running in hole.
30th April, 1983	4565m	Continued picking up 3-1/2" drill pipe and running in hole. Tagged D.V. collar at 2545

Date	Total Depth (metres RKB)	Work Performed
		metres and drilled out same. Continued running in hole to 2591 metres. Circulated and pulled out of hole. Ran CLB-VDL-GR-CCL from 4493 metres to 2520 metres. Cement bond log showed excellent bond throughout test intervals. Started running in hole with 6 inch bit and 7 inch casing scraper.
1st May, 1983	4565m	Continued picking up 3-1/2" drill pipe running in hole with casing scraper. Tagged cement at 4504 metres. Drilled cement from 4504 metres to 4517 metres. Circulated and pulled out of hole. Ran in hole and perforated 4 shots per foot with 4" casing gun from 4433 metres to 4442 metres and 4416 metres to 4425 metres.
2nd May, 1983	4565m	Perforated 4 shots per foot from 4415 metres to 4416 metres, 4427 metres to 4431 metres and 4432 metres to 4433 metres. Made up drill stem test tools. Started running in hole with DST tools, externally pressure testing all drill pipe connections.
3rd May, 1983	4565m	Continued running hole with DST tools. Landed subsea test tree. Function-tested subsea tree at surface and externally tested the 5 inch landing string. Picked up and set packer at 4393 metres. Connected surface connections. Tested surface lines and valves. Opened test tool at 0722 hours with no apparent flow. At 0750 hours, started getting a weak blow of air at

Date	Total Depth (metres RKB)	Work Performed
		the bubble hose, indicating that the test tool was open.
4th May, 1983	4565m	Well flowed air through bubble hose. Diesel cushion at surface at 1612 hours. Well flowed through 1 inch fixed choke and 1-1/4 inch variable choke. Gas to surface at 2322 hours. Well shut in at 2330m hours to repair leak on data manifold. Well re-opened to flare at 0022 hours. Gas contains trace of CO_2 and no H_2S.
5th May, 1983	4565m	Continued Drillstem Test No. 1, perforations - 4415 metres to 4425 metres, 4427 metres to 4431 metres and 4432 metres to 4442 metres.
6th May, 1983	4565m	Circulated water and gas out of drill stem test string. Circulated and conditioned mud. Unseated packer. Pulled out of hole with drillstem test tools.
7th May, 1983	4565m	Finished pulling out of hole. Discovered that 7.3 metres of DST tools had been left in hole. The pin on the Big John jars had broken off when attempting to unseat the packer. Ran in hole with gauge ring and junk basket on wire line. Tagged fish at 4394 metres. Ran in hole with fishing bottom hole assembly. Caught on to fish. Unseated packer. Pulled out of hole.
8th May, 1983	4565m	Set EZSV squeeze packer at 4411 metres. Ran in hole with stinger and attempted to

Date	Total Depth (metres RKB)	Work Performed
8th May, 1983 (continued)		establish an injection rate Could not inject into formation
9th May, 1983	4565m	Pulled out of hole with stinger. Rigged up perforators and perforated 4 shots per foot from 4363 metres to 4388 metres and 4400 metres to 4403 metres. Made up DST tools and started running in hole with same.
10th May, 1983	4565m	Finished running in hole with DST No. 2. Tested string to 6000 psi. Okay. Set packer at 4370 metres. Ran in hole with surface pressure read out equipment. Opened well for initial flow period at 0853 hours. Had gas at surface at 0725 hours.
11th May, 1983	4565m	Continued with Drill Stem Test No. 2. Started pulling out of hole with drill stem test string.
12th May, 1983	4565m	Finished pulling out of hole with DST No. 2 tools. Rigged up Schlumberger and ran FIT No. 1 at 4232 metres. Ran FIT No. 2 at 3567 metres. Lost FIT No. 2 tool in the hole. Ran in hole with fishing bottom hole assembly, caught fish and pulled out of hole.
13th May, 1983	4565m	Re-ran FIT No. 1 between 4230 metres and 4232 metres. Mis-run. Rigged down Schlumberger. Rigged up to plug well. Placed a cement plug from 4411 metres to 4160 metres. Placed another cement plug from 3630 metres to 3500 metres. Covered all open perforations with cement.

14th May, 1983	4565m	Rigged up Schlumberger and set an EZ SV packer at 3490 metres. Placed a cement plug from 3490 metres to 3358 metres. Pulled out of hole laying down drill pipe.
15th May, 1983	4565m	Cut 7 inch casing at 251 metres. Recovered same. Cut 9-5/8 inch casing at 194 metres. Recovered same. Placed a cement plug from 290 metres to 126 metres. Pulled and recovered BOP stack.
16th May, 1983	4565m	Detonated an explosive charge 9 metres below the 16-3/4 inch wellhead. Recovered the 16-3/4 inch wellhead and 13-3/8 inch casing stub. Ran back in with another explosive charge to recover 30 inch housing. Detonated charge. Mis-fire. Pulled 80,000 lbs on 30 inch housing. Recovered 30 inch housing, permanent guide base. Workboats recovered piggy back anchors No. 2, 5, and 6. (Lost eleven hours due to weather).
17th May, 1983	4565m	Workboats worked anchors. (Lost 18-1/2 hours due to weather).
18th May, 1983	4565m	Workboats recovered piggy back anchors No. 4 and 8, and main anchors No. 4 and 8. Present operation is continuing to pull anchors.
19th May, 1983	4565m	Workboats recovered piggy back anchors No. 1 and 7. Rig bolstered primary anchors No. 1, 4, and 5.
20th May, 1983	4565m	Rig bolstered anchors No. 2, 3, 6 and 7. Last anchor bolstered and rig towed off location at 1930 hours EST.

APPENDIX NO. 3

MICROPALEONTOLOGICAL REPORT

STRATIGRAPHY
of the
FORAMINIFERAL SEQUENCE
in
HERMES # 1,
GIPPSLAND BASIN.

for: PHILLIPS AUSTRALIAN OIL COMPANY

June 21st, 1983.

David Taylor,
23 Ballast Point Road, Birchgrove 2041
AUSTRALIA (02) 82 5643

BIOSTRATIGRAPHY from sidewall cores: Depth in metres at Base of Zones (refer Tables 2 & 3 for data)	Depth	Zone	E-LOG PICKS	PALEOENVIRONMENTS (refer Table 4): BIOFACIES with estimated paleodepths in metres (0 10 40 100 200 400)	LITHOFACIES
?	1845	?	1879	SHELF EDGE CANYON	recrystallised biomicrite
MID MIOCENE	2077	D-1		CANYON in UPPER SLOPE SCOURING	biomicrite
~~ ? ~~~		~~~ ? ~~~	2160	~~~ ? ~~~	~~~ ? ~~~ ? ~~~
EARLY MIOCENE	2371	E-2 F G		UPPER SLOPE	impure biomicrite
		?H-1	?2475		
EO/OLIGOCENE	2505	J-2 & K	2508	inner shelf	calcareous qtz sdst.
MID EOCENE	2541	O/P	2548	ESTUARINE INGRESSIONS	silts with windblown quartz sand
MID PALEOCENE	2575	new	2630	?	
?	2943	?	2947	? WEAK MARINE INGRESSION ?	lignitic/pyritic sands and silts with glauconite at top.

TABLE 1: INTERPRETED FORAMINIFERAL SEQUENCE for HERMES # 1.
(highest SWC at 1341m; lowest at 2943m).

~~~~~~~ = hiatus

~~~ ? ~~~ = probable hiatus

David Taylor, 21/6/1983.

INTRODUCTION.

Forty eight sidewall cores were submitted for examination from HERMES # 1 well between 2943.0 and 1340.0 metres. Foraminiferal fauna were infrequent between 2514.5 and 2943.0m with foraminifera being present in only seven of the thirty six samples examined. Planktic specimens were recorded only in three samples; namely Mid Eocene assemblages at 2525.0 and 2542.0m and a Mid Paleocene assemblage at 2575.0m. This sporadic vertical distribution illustrates the transient nature of marine ingressive events and emphasises the necessity of close sampling for paleontological investigations.

The following Tables accompany this report:-

- TABLE 1:- INTERPRETED FORAMINIFERAL SEQUENCE based on Tables 3 & 4: on Page 1.
- TABLE 2:- Interpretative:- BIOSTRATIGRAPHIC DATA with reliability of Zonal picks: at back of text.
- TABLE 3:- Factual data:- PLANKTONIC FORAMINIFERAL DISTRIBUTION: at back of text.
- TABLE 4:- Factual data:- BENTHONIC FORAMINIFERAL DISTRIBUTION & SEDIMENT GRAIN ANALYSIS: at back of text.

The HERMES # 1 sequence is briefly discussed in ascending biostratigraphic order (i.e. uphole).

LATEST CRETACEOUS to MID PALEOCENE - ? to 2943.0 to 2583.0m.

Age based solely on playnology by Helene Martin as planktonic foraminifera were not found in this interval.

The two deepest samples examined (at 2943.0 and 2924.0) contained assemblages of arenaceous, benthonic foraminifera, indicating weak marine ingressions at these levels. Dr. Martin found dinoflagellates in these two samples which were within the *Tricolpites longus* spore/pollen Zone. A similar arenaceous foraminiferal fauna, within the *T. longus* Zone was found at 3020.0m in SELENE # 1.

MID PALEOCENE at 2575.0m:-

A poorly preserved, limonitic stained planktonic fauna was recovered from the sidewall core at 2575.0m. This assemblage includes *Globorotalia pusilla pusilla*, *G. chapmani* and *G. angulata*, indicating a mid Paleocene age, biostratigraphically correlating with Blow Zone P3 and the *G. pusilla pusilla* Zone of Stainforth et al.

This is only the second Paleocene fauna definitely identified from the Gippsland Basin. A very similar mid Paleocene fauna was reported from a sidewall core at 2804.8m in ALBACORE # 1. This mid Paleocene assemblage is present in the Otway Basin, being documented from the "greensand" unit near the top of the Pebble Point Formation (McGowran, 1965). In Hermes # 1, Dr. Martin found that samples near 2575.0m were within the *Lycistepollenites balmei* spore/pollen Zone and contained the dinoflagellate *Eisenackia crassitabulata*. These determinations confirm correlation with the Pebble Point Formation.
Precise correlation with the New Zealand sequence is not possible, but a similar mid Paleocene, *G. pusilla pusilla* fauna was recorded by Webb (1973) from D.S.D.P. Site 208 from the Tasman Sea.

The mid Paleocene sample at 2575.0m was within a lithological unit from 2625.0m to 2541.0m, which contained frosted and fractured quartz sand, features probably caused by eolian processes. This could be evidence of a barrier/dune system adjacent to the depositional site. The benthonic, arenaceous foraminiferal fauna at 2515.0m in Hermes suggests a marginal marine, estuarine situation, which is also shown by the fact that planktonic foraminifera were absent from sidewall cores vertically contiguous to 2575.0m. Thus this sample may be indicative of a high sea level event on the coastal onlap curve; probably near the peak of Cycle TP2-1 on Figure 9 of Loutit & Kennett (1981). The limonite stained nature of the planktonic specimens suggests that they were stranded above the normal high tide level, as this sample was some 27m below the top of the unit and thus was not oxidised during an errosional hiatus. This interpretation of an instantaneous high sea level event could also explain the sporadic record of this faunal event in the Tasman Sea region.

MID EOCENE - 2541.0m to 2545.0m (2548.0 to 2508.0m on E-logs):-

The presence of *Globigerina frontosa* at both 2541.0 and 2525.0m suggests a position low in the Mid Eocene (= Blow Zone P10 & P11) with a concurrence of range with *Globorotalia centralis,* suggesting a more precise placement within Blow Zone P11. The presence of *G. collactea* confirms a Mid Eocene age. In North Africa, the same association of *G. frontosa* (= *G. cerroazulensis frontosa*), *G. centralis* (= *G. cerroazulensis pomeroli*) and *G. collactea* are placed at the base of the *G. lehnei* Zone of Stainforth et al and thus in a medial position within the Mid Eocene (refer for example, Boukhary et al, 1982). Similar associations were found in both the HELIOS # 1 and SELENE # 1 sequences.

Environmentally the Mid Eocene sequence was similar to that discussed for the Mid Paleocene. It was at the top of the unit containing quartz, probably transported by eolian processes. The samples also contained estuarine arenaceous, benthonic foraminifera. There must have been an hiatus of some 10 to 12 million years within the unit; between the Mid Paleocene and Mid Eocene (at 2548.0m on E-logs). However, absence of planktonic faunas in samples between 2575.0 and 2541.0m makes this assumption speculative.

LATEST EOCENE to EARLIEST OLIGOCENE - 2505.0 to 2499.0m (2508.0 to 2475.0m on E-logs):-

The only sidewall cores available were at the base of the unit and both (at 2505.0 and 2499.0m) consisted of calcareous cemented, quartz sandstones. The samples contained similar planktonic assemblages, apart from the presence of *Globigerina linaperta* at 2505.0m and the presence of *G. brevis* at 2499.0m; the former represented the highest Eocene Zone K, whilst the latter the lowest Oligocene Zone J-2. Both samples were deposited on an inner continental shelf platform.

EARLY MIOCENE - 2371.0 to 2163.0m (?2475.0 to 2160.0m on E-logs):-

Unfortunately, neither the top of the underlying Oligocene unit nor the base of this Miocene unit are represented by sidewall cores (Sample Gap = 124m). The deepest Early Miocene sample at 2371.0m contains a Zone G fauna, but it is suspected that Zone H-1 was present below 2371.0m and above 2475.0m. This leads to an assumption that the regional Oligocene hiatus, of some 12 million years, occurred within Hermes at approximately 2475.0m.

The Early Miocene unit was deposited in deep water (upper slope paleoenvironment) up to Zone E-2 times.

MID MIOCENE - 2077.0m to 1950.0m (2160.0 to 1879.0m on E-logs):-

Zone D-1 faunas were present at 2077.0 and 1950.0m. Once again, an hiatus is suspected due to the possible absence of the basal Zones of the Mid Miocene (i.e. Zones E-1 & D-2). A sample gap of 86m between the top Early Miocene sample and the basal Mid Miocene one. However, the E-logs show a sudden character change at 2160.0m and the sediment at and above 2077.0m have most of the features of a carbonate, submarine carbonate fill. The hiatus, if present, would have been caused by canyon scouring. Carbonate diagenesis in canyon fill sediments at and above 1845.0m precluded a biostratigraphic designation for the interval between 1845.0 to 1341.0m.

REFERENCES.

BOUKHARY, M., et al, 1982 - Étude biostratigraphique à l'aide des Foraminifères planctoniques et des Ostracodes de l'Éocène de Beni Mazar, vallée du Nil, Égypte. *Cahiers de Micropaléontologie, 1-1982. 8e Colloque Africain de Micropaléontologie, Paris, 18-19 Juillet, 1980.* 53-64.

LOUTIT, T.S. & KENNETT, J.P., 1981b - New Zealand and Australian Cenozoic Sedimentary Cycles and Global Sea-Level Changes. *AAPG Bull. 65(9);* 1586-1601.

McGOWRAN, B., 1965 - Two Paleocene Foraminiferal Faunas from the Wangerrip Group, Pebble Point Coastal Section, Western Victoria. *Proc. Roy. Soc. Victoria, 79(1);* 9-74.

WEBB, P.N., 1973 - Upper Cretaceous-Paleocene Foraminifera from Site 208 (Lord Howe Rise, Tasman Sea), D.S.D.P., Leg 21. *Burns, R.D., Andrews, J.E. et al, I.R.D.S.D.P., 21;* 541-573.

PE904954

This is an enclosure indicator page.
The enclosure PE904954 is enclosed within the container PE902581 at this location in this document.

The enclosure PE904954 has the following characteristics:

ITEM_BARCODE = PE904954
CONTAINER_BARCODE = PE902581
NAME = Foraminiferal Distribution
BASIN = GIPPSLAND
PERMIT = VIC/P18
TYPE = WELL
SUBTYPE = DIAGRAM
DESCRIPTION = Hermes 1 Planktonic Foraminiferal Distribution. Table 3 from Appendix 3 of WCR volume 1.
REMARKS =
DATE_CREATED = 17/06/83
DATE_RECEIVED = 23/09/83
W_NO = W803
WELL_NAME = Hermes-1
CONTRACTOR =
CLIENT_OP_CO = Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)

PE904955

This is an enclosure indicator page.
The enclosure PE904955 is enclosed within the container PE902581 at this location in this document.

The enclosure PE904955 has the following characteristics:

ITEM_BARCODE =	PE904955
CONTAINER_BARCODE =	PE902581
NAME =	Foraminiferal Distribution
BASIN =	GIPPSLAND
PERMIT =	VIC/P18
TYPE =	WELL
SUBTYPE =	DIAGRAM
DESCRIPTION =	Hermes 1 Benthonic Foraminiferal Distribution and Sediment Grain Analysis . Table 4 from Appendix 3 of WCR volume 1.
REMARKS =	
DATE_CREATED =	16/06/83
DATE_RECEIVED =	23/09/83
W_NO =	W803
WELL_NAME =	Hermes-1
CONTRACTOR =	
CLIENT_OP_CO =	Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)

TABLE 2

MICROPALEONTOLOGICAL DATA SHEET

BASIN: GIPPSLAND

WELL NAME: HERMES # 1

ELEVATION: KB: 23.0m GL: 108m

TOTAL DEPTH:

AGE		FORAM. ZONULES	HIGHEST DATA Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	LOWEST DATA Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
PLEISTOCENE		A_1										
		A_2										
PLIOCENE		A_3										
		A_4										
		B_1										
MIOCENE	LATE	B_2										
		C										
	MIDDLE	D_1	1950	1				2077	1			
		D_2	**					*				
		E_1										
		E_2	2163	0				2163	0			
	EARLY	F	2251	1				2251	1			
		G	2375	0				2375	0			
		H_1	¶					¶				
OLIGOCENE	LATE	H_2										
		I_1										
		I_2										
	EARLY	J_1										
		J_2	2499	0				2499	0			
EOCENE		K	2505	1				2505	1			
		Pre-K	2525	1				2575	1			

COMMENTS: ** Sample Gap Zone D-2 probably absent due to canyon scouring or slope slumping.

¶ Sample Gap Zone H-1 probably present.

Pre K 2525 & 2541 contain middle Eocene planktonic foraminifera assemblage. 2575 contained mid Paleocene planktonic foraminiferal assemblage.

No planktonic foraminifera found between 2583 & 2943.

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: David Taylor DATE: 17/6/1983.

DATA REVISED BY: DATE:

APPENDIX NO. 4

PALYNOLOGICAL REPORT

THE STRATIGRAPHIC PALYNOLOGY
of
HERMES # 1,
GIPPSLAND BASIN.

for: PHILLIPS AUSTRALIAN OIL COMPANY.

July 13, 1983.

Helene A Martin,
School of Botany,
University of New South Wales,
Box 1, Post Office,
KENSINGTON, NSW, 2033.
AUSTRALIA.
(02) 662 2954

SPORES and POLLEN.

The spores and pollen identified are listed in Table 1 and the ranges of diagnostic species are shown on Figure 1 with species in Table 1 grouped into three categories:-

1) Spores, mostly from ferns and their allies.
2) Gymnosperm pollen: pines e.g. hoop pine, Huon pine etc. These would have been mostly forest trees. Their relatives are found today in forests of Tasmania, New Zealand, New Caledonia and New Guinea. Only a few grow on the Australian Mainland and they are restricted to rainforests and the wetter climates.
3) Angiosperm pollen: flowering plants. These may have been trees or shrubs.

The ranges of diagnostic species and zonation follows Stover & Partridge (1973) as ammended by Partridge (1976). Some modification has been made in the light of experience and they are explained in the text.

Experience has shown that subsequent publications on the smae period extend the ranges of some diagnostic species. This is seen especially for the Early and Middle Cretaceous where three groups of authors have published on this time range. For this reason, if the ranges of some species fall slightly outside of those given in the references, then it is not considered serious. Sometimes there is conflicting evidence, and the method adopted then is to add up all the pros and cons before making a decision. Even with this approach, some assemblages remain problematical and it requires independant evidence to resolve these difficulties.

1. *T. lilliei* Zone, Campanian, 3587-4558m.

The lower-most assemblage is extremely poorly preserved, limiting identifications, but it does contain *Triporopollenites sectilis* and a doubtful specimen of *Lygistepollenites balmei*. Both of these species first appear at the base of the *T. lilliei* Zone. *Nothofagidites endurus* and *Proteacidites palisadus* also first appear at the base of the *T. lilliei* zones and they are found in the assemblages above.

Wood, cuticles and other plant tissue are found in most samples in variable quantities. The gymnosperm pollen frequency is lower than usually encountered, with *Nothofagidites* spp. being more common.

2. *T. longus* Zone, Maastrichtian into Paleocene, 2700-3568m.

The overall characteristics of the assemblages here are much the same as those of the *T. lilliei* Zone. The top of the older zone is defined by the introduction of species of the younger zone, i.e. negative evidence. Here, *Australopollis obscurus, Dilwynites granulatus* and *Tetracolporites verrucosus,* which first appear at the base of the *T. longus* Zone, are found at 3382m to 3568m. As with the *T. lilliei* Zone, plant tissue is common throughout and gymnosperm pollen is lower than usual with *Nothofagidites* more abundant than previously encountered.

As in Helios # 1, dating the top of the *T. longus* Zone is problematical. The following modifications are adopted here, for the following reasons.

Originally, Stover & Partridge (1973) placed the whole of the *T. longus* Zone in the Paleocene. Partridge (1976) relocated it into the Maastrichtian, with the top of zone coeval with the top of the dinoflagellate *Isabelidinium* (= *Deflandrea*) *druggii* Zone. According to this latter reference, both zones terminated at the Creteacous - Paleocene boundary. Subsequently, *I. druggii* has been reported from both below and above unconformable contact between late Maastrichtian and early/mid Paleocene in a single, thoroughly documented outcrop in New Zealand (Strong, 1977 and Wilson, 1978). Moreover, *I. druggii* occurs in the type Danian of Denmark (Wilson, 1978). Hence the modification adopted here is that the *I. druggii* Zone occurs both above and below the Cretaceous - Paleocene boundary. Helios # 1 showed that the *I. druggii* Zone occurs within the *T. longus* Zone. Consequently, the modification adopted here is that the *T. longus* Zone terminated within the Paleocene.

3. *L. balmei* Zone, Paleocene, 2567-2583m.

The basal assemblage lacks any of the species whose ranges end at the top of the *T. longus* Zone. It also lacks species which first appear in the *L. balmei* Zone, however the overall characteristics are more like the *L. balmei* assemblages above than in the zone below. Species which first appear in the *L. balmei* Zone are found in other assemblages above the base, include *Lygistepollenites ellipticus, Rugulatisporites mallatus* and *Nothofagidites flemingii* (Stover & Partridge, 1973). *Proteacidites reticuloscabratus* first appears in the *M. diversus* Zone, but is present at 2575m. This species has been found in assemblages older than the *M. diversus* Zone before, so it's published restricted range is now considered unreliable.

4. Transitional *M. diversus-L. balmei*, Age Problematical, 2525-2562m.

These spore-pollen assemblages are problematical in that *L. balmei* Zone indicators (species which terminate at the top of the *L. balmei* Zone) and *M. diversus* Zone indicators (those which first appear at the base of this zone) co-exist throughout this interval. The number of each indicator is scored on Table 1, and overall, each sample has more of the *L. balmei* Zone indicators than those of the *M. diversus* Zone. Moreover, the overall characteristics of the assemblages show very little change from those of the underlying *L. balmei* Zone.

A further problem is encountered with the presence of the dinoflagellate *Schematophora speciosa* at 2550m. *S. speciosa* has a recorded range from the top part of the Lower *N. asperus* into the bottom of the Middle *N. asperus* Zones (Stover et al, 1979). Therefore the spore pollen evidence is inclusive regarding age (refer page 7 this report).

Two questions should be considered in conjunction with these problematical assemblages:

1) How much variation is there between assemblages within the same spore-pollen zone?

   The spore-pollen zone is an artifact of the vegetation, of course. One does not have to traverse far to appreciate that today, vegetation is by no means uniform. For instance a traverse of several kilometres in the Royal National Park, south of Sydney, will reveal *floral lateral facies* changes from moist eucalypt forest to stunted, coastal heath, to rain forest. Therefore, spore-pollen deposited today will reflect these ecological changes and the characteristics of the *present day Zone* will not be uniform.

Variation should be expected of spore-pollen zones in past ages. The following example of variation in Late Eocene-Early Oligocene assemblages in the Murray Basin illustrates this point.

Only one assemblage of the Upper *N. asperus* Zone (Late Eocene into Early Oligocene) has been found in the non-marine part of the Murray Basin. It is missing from numerous other bores which simply show a gradation from the underlying Middle *N. asperus* Zone into the overlying *P.tuberculatus* Zone. It is thought that the vegetation which laid down the Upper *N. asperus* Zone required a special environment, possibly coastal dunes and the swampy interdunes. This environment would not have existed in the non-marine part of the Murray Basin. Indeed, the only occurrence of the Upper *N. asperus* Zone here occurs in the bore closest to the limits of the marine transgression. Thus it is possible for whole zones not to be recognised, even deposition was almost continuous.

2) Is it possible for spore-pollen zones to be time-transgressive?

Obviously, in the example given above, the top of the Middle *N. asperus* Zone and/or the bottom of the *P. tuberculatus* Zone must be diachronous for them to intergrade. A further example may be given.

Assemblages which on general characteristics resemble those of the Pliocene in the Gippsland Basin are found in numerous places in inland New South Wales. In the Warrumbungle Mountains, they are found in association with basalt flows of Mid Miocene age. The Miocene-Pliocene spore-pollen zones reflect an increasingly drier climate. Inland areas are drier than those of coastal regions, hence it is not surprising that a specific spore-pollen zone appears earlier in inland areas than on the coast (Holmes et al, 1983). Thus the spore-pollen assemblages were time transgressive, reflecting encroachment of dry conditions from the inland to the coast.

Thus there may be considerable variation in the spore-pollen zones; whole zones may be missing in almost continuous deposition and zones may be time transgressive. In Hermes # 1, the assemblages between 2525m and 2562m fit the palynological definition of a transitional *M. diversus - L. balmei* Zone, but dating them on this evidence alone is suspect. A satisfactory interpretation requires independant evidence.

5. 2505 - 2145m.

The spore-pollen assemblage is extremely restricted and insufficient for zone determination. There is practically no plant debris, indicating a marine environment.

DINOFLAGELLATES

The dinoflagellates identified are listed on Table 1 and the ranges of diagnostic species shown on Figure 2.

Dinoflagellate zones have been named in Partridge (1976) and Stover et al (1979) but they have not been described, so the diagnostic features of the zones are not known. For the present purpose, it is assumed that the species after which the zone is named is common therein. It should be noted that the ranges of these species usually extend beyond the zone. As with the spores and pollen, experience may show that the ranges require modification. Some modifications have been adopted in this report and they are explained below.

1. 3851.5m?

Broken pieces of a possible *Deflandrea* type dinoflagellate and one other poorly preserved species is present in trace quantities. It is impossible to reliably identify these specimens in such poor condition. The spore-pollen assemblage is equally poorly preserved. However, there is very little plant debris in this sample which suggests the possibility of marine conditions. The poor state of this evidence should be borne in mind and it is impossible to interpret it further.

2. 3027m.

One unidentifiable dinoflagellate specimen occurs here. The spore-pollen assemblage is fairly normal and there is the usual quantity of plant debris. This one specimen can be disregarded.

3. "*Apectodinium* spp. Assemblage", 2924-2943m.

A most variable dinoflagellate is found here, and in 2934, it is very abundant. One form resembles *Apectodinium homomorphum* but others clearly fall well outside of the morphology of this species.

Apectodinium homomorphum occurs in Helios at 2917m, beneath the *I. druggii* Zone. The low content of dinoflagellates did not show the morphological variation seen in Hermes. It is thought that the same event is represented in both wells, although the *I. druggii* Zone, if present, is very poorly expressed in Hermes (discussed further below). *A. homomorphum* was also recorded above the *I. druggii* Zone, within the *T. longus* Zone of Helios. It is also present here in the same relative position in 2786m. There is no documentation of this event in the literature and it is informally named the "*Apectodinium* spp. Assemblage" here.

4. ?2854-2881m.

A few specimens of broken *Deflandrea*-type dinoflagellates are found here. They might be *I. druggii*, but the diagnostic features for positive identification are lacking, so they might be other species of the *Deflandrea* group. However, they are found in a more or less equivalent stratigraphic position to the *I. druggii* Zone in Helios. The tenuous nature of the evidence here should be borne in mind.

5. 2583-2700m.

A few dinoflagellates occur here. *Isabelidinium pellucidum* is found in the *T. longus* Zone (2575m). Stover (1973) records this species from the *L. balmei* Zone and Evans (1966) gives the range of this species as late Cretaceous into Tertiary.

6. *E. crassitabulata* Zone, 2573-2575m.

This species is present here in low to trace numbers. It is not very well preserved.

7. 2573-2505m.

Dinoflagellates are present in low to trace numbers in all of the assemblages here, from the top of the *L. balmei* through the transitional *M. diversus* - *L. balmei* Zone and into the marine. Most are long ranging and not diagnostic for dating with the following exceptions.

Senegalinium dilwynense is found at 2552m, within the transitional

M. diversus - L. balmei Zone, whereas according to Stover et al (1979), its range does not extend above the top of the *L. balmei* Zone. See Figure 2.

Glaphrocysta retiintexta is found within the range reported by Stover et al (1979). See Figure 2.

The presence of *Schematsphora speciosa* at 2550m and its range, mid into late Eocene (Stover et al, 1979) is problematical here. See Figure 2. However, Taylor reports Mid Eocene planktonic foraminifera at 2541 and 2525m in Hermes # 1.

PALEOECOLOGY.

Late Cretaceous deposition was non-marine up to 2983m, with the possible exception of a marine environment at 3851.5m. (figure 3) However, the evidence for this is not conclusive. Marginal marine conditions are found at 2854-2943m, the latest Cretaceous into earliest Paleocene. Non marine conditions return, 2700-2787m, with marginal marine deposition again at 2573-2583m in the Paleocene, where Taylor reported mid Paleocene planktonic foraminifera. This is followed by non marine, 2567-2568.5m, then marginal marine, 2525-2562m, (confirmed by the foraminifera) possibly in the Eocene, although the palynological evidence of the age is problematical. Finally, marine deposition commences at 2514.5m and continues to 2505m.

REFERENCES.

COOKSON, I.C. & PIKE, K.M., 1953 - The Tertiary Occurrence and Distribution of *Podocarpus* (Section *Dacrycarpus*) in Australia and Tasmania. *Aust. J. Bot. 1;* 71-82.

COUPER, R.A., 1960 - New Zealand Mesozoic and Cainozoic Plant Microfossils. *N. Zld. Geological Survey,Palaeontological Bulletin 32.*

DETTMANN, M.E., 1963 - Upper Mesozoic Microfloras from South-eastern Australia. *Proc. Roy. Soc. Vict. 77;* 1-140.

EVANS, P.R., 1966 - Mesozoic Stratigraphic Palynology of the Otway Basin. *Bur. Min. Res. Geol. & Geophys. Rec. 1966/69.*

FOSTER, C.B., 1979 - Permian Plant Microfossils of the Blair Athol Coal Measures, Baralaba Coal Measures and Basal Rewan Formation of Queensland. *Geol. Surv. Qld. Publ. 372, Palaeontological Paper 45.*

HARRIS, W.K., 1965 - Basal Tertiary Microfloras from the Princetown Area, Victoria, Australia. *Palaeontographica B, 115;* 75-106.

HOLMES, W.B.K., HOLMES, F.M. & MARTIN, H.A., 1983 - Fossil *Eucalyptus* remains from the middle Miocene Chalk Mountain Formation, Warrumbungle Mountains, New South Wales. *Proc. Linn. Soc. N.S.W. 106;* 299-310.

LENTIN, J.K. & WILLIAMS, G.L., 1977 - Fossil Dinoflagellates: Index to Genera and Species. *Bedford Institute of Oceanography Report Series/Bl-R-77-8 July, 1977.*

MARTIN, H.A., 1973 - The Palynology of some Tertiary Pleistocene Deposits, Lachlan River Valley, New South Wales. *Aust. J. Bot. Suppl. Ser. 6;* 1-57.

McINTYRE, D.J., 1965 - Some New Pollen Species from New Zealand Tertiary Deposits. *N.Z. J. Bot. 3;* 205-214.

PARTRIDGE, A.D., 1976 - The Geological Expression of Eustacy in the Early Tertiary of the Gippsland Basin. *APEA J, 16;* 73-79.

STOVER, L.E., 1973 - Paleocene and Eocene Species of *Deflandrea* (Dinophyceae) in Victorian Coastal and Offshore Basins, Australia. *Geol. Surv. Aust. Spec. Publ. 4;* 167-188.

STOVER, L.E. & EVITT, W.R., 1978 - Analyses of pre-Pleistocene Organic-walled Dinoflagellates. *Stanford University Publications, Geological Sciences, Vol. 15.*

STOVER, L.E., HELBY, R.J. & PARTRIDGE, A.D., 1979 - Introduction to Dinoflagellates. *Earth Resources Foundation, University of Sydney,* Aug. 13-17, 1979.

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

STRONG, C.P., 1977 - Cretaceous-Tertiary Boundary at Woodside Creek, North-eastern Marlborough. *N.Z. J. Geol. & Geophys., 20;* 687-696.

WILSON, G.J., 1978 - The Dinoflagellate Species *Isabelia druggii* (Stover) and *I. seelandia* (Lange) in the Teurian of Woodside Creek, Marlborough, New Zealand. *Ibid, 21;* 75-80.

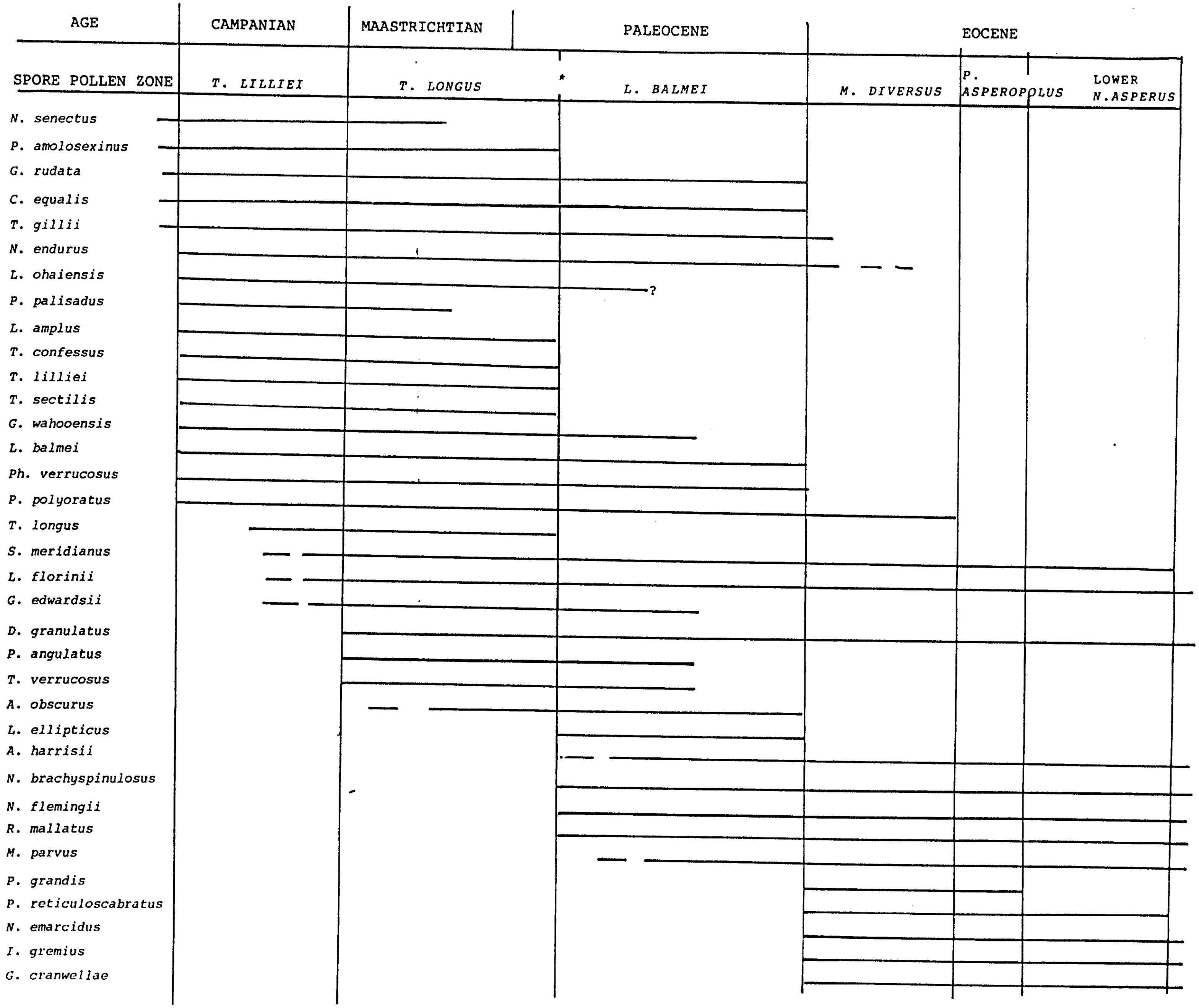


FIGURE 1: HERMES # 1 SPORE POLLEN RANGE CHART BASED ON STOVER & PARTRIDGE, 1973 and PARTRIDGE, 1976, with modifications.*
For further explanation, see text.

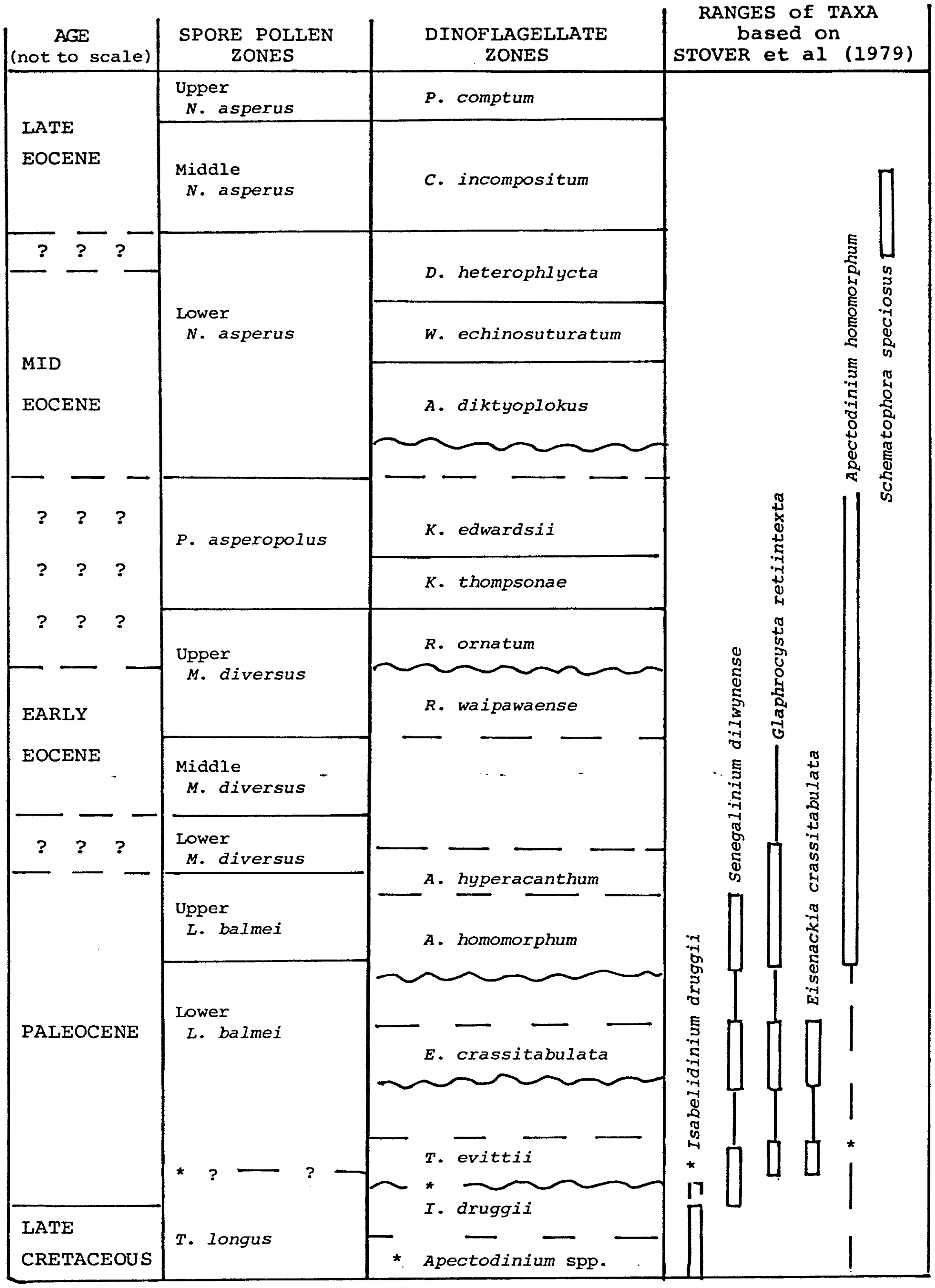


FIGURE 2: HERMES # 1 - DINOFLAGELLATE RANGES.
*Modifications from Stover et al (1979). See text for explanation.

Helene A. Martin, July 1983.

HERMES # 1

FIGURE 3 : STRATIGRAPHIC PALYNOLOGY SUMMARY

DEPTH (m)	SPORE/POLLEN ZONE	DINOFLAGELLATE ZONE	AGE	PALEOENVIRONMENT
2505 - 2514.5	?	?	?	marine
2525 - 2562	? *M. diversus* - *L. balmei* transitional ?	?	?	marginal marine to non marine
2567 - 2568.5	*L. balmei*		PALEOCENE	non marine
2573 - 2575		*E. crassitabulata*		marginal marine to non marine
2583		?		
2700 - 2787	*T. longus*		PALEOCENE	non marine
2854 - 2881		?	- - - - -	marginal marine to non marine
2924 - 2943		"*Apectodinium* spp"	MAASTRICHTIAN	
2983 - 3568				non marine
3587 - 3800	*T. lilliei*		CAMPANIAN	
3851.5		?		? marine ?
3895 - 4558				non marine

PE900484

This is an enclosure indicator page.
The enclosure PE900484 is enclosed within the container PE902581 at this location in this document.

The enclosure PE900484 has the following characteristics:

ITEM_BARCODE =	PE900484
CONTAINER_BARCODE =	PE902581
NAME =	Planktonic Biostratigraphy
BASIN =	GIPPSLAND
PERMIT =	VIC/P18
TYPE =	WELL
SUBTYPE =	DIAGRAM
DESCRIPTION =	Hermes 1 Summary Planktonic Foraminiferal Biostratigraphy. Enclosure from appendix 4 of WCR.
REMARKS =	
DATE_CREATED =	
DATE_RECEIVED =	
W_NO =	W803
WELL_NAME =	Hermes-1
CONTRACTOR =	
CLIENT_OP_CO =	Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)

PE900483

This is an enclosure indicator page.
The enclosure PE900483 is enclosed within the container PE902581 at this location in this document.

The enclosure PE900483 has the following characteristics:

ITEM_BARCODE =	PE900483
CONTAINER_BARCODE =	PE902581
NAME =	Spores, Pollen and Dinoflagellates
BASIN =	GIPPSLAND
PERMIT =	VIC/P18
TYPE =	WELL
SUBTYPE =	DIAGRAM
DESCRIPTION =	Spores Pollen and Dinoflagellates identified in Hermes 1. Table 1 from appendix 4 of WCR.
REMARKS =	
DATE_CREATED =	
DATE_RECEIVED =	
W_NO =	W803
WELL_NAME =	Hermes-1
CONTRACTOR =	
CLIENT_OP_CO =	Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)

APPENDIX NO. 5

DETAILED CUTTINGS DESCRIPTIONS

APPENDIX NO. 5

DETAILED CUTTINGS DESCRIPTIONS

All depths quoted are below Rotary Kelly Bushing, which is 23 metres above Mean Sea Level and 107 metres above the sea bed. Drill cuttings were collected at 10 metre intervals to the 2350 depth, then every 5 metres to total depth. No samples were collected above 365 metres.

365 metres - 540 metres : Calcarenite, light to dark grey, medium to coarse grained, soft to moderately hard, moderate to well sorted, calcareous cement, occasional fossil fragments, occasional platey calcite.

540 metres - 840 metres : Calcarenite, light grey to white, fine-medium grained, moderate to well sorted, calcareous cement, abundant calcitic plates, occasional fossil fragments, with interbedded Marl, light grey to light green, very plasticky, sticky, very calcareous, soft, homogeneous.

840 metres - 1145 metres : Marl, as above, with locally abundant calcareous grains, medium to coarse, well rounded, high sphericity, and very minor local glauconite as pellets.

1145 metres - 1200 metres :	Interbedded Marl and Calcarenite. Marl, light to dark grey, homogeneous, massive, sticky, non-fossiliferous, very calcareous. Calcarenite, light grey to white, fine to medium grained, moderate to well sorted, calcareous cement, occasional fossil fragments.
1200 metres - 1565 metres :	Calcarenite, light to medium grey, fine to medium grained, massive, moderately hard, moderately well sorted, calcareous to argillaceous matrix, calcareous cement, minor fossil fragments.
1565 metres - 1878 metres :	Interbedded Marl and Calcarenite. Marl, light grey, homogeneous, plasticky, very soft, highly calcareous, non-fossiliferous. Calcarenite, white to light grey to dark grey, fine to medium grained, moderately hard, calcareous cement, minor clay matrix, moderately well sorted.
1878 metres - 2162 metres :	Interbedded Claystone and Siltstone. Claystone, light to dark grey, firm to soft, homogeneous, very calcareous, minor to locally abundant carbonaceous matter, subfissile in part, silty, trace mica throughout. Siltstone, light to dark grey to black, hard, very calcareous, argillaceous matrix, sandy, abundant carbonaceous matter in part.

2162 metres - 2355 metres : Interbedded Siltstone, Shale and Claystone.

Siltstone, dark grey, firm to hard, homogeneous, argillaceous, calcareous cement, sandy with fine grained quartz grains, subfissile in part, carbonaceous, non fossiliferous.

Shale, dark grey to black, hard, homogeneous, fissile, very calcareous, carbonaceous, and minor Claystone, light grey, soft to firm, silty to sandy, very calcareous, trace foraminifera.

2355 metres - 2502 metres : Siltstone, dark grey, firm to hard, argillaceous, calcareous cement becoming very sandy, bordering on very fine grained silty sandstone, abundant pyrite, with interbedded Shale, dark grey, hard, fissile, calcareous, silty, mica, and minor Claystone, as above.

2502 metes - 2544 metres : Sandstone, white to light grey, very fine to fine grained, subrounded, poorly sorted, poorly cemented, friable, very silty with argillaceous matrix, glauconite, poor visual porosity with interbedded Siltstone, light to dark grey, hard to firm, subfissile, glauconite, very sandy, bordering on silty sandstone.

2544 metres - 2586 metres : Sandstone, white to light grey, fine to coarse grained, subangular to subrounded, poorly sorted, friable, very silty, calcareous, argillaceous matrix, glauconite, locally pyritic, poor visual porosity and interbedded Siltstone as above.

2586 metres - 2670 metres : Sandstone, white to light grey, coarse to very coarse grained, subrounded to rounded, moderate to high sphericity, well sorted, unconsolidated, very minor silt to clay matrix, glauconite, pyrite, excellent visual porosity with minor interbedded Sandy Siltstone, light to dark grey, firm, very sandy, carbonaceous in part.

2670 metres - 2763 metres : Siltstone, light grey, firm, sandy, calcareous, glauconite, with interbedded Sandstone, light grey, fine to coarse grained, subrounded to subangular, moderate to high sphericity, moderately well sorted, unconsolidated, pyrite, glauconite with minor interbedded Coal, and Claystone, dark grey, firm, silty.

2763 metres - 2785 metres : Sandstone, light grey, medium to very coarse grained, subrounded to subangular, poorly to moderately sorted, moderate sphericity, unconsolidated, pyrite, good visual porosity.

2785 metres - 2805 metres : Siltstone, dark grey to black, firm, very carbonaceous, non-calcareous, argillaceous matrix, with very fine grained sand supported by matrix, pyrite with interbedded Claystone, dark grey to black, soft, non-calcareous, very carbonaceous, and Sandstone, grey, very fine to fine grained, silty.

2805 metres - 2810 metres : Coal, brown to black, lignitic in part, soft to hard, occurs as three one metre seams with interbedded Claystone, dark grey to black, soft, homogeneous, non-calcareous.

2810 metres - 2851 metres : Sandstone, white to light grey, medium to coarse grained, subangular to subrounded, moderate to low sphericity, moderately well sorted, unconsolidated, minor local silty matrix, good visual porosity.

2851 metres - 2947 metres : Interbedded Siltstone, Sandstone and Claystone.

Siltstone, dark grey to black, firm, carbonaceous, argillaceous matrix, sandy.

Sandstone, light grey, medium to coarse grained, subangular to subrounded, moderately sorted, unconsolidated, fair visual porosity and Claystone, medium grey, soft, sticky, non-calcareous, pyritic.

2947 metres - 2981 metres : Sandstone, light grey to white, clear to frosted quartz grains, very coarse grained to pebbly, angular to subrounded, moderately low sphericity, moderately well sorted, unconsolidated, common pyrite, good visual porosity.

2981 metres - 3150 metres : Sandstone, light grey, medium to coarse grained, angular to subrounded, moderately well sorted, minor silty matrix, poorly cemented, trace mica, fair to good visual porosity in up to 10 metre beds, with thinly interbedded Sandy Siltstone to Silty Sandstone, light grey, very fine grained to silty, subangular to subrounded, fair sorting, and Claystone, light brown to dark grey, soft, non-calcareous, silty, carbonaceous, subfissile in part.

3150 metres - 3308 metres : Coal in one to two metre seams thinly interbedded with Claystone, brown to dark brown, soft to firm, massive, silty, carbonaceous in part, Shale, dark grey, hard to firm, subfissile to fissile, silty, carbonaceous, pyritic, and minor Sandstone, grey, fine to very coarse, subangular to subrounded, poorly sorted, poorly cemented, pyritic, fair visual porosity.

3308 metres - 3410 metres : Sandstone, light grey, fine to coarse grained, angular to subrounded, low to moderate sphericity, poorly sorted, kaolinitic matrix in part, poorly cemented, pyritic, good visual porosity occurring as 5-10 metre beds, with thinly interbedded Claystone, brown to dark brown, firm, massive, non-calcareous, silty and Shale, dark grey, hard, silty and occasionally one to three metre Coal seams, black, hard, vitreous, conchoidal fracture.

3410 metres - 4373 metres : Coal, occurring as abundant to locally very abundant one to five metre seams interbedded with Sandstone, Siltstone and Shale.

Sandstone, white to light grey, very fine to medium grained and medium to very coarse grained varieties, subangular to subrounded, low to high sphericity, fair to poorly sorted but locally well sorted, silty to argillaceous matrix, generally unconsolidated with locally abundant dolomitic cement, pyritic, mica, fair to poor visual porosity, occurs as thin one to five metre beds.

Siltstone, light grey to black, firm to hard, argillaceous, non-calcareous, carbonaceous to very carbonaceous and Shale, brown to black, soft to firm, silty, non-calcareous, very carbonaceous, pyritic.

4373 metres - 4442 metres : Sandstone, light grey to white, fine to coarse grained, quartzitic, feldspathic, lithic in part, angular to rounded, poorly sorted, kaolinitic to illitic matrix with local quartz overgrowths, some local dolomitic cement, very poor visual porosity, with interbedded Siltstone, grey to greenish grey, very argillaceous with abundant kaolinite and illite, silty, non-calcareous, friable.

4442 metres - 4513 metres : Siltstone, grey to brown, firm, very argillaceous, sandy, non-calcareous, carbonaceous with interbedded Siltstone, white to light grey, fine to medium grained, poorly sorted, subangular to subrounded, silty, calcareous cement in part, poor visual porosity, with minor Coal.

4513 metres - 4565 metres : Siltstone, brown, hard to firm, very argillaceous, non-calcareous, sandy in part, locally siliceous cement, with interbedded Coal, black, hard, vitreous, conchoidal fracture, as one to three metre seams and minor thinly interbedded Sandstone, white to greenish grey, very fine to fine grained, subangular to subrounded, poorly sorted, silty to argillaceous matrix, non-calcareous, poorly cemented, very poor visual porosity.

APPENDIX NO. 6

SIDEWALL CORE DESCRIPTIONS

APPENDIX NO. 6

SIDEWALL CORE DESCRIPTIONS

Four separate sidewall coring runs were made in Hermes No. 1 summarized as follows:

Suite	Run	Interval (m)	Attempted	Recovered
2	4	1104 - 2575 m	30	29
4	5	2559 - 4460 m	51	36
4	6	2559 - 4460 m	51	36
5	3	2559 - 4559 m	51	41

PHILLIPS AUSTRALIAN OIL COMPANY
SIDEWALL CORE DESCRIPTION

WELL HERMES-1 INTERVAL 4457m - 3382m DATE 17/4/83 PAGE 1

SWC ATTEMPTED 51 RECEIVED 36 MISSFIRES 0 NO RECOVERY 15

RUN No. 1 SUITE 4 GEOLOGIST D.H. Murray

DEPTH in metres	LENGTH RECVD cm	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
4457	3	Sandstone: White-light grey, fine to coarse, subangular-subrounded, no apparent cement, poor porosity, poorly sorted, Kaolinitic (?)	Yes		Very Light Yellow-White	White Residue Cloud
4456	1	Sandstone: White-Grey, Fine-Coarse, Subangular-Subrounded, Poorly Sorted, Very Loosely Consolidated, No Apparent Cement, Clay Matrix (Kaolinite ?), Poor Porosity, Carbonaceous, Including Mica and Pyrite.	Yes		Very Slight Yellow Pinpoint	Very Minor Streaming Yellow
4441	3	Sandstone: White-Clear, Fine-Coarse, Subangular-Subrounded, Very Loosely Consolidated, Dolomitic Cement(?), Very Poor Porosity, Poorly Sorted, 50% HCl Causes Large Bubbles and Stained Grains to bob and Float to surface.	Yes	Green and/ Tan/ Brown Maroon	Very Patchy White-Yellow	Very Slow Yellow Some Streaming (Minor)
4440	2	Sandstone: White-Clear, Coarse-Very Coarse, Subangular-Rounded, Fibrous Cement, Very Poor Porosity, Moderately Well Sorted, Mica.	Yes	Green and Brown/ Tan	Strong Pale Yellow, White Primary 90% Sample	White-Flash Then White Cloud
4433	1	Sandstone: White-Clear, Coarse to Very Coarse, Subangular-Rounded, Possible Fibrous Cement, Poor Porosity, Moderately Well Sorted, 50% HCl Causes Large Bubbles and Stained Grains to Bob.	Yes	Green and Brown/ Tan	Strong Pale Yellow-White Primary	White-Yellow Minor Secondary
4429.5	1½	Sandstone: White-Clear, Coarse to Very Coarse, Subangular-Rounded, White Clayey Cement, Poor Porosity, Moderately Well Sorted, 50% HCl Causes Large Bubbles, Stained Grains Bob and Rise in Bubbles.	Yes	Green and Black	Strong Pale Yellow White Primary 85% Sampling	White Yellow Flash
4424		NO RECOVERY - Mud Cake.				
4422.5		NO RECOVERY - Mud Cake				
4421.5		NO RECOVERY				
4417		NO RECOVERY - Mud Cake				
4400.5		NO RECOVERY - Mud Cake				

PHILLIPS AUSTRALIAN OIL COMPANY

SIDEWALL CORE DESCRIPTION

WELL HERMES-1 INTERVAL 4457m - 3382m DATE 17/4/83 PAGE 2

SWC ATTEMPTED 51 RECEIVED 36 MISSFIRES 0 NO RECOVERY 15

RUN No. 1 SUITE 4 GEOLOGIST D.H. Murray

DEPTH in metres	LENGTH RECVD cm	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
4399.5		NO RECOVERY - Mud Cake				
4397.5		NO RECOVERY				
4392	1½	Sandstone: White-Clear, Fine-Coarse, Subangular-Subrounded, Very Loosely Consolidated, No Apparent Cement, Poorly Sorted, Poor Porosity.	Yes	Tan/ Brown	Yellow Pinpoint Minor	Very Minor, Yellow Streaming
4386.5		NO RECOVERY - Mud Cake. 1 piece Shale, Black, Hard, Hard Silica, Carbonaceous.	Silt	-	-	-
4383		Sandstone: White-Clear-Grey, Fine-Coarse, Subangular-Subrounded, Very Loosely Consolidated, Poor Porosity, No Apparent Cement, Poorly Sorted, Mica, Grains Move and Bob With 50% HCl.	Yes	Black, Green	Pale Yellow-White, 50% Sampling	Yellow, Very Minor
4367		NO RECOVERY				
4343		NO RECOVERY				
4320	1	Sandstone: White-Grey, Very Fine-Fine, Well Sorted, Subangular-Rounded, Fair-Poor Porosity, 50% HCl Causes Some Grains to Rise to Surface, Very Loosely Consolidated. Shale: Black, Hard, Silica, Carbonaceous.	Yes	-	Minor, Yellow Pinpoint	Minor, Streaming Yellow
4305.5		NO RECOVERY				
4298	1-3/4	Sandstone: White-Grey, Very Fine-Fine, Well Sorted, Subangular-Rounded, Fair-Poor Porosity, 50% HCl Causes Black Stained Grains to Move Toward Surface, Very Minor Calcareous Cement. Shale: Black, Hard, Silica, Carbonaceous, Very Minor Cement.	Yes	Black Minor	Minor Yellow and White Primary	Streaming Yellow
4287.5	1	Sandstone: White-Grey, Very Fine-Fine, Well Sorted, Subangular-Rounded, Fair-Poor Porosity, 50% HCl Causes Bubbles and Grain Movement, Perhaps Calcareous Cement. Shale: Black, Hard, Silica, Carbonaceous, Minor Cement. Coal: Black, Brittle, Vitreous, Conchoidal Fracture, Very Minor Cement.	Yes	Black, Minor	Pale Yellow-White Primary	White-Yellow Streaming Residual White Haze

PHILLIPS AUSTRALIAN OIL COMPANY
SIDEWALL CORE DESCRIPTION

WELL HERMES-1 INTERVAL 4457m - 3382m DATE 17/4/83 PAGE 3

SWC ATTEMPTED 51 RECEIVED 36 MISSFIRES 0 NO RECOVERY 15

RUN No. 1 SUITE 4 GEOLOGIST D.H. Murray

DEPTH in metres	LENGTH RECVD cm	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
4255		NO RECOVERY				
4255.5	2	Shale: Brown-Black, Hard, Silica, Carbonaceous. Coal: Black, Brittle, Vitreous, Conchoidal Fractures. Sandstone: White-Grey, Coarse Grains Well Sorted, Angular-Subangular, Silica Cement.	-	Black (?)	None	Very Slow Bleeding Yellow Cloud
4238		NO RECOVERY				
4197	1	Sandstone: White-Light Grey, Very Fine-Fine, Well Sorted, Subangular-Subrounded, Fair Porosity, No Apparent Cement. Shale: Black-Grey, Hard, Silica, Carbonaceous, Minor Amount. Coal: Black, Brittle, Vitreous, Conchoidal Fracture, Very Minor Amount.	-	Black (?)	Very Pale Yellow Cream Primary	Very Slow Bleeding Yellow Cloud
4154		NO RECOVERY				
4125	2	Sandstone: White-Light Grey, Medium-Coarse Grains, Moderately Well Sorted Subangular-Subrounded, Fair Porosity, Dolomitic Cement. Shale: Brown-Black, Hard, Silica, Carbonaceous, Minor Cement. Coal: Black, Brittle, Vitreous, Conchoidal Fracture, Very Minor Amount.	-	-	Yellow, White Pinpoint-Patchy	Yellow Streaming
4105	1	Sandstone: White-Light Grey, Fine-Coarse Grains, Poorly Sorted, Sub-angular-Subrounded, Kaolinitic matrix?, No Apparent Cement, Mica, Pyrite, Fair to Poor Porosity. Shale: Grey-Black, Hard, Silica, Carbonaceous, Minor Amount. Coal: Black, Brittle, Vitreous, Conchoidal Fracture, Very Minor Amount.	-	-	Cream-White Blotchy Very Faint	Very Minor Streaming Yellow-White
4065	1½	Shale: Brown-Black, Hard-Medium Soft, Silica, Very Carbonaceous. Coal: Black, Brittle, Vitreous, Conchoidal Fracture, Minor Amount. Sandstone: Grey and Clear, Very Fine-Fine, Moderately Well Sorted, Angular-Subangular, Very Poor Porosity, Very Minor Amount.	-	-	None	None

PHILLIPS AUSTRALIAN OIL COMPANY
SIDEWALL CORE DESCRIPTION

WELL HERMES-1 INTERVAL 4457m - 3382m DATE 17/4/83 PAGE 4

SWC ATTEMPTED 51 RECEIVED 36 MISSFIRES 0 NO RECOVERY 15

RUN No. 1 SUITE 4 GEOLOGIST D.H. Murray

DEPTH in metres	LENGTH REC'VD cm	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
4049	1	Sandstone: White-Light Grey-Grey, Medium Grains, Well Sorted, Sub-angular-Subrounded, Argillaceous Fair to Poor Porosity, Mica. Shale: Grey-Black, Hard, Silica, Very Carbonaceous, Minor Amount. Coal: Black, Brittle, Silica, Conchoidal Fracture, Very Minor Amount.	-	-	Cream-White Primary in Part Pinpoint Overall	White-Yellow Streaming Minor Residual Cloud, White
3999.5	1½	Shale: Dark Grey-Black, Hard-Very Hard, Silica, Very Carbonaceous. Coal: Black, Brittle, Silica, Conchoidal Fracture, Very Minor Amount.	-	-	None	None
3953	1	Sandstone: Grey-Brown, Medium-Coarse Grains, Moderately Sorted, Subangular-Angular, Argillaceous, Poor Porosity, Shale: Black, Very Hard, Silica, Very Carbonaceous.	-	-	None	None
3927.5	1	Siltstone: Brown-Black, Medium/Soft, Non Calcareous, Argillaceous, Carbonaceous, reworked coal debris.	-	-	None	None
3895	1	Siltstone: Brown-Black, Silt Size Grains, Moderate-Soft, Non Calcareous, Argillaceous, Carbonaceous Coal: Black, Brittle, Vitreous, Conchoidal Fracture - Greatly Influences Sample.	-	-	None	None
3851.5	1	Sandstone: White-Light Grey, Medium Grains, Well Sorted, Subangular-Subrounded, Argillaceous Fair Porosity, Carbonaceous.	-	-	Yellow Pinpoint Very Minor	Very Minor Streaming Yellow
3800	1	Sandstone: White-Light Grey, Fine-Medium Grains, Moderately Sorted, Subangular to Subrounded, Argillaceous Cement, Fair Porosity, Slightly Carbonaceous, Possibly Dolomitic Cement, Coal Laminations	-	-	None	Very Minor Streaming Yellow
3749	1½	Siltstone/Shale: Grey-Black, Moderately Hard, Non Calcareous, Argillaceous, Very Carbonaceous. Coal Black, Brittle, Vitreous, Conchoidal Fracture.	-	-	Very Minor Pinpoint	None

PHILLIPS AUSTRALIAN OIL COMPANY
SIDEWALL CORE DESCRIPTION

WELL HERMES-1 INTERVAL 4457m - 3382m DATE 17/4/83 PAGE 5

SWC ATTEMPTED 51 RECEIVED 36 MISSFIRES 0 NO RECOVERY 15

RUN No. 1 SUITE 4 GEOLOGIST D.H. Murray

DEPTH in metres	LENGTH RECVD cm	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
3729	1½	Siltstone/Shale: Grey-Black, Moderately Hard, Non Calcareous, Argillaceous, Very Carbonaceous. Coal: Black, Brittle, Vitreous, Conchoidal Fracture.	-	-	None	None
3683.5	1½	Argillaceous Sandstone: White-Grey, Fine-Medium Grains, Moderately Well Sorted, Subangular-Subrounded, Argillaceous, Carbonaceous, Fair Porosity. Coal: Black, Vitreous, Conchoidal Fracture, Stringers.	-	-	None	Very Slow Yellow Streaming
3637.5	1	Siltstone: Light Grey-Black, Moderately Hard, Calcareous, Argillaceous, Carbonaceous.	-	-	None	None
3602	1½	Sandstone: White-Grey-Clear, Fine-Medium Grains, Moderately Well Sorted, Subangular to Subrounded, Argillaceous Fair-Poor Porosity, Carbonaceous.	-	-	Minor Yellow Pinpoint	Very Minor Streaming Yellow
3599	1½	Siltstone: Light Grey-Grey-Black, Moderately Hard, Calcareous, Argillaceous, Carbonaceous.	-	-	None	None
3587	1	Sandstone: White-Light Grey, Medium Grains, Well Sorted, Subangular-Subrounded, Argillaceous Carbonaceous, Fair Porosity, Mica, Pyrite.	-	-	White-Yellow Pinpoint Minor	None
3570		NO RECOVERY				
3568	1	Sandstone: White-Clear, Medium-Very Coarse Grains, Moderately Sorted, Subangular-Angular, Argillaceous, Kaolinitic, Poor-Fair Porosity Slightly Carbonaceous, Mica, Pyrite	-	-	White-Yellow Minor Pinpoint	Minor Yellow Streaming
3539	1½	Coal: Black, Hard, Brittle, Vitreous, Conchoidal Fracture.	Yes	-	None	Minor, Very Silty White Streaming
3490	1	Shale: Dark Grey-Black, Hard-Very Hard, Silica, Carbonaceous.	-	-	None	None

PHILLIPS AUSTRALIAN OIL COMPANY
SIDEWALL CORE DESCRIPTION

WELL HERMES-1 INTERVAL 4457m - 3382m DATE 17/4/83 PAGE 6

SWC ATTEMPTED 51 RECEIVED 36 MISSFIRES 0 NO RECOVERY 15

RUN No. 1 SUITE 4 GEOLOGIST D.H. Murray

DEPTH in metres	LENGTH RECVD cm	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
3436	1½	Siltstone/Shale: Grey-Black, Moderately Soft-Hard, Non Calcareous, Argillaceous, Very Carbonaceous, Mica(?)	-	-	None	None
3397	2	Siltstone: Grey-Black, Moderately Hard-Hard, Non Calcareous, Argillaceous, Very Carbonaceous,	-	-	None	None
3382	1	Sandstone: White-Light Grey-Grey, Medium Grains, Well Sorted, Sub-angular-Subrounded, Argillaceous Very Carbonaceous, Fair Porosity.	-	-	None	Minor, Yellow Streaming

PHILLIPS AUSTRALIAN OIL COMPANY
SIDEWALL CORE DESCRIPTION

WELL HERMES-1 INTERVAL 4397.5m - 2573m DATE 17/4/83 PAGE 1

SWC ATTEMPTED 51 RECEIVED 36 MISSFIRES 0 NO RECOVERY 15

RUN No. 2 SUITE 4 GEOLOGIST D.H. Murray

DEPTH in metres	LENGTH RECVD	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
4397.5	½	Sandstone: Light Grey-Grey, Fine-Coarse, Subangular-Subrounded, Very Loosely Consolidated, No Apparent Cement, Fair-Poor Porosity, Poorly Sorted, Carbonaceous.	Yes	-	Cream-Yellow Primary	Very Minor Yellow Streaming
4367		NO RECOVERY				
4343	½	Sandstone: Light Grey-Grey, Fine-Coarse, Subangular-Subrounded, No Apparent Cement, Fair Porosity, Poorly Sorted, Carbonaceous.	-	-	Very Minor Yellow Pinpoint	Very Minor Yellow Streaming
4305.5	2	Siltstone/Shale: Grey-Black, Moderately Soft-Hard, Silt Size Grains, Non Calcareous, Argillaceous, Carbonaceous.	Yes	-	None	None
4265		NO RECOVERY				
4238		NO RECOVERY				
4154	1	Coal: Black, Brittle, Vitreous, Conchoidal Fracture.	Yes	-	None	None
3570		NO RECOVERY				
3368.5	1	Sandstone: White-Light Grey, Fine-Coarse, Subangular-Subrounded, Poorly Sorted, Very Loosely Consolidated, No Apparent Cement, Possible Kaolinitic Matrix, Fair Porosity, Slightly Carbonaceous.	Yes	-	Yellow Pinpoint Minor	Very Minor Yellow Streaming
3332	3/4	Siltstone: Grey-Black, Moderately Soft, Non-Calcareous, Argillaceous, Carbonaceous.	Yes	-	None	None
3277		NO RECOVERY				
3231	1	Shale/Siltstone: Grey-Black, Moderately Hard, Non Calcareous, Argillaceous, Extremely Carbonaceous. Coal: Black, Hard, Vitreous, Conchoidal Fracture.	-	-	None	None
3199		NO RECOVERY - Mud Cake				
3185		NO RECOVERY				

PHILLIPS AUSTRALIAN OIL COMPANY
SIDEWALL CORE DESCRIPTION

WELL HERMES-1 INTERVAL 4397.5m - 2573m DATE 17/4/83 PAGE 2

SWC ATTEMPTED 51 RECEIVED 36 MISSFIRES 0 NO RECOVERY 15

RUN No. 2 SUITE 4 GEOLOGIST D.H. Murray

DEPTH in metres	LENGTH RECVD cm	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
3174		NO RECOVERY				
3165		NO RECOVERY				
3156		NO RECOVERY				
3147		NO RECOVERY				
3137.5		NO RECOVERY				
3074		NO RECOVERY				
3067		NO RECOVERY				
3055	3/4	Claystone: Light Grey-Grey, Soft, Non Calcareous, Very Carbonaceous, Subfissile, With Coal Seams, Black, Brittle, Vitreous, Conchoidal Fracture.	-	-	None	None
3047	3/4	Silty Sandstone: White-Clear-Grey, Medium-Very Coarse, Angular-Subrounded, Moderately Sorted, No Apparent Cement, Silt Matrix, Carbonaceous, Poor-Fair Porosity.	-	-	None	None
3036	1½	Silty Sandstone: White-Clear-Grey, Medium-Coarse Grains, Angular-Subrounded, Moderately Sorted, No Apparent Cement, Silt Matrix, Carbonaceous, Poor Porosity. Coal Seams, Black, Brittle, Vitreous, Conchoidal Fracture.	-	-	None	None
3027	1	Silty Sandstone: White-Clear-Grey, Medium Grains, Angular-Subrounded, Moderately Sorted, No Apparent Cement, Silt Matrix, Carbonaceous, Poor Porosity. Coal Seams, Black, Brittle, Vitreous, Conchoidal Fracture, Poor Porosity.	-	-	None	None
3017	1½	Claystone: Light Grey-Grey, Soft, Non Calcareous, Very Carbonaceous, Silty.	-	-	None	None
3003	1	Silty Sandstone: Clear-Light Grey, Fine-Very Fine Grains, Subangular-Subrounded, Moderately Well Sorted, No Apparent Cement, Silt Matrix, Carbonaceous, Poor Porosity.	-	-	None	None

PHILLIPS AUSTRALIAN OIL COMPANY

SIDEWALL CORE DESCRIPTION

WELL HERMES-1 INTERVAL 4397.5m - 2573m DATE 17/4/83 PAGE 3

SWC ATTEMPTED 51 RECEIVED 36 MISSFIRES 0 NO RECOVERY 15

RUN No. 2 SUITE 4 GEOLOGIST D.H. Murray

DEPTH in metres	LENGTH REC'VD	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
3002	3/4	Silty Sandstone: Light Grey-Clear-Grey, Fine-Very Fine Grains, Subangular-Subrounded, Moderately Well Sorted, No Apparent Cement, Silt Matrix, Carbonaceous, Porosity.	-	-	None	None
2991.5	3/4	Silty Sandstone: Clear-Light Grey-Grey, Fine-Very Fine Grains, Subangular-Subrounded, Moderately Well Sorted, No Apparent, Cement, Silt Matrix, Carbonaceous, Poor Porosity.	-	-	None	None
2982	1	Silty Sandstone: Clear-Light Grey-Grey, Fine-Very Fine Grains, Subangular-Subrounded, Moderately Well Sorted, No Apparent Cement, Silt Matrix, Very Carbonaceous, Poor Porosity.	-	-	None	None
2943	2	Silty Sandstone: White-Clear-Light Grey-Grey, Fine-Coarse Grains, Subrounded-Angular, Poorly Sorted, No Apparent Cement, Silt Matrix, Very Carbonaceous, Poor Porosity Coal: Black, Brittle, Vitreous, Conchoidal Fracture, Seam.	-	-	None	None
2924	2	Claystone: Dark Grey, Soft-Moderately Hard, Non Calcareous, Very Carbonaceous, Clay Matrix.	-	-	None	None
2881	1	Silty Sandstone: Clear-Grey, Fine-Coarse Grains, Subangular-Subrounded, Fair to Poorly Sorted, No Apparent Cement, Silt Matrix, Very Carbonaceous, Mica. Coal: Black, Brittle, Vitreous, Conchoidal Fracture, Chips, Poor Porosity.	-	-	None	None
2854	1½	Argillaceous Sandstone: White-Clear-Light Grey, Medium Grains, Subangular-Subrounded, Well Sorted, No Apparent Cement, Clayey Matrix, Carbonaceous, Poor Porosity.	-	-	None	None
2787	2	Silty Sandstone: White-Clear-Dark Grey, Fine-Medium Grains, Minor Pebbles, Subangular-Rounded, Moderately Well Sorted, No Apparent Cement, Silt Matrix, Carbonaceous, Poor-Fair Porosity.	-	-	None	None

PHILLIPS AUSTRALIAN OIL COMPANY

SIDEWALL CORE DESCRIPTION

WELL HERMES-1 INTERVAL 4397.5m - 2573m DATE 17/4/83 PAGE 4

SWC ATTEMPTED 51 RECEIVED 36 MISSFIRES 0 NO RECOVERY 15

RUN No. 2 SUITE 4 GEOLOGIST D.H. Murray

DEPTH in metres	LENGTH REC'VD cm	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
2786	1½	Claystone: Dark Grey-Black, Soft, Non Calcareous, Very Carbonaceous,	-	-	None	None
2759	1	Claystone: Dark Grey-Black, Soft, Non Calcareous, Very Carbonaceous, Coal: Black, Brittle, Vitreous, Conchoidal Fracture, Chips.	-	-	None	None
2751.5	1½	Claystone: Dark Grey-Black, Soft, Non Calcareous, Very Carbonaceous, Sandstone: White-Light Grey, Fine Grains, Subrounded, Well Sorted, No Apparent Cement, Clayey Matrix, Poor Porosity, Seam. Coal: Black, Brittle, Vitreous, Conchoidal Fracture, Chips.	-	-	None	None
2744	2	Claystone: Dark Grey-Black, Soft, Non Calcareous, Very Carbonaceous, Matrix. Sandstone: White-Light Grey, Fine Grains, Subrounded, Well Sorted, No Apparent Cement, Clayey Matrix, Poor Porosity, Seam.	-	-	None	None
2733	2	Argillaceous Sandstone: White-Light Grey-Grey, Fine-Very Coarse, Angular-Subrounded, Very Carbonaceous Clayey Matrix, No Apparent Cement, Poorly Sorted, Poor Porosity, Pyrite, Mica.	-	-	None	None
2726	1	Argillaceous Sandstone: White-Light Grey-Grey, Fine-Coarse, Angular-Subrounded, Moderately Sorted, Very Carbonaceous, No Apparent Cement, Clay Matrix, Poor Porosity, Pyrite, Mica.	-	-	None	None
2716.5	2	Argillaceous Sandstone: White-Light Grey-Grey, Fine-Coarse Grains, Angular-Subrounded, Poorly Sorted, Carbonaceous, No Apparent Cement, Clay Matrix, Poor Porosity, Pyrite, Mica.	-	-	None	None
2703	1	Argillaceous Sandstone: White-Light Grey-Grey, Fine-Coarse Grains, Angular-Subrounded, Poorly Sorted, Carbonaceous, No Apparent Cement, Clay Matrix, Poor-Fair Porosity, Pyrite, Mica.	-	-	None	None

PHILLIPS AUSTRALIAN OIL COMPANY
SIDEWALL CORE DESCRIPTION

WELL HERMES-1 INTERVAL 4397.5m - 2573m DATE 17/4/83 PAGE 5

SWC ATTEMPTED 51 RECEIVED 36 MISSFIRES 0 NO RECOVERY 26

RUN No. 2 SUITE 4 GEOLOGIST

DEPTH in metres	LENGTH RECVD	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
2700	1½	Argillaceous Sandstone: Light Grey-Grey, Fine Very Coarse Grains, Angular-Subrounded, Some Pebbles, Moderately Poorly Sorted, Very Carbonaceous, No Apparent Cement, Clay Matrix, Poor Porosity, Pyrite, Mica.	–	–	None	None
2682	2½	Argillaceous Sandstone: Grey-Black, Fine-Very Coarse Grains and Pebbles, Angular-Very Well Rounded, Poorly Sorted, Very Carbonaceous, No Apparent Cement, Clay Matrix, Poor Porosity, Pyrite Mica, With Interlaminated Coal.	–	–	None	None
2672		NO RECOVERY				
2625	2	Sandstone: White-Clear-Light Grey, Very Coarse, Angular-Subrounded, Well Sorted, No Apparent Cement, Good Porosity, Glauconitic.	–	–	None	None
2600	1½	Sandstone: White-Clear-Light Grey, Very Coarse Grains, Angular-Subrounded, Well Sorted, No Apparent Cement, Good Porosity, Glauconitic.	–	–	None	None
2583	1½	Argillaceous Sandstone: Light Grey-Grey, Fine-Medium Grains, Subangular-Subrounded, Moderately Sorted, Carbonaceous, No Apparent Cement, Clayey Matrix, Poor-Fair Porosity.	–	–	None	None
2580	1½	Argillaceous Sandstone: Light Grey-Grey, Fine-Medium Grains, Subangular-Subrounded, Moderately Sorted, Carbonaceous, No Apparent Cement, Clayey Matrix, Poor-Fair Porosity.	–	–	None	None
2573	2½	Argillaceous Sandstone: Light Grey-Grey, Fine Grained, Subangular-Subrounded, Well Sorted, Very Carbonaceous, No Apparent Cement, Clayey Matrix, Poor Porosity.	–	–	None	None

PHILLIPS AUSTRALIAN OIL COMPANY

SIDEWALL CORE DESCRIPTION

WELL HERMES-1 INTERVAL 4558m - 3217m DATE 22/4/83 PAGE 1

SWC ATTEMPTED 51 RECEIVED 41 MISSFIRES 1 NO RECOVERY 9

RUN No. 3 SUITE 5 GEOLOGIST G. YARROW

DEPTH in metres	LENGTH RECVD cm	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
4558	1	Siltstone: Brown, argillaceous, non calcareous, hard. No Recovery.	Minor	No	No	No
4530	2	Siltstone: Dark grey, argillaceous, carbonaceous, non calcareous, siliceous cement, hard.	Minor	No	No	Slow Seeping Blue White
4518	3	Sandstone: Greenish grey, fine grained, subangular to subrounded, poor sorting, moderate sphericity, poorly cemented, silty matrix, very low porosity, friable.	Moderate Hydrocarbon	No	Patchy Moderate Blue-White Yellow Scum Floats To Surface When Disaggregated.	Very Faint Light Blue Crush Cut
		NO RECOVERY				
4492	2	Sandstone: Brownish grey, fine to very fine grained, subangular to subrounded, poor sorting, poorly sorted silty matrix, salt and pepper texture, poor porosity and permeability.	Moderate Hydrocarbon	No	Pinpoint to Splotchy Yellow Faint	Faint Light Blue to White Crush Cut
4482	2	Coal: Dark brown, splintery fracture, very argillaceous.	Moderate Hydrocarbon	No	None, Gas Bubbling From Fracture	Bleeding Light Blue
4467	1½	Sandy Siltstone greyish brown, firm, argillaceous.	Moderate Hydrocarbon	Patchy Brown	Patchy Light Blue to White	Bleeding Light Blue to White
4447	3	Sandstone: Greenish white, fine to very fine grained, subangular to subrounded, poorly sorted, silty, very little cement.	Moderate Hydrocarbon	None	Strong Greenish White	Instant Pale White
4442	2	Siltstone: Grey, argillaceous, minor mica, friable.	Moderate Hydrocarbon	No	Very Faint White	Pale White Crush Cut

PHILLIPS AUSTRALIAN OIL COMPANY
SIDEWALL CORE DESCRIPTION

WELL HERMES-1 INTERVAL 4558m - 3217m DATE 22/4/83 PAGE 2

SWC ATTEMPTED 51 RECEIVED 41 MISSFIRES 1 NO RECOVERY 9

RUN No. 3 SUITE 5 GEOLOGIST G. YARROW

DEPTH in metres	LENGTH RECVD cm	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
4441	3	Sandstone: White, coarse to very coarse grained, subangular to sub-rounded, moderate to well sorted, fiberous cement clogging most porosity and permeability	Strong Hydro-carbon	No	White and Pinpoint Yellow	None
4438	2	Sandstone: White, coarse to very coarse grained, subrounded, moderate sphericity, white fiberous cement.	Strong Hydro-carbon	None	Greenish White	None
4436	½	Sandstone: White, coarse to very coarse grained, subrounded, moderate sphericity, white fiberous cement, poor porosity.	Strong	None	Greyish White	None
4433	3	Sandstone: White, coarse to very coarse grained, subrounded, moderate sphericity, white fiberous cement, poor porosity.	Strong	None	Greenish White	Instant Faint White
4431	1½	Siltstone: Greenish grey, salt and pepper texture, greenish clay cement.	Strong	None	Faint Greenish White	None
4429	1½	Sandstone: White, coarse to very coarse grained, subangular to sub-rounded, moderate sphericity, white clayey cement, poor porosity.	Strong	None	Bright Greenish White	None
		NO RECOVERY				
4426	1	Siltstone: Greenish grey, salt and pepper texture, fiberous cement.	Moder-ate	None	Very Faint White	Crush Faint White
4423	½	Sandstone: White, fine grained, subrounded, moderate sphericity, white clayey cement.	Moder-ate	None	Moderate Greenish White	Instant Yellow White
4421	2	Sandstone: White, medium to coarse grained, subangular to subrounded, fiberous cement, poor porosity.	Strong	None	Pale Greenish Back-Ground With Patchy Yellow White	Faint Bleeding Yellow White
4419	2	Sandstone: White, fine grained, subangular to subrounded, fiberous cement, poor porosity.	Strong	None	Moderate Greenish White	Faint Bleeding White Cut

PHILLIPS AUSTRALIAN OIL COMPANY
SIDEWALL CORE DESCRIPTION

WELL HERMES-1 INTERVAL 4558m - 3217m DATE 22/4/83 PAGE 3

SWC ATTEMPTED 51 RECEIVED 41 MISSFIRES 1 NO RECOVERY 9

RUN No. 3 SUITE 5 GEOLOGIST G. YARROW

DEPTH in metres	LENGTH RECVD cm	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
4416	2	Interlaminated fiberous cemented Siltstone and Sandstone as previously described.	Strong	No	Moderate Greenish White in Sandstone	Instant Bleeding Light Blue in Sandstone Slow Bleeding Yellow in Siltstone
		NO RECOVERY				
4410	-	Sandstone: Greenish white, fine grained, subangular to subrounded, salt and pepper texture, silty.	Strong	No	Greenish White With Patchy Dull Yellow	Instant Streaming Light Yellow
		NO RECOVERY				
		NO RECOVERY				
4401	3	Sandstone: White, medium grained, subangular to subrounded, moderate sphericity, fiberous cement, poor porosity.	Strong Like Gasoline	Yes	Greenish White Background With Patchy Bright Yellow White	Crush Pale Yellow White
4389	1½	Sandstone: Greenish white, medium grained, subangular, poor sphericity, fiberous cement.	Moderate	No	Greenish White With Bright Patchy Yellow White	Poor Seeping White
4385	1½	Sandstone: Greenish white, fine to very fine grained, silty to argillaceous matrix, poor porosity.	Slight	No	Greenish White	No
4397	1	Siltstone: Light green, fiberous cement.	Moderate	No	Faint Whitish Yellow	Instant Streaming Light Yellow
4395	1	Siltstone: Light green, fiberous cement.	Moderate	No	Faint Whitish Yellow	Streaming Pale White

PHILLIPS AUSTRALIAN OIL COMPANY
SIDEWALL CORE DESCRIPTION

WELL HERMES-1 INTERVAL 4558m - 3217m DATE 22/4/83 PAGE 4

SWC ATTEMPTED 51 RECEIVED 41 MISSFIRES 1 NO RECOVERY 9

RUN No. 3 SUITE 5 GEOLOGIST G. YARROW

DEPTH in metres	LENGTH RECVD cm	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
4375	1	Sandstone: Light green, fine to very fine grained, silty, argillaceous matrix, poor porosity.	Slight	No	Faint Greenish White	No
4369	1½	Sandstone: Light green, fine to very fine grained, silty, argillaceous matrix, poor porosity.	Strong	No	Faint Greenish White With Pinpoint Yellow	Crush Faint White
4366	1	Siltstone: Light green, fiberous cement, with dark brown argillaceous laminations.	Moderate	No	Faint Greenish White	Crush Faint White
4355	1	Claystone: Brownish grey, splintery	Moderate	No	Very Faint White	Crush Yellow White
4337	½	Sandstone: Silty, light green, fine grained, argillaceous, poor porosity.	Moderate	No	Greenish White With Yellow Pinpoint	Streaming Yellow White
4242	½	Sandstone: Silty, light green, fine grained, argillaceous, poor porosity.	Slight	No	Faint Greenish White	Crush Pale White
4227	½	Sandstone: Light green, medium grained, angular to subrounded, poor sorting, silty matrix, poor porosity.	Slight	No	Faint Greenish White	No Cut
4217	½	Sandstone: Light green, medium grained, angular to subrounded, poor sorting, silty matrix, poor porosity.	Slight	No	Faint Greenish White	No Cut
4201	½	Sandstone: White to light green, medium grained, subangular to subrounded, poor sorting, silty matrix, poor porosity.	Very Slight	No	Faint Greenish White	No Cut
		NO RECOVERY				
4157	1	Sandstone: White to light green, fine grained, subangular to subrounded, poor sorting, salt and pepper texture, silty matrix, poor porosity.	Moderate	No	Good Greenish White	Faint White Residual

PHILLIPS AUSTRALIAN OIL COMPANY
SIDEWALL CORE DESCRIPTION

WELL HERMES-1 INTERVAL 4558m - 3217m DATE 22/4/83 PAGE 5

SWC ATTEMPTED 51 RECEIVED 41 MISSFIRES 1 NO RECOVERY 9

RUN No. 3 SUITE 5 GEOLOGIST G. YARROW

DEPTH in metres	LENGTH RECVD cm	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
4051	1	Sandstone: Light green, fine to very fine grained, subangular to subrounded, argillaceous, poor sorting, poor porosity.	Slight	No	Faint Light Green	Faint White Residual
3941.5	2½	Sandstone: White, fine grained, angular to subrounded, silty matrix, friable, poor porosity.	Slight	No	Light Green	Faint White Residual
3911.5	1½	Sandstone: White to light green, fine grained, subangular to subrounded, silty matrix, friable, poor porosity.	Slight	No	Faint Light Green	Faint White Residual
3829	1	Sandstone: Light green, fine grained, subangular to subrounded, poor sorting, silty matrix, poor porosity.	Moderate	No	Faint Light Green	Residual Cut Faint Yellow White
3823	1	Sandstone: Light grey, fine grained, subangular to subrounded, poor sorting, silty matrix, poor porosity.	Slight	No	Faint Light Green	No Cut
3717	½	Sandstone: White, fine grained, subangular to subrounded, poor sorting, silty to argillaceous matrix, calcareous cement, speckled dark non quartz grains, poor porosity, friable.	Moderate	No	Bright Light Green to White	Crush Faint White
3217	1½	Claystone: Grey, silty.	Slight	No	Pale Light Blue	No Cut

PHILLIPS AUSTRALIAN OIL COMPANY
SIDEWALL CORE DESCRIPTION

WELL HERMES-1 INTERVAL 2590m - 1104m DATE 17/3/83 PAGE 1

SWC ATTEMPTED 30 RECEIVED 29 MISSFIRES 0 NO RECOVERY 1

RUN No. 1 of SWC : Suite 2, Run 4 GEOLOGIST J. Garrity

DEPTH in metres	LENGTH RECVD	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
2575	1.5cm	Interbedded Sandstone and Siltstone: Sandstone: Clear to Cream, Very Fine to Fine Grained Quartz, Angular to Subangular, Moderately Well Sorted, Low Sphericity, Occasional Well Rounded Medium Grained Quartz Grains, Moderate to High Clay Content, Very Poorly Cemented, Non Calcareous, Low Porosity. Siltstone: Dark Grey, Silt Size Grains of Quartz, Moderate to Good Sorting, Non Calcareous Cement, Low Clay Content, Weakly Consolidated, Poor Visual Porosity.	-	-	-	-
2568.5	1cm	Sandstone With Minor Siltstone: Sandstone: Clear, Fine to Medium Grained Quartz, Subangular to Subrounded, Moderate Sorting, Common Well Rounded to Subrounded Coarse to Very Coarse Grained Clear Quartz Grains, Non Calcareous, Low Clay Content, Good Visual Porosity. Siltstone: Dark Grey, Silt Size Grains of Quartz, Poorly Cemented, Non Calcareous, Low Clay Content, Poor Visual Porosity.	-	-	-	-
2567	2cm	Sandstone: Clear, Fine to Medium Grained Quartz Grains, Subangular to Subrounded, Moderate to Poor Sorting, Common Subrounded to Subangular Coarse to Very Coarse Grained Frosted Quartz Grains, Non Calcareous, Silty Matrix, Poorly Consolidated, Low to Moderate Visual Porosity.	-	-	-	-
2562	1.25cm	Pyritic Sandstone: Clear to Grey to Frosted, Fine to Medium Grained Quartz Grains, Subangular to Subrounded, Moderate Sorting, Rare Coarse to Very Coarse Subrounded to Subangular Quartz Grains, Very Poorly Consolidated, Over 50% of Sample is Pyrite, Pyrite Varies From Very Fine to Granule Size. Very Poor Visual Porosity.	-	-	-	-

PHILLIPS AUSTRALIAN OIL COMPANY
SIDEWALL CORE DESCRIPTION

WELL HERMES-1 INTERVAL 2590m - 1104m DATE 17/3/83 PAGE 2

SWC ATTEMPTED 30 RECEIVED 29 MISSFIRES 0 NO RECOVERY 1

RUN No. 1 of SWC : Suite 2, Run 4 GEOLOGIST J. Garrity

DEPTH in metres	LENGTH RECVD	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
2561	1.5cm	Sandstone: Clear to Frosted, Quartzitic, Dominantly Coarse to Medium Grained Subspherical Quartz Grains, Subrounded to Well Rounded, Common Frosted Very Coarse to Granular, Well Rounded, Highly Spherical Quartz Grains, Unconsolidated, Low Silt Content, Excellent Visual Porosity.	-	-	-	-
2555.5	1.5cm	Sandstone: Clear to Dark Grey, Dominantly Fine to Medium Grained Quartz, Subrounded, Moderate to Poor Sorting, Very Coarse to Granular, Frosted-Clear, Subrounded to Rounded Subspherical Quartz Grains, Common to Abundant, Non Calcareous, Silty Matrix.	-	-	-	-
2552	1.5cm	Sandstone: Clear to Frosted, Dominantly Fine to Medium to Coarse Grained Quartz, Subrounded to Rounded, Moderate Sphericity, Common Frosted Very Coarse to Granule Size Quartz Grains, Unconsolidated, Non-Calcareous, Very Little Silt or Clay, Excellent Visual Porosity.	-	-	-	-
2551	1cm	Sandstone: Clear to Light Grey, Fine to Very Fine Quartz, Subangular to Subrounded, Moderate Sphericity, Very Coarse to Coarse Subangular to Subrounded Quartz Abundant, Unconsolidated, Non-Calcareous, Moderate Silt/Clay Content, Muscovite Plates Common.	-	-	-	-
2550	1cm	Sandstone: Clear, Fine to Medium Grained Quartz, Well Sorted, Subrounded to Subangular, Moderate Sphericity, Non Calcareous, Clean, Very Minor Clay Content, Excellent Visual Porosity.	-	-	-	-
2549	1cm	Sandstone: Dark to Light Grey, Fine to Medium Grained Quartz, Well Sorted, Subrounded, Moderate Sphericity, Unconsolidated, Non Calcareous, Silty, Moderate to Good Visual Porosity.	-	-	-	-

PHILLIPS AUSTRALIAN OIL COMPANY
SIDEWALL CORE DESCRIPTION

WELL HERMES-1 INTERVAL 2590m - 1104m DATE 17/3/83 PAGE 3

SWC ATTEMPTED 30 RECEIVED 29 MISSFIRES 0 NO RECOVERY 1

RUN No. 1 of SWC : Suite 2, Run 4 GEOLOGIST J. GARRITY

DEPTH in metres	LENGTH RECVD	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
2548	0.75cm	Sandstone: Dark to Light Grey, Fine to Medium Grained Quartz, Moderate to Poor Sorting, Subangular to Subrounded, Occasional Very Coarse to Coarse Subrounded Quartz Grains, Unconsolidated, Non-Calcareous, Silty, No Fossils, Moderate to Poor Visual Porosity.	–	–	–	–
2543.5	1.75cm	Sandstone: Dark Grey, Very Fine to Medium Grained Quartz, Subrounded, Moderate Sphericity; Frosted Granular, Well Rounded, Highly Spherical Quartz Grains Common, Unconsolidated, Non Calcareous, Very Silty, Non Fossiliferous, Moderate to Poor Visual Porosity.	–	–	–	–
2452.5	1cm	Sandstone: Dark Grey, Very Fine to Medium Grained Quartz, Subrounded, Moderate Sphericity, Moderately Well Sorted, Unconsolidated, Non Calcareous, Very Silty, Moderate to Poor Visual Porosity.	–	–	–	–
2541	1.5cm	Sandstone and Minor Siltstone: Sandstone: Dark Grey, Fine to Coarse Grained Quartz, Rounded to Subrounded, High Sphericity, Unconsolidated, Non-Calcareous, Silty, Moderate Visual Porosity. Siltstone: Dark Grey, Quartzitic, Well Sorted, Occasional Fine to Very Fine, Well Rounded, Subspherical Quartz Floating in Matrix, Hard, Calcareous Cement, Very Poor Visual Porosity.	–	–	–	–
2540	1.75cm	Sandstone: Dark Grey, Very Fine to Fine Grained Quartz, Subangular to Subrounded, Moderate Sphericity, Hard to Firm, Non-Calcareous, Carbonaceous, Silty, Poor Visual Porosity.	–	–	–	–

ORIGINAL - TO ACCOMPANY SAMPLES COPY TO PERTH OFFICE COPY TO RIG FILES A-5633-1

PHILLIPS AUSTRALIAN OIL COMPANY
SIDEWALL CORE DESCRIPTION

WELL HERMES-1 INTERVAL 2590m - 1104m DATE 17/3/83 PAGE 4

SWC ATTEMPTED 30 RECEIVED 29 MISSFIRES 0 NO RECOVERY 1

RUN No. 1 of SWC : Suite 2, Run 4 GEOLOGIST

DEPTH in metres	LENGTH RECVD	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
2537.5	1.5cm	Sandstone: Dark Grey to Light Grey, Very Fine to Fine Grained Quartz, Subrounded to Subangular, Moderate Sorting, Rare Frosted, Very Coarse to Coarse, Well Rounded, Highly Spherical Quartz Grains, Poorly Consolidated, Non Calcareous, Silty, Moderate Clay Content, Carbonaceous, Poor Visual Porosity.	-	-	-	-
2534	1.5cm	Sandstone: Dark Grey, Predominantly Very Fine to Fine Grained Quartz, Subrounded to Subangular, Moderate Sorting, Firm to Hard, Slightly Calcareous, Silty, Some Clay, Carbonaceous, Poor Visual Porosity.	-	-	-	-
2525	1.25cm	Sandstone: Dark Grey, Predominantly Very Fine to Fine Grained Quartz, Subrounded, Firm to Hard, Non-Calcareous, Silty, Carbonaceous, Poor Visual Porosity.	-	-	-	-
2514.5	0.25cm	Contaminated With Mud. Sandstone: Dark Grey, Dominantly Very Fine to Fine Grained Quartz, Subrounded, Subspherical, Common Medium to Very Coarse Grained, Rounded, Highly Spherical Quartz Grains, Soft, Unconsolidated, Non Calcareous, High Clay and Silt Content, Carbonaceous, Very Poor Visual Porosity.	-	-	-	-
2505	1.25cm	Sandstone: Light Grey, Dominantly Very Fine Grained Quartz, Subrounded, Moderately Spherical, Very Calcareous, Firm to Pliable, Minor Glauconite, Very High Clay Content, Very Poor Visual Porosity.	-	-	-	-
2499	1.5cm	Sandstone: Light to Dark Grey, Dominantly Very Fine Grained Quartz, Subangular to Subrounded, Moderately Spherical, Firm to Hard, Very Calcareous, Carbonaceous, Very High Clay Content, Minor Fine Grained Glauconite, Very Poor Visual Porosity.	-	-	-	-

ORIGINAL - TO ACCOMPANY SAMPLES COPY TO PERTH OFFICE COPY TO RIG FILES A-5633-1

PHILLIPS AUSTRALIAN OIL COMPANY
SIDEWALL CORE DESCRIPTION

WELL HERMES-1 INTERVAL 2590m - 1104m DATE 17/3/83 PAGE 5

SWC ATTEMPTED 30 RECEIVED 29 MISSFIRES 0 NO RECOVERY 1

RUN No. 1 of SWC : Suite 2, Run 4 GEOLOGIST J. Garrity

DEPTH in metres	LENGTH REC'VD	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
2375	1.5cm	Siltstone: Dark Grey, Dominantly Silt Size Quartz Grains, Abundant Very Fine Grained Quartz Floating in Matrix, Firm, Very Calcareous, Abundant Clay, Carbonaceous, Subfissile in Part, Very Poor Visual Porosity.	-	-	-	-
2251	2.5cm	Shale: Dark Grey, Silt Size Quartz Grains, Very Fine Grained Quartz Common, Well Sorted, Hard, Very Calcareous, Carbonaceous, Micaceous, Minor Clay, Non-Fossiliferous, Fissile, Very Poor Visual Porosity.	-	-	-	-
2163	1.5cm	Siltstone: Light Grey, Dominantly Silt Sized Quartz Grains, Very Fine Grained Quartz Grains Common in Matrix, Well Sorted, Hard, Very Calcareous, Clay Common, Micaceous, Sub Fissile in Part, Very Poor Visual Porosity.	-	-	-	-
2077	2cm	Siltstone: Dark to Light Grey, Silt Sized Quartz Grains, Well Sorted, Very Minor Very Fine Grained Quartz in Matrix, Very Hard, Very Calcareous, Minor Clay, Carbonaceous, Slightly Micaceous, Sub Fissile in Part, Very Poor Visual Porosity.	-	-	-	-
1950	1cm	Claystone: Dark Grey, Dominantly Clay With Abundant Silt Size Quartz Grains, Firm to Soft, Very Calcareous, Carbonaceous, Slightly Micaceous, Sub Fissile in Part, Very Poor Visual Porosity.	-	-	-	-
1845	0.75cm	Mud Contaminated. Claystone (Marl): Dark Grey, Clay With Abundant Silt Sized Quartz Grains in Matrix, Soft, Sticky, Very Calcareous, Carbonaceous, Non Fossiliferous, Very Poor Visual Porosity.	-	-	-	-
1731	0.5cm	Calcarenite: Dark Grey, Very Fine to Fine Grained Carbonate Grains, Abundant Silt Sized Quartz Grains, Very Hard, Calcareous Cement, Non Fossiliferous, Very Poor Visual Porosity.	-	-	-	-

PHILLIPS AUSTRALIAN OIL COMPANY
SIDEWALL CORE DESCRIPTION

WELL HERMES-1 INTERVAL 2590m - 1104m DATE 17/3/83 PAGE 6

SWC ATTEMPTED 30 RECEIVED 29 MISSFIRES 0 NO RECOVERY 1

RUN No. 1 of SWC : Suite 2, Run 4 GEOLOGIST J. Garrity

DEPTH in metres	LENGTH RECVD	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
1537	0.75cm	Calcareous Siltstone: Dark to Light Grey, Silt Sized Quartz Grains, Well Sorted, Very Hard, Very Calcareous, Cemented With Something Other Than Calcite-Dolomite?, Homogeneous, Clay Abundant in Matrix, Non Fossilifereous, Very Poor Visual Porosity.	-	-	-	-
1341	0.5cm	Calcarenite: Light Grey, Very Fine to Fine Grained to Silt Sized Calcareous Grains, Minor Very Fine Grained Quartz in Matrix, Moderately Hard, Well Cemented, Non Fossiliferous, Homogeneous, Very Poor Visual Porosity.	-	-	-	-

APPENDIX NO. 7

DIPMETER INTERPRETATIONS

DIPMETER ANALYSIS

The dipmeter was run over the interval from 2250 metres to 4559 metres in Hermes No. 1. This interval includes the objective sedimentary sections of the Latrobe Group. Dipmeter analysis has helped in determining the main paleocurrent directions of the various units and their respective depositional environments. The study has concentrated mainly on major sand bodies of the Maastrichtian-to-Paleocene Latrobe Group.

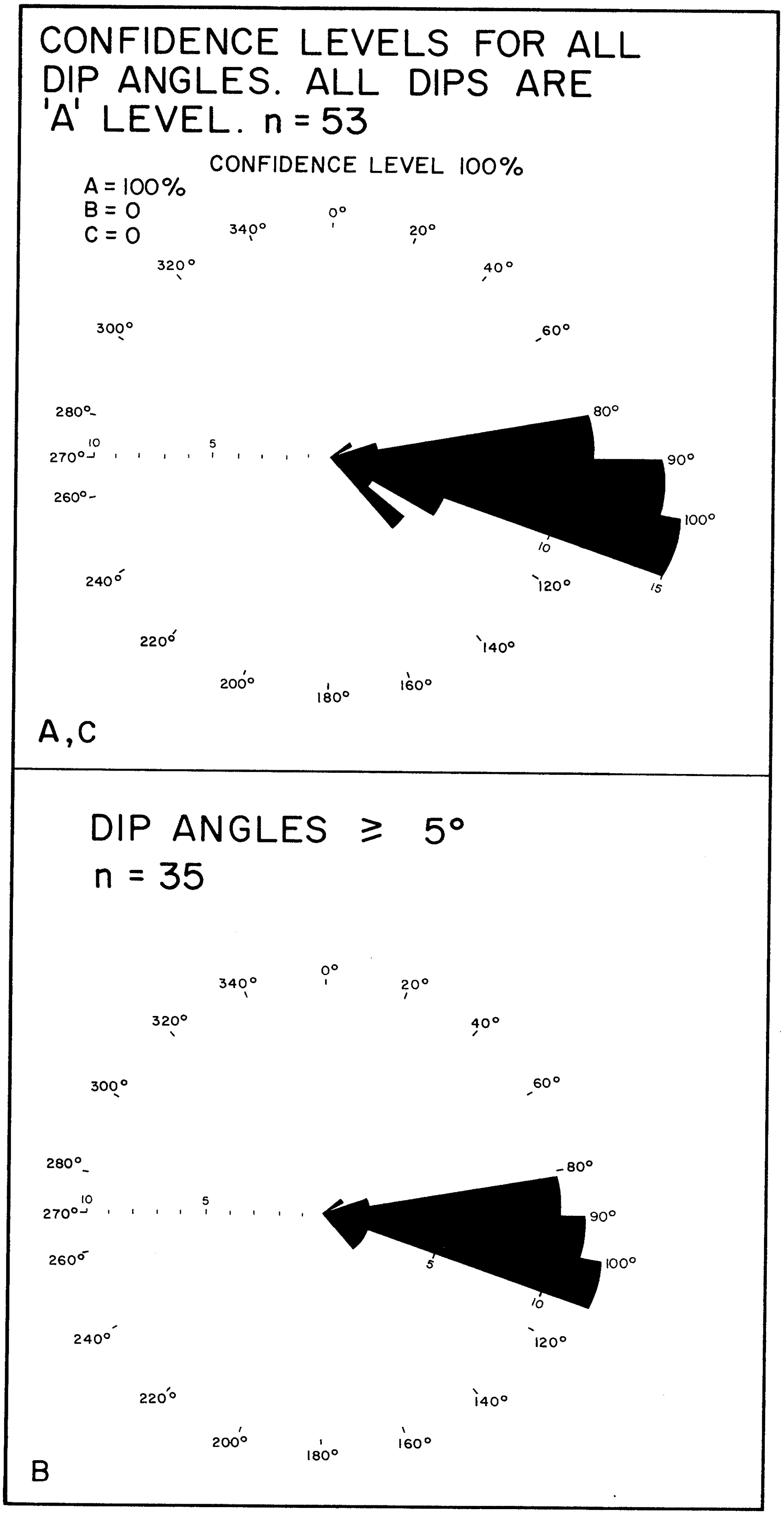
In order to study the sedimentary dips a correlation interval of 1 metre, step distance of 0.5 metre and search angle of 35 degrees was used. The standard removal of structural dip was not necessary as it remains at 2° southwest throughout the sedimentary section.

Polar plots were constructed to display depositional information which is unique for each situation. Three basic types of plots were made, namely, one including all dip values, another plotting dip values greater than or equal to 5 degrees and lastly a plot based on confidence of dipmeter data. The polar plot which includes all dip values was used to determine the general sedimentary dip direction. The plot which uses dip values greater than or equal to 5 degrees determined any trend in larger dip values which may be particularly relevant in fluvio-deltaic environments. Polar plots based on confidence of dipmeter data were used to eliminate data of poor quality which may be misleading or erroneous. Dip azimuths were grouped into 10 degree intervals for plotting purposes.

A coarse sand of the Latrobe Clastics extends over the interval 2544 to 2571 metres in Hermes No. 1. These Paleocene sands are capped by a 10 million-year hiatus which separates the Paleocene Latrobe Clastics from the Mid-Eocene Flounder Formation. Dipmeter readings, when all dips are plotted (Figure 1A), indicate strong easterly dip. When dips of 5 degrees or greater are used (Figure 1B), the primary sedimentary dip direction remains easterly. Figure 1C indicates that 100% of all dips plotted have a confidence level of C or higher (A is best, D is eliminated). In fact, all of the dips plotted in Figure 1C are A level dips indicating the utmost confidence in the data.

The dipmeter data, along with electric log, lithological and palynological data suggest that the sand body penetrated between 2544 and 2571 metres is a low-lying beach strand line-to-marginal marine deposit. From the base of the unit up to 2562 metres deposition occurred on a beach as is indicated by grain frosting and lack of marine fossils. From 2562 to 2552 metres deposition took place on the beach foreshore with deposition by swash of low-angle beach placers. Above 2552 metres marine influences prevailed and deposition was very near-shore marine. Overall the sequence is indicative of a marine transgression. The beach had a generally north-south orientation with sediment being deposited in an easterly direction. Sediment supply was from a landmass to the west.

A massive sand was penetrated between 2586 and 2645 metres in Hermes No. 1. The sands are of Paleocene age and represent a major beach system. Dipmeter readings, when all dips are plotted (Figure 2A) exhibit a broad scatter from the northwest quadrant clockwise to the southeast quadrant. When dips of 5 degrees are plotted (Figure 2B) the scatter is lessened and the dips take on a northeast-to-southeast trend.



PHILLIPS AUSTRALIAN OIL COMPANY

POLAR PLOT OF PALEOCURRENTS MEASURED FROM DIPMETER DATA, HERMES-1

LATROBE GROUP PALEOCENE

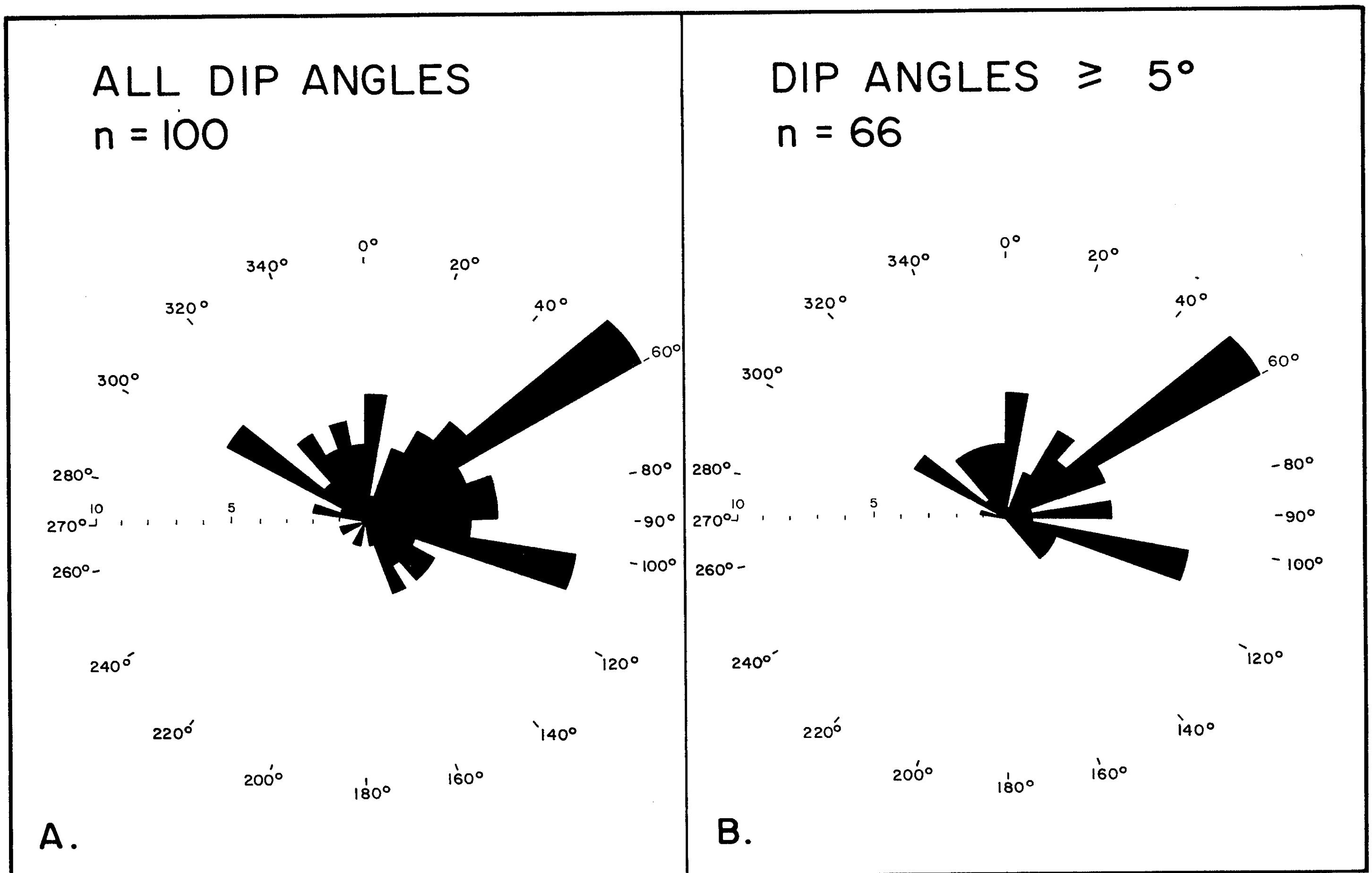
BEACH STRAND LINE/MARGINAL MARINE SANDS

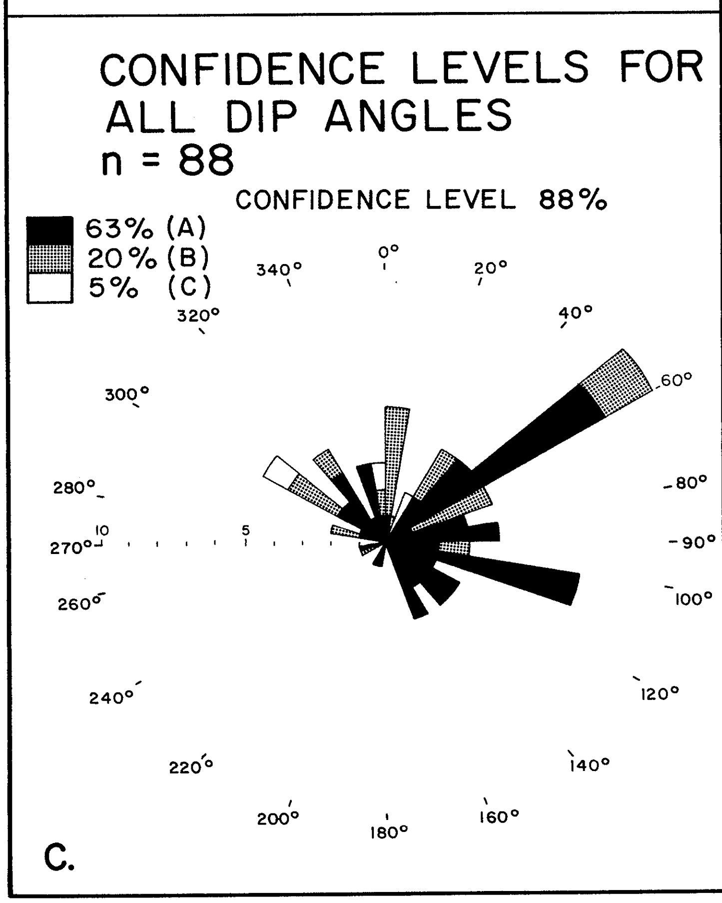
2544-2571m

B.E.SEE AUG,1983

A-5756-11

FIGURE 1





PHILLIPS AUSTRALIAN OIL COMPANY

POLAR PLOT OF PALEOCURRENTS MEASURED FROM DIPMETER DATA

LATROBE GROUP PALEOCENE
BARRIER ISLAND
BEACH STRAND LINE SANDS
HERMES-1
2586-2645m

B.E.SEE AUG, 1983

A-5756-12

FIGURE 2

The dipmeter confidence level plot (Figure 2C) indicates an overall confidence level of 88% for C level-and-better dips. High quality A level dips account for 63% of the total. The dipmeter data is considered to be of very good quality and Figure 2C displays a generally easterly sedimentary dip trend.

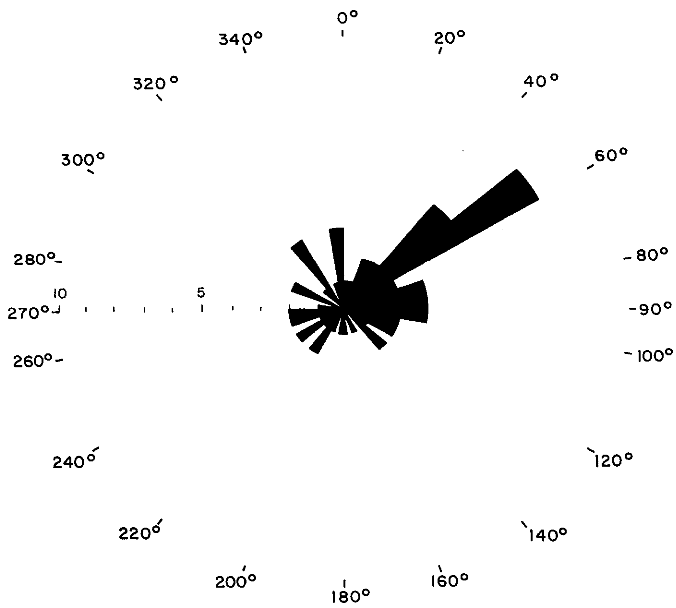
Dip angles throughout most of the sand body decrease with depth (Figure 8) and are indicative of shoreface deposition. The high dip cycles also suggest deposition in a high energy environment.

The dipmeter data, along with electric log and lithological data suggest that the sand body penetrated between 2586 and 2645 metres is a prograding beach strand line system probably located on a barrier island. The barrier island system had a generally northwest-southeast orientation with sediment being deposited in a northeasterly direction. Sediment supply was from the southwest.

The next group of sands studied using dipmeter techniques were those penetrated between 2655 and 2750 metres. These sands are generally thin (5 - 15 metres), fluvially deposited and carbonaceous. Dipmeter results are excellent in these sands and have a confidence level of 94% (Figure 3C). When all the dips are plotted (Figure 3A) a random series of dip directions which tend to favour a northeasterly direction are evident.

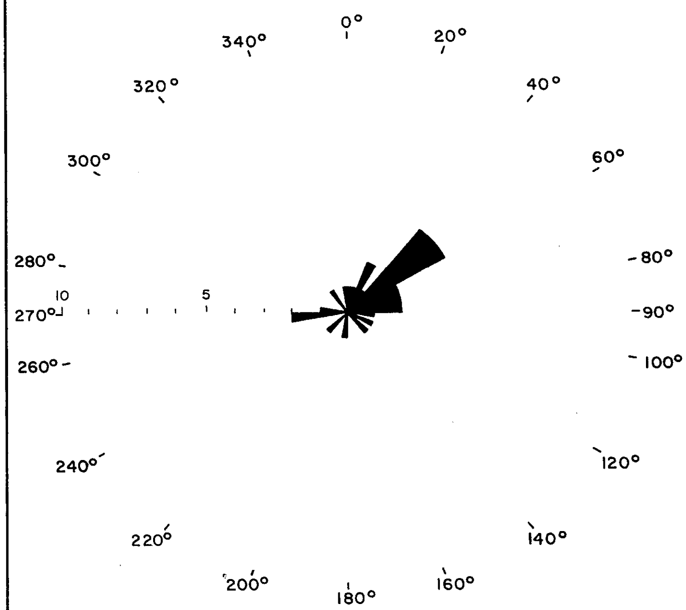
Dips which equal or are greater than 5° (Figure 3B) also exhibit a random dip pattern but again favour a northeasterly dip direction. The dipmeter confidence level plot (Figure 3C) again displays a random dip pattern with a northeasterly trend. The randomness of the sedimentary dip is attributed to deposition by a meandering fluvial system that was continually changing flow direction.

ALL DIP ANGLES
n = 62



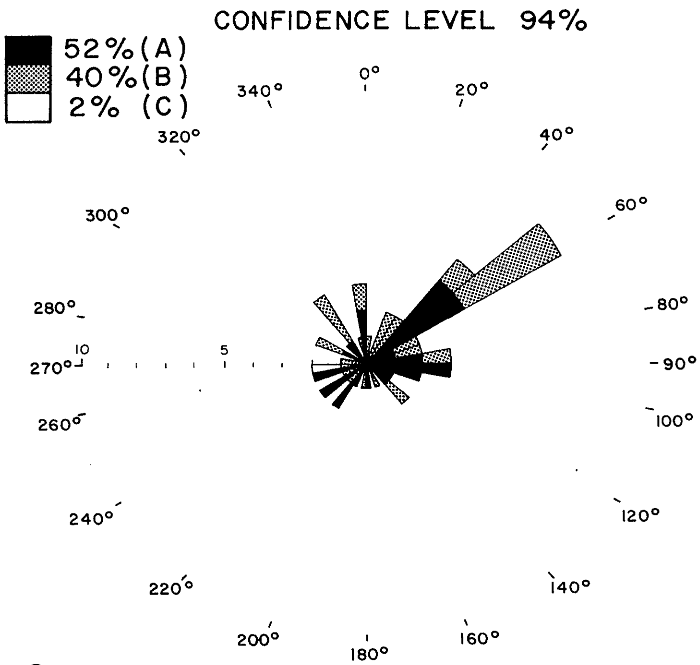
A.

DIP ANGLES ≥ 5°
n = 29



B.

CONFIDENCE LEVELS FOR ALL DIP ANGLES
n = 62



C.

PHILLIPS AUSTRALIAN OIL COMPANY

POLAR PLOT OF PALEOCURRENTS MEASURED FROM DIPMETER DATA

LATROBE GROUP PALEOCENE
POINT BAR SANDS
HERMES-1
2655-2750m

B.E.SEE AUG, 1983

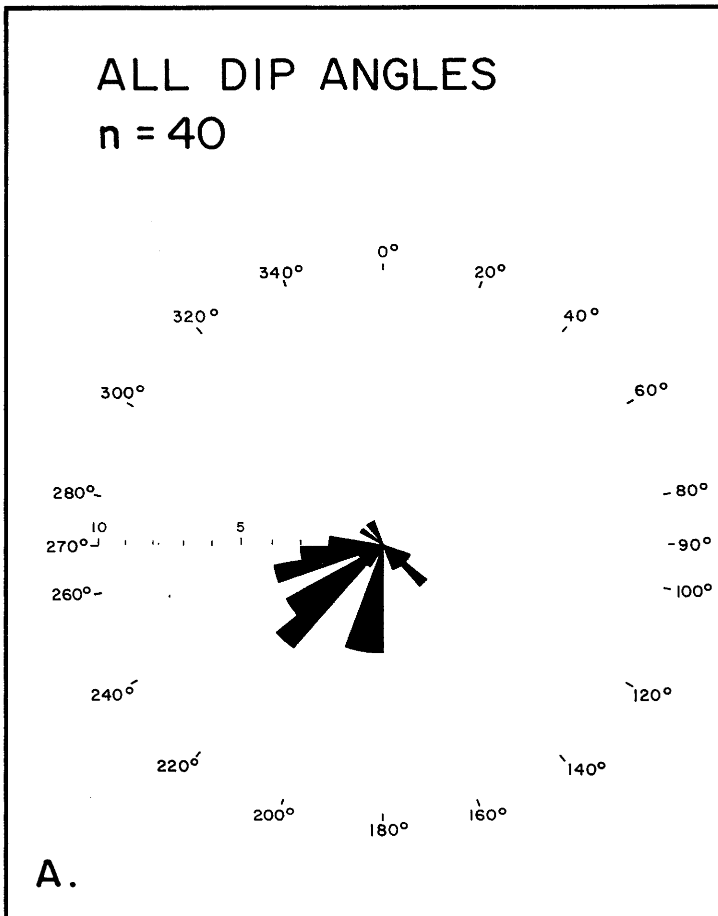
A-5756-13

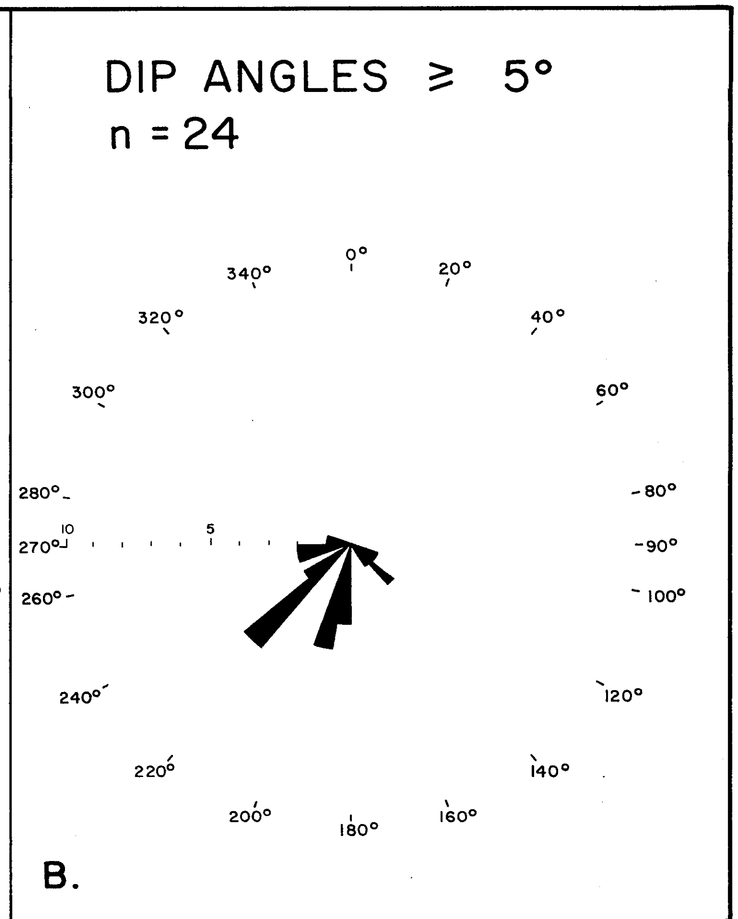
FIGURE 3

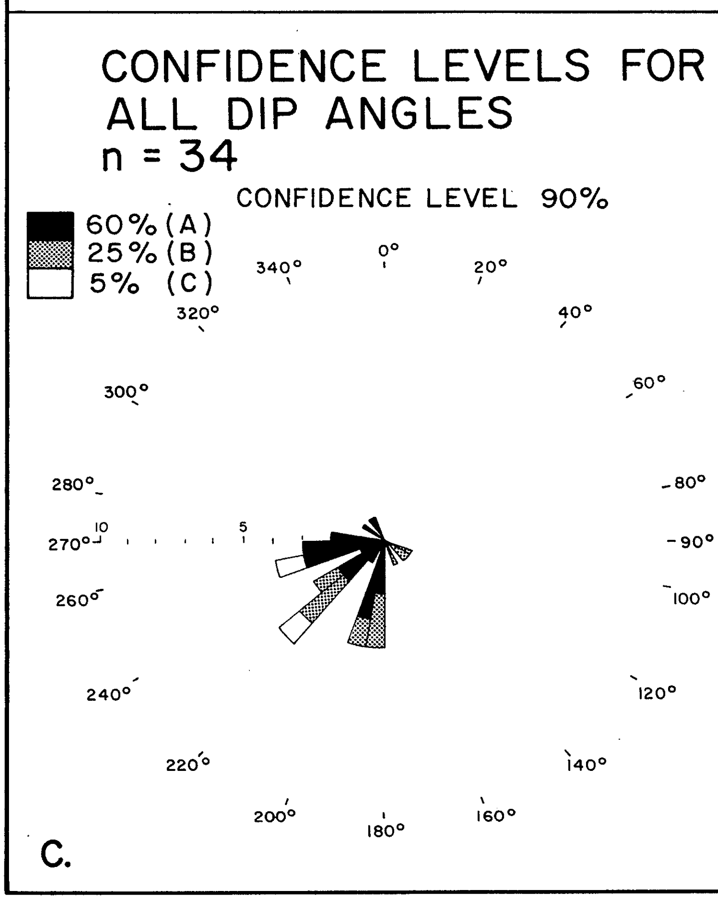
This depositional system may have also been influenced by tides which change the flow regime and added further to the randomness of sedimentation. The Paleocene sand bodies penetrated between 2655 and 2750 metres were deposited as thin point bars in meandering tidal-influenced creeks and small tidal-influenced rivers. Although dip direction is random in this zone dip directions of east to northeast dominate. It is believed that these so called "tidal creeks and tidal rivers" flowed generally northeasterly into lagoons which were located between the mainland and an extensive barrier island system. This barrier island-lagoon system had a generally northwest-to-southeast trend during the Paleocene in the Hermes area with the source of sediment to the southwest.

A small 18-metre thick Paleocene sand was penetrated between 2765 and 2783 metres. Dipmeter readings, when all dips are plotted (Figure 4A) indicate multiple sedimentary dip directions with a southwesterly trend. When dips of 5 degrees or greater are used (Figure 4B) the primary sedimentary dip direction is less variable and has a definite southwesterly trend. The dipmeter confidence level plot (Figure 4C) displays a 92% confidence level and supports southwesterly dip.

Using paleontological data, log characteristics, lithology and dipmeter data, it is concluded that the sands penetrated between 2765 and 2783 metres represent flood tidal delta deposits. These type of deposits are formed in the lagoon, landward of a tidal inlet. The tidal inlet is a break between two beach barriers allowing communication between lagoon and marine conditions. Hermes No. 1 penetrated the landward slope of the flood tidal delta which resulted in sedimentary dip direction that is opposite to that of the overlying units described above (southwest dip versus northeast dip). The beach barrier coastline, at the time of deposition of the flood tidal delta, had a northwest to southeast orientation.







PHILLIPS AUSTRALIAN OIL COMPANY

POLAR PLOT OF PALEOCURRENTS MEASURED FROM DIPMETER DATA

LATROBE GROUP PALEOCENE FLOOD TIDAL DELTA SANDS

HERMES-1

2765-2783m

B.E.SEE AUG, 1983

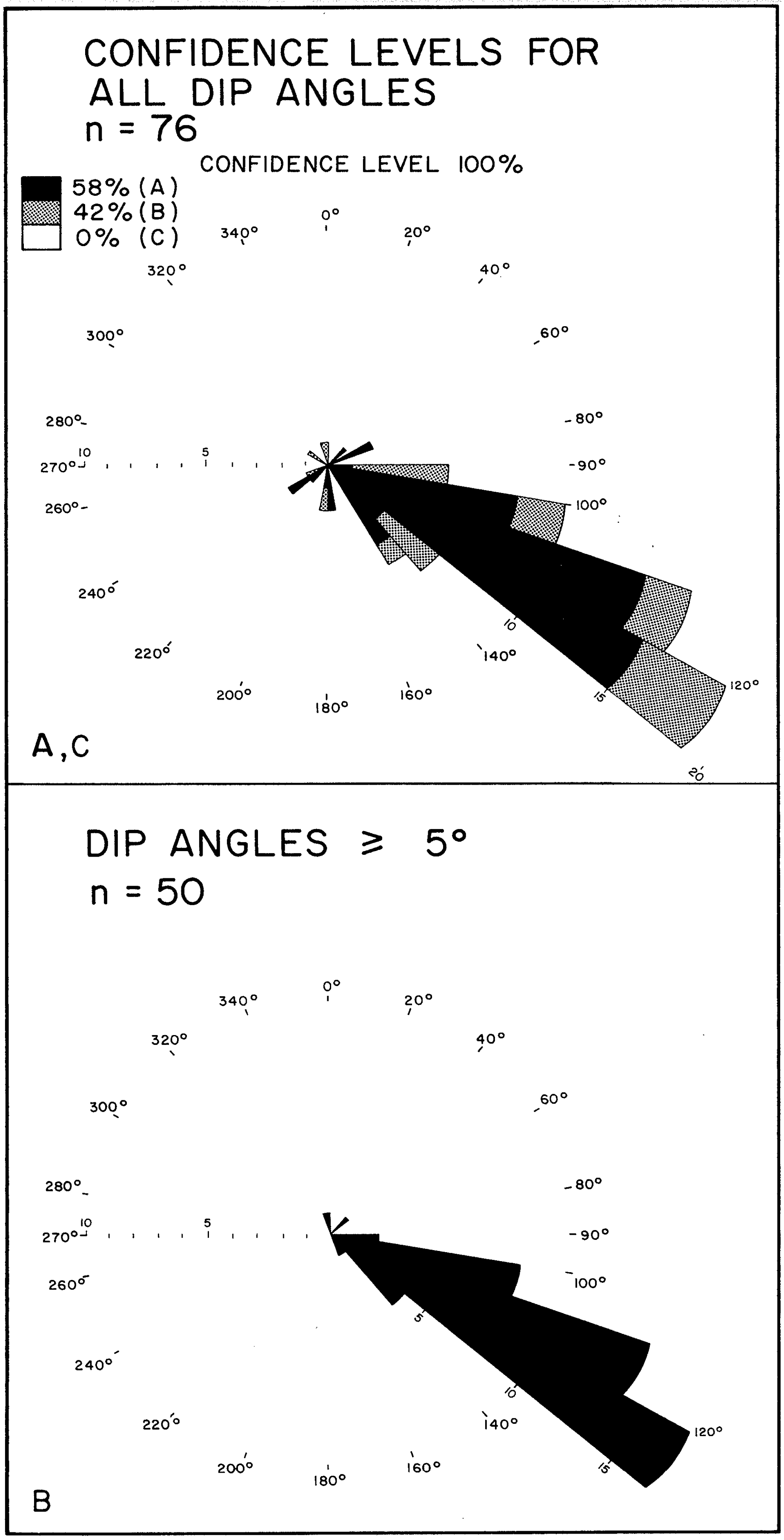
A-5756-14

FIGURE 4

A massive sand of Early Paleocene age was penetrated between 2810 and 2878 metres. The sand is a prograding stacked beach-barrier system. Dipmeter readings, when all dips are plotted (Figure 5A), indicate strong southeasterly dip. When dips of 5 degrees or greater (Figure 5B) are plotted the dip remains strong to the southeast. The dipmeter confidence level plot (Figure 5C) indicates that 100% of the dips are of B-or-better quality. The southeasterly dip of these 68 metre thick sands indicate that the orientation of the shoreline was northeast to southwest in the Early Paleocene and later in Paleocene time shifted to northwest-southeast as described above.

The first major sands penetrated beneath the Maastrichtian unconformity (the unconformity will be discussed later in this report) occur between 2890 to 2907 metres and 2927 to 2940 metres. When all dips are plotted (Figure 6A) the polar plot reveals a generally northwest sedimentary dip trend, slightly bimodal to the southeast. The bimodal trend increases when sedimentary dips equal to or greater than 5 degrees are plotted (Figure 6B). The dipmeter confidence level plot (Figure 6C) indicates that 86% of the dips are of C level or better and that the primary sedimentary dip direction is to the northwest.

The environment of deposition for the two sands was back barrier-lagoonal. The sands were initially transported from the northwest by meandering, tidally-influenced creeks and streams and deposited in mainly fresh water lagoons behind barrier islands. Tidal currents entering the lagoon through tidal inlets between barrier islands influenced the depositional regime, creating northwest dip. The lagoonal/barrier island system had a northeast-to-southwest trend. Tidal influence created the bimodal dip described above. The deposits are best described as small flood tidal deltas.



PHILLIPS AUSTRALIAN OIL COMPANY

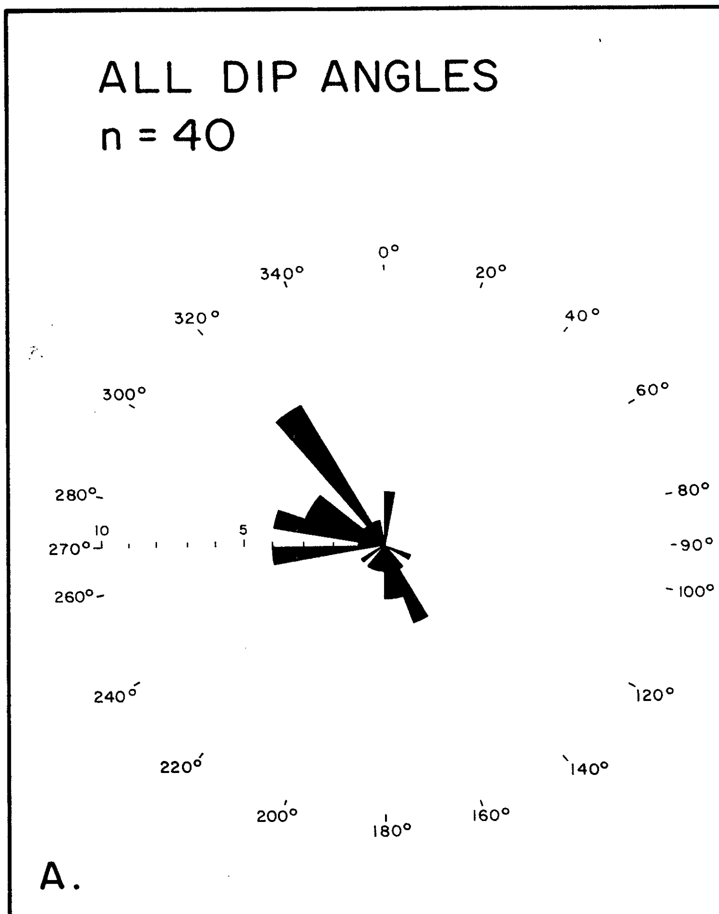
POLAR PLOT OF PALEOCURRENTS MEASURED FROM DIPMETER DATA, HERMES-1

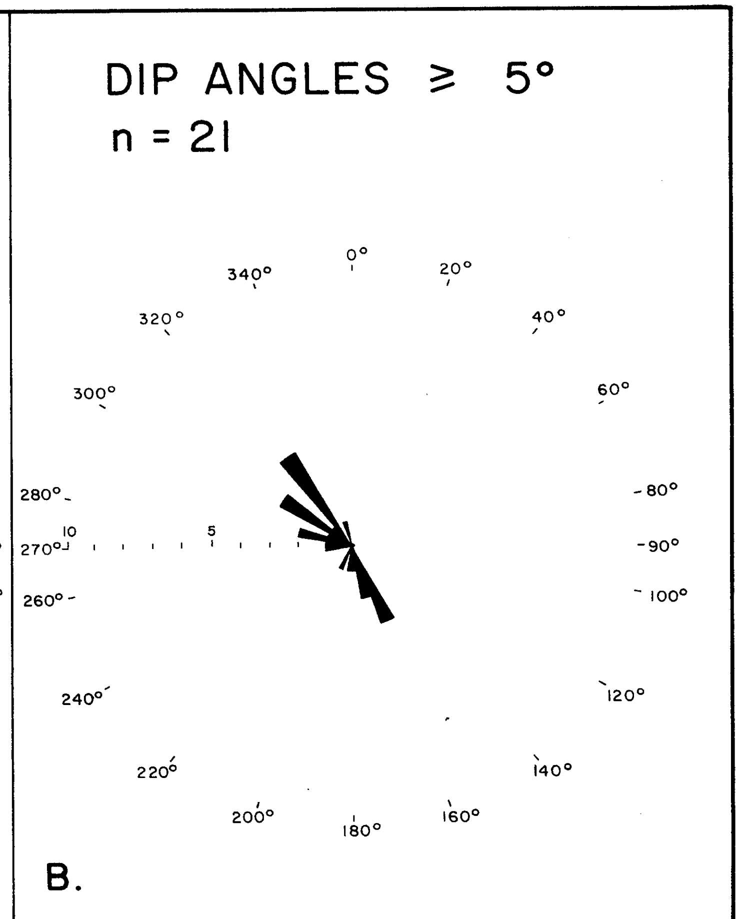
LATROBE GP EARLY PALEOCENE
STACKED BEACH BARRIER SANDS
2810-2878m

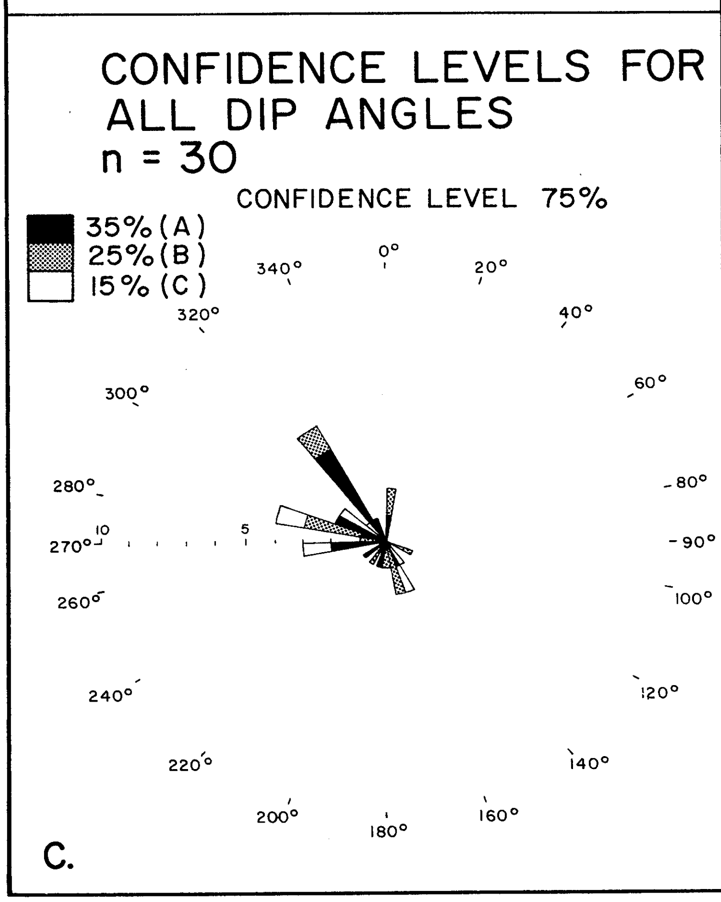
B.E.SEE AUG,1983

A-5756-15

FIGURE 5







PHILLIPS AUSTRALIAN OIL COMPANY

POLAR PLOT OF PALEOCURRENTS MEASURED FROM DIPMETER DATA

LATROBE GROUP MAASTRICHTIAN BACK BARRIER/LAGOONAL SANDS

HERMES-1

2890-2907m
2927-2940m

B.E.SEE AUG, 1983

A-5756-16

FIGURE 6

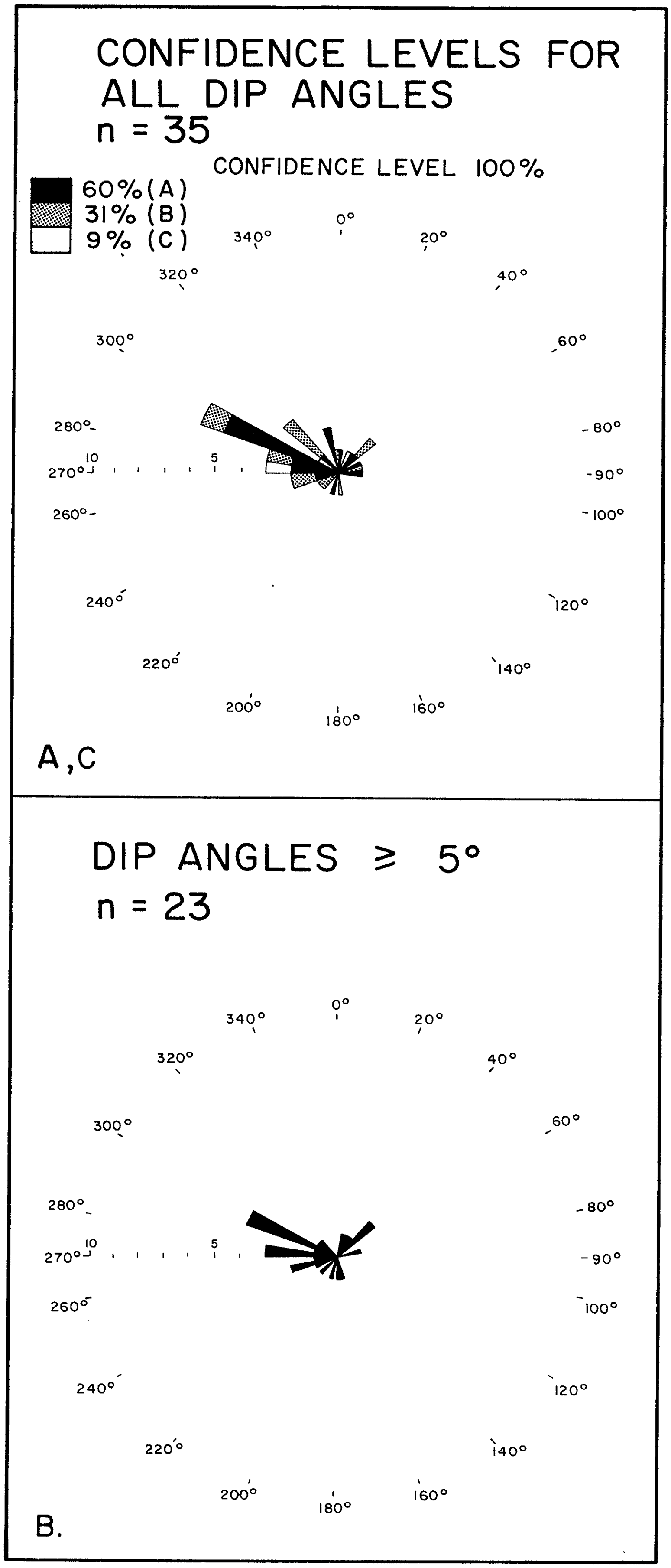
Between 2945 and 2981 metres Hermes No. 1 penetrated the lowermost major Maastrichtian sand. Figure 7A indicates a strong northwesterly direction when all dips are plotted. When dips equal to or greater than 5 degrees (Figure 7B) are plotted the dip remains northwesterly. The dipmeter confidence level plot (Figure 7C) indicates that 100% of the sedimentary dips are C quality or greater and supports northwesterly dip.

The sands between 2945 and 2981 metres were deposited as a beach barrier system. Hermes No. 1 penetrated the portion of the beach barrier proximal to the lagoonal/back barrier environment. The northwesterly dips described above are toward the back barrier lagoons. The beach barrier system had a northeast-to-southwest trend.

Below 2981 metres the sands were not studied in great detail using dipmeter techniques, however, a few general comments concerning the various sands are justified. Between 2981 and 3132 metres the sands were deposited in a back barrier/washover zone. The sedimentary dips are somewhat random but tend to be northwesterly. The northwesterly dips tend to confirm a washover zone, lagoonward of a northeast-southwest trending barrier coastline.

Between 3132 and 4375 metres the sands were deposited in a paludal swamp environment as thin point bars in meandering tidal-influenced creeks and small tidal rivers. A random series of dip directions are evident. The randomness of the sedimentary dip is attributed to deposition by a meandering fluvial system that was continually changing flow direction. Flow direction was in a generally southeast direction.

Below 4375 metres the sands represent alluvial fan with upper fluvial plain braided-stream deposits. Flow remained in a southeasterly direction.



PHILLIPS AUSTRALIAN OIL COMPANY

POLAR PLOT OF PALEOCURRENTS MEASURED FROM DIPMETER DATA, HERMES-1

LATROBE GROUP MAASTRICHTIAN BEACH BARRIER SANDS

2945-2981m

B.E.SEE AUG, 1983

A-5756-17

FIGURE 7

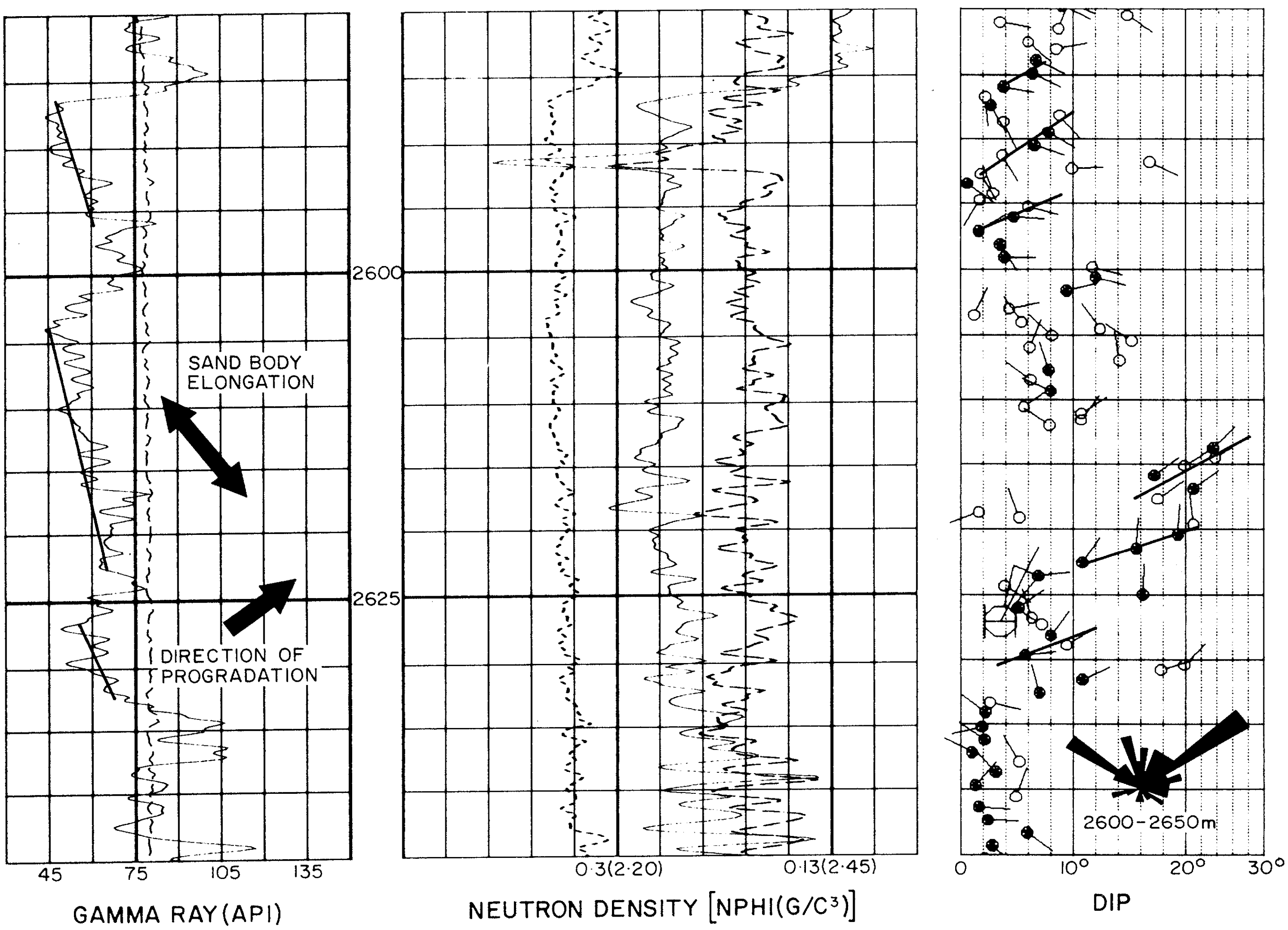
Correlation of Dipmeter with Wireline Log Responses

Figure 8 illustrates a prograding barrier island/beach strand line from the Paleocene Latrobe Group. The barrier island/beach strand line system shows a stacked series of serrated funnel shapes on the gamma-ray log, good porosity on the neutron-density combination and low to moderate dip magnitudes trending generally northeast. The serrated funnel shaped gamma-ray indicates a series of coarsening-upward sands which are probably glauconitic. The funnel shape also indicates a marine regressive sequence with a prograding beach. Dip angles decrease with depth and indicate shoreface deposition. The moderate spread of dip magnitudes indicates deposition in a moderately high energy environment. The barrier island/beach strand line system had a northwest-tosoutheast elongation and was prograding to the northeast.

Figure 9 shows small point bars deposited by meandering tidal creeks. The point bars display serrated bell-shaped gamma-ray traces indicative of a fining-upward sandstone, associated with a decrease in dip magnitude and depositional energy. High dip azimuth scatter implies continuous changes in current direction. The neutron-density combination indicates generally poor porosity. Current flow direction was generally to the northeast.

Figure 10 displays a Lower Paleocene prograding stacked beach-barrier system. The prograding beach system shows three stacked serrated funnel shapes on the gamma-ray log, fair-to-excellent porosity on the neutron-density combination and low-to-moderately high dip magnitudes with dip azimuths trending generally southwest. Dip angles both decrease and increase with depth indicating a stacked sequence of prograding beaches. The relatively large spread of dip magnitudes indicates deposition in a fairly high energy environment. The beach system had a northeast-to-southwest trend and was prograding to the southeast. The trend of this beach system denotes a marked change in shoreline orientation from the northwest-to-southeast trend of later Paleocene time.

DIPMETER, GAMMA RAY LOG SHAPE AND POROSITY RELATIONSHIPS. HERMES-1

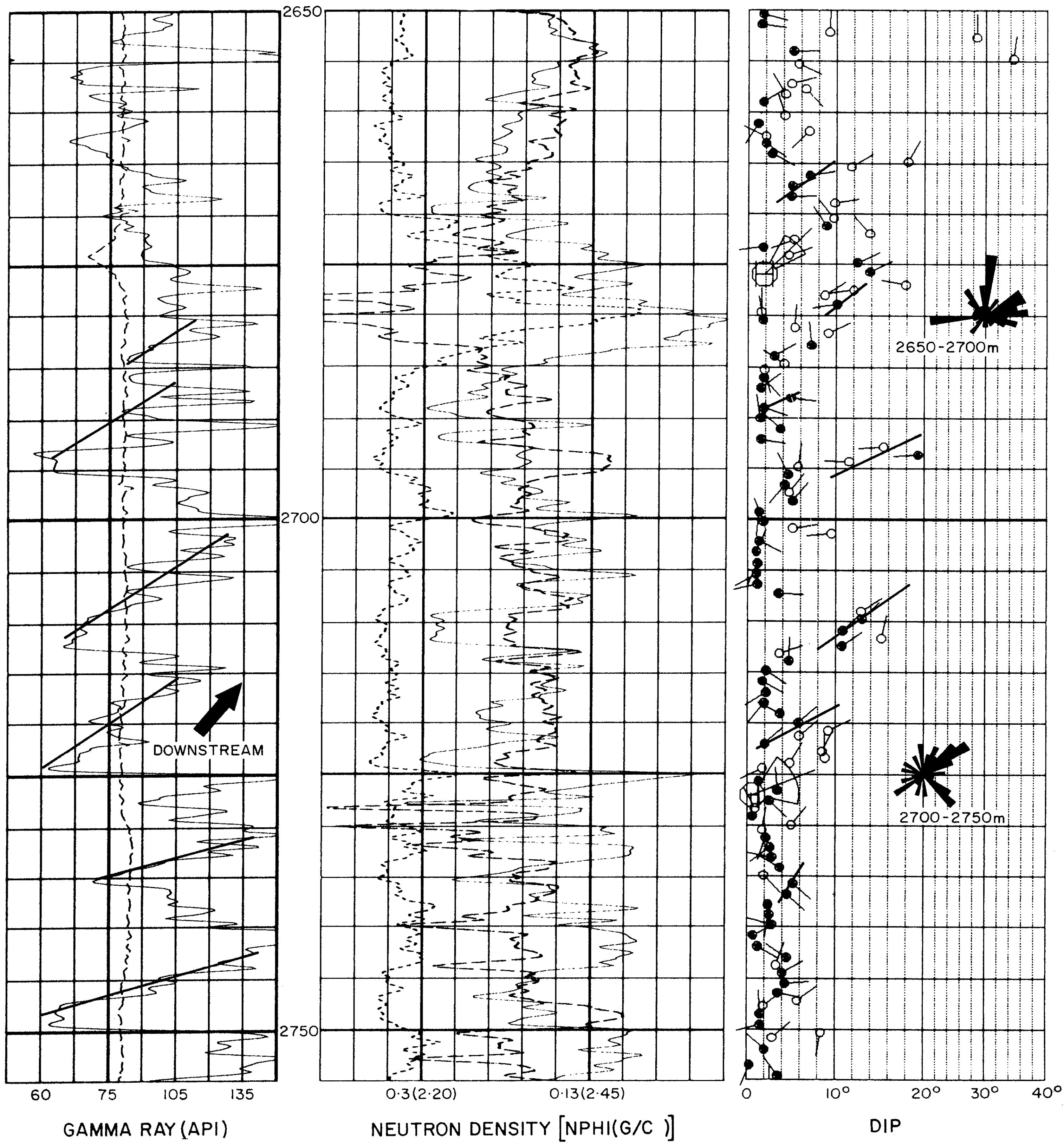


LATROBE GROUP PALEOCENE PROGRADING BARRIER ISLAND/BEACH STRAND LINE SYSTEM 2586-2645m

FIGURE 8

A-5967

DIPMETER, GAMMA RAY LOG SHAPE AND POROSITY RELATIONSHIPS. HERMES-1

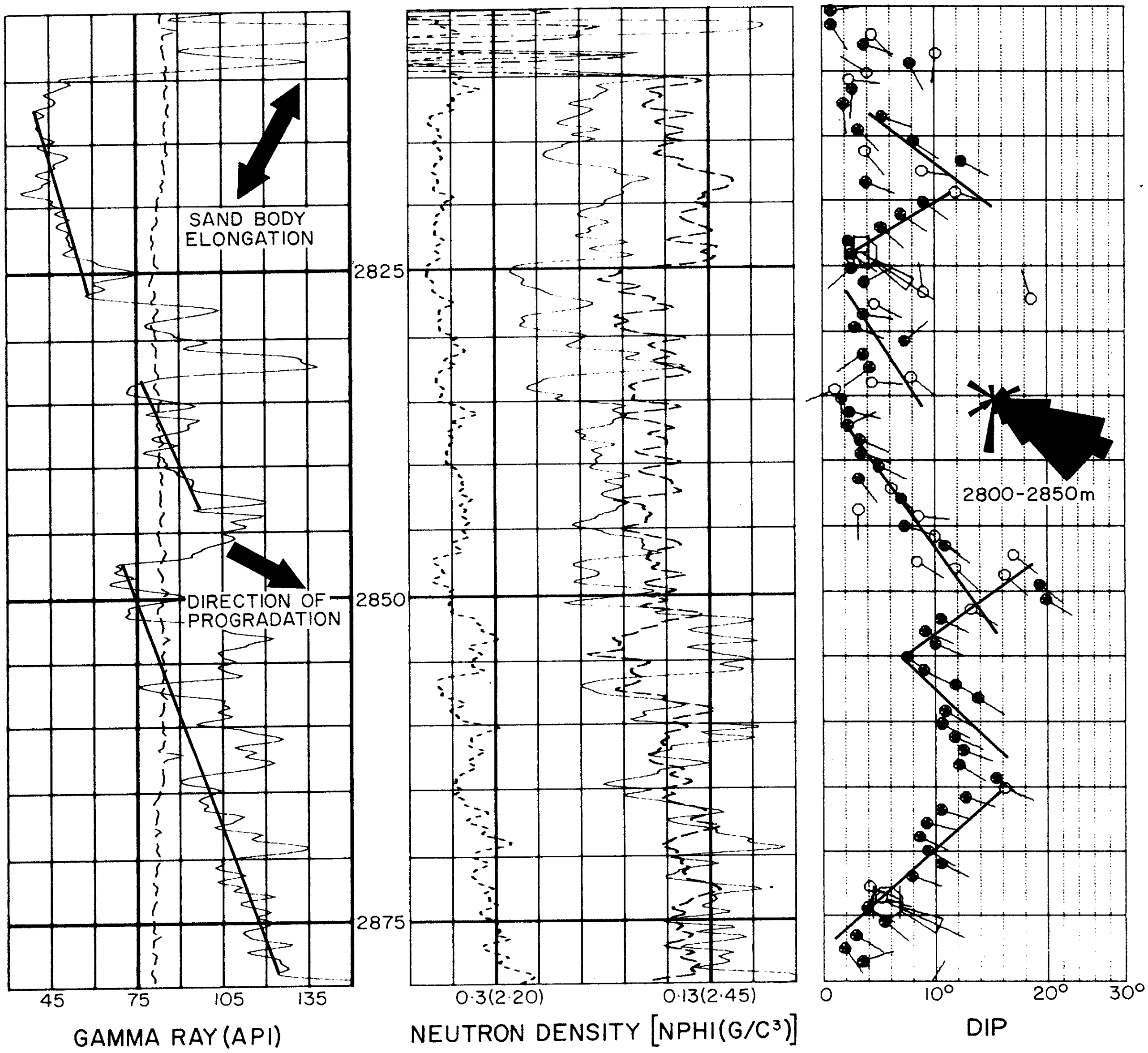


PALEOCENE POINT BAR SANDS 2655-2750m

FIGURE 9

A-5964

DIPMETER, GAMMA RAY LOG SHAPE AND POROSITY RELATIONSHIPS. HERMES-1



LATROBE GROUP LOWER PALEOCENE PROGRADING STACKED BEACH BARRIER SYSTEM 2810-2878m

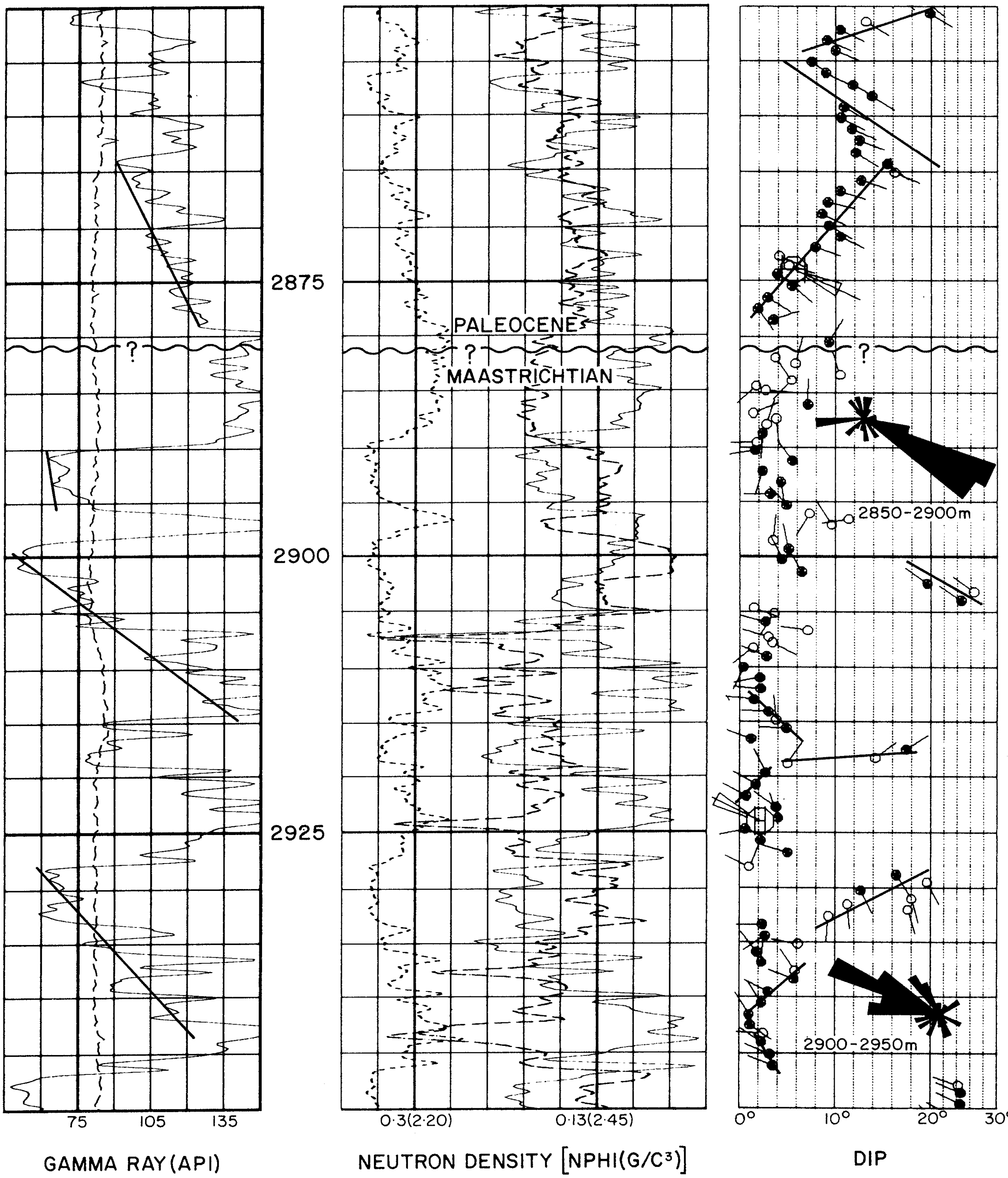
A-5965

FIGURE 10

Figure 11 illustrates the Paleocene/Maastrichtian boundary and Maastrichtian back barrier sands. A marked change in dip azimuth at 2881 metres coincides with the Paleocene/Maastrichtian boundary picked using palynological data and could represent an angular unconformity. The dip azimuth changes 180° from southeast to northwest and this also suggests that the dip change is related to the sedimentary environment. The back-barrier sands from 2890 to 2907 metres and 2927 to 2940 metres are an example of tidal currents entering the back-barrier lagoonal system and creating northwesterly dip. The sand deposits most likely represent small flood-tidal deltas. Ocean waves washing over low-lying barrier islands which had a northeast-to-southwest trend may also be responsible, in part, for the northwesterly dip.

The back-barrier sands show serrated funnel shapes on the gamma-ray log, fair-to-good porosity on the neutron-density combination and low-to-moderately high dip magnitudes with dip azimuths trending generally northeasterly. The high dip magnitudes indicate deposition in close proximity to tidal inlets while the lower dip magnitudes indicate deposition farther back in the lagoonal system with less tidal current influences.

DIPMETER, GAMMA RAY LOG SHAPE AND POROSITY RELATIONSHIPS. HERMES-1



LATROBE GROUP PALEOCENE/MAASTRICHTIAN BOUNDARY
AND MAASTRICHTIAN BACK-BARRIER SANDS
2890 to 2907m AND 2927 to 2940m

FIGURE 11

A-5963

Dip Summary and Environmental Interpretation

Dipmeter data, when used with wireline log, palynological and lithological information has proved useful in environmental interpretation in Hermes No. 1. The environmental history is as follows:

1) During intra-Campanian time the Hermes area had an alluvial environment dominated by alluvial-fan and braided-stream deposition. The river system flowed to the southeast.

2) Later in Campanian time, due to the beginnings of a marine transgression, the environment changed from an upper fluvial plain-to-a paludal swamp environment dominated by coal swamps which were dissected by tidal creeks and small tidal streams. These small streams emptied into lagoons located between the mainland and an extensive barrier island system. The barrier islands paralleled the coast in a northeast-southwesterly trend. Sediment supply was from the northwest. This environment continued into the Maastrichtian.

3) Later in Maastrichtian time the environment in the Hermes area changed from the paludal swamp/tidal stream environment, described above, to lagoonal/back barrier. The lagoonal environment was located between barrier islands and the mainland. These lagoonal sediments were overlain by sands of a back barrier/washover zone. The barrier coastline maintained a northeast-to-southwest trend.

4) In latest Maastrichtian time the Hermes No. 1 location received beach barrier sediments which were proximal to the lagoonal/back barrier environment. The beach barrier system was deposited during a marine transgression. The transgression did not cross the Hermes area during the Late Maastrichtian and the shoreline prograded to the southeast. Due to the southeastward progradation of the beach barrier system the last Maastrichtian sediments deposited at the Hermes No. 1 location were back-barrier sands.

5) Dip reversals at the Paleocene/Maastrichtian boundary may represent an angular unconformity. The dip reversals, however, could also be related to depositional environments associated with a prograding beach-barrier system.

6) In the earliest Paleocene sediments penetrated in Hermes No. 1 a prograding stacked beach-barrier system is evident. The dipmeter data of this beach system was of the highest quality obtained in Hermes No. 1 resulting in a very confident dipmeter interpretation. The beach system had a northeast-to-southwest trend and prograded to the southeast.

7) Above 2810 metres in Hermes No. 1 the beach barrier system depositional strike rotated counter clockwise and took on a northwest-to-southeast trend.

8) Sedimentary processes remained essentially the same above 2810 metres as below. Deposition occurred mainly as back barrier, washover, beach barrier and marine deposits.

APPENDIX NO. 8

PETROGRAPHIC REPORTS

The Australian
Mineral Development
Laboratories

:mington Street, Frewville,
South Australia 5063
P[illegible]one Adelaide 79 1662
Telex AA 82520

Please address all
correspondence to
P.O. Box 114 Eastwood
SA 5063
In reply quote:

amdel

28 April 1983

F3/0/0
5477/83

Phillips Australian Oil Company,
23rd Floor,
City Centre Tower,
44 St George's Terrace,
PERTH Aust. 6000

Attention: Mr Peter Barber

REPORT F5477/83 - Part 1

YOUR REFERENCE:	Requistion from Perth Branch and subsequent telephone calls
MATERIAL:	Sidewall Cores
LOCALITY:	HERMES No.1
DATE RECEIVED:	22 April 1983
WORK REQUIRED:	Petrography, bulk XRD and SEM

Investigation and Report by:	Dr Brian G. Steveson
XRD by:	Michael Till
SEM by:	Brian Watson

Chief - Fuel Section: Dr Brian G. Steveson
Manager, Mineral and Materials Sciences Division: Dr William G. Spencer

for Norton Jackson
Managing Director

Head Office:
Flemington Street, Frewville
South Australia 5063,
Telephone (08) 79 1662
Telex: Amdel AA82520
Pilot Plant:
Osman Place
Thebarton, S.A.
Telephone (08) 43 8053
Branch Laboratories:
Melbourne, Vic.
Telephone (03) 645 3093
Perth, W.A.
Telephone (09) 325 7311
Townsville
Queensland 4814
Telephone (077) 75 1377

1. INTRODUCTION

Initially, a group of six sidewall cores from Hermes No.1 was received from Phillips Australian Oil Company (via AMDEL's Perth Branch). The client requested petrography of five of the samples, X-ray diffraction (bulk only) on four, SEM on two. Porosity and permeability determinations could not be carried out. Because of the urgency of the work, only uncovered, unstained sections have been prepared.

Subsequently (22 April) a further batch of 19 sidewall cores was received and petrographic results were reported by telephone on 24 April. Bulk X-ray diffraction results are given here.

2. PETROGRAPHIC RESULTS

Thin sections of sidewall cores have limitations in mineral identification and petrographic analysis and the quality of the section varies directly with the quality of the sample received. In general interpretations of the gross features of the rocks are possible but details of, for example, mineral proportions and textures cannot be obtained. Rigid detrital grains are commonly fractured and channelways (and incipient channelways) are partially mud-invaded.

The rocks examined have been divided into four lithological types, as follows:

Lithology A

These rocks are not sandstones but coarse siltstones. Most are distinctly argillaceous and contain 20-50% of clay. Some of the clay is derived from argillaceous, labile, lithic clasts, now more or less distorted. Much of the clay in the clasts is a birefringent type - probably illite/muscovite/sericite. The remainder of the clay is more homogeneous since it is derived from primary muddy matrix. The mineralogy of this material is difficult to assess but both illite and kaolinite are likely to be present.

The argillaceous nature of these rocks suggests that only very limited porosity and permeability are present, and that is confined to interstices within clay aggregates.

Lithology B

A large proportion of each rock consists of detrital grains 0.6 to 2 mm in size. Quartz is the most abundant of the grain types, followed by polycrystalline quartz or quartzo-feldspathic grains, feldspar, mica and argillaceous clasts. Feldspar is generally somewhat altered and this alteration process may have given rise to a small proportion of kaolinite. Large argillaceous clasts are not common but where they occur they completely fill the intergranular space.

Elsewhere intergranular areas in the rock are filled with a fine-grained mosaic of quartz grains. These show evidence of pressure solution but there is commonly an intergranular film of (?)clay. It is not possible to give more details of the nature of this material. The fine sand/silt grains too, however, appear to be an integral part of the rock and not a result of the fracturing of larger grains.

The rocks are, therefore, bimodal (ranging to samples that are more akin to ill-sorted sandstones) in grain-size distribution. They are likely to be more porous and permeable than lithology A samples although the porosity is not likely (in the author's estimation) to exceed about 10-15%. Much of the porosity is likely to be in small interstices in clay and channelways between quartz, etc., grains.

As far as can be judged clay in these rocks comproses less than 20%; there are traces of feldspar and authigenic carbonate also.

Lithology C

This is a variation of lithology B; it is different in that the large detrital grains have undergone pressure solution and are therefore characterised by curved, concavo-convex grain margins. Optically continuous overgrowths cannot commonly be identified but quartz has clearly been removed from tangential contacts in the original sand. As a result the proportion of rigid, large detrital grains is larger than in lithology B rocks and clays and pores correspondingly reduced. Nevertheless, there is some of the fine sand/silt siliceous matrix as described in lithology B.

It is possible that these lithology C sandstones were cleaner (less clayey), permitted greater circulation of pore water and hence enhanced pressure solution.

Lithology D

Two sidewall core samples have significant authigenic carbonate; about 20% in SWC 9 and 15% in SWC 17. Considering the amount of non-quartz material in the rocks, it is clear that this carbonate is significant in reducing pore space. The carbonate is coarse, recrystallised and granular and hence is definitely authigenic. It may have been deposited from circulating pore waters or simply be locally recrystallised limestone detrital fragments - not moved far, nor introduced into the system. In view of the immaturity of the sediments, the presence of limestone clasts is certainly possible.

Apart from this carbonate, these rocks resemble lithology B.

In summary therefore:

Most Porous -	Lithology B -	ill-sorted sandstone with fine matrix
↓ -	Lithology C -	as B, but more quartz, pressure solution
-	Lithology D -	as B, with significant authigenic carbonate
Least Porous -	Lithology A -	argillaceous siltstone

The sidewall cores examined are as follows:

SWC	Depth (m)	Lithology
1	4558	B
3	4530	B
4	4518	B
6	4492	B
9	4447	D
11	4442	A
12	4441	B
13	4438	B
14	4336 (sic)	B
15	4433	C
16	4431	A
17	4429	D
19	4426	A
20	4423	A, B, Varies
21	4421	C
22	4419	B
23	4416	B-C
25	4410	B
28	4401	B
20	4399 (?)	B
30	4385	B
31	4397	A
32	4395	A

The lithology A samples show some correlation with tight zones identified at 4394-4400 m, 4414-4415 m, 4425-4426 m and 4442-4450 m and it seems likely that there are siltstone/fine sandstone zones within the coarse, ill-sorted or bimodal sandstones of groups B, C and D.

The sandstone sequence, as far as can be guessed from the petrography of isolated, shattered samples, is most likely to represent some fluvial non-marine environment. The presence of clasts larger than 1 mm is more indicative of periodically fast-flowing rivers than, say, more quiescent swamp or delta environments. Bimodal sandstones can represent braided (sediment laden) river systems.

3. CLAY MINERALOGY

Some 60 to 80% of each sandstone consists of quartz, feldspar and carbonate, consequently an examination of the bulk of the material by x-ray diffraction results in only small clay diffraction peaks. Furthermore, the clay flake orientation range is unknown and there generally is not sufficient material to obtain oriented samples of clay-rich portions nor to subject these to diagnostic identification tests. Because of uncertainties regarding the orientation and degree of crystallinity of the clays and their response to crushing, it is not possible to give clay mineral proportions. Qualitative appraisals of relative amounts are made. Since the bulk of the material is quartz, etc., these appraisals are invariably not very discriminating - between, say, 'accessory' and 'trace' where the former might imply, say more than 5% and the latter less than 5%.

The results obtained by bulk x-ray diffraction analysis of the sidewall cores are shown in Table 1.

The results given above apply to the 25 sidewall cores examined, which cover about 200 m of stratigraphic section. Note, also, that best sidewall core recovery is likely to be from the strongest, most compact - and probably least porous - parts of the section and hence the cores are unlikely to be a truly random sampling of the lithologies.

TABLE 1: BULK MINERALOGY OF NINETEEN SIDEWALL CORES
(Minerals given in decreasing order of abundance)

Sample	1		3		4		9		11		12		13		14		15	
Mineralogy	Q	D	Q	D	Q	D	Q	D	Q	D	Q	D	Q	D	Q	D	Q	CD
	K	A	M	A	F^1	A	K	A	K	A-SD	M	SD	Ba	A	M	A	Ba	CD
	M	A	K	A	M	A	Dol	A	C	A-SD	K	A	Sid	A	K	Tr-A	M	A
	F^1	A	F^1	A	K	A	M	A	M	A	F^1	A	K	A	Ba	Tr-A	K	A
	Sid	A	Dol	Tr	Dol	Tr	F^1	A	Py	A	C	Tr-A	M	A	F^1	Tr	C	Tr-A
	Dol	A	F	Tr	F	Tr	F	Tr-A	F	A	?Dol	Tr	C	Tr-A	F	Tr		
	C	Tr			?Ha	Tr	C	Tr-A	F^1	Tr	?Py	Tr	F^1	Tr	?Dol	Tr		
	F	Tr					?Ha	Tr			?Ha	Tr	F	Tr	Ha	Tr		
	Ba	Tr											Py	Tr				
	?Ana	Tr																

Sample	16		17		19		20		21		22		23	
Mineralogy	Q	D	Q	D	Q	D	Q	D	Q	D	Q	D	Q	D
	M	SD	Dol	A	M	SD	M	A	K	A	M	A	ML	A
	K	SD	M	A	C	A	C	A	M	A	K	A	M	A
	C	A	F	A	K	A	K	A	F^1	A	F^1	A	K	A
	F	Tr-A	F^1	A	F^1	Tr-A	F^1	A	F	Tr-A	C	Tr-A	Ba	A
	F^1	Tr-A	K	Tr-A	F	Tr-A	Py	Tr-A	?Dol	Tr	F	Tr-A	C	Tr-A
			C	Tr-A	Py	Tr	Ba	Tr-A	?Ha	Tr	?Ha	Tr	F^1	Tr-A
							F	Tr					F	Tr-A
							?Ha	Tr					Py	Tr
													?Ha	Tr

Sample	25		28		29		30		31		32	
Mineralogy	Q	D	Q	D	Q	D	Q	D	Q	D	Q	D
	ML	A	Ba	SD	ML	A	M	A	M	A	K	A
	M	A	K	A	M	A	K	A	K	A	C	A
	K	A	M	A	F^1	A	F^1	A	C	A	M	A
	F^1	A	F^1	A	C	Tr-A	C	Tr-A	Sid	Tr-A	Sid	Tr-A
	C	Tr-A	F	Tr	K	Tr-A	Dol	Tr	F	Tr-A	F	Tr-A
	F	Tr	Dol	Tr	F	Tr	Ha	Tr	F^1	Tr-A	F^1	Tr-A
	?Ha	Tr			Dol	Tr						

KEY TO TABLE 1

Mineral Key

Ba	Barytes
C	Chlorite
Dol	Dolomite
F	Plagioclase
F^1	K-feldspar
Ha	Halite
K	Kaolinite
M	Mica/illite
ML	Mixed layer clay of indeterminate type, but probably containing a major proportion of illite
Py	Pyrite
Q	Quartz
Sid	Siderite

Semi-Quantitative Abbreviations

D	Dominant. Used for the component apparently most abundant, regardless of its probably percentage level
CD	Co-dominant. Used for two (or more) predominating components, both or all of which are judged to be present in roughly equal amounts
SD	Sub-dominant. The next most abundant component(s) providing its percentage level is judged above about 20
A	Accessory. Components judged to be present between the levels of roughly 5 and 20%
Tr	Trace. Components judged to be below about 5%

HERMES NO.1

PHOTOGRAPHY AND SEM

Phillips Australian Oil Company

F3/0/0-5477/83 May, 1983

The Australian
Mineral Development
Laboratories

...ington Street, Frewville,
South Australia 5063
Phone Adelaide 79 1662
Telex AA 82520

Please address all
correspondence to
P.O. Box 114 Eastwood
SA 5063
In reply quote:

amdel

19 May 1983

F3/0/0
5477/83 - Part 2 (Final)

Phillips Australian Oil Company,
23rd Floor,
City Centre Tower,
44 St George's Terrace,
PERTH WA 6000

Attention: Peter Barber

REPORT F5477/83 - Part 2 (Final)

YOUR REFERENCE:	Telephone calls
MATERIAL:	Sidewall cores
IDENTIFICATION:	HERMES No.1
WORK REQUIRED:	Photography and SEM

Investigation and Report by: Brian G. Steveson and Brian Watson

Chief - Fuel Section: Dr Brian G. Steveson
Manager, Mineral and Materials Sciences Division: Dr William G. Spencer

for Norton Jackson
Managing Director

cah

Pilot Plant: Osman Place
Thebarton S.A.,
Telephone 43 6053
Branch Laboratories:
Perth W.A.
Telephone 325 7311
Melbourne Vic.
Telephone 645 3093

This final part report gives photomicrographs of four thin sections illustrative of the four lithologies (A-D) described in part report No.1.

S.E.M. photographs are also included. Identifications of the phases in the SEM fields is based on EDAX analysis only.

TABLE 1: SUMMARY OF SEM RESULTS BASED ON ENERGY DISPERSIVE X-RAY ANALYSIS

SWC	Depth (m)	Minerals Lining Pore Spaces
3	4530	Illite +*Kaolinite
12	4441	Kaolinite + Illite
15	4433	Illite +*fine-grained Quartz
16	4431	Illite + mica
21	4421	Illite + *fine-grained Quartz
23	4416	Illite + *Kaolinite
28	4401	Illite
30	4385	Illite + Kaolinite

* minor quantities

Sidewall Cores 16, 21 and 28 have very little visible porosity.

APPENDIX 1

PHOTOMICROGRAPHS OF THIN SECTIONS

PE904956

This is an enclosure indicator page.
The enclosure PE904956 is enclosed within the container PE902581 at this location in this document.

The enclosure PE904956 has the following characteristics:

ITEM_BARCODE =	PE904956
CONTAINER_BARCODE =	PE902581
NAME =	Photomicrographs
BASIN =	GIPPSLAND
ON_OFF =	OFFSHORE
PERMIT =	VIC/P18
TYPE =	WELL
SUBTYPE =	PHOTOMICROGRAPH
DESCRIPTION =	Hermes 1 Photomicrograph of Thin Sections (crossed polars). From appendix 8 of WCR volume 1.
REMARKS =	Coloured photos.
DATE_CREATED =	
DATE_RECEIVED =	23/09/83
W_NO =	W803
WELL_NAME =	Hermes 1
CONTRACTOR =	
CLIENT_OP_CO =	Phillips Australia Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)

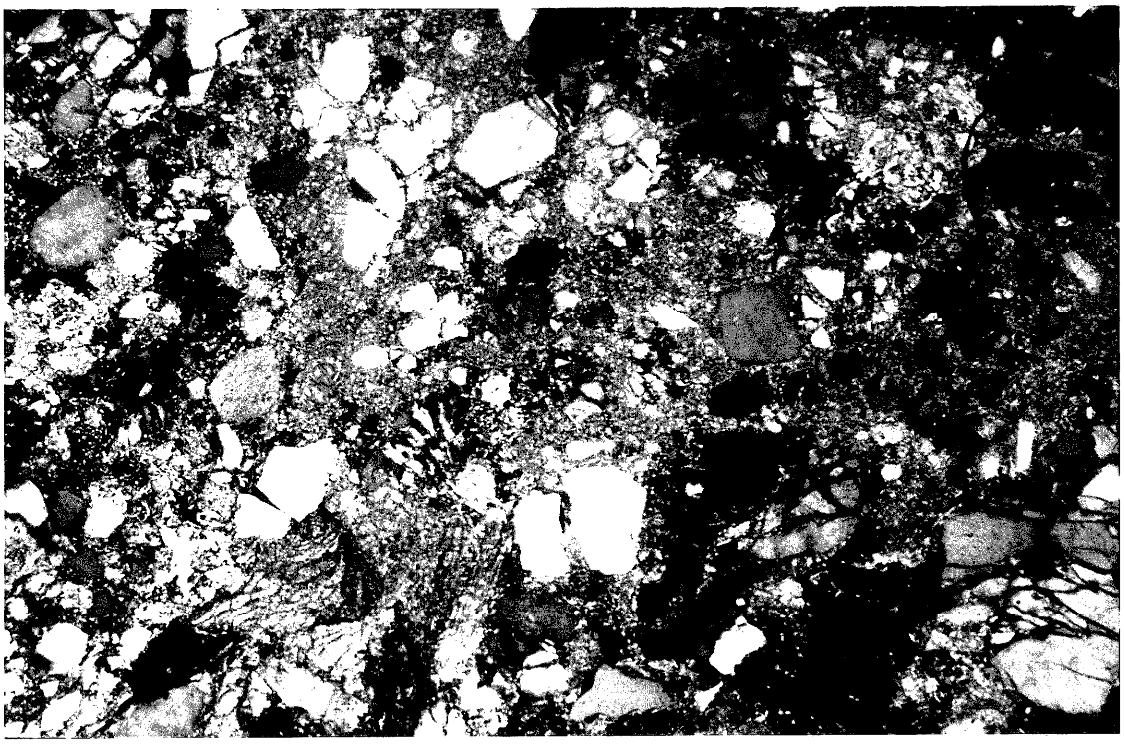


PLATE 1A: SWC 9. Crossed nicols. Long axis: 2.2 mm.

Carbonate is the pale brown speckled material and much of the grey-white-black is quartz. Most of the space around the quartz grains is filled by the authigenic carbonate.

PLATE 1B: SWC 12. Crossed nicols. Long axis: 2.2 mm

Relatively large quartz grains occur, particularly around the edge of the field of view. In the central portion is distinctly finer-grained quartz. There are very small patches and thin films of clay but such material is, volumetrically, a trace component only.

PE904957

This is an enclosure indicator page.
The enclosure PE904957 is enclosed within the container PE902581 at this location in this document.

The enclosure PE904957 has the following characteristics:

ITEM_BARCODE =	PE904957
CONTAINER_BARCODE =	PE902581
NAME =	Photomicrograph
BASIN =	GIPPSLAND
ON_OFF =	OFFSHORE
PERMIT =	VIC/P18
TYPE =	WELL
SUBTYPE =	PHOTOMICROGRAPH
DESCRIPTION =	Hermes 1 Photomicrograph of Thin Section (crossed polars). From appendix 8 of WCR volume 1.
REMARKS =	Coloured photo.
DATE_CREATED =	
DATE_RECEIVED =	23/09/83
W_NO =	W803
WELL_NAME =	Hermes 1
CONTRACTOR =	
CLIENT_OP_CO =	Phillips Australia Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)

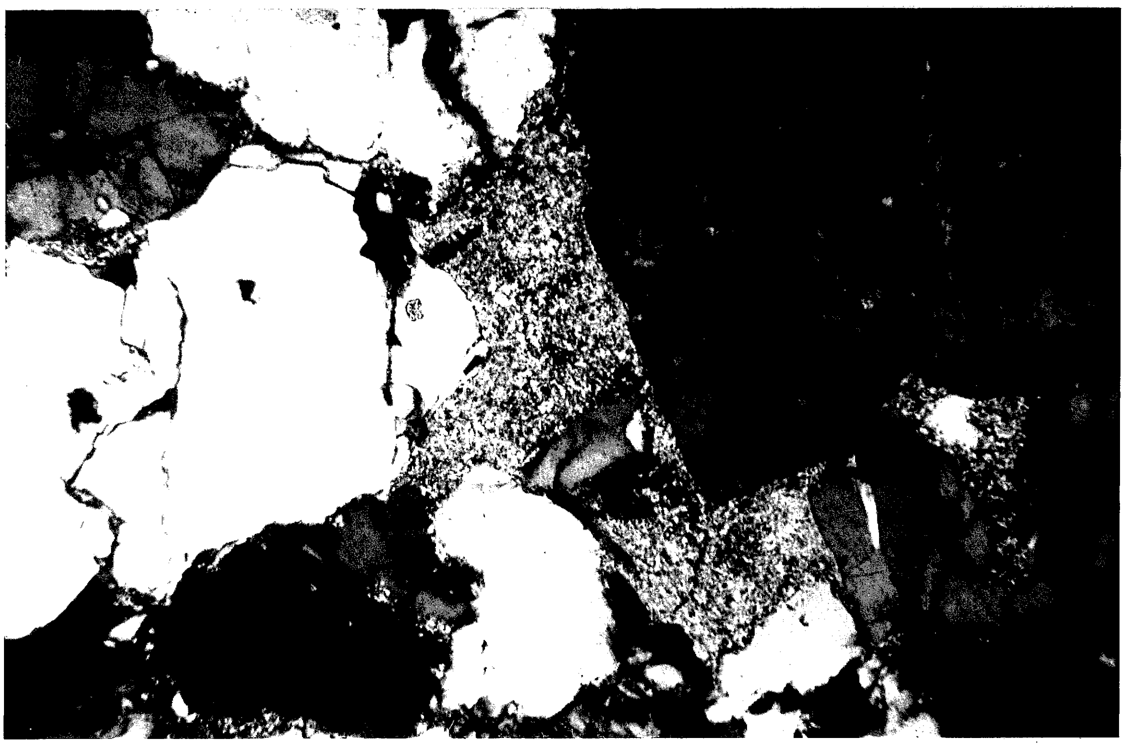


PLATE 2: SWC 21. Crossed nicols. Long axis: 2.2 mm

An atypical field but showing characteristic development of clayey lithic clasts in these group B and C lithologies. The central patch is a soft clay clast which has been deformed and squeezed between adjacent quartz grains. Thus the porosity has been reduced.

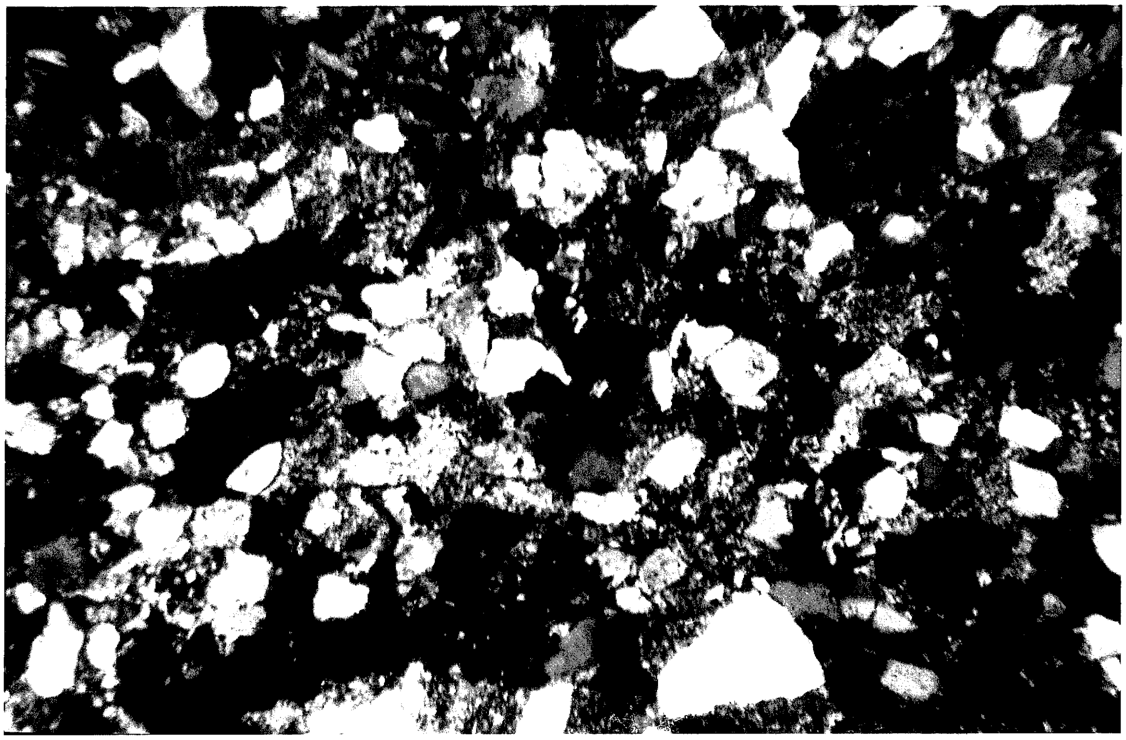
PE904958

This is an enclosure indicator page.
The enclosure PE904958 is enclosed within the container PE902581 at this location in this document.

The enclosure PE904958 has the following characteristics:

ITEM_BARCODE =	PE904958
CONTAINER_BARCODE =	PE902581
NAME =	Photomicrographs
BASIN =	GIPPSLAND
ON_OFF =	OFFSHORE
PERMIT =	VIC/P18
TYPE =	WELL
SUBTYPE =	PHOTOMICROGRAPH
DESCRIPTION =	Hermes 1 Photomicrograph of Thin Sections (crossed polars). From appendix 8 of WCR volume 1.
REMARKS =	Coloured photos.
DATE_CREATED =	
DATE_RECEIVED =	23/09/83
W_NO =	W803
WELL_NAME =	Hermes 1
CONTRACTOR =	
CLIENT_OP_CO =	Phillips Australia Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)



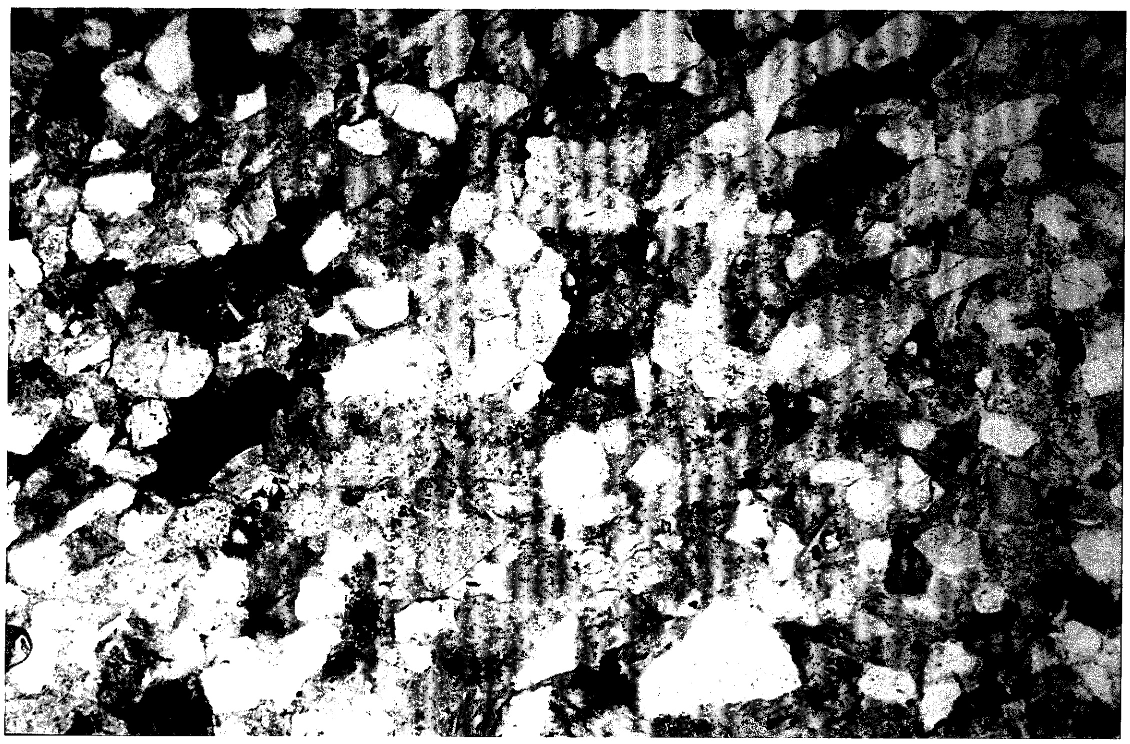


PLATE 3: SWC 31. Crossed nicols (upper), plane polarised light (lower). Long axis: 2.2 mm

Coarse siltstone with abundant clay. Quartz comprises only about 50% of the field-of-view. Compaction has resulted in deformation of original clay clasts and occlusion of much of the original porosity.

APPENDIX 2

S.E.M. PHOTOGRAPHS

PE904959

This is an enclosure indicator page.
The enclosure PE904959 is enclosed within the container PE902581 at this location in this document.

The enclosure PE904959 has the following characteristics:

ITEM_BARCODE = PE904959
CONTAINER_BARCODE = PE902581
NAME = S.E.M. Photograph
BASIN = GIPPSLAND
ON_OFF = OFFSHORE
PERMIT = VIC/P18
TYPE = WELL
SUBTYPE = PHOTOMICROGRAPH
DESCRIPTION = Hermes 1 S.E.M. Photograph of large pore space between a quartz grain, with authigenic quartz overgrowths, and clay minerals. Plate 1, SWC 3, 4530 m. From appendix 8 of WCR volume 1.
REMARKS =
DATE_CREATED =
DATE_RECEIVED = 23/09/83
W_NO = W803
WELL_NAME = Hermes 1
CONTRACTOR =
CLIENT_OP_CO = Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)

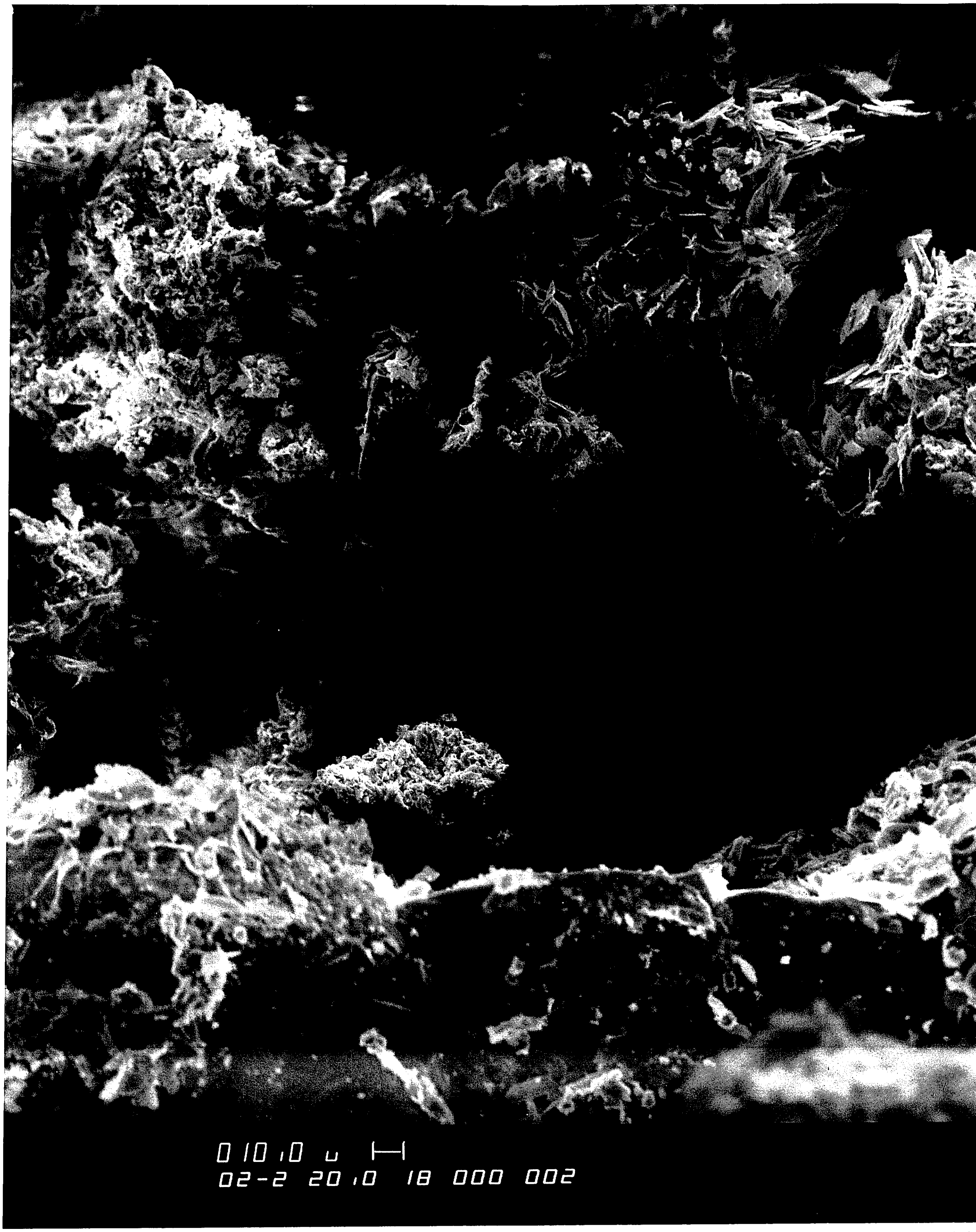


PLATE 1: SWC 3: 4530 m

This large pore space occurs between a quartz grain, with authigenic quartz over-growths, (lower field) and clay minerals. The pore space is lined with illite and minor kaolinite.

PE904960

This is an enclosure indicator page.
The enclosure PE904960 is enclosed within the container PE902581 at this location in this document.

The enclosure PE904960 has the following characteristics:

ITEM_BARCODE =	PE904960
CONTAINER_BARCODE =	PE902581
NAME =	S.E.M. Photograph
BASIN =	GIPPSLAND
ON_OFF =	OFFSHORE
PERMIT =	VIC/P18
TYPE =	WELL
SUBTYPE =	PHOTOMICROGRAPH
DESCRIPTION =	Hermes 1 S.E.M. Photograph of a pore space adjacent to an overgrown quartz grain lined chiefly with illite and with minor quantities of kaolinite. Plate 2, SWC 23, 4416 m. From appendix 8 of WCR volume 1.
REMARKS =	
DATE_CREATED =	
DATE_RECEIVED =	23/09/83
W_NO =	W803
WELL_NAME =	Hermes 1
CONTRACTOR =	
CLIENT_OP_CO =	Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)

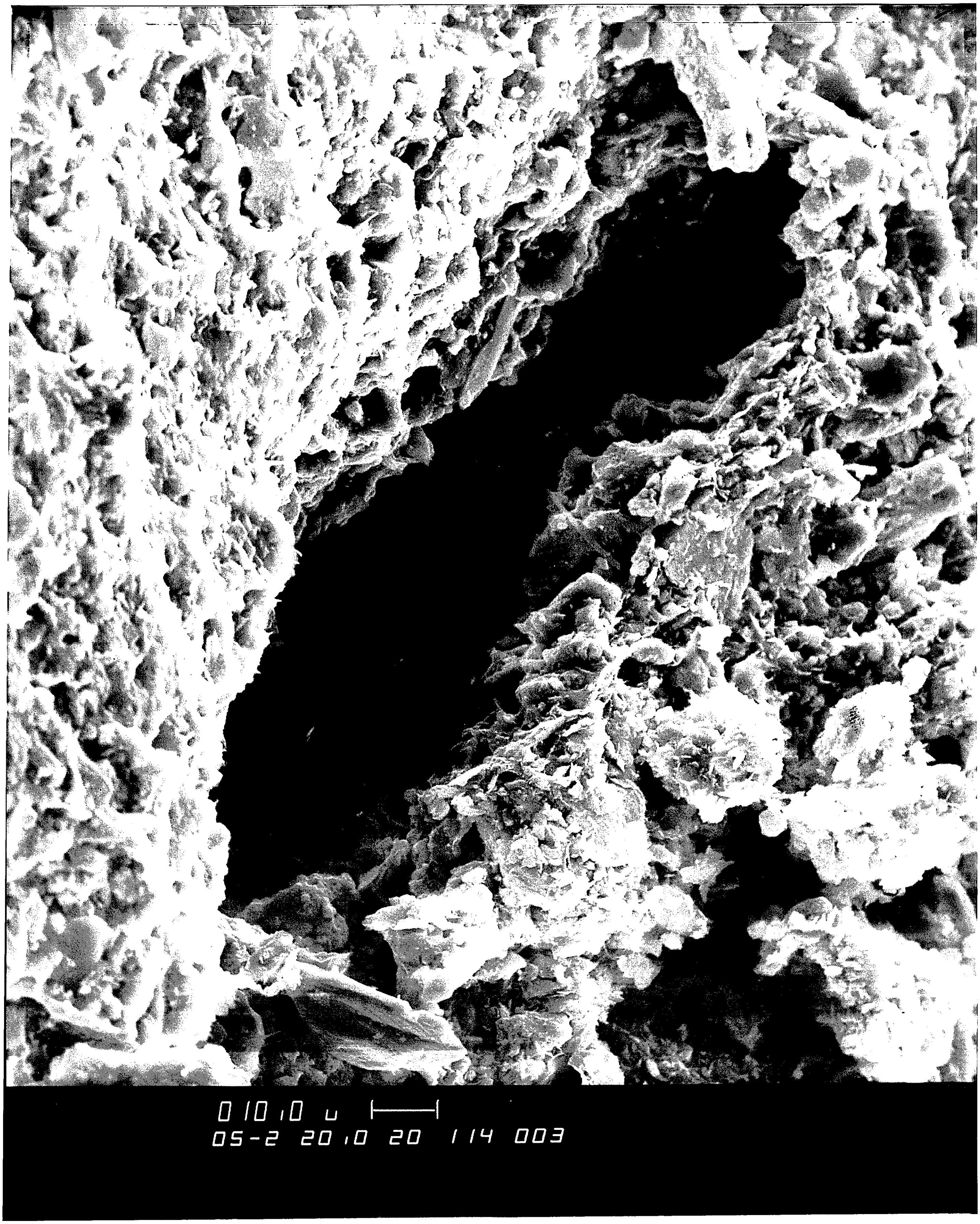


PLATE 2: SWC 23: 4416 m

This pore is adjacent to an overgrown quartz grain and is lined chiefly with illite and with minor quantities of kaolinite.

PE904961

This is an enclosure indicator page.
The enclosure PE904961 is enclosed within the container PE902581 at this location in this document.

The enclosure PE904961 has the following characteristics:

ITEM_BARCODE =	PE904961
CONTAINER_BARCODE =	PE902581
NAME =	S.E.M. Photograph
BASIN =	GIPPSLAND
ON_OFF =	OFFSHORE
PERMIT =	VIC/P18
TYPE =	WELL
SUBTYPE =	PHOTOMICROGRAPH
DESCRIPTION =	Hermes 1 S.E.M. Photograph of a fracture in a sandstone. Plate 3, SWC 28, 4401 m. From appendix 8 of WCR volume 1.
REMARKS =	
DATE_CREATED =	
DATE_RECEIVED =	23/09/83
W_NO =	W803
WELL_NAME =	Hermes 1
CONTRACTOR =	
CLIENT_OP_CO =	Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)

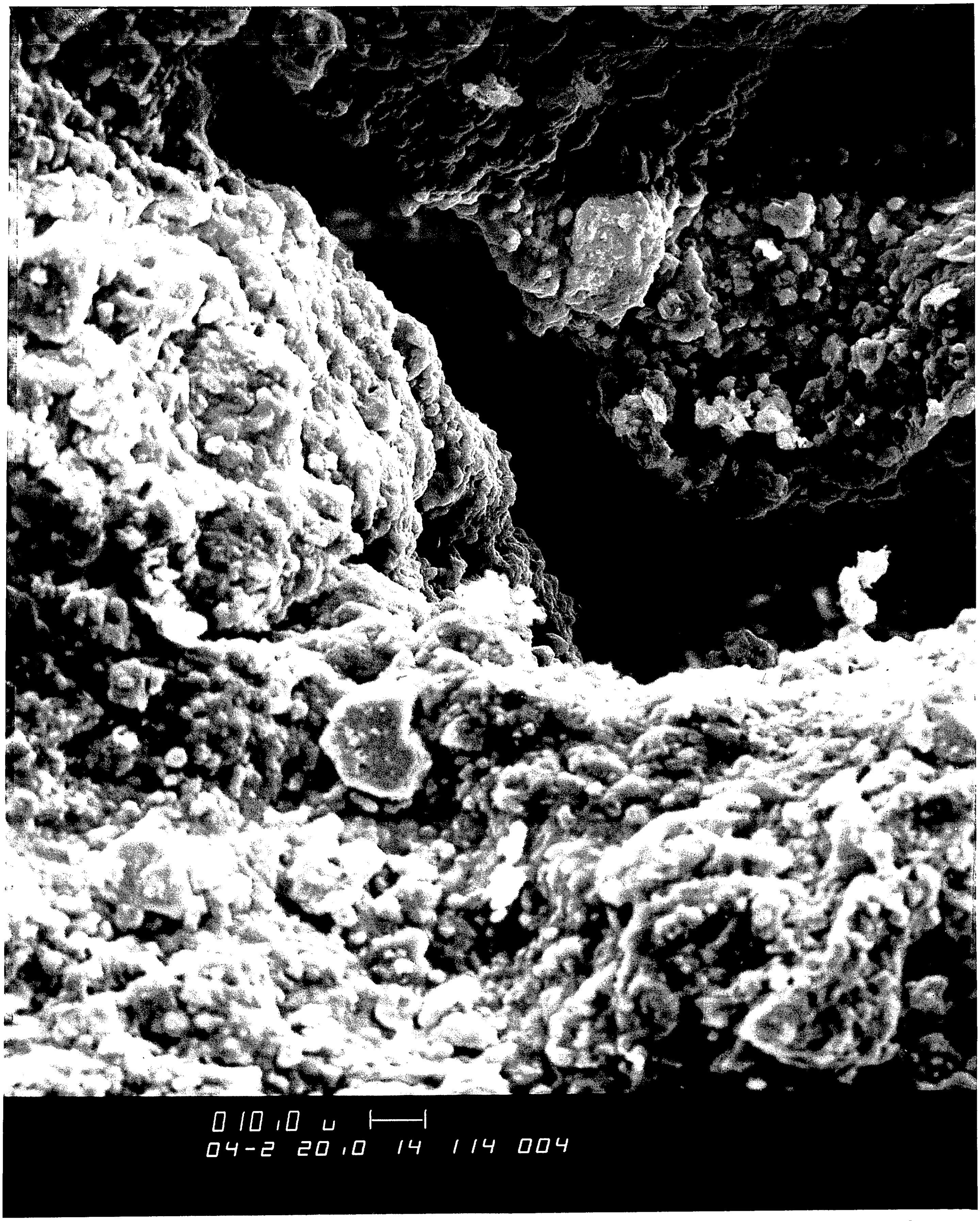


PLATE 3: SWC 28: 4401 m

This cavity is a fracture in the sandstone; the fine-grained lining material is chiefly illite.

APPENDIX NO. 9

LOG ANALYSIS

LOG ANALYSIS

All wireline logs run in Hermes No. 1 are listed in Table 1. A Phillips Computer Well Log Plot (CPI), a composite of log analysis over the interval 2250 metres to 4538 metres is provided in Enclosure 5. Variable Rw values were used in calculating water saturations to reflect increasingly fresher formation waters with depth. A cementation exponent (m) of 1.9 was used with the saturation exponent (n) = 1.

Several data sources were used for interpreting the lithology on the Composite Log including the mud log, geologist's lithologic log, daily drilling reports, and sidewall core descriptions. On the other hand, only wireline log responses were used to interpret lithology of the computer well log plot. For this reason, the lithology portrayed on the Phillips Computer Well Log Plot may not everywhere mirror the interpretated lithology on the Composite Log (Enclosure 7).

Log analysis reveals the massive Paleocene beach/barrier sands of the Latrobe Clastics are 100% water saturated with excellent porosities. The numerous thin sands within the coal measures exhibit a wide range of water saturations, some with indicated moveable hydrocarbons. Two of these were tested by Formation Interval Tests 1 and 2 and were found to contain gas and water, with minor condensate-like oil emulsion in the sand tested by F.I.T.-1 at 4231.5 metres.

Log analysis within the deep sands below 4375 metres was hampered by several factors. Extreme rugosity of the hole rendered the density-neutron logs useless for calculating porosity. Sonic porosities were calculated but were later found to be erroneously high due to the effects of clay matrix material. The Rw originally used for calculating water saturations in the deep sands was too low, leading to erroneously low water saturations. Only after drillstem test-1 was completed and the Rw of recovered formation water was measured could more realistic water saturations be computed.

SUMMARY OF WIRELINE LOGGING

SUITE	RUN	LOG	INTERVAL (M)
1	1	DIL-SLS-GR-CAL	351 - 1109
2	1	DIL-SLS-GR-CAL	1104 - 2575
2	2	LDL-CNL-GR	2250 - 2576
2	3	HDT-BGL	2250 - 2576 (HDT)
			1104 - 2576 (BGL)
2	4	CST	1104 - 2575
3	1	DIL-SLS-GR	2559 - 3722
3	2	LDL-CNL-GR	2559 - 3722
4	1	DIL-BHC-GR	3711 - 4460
4	2	LDL-CNL-GR	3716 - 4460
4	3	DLT-MSFL-GR	3550 - 4455
4	4	HDT-BGL	2559 - 4459
4	5	CST	2559 - 4460
4	6	CST	2559 - 4460
4	7	VSP	102 SHOTS
5	1	DIL-BHC-GR	4275 - 4557
5	2	HDT-BGL	2559 - 4559
5	3	CST	2559 - 4559
6	1	CBL-VDL-GR-CCL	2520 - 4493

TABLE 1

APPENDIX NO. 10

PETROLEUM GEOCHEMISTRY EVALUATION

PETROLEUM GEOCHEMISTRY

HYDROCARBON SOURCE ROCK

EVALUATION STUDY

PHILLIPS

HERMES No. 1

Prepared for

PHILLIPS AUSTRALIAN OIL COMPANY

May, 1983.

ANALABS
A Division of Macdonald Hamilton & Co. Pty. Ltd.
52 MURRAY ROAD, WELSHPOOL, W.A. 6106.
Telephone (09) 458 7999 Telex: ANALAB AA92560

HYDROCARBON SOURCE ROCK

EVALUATION STUDY

PHILLIPS

HERMES No. 1

SUMMARY

Organic geochemical analyses carried out on two hundred and eleven (211) well cuttings samples from the Phillips Hermes No. 1 well drilled in the Gippsland Basin, offshore Australia have indicated the following:-

- Based on the results of pyrolysis (Tmax, P.I.) and C_1 - C_7 light hydrocarbon (iC_4/nC_4) analyses, the rocks from 2400m to 3800m are thermally immature and considered to be pre oil generative. From 3800m to 4020m the sediments are marginally mature and interpreted to be within the top of the "oil window". Below 4020m, and continuing to total depth, the sediments are thermally mature and well within the oil generating zone.

- The rocks form 2400m to 2700m have a immature, apparent poor hydrocarbon source character.

- The rocks from 2700m to 3390m contain moderate amounts of C_1 - C_7 light hydrocarbon, which have mature characteristics (low iC_4/nC_4 ratios). As a result this interval may contain minor amounts of migrated, out-of-place hydrocarbon.

- Well interval 3390m to 3800m contains sediments that are thermally immature with potential to generate large amounts of petroleum at more mature levels of thermal maturation.

- The rocks from 3800m to 4565m are marginally mature to mature with very good to excellent oil and gas source generating capabilities.

This study focuses attention on any competent reservoir-traps in communication with the very good to excellent oil source rocks identified in well interval 3800m to 4565m.

Paul Tybor

PAUL TYBOR

INTRODUCTION

Organic geochemical analyses have been performed on two hundred and eleven (211) well cuttings samples from 2400metres to 4565 metres in the Phillips Hermes No. 1 well, drilled offshore Australia in the Gippsland Basin.

The purpose of this study has been to evaluate the hydrocarbon source rock characteristics of the sediments penetrated by this well.

Analytical

Upon arrival at Analabs all two hundred and eleven (211) samples were submitted to C_1 - C_7 head space gas chromatography. Samples from well intervals 2400m to 2460m and 4460m to 4565m were subjected to cuttings gas analysis as well as head space. Upon completion of these C_1 - C_7 analyses, samples from well interval 3400m to 4565m were washed, dried, sieved and ground before being submitted to total organic carbon determinations and two run (analysis performed on an acidified and unacidified sample) Rock Eval pyrolysis analysis.

These results are located in the following:-

Type of Analysis	Figure	Table
C_1 - C_7 head space gas chromatography	1	IA
C_1 - C_7 cuttings gas chromatography		IB
% total organic carbon determination	1,2	II
Pyrolysis analysis	2	II

A description of the various analyses performed in this study is presented in Appendix I, located at the back of this report.

General Information

Copies of this report have been sent to Mr. Bill Via of Phillips Australian Oil Co., located in Perth Western Australia.

Any questions related to this study should be directed to either Mr. Paul Tybor or Dr. Garry Woodhouse of Analabs, in Perth Western Australia.

All data and interpretations contained within this study are proprietary to the Phillips Australian Oil Co., and are treated as highly confidential material by all Analabs personnel.

RESULTS AND INTERPRETATIONS

A. Thermal Maturity of Sediments

Based on Tmax values (Figure 2; Table 2) the rocks from 3390m to 3800m are thermally immature and non prospective for any indigenously generated hydrocarbons. The rocks from 3800m to 4020m have Tmax values ranging between 435°C to 440°C, which are considered to be marginally mature. At this level of maturation, these sediments are considered to be within the very early stages of petroleum generation. Below 4020m the temperatures are generally all above 440°C and correspond to mature maturities. At these mature maturation levels, the rocks are interpreted to be actively generating hydrocarbon. This active petroleum generation is evidenced by the increase of the production index (PI) to above .10 for the rocks below 4020m (PI; Figure 2; Table 2) (A P.I.value of .1 or greater is believed to correspond to the initiation of petroleum generation).

The iC_4/nC_4 ratios, computed from the C_1 - C_7 head space gas chromatography analyses, yield maturity values which correlate very closely to the maturities determined by Tmax values. With the exception of the samples between 2530m to 3210m that have low iC_4/nC_4 ratios, the samples above 3800m generally have high iC_4/nC_4 ratios, and are thus considered to be immature. Immature sediments contain more isobutane (iC_4) than normal butane (nC_4), however with the advent of time and increasing temperature, the amount of normal butane increases causing the iC_4/nC_4 ratio to decrease. In this well, below 3800m the iC_4/nC_4 ratios decrease and indicate that the maturation processes are underway in these sediments (Figure 1; Table 1).

The rocks within well interval 2530m to 3210m gave low iC_4/nC_4 ratios, which are anomalous to the interpreted immature nature of the sediments within this interval. One explanation for this observation is that these low ratios maybe reflecting mature migrated, out-of-place hydrocarbon present in this thermally immature sedimentary sequence. The percent gas wetness of these sediments increases and further substantiate the mature interpretation of this hydrocarbon. Another possibility is that this interval may represent a separate organic facies of which one characteristic is low iC_4/nC_4 ratios. Kerogen and maceral description would establish this possibility.

B. Hydrocarbon Source Characterization

Well Interval 2400m to 2700m

The results of C_1 - C_7 light hydrocarbon analysis are the only data available for the sediments within this interval. The amounts of C_1 - C_7 light hydrocarbon is low and indicates that these rocks have poor hydrocarbon generating characteristics.

B. Hydrocarbon Source Characterization (Cont)....

Well Interval 2700m to 3390m

C_1-C_7 light hydrocarbon data are also the only data available for the sediments within this well interval. Moderate amounts of C_1 - C_7 light hydrocarbon were analyzed and suggests that these rocks have moderate source rock potential. However, as pointed out in Section A (Thermal Maturity of Sediments), the iC_4/nC_4 ratios appear to represent a mature hydrocarbon, which would be migrated out-of-place. Before a complete understanding of this hydrocarbon can be made, further analytical work is required to establish the thermal maturity of these sediments, via visual kerogen or vitrinite reflectance, and extraction, liquid chromatography and C_{12}+ saturate gas chromatography should be performed to accurately characterize the hydrocarbon in these rocks.

Well Interval 3390m to 4565m

C_1-C_7 light hydrocarbon, % total organic carbon and pyrolysis analyses were performed on the rocks in well interval 3390m to 4565m. These data indicate that the sediments contain very good to excellent amounts of organic matter (% TOC; Figure 1, 2; Table II), comprised predominantly of oil-prone organic matter (HI >200; Figure 2; Table 2). There are zones in this interval that are apparently sand, lean in organic richness. However, the bulk of the sediments are claystones and coal, which yielded excellent hydrocarbon generating potential (S_2; Figure 2; Table 2), and very high free hydrocarbon yields (S_1; Figure 2; Table 2), especially in the moderately mature to mature rocks below 3800m. As a result, the rocks in this interval from 3390m to 3800m have an immature, potential excellent oil and associated gas source character at a higher level of thermal maturity. Below 3800m, the sediments are interpreted to have a moderately mature to mature, excellent oil and associated gas source character. Significant oil and gas generation and expellsion should have occurred from these rocks below 3800m.

C_1 - C_7 light hydrocarbon head space gas data indicate that the rocks below 3390m have very good to excellent amounts of C_1 dry gas, but only moderate to occasionally good concentrations of wet gas (C_2-C_4; Figure 1; Table 1A), and very poor amounts of gasoline-range (C_5-C_7) hydrocarbon. The fact that there is so little wet gas and gasoline-range hydrocarbon associated with these sediments with excellent oil source characteristics is anomalous, because usually good oil source rocks also generate large quantities of wet gas and gasoline-range hydrocarbon. One possible explanation for this observation is that since these rocks apparently contain terrestrial organic matter, which is prone to initially generate heavy hydrocarbons, sufficient thermal maturation of the rocks has not been attained to generate the more volatile light hydrocarbons. This is substantiated by the fact that the crude oils produced in the Gippsland are deficient in volatile light hydrocarbons.

B. <u>Hydrocarbon Source Characterization</u> (Cont)....

Cuttings gas C_1 - C_7 light hydrocarbon gas chromatography was carried out on samples from the top and bottom of the well interval. This was done to check whether the wet gas and gasoline range hydrocarbons could be readily released and analyzed from the macerated samples. These results show that little wet gas and gasoline range hydrocarbons were recovered from this analysis, and that the headspace data is valid and can be used solely without the cuttings gas results.

PE603289

This is an enclosure indicator page.
The enclosure PE603289 is enclosed within the container PE902581 at this location in this document.

The enclosure PE603289 has the following characteristics:

ITEM_BARCODE =	PE603289
CONTAINER_BARCODE =	PE902581
NAME =	Hermes ANA-Log
BASIN =	GIPPSLAND
PERMIT =	VIC/P18
TYPE =	WELL
SUBTYPE =	WELL_LOG
DESCRIPTION =	Hermes 1 ANA-Log, Hydrocarbon Source Rock Evaluation. Figure 1 from appendix 10 of WCR volume 1.
REMARKS =	
DATE_CREATED =	31/05/83
DATE_RECEIVED =	23/09/83
W_NO =	W803
WELL_NAME =	Hermes-1
CONTRACTOR =	
CLIENT_OP_CO =	Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)

PE603290

This is an enclosure indicator page.
The enclosure PE603290 is enclosed within the container PE902581 at this location in this document.

The enclosure PE603290 has the following characteristics:

ITEM_BARCODE =	PE603290
CONTAINER_BARCODE =	PE902581
NAME =	Hermes ANA-Log
BASIN =	GIPPSLAND
PERMIT =	VIC/P18
TYPE =	WELL
SUBTYPE =	WELL_LOG
DESCRIPTION =	Hermes 1 ANA-Log, Hydrocarbon Source Rock Evaluation. Figure 2 from appendix 10 of WCR volume 1.
REMARKS =	
DATE_CREATED =	31/05/83
DATE_RECEIVED =	23/09/83
W_NO =	W803
WELL_NAME =	Hermes-1
CONTRACTOR =	
CLIENT_OP_CO =	Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)

TABLE 1A

HEADSPACE ANALYSIS DATA

WELLNAME = HERMES #1

DATE OF JOB = APRIL, 1983

DEPTH(m)	METHANE	ETHANE	PROPANE	ISOBUTANE	BUTANE	C1-C4	C2-C4	%WETNESS	C5-C7	i-C4/n-C4
2400.0- 2410.0	165.0	5.9	7.8	5.7	2.4	186.9	21.9	11.7	8.0	2.38
2410.0- 2420.0	293.6	11.4	10.3	4.7	2.2	322.2	28.6	8.9	7.7	2.17
2420.0- 2430.0	795.9	6.2	8.2	5.9	2.3	818.5	22.7	2.8	8.1	2.61
2430.0- 2440.0	138.1	4.1	6.9	6.0	2.4	157.5	19.5	12.3	7.5	2.54
2440.0- 2450.0	41.2	2.2	3.8	3.4	1.5	52.1	10.8	20.8	3.9	2.29
2450.0- 2460.0	18.6	0.8	1.2	1.0	0.4	21.9	3.4	15.3	0.7	2.42
2460.0- 2470.0	78.7	4.0	5.3	3.7	1.4	93.2	14.4	15.5	4.7	2.73
2470.0- 2480.0	91.3	4.1	4.5	2.9	1.0	103.9	12.6	12.1	3.3	2.78
2480.0- 2490.0	57.3	3.4	5.2	4.5	1.8	72.1	14.8	20.5	6.7	2.56
2490.0- 2500.0	314.5	2.9	8.2	8.9	3.3	337.8	23.4	6.9	9.5	2.66
2500.0- 2510.0	238.9	2.4	5.6	5.8	2.5	255.2	16.2	6.4	5.9	2.35
2510.0- 2520.0	19.4	2.4	5.7	5.3	2.3	35.1	15.7	44.8	7.1	2.37
2520.0- 2530.0	22.1	3.2	7.6	5.4	2.9	41.2	19.1	46.4	9.4	1.87
2530.0- 2540.0	33.9	14.3	28.2	11.7	14.0	102.2	68.3	66.8	18.0	0.84
2540.0- 2550.0	32.9	12.9	32.1	16.0	20.9	114.9	82.0	71.3	34.4	0.77
2550.0- 2560.0	33.2	6.1	16.6	9.6	11.5	77.0	43.9	56.9	20.8	0.84
2560.0- 2570.0	525.0	6.9	17.2	9.6	14.0	572.7	47.7	8.3	22.2	0.69
2570.0- 2580.0	27.5	5.8	17.4	22.3	29.7	102.7	75.2	73.3	36.7	0.75
2580.0- 2590.0	19.5	7.5	16.9	8.3	13.8	66.0	46.5	70.5	38.8	0.60
2590.0- 2600.0	3.3	0.3	0.4	0.3	0.1	4.4	1.1	25.4	<0.1	2.00
2600.0- 2610.0	12.4	82.5	0.2	<0.1	<0.1	95.2	82.7	86.9	<0.1	bdl
2610.0- 2620.0	4.1	4.4	0.5	0.2	<0.1	9.1	5.0	54.9	<0.1	bdl
2640.0- 2650.0	3.0	1.7	6.7	3.5	6.9	21.7	18.8	86.3	10.3	0.50
2660.0- 2670.0	7.2	3.1	8.0	4.3	8.3	31.0	23.7	76.6	15.9	0.51
2670.0- 2680.0	17.1	6.6	10.6	4.5	7.5	46.4	29.3	63.1	11.1	0.60
2680.0- 2690.0	15.4	5.3	6.7	2.0	3.5	32.9	17.5	53.1	7.3	0.58
2690.0- 2700.0	3.4	1.3	1.5	0.3	0.7	7.2	3.8	52.9	<0.1	0.40
2700.0- 2710.0	691.4	316.0	170.8	29.6	46.2	1254.0	562.6	44.9	42.8	0.64
2710.0- 2720.0	796.8	296.0	144.4	29.7	40.6	1307.5	510.7	39.1	46.0	0.73
2720.0- 2730.0	26.7	16.2	18.8	5.9	10.9	78.5	51.8	66.0	13.3	0.54
2730.0- 2740.0	2768.7	604.6	254.4	42.4	54.6	3724.6	955.9	25.7	43.6	0.78
2740.0- 2750.0	1353.5	620.9	350.5	66.5	87.0	2478.3	1124.9	45.4	64.9	0.76
2750.0- 2760.0	299.2	172.0	102.2	22.7	28.3	624.4	325.1	52.1	20.5	0.80
2760.0- 2770.0	213.3	93.8	46.8	9.7	11.9	375.4	162.1	43.2	10.9	0.82
2770.0- 2780.0	31.8	18.3	14.7	3.5	5.3	73.6	41.8	56.8	3.7	0.66
2780.0- 2790.0	69.2	36.8	23.1	5.9	7.0	141.9	72.7	51.2	6.2	0.85
2790.0- 2800.0	27.2	16.7	14.3	3.7	5.2	67.0	39.8	59.4	6.5	0.70
2800.0- 2810.0	108.0	44.9	23.5	21.9	11.7	209.9	102.0	48.6	5.7	1.87
2810.0- 2820.0	8752.0	859.6	261.8	37.6	36.8	9947.7	1195.7	12.0	40.5	1.02
2820.0- 2830.0	1128.8	202.1	72.9	10.0	10.7	1424.4	295.6	20.8	10.2	0.93
2830.0- 2840.0	251.2	57.8	25.5	3.6	4.8	342.8	91.7	26.7	3.9	0.74
2840.0- 2850.0	105.7	23.5	12.9	2.6	4.0	148.7	43.0	28.9	4.8	0.64
2850.0- 2860.0	74.1	56.7	40.7	5.9	11.1	188.5	114.4	60.7	10.7	0.54
2860.0- 2870.0	57.9	45.2	51.5	5.4	11.0	171.1	113.2	66.2	8.2	0.49
2880.0- 2890.0	75.0	116.5	183.8	38.1	42.1	455.5	380.5	83.5	16.0	0.90
2890.0- 2900.0	33.4	55.7	142.9	29.4	42.4	303.9	270.5	89.0	24.4	0.69
2920.0- 2930.0	9.5	4.0	5.0	1.5	1.5	21.6	12.1	55.8	<0.1	0.96
2940.0- 2950.0	274.1	125.4	153.1	37.7	55.5	645.8	371.8	57.6	35.5	0.68

N.B. 1. GAS CONCENTRATIONS EXPRESSED IN PPM (VOL. GAS/VOL. SEDIMENT)
2. bdl = BELOW DETECTION LIMIT

TABLE 1A(cont)

HEADSPACE ANALYSIS DATA

WELLNAME = HERMES #1 DATE OF JOB = APRIL, 1983

DEPTH(m)	METHANE	ETHANE	PROPANE	ISOBUTANE	BUTANE	C1-C4	C2-C4	%WETNESS	C5-C7	i-C4/n-C4
2950.0- 2960.0	15010.3	1681.0	538.4	63.6	93.7	17387.0	2376.7	13.7	45.1	0.68
2960.0- 2970.0	5984.4	511.3	160.8	22.2	30.6	6709.3	725.0	10.8	16.1	0.72
2970.0- 2980.0	1027.7	158.1	81.1	12.7	21.7	1301.3	273.5	21.0	15.0	0.58
2980.0- 2990.0	337.8	88.8	48.9	4.5	7.1	487.0	149.3	30.6	<0.1	0.64
2990.0- 3000.0	858.0	248.3	224.3	38.5	46.5	1415.6	557.6	39.4	32.5	0.83
3000.0- 3010.0	775.3	182.8	182.0	34.2	44.1	1218.4	443.0	36.4	30.0	0.77
3010.0- 3020.0	652.7	163.1	173.1	29.0	41.1	1059.0	406.4	38.4	29.3	0.71
3030.0- 3040.0	417.4	162.5	146.3	27.3	28.7	782.2	364.7	46.6	16.9	0.95
3040.0- 3050.0	258.7	107.4	106.0	19.5	23.2	514.8	256.1	49.7	12.3	0.84
3060.0- 3070.0	100.5	23.5	14.8	2.4	2.4	143.6	43.1	30.0	<0.1	1.02
3070.0- 3080.0	7.5	2.7	1.6	0.2	0.3	12.3	4.8	38.8	<0.1	0.56
3080.0- 3090.0	22.4	6.0	4.2	0.8	0.9	34.2	11.9	34.6	<0.1	0.89
3090.0- 3100.0	2519.2	566.0	433.8	95.8	112.7	3727.4	1208.2	32.4	78.2	0.85
3100.0- 3110.0	1020.4	284.1	221.6	43.0	50.7	1619.8	599.4	37.0	30.8	0.85
3110.0- 3120.0	155.0	60.4	65.8	14.6	18.6	314.3	159.3	50.7	11.8	0.79
3120.0- 3130.0	143.7	66.0	81.0	17.1	25.7	333.4	189.7	56.9	16.9	0.67
3130.0- 3140.0	44.4	18.6	24.4	6.8	7.9	102.1	57.7	56.5	6.7	0.86
3140.0- 3150.0	6653.7	1071.4	504.4	79.3	96.3	8405.1	1751.4	20.8	62.9	0.82
3150.0- 3160.0	2992.0	441.9	197.2	30.5	36.7	3698.2	706.2	19.1	22.3	0.83
3160.0- 3170.0	2535.1	292.3	99.6	8.5	8.7	2944.2	409.1	13.9	5.1	0.98
3170.0- 3180.0	2796.6	597.2	345.4	47.4	68.3	3854.9	1058.3	27.5	46.7	0.69
3180.0- 3190.0	1321.3	272.9	173.7	36.0	44.5	1848.3	527.0	28.5	29.3	0.81
3190.0- 3200.0	975.9	137.0	71.5	12.0	14.8	1211.2	235.3	19.4	8.2	0.82
3200.0- 3210.0	1238.6	421.4	292.5	34.1	40.4	2027.1	788.5	38.9	17.8	0.85
3210.0- 3220.0	516.4	168.3	115.5	11.9	10.5	822.7	306.3	37.2	3.7	1.14
3220.0- 3230.0	647.1	313.7	293.9	39.8	33.1	1327.6	680.5	51.3	15.2	1.20
3240.0- 3250.0	93.5	10.0	1.9	<0.1	<0.1	105.4	11.9	11.3	<0.1	bdl
3250.0- 3260.0	602.1	47.8	8.4	<0.1	<0.1	658.2	56.1	8.5	<0.1	bdl
3260.0- 3270.0	2724.2	296.6	87.8	10.2	9.2	3127.9	403.8	12.9	3.5	1.10
3270.0- 3280.0	591.4	58.5	19.8	3.0	2.8	675.5	84.1	12.5	1.1	1.07
3280.0- 3290.0	17.4	1.2	0.4	<0.1	<0.1	19.0	1.6	8.3	<0.1	bdl
3290.0- 3300.0	688.3	33.3	16.4	4.3	1.7	744.0	55.7	7.5	0.8	2.53
3300.0- 3310.0	326.0	24.1	12.7	4.0	1.9	368.7	42.7	11.6	<0.1	2.14
3310.0- 3320.0	191.2	18.9	8.4	2.1	1.2	221.8	30.6	13.8	1.3	1.77
3320.0- 3330.0	51.1	6.7	2.7	0.4	<0.1	60.9	9.8	16.1	<0.1	bdl
3330.0- 3340.0	58.2	10.8	5.5	1.1	0.9	76.6	18.4	24.0	2.2	1.21
3340.0- 3350.0	147.6	15.8	25.2	8.0	8.5	205.1	57.6	28.1	4.7	0.94
3350.0- 3360.0	464.7	56.6	66.1	20.6	22.2	630.2	165.5	26.3	19.8	0.93
3360.0- 3370.0	2533.2	357.8	112.7	11.3	14.7	3029.7	496.5	16.4	7.3	0.77
3370.0- 3380.0	489.3	83.5	36.8	4.7	5.6	619.9	130.6	21.1	2.8	0.85
3380.0- 3390.0	1681.8	156.8	53.2	8.9	7.7	1908.4	226.6	11.9	6.9	1.16
3390.0- 3400.0	3398.0	379.6	132.0	24.9	17.2	3951.8	553.7	14.0	28.1	1.45
3400.0- 3410.0	2293.2	175.9	63.8	20.5	10.5	2563.9	270.7	10.6	4.5	1.95
3410.0- 3420.0	4271.5	333.8	114.7	29.9	15.0	4765.0	493.5	10.4	20.0	1.99
3420.0- 3430.0	7187.9	364.1	102.9	26.0	11.8	7692.8	504.9	6.6	16.5	2.20
3430.0- 3440.0	322.3	16.8	4.2	0.8	<0.1	344.1	21.8	6.3	<0.1	bdl
3440.0- 3450.0	13188.2	841.9	208.2	49.9	21.0	14309.3	1121.0	7.8	25.1	2.37
3450.0- 3460.0	8372.1	690.6	202.6	50.7	23.9	9339.9	967.8	10.4	35.6	2.12

N.B. 1. GAS CONCENTRATIONS EXPRESSED IN PPM (VOL. GAS/VOL. SEDIMENT)
2. bdl = BELOW DETECTION LIMIT

TABLE 1A(cont)

HEADSPACE ANALYSIS DATA

WELLNAME = HERMES #1 DATE OF JOB = APRIL, 1983

DEPTH(m)	METHANE	ETHANE	PROPANE	ISOBUTANE	BUTANE	C1-C4	C2-C4	%WETNESS	C5-C7	i-C4/n-C4
3460.0- 3470.0	13732.5	983.9	226.3	53.9	22.1	15018.7	1286.2	8.6	27.6	2.44
3470.0- 3480.0	20974.7	2012.6	404.8	111.8	29.7	23533.6	2558.9	10.9	33.7	3.77
3480.0- 3490.0	17214.2	1969.9	438.9	85.4	30.1	19738.5	2524.3	12.8	22.3	2.84
3490.0- 3500.0	24837.1	2290.2	631.0	131.0	64.0	27953.3	3116.2	11.1	46.9	2.05
3500.0- 3510.0	25641.4	1651.4	266.9	55.8	16.7	27632.0	1990.7	7.2	14.4	3.35
3510.0- 3520.0	40759.3	3312.0	824.4	169.3	73.5	45137.6	4378.2	9.7	31.4	2.29
3520.0- 3530.0	38791.7	3153.5	998.1	241.9	99.7	43285.0	4493.3	10.4	97.8	2.43
3530.0- 3540.0	16394.6	722.1	219.7	52.7	16.3	17405.4	1010.8	5.8	13.5	3.23
3540.0- 3550.0	67656.0	4368.1	2007.8	522.8	190.5	74745.1	7089.1	9.5	190.5	2.74
3560.0- 3570.0	18940.8	1360.5	276.1	53.5	19.1	20649.8	1709.1	8.3	17.1	2.80
3570.0- 3580.0	22430.2	1226.3	230.6	40.3	17.7	23945.0	1514.8	6.3	12.5	2.28
3580.0- 3590.0	19532.8	1349.9	241.7	33.8	15.4	21173.6	1640.7	7.7	8.1	2.19
3590.0- 3600.0	19033.6	1985.6	470.5	68.9	40.0	21598.7	2565.0	11.9	26.5	1.72
3600.0- 3610.0	14598.4	1735.9	458.6	56.4	37.1	16886.4	2288.0	13.5	22.1	1.52
3610.0- 3620.0	72514.1	5256.7	1789.9	293.6	216.2	80070.5	7556.4	9.4	146.2	1.36
3620.0- 3630.0	24050.1	2206.7	698.2	93.9	73.7	27122.5	3072.4	11.3	58.6	1.27
3630.0- 3640.0	111200.	8224.7	2329.7	376.8	227.2	122359.	11158.5	9.1	193.5	1.66
3650.0- 3660.0	3357.5	134.4	29.0	5.4	1.3	3527.5	170.0	4.8	<0.1	4.20
3660.0- 3670.0	31472.6	1976.5	533.8	100.5	41.7	34125.1	2652.4	7.8	26.0	2.41
3670.0- 3680.0	12131.5	1192.2	507.0	64.7	47.1	13942.6	1811.1	13.0	31.8	1.37
3680.0- 3690.0	17996.4	1157.4	222.6	33.5	13.9	19423.8	1427.5	7.3	4.4	2.40
3690.0- 3700.0	14401.3	578.3	130.0	23.3	9.6	15142.4	741.1	4.9	7.6	2.44
3700.0- 3710.0	23515.6	1116.9	306.3	53.0	30.6	25022.5	1506.9	6.0	25.7	1.73
3710.0- 3720.0	22192.6	1864.1	454.7	81.6	31.9	24624.9	2432.3	9.9	17.3	2.56
3720.0- 3730.0	37536.0	2122.8	376.1	59.9	23.2	40118.0	2582.0	6.4	14.9	2.59
3730.0- 3740.0	55540.0	4409.3	913.7	162.2	73.1	61098.4	5558.4	9.1	59.5	2.22
3740.0- 3750.0	21443.2	3842.5	883.4	172.0	71.0	26412.1	4968.9	18.8	55.6	2.42
3750.0- 3760.0	22494.1	2844.2	772.3	143.3	66.9	26320.8	3826.7	14.5	53.2	2.14
3760.0- 3770.0	17097.3	762.1	187.9	35.7	16.4	18099.3	1002.0	5.5	11.7	2.18
3770.0- 3780.0	14532.3	1009.1	233.9	39.4	16.3	15831.0	1298.7	8.2	9.9	2.42
3780.0- 3790.0	24110.9	991.4	221.3	37.7	17.1	25378.4	1267.4	5.0	12.4	2.21
3790.0- 3800.0	44392.5	3092.5	589.4	88.9	43.6	48206.9	3814.4	7.9	33.4	2.04
3800.0- 3810.0	31797.9	1661.9	333.1	49.7	27.9	33870.5	2072.6	6.1	20.0	1.78
3810.0- 3820.0	19731.0	1121.6	256.9	34.1	22.8	21166.5	1435.4	6.8	11.9	1.50
3820.0- 3830.0	76722.6	5151.4	1105.9	137.7	106.7	83224.2	6501.7	7.8	94.1	1.29
3830.0- 3840.0	65577.2	8832.9	2321.9	353.7	258.7	77344.4	11767.2	15.2	160.0	1.37
3840.0- 3850.0	59268.6	6904.3	1893.1	277.0	213.0	68556.0	9287.3	13.5	130.1	1.30
3850.0- 3860.0	81383.6	9500.0	2779.4	387.4	298.9	94349.4	12965.8	13.7	173.7	1.30
3860.0- 3870.0	22874.9	3427.9	879.8	118.1	82.7	27383.5	4508.6	16.5	52.0	1.43
3870.0- 3880.0	25277.4	1843.5	552.5	78.0	51.2	27802.7	2525.2	9.1	30.8	1.52
3880.0- 3890.0	26130.1	2613.3	814.4	114.3	72.0	29744.1	3614.0	12.2	40.9	1.59
3890.0- 3900.0	17122.5	2662.8	841.1	107.2	72.0	20805.7	3683.1	17.7	38.3	1.49
3900.0- 3910.0	22970.2	3438.0	1110.4	157.6	103.6	27779.8	4809.6	17.3	62.9	1.52
3910.0- 3920.0	33083.9	3361.2	751.6	100.8	73.3	37370.7	4286.9	11.5	50.7	1.38
3920.0- 3930.0	59957.7	5672.3	1262.2	155.9	128.4	67176.5	7218.8	10.7	94.9	1.21
3930.0- 3940.0	38529.3	3962.7	1361.8	182.8	162.0	44198.6	5669.3	12.8	90.1	1.13
3940.0- 3950.0	31408.2	3293.8	1094.0	151.5	176.5	36124.1	4715.9	13.1	164.4	0.86
3950.0- 3960.0	36478.1	4274.6	1259.7	210.0	185.4	42407.8	5929.7	14.0	215.4	1.13

N.B. 1. GAS CONCENTRATIONS EXPRESSED IN PPM (VOL. GAS/VOL. SEDIMENT)
2. bdl = BELOW DETECTION LIMIT

TABLE 1A(cont)

HEADSPACE ANALYSIS DATA

WELLNAME = HERMES #1 DATE OF JOB = APRIL, 1983

DEPTH(m)	METHANE	ETHANE	PROPANE	ISOBUTANE	BUTANE	C1-C4	C2-C4	%WETNESS	C5-C7	i-C4/n-C4
3960.0- 3970.0	38580.1	3400.0	1024.3	172.3	150.6	43327.2	4747.1	11.0	153.2	1.14
3970.0- 3980.0	25970.0	2824.4	828.6	136.7	111.1	29870.8	3900.8	13.1	103.9	1.23
3980.0- 3990.0	48039.5	5483.4	1868.9	250.7	253.4	55895.8	7856.3	14.1	217.1	0.99
3990.0- 4000.0	17149.1	2301.4	863.4	127.6	100.6	20542.1	3393.0	16.5	66.5	1.27
4000.0- 4010.0	17272.5	1299.7	474.5	68.5	55.0	19170.2	1897.8	9.9	42.4	1.25
4010.0- 4020.0	15574.0	1746.7	696.5	97.1	79.2	18193.4	2619.4	14.4	55.5	1.23
4020.0- 4030.0	13158.0	1167.7	455.4	61.4	50.7	14893.2	1735.2	11.7	34.2	1.21
4030.0- 4040.0	43182.1	5011.5	2122.6	261.3	251.7	50829.1	7647.0	15.0	163.4	1.04
4050.0- 4060.0	27348.9	3898.4	1386.9	177.7	153.9	32965.8	5616.9	17.0	94.6	1.15
4060.0- 4070.0	19990.9	2197.0	601.6	81.8	64.7	22936.1	2945.1	12.8	38.4	1.27
4070.0- 4080.0	31527.1	3904.7	1508.7	182.9	183.5	37306.8	5779.8	15.5	106.0	1.00
4080.0- 4090.0	47861.4	5824.6	2172.3	249.0	232.5	56339.7	8478.3	15.0	154.5	1.07
4090.0- 4100.0	16615.4	2604.3	711.7	94.9	95.2	20121.6	3506.1	17.4	64.5	1.00
4100.0- 4110.0	17491.7	1969.9	613.7	74.8	90.5	20240.6	2748.8	13.6	63.5	0.83
4110.0- 4120.0	11028.6	1393.0	426.0	40.1	52.7	12940.4	1911.8	14.8	35.7	0.76
4120.0- 4130.0	11037.9	1538.5	497.2	55.1	64.9	13193.6	2155.8	16.3	43.3	0.85
4130.0- 4140.0	15372.7	1435.1	402.6	50.4	72.8	17333.6	1960.9	11.3	42.3	0.69
4147.0- 4150.0	32975.2	3468.2	1144.3	153.7	175.9	37917.3	4942.1	13.0	135.0	0.87
4150.0- 4160.0	9655.9	1074.1	294.5	33.4	39.5	11097.3	1441.4	13.0	23.3	0.85
4160.0- 4170.0	18363.7	2385.8	752.9	95.0	105.0	21702.4	3338.7	15.4	85.9	0.90
4170.0- 4180.0	20710.3	2258.7	640.5	62.6	88.0	23760.1	3049.8	12.8	73.7	0.71
4180.0- 4190.0	24460.5	2007.1	710.4	79.5	123.9	27381.5	2920.9	10.7	138.5	0.64
4190.0- 4200.0	14722.4	1775.8	698.2	65.7	139.7	17401.9	2679.5	15.4	143.7	0.47
4200.0- 4210.0	3885.5	370.7	145.1	17.0	27.7	4446.0	560.6	12.6	31.7	0.61
4210.0- 4220.0	6714.1	633.4	229.3	26.8	42.1	7645.7	931.6	12.2	50.5	0.64
4220.0- 4230.0	3025.0	279.0	99.4	10.8	18.1	3432.3	407.3	11.9	21.3	0.60
4230.0- 4240.0	8121.8	712.9	299.3	29.1	54.5	9217.6	1095.8	11.9	44.0	0.54
4240.0- 4250.0	9363.6	1058.3	472.6	37.6	76.6	11008.8	1645.1	14.9	58.8	0.49
4250.0- 4260.0	10174.0	1010.0	425.3	40.8	73.2	11723.3	1549.3	13.2	79.5	0.56
4260.0- 4270.0	10837.5	1153.1	482.6	43.4	77.9	12594.5	1757.0	14.0	73.9	0.56
4270.0- 4280.0	6459.2	889.9	280.8	24.5	38.4	7692.8	1233.6	16.0	18.7	0.64
4280.0- 4290.0	6786.9	688.1	235.7	23.4	34.1	7768.1	981.2	12.6	33.9	0.69
4290.0- 4300.0	3850.6	343.0	119.8	11.9	16.7	4342.0	491.4	11.3	8.2	0.71
4300.0- 4310.0	6407.2	1142.3	424.0	44.2	60.6	8078.4	1671.2	20.7	33.9	0.73
4310.0- 4320.0	5308.1	616.8	289.3	19.3	33.8	6267.3	959.2	15.3	19.3	0.57
4320.0- 4330.0	15684.1	3412.1	1198.8	120.8	174.3	20590.1	4906.0	23.8	99.8	0.69
4350.0- 4360.0	14128.6	1530.9	448.1	38.5	70.0	16216.1	2087.5	12.9	46.2	0.55
4360.0- 4370.0	4701.6	455.4	129.5	10.1	20.3	5316.8	615.3	11.6	13.0	0.49
4370.0- 4380.0	7683.6	854.1	285.6	25.8	49.2	8898.2	1214.6	13.7	40.9	0.52
4380.0- 4390.0	4585.8	657.8	257.2	26.3	49.8	5576.9	991.1	17.8	58.8	0.53
4400.0- 4410.0	3284.0	542.1	217.0	27.6	70.1	4140.8	856.8	20.7	47.9	0.39
4410.0- 4420.0	2922.1	473.4	206.2	27.5	42.9	3672.1	750.0	20.4	61.5	0.64
4420.0- 4430.0	2677.1	450.0	207.2	25.1	47.1	3406.4	729.4	21.4	63.1	0.53
4430.0- 4440.0	2279.6	292.0	147.2	20.5	39.7	2779.1	499.5	18.0	60.6	0.52
4440.0- 4450.0	2431.4	353.9	168.9	22.0	43.3	3019.5	588.1	19.5	65.1	0.51
4450.0- 4460.0	4870.5	529.6	230.5	31.3	54.1	5715.9	845.4	14.8	104.2	0.58
4520.0- 4530.0	691.1	53.0	13.4	0.9	1.3	759.8	68.6	9.0	<0.1	0.70
4530.0- 4540.0	7076.4	769.1	248.5	19.9	32.7	8146.5	1070.1	13.1	16.4	0.61

N.B. 1. GAS CONCENTRATIONS EXPRESSED IN PPM (VOL. GAS/VOL. SEDIMENT)
2. bdl = BELOW DETECTION LIMIT

TABLE 1A(cont)

HEADSPACE ANALYSIS DATA

WELLNAME = HERMES #1

DATE OF JOB = APRIL, 1983

DEPTH(m)	METHANE	ETHANE	PROPANE	ISOBUTANE	BUTANE	C1-C4	C2-C4	%WETNESS	C5-C7	i-C4/n-C4
4540.0- 4550.0	46.0	6.0	2.0	0.2	0.3	54.6	8.6	15.7	<0.1	0.45
4550.0- 4560.0	10340.8	2040.0	721.3	72.4	106.5	13281.0	2940.2	22.1	68.9	0.68
4560.0- 4565.0	22976.3	4772.7	1656.7	145.8	229.2	29780.8	6804.5	22.8	158.9	0.64

N.B. 1. GAS CONCENTRATIONS EXPRESSED IN PPM (VOL. GAS/VOL. SEDIMENT)
2. bdl = BELOW DETECTION LIMIT

TABLE 1B

CUTTINGS GAS ANALYSIS DATA

WELLNAME = HERMES #1

DATE OF JOB = APRIL, 1983

DEPTH(m)	METHANE	ETHANE	PROPANE	ISOBUTANE	BUTANE	C1-C4	C2-C4	%WETNESS	C5-C7	i-C4/n-C4
2400.0- 2410.0	14.3	<0.1	1.7	1.5	<0.1	17.4	3.1	18.0	5.1	bdl
2410.0- 2420.0	21.1	<0.1	2.6	1.5	<0.1	25.2	4.1	16.3	<0.1	bdl
2420.0- 2430.0	159.7	<0.1	1.4	1.5	<0.1	162.6	2.9	1.8	7.3	bdl
2430.0- 2440.0	19.7	<0.1	1.7	2.2	1.3	24.9	5.2	20.8	10.6	1.71
2440.0- 2450.0	4.8	<0.1	<0.1	1.1	<0.1	5.9	1.1	18.9	<0.1	bdl
2450.0- 2460.0	8.2	<0.1	<0.1	0.9	<0.1	9.1	0.9	10.2	<0.1	bdl
4460.0- 4470.0	249.3	91.2	45.4	5.3	14.8	406.1	156.7	38.6	47.7	0.36
4470.0- 4480.0	542.2	119.7	63.0	6.1	18.4	749.5	207.3	27.7	27.6	0.33
4480.0- 4490.0	657.0	190.5	96.3	6.8	24.3	975.0	318.0	32.6	36.0	0.28
4490.0- 4500.0	559.2	108.1	49.7	4.8	13.5	735.2	176.1	23.9	38.7	0.36
4500.0- 4510.0	1147.5	180.3	76.1	8.5	20.7	1433.1	285.5	19.9	53.8	0.41
4510.0- 4520.0	589.7	133.5	61.6	7.2	17.9	809.9	220.1	27.2	86.5	0.40
4520.0- 4530.0	2280.8	510.3	205.2	15.5	44.3	3056.0	775.3	25.4	64.2	0.35
4530.0- 4540.0	1885.4	438.4	180.7	13.6	38.4	2556.5	671.2	26.3	44.8	0.36
4540.0- 4550.0	1871.8	445.1	224.0	21.4	58.1	2620.4	748.6	28.6	66.7	0.37
4550.0- 4560.0	3080.5	692.7	284.4	24.3	65.7	4147.6	1067.1	25.7	75.8	0.37
4560.0- 4565.0	1665.2	376.1	167.7	14.9	39.8	2263.8	598.5	26.4	62.7	0.38

N.B. 1. GAS CONCENTRATIONS EXPRESSED IN PPM (VOL. GAS/VOL. SEDIMENT)
2. bdl = BELOW DETECTION LIMIT

TABLE 1C

COMBINED HEADSPACE/CUTTINGS DATA

WELLNAME = HERMES #1

DATE OF JOB = APRIL, 1983

DEPTH(m)	METHANE	ETHANE	PROPANE	ISOBUTANE	BUTANE	C1-C4	C2-C4	%WETNESS	C5-C7	i-C4/n-C4
2400.0- 2410.0	179.2	5.9	9.5	7.2	2.4	204.3	25.0	14.9	13.0	bdl
2410.0- 2420.0	314.7	11.4	12.9	6.2	2.2	347.3	32.7	12.6	7.7	bdl
2420.0- 2430.0	955.5	6.2	9.7	7.4	2.3	981.1	25.6	2.3	15.4	bdl
2430.0- 2440.0	157.8	4.1	8.6	8.2	3.7	182.4	24.6	16.6	18.1	2.13
2440.0- 2450.0	46.0	2.2	3.8	4.5	1.5	57.9	11.9	19.8	3.9	bdl
2450.0- 2460.0	26.7	0.8	1.2	1.9	0.4	31.0	4.3	12.7	0.7	bdl
4520.0- 4530.0	2971.9	563.3	218.7	16.4	45.5	3815.8	843.9	17.2	64.2	0.53
4530.0- 4540.0	8961.8	1207.5	429.2	33.5	71.1	10703.1	1741.3	19.7	61.2	0.48
4540.0- 4550.0	1917.8	451.1	226.1	21.6	58.4	2675.0	757.2	22.1	66.7	0.41
4550.0- 4560.0	13421.3	2732.7	1005.7	96.7	172.2	17428.6	4007.4	23.9	144.7	0.53
4560.0- 4565.0	24641.5	5148.8	1824.4	160.8	269.1	32044.6	7403.0	24.6	221.6	0.51

N.B. 1. GAS CONCENTRATIONS EXPRESSED IN PPM (VOL. GAS/VOL. SEDIMENT)
2. bdl = BELOW DETECTION LIMIT

TABLE 2

ROCK-EVAL PYROLYSIS DATA (two run)

WELLNAME = HERMES #1

DATE OF JOB = MAY 1983

DEPTH(m)	TMAX	S1	S2	S3	S1+S2	S2/S3	PI	PC	TOC	HI	OI
3390.0-3400.0	428	0.45	4.06	1.10	4.51	3.69	0.10	0.37	2.02	200	54
3400.0-3410.0	429	0.38	3.72	1.21	4.10	3.07	0.09	0.34	2.04	182	59
3410.0-3420.0	429	0.47	5.37	1.30	5.84	4.13	0.08	0.48	2.80	191	46
3420.0-3430.0	429	0.65	7.87	1.30	8.52	6.05	0.08	0.71	3.97	198	32
3430.0-3440.0	428	0.72	9.08	1.69	9.80	5.37	0.07	0.81	4.48	202	37
3440.0-3450.0	428	0.58	6.07	1.09	6.65	5.57	0.09	0.55	3.38	179	32
3450.0-3460.0	430	0.55	5.64	1.36	6.19	4.15	0.09	0.51	3.00	188	45
3460.0-3470.0	432	0.72	9.38	1.04	10.10	9.02	0.07	0.84	4.14	226	25
3470.0-3480.0	432	0.87	13.46	1.51	14.33	8.91	0.06	1.19	5.49	245	27
3480.0-3490.0	431	1.06	17.64	2.32	18.70	7.60	0.06	1.55	6.92	254	33
3490.0-3500.0	430	0.63	10.47	1.90	11.10	5.51	0.06	0.92	4.21	248	45
3500.0-3510.0	432	0.86	16.40	1.61	17.26	10.19	0.05	1.43	5.91	277	27
3510.0-3520.0	432	0.51	6.80	1.58	7.31	4.30	0.07	0.61	3.63	187	43
3520.0-3530.0	432	0.69	10.58	1.85	11.27	5.72	0.06	0.94	4.53	233	40
3530.0-3540.0	434	1.08	21.15	2.73	22.23	7.75	0.05	1.85	7.66	276	35
3540.0-3550.0	432	1.19	17.93	2.38	19.12	7.53	0.06	1.59	7.54	237	31
3550.0-3560.0	431	6.64	121.34	7.43	127.98	16.33	0.05	10.62	39.60	306	18
3560.0-3570.0	429	1.33	23.70	2.60	25.03	9.12	0.05	2.08	8.17	290	31
3570.0-3580.0	431	0.92	16.38	2.48	17.30	6.60	0.05	1.44	6.48	252	38
3580.0-3590.0	431	2.68	37.25	2.79	39.93	13.35	0.07	3.31	12.51	297	22
3590.0-3600.0	429	1.08	12.90	1.92	13.98	6.72	0.08	1.16	4.80	268	40
3600.0-3610.0	428	1.14	15.26	1.98	16.40	7.71	0.07	1.36	4.36	350	45
3610.0-3620.0	430	0.94	13.99	1.98	14.93	7.07	0.06	1.24	5.59	250	35
3620.0-3630.0	430	0.49	7.39	1.58	7.88	4.68	0.06	0.65	2.94	251	53
3630.0-3640.0	428	0.97	13.24	2.22	14.21	5.96	0.07	1.18	5.17	256	42
3640.0-3650.0	434	0.76	12.66	1.83	13.42	6.92	0.06	1.11	5.67	223	32
3650.0-3660.0	431	1.39	24.88	1.42	26.27	17.52	0.05	2.18	8.80	282	16
3660.0-3670.0	433	1.82	29.67	1.83	31.49	16.21	0.06	2.61	8.88	334	20
3670.0-3680.0	433	0.74	7.16	2.05	7.90	3.49	0.09	0.66	3.06	233	66
3680.0-3690.0	432	1.13	18.28	2.05	19.41	8.92	0.06	1.61	6.06	301	33
3690.0-3700.0	430	1.84	32.79	1.16	34.63	28.27	0.05	2.87	10.87	301	10
3700.0-3710.0	431	1.05	18.58	1.06	19.63	17.53	0.05	1.63	6.73	276	15
3710.0-3720.0	436	0.52	10.68	1.02	11.20	10.47	0.05	0.93	4.18	255	24
3720.0-3730.0	435	6.16	101.39	5.49	107.55	18.47	0.06	8.93	33.47	302	16
3730.0-3740.0	434	4.03	67.42	4.31	71.45	15.64	0.06	5.93	22.49	299	19
3740.0-3750.0	434	1.72	34.30	2.75	36.02	12.47	0.05	2.99	32.39	105	8
3750.0-3760.0	435	1.02	19.74	1.56	20.76	12.65	0.05	1.72	6.22	317	25
3760.0-3770.0	434	1.06	23.36	1.44	24.42	16.22	0.04	2.03	6.97	335	20
3770.0-3780.0	432	1.33	28.71	1.94	30.04	14.80	0.04	2.49	8.47	338	22
3780.0-3790.0	434	1.92	38.80	1.61	40.72	24.10	0.05	3.38	11.83	327	13
3790.0-3800.0	434	1.59	33.40	1.74	34.99	19.20	0.05	2.90	10.32	323	16
3800.0-3810.0	434	0.83	14.75	1.63	15.58	9.05	0.05	1.29	5.10	289	31
3810.0-3820.0	437	1.21	17.73	1.98	18.94	8.95	0.06	1.57	5.68	312	34
3820.0-3830.0	440	0.11	0.84	0.70	0.95	1.20	0.12	0.08	0.76	110	92
3830.0-3840.0	437	1.93	29.49	2.25	31.42	13.11	0.06	2.61	9.68	304	23
3840.0-3850.0	438	1.79	24.76	2.31	26.55	10.72	0.07	2.20	7.75	319	29
3850.0-3860.0	438	1.80	29.64	1.63	31.44	18.18	0.06	2.61	7.90	375	20

TMAX = Max. temperature S2
S1+S2 = Potential yield
PC = Pyrolysable carbon
OI = Oxygen Index
S1 = Volatile hydrocarbons (HC)
S3 = Organic carbon dioxide
TOC = Total organic carbon
nd = no data
S2 = HC generating potential
PI = Production index
HI = Hydrogen index

TABLE 2(cont)

ROCK-EVAL PYROLYSIS DATA (two run)

WELLNAME = HERMES #1

DATE OF JOB = MAY 1983

DEPTH(m)	TMAX	S1	S2	S3	S1+S2	S2/S3	PI	PC	TOC	HI	OI
3860.0-3870.0	432	0.81	12.15	1.77	12.96	6.86	0.06	1.08	4.07	298	43
3870.0-3880.0	438	2.04	31.42	2.70	33.46	11.64	0.06	2.78	9.65	325	27
3880.0-3890.0	434	1.16	14.44	1.42	15.60	10.17	0.07	1.29	5.41	266	26
3890.0-3900.0	436	3.25	42.20	3.68	45.45	11.47	0.07	3.77	13.01	324	28
3900.0-3910.0	437	1.16	18.32	3.04	19.48	6.03	0.06	1.62	6.27	292	48
3910.0-3920.0	439	0.97	13.51	2.98	14.48	4.53	0.07	1.20	4.86	277	61
3920.0-3930.0	438	0.43	4.89	1.32	5.32	3.70	0.08	0.44	2.15	227	61
3930.0-3940.0	437	2.09	24.53	1.78	26.62	13.78	0.08	2.21	8.10	302	21
3940.0-3950.0	439	0.13	0.83	1.18	0.96	0.70	0.14	0.08	0.68	122	173
3950.0-3960.0	437	0.29	2.46	0.96	2.75	2.56	0.11	0.23	1.50	164	64
3960.0-3970.0	435	0.86	9.46	1.37	10.32	6.91	0.08	0.86	4.04	234	33
3970.0-3980.0	439	1.35	14.62	1.72	15.97	8.50	0.08	1.33	5.61	260	30
3980.0-3990.0	433	0.49	4.10	0.76	4.59	5.39	0.11	0.38	2.00	205	38
3990.0-4000.0	436	1.00	9.53	1.39	10.53	6.86	0.09	0.87	4.21	226	33
4000.0-4010.0	433	1.17	10.00	1.69	11.17	5.92	0.10	0.93	4.70	212	35
4010.0-4020.0	436	1.84	16.94	1.83	18.78	9.26	0.10	1.56	6.12	276	29
4020.0-4030.0	440	3.42	30.08	1.71	33.50	17.59	0.10	2.78	10.83	277	15
4030.0-4040.0	443	1.94	16.62	1.97	18.56	8.44	0.10	1.54	7.52	221	26
4040.0-4060.0	436	2.03	16.64	1.98	18.67	8.40	0.11	1.55	7.08	235	27
4060.0-4070.0	440	2.78	27.15	1.96	29.93	13.85	0.09	2.48	9.67	280	20
4070.0-4080.0	443	3.65	33.54	3.17	37.19	10.58	0.10	3.09	11.47	292	27
4080.0-4090.0	441	3.76	34.63	2.05	38.39	16.89	0.10	3.19	11.59	298	17
4090.0-4100.0	442	5.20	37.84	2.20	43.04	17.20	0.12	3.57	12.74	297	17
4100.0-4110.0	438	2.08	13.72	1.48	15.80	9.27	0.13	1.31	6.14	223	24
4110.0-4120.0	444	3.41	27.10	1.54	30.51	17.60	0.11	2.53	9.46	286	16
4120.0-4130.0	442	2.16	15.22	1.68	17.38	9.06	0.12	1.44	5.61	271	29
4130.0-4140.0	444	1.73	13.52	1.17	15.25	11.56	0.11	1.27	5.39	250	21
4147.0-4150.0	441	2.09	18.68	1.32	20.77	14.15	0.10	1.72	6.52	286	20
4150.0-4160.0	445	1.78	15.61	1.01	17.39	15.46	0.10	1.44	5.55	281	18
4160.0-4170.0	438	1.24	9.58	1.19	10.82	8.05	0.11	0.90	3.89	246	30
4170.0-4180.0	444	1.53	13.07	1.03	14.60	12.69	0.10	1.21	5.06	258	20
4180.0-4190.0	440	1.71	16.26	1.53	17.97	10.63	0.10	1.49	5.85	277	26
4190.0-4200.0	440	1.43	8.55	1.23	9.98	6.95	0.14	0.83	3.54	241	34
4200.0-4210.0	438	0.45	2.17	0.58	2.62	3.74	0.17	0.22	1.28	169	45
4210.0-4220.0	439	0.37	1.76	0.60	2.13	2.93	0.17	0.18	1.15	153	52
4220.0-4230.0	442	0.29	1.45	0.53	1.74	2.74	0.17	0.14	1.00	145	53
4230.0-4240.0	443	1.72	9.01	0.75	10.73	12.01	0.16	0.89	3.88	232	19
4240.0-4250.0	446	2.86	15.26	1.75	18.12	8.72	0.16	1.50	6.18	246	28
4250.0-4260.0	443	1.38	5.72	1.11	7.10	5.15	0.19	0.59	3.44	166	32
4260.0-4270.0	446	2.38	11.22	2.58	13.60	4.35	0.18	1.13	5.36	209	48
4270.0-4280.0	451	6.56	40.03	2.32	46.59	17.25	0.14	3.87	14.27	280	16
4280.0-4290.0	450	7.38	49.50	1.32	56.88	37.50	0.13	4.72	16.68	296	7
4290.0-4300.0	448	3.95	24.69	1.54	28.64	16.03	0.14	2.38	8.84	279	17
4300.0-4310.0	448	3.31	20.55	1.16	23.86	17.72	0.14	1.98	7.48	274	15
4310.0-4320.0	449	3.31	18.79	1.29	22.10	14.57	0.15	1.83	7.41	253	17
4320.0-4330.0	448	2.83	15.25	0.99	18.08	15.40	0.16	1.50	6.50	234	15
4330.0-4340.0	447	1.95	10.73	0.94	12.68	11.41	0.15	1.05	4.40	243	21

TMAX = Max. temperature S2
S1+S2 = Potential yield
PC = Pyrolysable carbon
OI = Oxygen Index
S1 = Volatile hydrocarbons (HC)
S3 = Organic carbon dioxide
TOC = Total organic carbon
nd = no data
S2 = HC generating potential
PI = Production index
HI = Hydrogen index

TABLE 2(cont)

ROCK-EVAL PYROLYSIS DATA (two run)

WELLNAME = HERMES #1 DATE OF JOB = MAY 1983

DEPTH(m)	TMAX	S1	S2	S3	S1+S2	S2/S3	PI	PC	TOC	HI	OI
4340.0-4350.0	446	1.57	7.94	1.09	9.51	7.28	0.17	0.79	4.02	197	27
4350.0-4360.0	449	3.03	17.04	1.29	20.07	13.21	0.15	1.67	6.97	244	18
4360.0-4370.0	448	1.80	8.94	0.76	10.74	11.76	0.17	0.89	4.12	216	18
4370.0-4380.0	447	0.95	4.00	0.88	4.95	4.55	0.19	0.41	2.17	184	40
4380.0-4390.0	447	0.19	0.63	0.71	0.82	0.89	0.23	0.07	0.53	118	133
4390.0-4400.0	445	0.33	1.28	0.43	1.61	2.98	0.20	0.13	0.96	133	44
4400.0-4410.0	443	0.16	0.56	0.35	0.72	1.60	0.22	0.06	0.52	107	67
4410.0-4420.0	449	0.12	0.36	0.12	0.48	3.00	0.25	0.04	0.41	87	29
4420.0-4430.0	445	0.09	0.31	0.01	0.40	31.00	0.22	0.03	0.32	96	3
4430.0-4440.0	446	0.13	0.54	0.10	0.67	5.40	0.19	0.06	0.47	114	21
4440.0-4450.0	444	0.10	0.35	0.01	0.45	35.00	0.22	0.04	0.38	92	2
4450.0-4460.0	444	0.35	1.35	0.22	1.70	6.14	0.21	0.14	1.12	120	19
4460.0-4470.0	443	0.96	5.46	0.59	6.42	9.25	0.15	0.53	3.01	181	19
4470.0-4480.0	443	1.80	11.98	1.13	13.78	10.60	0.13	1.14	5.16	232	21
4480.0-4490.0	450	2.77	14.45	1.38	17.22	10.47	0.16	1.43	6.71	215	20
4490.0-4500.0	442	1.40	6.80	1.19	8.20	5.71	0.17	0.68	3.43	198	34
4500.0-4510.0	443	1.08	5.86	0.98	6.94	5.98	0.16	0.58	3.31	177	29
4510.0-4520.0	439	1.19	8.10	1.05	9.29	7.71	0.13	0.77	3.93	206	26
4520.0-4530.0	450	2.61	14.28	1.53	16.89	9.33	0.15	1.40	6.84	208	22
4530.0-4540.0	453	3.27	18.97	2.27	22.24	8.36	0.15	1.85	8.48	223	26
4540.0-4550.0	451	2.35	9.72	1.38	12.07	7.04	0.19	1.00	5.63	172	24
4550.0-4560.0	448	1.85	8.67	1.15	10.52	7.54	0.18	0.87	4.78	181	24
4560.0-4565.0	449	1.45	5.68	1.23	7.13	4.62	0.20	0.59	3.75	151	32

TMAX = Max. temperature S2
S1+S2 = Potential yield
PC = Pyrolysable carbon
OI = Oxygen Index
S1 = Volatile hydrocarbons (HC)
S3 = Organic carbon dioxide
TOC = Total organic carbon
nd = no data
S2 = HC generating potential
PI = Production index
HI = Hydrogen index

APPENDIX I

THEORY AND METHOD

1. PREPARATION OF SAMPLES

The samples provided for geochemical studies are firstly, where necessary, carefully air dried. Then they are crushed to 1/8" chips using a van Gelder jaw crusher, and finally they are crushed to 0.1mm using an NV Tema grinder.

2. TOC DETERMINATIONS

The total organic carbon value (TOC) was determined on the unextracted sediment sample. The value was determined by treating a known weight of sediment with dilute HCl to remove carbonate minerals, and then heating the residue to approximately 1700 °C (Leco Induction Furnace) in an atmosphere of pure oxygen. The carbon dioxide produced was absorbed on a "Carbosorb" tower. The weight of carbon dioxide produced was then used to calculate %TOC in the sediment.

3. ROCK-EVAL PYROLYSIS

Rock-Eval pyrolysis is carried out by placing approximately 100mg of the crushed sample into a crucible and then subjecting it to the following pyrolysis cycle:

Stage (i) - Sample purged with helium for 3.5 minutes outside of heated part of pyrolysis furnace;

Stage (ii) - Sample heated at 300°C for 3 minutes to liberate free petroleum (S_1 peak);

Stage (iii)- Sample heated from 300°C to 550°C at 25°C/minute to produce petroleum from kerogen (S_2 peak). The furnace is maintained at 550°C for one minute. Carbon dioxide produced during this pyrolysis up to 390°C (550°C in the case of the carbonate-free sediment) is absorbed on a special column;

Stage (iv) - During cool-down period the carbon dioxide produced during pyrolysis is measured (S_3 peak).

The units used for Rock-Eval data are as follows:

S_1, S_2, S_3 = kg/tonne of rock
T_{max} = °C
Hydrogen Index = mg HC/g TOC
Oxygen Index = mg CO_2/g TOC

Rock-Eval data is most commonly used in the following manner:

(i) S_1 - indicates the level of oil and/or gas already generated by the sample.

(ii) S_1+S_2 - referred to as the genetic potential this parameter is used for source rock evaluation according to the following criteria:

<2	kg/tonne	Poor
2–6	kg/tonne	Moderate
>6	kg/tonne	Good

(iii) $S_1/(S_1+S_2)$ - this parameter is the production index which is a measure of the level of maturity of the sample.

(iv) T_{max} - the temperature corresponding to the S_2 maxima. This temperature increases with increasingly mature sediments.

(v) HI, OI - the hydrogen ($[S_2 x100]/TOC$) and oxygen ($[S_3 x100]/TOC$) indices when plotted against one another provide information about the type of kerogen contained in the sample and the maturity of the sample.

REFERENCES

Alexander, R., Kagi, R.I. and Woodhouse, G.W. "Measurement of thermal maturation of petroleum by proton magnetic resonance spectroscopy". Nature, 276, 1978, 598.

Alexander, R., Kagi, R.I. and Woodhouse, G.W. "A new method for measuring the maturity of petroleum in source rocks". APEA J., 19, 1979, 90-93.

Cooper, J.E. and Bray, E.E. "Apostulated role of fatty acids in petroleum formation". Geochim. Cosmochim. Acta, 27, 1963, 1113-1127.

Gransch, J.A. and Eisma, E. "Characterization of the insoluble organic matter of sediments by pyrolysis". Advances in Organic Geochemistry, 1966, 407-426.

Hunt, J.M. "Geochemistry of petroleum". Am. Assoc. Pet. Geol. Continuing Education Lecture Series.

Lijmbach, G.W.M. "On the origin of petroleum". Proc. 9th World Petroleum Congress, 2, 1975, 357-369.

LeTran, K., Connan, J. and Van der Weide, B. "Diagenesis of organic matter and occurrence of hydrocarbons and hydrogen sulphide in the S.W. Aquitaine Basin". Bull. Centre Rech., Pau-SNPA, 8, 1974, 111.

Philippi, G.T. "The influence of marine and terrestrial source material on the composition of petroleum". Geochim. Cosmochim. Acta, 38, 1974, 947.

Powell, T.G. and McKirdy, D.M. "Geological factors controlling crude oil composition in Australia and Papua New Guinea". Amer. Assoc. Petrol. Geol. 59, 1975, 1176.

Scalan, R.S. and Smith, J.E. "An improved measure of the odd-even predominance in the normal alkanes of sediment extracts and petroleum". Geochim. Cosmochim. Acta, 34, 1970, 611-620.

Stahl, W.J. "Carbon and nitrogen isotopes in hydrocarbon research and exploration". Chem. Geol., 20, 1977, 121-149.

Stahl, W.J. "Source rock-crude oil correlation by isotopic type-curves". Geochim. Cosmochim. Acta, 42, 1978, 1573-1577.

Tissot, B. et al. "Origin and evolution of hydrocarbons in early Toarcian shales, Paris Basin, France". Amer. Assoc. Petrol. Geol., 55, 1971, 2177.

Tissot, B. et al. "Influence of nature and diagenesis of organic matter in the formation of petroleum". Amer. Assoc. Petrol. Geol., 58 1974, 499.

Tissot, B. and Welte, D.H. "Petroleum Formation and Occurrence". Springer-Verlag. Berlin Heidelberg New York, 1978.

Welte, D.H., et al., "Correlation between petroleum and source rock". Proc. 9th World Petroleum Congress, 2, 1975, 179-191.

APPENDIX NO. 11

BASIC HYDROCARBON SOURCE ROCK POTENTIAL AND

VITRINITE REFLECTANCE ANALYSIS

BASIC HYDROCARBON SOURCE ROCK POTENTIAL AND VITRINITE REFLECTANCE ANALYSIS

SAMPLE DEPTH (M)	PERCENT OIL PRONE KEROGEN	PERCENT GAS PRONE KEROGEN	VITRINITE REFLECTANCE (% RO)	TOTAL ORGANIC CARBON (WT.%)	HYDROGEN INDEX
1950.0	80	20	0.42	0.67	151
2251.0	75	25	0.44	0.58	83
2534.0	25	75	0.54	0.69	93
2580.0	45	55	0.53	0.71	72
2786.0	35	65	N.G.	1.93	128
3002.0	35	65	0.54	0.93	129
3231.0	65	35	0.54	1.13	348
3397.0	70	30	N.G.	1.74	329
3599.0	45	55	0.59	0.91	137
3800.0	40	60	0.62	0.65	108
3999.5	75	25	0.68	0.71	138
4197.0	65	35	0.72	1.19	172
4397.5	60	40	0.74	1.41	88

PHILLIPS PETROLEUM COMPANY,
BARTLESVILLE, OKLAHOMA
MAY 17, 1983.

APPENDIX NO. 12

FLOPETROL F.I.T. REPORT

P.V.T.STUDY REPORT

Client:PHILLIPS AUSTRALIAN OIL CO
Field :HERMES Well : HERMES#1
Zone :4231.5 M Samp. date: FIT NO. 1

Report #:18/AL/83 Date: JUNE,1983

ADELAIDE LABORATORY

FLOPETROL JOHNSTON Schlumberger

COMPANY : PHILLIPS AUSTRALIAN OIL CO

WELL : HERMES#1

INDEX

COMPANY : PHILLIPS AUSTRALIAN OIL CO

WELL : HERMES#1

SUMMARY AND MAIN RESULTS

The present report gives the experimental results of the P.V.T. study

The initial reservoir conditions are :

- Pi : N/A
- T : 280 F

RECEPTION OF GAS SAMPLE

CYLINDER H 217368(1116/388)

Water content : NIL

TABLE 2

MOLECULAR COMPOSITION OF FIELD SEPARATOR GAS(ES)

(mole percent)

Components	Cylinder H217368
Nitrogen	0.33
Carbon dioxide	0.05
Hydrocarbons:	
Methane	85.91
Ethane	7.96
Propane	3.54
I - Butane	0.49
N - Butane	0.98
I - Pentane	0.26
N - Pentane	0.27
Hexanes	0.13
Heptanes plus	0.08
TOTAL	100.00
Molecular weight	19.283
Gravity (Air=1)	0.665
Molecular weight of heptanes plus	103.7

The cylinder H217368 has been used for recombination

VISCOSITY OF GAS

Centipoises

Pressure (psig)	Temperature 280 F
7000	0.0331
6500	0.0311
6000	0.0293
5500	0.0275
5000	0.0259
4500	0.0243
4000	0.0229
3000	0.0202
2000	0.0179
1000	0.0158

G.P.M OF GAS (Gallons per thousand standard cubic feet)

HEAT CONTENT (API research project 44)

G.P.M	
c3 +	1.720
c4 +	0.750
c5 +	0.283
HEAT CONTENT	1180.23

NOMENCLATURE

P	:	Pressure
V	:	Volume
T	:	Temperature
Pi	:	Initial static pressure
Pb	:	Bubble point pressure
Pd	:	Dew point pressure
Vr=V/V Pb	:	Relative volume (oil reservoir fluid)
Vr=V/V Pd	:	Relative volume (gas reservoir fluid)
$c = -\frac{1}{V} x \frac{dV}{dP}$	:	Compressibility factor of reservoir fluid
$\alpha = \frac{1}{V} x \frac{dV}{dT}$	:	Thermal expansion of reservoir fluid
$Y = \frac{Pb/P-1}{Vr-1}$	:	Dimensionless compressibility function
Bo	:	Oil formation volume factor
Rs	:	Solution gas oil ratio
Z	:	Gas compressibility factor or gas deviation factor
Bg	:	Gas formation volume factor
do	:	Reservoir oil density
Go	:	Residual oil gravity
G	:	Gas gravity (Air=1)
sto	:	Stock tank oil
GOR	:	Gas oil ratio
GLR	:	Gas liquid ratio
WOR	:	Water liquid ratio
Shrinkage factor	:	$\frac{\text{Oil volume at standard conditions}}{\text{Oil volume at separator conditions}}$
$Z = \frac{PV}{nRT}$	:	n=Total moles of a mixture in the gas state R=Universal gas constant (per mole)
GPM	:	Gallons per thousand standard cubic feet
Standard conditions	:	For gas volumes =60 F and 14.7 psia
	:	For oil measurements=60 F and atmospheric pressure

Gross heat content is calculated from API research project 44
Molecular weights,densities,critical values are from CRC Handbook of chemistry and physics
Gas viscosity is calculated with equations from Standing (Behavior of oil field hydrocarbon systems)