OW797

WCR (VOLUME 2)
WIRRAH-2
W797

INTERPRETIVE DATA

ESSO EXPLORATION AND PRODUCTION AUSTRALIA INC.

WELL COMPLETION REPORT

WIRRAH-2

INTERPRETIVE DATA

VOLUME II

GIPPSLAND BASIN

VICTORIA

ESSO AUSTRALIA LIMITED

Compiled by: J. ROCHE

JUNE, 1984

WIRRAH-2

WELL COMPLETION REPORT

VOLUME II

WIRRAH-2

WELL COMPLETION REPORT

VOLUME II

(Interpretative Data)

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INTRODUCTION

Wirrah is a fault controlled anticline, located between the Snapper and Seahorse structures. Wirrah-1, a crestal well at the top of the Latrobe Group intersected eight hydrocarbon zones within the Latrobe Group. Wirrah-2 located 1km to the northeast of Wirrah-1 was designed to assess the northern upthrown fault block of the structure, in particular the lateral extent of the Zone 6, 7 (L3, 4) oil discovered in Wirrah-1. Wirrah-2 intersected the top of Latrobe Group gas-oil accumulation, and the N-2 oil accumulation, but failed to extend the intra-Latrobe Group oil accumulations (Zones N3, L1-L4 and T-1) to the upthrown fault block.

The well was programmed to be drilled to -3500m, but due to lack of porosity and shows, the well was terminated at -3063m.

PREVIOUS DRILLING HISTORY

Wirrah-1, drilled September-December 1982, is located 1km southwest of Wirrah-2. Wirrah-1 encountered eight hydrocarbon zones within the Latrobe Group. Additional cut and fluorescence in cuttings and sidewall cores in non-net conglomerate and deep intra-Latrobe Group sediments was found to a total depth of -3005 metres.

GEOLOGICAL ANALYSIS

Structure

Post-drill mapping of the Wirrah area is consistent with the pre-drill interpretation. The feature is a fault controlled anticline approximately 2.5km x 3km.

The height of closure on top of the "coarse clastics" is approximately 54 metres. Closure increases with depth, and at the Middle *M. diversus* seismic marker level is interpreted to be approximately 100 metres. Two east-west trending normal faults cut this level and have throws of up to 25 metres. The correlation between Wirrah-1 and Wirrah-2 indicates that during deposition of the lower part of the Latrobe Group, there was significant growth on these faults, as evidenced by the fact that Wirrah-2 intersected a thinner *T. longus* sequence, and reached a total depth in sediments much older than penetrated in Wirrah-1. The thinning of the Late Cretaceous sediments between Wirrah-1 and Wirrah-2 and the absence of sediments older than *T. lilliei* in Wirrah-1 suggests alternatively that Wirrah-2 may lie close to a structural high of Late Cretaceous age.

An alternative to either of the above may be a pulse faulting mechanism involving two separate periods of deformation. The first period of rifting related to the opening of the Tasman may have initiated a series of normal NW-SE faults at about the T. longus zone (Upper Cretaceous to Early Paleocene). Greater subsidence on the downthrown block relative to the upper block, produced a thicker T. lilliei/T. longus zone in Wirrah-1. A later and separate period of faulting associated with the continuing opening of the Southern Ocean may have occurred from the Late Paleocene to Early Eocene, explaining the displacement of the M. diversus coals, and the relative inability to correlate below the M. diversus seismic marker.

Stratigraphy

Stratigraphic Summary

AGE	UNIT/HORIZON	DEPTH PREDICTED mKB	DEPTH DRILLED mKB	DEPTH DRILLED mSS	THICKNESS m
Pleistocene to Middle Miocene	Gippsland Limestone (Sea Floor)	71	71	50	1226
Early Miocene to Late Oligocene	Lakes Entrance Formation	1323	1297	1276	191
Late Eocene	LATROBE GROUP Gurnard Formation	1491	1488	1467	23
	"Coarse Clastics"		1511	1490	1573+
Late Cretaceous	TOTAL DEPTH	3521	3084	3063	

Wirrah-2 intersected a comparable stratigraphic sequence to that seen in Wirrah-1 from the top of the Latrobe Group to the top of the T. lilliei interval. However, below the T. lilliei, Wirrah-2 intersected a sequence of older Latrobe Group sediments not seen in Wirrah-1.

Wirrah-2 contains a continuous sequence of sediments from at least the Late Cretaceous T. lilliei zone to the Late Eocene Middle N. asperus zone. The only period of non-deposition is represented by a major unconformity of 9 million years, covering most of the Oligocene P. tuberculatus zone, which occurs between the Lakes Entrance and Latrobe Group Gurnard Formations.

A moderately thick 23 metre section of the nearshore shallow marine sediments is represented by the Gurnard Formation. In Wirrah-2 it consists of glauconitic rich siltstone and abundant pyrite, and is interpreted to be Middle N. asperus age.

Dinoflagellates occur within the top 19 metres of the reservoir "coarse clastics" from -1492 to -1511.5 metres, and is interpreted to be a prograding shoreface surface. The sand culminates in a coarse grained and clean blocky sand body, producing high quality reservoir sands of a beach environment.

From below the Lower N. asperus reservoir unit to the Upper M. diversus seismic marker, a typical Latrobe braided stream fluvial sedimentation occurs which produce a series of stacked thick sandstone units, interbedded with shales and coals. From the Upper M. diversus Seismic Marker to the top of the Upper L. balmei zone, the high sand to shale ratio remains fairly consistent at approximately 70%, compared to an average of 40% for the equivalent section seen in Wirrah-1. The number of thin coal beds below the main M. diversus coal markers is higher in Wirrah-2 than in Wirrah-1. The higher sand and coal volumes seen in Wirrah-2, may suggest that Wirrah-2 is closer to the sediment source. This ties in with Wirrah-2 being closer to the bounding fault, which was active up until the Late-Middle Eocene.

The Lower L. balmei section consists of interbedded sands and shales. The sediments in the upper part of the T. longus zone consists of relatively thicker shales compared to the zones above, interbedded with delta plain stream sands and minor coals.

Throughout the Lower L. balmei to T. longus section, a series of interpreted volcanics were penetrated . The occurrence of volcanics between -2240m and -2320m and -2500m and -2560m is reflected by relatively high total alteration index values, and the relative lack of total organic matter within the zone.

Below the volcanics, Wirrah-2 penetrated a similar lithological conglomerate section first encountered in Wirrah-1, however, the conglomerate is interbedded with thick sandstone/siltstone units, ranging from 20 to 80 metres thick. It is interpreted that these conglomerates were probably deposited in alluvial fan complexes sourced from the Strzelecki Terrace in the north and fanning out in the basin over the north bounding fault (interpreted to be normal during deposition but now a reverse fault due to later compression probably in the Oligocene to Miocene).

The conglomerate is composed of sandstone, siltstone, broken quartzite pebbles, basalt, chert, and dolomitic siltstone in a feldspathic sandstone matrix with siliceous calcareous cements. The higher proportion of sandstone and siltstone within the conglomerate interval tends to support the idea that there is an association between the rate of sedimentation and the syndepositional basin margin faulting 1km north of Wirrah-2.

Below T. lilliei, Wirrah-2 intersected a sequence of older Latrobe Group rocks not seen in Wirrah-1, which at total depth are dated by the A. distocarinatus zonule.

Due to lack of hydrocarbon shows, porosity and associated overpressure, Wirrah-2 was terminated above the proposed total depth.

HYDROCARBONS

Wirrah-1 intersected eight hydrocarbon zones. However, the accumulations at the top of the Latrobe Group "coarse clastics" (N-1 and N-2 Zones), where the only two zones intersected in Wirrah-2. At the top of the N-1 Zone, the structure is interpreted to be full to spill point with gas and an associated thin oil leg.

It is not exactly clear at this stage why no hydrocarbons were penetrated below the Lower N. asperus in Wirrah-2, but is thought to be either stratigraphically or structurally related. The stratigraphic explanation may be that the hydrocarbon bearing sands in Wirrah-1 does not extend to Wirrah-2. Below the M. diversus, the sand:shale ratio is decreased in Wirrah-1, improving the chance of intraformational sealing in the southwest downthrown block.

The structural explanation is that there may be stratigraphic communication between Wirrah-1 and Wirrah-2, however the normal fault separating both wells acts as a sealing fault. The lower sand:shale ratio in the southwest downthrown block compared to the northeast upthrown block, may enhance the possibility of dip and cross seal.

It should be noted that although the equivalent L and T zones in Wirrah-2 were interpreted to be water prone, there is a possibility of having 35 metres updip potential from Wirrah-2.

N-1 Zone:

The N-1 gas zone has been reduced from a net average thickness of 40m in Wirrah-1 to a net average thickness of 19.5m in Wirrah-2. The 19.5m net gas sand extends from the field GOC at -1510m to the top of the "coarse clastics" at -1490.5m. Wirrah-2 intersected the OWC at -1514m, 1.5m deeper than in Wirrah-1. The small difference maybe due to either stratigraphic or structural anomalies, or a combination of both.

N-2 Zone:

Log analysis in Wirrah-2 indicates the presence of oil over the interval -1568.75m to -1569m, with -1569m being an OWC. Other evidence that supports the presence of oil is that a sidewall core recovered from -1569.9m exhibited 80% even dull yellow cut fluorescence, with moderately blue yellow cut residue. An RFT at -1569m recovered filtrate, in which water analysis indicates reservoir fluids were not recovered, making the test inconclusive. The N-2 zone in Wirrah-1 extends from an inferred OWC at -1569m to -1553m, and has an average 1.75m net sand.

Hydrocarbon shows from cuttings and sidewall cores were consistently seen throughout the entire conglomeratic section.

GEOPHYSICAL ANALYSIS

Mapping over Wirrah was based on a 1km grid of G81A and migrated G80A lines, and three additional G82B lines. All these data were available for the initial mapping prior to drilling Wirrah-1. Data quality is good down to and including the Middle M. diversus seismic marker.

The top of the Latrobe Group in Wirrah-2 was penetrated at -1467m, 3 metres high to prediction. After examination of synthetic seismic traces for Wirrah-1 and Wirrah-2, the reflector mapped as the top of Latrobe was interpreted to originate from the top of "coarse clastics". Subsequently, the value of the seismic lag was redefined as 13ms. Velocities for the top of "coarse clastics" were reinterpreted from scattergrams and smoothed in both in-line and cross-line directions. The resultant velocity grid differs only slightly from the previous interpretation. Remapping of the "coarse clastics" was subsequently carried out using the modified lag and a constant conversion factor to tie the wells.

The top of the Middle M. diversus coal was intersected at -1828m in Wirrah-2, 1% high to the predicted depth of -1846m. The depth to the Middle M. diversus seismic marker was remapped by isopaching down from the revised top of "coarse clastics" map, using a constant interval velocity of 2900 ms^{-1} derived from Wirrah-1 and 2 velocity data.

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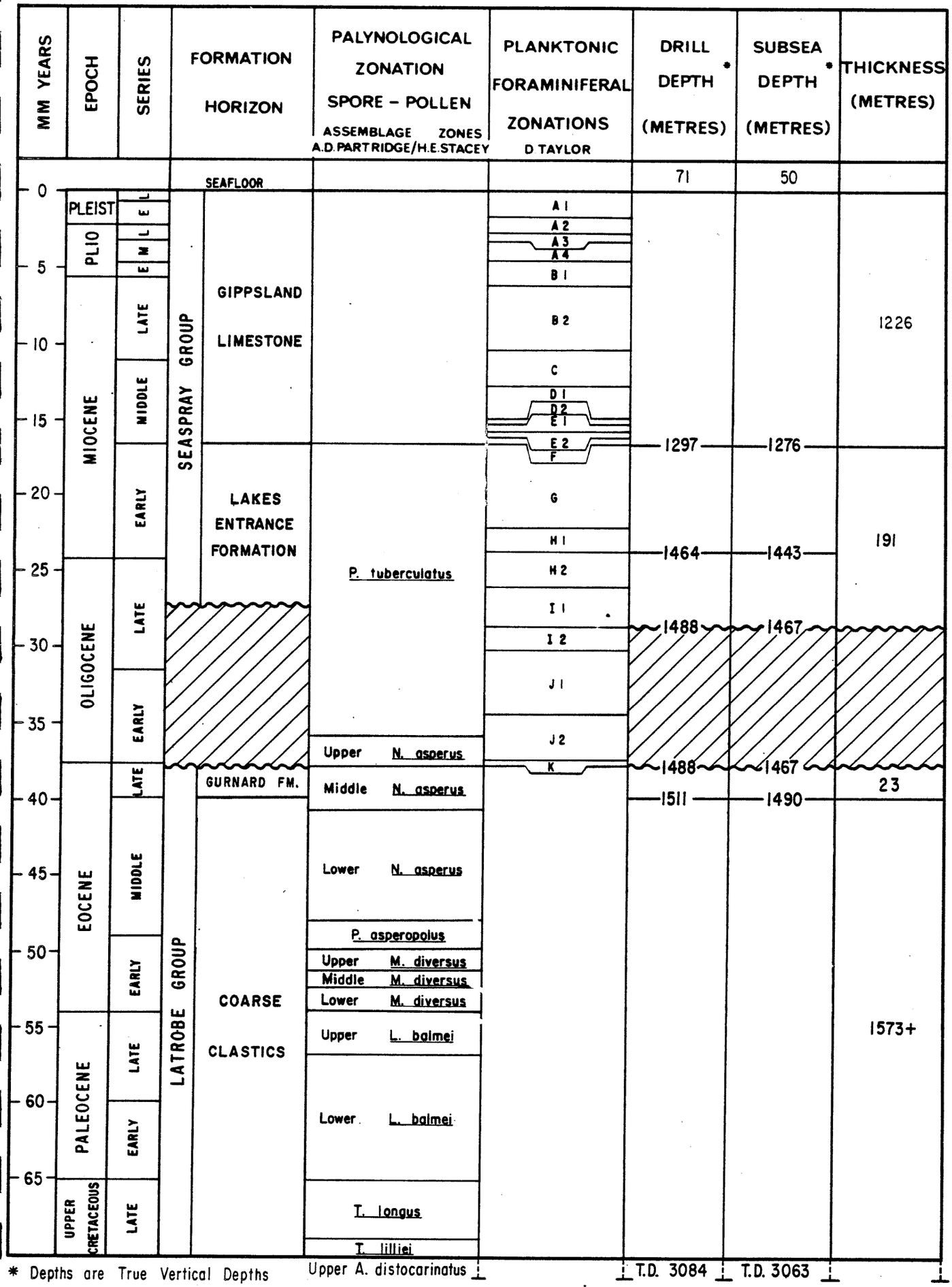
FIGURES

WIRRAH-2

STRATIGRAPHIC TABLE



* Depths are True Vertical Depths

Base Dwg. 1107/OP/149

Dwg. 2173/OP/1

APPENDIX 1

APPENDIX 1

Micropalaeontological Analysis

FORAMINIFERAL ANALYSIS OF WIRRAH-2, GIPPSLAND BASIN.

by

M.J. Hannah.

Esso Australia Ltd.
Palaeontology Report 1983/22.
0503L

June 1983.

PART 1

INTERPRETATIVE DATA

INTRODUCTION

Sidewall core samples from Wirrah-2 range in age from Zone H1 to Zone D. (early Early Miocene to Middle Miocene) a very similar pattern to that obtained in Wirrah-1 (Rexilius 1983).

Because of extensive caving at the base of the Lakes Entrance Formation/Top of Latrobe Group no sidewall cores were able to be taken over this critical interval therefore cuttings have been examined. Ages obtained from these samples are, however, inconclusive. Lithological evidence suggests that the top of Latrobe boundary occurs within the 5m. interval between 1485.0m and 1490.0m.

TABLE 1, GEOLOGICAL SUMMARY - WIRRAH 2.

sea floor			
Middle Miocene	GIPPSLAND LIMESTONE	Preservation deteriorating. Abundant bryozoal remains, sponge spicules and echinoid spines.	Zone D (840.14m to 1179.37m)
Late Early Miocene			Zone F (1249.01m to 1271.19m)
Early Miocene	LAKES ENTRANCE FORMATION	Increasing amount of carbonate	Zone G (1313.99m to 1456.63m)
Early Early Miocene		Sandy, glauconitic at base	Zone H 1 (1463.65m)
between 1485 and 1490m			
Early Oligocene or older	? GURNARD FORMATION	Dominately glauconite	Minimum age ZONE J2
between 1505 and 1510m			
	LATROBE COARSE CLASTICS		
TD 3084.0m			

GEOLOGICAL COMMENTS

1. TOP OF LATROBE

Caving across the top of Latrobe Group makes the exact placement of the Latrobe Group/Lakes Entrance Formation boundary almost impossible. Lithological examination of the washed residues of cuttings between 1510.0m and 1480.0m suggests that the boundary lies within the five metre interval between 1485.0m and 1490.0m. This conclusion is derived from the amount of glauconite in washed residues.

The sample from 1510.0m to 1505.0m is a fine grained quartz sand containing less than 5% glauconite. Upsection, glauconite levels increase reaching 40-50% between 1485.0 and 1490.0m suggesting that this sample is largely from the Gurnard Formation. In the next sample (from 1480.0m to 1485.0m,) glauconite levels decrease sharply (Basal Lakes Entrance Formation). Continuing upsection glauconite levels quickly drop away to Zero. At the same time the carbonate content of samples increase.

The ages of the cuttings are imprecise due to the swamping by downhole contamination. Samples from above the top of the Latrobe Group are of indeterminate age whereas those from below this level are assigned a minimum age of J2 (Early Oligocene).

2. COMPARISON WITH WIRRAH-2.

For the most part the age determinations reported here are identical with Wirrah-1, there are two exceptions:

a) the thickness of H1 (Early Miocene) is thinner in Wirrah-2 than in Wirrah-1, this is probably due to :
   1) better sidewall core control in Wirrah-2, and
   2) difficulty in consistantly separating Globigerinoides quadrilobatus trilobus and Globigerina woodi connecta.

b) The lack of Zone C in Wirrah-2 is due to the non-recognition of Globorotalia miotumida miotumida. Supporting evidence for the absence of this zone is the recognition of Globorotalia fosi peripheroronda up to the topmost sample examined.

BIOSTRATIGRAPHY

1. Preservation.

In the lowest part of the marine section of Wirrah-2 (Zones Hl to F) is, in general, very good. Both the planktonic and benthonic assemblages obtained from samples within this interval are quite diverse. Unfortunately this situation does not continue up section. Above Zone F the carbonates become increasingly recrystalised, preservation and yield deteriorates and zonal assignments become more difficult.

2. Zonal determination.

Zone J2 (Early Oligocene) or older, cuttings between 1510.0m and 1475.0m.
Planktonic assemblages derived from this interval are well preserved and exceedingly diverse. Unfortunately only Globigerina angiporoides and Globorotalia postcretcea can be considered as not being derived from down-hole contaminants and hence used to derive an age. The presence of these species suggests a minimum age of J2 (Early Oligocene). A painstaking search for species such Globigerina linaperta which would have further refined the age determination was unsuccessful.

Zone Hl (early Early Miocene), SWC 12 (1463.65m).
The presence in this single sample of Globigerina woodi connecta without Globigerinoides quadrilobatus trilobus is indicative of an Early Miocene (Hl) age. The sample yielded a moderately diverse assemblage including Globorotalia obesa, Globorotalia opima nana and Catapsyderax dissimilis.

Zone G (Early Miocene), SWC 13 (1456.63m) to SWC 20 (1313.99m).
The appearance of Globigerina quadrilobatus trilobus in sidewall core 13 at 1456.63m marks the base of a thick (150m) sequence of Zone G age sediments. Preservation throughout the interval is very good and planktonic diversity is moderate to high. As expected Catapsyderax dissimilis is confined to the base of the sequence. SWC 20 at 1313.99m is unusual in the number of specimens of Globoquadrina dehiscens present. This species which normally only makes up a small proportion of an assemblage is here the most dominant planktonic form. Both the ss and sl forms are present.

Zone F (late Early Miocene), SWC 21 (1271.19m) to SWC 22 (1249.01m).
Both sidewall cores assigned to this zone contain Globigerinoides sicanus without Praeorbulina glomerosa or either form of Orbulina.

Zone D (Middle Miocene) SWC 23 (1179.37m) to SWC 30 (840.14m).
The presence of Orbulina universa in all remaining sidewall cores without Globorotalia miotumida miotumida is indicative of Zone D. The presence of Globorotalia fosi peripheroronda throughout the interval supports this zonal assignment. Restricted to this interval is Globorotalia praemenardii which Taylor has reported to be extinct by D1 time. However, because of the thickness of the interval (340.0m) one is hesitant to assign it all to D2: suggesting instead that this species ranges higher than previously thought.

MICROPALEONTOLOGICAL DATA SHEET

BASIN: GIPPSLAND ELEVATION: KB: 21.0 GL: -50.0

WELL NAME: WIRRAH-2 TOTAL DEPTH: 2375.0

AGE		FORAM. ZONULES	HIGHEST DATA					LOWEST DATA				
			Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
PLEISTOCENE		A_1										
		A_2										
PLIOCENE		A_3										
		A_4										
MIOCENE	LATE	B_1										
		B_2										
		C										
	MIDDLE	D_1										
		D_2	840.14	2				1179.37	1			
		E_1										
		E_2										
	EARLY	F	1249.01	0				1271.19	0			
		G	1313.99	1				1456.63	0			
		H_1	1463.65	1				1463.65	1			
OLIGOCENE	LATE	H_2										
		I_1										
		I_2										
	EARLY	J_1										
		J_2										
EOCENE		K										
		Pre-K										

COMMENTS: Cuttings from 1485.0m to 1510.0m are assigned a minimum age of J2.

The lack of Zone E is probably a result of a sample gap.

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: M.J. Hannah. DATE: 24th June, 1983.

DATA REVISED BY: _____ DATE: _____

TABLE 2, INTERPRETATIVE DATA WIRRAH-2.

SIDEWALL CORE NO.	DEPTH (M)	MICROFOSSIL YIELD	MICROFISSIL PRESERVATION	PLANKTON DIVERSITY	ZONE (RATING)	AGE
SWC 30	840.14	Moderate	Poor	Low	D(2)	Middle Miocene
SWC 29	871.19	Very Low	Very Poor	Low	D(2)	Middle Miocene
SWC 28	933.88	Very Low	Very Poor	Low	D(2)	Middle Miocene
SWC 27	975.03	Very Low	Very Poor	Very Low	D(2)	Middle Miocene
SWC 26	1029.27	Very Low	Very Poor	Very Low	D(2)	Middle Miocene
SWC 25	1073.85	Very Low	Very Poor	Low	D(2)	Middle Miocene
SWC 24	1134.54	Moderate	Moderate	Low	D(1)	Middle Miocene
SWC 23	1179.37	Moderate	Poor	Low	D(1)	Middle Miocene
SWC 22	1249.01	High	Good	Moderate	F(0)	Early Miocene
SWC 21	1271.19	High	Very Good	High	F(0)	Early Miocene
SWC 20	1313.99	High	Very Poor	Moderate	G(1)	Early Miocene
SWC 19	1380.61	Moderate	Poor	Moderate	G(1)	Early Miocene
SWC 18	1431.98	High	Good	High	G(0)	Early Miocene
SWC 17	1441.85	High	Good	High	G(0)	Early Miocene
SWC 15	1450.67	Moderate	Good	High	G(0)	Early Miocene
SWC 14	1459.57	High	Good	Moderate	G(1)	Early Miocene
SWC 13	1456.63	High	Moderate	Moderate	G(0)	Early Miocene
SWC 12	1463.65	High	Moderate	Moderate	H1(1)	Early Miocene
CTS	1465.0-1470.0	High	Good	Moderate	?	Indeterminate
CTS	1470.0-1475.0	High	Good	Moderate	?	Indeterminate
CTS	1475.0-1480.0	High	Very Good	High	?	No younger than J2 (Early Oligocene)
CTS	1480.0-1485.0	High	Good	High	?	Indeterminate
CTS	1485.0-1490.0	High	Good	High	?	No younger than J2 (Early Oligocene)
CTS	1495.0-1500.0	High	Good	High	?	No younger than J2 (Early Oligocene)
CTS	1505.0-1510.0	High	Good	High	?	Indeterminate

BASIC DATA

SUMMARY TABLE

RANGE CHART

TABLE 2, INTERPRETATIVE DATA WIRRAH-2.

SIDEWALL CORE NO.	DEPTH (M)	MICROFOSSIL YIELD	MICROFOSSIL PRESERVATION	PLANKTON DIVERSITY
SWC 30	840.14	Moderate	Poor	Low
SWC 29	871.19	Very Low	Very Poor	Low
SWC 28	933.88	Very Low	Very Poor	Low
SWC 27	975.03	Very Low	Very Poor	Very Low
SWC 26	1029.27	Very Low	Very Poor	Very Low
SWC 25	1073.85	Very Low	Very Poor	Low
SWC 24	1134.54	Moderate	Moderate	Low
SWC 23	1179.37	Moderate	Poor	Low
SWC 22	1249.01	High	Good	Moderate
SWC 21	1271.19	High	Very Good	High
SWC 20	1313.99	High	Very Poor	Moderate
SWC 19	1380.61	Moderate	Poor	Moderate
SWC 18	1431.98	High	Good	High
SWC 17	1441.85	High	Good	High
SWC 15	1450.67	Moderate	Good	High
SWC 14	1459.57	High	Good	Moderate
SWC 13	1456.63	High	Moderate	Moderate
SWC 12	1463.65	High	Moderate	Moderate
CTS	1465.0-1470.0	High	Good	Moderate
CTS	1470.0-1475.0	High	Good	Moderate
CTS	1475.0-1480.0	High	Very Good	High
CTS	1480.0-1485.0	High	Good	High
CTS	1485.0-1490.0	High	Good	High
CTS	1495.0-1500.0	High	Good	High
CTS	1505.0-1510.0	High	Good	High

PE905528

This is an enclosure indicator page.
The enclosure PE905528 is enclosed within the container PE902600 at this location in this document.

The enclosure PE905528 has the following characteristics:

ITEM_BARCODE	= PE905528
CONTAINER_BARCODE	= PE902600
NAME	= Dinoflagellates Range Chart
BASIN	= GIPPSLAND
PERMIT	= VIC/L2
TYPE	= WELL
SUBTYPE	= DIAGRAM
DESCRIPTION	= Dinoflagellates Range Chart for Gippsland Basin Planktonic Foraminifera (from WCR) for Wirrah-2
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	= 23/07/84
W_NO	= W797
WELL_NAME	= WIRRAH-2
CONTRACTOR	=
CLIENT_OP_CO	= ESSO BHP

(Inserted by DNRE - Vic Govt Mines Dept)

APPENDIX 2

APPENDIX 2

Palynological Analysis

APPENDIX

PALYNOLOGICAL ANALYSIS, WIRRAH-2

GIPPSLAND BASIN

by

M.K. Macphail.

Esso Australia Ltd.,
Palaeontology Report 1983/21.
0456L

6 May, 1983.

INTERPRETATIVE DATA

INTRODUCTION

Eighty (80) sidewall cores, four (4) conventional cores and one cuttings samples were processed and examined for spore-pollen and dinoflagellates. Recovery and preservation was often poor to very poor particularly for samples older than Middle Eocene. This necessitated analysis of several slides per sample to obtain an age-determination.

Palynological zones and lithological facies divisions from the base of the Lakes Entrance Formation to the total depth of the well are given below. Occurrences of spore-pollen and dinoflagellate species are tabulated in the accompanying range charts. In order to facilitate future revisions of the Gippsland Basin Late Cretaceous-Tertiary Zonation, anomalous and unusual occurrences in this and subsequent wells will be listed at the end of the Biostratigraphy Section (see Table 2).

SUMMARY

UNIT/FACIES	ZONE	DEPTH (m)
Lakes Entrance Formation	*P. tuberculatus*	1463.7
	Unsampled interval	
Gurnard Formation?	Middle *N. asperus*	1513.5
Latrobe Group Coarse clastics	Middle *N. asperus*	1515.5 - 1534.5
	Lower *N. asperus*	1590.9 - 1647.4
	P. asperopolus	1694.6
	Upper *M. diversus*	1811.8 - 1828.8
	Middle *M. diversus*	1873.3
	Lower *M. diversus*	1923.0
	Upper *L. balmei*	1946.2 - 2206.8
	Lower *L. balmei*	2254.6 - 2424.9
	Upper *T. longus*	2512.6 - 2630.0
	T. lilliei	2648.9 - 2669.2
	C. triplex	2765.0 - 2838.0
	? Uppermost *A. distocarinatus*	2849.5 - 3067.0

GEOLOGICAL COMMENTS

1. The Wirrah-2 well contains a continuous sequence of sediments from at least the Late Cretaceous T. lilliei Zone to the Late Eocene Middle N. asperus Zone.

2. Because of massive caving, the interval between 1463.7 and 1513.5m was not sampled by sidewall coring and the base of the Lakes Entrance Formation cannot be picked from log characteristics. Foraminiferal data (Hannah 1983) demonstrate the sample at 1463.7m is Early Miocene in age.

3. The sidewall core at 1513.5m, below the caved interval, contains trace amounts of glauconite and has been provisionally picked as the base of the Gurnard Formation. This sample contains a rich upper Middle N. asperus Zone palynoflora. The Gurnard Formation in the Wirrah-1 well is wholly Middle N. asperus Zone in age (Macphail 1983) and a similar situation may be expected to exist in Wirrah-2. Unlike in Wirrah-1, marine sediments of Middle N. asperus Zone age occur below the picked base of the Gurnard Formation.

4. Abundance of dinoflagellates decreases below 1515.5m with the lowest records being found approximately 19m into the Latrobe Group coarse clastics at 1532.4m. This sample is 1m above an exceptionally rich upper Middle N. asperus Zone palynoflora lacking in dinoflagellates (1533.3m). As in Wirrah-1, sediments of Lower N. asperus Zone age were deposited in a fluvial deltaic environment. The highest occurrence of a coal is at 1555m.

5. Only one sample (1694.6m) contained a reliable P. asperopolus Zone palynoflora. This is in contrast with Wirrah-1 (Macphail 1983 ibid) where sediments of P. asperopolus Zone age were exceptionally thick (144m). Thick masses of M. diversus Zone sediments are approximately the same in both wells (118m and 110m respectively). Accordingly, much of the undated section between 1694.6 to 1811.8m may be P. asperopolus Zone in age. Palynomorphs at 1710.6m are swollen, indicating prolonged contact with liquid hydrocarbons and therefore probably differential destruction of less robust species. None of the species recorded in this sample range no higher than the Upper M. diversus Zone.

6. Thicknesses of Paleocene (L. balmei Zone) sediment in Wirrah-2 are greater than in Wirrah-1 (Macphail 1983 ibid) irrespective of whether the lower boundary of the Lower L. balmei Zone is placed at 2424.9m or 2472.4m (see Biostratigraphy Section). The reverse situation occurs in the Late

Cretaceous sections. Here sediments of T. longus and T. lilliei Zone ages are markedly thinner in Wirrah-2 than in Wirrah-1 (117m vs. 370m, 20m vs. 208m respectively). The phenomenon is still apparent if the undated intervals between the T. longus, T. lilliei and C. triplex Zones in Wirrah-2 are assigned T. longus and T. lilliei Zone ages respectively. Unlike Wirrah-1 (2705.0 - 2752.5m), sediments of Lower T. longus Zone age cannot be recognised in Wirrah-2.

7. Sediments of T. pachyexinus and N. senectus Zone ages could not be recognised in the essentially barren interval between 2669.2 and 2765.0m. The former zone has not been recorded to date in the Gippsland Basin and, unlike in the Otway Basin, may not be separable via spore-pollen from the underlying C. triplex Zone. This is not the case with the N. senectus Zone.

8. Thinning of the Late Cretaceous sediments between Wirrah-1 and Wirrah-2 and absence of sediments older than T. lilliei Zone age in Wirrah-1 suggests that the Wirrah-2 well may lie close to a structural high of pre-Campanian age. Because of relatively poor spore-pollen recovery in the Late Cretaceous section in Wirrah-2, it is not possible to say whether deposition has been continuous but slow since the A. distocarinatus Zone (resulting in a condensed N. senectus to Upper T. longus Zone sequence) or whether periods of erosion and non-deposition have occured.

9. The well bottomed in sediments of possible uppermost A. distocarinatus Zone age.

BIOSTRATIGRAPHY

The zone boundaries have been established using the criteria of Dettman & Playford (1969), Stover & Evans (1973), Stover & Partridge (1973) and subsequent revisions. It is noted that published ranges for pre-Maastrichtian Late Cretaceous species are unreliable and the present zonation is in urgent need of revision. Unusual or anomalous occurrences of spore-pollen taxa are ennumerated in Table 2.

? Uppermost Appendicisporites distocarinatus Zone 2927.7 - 3067.0m.
Samples within this interval are characterised by Pilosisporites notensis, a species which is not known to range higher than the A. distocarinatus Zone but which is occasionally found reworked into younger sediments, and Phyllocladidites mawsonii, a species which is not known below the C. triplex Zone. Because of the consistency with which P. mawsonii occurs throughout the

interval it is unlikely to have been caved. Because of relatively poor biostratigraphic information concerning Albian to Santonian palynofloras, the interval is provisionally identified as Uppermost A. distocarinatus Zone in age but may well be C. triplex Zone in age. The zone species Appendicisporites distocarinatus was not recorded, but the absence of angiosperm pollen indicates the interval is unlikely to be younger than C. triplex Zone in age. Otherwise the palynofloras in this and the overlying interval provisionally identified as C. triplex Zone in age consisted of widely ranging Cretaceous species and reworked Paleozoic/Mesozoic species only.

C. triplex Zone 2838.0 - 2765.0m.
The lower boundary of the zone is provisionally placed at 2838.0m, based on the first occurrence of angiosperm pollen (an undescribed Proteacidites sp.) in an assemblage lacking distinctive species restricted to the A. distocarinatus or earlier Zones. Phyllocladidites mawsonii is recorded at 2810.4m and, in association with Amosopollis cruciformis, at 2808.96m. The top of the zone is provisionally placed at 2765.0m, based on the highest occurrence of Amosopollis cruciformis in an assemblage otherwise dominated by long-ranging Late Cretaceous spores and gymnosperm pollen. The adjoining sample, at 2716.9m contains a mixed Paleocene/Late Cretaceous palynoflora including Proteacidites grandis, Haloragacidites harrisii and Proteacidites gemmatus. The zone indicator species, Clavifera triplex was not recorded.

T. lilliei Zone 2669.2 - 2648.9m.
As with the deeper samples within the Late Cretaceous sediments, samples assigned a T. lilliei Zone age are characterised by poorly preserved palynofloras dominated by long-ranging Cretaceous spores and gymnosperm pollen. The base of the zone is placed at 2669.2m, the first occurrence of Gambierina edwardsii, a species which ranges no lower than the T. lilliei Zone. This sample contains abundant Proteacidites and Latrobosporites amplus, a species which first appears in the T. pachyexinus Zone in the Otway Basin. Proteacidites reticuloconcavus, Triporopollenites sectilis occur with frequent Gambierina rudata and Lygistepollenites balmei at 2661.0m, showing the sample is no younger than T. longus Zone in age. The top of the zone is placed at 2648.9m, based on Tricolporites lilliei and Proteacidites reticuloconcavus in an assemblage lacking species restricted to T. longus Zone age or younger sediment.

Upper T. longus Zone 2630.0 - 2512.6m.
The base of the zone is defined by the first appearances of Tricolpites longus and Proteacidites gemmatus in a sparse palynoflora of low diversity at 2630.0m. Stereisporites (Tripunctisporis) punctatus occurs at 2587.2m. This sample is overlain by 75m of essentially barren sandstones and claystones. The top of the zone, at 2512.5m is defined by highest occurrence of the Late Cretaceous species Proteacidites otwayensis in an assemblage containing other relatively large diameter but undescribed Proteacidites species.

Lower L. balmei Zone 2424.9 - 2254.6m.
As with the Late Cretaceous section in Wirrah-2, the Paleocene section comprises essentially barren sediments in which well-preserved or diverse palynofloras are rare. The lower boundary is defined by the first occurrence of frequent Lygistepollenites balmei and Proteacidites gemmatus in an assemblage lacking other distinctive or large Proteacidites spp. (2424.9m). The sample at 2472.4m contains rare L. balmei, P. gemmatus and Stereisporites regium and may be either Lower L. balmei or Upper T. longus Zone in age. Tetracolporites verrucosus, which is also recorded in the Lower L. balmei Zone, occurs at 2373.0m, 2259.4m and, in association with abundant Australepollis obscurus, at 2254.6m.

Upper L. balmei Zone 2206.8 - 1946.2m.
The lower boundary of the zone is defined by the first appearance of Verrucosisporites kopukuensis at 2206.8m. This species in association with common to abundant Lygistepollenites balmei occurs throughout the section up to 2119.0m. Other general L. balmei Zone markers are first recorded in this zone, including Polycolpites langstonii, Tetracolporites multistrixus, Peromonolites densus and common Periporopollenites polyoratus. Gambierina rudata is last recorded at 2160.5m. The top of the zone is provisionally placed at 1946.2m, based on the highest appearance of Lygistepollenites balmei. There is some uncertainty about this age-determination since the sample contains frequent Ischyosporites irregularis, a species which normally first appears in the Lower M. diversus Zone. An alternative upper boundary for the Upper L. balmei Zone is 2119.0m.

Lower M. diversus Zone 1923.0m.
One sample, at 1923.0m, is assigned to this zone, based on the occurrence of Ischyosporites irregularis with other species which first occur in this Lower M. diversus Zone, eg. Ilexpollenites anguloclavatus and Polycolpites esobalteus. Parvisaccites catastus and Basopollis otwayensis occur in the sample.

Middle M. diversus Zone 1873.3m.
The simultaneous first appearance of Intratriporopollenites notabilis, Proteacidites tuberculiformis, P. xestoformis, P. kopiensis, Polypodiaceosporites varus and Beaupreadites verrucosus in an assemblage lacking dinoflagellates, indicates the sample at 1873.3m is no older than Middle M. diversus. Species first appearing in the Upper M. diversus Zone, eg. Myrtaceidites tenuis, Proteacidites pachypolus, P. crassus and Foveotriletes balteus, are absent and the sample is unlikely to be younger than Middle M. diversus.

Upper M. diversus Zone 1811.8 - 1828.8m.
Two samples are assigned to this zone. The lowermost, at 1828.8m contains the first occurrences of Myrtaceidites tenuis, Proteacidites tuberculotumulatus and Foveotriletes balteus as well as taxa that first occur in the Middle M. diversus Zone eg. Anacolosidites acutullus and Proteacidites ornatus. The upper samples, at 1811.8m mostly lacks species characteristic of the Upper M. diversus but is assigned to this unit on the basis of its closer similarity to M. diversus than P. asperopolus Zone palynofloras.

P. asperopolus Zone 1694.6m.
One sample only, at 1694.6m is identified as P. asperopolus Zone in age, based on the first occurrences of Proteacidites pachypolus (frequent in the sample) and P. latrobensis in a Proteacidites - dominated assemblage (38%). The sample contains 26% Nothofagidites pollen which is high for P. asperopolus Zone sediments but well below values recorded in the adjoining sample. Geological considerations indicate the sample at 1710.6m is also P. asperopolus Zone in age (see Geological Comments).

Lower N. asperus Zone 1647.4 - 1590.9m.
The zone is distinguished by common to abundant Nothofagidites together with Proteacidites asperopolus, a species which first appears in the P. asperopolus Zone. The lower boundary of the zone is placed at 1647.4m, based on 39% Nothofagidites and common Proteacidites asperopolus. The upper boundary, at 1590.9m, is defined by the last appearance of P. asperopolus. Tricolpites simatus and Nothofagidites falcatus, which first appear in the Lower N. asperus Zone, occur in this sample. The sample at 1577.2m contains N. falcatus and Proteacidites scitus and is therefore no older than Lower N. asperus Zone in age.

Middle N. asperus Zone 1534.5 - 1513.5m.

The base of the zone is defined by frequent Proteacidites pachypolus in a species rich Nothofagidites - dominant assemblage which lacks Proteacidites asperopolus. The presence of Polycolpites esobalteus, Banksieaeidites elongatus and Tricolpites thomasii shows the sample is no younger than Middle N. asperus Zone in age. The sample also contains the rare species Verrucatosporites attinatus, Ilexpollenites cf. megagemmatus, Cranwellia notodemus and C. costata. The latter two species strongly indicate the sample is upper Middle N. asperus Zone in age. A similar age is demonstrated by occurrences of Proteacidites tuberculatus at 1521.3m and Tricolporites retequetrus at 1533.5, 1521.3 and 1513.5m. Anacolosidites sectus which is restricted to the Middle N. asperus Zone occurs at 1518.5m. The sample at 1513.5m, representing the upper boundary of the zone, contains the zone indicator species, Triorites magnificus. Also present are a large number of species which range no higher than, or are rare above, the Middle N. asperus Zone, eg. Proteacidites pachypolus, P. crassus, P. incurvatus, Santalumidites cainozoicus, Tricolpites thomasii and Beaupreadites trigonalis.
Dinoflagellates are first recorded at 1532.4m but only become common above 1518.9m. This sample and those at 1518.5m and 1513.5m contain frequent to common Vozzhenikova extensis and (1513.5m) Corrudinium corrugatum.

P. tuberculatus Zone 1463.5m.

The occurrence of Cyatheacidites annulatus at 1463.5m confirms a P. tuberculatus Zone age for this level. Dacrycarpidites australiensis is unusually abundant in the sample.

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TABLE - 1 SUMMARY OF PALYNOLOGICAL ANALYSIS, WIRRAH-2, GIPPSLAND BASIN.

INTERPRETATIVE DATA

SAMPLE NO.	DEPTH (m)	YIELD	DIVERSITY SPORE-POLLEN	LITHOLOGY	ZONE	AGE	CONFIDENCE RATING	COMMENTS
114	1463.7	High	Good	Mdst., calc.	P. tuberculatus	Early Miocene	0	C. annulatus
113	1513.5	V. High	Excellent	Ss., tr. glau.	Middle N. asperus	Late Eocene	0	T.magnificus, T.thomasii, V.extensa, C. corrugatum.
112	1515.5	Low	Poor	Ss.	Middle N. asperus	Late Eocene	1	V.extensa, B.verrucosus.
111	1518.9	High	Fair	Ss.	Middle N. asperus	Late Eocene	0	A.sectus, common V.extensa.
110	1521.3	Low	Fair	Ss.	Middle N. asperus	Late Eocene	0	P.tuberculatus, T.retequetrus, P.unicus, C.subtilis, V.extensa.
109	1522.3	V. Low	Poor	Ss.	N. asperus	Eocene	-	
108	1524.4	V. Low	Poor	Ss.	Middle N. asperus	Late Eocene	1	P.pachypolus, abundant Nothofagidites.
107	1530.0	Negligible	Spore pollen	Ss.	Indeterminate	-	-	
106	1532.4	V. Low	Poor	Ss.	N. asperus	Eocene	-	Lowest records of dinoflagellates.
105	1533.5	High	Good	Ss.	Upper Middle N. asperus	Late Eocene	0	T.retequetrus, P.pachypolus, B.verrucosus.
104	1534.5	V. High	Excellent	Ss.	Upper Middle N. asperus	Late Eocene	0	Frequent P.pachypolus, C.costata, C.notodemus, V.attinatus.
103	1548.8	Barren	-	Ss.	-		-	
102	1577.2	V. Low	Poor	Ss.	N. asperus	Eocene	-	C.glarius, P.scitus, D.cf.diwynensis.
101	1590.9	High	Good	Ss.	Lower N. asperus	Middle Eocene	1	P.asperopolus, T.simatus, T.leuros.
100	1598.5	High	Fair	Ss.	Lower N. asperus	Middle Eocene	1	P.asperopolus, abundant Nothofagidites.
99	1630.7	Moderate	Good	Ss.	Lower N. asperus	Middle Eocene	2	Abundant Nothofagidites.
98	1647.4	V. High	Good	Ss.	Lower N. asperus	Middle Eocene	1	39% Nothofagidites, common P.asperopolus and P.pachypolus.

TABLE - 1 SUMMARY OF PALYNOLOGICAL ANALYSIS, WIRRAH-2, GIPPSLAND BASIN.

INTERPRETATIVE DATA

SAMPLE NO.	DEPTH (m)	YIELD	DIVERSITY SPORE-POLLEN	LITHOLOGY	ZONE	AGE	CONFIDENCE RATING	COMMENTS
97	1694.6	High	Fair	Ss.	P. asperopolus	Middle Eocene	2	26% Nothofagidites, 38% Proteacidites, P.pachypolus frequent.
96	1710.6	Low	Fair	Ss.	Indeterminate	Early Eocene	2	M.diversus, hydrocarbon - affected.
95	1761.9	Barren	-	Ss.	-	-	-	
93	1811.8	Moderate	Fair	Ss.	Upper M. diversus	Early Eocene	2	F.balteus, P.ornatus, P.xestoformis.
92	1828.8	High	Good	Ss.	Upper M. diversus	Early Eocene	1	F.balteus, M.tenuis, P.tuberculo-tumulatus, frequent M.diversus.
91	1873.3	High	Excellent	Ss.	Middle M.diversus	Early Eocene	1	P.varus, B.verrucosus, P.xestoformis, P.tuberculiformis.
90	1901.0	Barren	-	Ss.	-	-	-	
89	1923.0	High	Good	Ss.	Lower M.diversus	Early Eocene	2	I.anguloclavatus, I.irregularis, P.esobalteus, P.catastus.
88	1946.2	V. High	Fair	Sist.	Upper L. balmei	Paleocene	2	L.balmei, V.kopukuensis.
87	1984.1	Barren	-	Ss.	-	-	-	
86	2023.3	Negligible Spore pollen		Ss.	Indeterminate	-	-	
85	2052.0	Barren	-	Sistst.	-	-	-	
83	2119.0	Moderate	Low	Mdst.	L. balmei	Paleocene	-	Abundant L.balmei.
82	2146.2	Good	Fair	Mdst.	L. balmei	Paleocene	-	Abundant L.balmei.
153	2160.1	High	Good	Ss., coaly	Upper L. balmei	Paleocene	1	Common L.balmei, V.kopukuensis.
151	2180.0	High	Fair	Ss.	Upper L. balmei	Paleocene	1	Abundant L.balmei, V.kopukuensis.
149	2199.5	V. Good	Fair	Ss.	Upper L. balmei	Paleocene	2	Abundant L.balmei.
148	2206.8	V. High	Low	Sist.	Upper L. balmei	Paleocene	1	Abundant L.balmei, V.kopukuensis.

TABLE - 1 SUMMARY OF PALYNOLOGICAL ANALYSIS, WIRRAH-2, GIPPSLAND BASIN.

INTERPRETATIVE DATA

SAMPLE NO.	DEPTH (m)	YIELD	DIVERSITY SPORE-POLLEN	LITHOLOGY	ZONE	AGE	CONFIDENCE RATING	COMMENTS
147	2221.1	Negligible	Spore pollen	Slst.	Indeterminate	-	-	
Core	2254.6	Moderate	Fair	-	Lower L. balmei	Paleocene	1	T.verrucosus, abundant A.obscurus.
Core	2258.98	Barren	-	-	-	-	-	
143	2259.4	High	Fair	Ss.	Lower L. balmei	Paleocene	1	L.balmei, T.verrucosus, A.obscurus.
142	2263.0	Barren	-	Ss.	-	-	-	
140	2274.3	Barren	-	Slst.	-	-	-	
139	2275.0	Barren	-	Slst.	-	-	-	
138	2281.0	Barren	-	Clyst.	-	-	-	
137	2284.0	Moderate	Fair	Slst.	Indeterminate	-	-	Reworked Middle Cretaceous spore-pollen.
136	2290.9	Barren	-	Mdst.	-	-	-	
135	2295.9	Low	V. Poor	Ss.	L. balmei	-	-	L.balmei, abundant Proteacidites.
134	2301.2	Barren	-	Mdst.	-	-	-	
133	2306.2	Barren	-	Mdst.	-	-	-	
81	2312.1	Barren	-	Mdst.	-	-	-	
79	2337.0	Barren	-	Ss.	-	-	-	
78	2349.6	V. Low	Low	Ss.	Indeterminate	-	-	B.otwayensis.
77	2373.0	Moderate	High	Mdst.	Lower L. balmei	Paleocene	1	Frequent L. balmei, T. verrucosus
75	2422.9	Barren	-	Ss.	-	-	-	
74	2424.9	High	Fair	Ss.	Lower L. balmei	Paleocene	1	Frequent L. balmei, P. gemmatus, S. punctatus
73	2447.0	Barren	-	Mdst.	-	-	-	

TABLE - 1 SUMMARY OF PALYNOLOGICAL ANALYSIS, WIRRAH-2, GIPPSLAND BASIN.

INTERPRETATIVE DATA

SAMPLE NO.	DEPTH (m)	YIELD	DIVERSITY SPORE-POLLEN	LITHOLOGY	ZONE	AGE	CONFIDENCE RATING	COMMENTS
72	2472.2	Moderate	Fair	Ss.	Lower L. balmei/ Upper T. longus		-	P. gemmatus, S. regium, L. balmei
71	2512.6	Moderate	Low	Ss.	Upper T. longus	Maastrichtian	2	S. punctatus, P. otwayensis, L. balmei, S. regium
69	2540.8	Barren	-	Ss	-		-	
68	2545.3	Barren	-	Ss	-		-	
67	2583.4	Barren	-	Clyst.	-		-	
66	2587.2	Low	V. low	Mdst./Ss	Upper T. longus	Maastrictian	2	S. punctatus, G. rudata
64	2630.0	Low	V. low	Slst/Mdst	Upper T. longus	Maastrictian	1	P. gemmatus, T. longus, G. rudata
63	2648.9	Moderate	Fair	Mdst.	T. lilliei	Late Cretaceous	2	T. lilliei, P. reticuloconcavus
62	2661.0	Low	Good	Ss.	T. lilliei	Late Cretaceous	2	G. rudata, P. reticuloconcavus, L. balmei
60	2669.2	Low	Fair	Mdst	T. lilliei	Late Cretaceous	2	G. edwardsii, Late Cretaceous spores
57	2716.9	Moderate	Good	Mdst.	Indeterminate	-	-	Mixed Paleocene & Late Cretaceous palynoflora
52	2773.4	Low	Low	Mdst.	Indeterminate	-	-	Early Upper Cretaceous spores only
30	2792.6	Moderate	Fair	Ss	C. triplex	Late Cretaceous	2	Proteacidites sp., F. assymetricus
Core	2808.96	Low	Good	-	C. triplex	Late Cretaceous	1	P. mawsonii, A. cruciformis, angiosperm pollen absent
Core	2810.41	Moderate	Fair	-	C. triplex	Late Cretaceous	2	P. mawsonii
25	2830.0	Barren	-	Ss	-	-	-	-
24	2838.0	V. low	Low	Ss; carb	C. triplex	Late Cretaceous	2	Proteacidites sp

TABLE - 1 SUMMARY OF PALYNOLOGICAL ANALYSIS, WIRRAH-2, GIPPSLAND BASIN.

INTERPRETATIVE DATA

SAMPLE NO.	DEPTH (m)	YIELD	DIVERSITY SPORE-POLLEN	LITHOLOGY	ZONE	AGE	CONFIDENCE RATING	COMMENTS
20	2849.5	Moderate	Low	Ss./Mdst.	No older than uppermost *A. distocarinatus*	Late Cretaceous	2	*P. notensis*, *P. mawsonii*
14	2891.0	V. low	V. low	Ss.	Indeterminate	-	2	*K. scaberis*, *C. equalis*
12	2905.0	Moderate	Good	Ss./Mdst.	Indeterminate	-	-	*C. australiensis*, *C. ludbrookii*
9	2972.7	Good	Fair	Mdst	No older than uppermost *A. distocarinatus*	Late Cretaceous	-	*P. mawsonii*, *F. assymmetricus*
53	2765.0	V. low	V. low	Mdst	*C. triplex*	Late Cretaceous	2	*A. cruciformis*
8	2985-90	Moderate	Fair	Ss./Mdst.	No older than uppermost *A. distocarinatus*	Late Cretaceous	3	*P. mawsonii*, *C. hughesii*, Late Cretaceous spores & gymnosperm pollen
7	3022.3	Good	Good	Mdst.	No older than uppermost *A. distocarinatus*	Late Cretaceous	2	*P. mawsonii*, *P. notensis* *C. ludbrookii*
6	3034.6	Low	Low	Mdst.	Indeterminate	-	-	Non-diagnostic Late Cretaceous spores & gymnosperm pollen only
4	3049.6	Barren	-	Mdst.	-	-	-	
1	3067.0	Moderate	Fair	Sltst.	No older than uppermost *A. distocarinatus*	Late Cretaceous	2	*P. mawsonii*, *Proteacidites* sp

TABLE 2

ANOMALOUS AND UNUSUAL OCCURRENCES OF SPORE-POLLEN TAXA IN WIRRAH-2

SAMPLE NO.	DEPTH (METRES)	ZONE	TAXON	COMMENTS
SWC 114	1463.7	P. tuberculatus	Rugulatisporites trophus	Although R. trophus extends into the P. tuberculatus Zone, it is not known above the early Oligocene. Foram data indicate the sample is early Miocene.
SWC 114	1463.7	P. tuberculatus	Gleichenilidites magnus	Rare species described by Stough (1969)
SWC 114	1463.7	P. tuberculatus	Proteacidites cf P. cumulus	P. cumulus not recorded outside W.A.
SWC 113	1513.5	Middle N. asperus	Gyrostemanaceae	
SWC 111	1518.9	Middle N. asperus	? Dododaea	Pore lalongate not circular. Possibly Umbelliferae
SWC 110	1521.3	Middle N. asperus	Cyathidites subtilis	Rare below P. tuberculatus Zone
SWC 110	1521.3	Middle N. asperus	Proteacidites unicus	Ms species (Harris)
SWC 110	1521.3	Middle N. asperus	Proteacidites truncatus	Rare below P. tuberculatus Zone
SWC 105	1533.5	Middle N. asperus	Tricolporites retequetrus	Tetrad with individual units of ca. 70m
SWC 104	1534.5	Middle N. asperus	Cranwellia notodemus, C. costate	Rare species not known outside Middle N. asperus Zone. C. costata is restricted to the Plio-Pleistocene in N.Z.
SWC 104	1534.5	Middle N. asperus	Tricolpites reticulatus (Cookson)	Possibly conspecific with Late Cretaceous species T.
SWC 104	1534.5	Middle N. asperus	Tricolporites aff T. geraniodes	New species with sculpturing analogous to Proteacidites confragosus
SWC 102	1577.2	Lower N. asperus?	Clavatipollenites glarius	Rare species homologous with modern N.Z. species Ascarina lucida. See Stover & Partridge 1982.
SWC 101	1590.9	Lower N. asperus	Proteacidites callosus (Cookson)	Very rare species. Second record in Gippsland wells
SWC 101	1590.9	Lower N. asperus	Triporopollenites apiculatus	Rare species (ms?)
SWC 98	1647.4	P. asperopolus	Astelia	Echinate monosulcate type analogous with Astelia (Liliaceae)

TABLE 2

ANOMALOUS AND UNUSUAL OCCURRENCES OF SPORE-POLLEN TAXA IN WIRRAH-2

SAMPLE NO.	DEPTH (METRES)	ZONE	TAXON	COMMENTS
SWC 98	1647.4	P. asperopolus	Tricolporites sp. nov.	Similar to prolate T. retequetrus but exine punctate - reticulate across pole. Differs from Rhoipites pilatus (N.Z.) in that widest diameter lumina are confined to equatorial not polar regions.
SWC 98	1647.4	P. asperopolus	Tricolpites gigantis	ms species (Macphail). Similar to "T. enormus", ms species (Mulholland & Evans 1970)
SWC 93	1811.8	Upper M. diversus	Cicatricosisporites australiensis (frequent)	Late Cretaceous species
SWC 92	1828.8	Upper M. diversus	Tricolpites circumlumenus (sp.nov)	Ms sp. (Macphail). Reticulate, lumina circular to elliptical; name derived from Lycopodiumsporites circumlumenus.
SWC 92	1828.8	Upper M. diversus	Proteacidites reticulatus	Very rare below P. tuberculatus Zone
SWC 91	1873.3	Middle M. diversus	Proteacidites santius	Ms sp. (Mulholland & Evans 1970)
SWC 91	1873.3	Middle M. diversus	Tetracolporites multistrixus	Paleocene species extending very rarely into Lower M. diversus Zone
SWC 91	1873.3	Middle M. diversus	Tricolpites reticulatus/waiparensis	Conforms with Late Cretaceous morphotype of T. waiparensis
SWC 89	1923.0	Lower M. diversus	Basopollis otwayensis	Paleocene species
SWC 89	1923.0	Lower M. diversus	Tricolporites adelaidensis	Uncommon below Middle M. diversus Zone
SWC 88	1946.2	Upper L. balmei	Ischyosporites irregularis	Not recorded below Lower M. diversus Zone
SWC 88	1946.2	Upper L. balmei	Tricolporites moultonii	Not recorded below Lower M. diversus Zone (Middle M. diversus Zone in Bass Basin)

TABLE 2

ANOMALOUS AND UNUSUAL OCCURRENCES OF SPORE-POLLEN TAXA IN WIRRAH-2

SAMPLE NO.	DEPTH (METRES)	ZONE	TAXON	COMMENTS
SWC 82	2146.2	Upper *L. balmei*	*Tricolporites* cf *adelaidensis*	See above (SWC 89)
SWC 153	2160.5	Upper *L. balmei*	*Banksieacidites arcuatus*	Not recorded below upper Lower *M. diversus* Zone
SWC 153	2160.5	Upper *L. balmei*	*Polycolpites* cf *langstonii*	Markedly small var. of *P. langstonii*
SWC 151	2180.0	Upper *L. balmei*	*Tricolpites* cf *T. gigantis*	See above (SWC 98)
Core	2254.6m	Lower *L. balmei*	*Tricolpites reticulatus* (Stover & Evans	In *Australopollis obscurus* dominated palynoflora
SWC 77	2373.0	Lower *L. balmei*	*Proteacidites otwayensis*	Not previously recorded in post Late Cretaceous sediment
SWC 74	2425.0	Lower *L. balmei*	*Camarozonosporites bullatus*	Rare species
SWC 74	2425.0	Lower *L. balmei*	*Proteacidites gemmatus*	Specimen with tuberculate sculpturing

BASIC DATA

Table 3 - Palynological Data

Range Chart - Dinoflagellates ✓

Range Chart - Spore pollen ? where

TABLE - 3 SUMMARY OF PALYNOLOGICAL ANALYSIS, WIRRAH-2, GIPPSLAND BASIN.

BASIC DATA

SAMPLE NO.	DEPTH (m)	YIELD	DIVERSITY SPORE-POLLEN	LITHOLOGY
114	1463.7	High	Good	Mdst., calc.
113	1513.5	V. High	Excellent	Ss., tr. glau.
112	1515.5	Low	Poor	Ss.
111	1518.9	High	Fair	Ss.
110	1521.3	Low	Fair	Ss.
109	1522.3	V. Low	Poor	Ss.
108	1524.4	V. Low	Poor	Ss.
107	1530.0	Negligible Spore pollen		Ss.
106	1532.4	V. Low	Poor	Ss.
105	1533.5	High	Good	Ss.
104	1534.5	V. High	Excellent	Ss.
103	1548.8	Barren	-	Ss.
102	1577.2	V. Low	Poor	Ss.
101	1590.9	High	Good	Ss.
100	1598.5	High	Fair	Ss.
99	1630.7	Moderate	Good	Ss.
98	1647.4	V. High	Good	Ss.
97	1694.6	High	Fair	Ss.
96	1710.6	Low	Fair	Ss.
95	1761.9	Barren	-	Ss.
93	1811.8	Moderate	Fair	Ss.
92	1828.8	High	Good	Ss.
91	1873.3	High	Excellent	Ss.
90	1901.0	Barren	-	Ss.
89	1923.0	High	Good	Ss.
88	1946.2	V. High	Fair	Slst.
87	1984.1	Barren	-	Ss.
86	2023.3	Negligible Spore pollen		Ss.
85	2052.0	Barren	-	Slstst.
83	2119.0	Moderate	Low	Mdst.
82	2146.2	Good	Fair	Mdst.

TABLE - 3 SUMMARY OF PALYNOLOGICAL ANALYSIS, WIRRAH-2, GIPPSLAND BASIN.

BASIC DATA

SAMPLE NO.	DEPTH (m)	YIELD	DIVERSITY SPORE-POLLEN	LITHOLOGY
153	2160.1	High	Good	Ss., coaly
151	2180.0	High	Fair	Ss.
149	2199.5	V. Good	Fair	Ss.
148	2206.8	V. High	Low	Slst.
147	2221.1	Negligible Spore pollen		Slst.
Core	2254.6	Moderate	Fair	-
Core	2258.98	Barren	-	-
143	2259.4	High	Fair	Ss.
142	2263.0	Barren	-	Ss.
140	2274.3	Barren	-	Slst.
139	2275.0	Barren	-	Slst.
138	2281.0	Barren	-	Clyst.
137	2284.0	Moderate	Fair	Slst.
136	2290.9	Barren	-	Mdst.
135	2295.9	Low	V. Poor	Ss.
134	2301.2	Barren	-	Mdst.
133	2306.2	Barren	-	Mdst.
81	2312.1	Barren	-	Mdst.
79	2337.0	Barren	-	Ss.
78	2349.6	V. Low	Low	Ss.
77	2373.0	Moderate	High	Mdst.
75	2422.9	Barren	-	Ss.
74	2424.9	High	Fair	Ss.
73	2447.0	Barren	-	Mdst.
72	2472.2	Moderate	Fair	Ss.
71	2512.6	Moderate	Low	Ss.
69	2540.8	Barren	-	Ss
68	2545.3	Barren	-	Ss
67	2583.4	Barren	-	Clyst.
66	2587.2	Low	V. low	Mdst./Ss
64	2630.0	Low	V. low	Slst/Mdst

TABLE - 3 SUMMARY OF PALYNOLOGICAL ANALYSIS, WIRRAH-2, GIPPSLAND BASIN.

BASIC DATA

SAMPLE NO.	DEPTH (m)	YIELD	DIVERSITY SPORE-POLLEN	LITHOLOGY
63	2648.9	Moderate	Fair	Mdst.
62	2661.0	Low	Good	Ss.
60	2669.2	Low	Fair	Mdst
57	2716.9	Moderate	Good	Mdst.
52	2773.4	Low	Low	Mdst.
30	2792.6	Moderate	Fair	Ss.
Core	2808.96	Low	Good	-
Core	2810.41	Moderate	Fair	-
25	2830.0	Barren	-	Ss
24	2838.0	V. low	Low	Ss; carb
20	2849.5	Moderate	Low	Ss./Mdst.
14	2891.0	V. low	V. low	Ss.
12	2905.0	Moderate	Good	Ss./Mdst.
9	2972.7	Good	Fair	Mdst
53	2765.0	V. low	V. low	Mdst
8	2985-90	Moderate	Fair	Ss./Mdst.
7	3022.3	Good	Good	Mdst.
6	3034.6	Low	Low	Mdst.
4	3049.6	Barren	-	Mdst.
1	3067.0	Moderate	Fair	Sltst.

PALYNOLOGY DATA SHEET

BASIN: GIPPSLAND ELEVATION: KB: 21m GL: 37m

WELL NAME: WIRRAH-2 TOTAL DEPTH:

AGE	PALYNOLOGICAL ZONES	HIGHEST DATA					LOWEST DATA				
		Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
NEOGENE	*T. pleistocenicus*										
	M. lipsis										
	C. bifurcatus										
	T. bellus										
PALEOGENE	*P. tuberculatus*	1463.7	0				1463.7	0			
	Upper *N. asperus*										
	Mid *N. asperus*	1513.5	0				1534.5	0			
	Lower *N. asperus*	1590.9	1				1647.4	1			
	P. asperopolus	1694.6	2				1694.6	1			
	Upper *M. diversus*	1811.8	2	1828.8	1		1828.8	1			
	Mid *M. diversus*	1873.3	1				1873.3	1			
	Lower *M. diversus*	1923.0	2				1923.0	2			
	Upper *L. balmei*	1946.2	2	2119.0	1		2206.8	1			
	Lower *L. balmei*	2254.6	1				2424.9	1			
LATE CRETACEOUS	*T. longus*	2512.6	1				2630.0	1			
	T. lilliei	2648.9	2				2669.2	2			
	N. senectus										
	U. *T. pachyexinus*										
	L. *T. pachyexinus*										
	C. triplex	2765.0	2	2792.6	2		2838.0	2			
	A. distocarinatus	2849.5	2				3067.0	2			
EARLY CRET.	*C. paradoxus*										
	C. striatus										
	F. asymmetricus										
	F. wonthaggiensis										
	C. australiensis										
PRE-CRETACEOUS											

COMMENTS: Samples within the A. distocarinatus Zone are no older than Uppermost A. distocarinatus Zone and possibly C. triplex Zone in age.

CONFIDENCE RATING:

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

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

DATA RECORDED BY: M.K. Macphail DATE: 2 May, 1983.

DATA REVISED BY: DATE:

APPENDIX 3

APPENDIX 3

Quantitative Log Analysis

WIRRAH-2
QUANTITATIVE LOG ANALYSIS

Interval: 1500-3082m KB
Analyst : W.J. Mudge
Date : October, 1983

WIRRAH - 2 QUANTITATIVE LOG ANALYSIS

Wirrah-2 wireline logs have been analysed for effective porosity and water saturation over the interval 1500-3082m KB. Analysis was carried out using a reiterative technique which incorporates hydrocarbon correction to the porosity logs, density-neutron crossplot porosities, a Dual Water saturation relationship, and convergence on a preselected grain density window by shale volume adjustment.

Logs Used and Log Quality

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

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

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

Coals and carbonaceous shales were edited for an output of:

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

Log quality is good.

Analysis Parameters

Apparent shale density and shale neutron porosity values were derived from crossplots of the density and neutron logs. Shale resistivities were read directly from the logs.

The apparent connate water salinities used and the method by which they were obtained will be discussed later in the text.

Table 1 summarises the analysis parameters.

Shale Volume

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

$$VSH = \frac{GRlog - GRmin}{GRmax - GRmin} \qquad - 1$$

Total Porosities

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

$$h = 2.71 - RHOB + NPHI\ (RHOF - 2.71) \qquad - 2$$

if h is greater than 0, then

$$\text{apparent matrix density, } RHOMa = 2.71 - h/2 \qquad - 3$$

if h is less than 0, then

$$\text{apparent matrix density, } RHOMa = 2.71 - 0.64h \qquad - 4$$

$$\text{Total porosity: } PHIT = \frac{RHOMa - RHOB}{RHOMa - RHOF} \quad - 5$$

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

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

Rwb and Swb were calculated using the following relationships:

$$Rwb = \frac{RSH * PHITSH^m}{a} \quad - 6$$

where PHITSH = total porosity in shale from density-neutron crossplots.
RSH = Rt in shales.

$$Swb = \frac{VSH * PHITSH}{PHIT} \quad - 7$$

Free Water Resistivities (Rw) and Salinities

Apparent free water resistivities and salinities were calculated using the following relationships:

$$Rw = \frac{Rt * PHIT^m}{a} \quad - 8$$

where a = 1, m = 2, and PHIT = total porosity determined from density-neutron logs using equations 2 and 3.

$$\text{Salinity (ppm)} = \left[\frac{300,000}{Rw(Ti + 7) - 1}\right]^{1.05} \quad - 9$$

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

It should be emphasised that the calculated salinities are apparent salinities. It is not absolutely essential that true free water salinities be used in water saturation calculations for the following reasons:

(a) in order to obtain true free water salinities appropriate a and m values must be known or obtained and this data is generally not available.

(b) the calculated water saturation values using the apparent salinities are virtually the same as those obtained using true salinities as long as the appropriate a, m and n are used in the calculations.

The sands in the interval 1500 - 1930m have been subjected to fresh water flushing making precise determination of apparent free water salinities difficult. The apparent salinities in the water bearing sands are very variable. They not only vary from sand to sand but also within individual sand intervals. An attempt was made to "normalise" the variable salinities within the sand intervals by using the following relationship:

$$Rw = \frac{Ro * PHIT^m * Rwb\ (Swb - 1)}{Ro * PHIT^m * (Swb - Rwb)} \quad -10$$

where Ro = Rt in water bearing sands

and salinities were calculated using equation 9. The salinities were then averaged for each sand. As for the hydrocarbon bearing zones within the interval the apparent free water salinities (or connate water salinities) were taken to be the salinities of the sands, below the limit of fresh water flushing. The adjacent fresh water aquifer salinities were not used in the saturation calculations for the following reasons:

(i) To be consistent with Wirrah-1 ie. water saturations obtained using fresh water salinities in Wirrah-1 tended to be high and inconsistent with hydrocarbon recoveries.

(ii) SP deflections opposite hydrocarbon bearing sands suggest that the free water salinities are higher than the aquifer salinities and probably closer to mud filtrate salinities.

(iii) Hydrocarbon bearing sands calculate to be water bearing if adjacent fresh water aquifer salinities are used.

Free water salinities are summarised in Table 2.

Water Saturations

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

$$\frac{1}{Rt} = SwT^n * \frac{PHIT^m}{aRw} + SwT^{(n-1)} \frac{Swb * PHIT^m}{a} \left[\frac{1}{Rwb} - \frac{1}{Rw}\right] \quad -11$$

and

$$\frac{1}{Rxo} = SwT^n * \frac{PHIT^m}{aRw} + SwT^{(n-1)} \frac{Swb * PHIT^m}{a} \left[\frac{1}{Rwb} - \frac{1}{Rmf}\right] \quad -12$$

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

Hydrocarbon Corrections

Hydrocarbon corrections to the environmentally corrected density and neutron logs were made using the following relationships:

$$RHOBHC = RHOB + 1.07\ PHIT\ (1-SxoT)\ [(1.11-0.15P)\ RHOF - 1.15\ RHOH] \quad -13$$

$$NPHIHC = NPHI + 1.3\ PHIT\ (1-SxoT)\ \frac{RHOF\ (1-P) - 1.5\ RHOH + 0.2}{RHOF\ (1-P)} \quad -14$$

where RHOBHC = hydrocarbon corrected RHOB
NPHIHC = hydrocarbon corrected PHIN
RHOH = hydrocarbon density (0.25 gms/cc for gas, 0.7 gms/cc for oil)
P = mud filtrate salinity in parts per unity

Grain Density

Grain density (RHOG) was calculated from the hydrocarbon corrected density and neutron logs using the following relationships:

$$RHOBC = \frac{RHOBHC - VSH * RHOBSH}{1 - VSH} \quad -15$$

$$NPHIC = \frac{NPHIHC - VSH * NPHISH}{1 - VSH} \quad -16$$

and equations 2, 3 and 4 are then used to compute RHOG.

where RHOBSH = environ. corrected bulk density of shale
NPHISH = environ. corrected neutron porosity of shale

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

$$PHIE = PHIT - VSH * PHITSH \quad -17$$

$$Swe = 1 - \frac{PHIT}{PHIE}(1-SwT) \quad -18$$

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

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

The results of the analysis are summarised in Table 3.

Comments

1. Below the limit of fresh water flushing (approximately 1930m KB) water bearing sands with an apparent salinity of 22000 ppm are present. An apparent connate water salinity of 22000 ppm was chosen for all hydrocarbon zones within the interval 1500-1930m KB.

2. The gas oil contact at 1531m KB in Wirrah-2 corresponds to that seen in Wirrah-1. The OWC however is at least 1.5m deeper in Wirrah-2. Log character indicates the contact to be at 1535m KB.

3. Log character indicates the presence of oil over the interval 1589.75m - 1590m, with 1590m KB being an OWC. Other indications of the presence of oil are:

   - a sidewall core recovered from 1590.9m had "80% even dull fluorescence, dull yellow cut fluorescence, moderately heavy blue yellow cut residue."

   - an RFT at 1590.0m recovered 9.75 lit. of filtrate (10.4 lit. chamber). A segregated sample was not taken. Water analysis indicates reservoir fluids were not recovered making the test inconclusive.

4. Core #2 was cut over the interval 2806.30m - 2824.00m. Patchy hydrocarbon shows were described over the entire core length. Log analysis indicates the interval is essentially water wet.

ANALYSIS PARAMETERS

TABLE 1

	1500-1850m KB	1850-1940m KB	1940-2408m KB	2408-2565m KB	2565-3081m KB
a	1	1	1	1	1
m	2	2	2	2	2
n	2	2	2	2	2
Bulk density of shale (gm/cc)	2.550	2.620	2.620	2.620	2.670
Neutron Porosity of Shale	0.330	0.300	0.300	0.300	0.280
RSH (ohmm)	20.000	20.000	9.000	20.000	20.000
Rmf (ohmm) @ 25°C	0.157	0.157	0.157	0.157	0.157
Grain density - lower limit (gm/cc)	2.650	2.650	2.650	2.650	2.650
Grain density - upper limit (gm/cc)	2.670	2.670	2.670	2.670	2.670
GR Maximum api units	120.000	120.000	120.000	120.000	120.000
GR Minimum api units	15.000	15.000	15.000	15.000	15.000
Invaded zone fluid density (gm/cc)	1.000	1.000	1.000	1.000	1.000

TABLE 2

Depth Interval (mKB)	Apparent Free Water Salinity (ppm)
1500 - 1535	22000
1535 - 1598	3000
1598 - 1606	1200
1606 - 1632	2000
1632 - 1710	3000
1710 - 1732	2600
1732 - 1762	3000
1762 - 1772	2000
1772 - 1812	1400
1812 - 1860	1900
1860 - 1890	3000
1890 - 1920	8000
1920 - 1930	15000
1930 - 2340	22000
2340 - 2522	15000
2522 - 2795	9000
2795 - 2930	7000
2930 - 3080	3500

SUMMARY OF RESULTS

TABLE 3

(i) Hydrocarbon Bearing Sands

Depth Interval (m KB)	Gross Thickness (m)	Net Porous Thickness (m)	*Porosity Average	*Swe Average	Hydrocarbon Type
1511.50 - 1531.00	19.50	16.50	.188	.516	Gas
1531.00 - 1535.00	4.00	4.00	.189	.289	Oil
1589.75 - 1590.00	.25	.25	.199	.296	Oil

* Refers to net sand with porosities greater than 10%.

SUMMARY OF RESULTS TABLE 3 (cont.)

(ii) Water Bearing Sands

Depth Interval (m KB)	Gross Thickness (m)	Net Porous Thickness (m)	*Porosity Average
1535.00 - 1584.75	49.75	45.25	.219
1590.00 - 1591.50	1.50	1.50	.252
1601.00 - 1604.00	3.00	3.00	.236
1609.00 - 1610.00	1.00	1.00	.215
1612.00 - 1628.50	16.50	10.50	.223
1635.00 - 1640.50	5.25	4.50	.228
1642.75 - 1643.75	1.00	1.00	.223
1648.25 - 1672.25	24.00	23.75	.251
1692.00 - 1695.00	3.00	1.75	.176
1715.50 - 1729.25	13.75	13.75	.255
1740.75 - 1758.50	17.75	17.75	.224
1764.75 - 1809.75	45.00	43.50	.232
1814.50 - 1847.00	32.50	28.00	.217
1875.75 - 1882.50	6.75	6.75	.237
1905.75 - 1910.50	4.75	4.75	.203
1935.25 - 1937.75	2.50	2.50	.237
1949.25 - 1965.25	16.00	16.00	.225
1971.75 - 1980.75	9.00	9.00	.191
1985.25 - 1992.00	6.75	6.75	.189
2000.00 - 2043.25	43.25	35.50	.190
2053.25 - 2099.50	46.25	33.00	.190
2105.25 - 2140.00	34.75	28.25	.178
2146.75 - 2151.50	4.75	3.00	.155
2166.25 - 2170.00	3.75	3.50	.154
2182.25 - 2201.25	19.00	12.50	.173
2207.25 - 2212.25	5.00	3.25	.140
2222.25 - 2258.00	35.75	26.75	.157
2267.50 - 2272.75	5.25	3.25	.184
2292.50 - 2305.50	13.00	6.25	.120
2366.25 - 2371.25	5.00	2.00	.114
2380.50 - 2385.00	4.50	2.25	.143
2450.00 - 2482.25	32.50	9.00	.125
2524.25 - 2529.75	5.50	3.75	.140
2533.75 - 2539.00	5.25	4.75	.150
2544.50 - 2553.25	8.75	3.25	.146

SUMMARY OF RESULTS TABLE 3 (cont.)

(ii) Water Bearing Sands (cont.)

Depth Interval (m KB)	Gross Thickness (m)	Net Porous Thickness (m)	*Porosity Average
2613.75 - 2620.25	6.50	4.50	.143
2654.50 - 2751.50	97.00	18.75	.123
2756.75 - 2762.00	5.25	4.75	.149
2772.50 - 2854.75	82.25	27.50	.125
2885.75 - 2899.25	13.50	8.75	.130
2935.00 - 2948.00	13.00	9.50	.142
3037.00 - 3059.25	22.25	11.50	.143
3070.75 - 3080.00	9.25	7.50	.137

+ No net sand is present in these intervals so gross porosities and porosity ranges have been quoted.

* Refers to net sand with porosities greater than 10%.

APPENDIX 4

APPENDIX 4

Wireline Test Report

WIRRAH 2 RFT TESTS

SUMMARY

A series of RFT tests consisting of three runs were made in the Wirrah-2 exploration well. The first two runs were made on 10-11 February, 1983, after drilling the 12-1/4" hole to 2450m MDKB while the third run was made after reaching the final well total depth of 3084m MDKB. The main objectives of these tests were to investigate oil and gas shows indicated on mudlogs or by log interpretation between the interval 1511-1533m MDKB and to confirm the lack of hydrocarbon in sands previously established as hydrocarbon bearing in Wirrah-1 exploration well. Results from this RFT programme confirmed log interpretations that sands between the Top of "Coarse Clastics" at 1511m MDKB and the OWC at 1533m MDKB are hydrocarbon bearing whereas all the sands below 1533m MDKB are water bearing sands including the other hydrocarbon bearing sands (Zones 2 to 8) encountered in Wirrah-1.

RESULTS AND DISCUSSIONS

Run 1 consisted of 22 pre-tests taken over the interval between 1521.5 and 2425m MDKB. Of the 22 pre-tests attempted, 18 were successful in providing formation pressures, 1 pre-test (with seat at 2268m MDKB) was tight and 3 were seal failures. Run 2 was a sample run consisting of a 6 gallon chamber and a 2-3/4 gallon chamber set at 1702.5 and 1590m MDKB respectively. Both sample chambers recovered formation water with some filtrate. Full details of data collected in this programme are given in the attached Tables 1 and 2. Pressure data obtained from the Hewlett-Packard gauge is considered to be accurate and the Schlumberger RFT strain gauge pressures are within $\pm$ 13 psi of the H.P. pressures indicating that the strain gauge (Serial No. 59008) should be checked and if neccessary recalibrated. The main results, which are illustrated in Figures 1 and 2 are :

a) A 20m gross gas column at the Top of "Coarse Clastics" with an underlying 2m gross thin oil column was identified on logs. The 20m gross gas column extends from the GOC at 1531m MDKB to the Top of "Coarse Clastics" at 1511m MDKB. The oil column extends from the OWC at 1533m MDKB to the GOC at 1531m MDKB. Pressure measurements were not sufficiently accurate to resolve the two oil column contacts. However, the pressure data confirmed a gas gradient (0.165 psi/m) between 1521.5-1530m MDKB and are also consistent with the RFT pressure data from the Wirrah-1 exploration well also shown in Figure 2.

b) The water gradient established immediately below the thin oil column is 1.40 psi/m indicating relatively fresh water and is consistent with the high resistivity indicated on logs. The fresh water is confirmed by the recovery of 21.75 litres of mostly formation water at 1702.5m MDKB. Analysis of this sample indicated a relatively low chloride content of 5000 ppm with trace nitrates measured.

c) All the hydrocarbon bearing sands (Zones 2 to 7) between 1533 and 2450m MDKB seen in Wirrah-1 were not hydrocarbon bearing in Wirrah-2 based on mudlog, wireline log analysis and the good water gradient established throughout this interval as shown in Figures 1 and 2.

d) The pressures measured in water sands between 1500 and 1600m MDKB consistently indicate a drawdown of 1 psi when compared to Wirrah-1 RFT pressures measured during September/October 1982. Below 1950m MDKB, Wirrah-2 pressures were 8 psi low relative to the Wirrah-1 RFT pressures, suggesting that the fault between the wells may be sealing. Hence the pressure data measured below 1600m MDKB in Wirrah-2 cannot be used to confirm estimated oil-water contacts in Zones 2-7 interpreted in Wirrah-1.

e) As shown in Figure 1, these is a discontinuity in the water gradient around 1950m MDKB. Below this depth, the measured water gradient of 1.47 psi/m (0.45 psi/ft) is higher than the Bass Strait average aquifer gradient of 1.42 psi/m (0.433 psi/ft). This water gradient discontinuity confirms log interpretation which indicates a change in water salinity at approximately 1950m MDKB.

Run 3 consisted of 6 pre-tests taken over the interval 2852.2-3044.5m MDKB of which 2 were successful in providing pressure data, 1 pre-test (with seat at 3042m MDKB) was tight and the remaining attempts were seal failures. The two seats which provided data were taken at 2893.0m MDKB and 3041.5m MDKB and their respective formation pressures were measured to be 4394.2 (8.94 ppg) and 4758.2 (9.21ppg) psia. These pressures suggest that the formation at these levels could either be abnormally pressured and/or supercharged. After the final pre-test attempt (seal failure) was made at 2852.8m MDKB, the RFT tool which included a 6 gallon chamber and a 1 gallon chamber was stuck. The RFT tool was freed when the overshot fishing tool was about 700m above the suspected tool stuck point at 2852.8m MDKB, suggesting that the Schlumberger cable may have been differentially stuck instead of the RFT tool.

10201/23-24

Figure 1: Wirrah No. 2 RFT RESULTS - Suite 1 1521.5 - 2425m MDKB

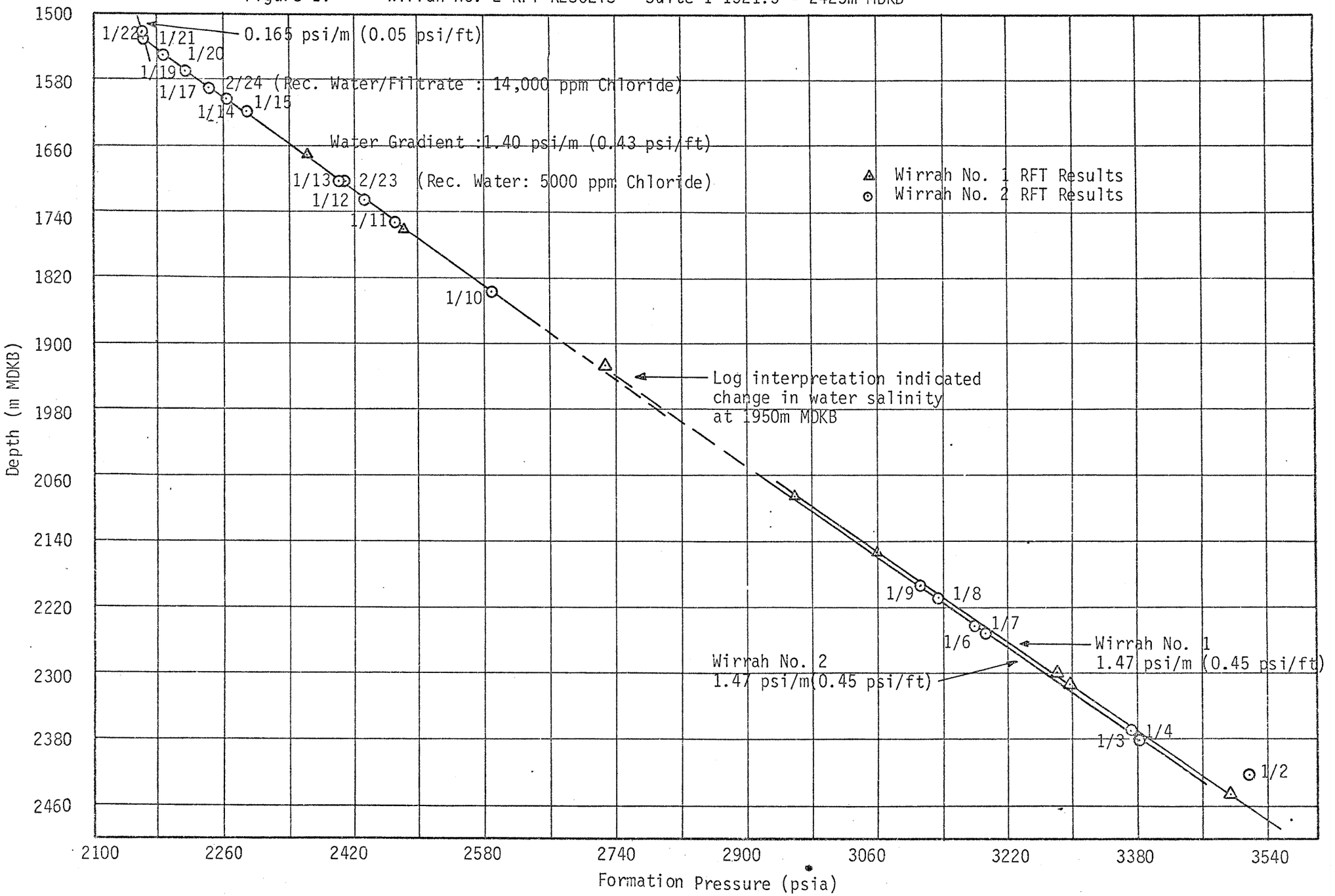
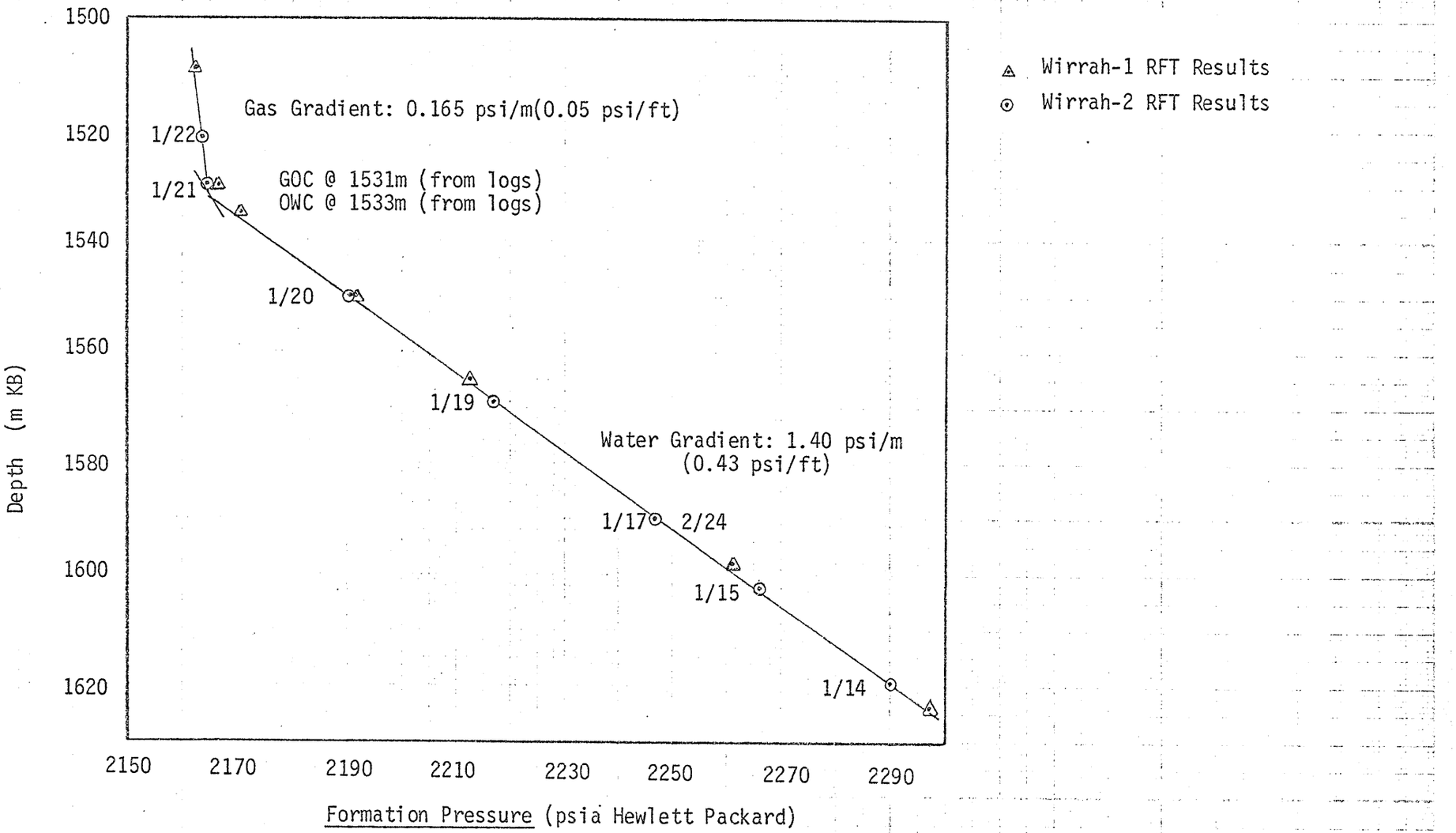


FIGURE 2



WIRRAH-2 RFT RESULTS SUITE NO.1 1521.5 - 1619.5m MDKB February 1983

RFT PRETEST PRESSURES - WIRRAH - 2

SERVICE COMPANY: Schlumberger RUN NO: One DATE: 10/2/83 OBSERVERS: M.Fittall, B.Crowther, S.T.Koh

SEAT NO.	DEPTH (m)	DEPTH (SS) (m)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP		FM. PRESS		FHP		TEST RESULT
							psi	ppg	psi	ppg	psi	ppg	
1/8	2209.5	2188.5	PT	HP	Y	A	3737	9.87	3136.6	8.36	3738	9.88	Valid
				SCH	Y	G	3715	9.86	3114	8.34	3715	9.86	
1/9	2195.0	2174.0	PT	HP	Y	A	3713	9.88	3115.2	8.36	3713	9.88	Valid
				SCH	Y	G	3690	9.85	3093	8.34	3690	9.85	
1/10	1836.0	1815.0	PT	HP	Y	A	3111	9.89	2590.6	8.32	3111	9.89	Valid
				SCH	Y	G	3088	9.86	2569	8.30	3087	9.86	
1/11	1752.5	1731.5	PT	HP	Y	A	2969	9.88	2472.7	8.32	2969	9.88	Valid
				SCH	Y	G	2951	9.87	2454	8.31	2950	9.87	
1/12	1725.3	1704.3	PT	HP	Y	A	2923	9.88	2435.3	8.33	2923	9.88	Valid
				SCH	Y	G	2900	9.85	2417	8.31	2900	9.85	
1/13	1702.5	1681.5	PT	HP	Y	A	2883	9.88	2404.5	8.33	2884	9.88	Valid
				SCH	Y	G	2861	9.85	2387	8.32	2862	9.85	
1/14	1619.5	1598.5	PT	HP	Y	A	2744	9.88	2289.8	8.34	2744	9.88	Valid
				SCH	Y	G	2727	9.87	2277	8.35	2727	9.87	

1. Pressure Test = PT
   Sample & Pressure = SPT

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

3. Yes = Y
   No = N

4. PSIA = A
   PSIG = G

RFT PRETEST PRESSURES - WIRRAH - 2

SERVICE COMPANY: Schlumberger RUN NO: One DATE: 10/2/83 OBSERVERS: M.Fittall, B.Crowther, S.T.Koh

SEAT NO.	DEPTH (m)	DEPTH (SS) (m)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP		FM. PRESS		FHP		TEST RESULT
							psi	ppg	psi	ppg	psi	ppg	
1/15	1602.5	1581.5	PT	HP	Y	A	2715	9.88	2265.9	8.34	2715	9.88	Valid
				SCH	Y	G	2696	9.86	2252	8.35	2696	9.86	
1/16	1590.5	1569.5	PT	HP	Y	A	2695	9.88					Seal failure
				SCH	Y	G	2675	9.86					
1/17	1590.0	1569.0	PT	HP	Y	A	2694	9.88	2247.0	8.34	2694	9.88	Valid
				SCH	Y	G	2673	9.85	2231	8.33	2673	9.85	
1/18	1568.0	1547.0	PT	HP	Y	A	2657	9.88					Seal failure
				SCH	Y	G	2636	9.85					
1/19	1569.0	1548.0	PT	HP	Y	A	2658	9.87	2217.0	8.34	2658	9.87	Valid
				SCH	Y	G	2638	9.86	2203	8.34	2638	9.86	
1/20	1550.0	1529.0	PT	HP	Y	A	2626	9.87	2190.4	8.34	2626	9.87	Valid
				SCH	Y	G	2608	9.86	2179	8.35	2608	9.86	
1/21	1530.0	1509.0	PT	HP	Y	A	2592	9.87	2164.7	8.35	2592	9.87	Valid
				SCH	Y	G	2572	9.85	2163	8.40	2572	9.85	

1. Pressure Test = PT
   Sample & Pressure = SPT

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

3. Yes = Y
   No = N

4. PSIA = A
   PSIG = G

RFT PRETEST PRESSURES - WIRRAH - 2

SERVICE COMPANY: Schlumberger RUN NO: 1, 2, & 3 DATE: 10/2/83 (Run 2), 27/2/83 (Run 3) OBSERVERS: M.Fittall, B.Crowther, S.T.Koh (Run 1,2); B.Crowther, R.Neuman, J.Roche (Run 3)

SEAT NO.	DEPTH (m)	DEPTH (SS) (m)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP		FM. PRESS		FHP		TEST RESULT
							psi	ppg	psi	ppg	psi	ppg	
1/22	1521.5	1500.5	PT	HP	Y	A	2577	9.87	2163.3	8.39	2577	9.87	Valid
				SCH	Y	G	2557	9.85	2160	8.44	2557	9.85	
2/23	1702.5	1681.5	SPT	HP	Y	A	2884	9.88	2404.7	8.33	2883	9.88	Pretest Seal Failure.
				SCH	Y	G	2860	9.85	2385	8.31	2862	9.85	Filled 22.7 lit chamber
2/24	1590.0	1569.0	SPT	HP	Y	A	2693	9.87	2247.0	8.34	2693	9.87	Pretest Seal Failure.
				SCH	Y	G	2669	9.84	2227	8.32	2670	9.84	Filled 10.2 lit chamber
3/25	3042.0	3021.0	PT	HP	Y	A	5389	10.36					Tight, invalid
				SCH	Y	G	5360	10.33					
3/26	3044.5	3023.5	PT	HP	Y	A	5388	10.35			5384	10.34	Seal failure
				SCH	Y	G	5360	10.32			5357	10.31	
3/27	3041.5	3020.5	PT	HP	Y	A	5389	10.36	4758.2	9.21	5387	10.35	Tight, valid
				SCH	Y	G	5359	10.33	4731	9.18	5359	10.33	
3/28	2893.0	2872.0	PT	HP	Y	A	5126	10.36	4394.2	8.94	5129	10.36	Valid
				SCH	Y	G	5107	10.35	4371	8.92	5107	10.35	

1. Pressure Test = PT
   Sample & Pressure = SPT

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

3. Yes = Y
   No = N

4. PSIA = A
   PSIG = G

RFT PRETEST PRESSURES - WIRRAH - 2

SERVICE COMPANY: Schlumberger RUN NO: 3 DATE: 27/2/83 OBSERVERS: J.Roche, B.Crowther, R.Neuman

SEAT NO.	DEPTH (m)	DEPTH (SS) (m)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP		FM. PRESS		FHP		TEST RESULT
							psi	ppg	psi	ppg	psi	ppg	
3/29	2852.5	2831.5	PT	HP	Y	A	5060	10.37			5059	10.37	Seal failure
				SCH	Y	G	5047	10.37			5046	10.37	
3/30	2852.8	2831.8	PT	HP	Y	A	5061	10.37			5061	10.37	Seal failure
				SCH	Y	G	5047	10.36			5047	10.37	

1. Pressure Test = PT
   Sample & Pressure = SPT

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

3. Yes = Y
   No = N

4. PSIA = A
   PSIG = G

10201/18-22

TABLE 2

RFT SAMPLE TEST REPORT - WIRRAH - 2

OBSERVER: M.Fittall, S.T.Koh DATE: 10-2-83 RUN NO: 2

SEAT NO.	2/23			2/24		
DEPTH	1702.5	m		1590.0	m	
	CHAMBER 1 (22.7	lit.)		CHAMBER 2 (10.4	lit.)	
A. RECORDING TIMES						
Tool Set	04-50-00	hrs		05-33-00	hrs	
Pretest Open	04-50-00	hrs		05-30-00	hrs	
Time Open	7-00	min		5-00	min	
Chamber Open	04-57-00	hrs		05-35-00	hrs	
Chamber Full	05-07-30	hrs		05-41-30	hrs	
Fill Time	10-30	min		6-30	min	
Start Build up	05-07-30	hrs		05-41-30	hrs	
Finish Build up	05-10-00	hrs		05-45-00	hrs	
Build Up Time	2-30	min		3-30	min	
Seal Chamber	05-10-30	hrs		05-45-00	hrs	
Tool Retract	05-12-00			05-46-00	hrs	
Total Time	22-00	min		13-00	min	
B. SAMPLE PRESSURES	psia			psia		
IHP	2884			2693		
ISIP	Not stabilized					
Initial Flowing Press.	1974			2187		
Final Flowing Press.	2125			2190		
Sampling Press. Range	1974 - 2125			2187 - 2190		
FSIP	2404.7			2247.0		
FHP	2883			2693		
Form.Press.(Horner)	2883			2693		
C. TEMPERATURE						
Depth Tool Reached	1702.5	m		1590.0	m	
Max.Rec. Temp.	88	°C		88	°C	
Time Circ. Stopped	10/02/83 @ 05.00	hrs		10/02/83 @ 05.00	hrs	
Time since Circ.	24	hrs		24.5	hrs	
Form. Temp.(Horner)		°C			°C	
D. SAMPLE RECOVERY						
Surface Pressure	500	psig		0	psig	
Amt Gas	0.95	cu ft		0.65	cu ft	
Amt Oil	Nil	lit.		Nil	lit.	
Amt Water	21.75	lit.	Water/filtrate:	9.75	lit.	
Amt Others	Nil	lit.		Nil	lit.	
E. SAMPLE PROPERTIES						
Gas Composition						
C1	125,400	ppm		270,100	ppm	
C2	5,100	ppm		13,600	ppm	
C3	800	ppm		2,400	ppm	
IC4/nC4	80	ppm		300	ppm	
C5	trace	ppm		trace	ppm	
C6+	-	ppm		-	ppm	
CO2/H2S	0.4%/trace	ppm		0.6%/Nil	ppm	
Oil Properties	- °API @ - °C					
Colour						
Fluorescence						
GOR cf/bbl						
Water Properties						
Resistivity	0.57 @ 20	°C		0.22 @ 20	°C	
NaCl Equivalent	10,700	ppm		32,000	ppm	
Cl-titrated	5,000	ppm		14,000	ppm	
pH/Nitrates	7.5 /tr	ppm		10/20	ppm	
Est. Water Type						
Mud Properties						
Resistivity	0.157 @ 25	°C		0.157 @ 25	°C	
NaCl Equivalent	41,000	ppm		41,000	ppm	
Cl-titrated	22,000	ppm		22,000	ppm	
pH/Nitrates	10/120	ppm		10/120	ppm	
Calibration						
Calibration Press.	-	psig		-	psig	
Calibration Temp.	72.8	°C		72.44	°C	
Mud Weight	9.7	ppg		9.7	ppg	
Calc.Hydrostatic	9.88	psig		9.88	psig	
RFT Chokesize	(0.51mm) 0.020	"		(0.51mm) 0.020	"	

APPENDIX 5

APPENDIX 5

Geochemical Report

GEOCHEMICAL REPORT

WIRRAH-2 WELL, GIPPSLAND BASIN

VICTORIA

by

J.K. Emmett.

Sample Handing and Analyses by:

D.M. Ford)

J. Maccoll) Esso Australia Ltd.

D.M. Hill)

Exxon Production Research Company,

Geochem Laboratories.

Esso Australia Ltd.

Geochemical Report.

0634L

September 1983.

CONTENTS

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Appendices.

INTRODUCTION

Various geochemical analyses were performed on samples of wet canned cuttings, sidewall cores and conventional core. Canned cuttings composited over 15-metre intervals were collected from 220m(KB) down to Total Depth (TD) at 3084m(KB). Light hydrocarbon (C_{1-4}) headspace gases were determined for alternate 15-metre intervals from 1250m(KB) down to T.D. Between 1325m(KB) and 3065m(KB), succeeding alternate 15-metre intervals were analysed for C_{4-7} gasoline-range hydrocarbons. Selected samples were then hand-picked for more detailed analyses such as Total Organic Carbon (T.O.C.), Rock-Eval pyrolysis, kerogen isolation and elemental analysis and C_{15+} liquid and gas chromatography. Vitrinite reflectance ($\bar{R}_v$ max) measurements were performed by Professor A.C. Cook of Wollongong.

DISCUSSION OF RESULTS

The detailed headspace C_{1-4} light hydrocarbon gas analysis data are presented in Table 1. This cuttings gas data is more conveniently represented in log form in Figure 1. Total gas values are lean in the Lakes Entrance Formation, but are generally rich in the undifferentiated Latrobe Group sediments suggesting a good hydrocarbon source potential for the latter. The amount of wet (C_{2+}) gas components present however, is relatively low (usually less than 25%) over most of the section penetrated, indicating that the source organic matter is either immature or generally gas prone or perhaps both.

The detailed C_{4-7} gasoline-range hydrocarbon data sheets are given in Appendix-1 and pertinent information has been plotted in Figure 2. Total gasoline contents in the Lakes Entrance Formation are generally poor, compared to the Latrobe Group where values vary mostly from moderately-rich to very rich. This confirms a good hydrocarbon source potential for the Latrobe Group. The richer total gasoline values occurring in the Latrobe Group (Figure 2) generally coincide with coal intervals in the section. It is also interesting to note that the amount of C_{6-7} gasoline is generally over 45% in the Latrobe Group sediments indicating that these beds have source potential for both oil and gas.

Based on Total Organic Carbon (T.O.C.) values (Table 2), the Gippsland Limestone Formation (average T.O.C. = 0.87%) and the underlying Lakes Entrance Formation (average T.O.C. = 0.42%) would rate as having fair-poor and poor hydrocarbon source potential, respectively. An average T.O.C. of 1.29% for

the undifferentiated Latrobe Group sediments, again suggests a good hydrocarbon source potential for this unit.

Vitrinite reflectance ($\bar{R}_v max$) data are presented in Table 3 and $\bar{R}_v max$ has been plotted with depth in Figure 3. With the exception of the $\bar{R}_v max$=0.85% value at 3067m(KB), which seems to be anomalously high, the vitrinite reflectance determinations in the Latrobe Group indicate a maturation trend which can be presented by a straight line such as that shown in Figure 3. Using this maturation profile, the top of organic maturity for significant hydrocarbon generation occurs just short of T.D. at about 3000m(KB). Detailed vitrinite reflectance and exinite fluorescence data are given in Appendix-2 (Report by A.C. Cook).

In Table 4, Rock-Eval pyrolysis results for a suite of sidewall core samples with T.O.C. values of 0.5% or more are listed. Figure 4 shows a plot of Rock-Eval Hydrogen Index (HI) vs. T_{max}, on which fields delineating values for the basic kerogen types and their degree of maturation (indicated by equivalent vitrinite reflectance curves) has also been outlined. Figure 4 indicates that the organic matter in the Latrobe Group sediments penetrated is predominantly Type III (ie. woody-herbaceous) considered to be gas/condensate-prone, although a few samples plot as Type II-III which indicates some oil source potential. T_{max} values (Table 4) confirm previous estimates for the top of organic maturity.

Elemental analyses of selected kerogen samples are listed in Table 5. Approximate Hydrogen (H): Carbon (C), Oxygen (O): Carbon and Nitrogen (N): Carbon atomic ratios for these samples are given in Table 6. (These ratios are 'approximate' since the O% is calculated by difference and the naturally occurring organic sulphur % which may be upto a few percent, was not determined). Figure 5 is a modified Van Krevelen Plot of atomic H/C Vs. atomic O/C ratio. Comparison of Figure 5 with Figure 6, a similar plot showing the 'Principal Products of Kerogen Evolution' confirms the indications of organic matter type and degree of maturation for Rock-Eval analysis and re-affirms a good gas plus oil source potential for the Latrobe Group sediments.

The C_{15+} liquid chromatography results from selected canned cuttings are listed in Table 7. The single sample interval in the Lakes Entrance Formation has a moderately rich total extract but is composed of predominantly of asphaltenes, with insufficient hydrocarbon material to warrant further

separation. A saturate fraction gas chromatogram was obtained however, and is shown in Figure 7. A mixture of marine and non-marine derived organic matter is indicated in Figure 7. The marine input is indicated by the envelope of n-C_{17} to n-C_{25} n-alkanes maximizing about n-C_{22} or n-C_{23}, whilst a non-marine contribution can be recognised from the odd-over-even predominance seen in the distribution of higher molecular weight (n-C_{27+} n-alkanes).

Total extract values from sample intervals in the Latrobe Group vary from moderately rich to rich, but the predominance of non-hydrocarbon material in all these samples again points to the present day organic immaturity of most of the Latrobe Group section penetrated. The corresponding C_{15+} saturate chromatograms for the Latrobe Group samples are shown in Figures 8-13. Figure 8 is similar in appearance to Figure 7 which may suggest analysis of caved material. Figures 9-13 represent immature predominantly non-marine (terrestrial) organic matter, becoming more mature with increasing depth. The relatively smooth n-alkane distribution seen in Figure 13 (although remnant odd-over-even predominance in the n-C_{23+} n-alkanes is still obvious) indicates that organic maturity has probably been reached at this depth ie. 3020-3035m(KB).

CONCLUSIONS

1. The top of organic maturity in the Wirrah-2 well is reached at approximately 3000m(KB).

2. The Latrobe Group sediments have good potential to be a gas plus oil source.

C1-C4 HYDROCARBON ANALYSES

REPORT A - HEADSPACE GAS

BASIN - GIPPSLAND
WELL - KIRRAE 2

Table 1.

SAMPLE NO.	DEPTH	METHANE C1	ETHANE C2	PROPANE C3	IBUTANE IC4	NBUTANE C4	WET C2-C4	TOTAL C1-C4	WET/TOTAL PERCENT	TOTAL GAS M	E	P	IB	NB	WET GAS E	P	IB	NB
GAS CONCENTRATION (VOLUME GAS PER MILLION VOLUMES CUTTINGS)										GAS COMPOSITION (PERCENT)								
72555 U	1265.00	3761	48	17	5	3	73	3834	1.89	98.	1.	0.	0.	0.	66.	23.	7.	4.
72555 T	1245.00	4351	46	29	13	8	96	4447	2.16	98.	1.	1.	0.	0.	48.	30.	14.	8.
72555 S	1365.00	3857	94	61	23	10	190	4083	4.80	95.	2.	1.	1.	0.	48.	31.	12.	9.
72555 I	1320.00	2552	32	26	9	8	75	327	22.94	77.	10.	8.	3.	2.	43.	35.	12.	11.
72555 G	1350.00	3559	47	27	2	4	80	619	12.92	87.	8.	4.	0.	1.	59.	34.	2.	5.
72555 F	1410.00	3904	70	44	8	6	128	712	17.98	82.	10.	6.	1.	1.	55.	34.	5.	5.
72555 E	1440.00	3339	55	41	7	8	111	450	24.67	75.	12.	9.	2.	2.	50.	37.	6.	7.
72555 D	1470.00	5882	80	70	12	20	183	1030	18.25	82.	8.	7.	1.	2.	46.	37.	6.	11.
72555 C	1515.00	33947	570	355	81	175	981	4620	21.20	79.	8.	8.	2.	4.	58.	36.	8.	16.
72555 B	1545.00	74457	1554	1158	243	367	3442	11389	30.22	70.	15.	10.	2.	3.	46.	34.	7.	11.
72555 A	1575.00	243553	7451	2208	372	375	10705	39059	27.40	73.	20.	6.	1.	1.	73.	21.	3.	4.
72555 Z	1605.00	311775	11872	4075	398	648	16993	80166	24.93	75.	17.	6.	1.	1.	70.	24.	2.	4.
72555 Y	1635.00	164948	5747	1560	193	334	5534	20598	27.45	73.	18.	7.	1.	2.	66.	24.	3.	6.
72555 X	1665.00	101980	1703	247	50	52	2112	12310	17.16	83.	14.	2.	0.	0.	63.	12.	2.	2.
72555 W	1695.00	1498630	12457	1494	112	69	14132	154967	9.12	91.	8.	1.	0.	0.	88.	11.	1.	1.
72555 V	1725.00	586849	5471	1065	136	136	6838	63439	10.77	89.	9.	2.	0.	0.	80.	16.	2.	2.
72555 U	1755.00	98940	1557	475	62	70	2259	10940	20.57	79.	15.	4.	1.	1.	69.	21.	3.	3.
72555 T	1785.00	117170	911	273	57	71	1012	4182	24.20	76.	15.	7.	1.	2.	60.	27.	6.	7.
72555 S	1815.00	19375	574	124	21	29	548	2121	25.84	74.	18.	6.	1.	1.	66.	23.	4.	5.
72555 R	1845.00	100531	1235	352	43	61	1694	11725	14.45	86.	11.	3.	0.	1.	73.	21.	3.	4.
72555 Q	1875.00	639472	3142	946	46	56	5882	74854	7.86	92.	7.	1.	0.	0.	86.	10.	1.	1.
72555 P	1905.00	1270472	10954	2541	257	231	15903	145435	10.98	89.	9.	2.	0.	0.	81.	16.	2.	1.
72555 O	1935.00	249400	3791	900	132	158	4981	34869	14.28	86.	11.	3.	0.	0.	76.	18.	3.	3.
72555 N	1965.00	59032	1009	476	84	94	1763	6795	25.51	74.	16.	7.	1.	1.	62.	28.	5.	5.
72555 M	2000.00	728384	9163	1590	185	198	10005	82405	12.25	88.	10.	2.	0.	0.	80.	16.	2.	2.
72555 L	2030.00	257077	3477	1044	127	144	4792	33499	14.30	86.	10.	3.	0.	0.	73.	22.	3.	3.
72555 K	2060.00	599550	4469	971	85	95	5641	60679	9.77	91.	7.	1.	0.	0.	84.	13.	2.	2.
72555 J	2090.00	287762	3370	970	154	116	5116	33676	15.10	85.	11.	3.	0.	0.	76.	19.	3.	2.
72555 H	2120.00	275964	3592	1019	184	163	5078	32772	15.49	85.	11.	3.	1.	1.	73.	20.	4.	4.
72555 F	2150.00	903263	8374	1170	119	95	8258	100621	7.73	92.	6.	1.	0.	0.	83.	14.	1.	1.
72555 E	2180.00	215547	3559	252	36	39	1146	66693	17.12	83.	13.	3.	1.	1.	75.	20.	3.	3.
72555 D	2210.00	243374	3494	751	85	75	4405	33779	13.04	87.	10.	2.	0.	1.	79.	17.	2.	2.
72555 C	2240.00	174435	2472	705	127	117	3471	16904	18.35	82.	13.	4.	1.	1.	71.	22.	4.	3.
72555 A	2270.00	68353	826	321	55	52	1235	7890	15.64	84.	10.	4.	0.	1.	67.	26.	5.	4.
72555 Z	2300.00	10511	1379	291	40	56	1766	12377	14.27	86.	11.	2.	0.	0.	78.	16.	3.	3.
72555 Y	2330.00	197	44	30	4	4	82	279	29.39	71.	16.	11.	1.	1.	54.	37.	5.	5.
72555 W	2360.00	1729	441	199	30	68	738	2467	29.91	70.	18.	8.	1.	3.	60.	27.	4.	9.
72555 U	2390.00	135535	6896	1312	170	148	10526	146179	7.20	93.	6.	1.	0.	0.	65.	12.	2.	1.
72555 T	2420.00	19001	2415	516	77	117	3123	21924	14.24	86.	11.	2.	0.	1.	77.	17.	3.	4.
72555 S	2450.00	89084	1104	245	37	37	1423	10407	13.67	86.	11.	2.	0.	0.	78.	17.	3.	3.
72555 R	2480.00	134013	2484	713	126	150	3605	15756	20.08	79.	15.	4.	1.	1.	71.	21.	3.	5.
72555 A	2510.00	453935	3507	638	74	93	4112	49705	8.27	92.	7.	1.	0.	0.	85.	16.	2.	2.
72555 Z	2540.00	76009	815	212	40	56	1126	8926	12.61	87.	9.	2.	0.	1.	72.	19.	4.	5.
72555 Y	2570.00	93117	1255	349	54	86	1684	10001	16.84	83.	13.	3.	0.	0.	75.	21.	3.	3.
72555 X	2600.00	65004	1303	427	56	75	1866	7370	25.32	75.	18.	6.	1.	1.	70.	23.	3.	4.
72555 W	2630.00	122299	1905	476	82	96	2240	14498	15.45	85.	11.	3.	1.	1.	71.	21.	4.	4.

C1-C4 HYDROCARBON ANALYSES

BASIN - GIPPSLAND Table 1 cont. REPORT A - HEADSPACE GAS
WELL - MIRRAH 2

SAMPLE NO.	DEPTH	GAS CONCENTRATION (VOLUME GAS PER MILLION VOLUMES CUTTINGS) METHANE C1	ETHANE C2	PROPANE C3	IBUTANE IC4	NBUTANE C4	WET C2-C4	TOTAL C1-C4	WET/TOTAL PERCENT	GAS COMPOSITION (PERCENT) TOTAL GAS M	E	P	IB	NB	WET GAS E	P	IB	NB
72529 Y	2705.00	4539	490	114	13	17	634	5173	12.26	88.	9.	2.	0.	0.	77.	18.	2.	3.
72529 X	2735.00	1386	186	50	22	17	277	1663	16.96	83.	12.	3.	1.	1.	66.	18.	8.	8.
72529 U	2755.00	5283	502	158	22	29	771	6054	12.74	87.	9.	3.	0.	0.	73.	20.	3.	4.
72529 S	2795.00	11966	1520	469	87	100	2176	13744	15.83	84.	11.	3.	1.	1.	70.	22.	4.	5.
72529 Q	2840.00	1490	215	68	9	11	303	1793	16.90	83.	12.	4.	1.	1.	71.	22.	3.	4.
72529 O	2870.00	1931	429	190	35	44	695	2626	26.47	74.	16.	7.	1.	2.	60.	28.	5.	6.
72529 M	2900.00	6822	702	200	33	29	964	7786	12.38	88.	9.	3.	0.	0.	73.	21.	3.	3.
72529 K	2930.00	10031	1082	320	61	43	1512	11543	13.10	87.	9.	3.	1.	0.	72.	22.	4.	3.
72529 I	2960.40	4522	566	212	35	22	935	5257	17.79	82.	13.	4.	1.	0.	71.	23.	4.	2.
72529 G	2990.00	6014	1009	260	30	21	1340	7380	18.24	82.	14.	4.	0.	0.	75.	21.	2.	2.
72529 E	3020.00	14989	1365	304	41	29	1739	16668	10.42	90.	8.	2.	0.	0.	78.	17.	2.	2.
72529 C	3050.00	5505	403	102	11	7	603	6108	9.87	90.	6.	2.	0.	0.	80.	17.	2.	1.
72529 A	3080.00	1319	109	26	4	2	141	1460	9.66	90.	7.	2.	0.	0.	77.	18.	3.	1.

Table 2. TOTAL ORGANIC CARBON REPORT

BASIN - GIPPSLAND
WELL - WIRRAH 2

SAMPLE NO.	DEPTH	AGE	FORMATION	AN	TOC%	AN	TOC%	AN	TOC%	DESCRIPTION
72619 U	840.00	EARLY-LATE MIOCENE	GIPPSLAND LIMESTONE	1	.89					M-DK GRY MDST CALCITE
72619 S	933.90	EARLY-LATE MIOCENE	GIPPSLAND LIMESTONE	1	1.03					M-DK GRY MDST CALCITE
72619 Q	1029.30	EARLY-LATE MIOCENE	GIPPSLAND LIMESTONE	1	1.70					DK GRY SLTST
72619 O	1134.50	EARLY-LATE MIOCENE	GIPPSLAND LIMESTONE	1	.73					DK GRY MDST
72619 L	1271.20	EARLY-LATE MIOCENE	GIPPSLAND LIMESTONE	1	.49					DK GRY MDST
72634 N	1280.00	EARLY-LATE MIOCENE	GIPPSLAND LIMESTONE	2	.39					LT.OL-GY SHALE,SL.CALC.
===>	DEPTH : .00 TO 1297.00 METRES. <=== I ===>		AVERAGE TOC :		.87 % EXCLUDING VALUES GREATER THAN 10.00 %					<===
72634 L	1310.00	EARLY MIOCENE	LAKES ENTRANCE	2	.41					MED.LT.GY-LT.OL.GY SHALE
72619 K	1314.00	EARLY MIOCENE	LAKES ENTRANCE	1	.51					DK GRY SLTST CALCITE
72634 J	1340.00	EARLY MIOCENE	LAKES ENTRANCE	2	.43					MED.OL-GY SH,MOD.CALC.
72634 H	1370.00	EARLY MIOCENE	LAKES ENTRANCE	2	.33					LT.OL-GY SHALE,SL.CALC.
72619 J	1380.60	EARLY MIOCENE	LAKES ENTRANCE	1	.43					DK GRY MDST
72634 F	1400.00	EARLY MIOCENE	LAKES ENTRANCE	2	.34					MED.LT.GY-LT.OL.GY SHALE
72634 D	1430.00	EARLY MIOCENE	LAKES ENTRANCE	2	.32					MED.LT.GY-LT.OL.GY MARL
72619 I	1432.00	EARLY MIOCENE	LAKES ENTRANCE	1	.56					DK GRY SLTST PYRITE MICA
72619 C	1463.70	EARLY MIOCENE	LAKES ENTRANCE	1	.43					M-DK GRY MDST PYRITE
===>	DEPTH : 1297.00 TO 1488.00 METRES. <=== I ===>		AVERAGE TOC :		.42 % EXCLUDING VALUES GREATER THAN 10.00 %					<===
72632 Z	1490.00	EARLY MIOCENE/EOCENE	LAKES ENTRANCE/GURNARD	2	.30					MED-LT OL.GY SHALE
72632 Y	1520.00	EOCENE	GURNARD FM./LATROBE GROUP	2	.42					LT OL GY-MED LT GY SHALE
===>	DEPTH : 1488.00 TO 1520.00 METRES. <=== I ===>		AVERAGE TOC :		.36 % EXCLUDING VALUES GREATER THAN 10.00 %					<===
72632 V	1550.00	EOCENE	LATROBE GROUP	2	.32					MED-LT OL GY SHALE,CALC.
72636 T	1580.00	EOCENE	LATROBE GROUP	2	.43					MED.OL-GY CLAYSTONE
72632 R	1610.00	EOCENE	LATROBE GROUP	2	47.50					COAL
72618 O	1630.70	EOCENE	LATROBE GROUP	1	1.74					LAM LT GY SS/M-DK GY SS
72632 P	1640.00	EOCENE	LATROBE GROUP	2	1.17					MED.GY SHALE,CALC.
72632 M	1670.00	EOCENE	LATROBE GROUP	2	.46					MED.GY-MED.LT.GY SHALE
72632 L	1700.00	EOCENE	LATROBE GROUP	2	41.60					COAL
72632 J	1735.00	EOCENE	LATROBE GROUP	2	4.94					MED.OL GY SHALE
72632 B	1855.00	EOCENE	LATROBE GROUP	2	61.70					COAL
72631 X	1915.00	EOCENE	LATROBE GROUP	2	60.60					COAL
72618 E	1946.20	EOCENE	LATROBE GROUP	1	1.69					M-DK GRY SLTST
72631 R	2015.00	EOCENE	LATROBE GROUP	2	1.11					GRN-GY CALC SH+LT GY SST
72631 P	2045.00	EOCENE	LATROBE GROUP	2	56.70					COAL
72618 B	2052.00	EOCENE	LATROBE GROUP	1	.38					M GRY MARL
72631 N	2075.00	EOCENE	LATROBE GROUP	2	.34					MED GY-LT OL GY SH+MARL

TOTAL ORGANIC CARBON REPORT

Table 2 cont.

BASIN - GIPPSLAND
WELL - WIRRAH 2

SAMPLE NO.	DEPTH	AGE	FORMATION	AN	TOC%	AN	TOC%	AN	TOC%	DESCRIPTION
72631 L	2105.00	EOCENE	LATROBE GROUP	2	.37					MED GY-LT OL GY SHALE
72617 Z	2119.00	EOCENE	LATROBE GROUP	1	2.11					M-DK GRY MARL
72631 J	2135.00	PALEOCENE	LATROBE GROUP	2	.33					MED LT GY-LT OL GY SHALE
72631 H	2165.00	PALEOCENE	LATROBE GROUP	2	.60					MED LT GY-LT OL GY SHALE
72631 F	2195.00	PALEOCENE	LATROBE GROUP	2	.75					LT OL GY CALC.SH+SST.
72620 H	2221.10	PALEOCENE	LATROBE GROUP	1	.19					M GRY SLTST
72631 D	2225.00	PALEOCENE	LATROBE GROUP	2	45.70					COAL
72631 B	2255.00	PALEOCENE	LATROBE GROUP	2	.80					MED LT GY-MED OL GY SH.
72630 Z	2265.00	PALEOCENE	LATROBE GROUP	2	.24					MED LT GY SHALE,CALC.
72617 X	2312.10	PALEOCENE	LATROBE GROUP	1	5.53					WH PRN CLST PYR MICA
72630 X	2315.00	PALEOCENE	LATROBE GROUP	2	.25					MED LT GY-LT OL GY SHALE
72630 V	2345.00	PALEOCENE	LATROBE GROUP	2	.49					LT GY SST+PYRITIC CLYST.
72617 T	2373.01	PALEOCENE	LATROBE GROUP	1	2.59					M-DK GRY SLTST
72630 T	2375.00	PALEOCENE	LATROBE GROUP	2	1.70					MED GY SH+MED LT GY SH.
72630 R	2405.00	PALEOCENE	LATROBE GROUP	2	.27					MED GY SH+MED LT GY SH.
72630 P	2435.00	PALEOCENE	LATROBE GROUP	2	.17					LT PRN GY-LT GY SST.
72617 Q	2447.00	PALEOCENE	LATROBE GROUP	1	.33					OL/GRY MARL
72630 N	2465.00	PALEOCENE	LATROBE GROUP	2	.53					MED DK GY SHALE
72630 L	2510.00	PALEOCENE	LATROBE GROUP	2	.32					MED GY-LT GRN GY SST.
72617 O	2512.69	PALEOCENE	LATROBE GROUP	1	1.68					M-DK GRY SLTST
72630 J	2540.00	PALEOCENE	LATROBE GROUP	2	28.20					COAL
72630 H	2570.00	PALEOCENE	LATROBE GROUP	2	.25					SST,SH,INTRUSIVES? MIX
72630 F	2600.00	PALEOCENE	LATROBE GROUP	2	.39					SST,SH,ALTERED ROCK FTX
72630 D	2630.00	PALEOCENE	LATROBE GROUP	2	.32					SST,CLYST,ALTERED VOLC'S
72617 H	2648.85	LATE CRETACEOUS	LATROBE GROUP	1	3.36					DK GRY SLTST
72630 B	2660.00	LATE CRETACEOUS	LATROBE GROUP	2	.47					MED DK GY-LT OL GY CLYST
72629 Z	2690.00	LATE CRETACEOUS	LATROBE GROUP	2	.60					MED GY-LT OL GY SHALE
72629 X	2720.00	LATE CRETACEOUS	LATROBE GROUP	2	.58					MED GY-MED LT GY SST
72629 V	2750.00	LATE CRETACEOUS	LATROBE GROUP	2	.34					LT GY PY SST,GRN GY SH
72616 Z	2765.00	LATE CRETACEOUS	LATROBE GROUP	1	4.95					M-DK GRY MDST
72616 Y	2773.40	LATE CRETACEOUS	LATROBE GROUP	1	1.85					M-DK GRY MDST
72629 T	2800.00	LATE CRETACEOUS	LATROBE GROUP	2	.53					MED GY-MED LT GY SHALE
72629 R	2810.00	LATE CRETACEOUS	LATROBE GROUP	2	1.97					MED DK GY-MED LT GY SH.
72616 M	2857.00	LATE CRETACEOUS	LATROBE GROUP	1	1.83					LAM M GY SLST/DK GY MDST
72629 N	2885.00	LATE CRETACEOUS	LATROBE GROUP	2	1.99					MED GY SH+LT OL GY MARL
72629 L	2915.00	LATE CRETACEOUS	LATROBE GROUP	2	2.25					MED DK GY SHALE
72616 I	2923.00	LATE CRETACEOUS	LATROBE GROUP	1	1.73					M GRY ARG SLTST
72629 J	2945.00	LATE CRETACEOUS	LATROBE GROUP	2	.45					LT BRN GY SANDSTONE
72616 H	2972.70	LATE CRETACEOUS	LATROBE GROUP	1	2.61					M GRY SLTY MDST
72629 H	2975.00	LATE CRETACEOUS	LATROBE GROUP	2	1.96					MED DK GY-MED GY SHALE
72616 G	2992.80	LATE CRETACEOUS	LATROBE GROUP	1	2.42					M GRY SLTY MDST
72629 F	3005.00	LATE CRETACEOUS	LATROBE GROUP	2	1.64					DK GY-MED DK GY SHALE
72616 E	3034.60	LATE CRETACEOUS	LATROBE GROUP	1	1.81					M-DK GRY MDST
72629 D	3035.00	LATE CRETACEOUS	LATROBE GROUP	2	1.51					DK GY-MED DK GY SHALE
72629 B	3065.00	LATE CRETACEOUS	LATROBE GROUP	2	.20					LT OL GY SANDSTONE
72616 A	3067.00	LATE CRETACEOUS	LATROBE GROUP	1	1.80					DK GRY SLTST

===> DEPTH : 1520.00 TO 3067.00 METRES. <=== I ===> AVERAGE TOC : 1.29 % EXCLUDING VALUES GREATER THAN 10.00 % <===

Table 3. VITRINITE REFLECTANCE REPORT

BASIN - GIPPSLAND
WELL - KIRRAM 2

SAMPLE NO.	DEPTH	AGE	FORMATION	AN	MAX. RO	FLUOR. COLOUR	NO.CNTS.	MACERAL TYPE
72918 A	1964.60	EOCENE	LATROBE GROUP	5	.46	YEL-BRN-OR	29	I>V>V,DOM ABUNDANT
72917 A	2119.00	EOCENE	LATROBE GROUP	5	.45	YEL-OR	30	I>V>E,DOM ABUNDANT
72917 F	2373.01	PALEOCENE	LATROBE GROUP	5	.49	OR-BRN	25	V>I>E,DOM ABUNDANT
72917 B	2643.33	LATE CRETACEOUS	LATROBE GROUP	5	.52	YEL-OR-BRN	37	I>V>/=E,DOM ABUNDANT
72916 A	3067.00	LATE CRETACEOUS	LATROBE GROUP	5	.85	YEL-OR-BRN	15	I>V>E,DOM ABUNDANT

Table 4. ROCK EVAL ANALYSES

BASIN - GIPPSLAND
WELL - VIRGINIA 2

REPORT A - SULPHUR & PYROLYZABLE CARBON

SAMPLE NO.	DEPTH	SAMPLE TYPE	AGE	TMAX	S1	S2	S3	PI	S2/S3	PC	COMMENTS
72019 U	840.0	SWC	EARLY-LATE MIOCENE	401.	.17	.46	.54	.27	.85	.05	
72019 S	955.4	SWC	EARLY-LATE MIOCENE	402.	.26	.57	.69	.32	.82	.06	
72019 R	1024.5	SWC	EARLY-LATE MIOCENE	400.	.22	.64	.58	.26	1.10	.07	
72019 L	1134.5	SWC	EARLY-LATE MIOCENE	402.	.13	.34	.42	.28	.80	.03	
72019 K	1314.8	SWC	EARLY MIOCENE	402.	.12	.26	.32	.32	.81	.03	
72019 J	1630.7	SWC	EOCENE	416.	.43	5.53	.50	.11	11.76	.53	
72019 E	1949.2	SWC	EOCENE	419.	.40	1.23	.20	.25	6.15	.13	
72017 Z	2119.0	SWC	EOCENE	428.	.60	5.65	.30	.09	19.50	.53	
72017 T	2375.4	SWC	PALEOCENE	425.	.64	2.58	.16	.20	16.12	.26	
72017 O	2512.7	SWC	PALEOCENE	426.	.23	.47	.15	.33	3.13	.05	
72017 M	2646.9	SWC	LATE CRETACEOUS	430.	1.21	2.53	.29	.14	25.27	.71	
72016 Z	2765.0	SWC	LATE CRETACEOUS	433.	.59	1.18	.27	.34	4.37	.14	
72016 Y	2775.4	SWC	LATE CRETACEOUS	425.	.30	.35	.22	.47	1.59	.05	
72016 W	2857.0	SWC	LATE CRETACEOUS	436.	.60	2.39	.20	.20	11.95	.24	
72016 T	2925.4	SWC	LATE CRETACEOUS	436.	.24	.96	.16	.20	6.00	.10	
72016 M	2972.7	SWC	LATE CRETACEOUS	440.	.34	2.14	.20	.14	10.70	.20	
72016 G	2992.6	SWC	LATE CRETACEOUS	440.	.35	2.29	.14	.14	16.35	.22	
72016 E	3034.6	SWC	LATE CRETACEOUS	442.	.28	1.09	.07	.21	15.57	.11	
72016 A	3067.0	SWC	LATE CRETACEOUS	439.	.39	1.96	.15	.17	13.06	.19	

T.O.C. = Total organic carbon, wt. %
S1 = Free hydrocarbons, mg HC/g of rock
S2 = Residual hydrocarbon potential (mg HC/g of rock)
S3 = CO2 produced from kerogen pyrolysis (mg CO2/g of rock)
PC* = 0.083 (S1 + S2)

Hydrogen Index = mg HC/g organic carbon
Oxygen Index = mg CO2/g organic carbon
PI = S1/S1+S2
Tmax = Temperature Index, degrees C.

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

Table 4 cont. ROCK EVAL ANALYSES

BASIN - GIPPSLAND
WELL - MIRRAT 2

REPORT B - TOTAL CARBON, HI/OI INDICES

SAMPLE NO.	DEPTH	SAMPLE TYPE	FORMATION	TC	HI	OI	HI/OI	COMMENTS
72619 U	848.0	SWC	GIPPSLAND LIMESTONE	.89	51.	60.	.85	
72619 S	933.9	SWC	GIPPSLAND LIMESTONE	1.03	55.	66.	.83	
72619 C	1024.5	SWC	GIPPSLAND LIMESTONE	1.70	37.	34.	1.09	
72619 B	1154.5	SWC	GIPPSLAND LIMESTONE	.73	46.	57.	.81	
72619 N	1514.0	SWC	LAKES ENTRANCE	.51	50.	62.	.81	
72618 J	1550.7	SWC	LATROBE GROUP	1.74	202.	17.	11.88	
72618 C	1900.2	SWC	LATROBE GROUP	1.69	72.	11.	6.55	
72617 Z	2119.0	SWC	LATROBE GROUP	2.11	277.	14.	19.79	
72617 T	2375.0	SWC	LATROBE GROUP	2.59	99.	6.	16.50	
72617 O	2512.7	SWC	LATROBE GROUP	1.03	27.	8.	3.38	
72617 H	2641.9	SWC	LATROBE GROUP	3.35	218.	8.	27.25	
72616 7	2755.0	SWC	LATROBE GROUP	4.93	23.	5.	4.60	
72616 Y	2773.4	SWC	LATROBE GROUP	1.85	18.	11.	1.64	
72616 R	2857.0	SWC	LATROBE GROUP	1.83	150.	10.	13.00	
72616 I	2923.0	SWC	LATROBE GROUP	1.73	55.	9.	6.11	
72616 E	2972.7	SWC	LATROBE GROUP	2.61	81.	7.	11.57	
72616 5	2996.0	SWC	LATROBE GROUP	2.42	94.	5.	18.80	
72616 2	3034.0	SWC	LATROBE GROUP	1.01	60.	3.	20.00	
72616 A	3067.0	SWC	LATROBE GROUP	1.80	108.	8.	13.50	

T.O.C. = Total organic carbon, wt. %
S1 = Free hydrocarbons, mg HC/g of rock
S2 = Residual hydrocarbon potential (mg HC/g of rock)
S3 = CO2 produced from kerogen pyrolysis (mg CO2/g of rock)
PC* = 0.083 (S1 + S2)

Hydrogen Index = mg HC/g organic carbon
Oxygen Index = mg CO2/g organic carbon
PI = S1/S1+S2
Tmax = Temperature Index, degrees C.

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

Table 5. KEROGEN ELEMENTAL ANALYSIS REPORT

BASIN - GIPPSLAND
WELL - [illegible]

SAMPLE NO.	DEPTH	SAMPLE TYPE	--- ELEMENTAL % (ASH FREE) ---						COMMENTS
			H%	C%	N%	S%	O%	ASH%	
72619 A	1515.00	SWC	1.22	68.22	5.52	.00	24.97	8.86	
72619 Z	1515.00	SWC	2.67	68.68	5.75	.00	26.90	7.95	
72619 V	1522.00	SWC	.68	68.21	5.20	.00	25.35	5.83	
72619 T	1526.00	SWC	.76	65.73	4.99	.00	28.49	11.90	HIGH ASH
72619 S	1530.00	SWC	.61	68.19	5.81	.00	25.40	12.52	HIGH ASH
72619 R	1535.00	SWC	.85	68.26	5.82	.00	24.43	11.21	HIGH ASH
72619 P	1552.00	SWC	.71	71.06	5.73	.00	22.50	6.23	
72619 N	1562.00	SWC	.59	71.54	5.48	.00	22.43	2.66	
72619 M	1570.00	SWC	.65	69.33	5.13	.00	24.43	8.51	
72619 L	1647.00	SWC	.84	69.65	5.26	.00	24.25	1.99	
72619 K	1673.00	SWC	1.03	70.56	5.69	.00	18.41	9.95	
72619 E	1722.00	SWC	1.04	72.24	5.91	.00	21.31	9.02	
72619 D	1766.00	SWC	.89	70.68	5.41	.00	23.02	3.13	
72619 C	2000.00	SWC	1.06	76.48	5.82	.00	16.69	2.47	
72617 Z	2111.00	SWC	1.02	77.54	5.79	.00	15.65	4.33	
72617 [illegible]	2161.00	SWC	1.01	75.27	5.24	.00	18.47	5.20	
72617 [illegible]	2198.00	SWC	.92	76.75	5.20	.00	18.14	9.41	
72617 [illegible]	2211.00	SWC	.81	74.98	5.25	.00	17.36	7.37	
72617 [illegible]	2220.00	SWC	.82	77.63	5.85	.00	15.70	9.38	
72617 [illegible]	2230.00	SWC	.81	77.91	4.54	.00	17.24	1.98	
72617 T	2271.00	SWC	.99	79.29	5.20	.00	14.52	6.09	
72617 [illegible]	2286.00	SWC	.96	81.06	4.70	.00	13.28	4.41	
72617 S	2297.00	SWC	.29	79.37	4.87	.00	15.49	2.24	
72617 [illegible]	2311.00	SWC	1.17	81.86	4.17	.00	12.81	3.01	
72617 [illegible]	2322.00	SWC	1.35	83.04	3.93	.00	11.68	3.68	
72617 J	2367.00	SWC	.63	84.75	5.87	.00	8.74	7.00	
72617 [illegible]	2388.00	SWC	.91	82.47	4.80	.00	11.82	3.75	
72617 [illegible]	2398.00	SWC	1.08	80.36	5.74	.00	12.83	11.83	HIGH ASH
72617 [illegible]	2461.00	SWC	.92	81.48	4.87	.00	12.72	2.68	
72617 [illegible]	2475.00	SWC	1.54	83.20	4.52	.00	10.74	4.11	
72617 [illegible]	2477.00	SWC	.96	81.63	3.98	.00	13.40	2.05	
72617 [illegible]	2479.00	SWC	1.41	81.98	5.12	.00	12.40	5.46	
72617 [illegible]	2810.00	CORE	1.55	82.15	4.49	.00	11.82	5.51	
72617 [illegible]	2838.00	SWC	1.03	81.61	4.91	.00	12.23	1.81	
72617 [illegible]	2848.00	SWC	1.41	82.89	4.43	.00	11.26	2.96	
72617 [illegible]	2860.00	SWC	1.56	82.70	5.14	.00	10.59	9.14	
72617 [illegible]	2870.00	SWC	1.41	85.79	2.40	.00	30.41	3.22	
72617 [illegible]	2877.00	SWC	1.75	82.96	4.49	.00	10.86	2.52	
72617 [illegible]	2900.00	SWC	1.53	84.81	2.31	.00	31.35	6.60	
72617 [illegible]	2920.00	SWC	1.79	82.57	4.63	.00	11.01	.79	
72617 T	2929.00	SWC	2.02	82.16	4.39	.00	11.44	3.32	
72617 [illegible]	2972.00	SWC	1.94	82.08	4.48	.00	11.50	2.76	
72617 [illegible]	2990.00	SWC	1.69	69.63	4.62	.00	23.86	23.13	HIGH ASH
72617 [illegible]	2992.00	SWC	2.98	80.78	4.41	.60	12.61	1.88	
72617 [illegible]	3020.00	SWC	1.96	81.63	4.43	.00	11.98	4.01	

Table 5 cont. REPORT ELEMENTAL ANALYSIS REPORT

BASIN - GIPPSLAND
WELL - WIRRAH 2

SAMPLE NO.	DEPTH	SAMPLE TYPE	--- ELEMENTAL % (ASH FREE) ---						COMMENTS
			N%	C%	H%	S%	O%	ASH%	
726[illegible] E	[illegible]30.50	SWC	2.08	78.90	4.04	.00	14.98	1.65	
726[illegible] F	[illegible]94.50	SWC	1.66	83.33	3.65	.00	11.43	2.89	
726[illegible] G	[illegible]50.00	DTS	1.70	60.32	2.19	.00	27.79	2.33	
726[illegible] I	[illegible]07.00	SWC	2.17	81.58	4.39	.00	12.06	1.51	

Table 6. KEROGEN ELEMENTAL ANALYSIS REPORT

BASIN = GIPPSLAND
WELL = [redacted]

SAMPLE NO.	DEPTH	SAMPLE TYPE	AGE	FORMATION	ATOMIC RATIOS H/C	O/C	N/C	COMMENTS
[redacted]	[redacted]	SWC	EOCENE	LATROBE GROUP	.97	.27	.02	
[redacted]	[redacted]	SWC	EOCENE	LATROBE GROUP	1.07	.31	.04	
[redacted]	[redacted]	SWC	EOCENE	LATROBE GROUP	.91	.28	.01	
[redacted]	[redacted]	SWC	EOCENE	LATROBE GROUP	.91	.33	.01	HIGH ASH
[redacted]	[redacted]	SWC	EOCENE	LATROBE GROUP	1.02	.28	.01	HIGH ASH
[redacted]	[redacted]	SWC	EOCENE	LATROBE GROUP	1.01	.26	.01	HIGH ASH
[redacted]	[redacted]	SWC	EOCENE	LATROBE GROUP	.97	.24	.01	
[redacted]	[redacted]	SWC	EOCENE	LATROBE GROUP	.91	.24	.01	
[redacted]	[redacted]	SWC	EOCENE	LATROBE GROUP	.89	.26	.01	
[redacted]	[redacted]	SWC	EOCENE	LATROBE GROUP	.91	.26	.01	
[redacted]	[redacted]	SWC	EOCENE	LATROBE GROUP	.95	.18	.01	
[redacted]	[redacted]	SWC	EOCENE	LATROBE GROUP	.90	.22	.01	
[redacted]	[redacted]	SWC	EOCENE	LATROBE GROUP	.92	.24	.01	
[redacted]	[redacted]	SWC	EOCENE	LATROBE GROUP	.91	.16	.01	
[redacted]	[redacted]	SWC	EOCENE	LATROBE GROUP	.90	.15	.01	
[redacted]	[redacted]	SWC	PALEOCENE	LATROBE GROUP	.84	.18	.01	
[redacted]	[redacted]	SWC	PALEOCENE	LATROBE GROUP	.82	.18	.01	
[redacted]	[redacted]	SWC	PALEOCENE	LATROBE GROUP	.92	.17	.00	
[redacted]	[redacted]	SWC	PALEOCENE	LATROBE GROUP	.90	.15	.01	
[redacted]	[redacted]	SWC	PALEOCENE	LATROBE GROUP	.78	.17	.00	
[redacted]	[redacted]	SWC	PALEOCENE	LATROBE GROUP	.79	.14	.01	
[redacted]	[redacted]	SWC	PALEOCENE	LATROBE GROUP	.70	.12	.01	
[redacted]	[redacted]	SWC	PALEOCENE	LATROBE GROUP	.74	.15	.00	
[redacted]	[redacted]	SWC	PALEOCENE	LATROBE GROUP	.61	.12	.01	
[redacted]	[redacted]	SWC	PALEOCENE	LATROBE GROUP	.57	.11	.01	
[redacted]	[redacted]	SWC	PALEOCENE	LATROBE GROUP	.63	.08	.01	
[redacted]	[redacted]	SWC	PALEOCENE	LATROBE GROUP	.70	.11	.01	
[redacted]	[redacted]	SWC	LATE CRETACEOUS	LATROBE GROUP	.36	.12	.01	HIGH ASH
[redacted]	[redacted]	SWC	LATE CRETACEOUS	LATROBE GROUP	.72	.12	.01	
[redacted]	[redacted]	SWC	LATE CRETACEOUS	LATROBE GROUP	.65	.10	.02	
[redacted]	[redacted]	SWC	LATE CRETACEOUS	LATROBE GROUP	.59	.12	.01	
[redacted]	[redacted]	SWC	LATE CRETACEOUS	LATROBE GROUP	.75	.11	.01	
[redacted]	[redacted]	SWC	EOCENE	LATROBE GROUP	.69	.11	.02	
[redacted]	[redacted]	SWC	LATE CRETACEOUS	LATROBE GROUP	.72	.11	.01	
[redacted]	[redacted]	SWC	LATE CRETACEOUS	LATROBE GROUP	.64	.10	.01	
[redacted]	[redacted]	SWC	LATE CRETACEOUS	LATROBE GROUP	.75	.10	.02	
[redacted]	[redacted]	CTS	LATE CRETACEOUS	LATROBE GROUP	.44	.35	.02	
[redacted]	[redacted]	SWC	LATE CRETACEOUS	LATROBE GROUP	.65	.10	.02	
[redacted]	[redacted]	CTS	LATE CRETACEOUS	LATROBE GROUP	.43	.36	.02	
[redacted]	[redacted]	SWC	LATE CRETACEOUS	LATROBE GROUP	.67	.10	.02	
[redacted]	[redacted]	SWC	LATE CRETACEOUS	LATROBE GROUP	.64	.10	.02	
[redacted]	[redacted]	SWC	LATE CRETACEOUS	LATROBE GROUP	.56	.11	.02	
[redacted]	[redacted]	SWC	LATE CRETACEOUS	LATROBE GROUP	.79	.26	.02	HIGH ASH
[redacted]	[redacted]	SWC	LATE CRETACEOUS	LATROBE GROUP	.69	.12	.02	
[redacted]	[redacted]	SWC	LATE CRETACEOUS	LATROBE GROUP	.65	.11	.02	

Table 6 cont. KEROGEN ELEMENTAL ANALYSIS REPORT

BASIN - GIPPSLAND
WELL - MIRRAT P

SAMPLE NO.	DEPTH	SAMPLE TYPE	AGE	FORMATION	ATOMIC RATIOS			COMMENTS
					H/C	O/C	N/C	
72615 E	3058.00	SWC	LATE CRETACEOUS	LATROBE GROUP	.61	.14	.02	
72615 C	3049.00	SWC	LATE CRETACEOUS	LATROBE GROUP	.52	.10	.02	
72610 G	3056.00	CTS	LATE CRETACEOUS	LATROBE GROUP	.38	.31	.02	
72615 A	3067.00	SWC	LATE CRETACEOUS	LATROBE GROUP	.65	.11	.02	

Table 7. C15+ EXTRACT ANALYSES

BASIN - GIPPSLAND
WELL - MIRRAM 2

REPORT A - EXTRACT DATA (PPM)

SAMPLE NO.	DEPTH	TYPE	AN	AGE	TOTAL EXTRACT	*--- HYDROCARBONS ---* SATS.	AROMS.	TOTAL H/CARBS	*--- NON-HYDROCARBONS ---* ASPH.	ELUTED NSO	NON-ELT NSO	TOTAL NSO	SULPHUR	TOTAL NON/HCS
72e34 4	1250.00	CTS	2	EARLY-LATE MIOCENE	356.	0.	0.	0.	240.	0.	0.	0.	0.	240.
72e32 1	1550.00	CTS	1	EOCENE	394.	9.	22.	31.	276.	45.	19.	64.	21.	363.
72e32 5	1850.00	CTS	2	EOCENE	71932.	584.	5998.	6582.	60550.	2538.	2462.	5000.	0.	65550.
72e30 2	2250.00	CTS	2	PALEOCENE	280.	22.	40.	62.	263.	39.	9.	46.	7.	318.
72e30 6	2450.00	CTS	2	PALEOCENE	1311.	48.	224.	272.	839.	150.	33.	183.	17.	1039.
72e29 1	2600.00	CTS	2	LATE CRETACEOUS	1101.	50.	168.	218.	648.	141.	48.	189.	46.	883.
72e29 5	3035.00	CTS	2	LATE CRETACEOUS	509.	15.	83.	98.	309.	59.	15.	74.	28.	411.

C15+ EXTRACT ANALYSES

BASIN - GIPPSLAND
WELL - MIRRAM 2

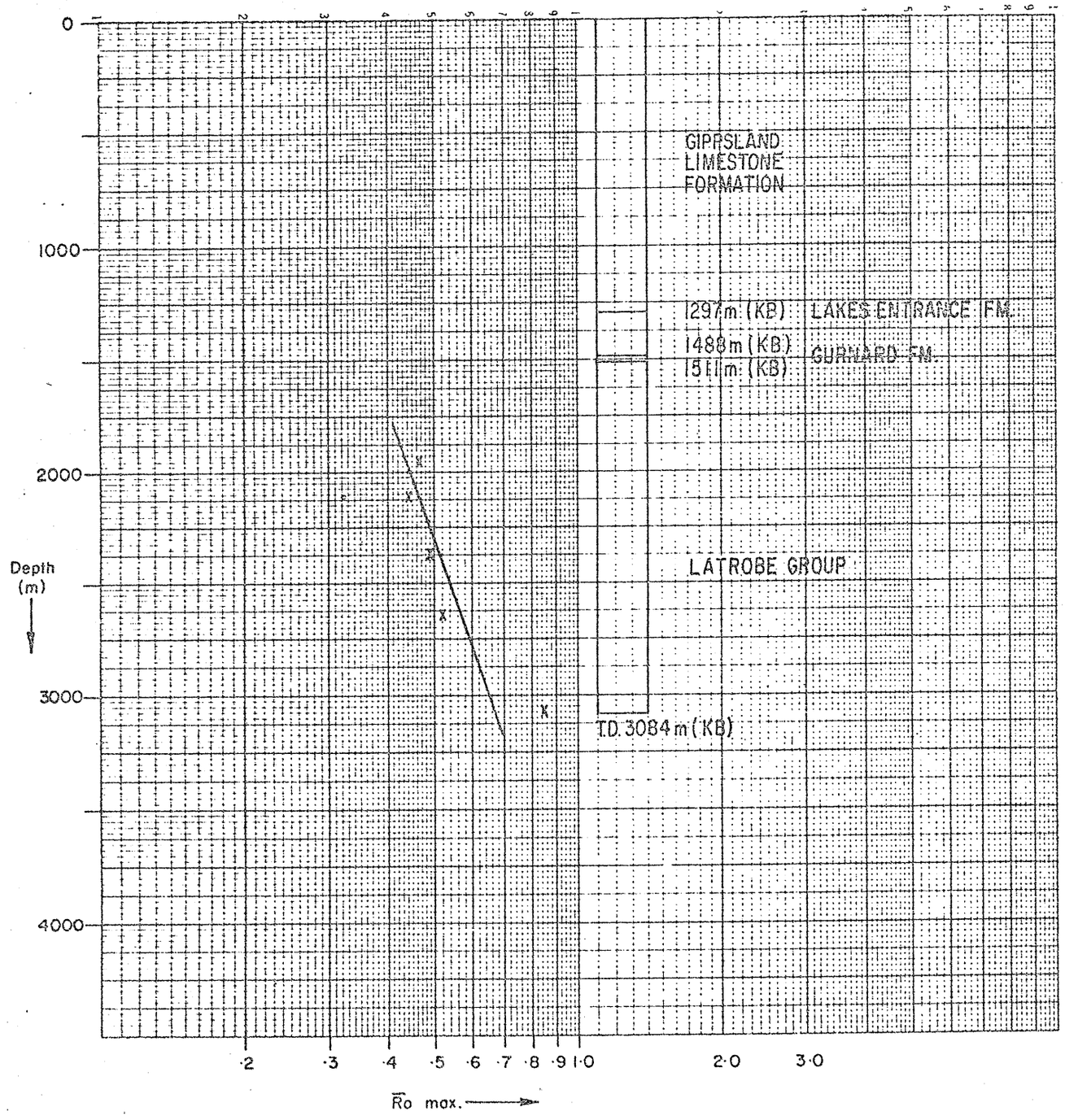
REPORT B - EXTRACTS % OF TOTAL

SAMPLE NO.	DEPTH	FORMATION	*HYDROCARBONS* SAT. %	AROM.%	*- NON-HYDROCARBONS -* NSO. %	ASPH.%	SULPHUR *	SAT/AR *	HC/NHC *	COMMENTS
72e34 4	1250.00	GIPPSLAND LIMESTONE	.0	.0	.0	71.4	.0 *	.0 *	.0 *	IMMATURE,MAR+NON-MAR.MIX
72e32 1	1550.00	LATROBE GROUP	2.3	5.6	16.2	70.6	5.3 *	.4 *	.1 *	IMMATURE,PREDOM.NON-MAR.
72e32 5	1850.00	LATROBE GROUP	.8	8.3	7.0	83.9	.0 *	.1 *	.1 *	IMMATURE,NON-MARINE
72e30 2	2250.00	LATROBE GROUP	5.8	10.5	12.6	69.2	1.8 *	.6 *	.2 *	IMMATURE,NON-MARINE
72e30 6	2450.00	LATROBE GROUP	3.7	17.1	14.0	64.0	1.3 *	.2 *	.3 *	IMMATURE,NON-MARINE
72e29 1	2600.00	LATROBE GROUP	4.5	15.3	17.2	58.9	4.2 *	.3 *	.2 *	IMMATURE,NON-MARINE
72e29 5	3035.00	LATROBE GROUP	2.9	16.3	14.5	60.7	5.5 *	.2 *	.2 *	MATURE,NON MARINE

FIG. 3

WIRRAH-2

VITRINITE REFLECTANCE vs DEPTH



Dwg. 2173/OP/6

FIG. 4

WIRRAH-2

ROCKEVAL MATURATION AND ORGANIC MATTER TYPE

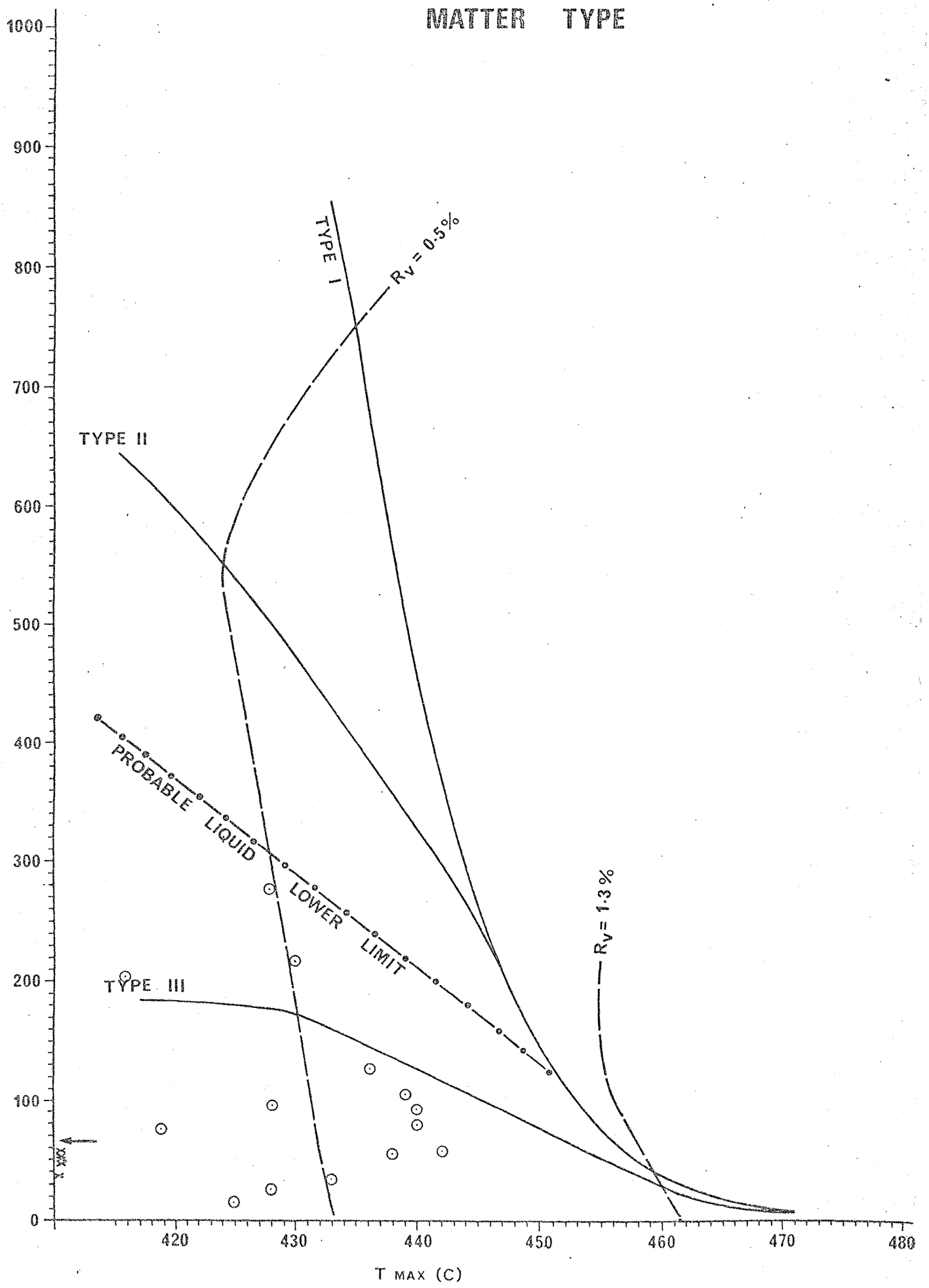
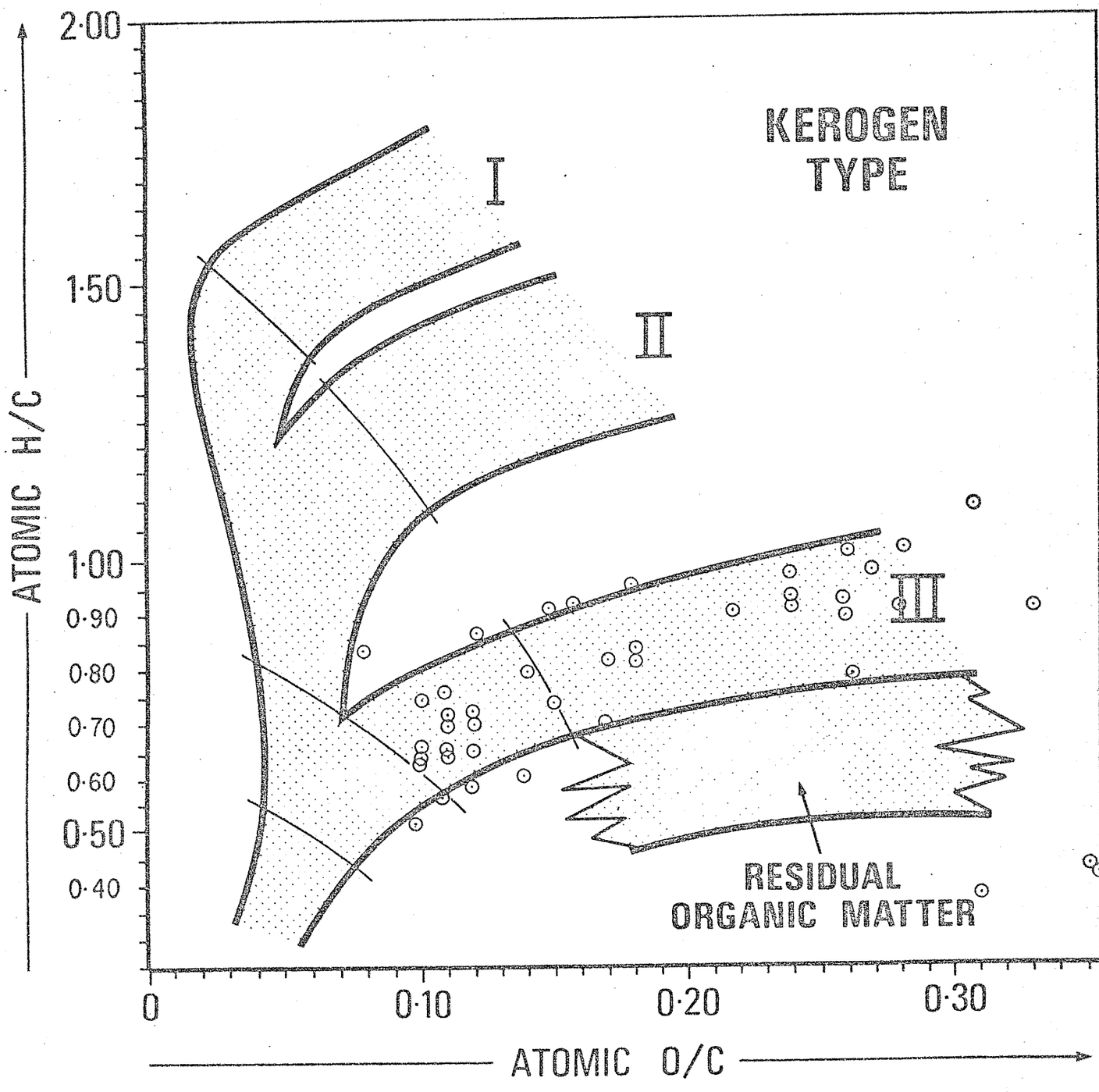


FIG. 5

WIRRAH-2

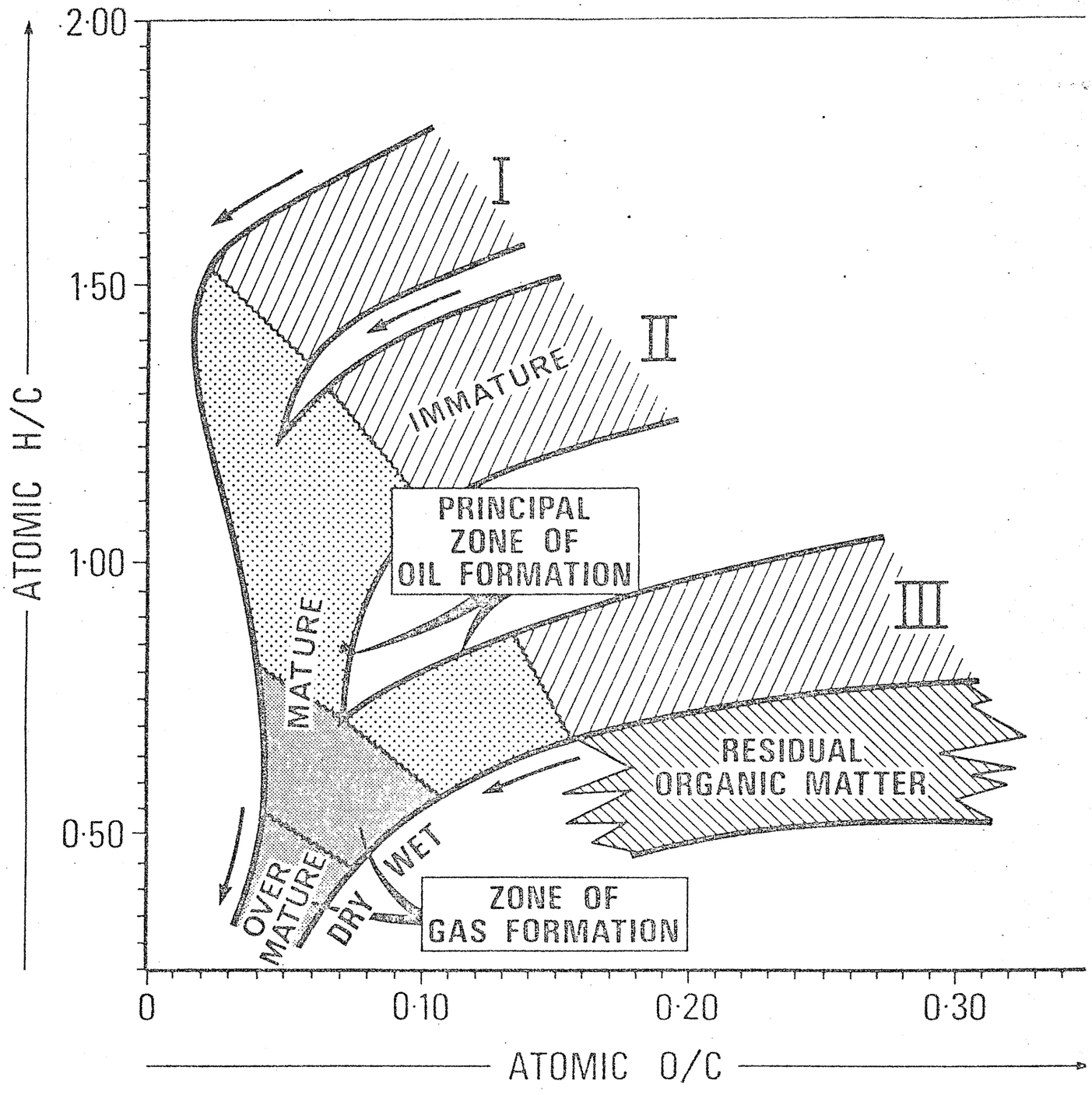


⊙ LATROBE GROUP

Dwg. 2173/OP/4

1107/OP/235 Base

FIGURE 6



PRINCIPAL PRODUCTS OF KEROGEN EVOLUTION

CO_2, H_2O

OIL

GAS

RESIDUAL ORGANIC MATTER
(NO POTENTIAL FOR OIL OR GAS)

1380/BS/75

C_{15+} Paraffin-Naphthene Hydrocarbons

GeoChem Sample No. E557-007

Exxon Identification No. 72634-N

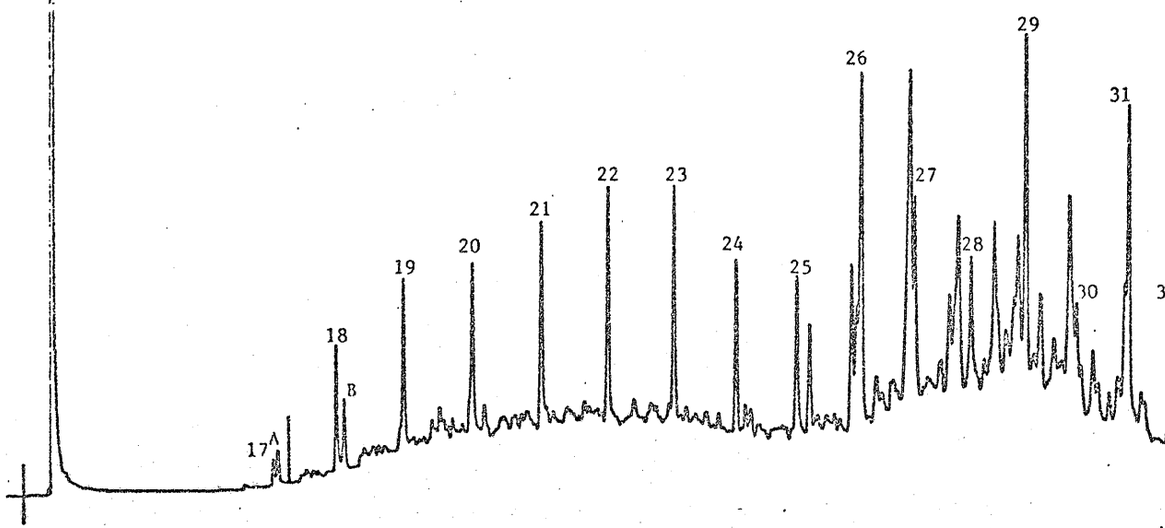


Figure 7, Wirrah-2, 1265-1280m(KB), Lakes Entrance Formation.

C_{15+} Paraffin-Naphthene Hydrocarbons

GeoChem Sample No. E557-006

Exxon Identification No. 72632-T

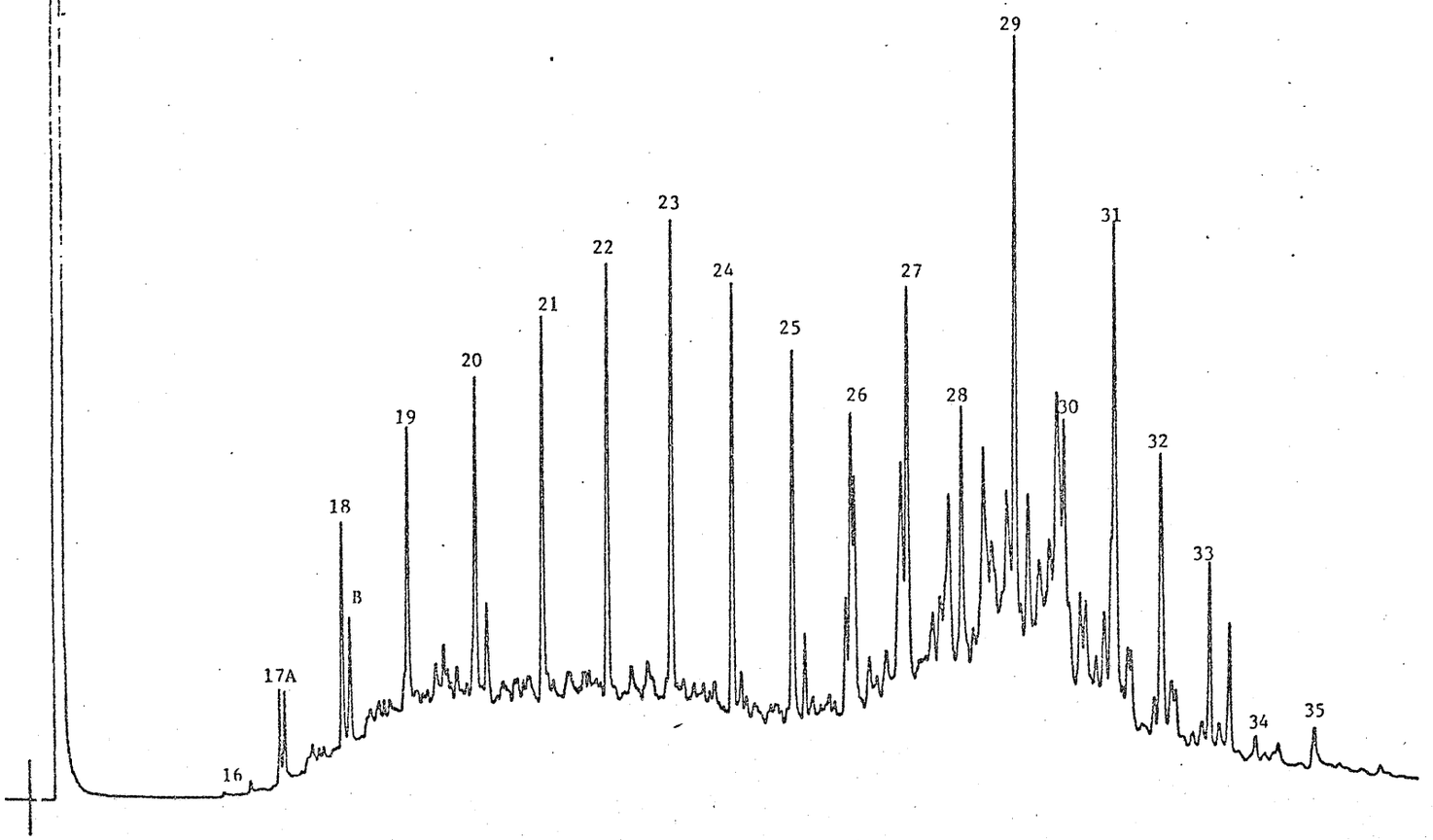


Figure 8, Wirrah-2, 1565-1580m(KB), Latrobe Group.

C_{15+} Paraffin-Naphthene Hydrocarbons

GeoChem Sample No. E557-005 (Coal)

Exxon Identification No. 72632-B

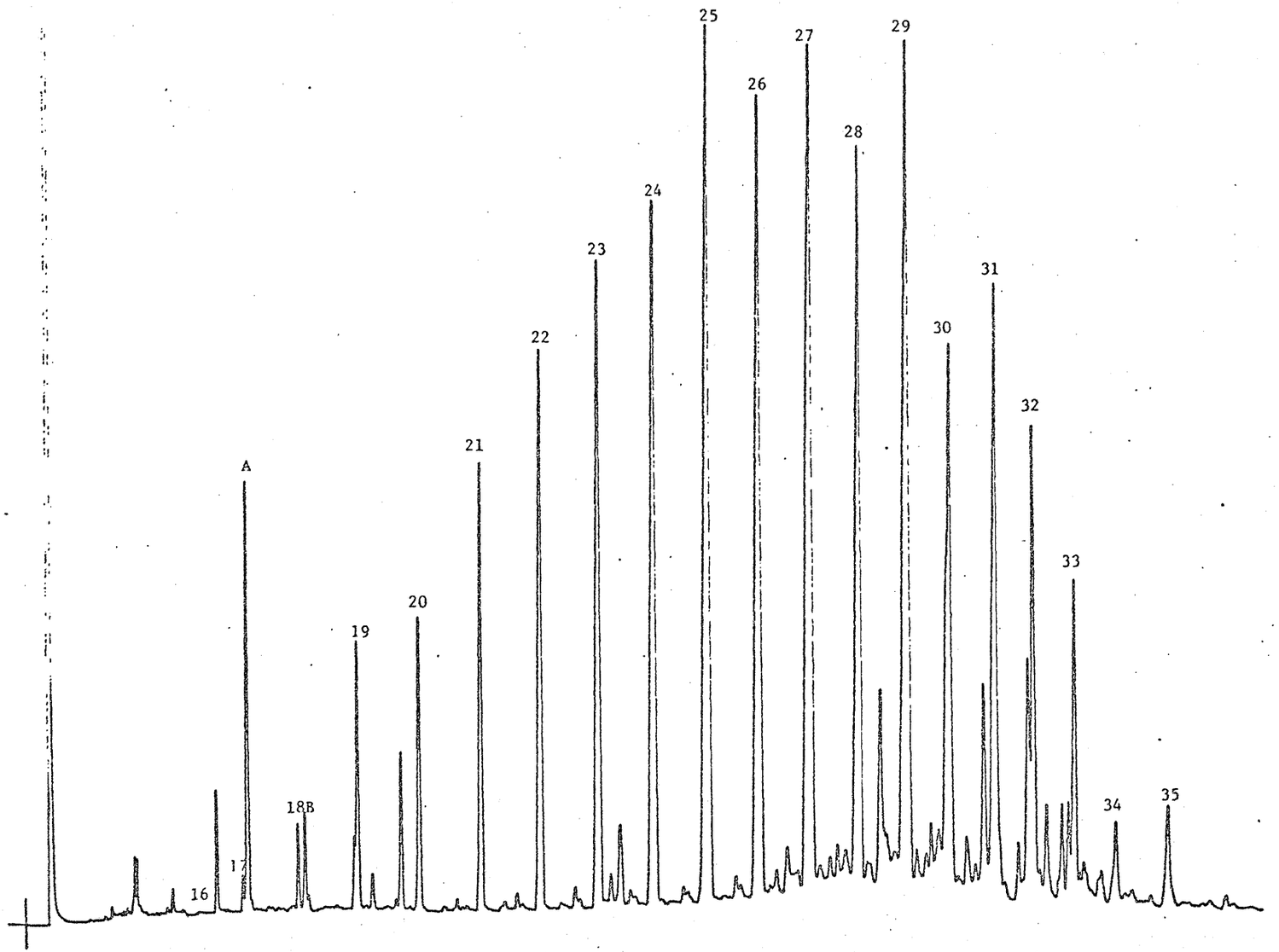


Figure 9, Wirrah-2, 1840-1855m(KB), Latrobe Group.

C_{15+} Paraffin-Naphthene Hydrocarbons

GeoChem Sample No. E557-004

Exxon Identification No. 72630-Z

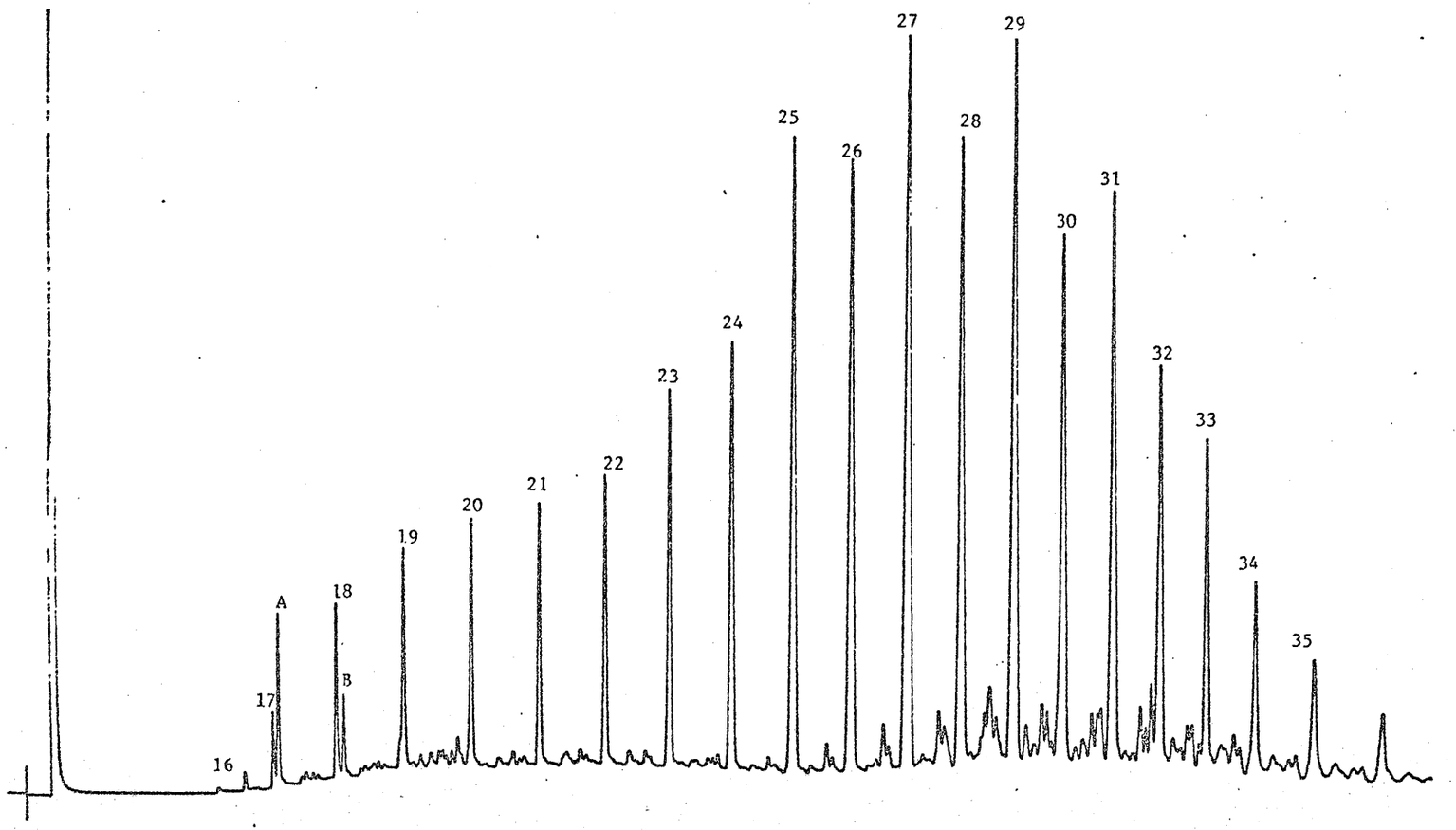


Figure 10, Wirrah-2, 2270-2285m(KB), Latrobe Group

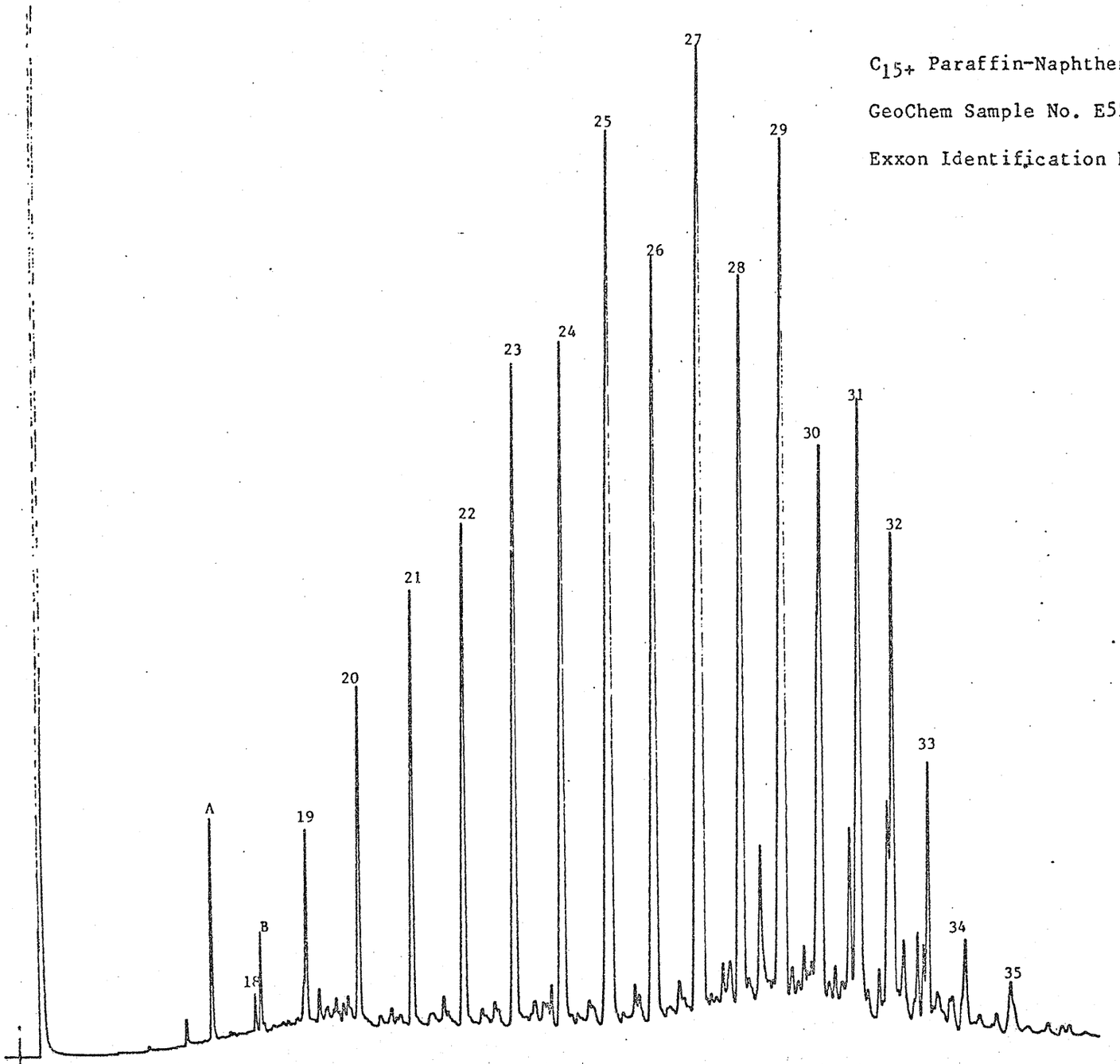


Figure 11, Wirrah-2, 2450-2465m(KB), Latrobe Group.

C_{15+} Paraffin-Naphthene Hydrocarbons

GeoChem Sample No. E557-002

Exxon Identification No. 72629-T

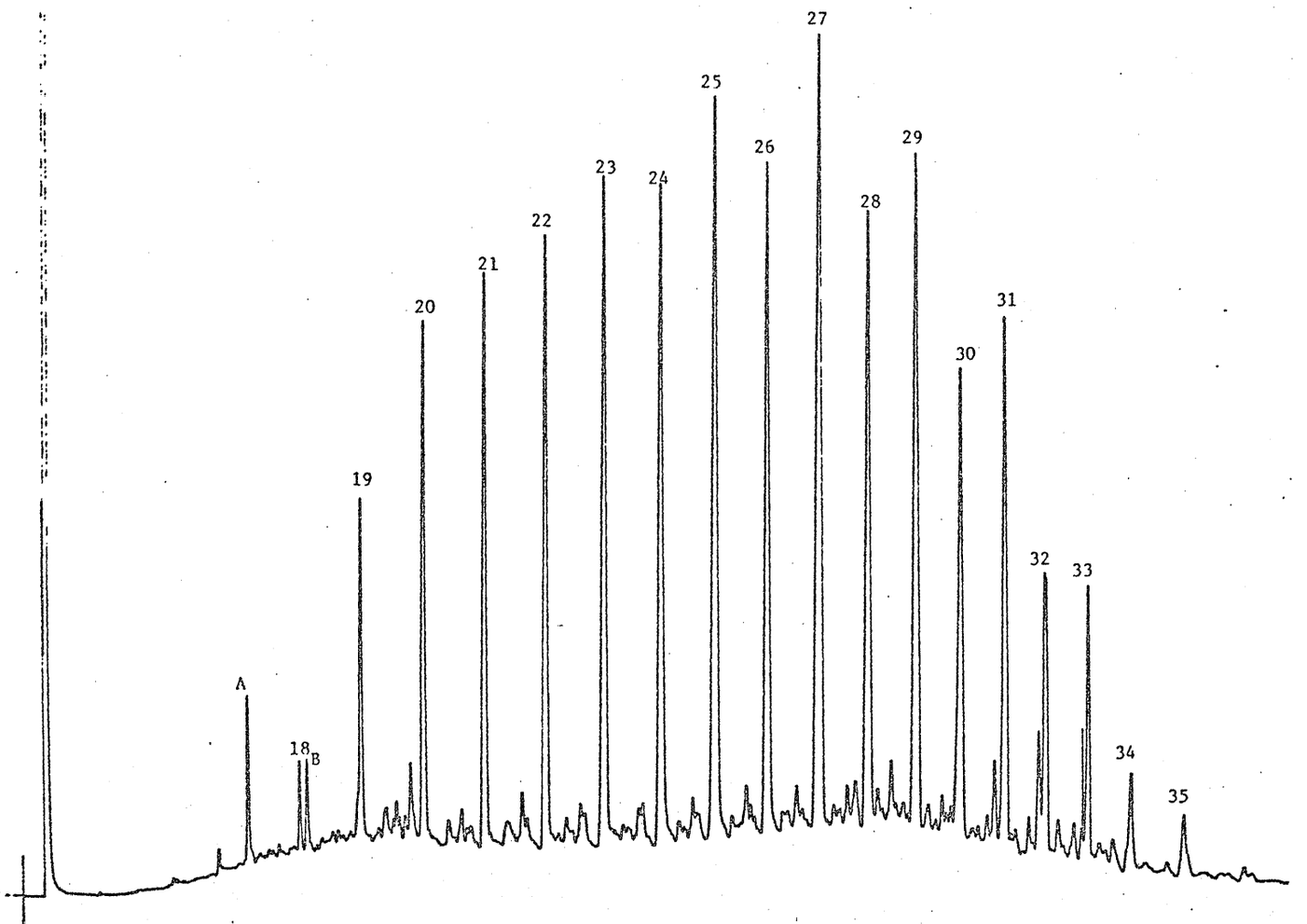


Figure 12, Wirrah-2, 2765-2780m(KB), Latrobe Group

C_{15+} Paraffin-Naphthene Hydrocarbons

GeoChem Sample No. E557-001

Exxon Identification No. 72629-D

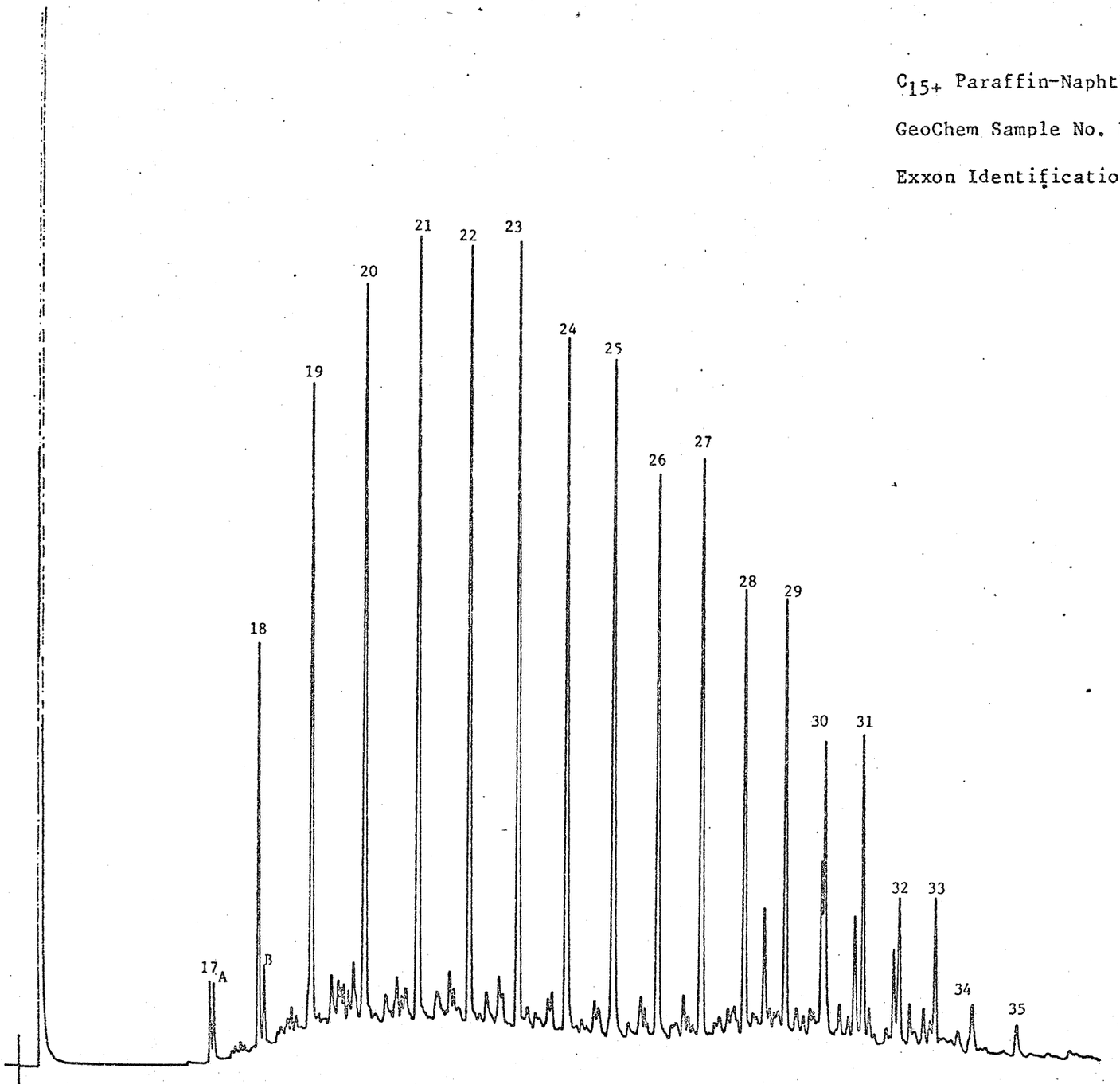


Figure 13, Wirrah-2, 3020-3035m(KB), Latrobe Group.

PE601306

This is an enclosure indicator page.
The enclosure PE601306 is enclosed within the container PE902600 at this location in this document.

The enclosure PE601306 has the following characteristics:

ITEM_BARCODE	= PE601306
CONTAINER_BARCODE	= PE902600
NAME	= C1-4 Cuttings Gas Log
BASIN	= GIPPSLAND
PERMIT	= VIC/L2
TYPE	= WELL
SUBTYPE	= WELL_LOG
DESCRIPTION	= C1-4 Cuttings Gas Log (enclosure from WCR vol.2) for Wirrah-2
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	= 23/07/84
W_NO	= W797
WELL_NAME	= Wirrah-2
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE601307

This is an enclosure indicator page.
The enclosure PE601307 is enclosed within the container PE902600 at this location in this document.

The enclosure PE601307 has the following characteristics:

ITEM_BARCODE	= PE601307
CONTAINER_BARCODE	= PE902600
NAME	= Geochemical Log
BASIN	= GIPPSLAND
PERMIT	= VIC/L2
TYPE	= WELL
SUBTYPE	= WELL_LOG
DESCRIPTION	= C4-7 Gasoline Range Geochemical Log (enclosure from WCR vol.2) for Wirrah-2
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	= 23/07/84
W_NO	= W797
WELL_NAME	= Wirrah-2
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

APPENDIX-1

C_{4-7} Detailed Data Sheets

16 JUN 83

72634N AUSTRALIA WIRRAH-2, 1280 METERS

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

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

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

PARAFFIN INDEX 1	0.000
PARAFFIN INDEX 2	0.000

16 JUN 83

72634L AUSTRALIA WIRRAH-2, 1310 METERS

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

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

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

PARAFFIN INDEX 1 0.000
PARAFFIN INDEX 2 0.000

16 JUN 83

72634J AUSTRALIA WIRRAH-2, 1340 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	18.2	3.17
ETHANE	0.0		1T2-DMCP	23.0	4.02
PROPANE	0.0		3-EPENT	0.0	0.00
IBUTANE	13.6	2.37	224-TMP	0.0	0.00
NBUTANE	21.7	3.78	NHEPTANE	51.7	9.02
IPENTANE	34.1	5.95	1C2-DMCP	2.9	0.50
NPENTANE	59.0	10.29	MCH	70.2	12.25
22-DMB	2.7	0.48			
CPENTANE	4.0	0.69			
23-DMB	7.8	1.35			
2-MP	65.3	11.39			
3-MP	29.1	5.08			
NHEXANE	45.6	7.96			
MCP	39.9	6.96			
22-DMP	0.0	0.00			
24-DMP	2.8	0.49			
223-TMB	0.0	0.00			
CHEXANE	13.6	2.37			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	23.4	4.08			
23-DMP ,	11.2	1.95			
3-MHEX ,	16.3	2.84			
1C3-DMCP	17.1	2.98			

	TOTALS PPB	NORM PERCENT.	SIG COMP RATIOS	
ALL COMP	573.		C1/C2	1.06
GASOLINE	573.		A /D2	5.98
NAPHTHENES	189.	32.96	C1/D2	6.59
C6-7	336.	58.61	CH/MCP	0.34
			PENT/IPENT,	1.73

	PPB	NORM PERCENT
MCP	39.9	32.2
CH	13.6	11.0
MCH	70.2	56.8
TOTAL	123.7	100.0

PARAFFIN INDEX 1	0.681
PARAFFIN INDEX 2	21.127

16 JUN 83

72634H AUSTRALIA WIRRAH-2, 1370 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	5.5	1.05
ETHANE	0.0		1T2-DMCP	6.4	1.23
PROPANE	0.0		3-EPENT	0.0	0.00
IBUTANE	29.3	5.62	224-TMP	0.0	0.00
NBUTANE	30.6	5.87	NHEPTANE	37.5	7.22
IPENTANE	37.2	7.16	1C2-DMCP	0.0	0.00
NPENTANE	70.2	13.50	MCH	14.6	2.80
22-DMB	70.2	13.50			
CPENTANE	3.8	0.73			
23-DMB	5.6	1.08			
2-MP	59.4	11.41			
3-MP	24.5	4.72			
NHEXANE	48.6	9.35			
MCP	26.6	5.11			
22-DMP	0.0	0.00			
24-DMP	1.0	0.19			
223-TMB	0.0	0.00			
CHEXANE	6.0	1.15			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	17.2	3.30			
23-DMP ,	8.6	1.65			
3-MHEX ,	11.5	2.21			
1C3-DMCP	6.0	1.15			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	520.		C1/C2	0.85
GASOLINE	520.		A /D2	7.51
NAPHTHENES	69.	13.23	C1/D2	3.29
C6-7	189.	36.42	CH/MCP	0.23
			PENT/IPENT,	1.89

	PPB	NORM PERCENT
MCP	26.6	56.4
CH	6.0	12.7
MCH	14.6	30.9
TOTAL	47.2	100.0

PARAFFIN INDEX 1	1.604
PARAFFIN INDEX 2	33.153

16 JUN 83

72634F AUSTRALIA WIRRAH-2, 1400 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	9.9	1.18
ETHANE	0.0		1T2-DMCP	10.9	1.31
PROPANE	0.0		3-EPENT	0.0	0.00
IBUTANE	42.6	5.08	224-TMP	0.0	0.00
NBUTANE	59.3	7.08	NHEPTANE	96.1	11.47
IPENTANE	96.5	11.52	1C2-DMCP	0.0	0.00
NPENTANE	116.6	13.92	MCH	54.0	6.44
22-DMB	0.0	0.00			
CPENTANE	8.7	1.03			
23-DMB	8.2	0.98			
2-MP	84.5	10.09			
3-MP	38.6	4.61			
NHEXANE	90.4	10.80			
MCP	32.8	3.92			
22-DMP	0.0	0.00			
24-DMP	3.2	0.38			
223-TMB	0.0	0.00			
CHEXANE	10.8	1.29			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	32.4	3.87			
23-DMP ,	14.6	1.74			
3-MHEX ,	19.6	2.34			
1C3-DMCP	7.9	0.94			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	838.		C1/C2	1.58
GASOLINE	838.		A /D2	9.51
NAPHTHENES	135.	16.12	C1/D2	4.95
C6-7	383.	45.68	CH/MCP	0.33
			PENT/IPENT,	1.21

	PPB	NORM PERCENT
MCP	32.8	33.6
CH	10.8	11.1
MCH	54.0	55.3
TOTAL	97.6	100.0

PARAFFIN INDEX 1	1.810
PARAFFIN INDEX 2	37.500

16 JUN 83

72634D AUSTRALIA WIRRAH-2, 1430 METERS

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

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

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

PARAFFIN INDEX 1	0.000
PARAFFIN INDEX 2	0.000

16 JUN 83

72634B AUSTRALIA WIRRAH-2, 1460 METERS

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

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

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

PARAFFIN INDEX 1	0.000
PARAFFIN INDEX 2	0.000

16 JUN 83

72632Z AUSTRALIA WIRRAH-2, 1490 METERS

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

	TOTALS PPB	NORM PERCENT
ALL COMP	0.	
GASOLINE	0.	
NAPHTHENES	0.	0.00
C6-7	0.	0.00

SIG COMP RATIOS

C1/C2 999.99
A /D2 999.99
C1/D2 999.99
CH/MCP 999.99
PENT/IPENT, 999.99

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

PARAFFIN INDEX 1	0.000
PARAFFIN INDEX 2	0.000

16 JUN 83

72632X AUSTRALIA WIRRAH-2, 1520 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	83.0	0.87
ETHANE	0.0		1T2-DMCP	148.7	1.56
PROPANE	0.0		3-EPENT	0.0	0.00
IBUTANE	526.9	5.52	224-TMP	0.0	0.00
NBUTANE	982.2	10.28	NHEPTANE	300.3	3.14
IPENTANE	1139.0	11.92	1C2-DMCP	15.4	0.16
NPENTANE	1444.2	15.12	MCH	826.0	8.65
22-DMB	33.6	0.35			
CPENTANE	114.5	1.20			
23-DMB	117.0	1.22			
2-MP	477.5	5.00			
3-MP	330.4	3.46			
NHEXANE	942.4	9.87			
MCP	787.4	8.24			
22-DMP	0.0	0.00			
24-DMP	10.0	0.11			
223-TMB	3.5	0.04			
CHEXANE	841.2	8.81			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	112.4	1.18			
23-DMP ,	85.9	0.90			
3-MHEX ,	138.3	1.45			
1C3-DMCP	91.4	0.96			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	9552.		C1/C2	1.58
GASOLINE	9552.		A /D2	8.98
NAPHTHENES	2908.	30.44	C1/D2	12.87
C6-7	4386.	45.92	CH/MCP	1.07
			PENT/IPENT,	1.27

	PPB	NORM PERCENT
MCP	787.4	32.1
CH	841.2	34.3
MCH	826.0	33.7
TOTAL	2454.6	100.0

PARAFFIN INDEX 1	0.776
PARAFFIN INDEX 2	11.429

16 JUN 83

72632V AUSTRALIA WIRRAH-2, 1550 METERS

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	62.8	4.63
NBUTANE	117.2	8.63
IPENTANE	172.4	12.70
NPENTANE	194.9	14.36
22-DMB	3.7	0.27
CPENTANE	20.4	1.51
23-DMB	16.9	1.24
2-MP	96.7	7.13
3-MP	54.3	4.00
NHEXANE	146.3	10.78
MCP	117.6	8.66
22-DMP	0.0	0.00
24-DMP	3.1	0.23
223-TMB	0.0	0.00
CHEXANE	99.6	7.34
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	25.0	1.84
23-DMP ,	14.2	1.05
3-MHEX ,	25.0	1.84
1C3-DMCP	12.6	0.93
1T3-DMCP	10.5	0.77
1T2-DMCP	13.2	0.97
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	70.1	5.16
1C2-DMCP	0.0	0.00
MCH	80.6	5.94

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	1357.		C1/C2	1.33
GASOLINE	1357.		A /D2	8.65
NAPHTHENES	355.	26.12	C1/D2	8.21
C6-7	618.	45.52	CH/MCP	0.85
			PENT/IPENT,	1.13

	PPB	NORM PERCENT
MCP	117.6	39.5
CH	99.6	33.5
MCH	80.6	27.1
TOTAL	297.8	100.0

PARAFFIN INDEX 1	1.377
PARAFFIN INDEX 2	19.974

16 JUN 83

72632T AUSTRALIA WIRRAH-2, 1580 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	19.6	1.24
ETHANE	0.0		1T2-DMCP	26.8	1.69
PROPANE	0.0		3-EPENT	0.0	0.00
IBUTANE	86.0	5.43	224-TMP	0.0	0.00
NBUTANE	182.9	11.55	NHEPTANE	78.3	4.94
IPENTANE	217.7	13.74	1C2-DMCP	0.0	0.00
NPENTANE	165.3	10.43	MCH	160.0	10.10
22-DMB	6.6	0.42			
CPENTANE	19.9	1.26			
23-DMB	19.2	1.21			
2-MP	100.9	6.37			
3-MP	60.6	3.82			
NHEXANE	103.7	6.55			
MCP	110.0	6.95			
22-DMP	0.0	0.00			
24-DMP	4.0	0.25			
223-TMB	0.0	0.00			
CHEXANE	127.0	8.02			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	30.6	1.93			
23-DMP ,	17.7	1.12			
3-MHEX ,	25.9	1.64			
1C3-DMCP	21.4	1.35			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	1584.		C1/C2	1.78
GASOLINE	1584.		A /D2	7.02
NAPHTHENES	485.	30.60	C1/D2	12.25
C6-7	725.	45.77	CH/MCP	1.15
			PENT/IPENT,	0.76

	PPB	NORM PERCENT
MCP	110.0	27.7
CH	127.0	32.0
MCH	160.0	40.3
TOTAL	397.0	100.0

PARAFFIN INDEX 1	0.832
PARAFFIN INDEX 2	15.430

16 JUN 83

72632R AUSTRALIA WIRRAH-2, 1610 METERS

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	50125.8	
IBUTANE	33567.6	2.74
NBUTANE	97080.2	7.93
IPENTANE	79620.9	6.51
NPENTANE	92689.6	7.57
22-DMB	2181.8	0.18
CPENTANE	21266.3	1.74
23-DMB	0.0	0.00
2-MP	78743.2	6.43
3-MP	26717.9	2.18
NHEXANE	105291.1	8.60
MCP	97635.4	7.98
22-DMP	0.0	0.00
24-DMP	794.4	0.06
223-TMB	367.9	0.03
CHEXANE	156064.8	12.75
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	21740.2	1.78
23-DMP ,	11140.5	0.91
3-MHEX ,	21511.3	1.76
1C3-DMCP	5378.7	0.44
1T3-DMCP	12965.6	1.06
1T2-DMCP	22527.1	1.84
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	104784.1	8.56
1C2-DMCP	2395.0	0.20
MCH	229520.2	18.75

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	1274108.		C1/C2	2.89
GASOLINE	1223983.		A /D2	9.77
NAPHTHENES	547753.	44.75	C1/D2	18.94
C6-7	792116.	64.72	CH/MCP	1.60
			PENT/IPENT,	1.16

	PPB	NORM PERCENT
MCP	97635.4	20.2
CH	156064.8	32.3
MCH	229520.2	47.5
TOTAL	483220.3	100.0

PARAFFIN INDEX 1	1.058
PARAFFIN INDEX 2	17.892

16 JUN 83

72632P AUSTRALIA WIRRAH-2, 1640 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	102.2	1.36
ETHANE	0.0		1T2-DMCP	182.9	2.44
PROPANE	139.2		3-EPENT	0.0	0.00
IBUTANE	176.2	2.35	224-TMP	0.0	0.00
NBUTANE	319.4	4.26	NHEPTANE	648.8	8.64
IPENTANE	427.8	5.70	1C2-DMCP	12.6	0.17
NPENTANE	516.3	6.88	MCH	1731.6	23.07
22-DMB	22.3	0.30			
CPENTANE	37.2	0.50			
23-DMB	80.1	1.07			
2-MP	464.5	6.19			
3-MP	244.9	3.26			
NHEXANE	821.9	10.95			
MCP	515.4	6.87			
22-DMP	0.0	0.00			
24-DMP	17.5	0.23			
223-TMB	4.2	0.06			
CHEXANE	603.8	8.05			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	169.6	2.26			
23-DMP ,	105.9	1.41			
3-MHEX ,	194.9	2.60			
1C3-DMCP	105.1	1.40			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	7644.		C1/C2	2.73
GASOLINE	7505.		A /D2	7.55
NAPHTHENES	3291.	43.85	C1/D2	12.85
C6-7	5216.	69.50	CH/MCP	1.17
			PENT/IPENT,	1.21

	PPB	NORM PERCENT
MCP	515.4	18.1
CH	603.8	21.2
MCH	1731.6	60.7
TOTAL	2850.8	100.0

PARAFFIN INDEX 1	0.934
PARAFFIN INDEX 2	16.875

16 JUN 83

72632N AUSTRALIA WIRRAH-2, 1670 METERS

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	148.0	
IBUTANE	189.6	3.51
NBUTANE	444.2	8.23
IPENTANE	495.5	9.18
NPENTANE	605.9	11.23
22-DMB	15.2	0.28
CPENTANE	64.1	1.19
23-DMB	59.3	1.10
2-MP	292.6	5.42
3-MP	163.6	3.03
NHEXANE	488.4	9.05
MCP	486.9	9.02
22-DMP	0.0	0.00
24-DMP	5.1	0.09
223-TMB	0.0	0.00
CHEXANE	529.5	9.81
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	83.9	1.55
23-DMP ,	51.9	0.96
3-MHEX ,	77.0	1.43
1C3-DMCP	58.7	1.09
1T3-DMCP	76.2	1.41
1T2-DMCP	75.5	1.40
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	312.9	5.80
1C2-DMCP	9.7	0.18
MCH	810.2	15.01

	TOTALS PPB	NORM PERCENT
ALL COMP	5544.	
GASOLINE	5396.	
NAPHTHENES	2111.	39.12
C6-7	3066.	56.82

SIG COMP RATIOS

C1/C2	2.01
A /D2	10.41
C1/D2	18.49
CH/MCP	1.09
PENT/IPENT,	1.22

	PPB	NORM PERCENT
MCP	486.9	26.7
CH	529.5	29.0
MCH	810.2	44.4
TOTAL	1826.6	100.0

PARAFFIN INDEX 1	0.765
PARAFFIN INDEX 2	15.073

16 JUN 83

72632L AUSTRALIA WIRRAH-2, 1700 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	483.0	0.78
ETHANE	0.0		1T2-DMCP	587.3	0.95
PROPANE	17036.9		3-EPENT	0.0	0.00
IBUTANE	6589.0	10.62	224-TMP	0.0	0.00
NBUTANE	15119.6	24.38	NHEPTANE	1515.6	2.44
IPENTANE	7525.3	12.13	1C2-DMCP	124.6	0.20
NPENTANE	7664.4	12.36	MCH	3145.4	5.07
22-DMB	133.2	0.21			
CPENTANE	1354.2	2.18			
23-DMB	562.6	0.91			
2-MP	2826.5	4.56			
3-MP	1278.1	2.06			
NHEXANE	3204.1	5.17			
MCP	4364.2	7.04			
22-DMP	0.0	0.00			
24-DMP	37.1	0.06			
223-TMB	12.7	0.02			
CHEXANE	3743.2	6.04			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	333.0	0.54			
23-DMP ,	396.2	0.64			
3-MHEX ,	407.6	0.66			
1C3-DMCP	607.9	0.98			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	79051.		C1/C2	1.17
GASOLINE	62015.		A /D2	11.58
NAPHTHENES	14410.	23.24	C1/D2	17.72
C6-7	18962.	30.58	CH/MCP	0.86
			PENT/IPENT, .	1.02

	PPB	NORM PERCENT
MCP	4364.2	38.8
CH	3743.2	33.3
MCH	3145.4	28.0
TOTAL	11252.8	100.0

PARAFFIN INDEX 1	0.441
PARAFFIN INDEX 2	13.509

16 JUN 83

72632J AUSTRALIA WIRRAH-2, 1735 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	457.8	0.94
ETHANE	0.0		1T2-DMCP	741.2	1.52
PROPANE	5288.9		3-EPENT	0.0	0.00
IBUTANE	3406.3	6.96	224-TMP	0.0	0.00
NBUTANE	8596.5	17.57	NHEPTANE	2171.1	4.44
IPENTANE	5364.8	10.97	1C2-DMCP	51.5	0.11
NPENTANE	5402.2	11.04	MCH	4839.8	9.89
22-DMB	120.1	0.25			
CPENTANE	804.4	1.64			
23-DMB	451.6	0.92			
2-MP	2384.0	4.87			
3-MP	1177.8	2.41			
NHEXANE	3260.3	6.66			
MCP	3673.2	7.51			
22-DMP	0.0	0.00			
24-DMP	43.9	0.09			
223-TMB	16.1	0.03			
CHEXANE	3837.6	7.84			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	568.1	1.16			
23-DMP ,	421.3	0.86			
3-MHEX ,	597.8	1.22			
1C3-DMCP	533.3	1.09			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	54210.		C1/C2	1.69
GASOLINE	48921.		A /D2	9.09
NAPHTHENES	14939.	30.54	C1/D2	15.47
C6-7	21213.	43.36	CH/MCP	1.04
			PENT/IPENT,	1.01

	PPB	NORM PERCENT
MCP	3673.2	29.7
CH	3837.6	31.1
MCH	4839.8	39.2
TOTAL	12350.6	100.0

PARAFFIN INDEX 1	0.673
PARAFFIN INDEX 2	15.324

16 JUN 83

72632B AUSTRALIA WIRRAH-2, 1855 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	970.2	0.80
ETHANE	0.0		1T2-DMCP	463.6	0.38
PROPANE	70604.1		3-EPENT	0.0	0.00
IBUTANE	22228.3	18.31	224-TMP	0.0	0.00
NBUTANE	29928.0	24.66	NHEPTANE	2692.1	2.22
IPENTANE	19328.0	15.92	1C2-DMCP	12.8	0.01
NPENTANE	10384.3	8.56	MCH	357.0	0.29
22-DMB	69.5	0.06			
CPENTANE	1470.3	1.21			
23-DMB	1781.0	1.47			
2-MP	9427.3	7.77			
3-MP	3834.4	3.16			
NHEXANE	5637.1	4.64			
MCP	6813.2	5.61			
22-DMP	0.0	0.00			
24-DMP	339.6	0.28			
223-TMB	16.6	0.01			
CHEXANE	729.1	0.60			
33-DMP ,	11.9	0.01			
11-DMCP	0.0	0.00			
2-MHEX ,	1439.4	1.19			
23-DMP ,	1443.1	1.19			
3-MHEX ,	1088.3	0.90			
1C3-DMCP	915.0	0.75			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	191984.		C1/C2	0.28
GASOLINE	121380.		A /D2	7.65
NAPHTHENES	11731.	9.66	C1/D2	2.33
C6-7	22929.	18.89	CH/MCP	0.11
			PENT/IPENT,	0.54

	PPB	NORM PERCENT
MCP	6813.2	86.2
CH	729.1	9.2
MCH	357.0	4.5
TOTAL	7899.3	100.0

PARAFFIN INDEX 1	1.076
PARAFFIN INDEX 2	26.629

16 JUN 83

72631X AUSTRALIA WIRRAH-2, 1915 METERS

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	41636.6	
IBUTANE	51556.1	1.56
NBUTANE	151618.4	4.57
IPENTANE	214196.1	6.46
NPENTANE	282413.7	8.52
22-DMB	10380.8	0.31
CPENTANE	22898.8	0.69
23-DMB	29712.2	0.90
2-MP	290273.6	8.76
3-MP	131446.5	3.97
NHEXANE	560785.6	16.92
MCP	162602.0	4.91
22-DMP	0.0	0.00
24-DMP	18866.2	0.57
223-TMB	2779.3	0.08
CHEXANE	210115.7	6.34
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	160888.9	4.85
23-DMP ,	67071.5	2.02
3-MHEX ,	153001.7	4.62
1C3-DMCP	41691.3	1.26
1T3-DMCP	43796.5	1.32
1T2-DMCP	76462.8	2.31
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	626957.2	18.92
1C2-DMCP	0.0	0.00
MCH	4822.2	0.15

	TOTALS PPB	NORM PERCENT
ALL COMP	3355970.	
GASOLINE	3314334.	
NAPHTHENES	562389.	16.97
C6-7	2129841.	64.26

SIG COMP RATIOS

C1/C2	1.16
A /D2	7.76
C1/D2	2.46
CH/MCP	1.29
PENT/IPENT,	1.32

	PPB	NORM PERCENT
MCP	162602.0	43.1
CH	210115.7	55.7
MCH	4822.2	1.3
TOTAL	377539.9	100.0

PARAFFIN INDEX 1	1.938
PARAFFIN INDEX 2	45.274

16 JUN 83

72631V AUSTRALIA WIRRAH-2, 1945 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	58.7	0.32
ETHANE	0.0		1T2-DMCP	95.4	0.52
PROPANE	157.9		3-EPENT	0.0	0.00
IBUTANE	423.0	2.29	224-TMP	0.0	0.00
NBUTANE	1554.0	8.42	NHEPTANE	410.2	2.22
IPENTANE	2719.9	14.73	1C2-DMCP	0.0	0.00
NPENTANE	3565.2	19.31	MCH	99.2	0.54
22-DMB	102.1	0.55			
CPENTANE	232.3	1.26			
23-DMB	333.4	1.81			
2-MP	2266.3	12.28			
3-MP	1062.9	5.76			
NHEXANE	3176.7	17.21			
MCP	1107.7	6.00			
22-DMP	0.0	0.00			
24-DMP	58.7	0.32			
223-TMB	10.2	0.06			
CHEXANE	419.0	2.27			
33-DMP ,	10.8	0.06			
11-DMCP	0.0	0.00			
2-MHEX ,	285.5	1.55			
23-DMP ,	144.0	0.78			
3-MHEX ,	265.4	1.44			
1C3-DMCP	60.3	0.33			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	18619.		C1/C2	0.62
GASOLINE	18461.		A /D2	13.52
NAPHTHENES	2073.	11.23	C1/D2	3.07
C6-7	6202.	33.59	CH/MCP	0.38
			PENT/IPENT,	1.31

	PPB	NORM PERCENT
MCP	1107.7	68.1
CH	419.0	25.8
MCH	99.2	6.1
TOTAL	1625.9	100.0

PARAFFIN INDEX 1	2.569
PARAFFIN INDEX 2	22.192

16 JUN 83

72631R AUSTRALIA WIRRAH-2, 2015 METERS

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	0.0	0.00
NBUTANE	802.5	5.46
IPENTANE	2906.9	19.77
NPENTANE	3506.6	23.85
22-DMB	59.0	0.40
CPENTANE	298.2	2.03
23-DMB	232.7	1.58
2-MP	1382.7	9.40
3-MP	699.4	4.76
NHEXANE	1887.1	12.83
MCP	1142.7	7.77
22-DMP	0.0	0.00
24-DMP	27.1	0.18
223-TMB	5.4	0.04
CHEXANE	509.6	3.47
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	205.2	1.40
23-DMP ,	88.1	0.60
3-MHEX ,	194.3	1.32
1C3-DMCP	59.8	0.41
1T3-DMCP	59.4	0.40
1T2-DMCP	103.6	0.70
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	330.3	2.25
1C2-DMCP	0.0	0.00
MCH	202.6	1.38

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	14703.		C1/C2	0.67
GASOLINE	14703.		A /D2	11.41
NAPHTHENES	2376.	16.16	C1/D2	4.72
C6-7	4815.	32.75	CH/MCP	0.45
			PENT/IPENT,	1.21

	PPB	NORM PERCENT
MCP	1142.7	61.6
CH	509.6	27.5
MCH	202.6	10.9
TOTAL	1854.9	100.0

PARAFFIN INDEX 1	1.793
PARAFFIN INDEX 2	18.844

16 JUN 83

72631P AUSTRALIA WIRRAH-2, 2045 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	3309.3	2.03
ETHANE	0.0		1T2-DMCP	3784.8	2.32
PROPANE	351.3		3-EPENT	0.0	0.00
IBUTANE	375.0	0.23	224-TMP	0.0	0.00
NBUTANE	3730.4	2.29	NHEPTANE	11219.4	6.89
IPENTANE	29049.6	17.84	1C2-DMCP	935.0	0.57
NPENTANE	19981.8	12.27	MCH	13489.1	8.29
22-DMB	142.4	0.09			
CPENTANE	3313.9	2.04			
23-DMB	2843.9	1.75			
2-MP	14669.7	9.01			
3-MP	6501.3	3.99			
NHEXANE	11330.5	6.96			
MCP	17193.0	10.56			
22-DMP	0.0	0.00			
24-DMP	469.4	0.29			
223-TMB	39.1	0.02			
CHEXANE	6962.5	4.28			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	2358.1	1.45			
23-DMP ,	3860.3	2.37			
3-MHEX ,	3194.9	1.96			
1C3-DMCP	4052.8	2.49			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	163157.		C1/C2	0.78
GASOLINE	162806.		A /D2	7.06
NAPHTHENES	53040.	32.58	C1/D2	7.14
C6-7	82198.	50.49	CH/MCP	0.40
			PENT/IPENT,	0.69

	PPB	NORM PERCENT
MCP	17193.0	45.7
CH	6962.5	18.5
MCH	13489.1	35.8
TOTAL	37644.6	100.0

PARAFFIN INDEX 1	0.498
PARAFFIN INDEX 2	21.480

16 JUN 83

72631N AUSTRALIA WIRRAH-2, 2075 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	0.0	0.00
ETHANE	0.0		1T2-DMCP	0.0	0.00
PROPANE	0.0		3-EPENT	0.0	0.00
IBUTANE	31.5	4.58	224-TMP	0.0	0.00
NBUTANE	66.5	9.65	NHEPTANE	49.0	7.12
IPENTANE	82.6	11.99	1C2-DMCP	0.0	0.00
NPENTANE	87.9	12.76	MCH	44.2	6.42
22-DMB	0.0	0.00			
CPENTANE	7.2	1.05			
23-DMB	8.2	1.19			
2-MP	60.0	8.70			
3-MP	32.1	4.67			
NHEXANE	92.6	13.45			
MCP	50.1	7.27			
22-DMP	0.0	0.00			
24-DMP	3.2	0.46			
223-TMB	0.0	0.00			
CHEXANE	29.4	4.27			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	17.8	2.58			
23-DMP ,	9.0	1.31			
3-MHEX ,	17.4	2.53			
1C3-DMCP	0.0	0.00			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	689.		C1/C2	1.83
GASOLINE	689.		A /D2	8.14
NAPHTHENES	131.	19.01	C1/D2	5.25
C6-7	313.	45.41	CH/MCP	0.59
			PENT/IPENT,	1.06

	PPB	NORM PERCENT
MCP	50.1	40.5
CH	29.4	23.8
MCH	44.2	35.7
TOTAL	123.7	100.0

PARAFFIN INDEX 1 0.000
PARAFFIN INDEX 2 29.379

16 JUN 83

72631L AUSTRALIA WIRRAH-2, 2105 METERS

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	0.0	0.00
NBUTANE	225.7	8.10
IPENTANE	243.1	8.72
NPENTANE	287.4	10.31
22-DMB	4.5	0.16
CPENTANE	38.6	1.38
23-DMB	23.6	0.85
2-MP	151.6	5.44
3-MP	82.5	2.96
NHEXANE	231.4	8.30
MCP	249.7	8.96
22-DMP	0.0	0.00
24-DMP	4.6	0.17
223-TMB	0.0	0.00
CHEXANE	256.1	9.19
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	57.3	2.06
23-DMP ,	28.9	1.04
3-MHEX ,	56.2	2.02
1C3-DMCP	35.3	1.27
1T3-DMCP	34.3	1.23
1T2-DMCP	60.6	2.18
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	172.1	6.18
1C2-DMCP	6.1	0.22
MCH	537.8	19.29

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	2788.		C1/C2	2.20
GASOLINE	2788.		A /D2	7.18
NAPHTHENES	1219.	43.71	C1/D2	15.14
C6-7	1731.	62.08	CH/MCP	1.03
			PENT/IPENT,	1.18

	PPB	NORM PERCENT
MCP	249.7	23.9
CH	256.1	24.5
MCH	537.8	51.5
TOTAL	1043.6	100.0

PARAFFIN INDEX 1	0.872
PARAFFIN INDEX 2	13.897

16 JUN 83

72631J AUSTRALIA WIRRAH-2, 2135 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	21.2	1.10
ETHANE	0.0		1T2-DMCP	32.5	1.69
PROPANE	0.0		3-EPENT	0.0	0.00
IBUTANE	0.0	0.00	224-TMP	0.0	0.00
NBUTANE	0.0	0.00	NHEPTANE	107.3	5.58
IPENTANE	110.7	5.75	1C2-DMCP	0.0	0.00
NPENTANE	462.5	24.04	MCH	144.5	7.51
22-DMB	5.5	0.28			
CPENTANE	38.3	1.99			
23-DMB	23.9	1.24			
2-MP	154.6	8.03			
3-MP	85.6	4.45			
NHEXANE	258.5	13.43			
MCP	200.8	10.43			
22-DMP	0.0	0.00			
24-DMP	3.0	0.15			
223-TMB	0.0	0.00			
CHEXANE	152.6	7.93			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	50.3	2.61			
23-DMP ,	16.9	0.88			
3-MHEX ,	36.4	1.89			
1C3-DMCP	19.3	1.00			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	1924.		C1/C2	1.27
GASOLINE	1924.		A /D2	10.05
NAPHTHENES	609.	31.65	C1/D2	9.54
C6-7	1043.	54.21	CH/MCP	0.76
			PENT/IPENT,	4.18

	PPB	NORM PERCENT
MCP	200.8	40.3
CH	152.6	30.7
MCH	144.5	29.0
TOTAL	497.9	100.0

PARAFFIN INDEX 1	1.189
PARAFFIN INDEX 2	18.469

16 JUN 83

72631H AUSTRALIA WIRRAH-2, 2165 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	0.0	0.00
ETHANE	0.0		1T2-DMCP	0.0	0.00
PROPANE	315.9		3-EPENT	0.0	0.00
IBUTANE	175.4	9.77	224-TMP	0.0	0.00
NBUTANE	408.8	22.76	NHEPTANE	7.9	0.44
IPENTANE	346.6	19.30	1C2-DMCP	0.0	0.00
NPENTANE	281.3	15.66	MCH	0.0	0.00
22-DMB	7.8	0.43			
CPENTANE	17.6	0.98			
23-DMB	29.0	1.61			
2-MP	173.5	9.66			
3-MP	80.0	4.46			
NHEXANE	175.7	9.78			
MCP	59.6	3.32			
22-DMP	0.0	0.00			
24-DMP	2.6	0.14			
223-TMB	0.0	0.00			
CHEXANE	10.7	0.60			
33-DMP	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX	8.8	0.49			
23-DMP	4.6	0.26			
3-MHEX	6.0	0.33			
1C3-DMCP	0.0	0.00			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	2112.		C1/C2	0.33
GASOLINE	1796.		A /D2	30.58
NAPHTHENES	88.	4.90	C1/D2	3.25
C6-7	276.	15.37	CH/MCP	0.18
			PENT/IPENT,	0.81

	PPB	NORM PERCENT
MCP	59.6	84.8
CH	10.7	15.2
MCH	0.0	0.0
TOTAL	70.3	100.0

PARAFFIN INDEX 1	0.000
PARAFFIN INDEX 2	20.767

16 JUN 83

72631F AUSTRALIA WIRRAH-2, 2195 METERS

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	0.0	0.00
NBUTANE	0.0	0.00
IPENTANE	0.0	0.00
NPENTANE	864.2	16.23
22-DMB	15.0	0.28
CPENTANE	124.4	2.34
23-DMB	72.6	1.36
2-MP	444.9	8.36
3-MP	206.3	3.88
NHEXANE	465.7	8.75
MCP	555.8	10.44
22-DMP	0.0	0.00
24-DMP	11.6	0.22
223-TMB	3.1	0.06
CHEXANE	519.0	9.75
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	114.1	2.14
23-DMP ,	78.4	1.47
3-MHEX ,	126.8	2.38
1C3-DMCP	84.2	1.58
1T3-DMCP	84.6	1.59
1T2-DMCP	135.7	2.55
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	311.3	5.85
1C2-DMCP	9.9	0.19
MCH	1096.8	20.60

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	5324.		C1/C2	1.99
GASOLINE	5324.		A /D2	6.13
NAPHTHENES	2610.	49.03	C1/D2	13.64
C6-7	3597.	67.56	CH/MCP	0.93
			PENT/IPENT,	999.99

	PPB	NORM PERCENT
MCP	555.8	25.6
CH	519.0	23.9
MCH	1096.8	50.5
TOTAL	2171.6	100.0

PARAFFIN INDEX 1	0.791
PARAFFIN INDEX 2	12.204

16 JUN 83

72631D AUSTRALIA WIRRAH-2, 2225 METERS

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	0.0	0.00
NBUTANE	44764.4	7.09
IPENTANE	71675.5	11.36
NPENTANE	75110.7	11.90
22-DMB	2399.0	0.38
CPENTANE	10507.2	1.66
23-DMB	6912.3	1.10
2-MP	45149.6	7.15
3-MP	20505.3	3.25
NHEXANE	61454.2	9.74
MCP	32552.8	5.16
22-DMP	0.0	0.00
24-DMP	4004.7	0.63
223-TMB	444.6	0.07
CHEXANE	73028.1	11.57
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	6825.2	1.08
23-DMP ,	7367.4	1.17
3-MHEX ,	7387.7	1.17
1C3-DMCP	3558.2	0.56
1T3-DMCP	3908.0	0.62
1T2-DMCP	7234.1	1.15
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	26772.3	4.24
1C2-DMCP	0.0	0.00
MCH	119557.3	18.94

	TOTALS PPB	NORM PERCENT
ALL COMP	631118.	
GASOLINE	631118.	
NAPHTHENES	250346.	39.67
C6-7	354095.	56.11

SIG COMP RATIOS

C1/C2	4.22
A /D2	11.94
C1/D2	26.99
CH/MCP	2.24
PENT/IPENT,	1.05

	PPB	NORM PERCENT
MCP	32552.8	14.5
CH	73028.4	32.4
MCH	119557.3	53.1
TOTAL	225138.5	100.0

PARAFFIN INDEX 1	0.967
PARAFFIN INDEX 2	10.473

16 JUN 83

72631B AUSTRALIA WIRRAH-2, 2255 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	132.5	1.26
ETHANE	0.0		1T2-DMCP	226.8	2.15
PROPANE	0.0		3-EPENT	0.0	0.00
IBUTANE	0.0	0.00	224-TMP	0.0	0.00
NBUTANE	0.0	0.00	NHEPTANE	861.8	8.17
IPENTANE	0.0	0.00	1C2-DMCP	27.7	0.26
NPENTANE	1022.4	9.70	MCH	2761.0	26.18
22-DMB	31.1	0.29			
CPENTANE	201.2	1.91			
23-DMB	124.3	1.18			
2-MP	727.1	6.90			
3-MP	357.1	3.39			
NHEXANE	1044.3	9.90			
MCP	950.5	9.01			
22-DMP	0.0	0.00			
24-DMP	23.0	0.22			
223-TMB	5.4	0.05			
CHEXANE	1258.0	11.93			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	221.6	2.10			
23-DMP ,	162.4	1.54			
3-MHEX ,	278.5	2.64			
1C3-DMCP	127.8	1.21			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	10544.		C1/C2	2.89
GASOLINE	10544.		A /D2	6.84
NAPHTHENES	5685.	53.92	C1/D2	15.22
C6-7	8081.	76.64	CH/MCP	1.32
			PENT/IPENT,	999.99

	PPB	NORM PERCENT
MCP	950.5	19.1
CH	1258.0	25.3
MCH	2761.0	55.6
TOTAL	4969.5	100.0

PARAFFIN INDEX 1	1.027
PARAFFIN INDEX 2	14.290

16 JUN 83

72630Z AUSTRALIA WIRRAH-2, 2285 METERS

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

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

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

PARAFFIN INDEX 1	0.000
PARAFFIN INDEX 2	0.000

16 JUN 83

72630X AUSTRALIA WIRRAH-2, 2315 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	129.3	1.05
ETHANE	0.0		1T2-DMCP	221.9	1.80
PROPANE	2043.4		3-EPENT	0.0	0.00
IBUTANE	518.2	4.21	224-TMP	0.0	0.00
NBUTANE	1762.1	14.31	NHEPTANE	562.2	4.56
IPENTANE	900.1	7.31	1C2-DMCP	0.0	0.00
NPENTANE	1282.5	10.41	MCH	1416.2	11.50
22-DMB	23.6	0.19			
CPENTANE	305.3	2.48			
23-DMB	91.7	0.74			
2-MP	455.7	3.70			
3-MP	263.2	2.14			
NHEXANE	872.2	7.08			
MCP	1236.4	10.04			
22-DMP	10.7	0.09			
24-DMP	0.0	0.00			
223-TMB	3.9	0.03			
CHEXANE	1662.5	13.50			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	156.6	1.27			
23-DMP ,	120.3	0.98			
3-MHEX ,	188.2	1.53			
1C3-DMCP	134.6	1.09			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	14361.		C1/C2	1.88
GASOLINE	12317.		A /D2	7.62
NAPHTHENES	5106.	41.46	C1/D2	17.19
C6-7	6715.	54.52	CH/MCP	1.34
			PENT/IPENT,	1.42

	PPB	NORM PERCENT
MCP	1236.4	28.7
CH	1662.5	38.5
MCH	1416.2	32.8
TOTAL	4315.1	100.0

PARAFFIN INDEX 1	0.710
PARAFFIN INDEX 2	12.244

16 JUN 83

72630V AUSTRALIA WIRRAH-2, 2345 METERS

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

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

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

PARAFFIN INDEX 1 0.000
PARAFFIN INDEX 2 0.000

16 JUN 83

72630T AUSTRALIA WIRRAH-2, 2375 METERS

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	1807.1	
IBUTANE	1301.5	3.01
NBUTANE	4231.0	9.80
IPENTANE	3713.2	8.60
NPENTANE	4185.8	9.69
22-DMB	119.2	0.28
CPENTANE	819.9	1.90
23-DMB	452.3	1.05
2-MP	2637.2	6.11
3-MP	1406.7	3.26
NHEXANE	3924.5	9.09
MCP	4093.4	9.48
22-DMP	0.0	0.00
24-DMP	83.7	0.19
223-TMB	30.6	0.07
CHEXANE	4719.1	10.93
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	805.8	1.87
23-DMP ,	557.8	1.29
3-MHEX ,	895.1	2.07
1C3-DMCP	512.3	1.19
1T3-DMCP	496.5	1.15
1T2-DMCP	872.1	2.02
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	2243.8	5.19
1C2-DMCP	59.9	0.14
MCH	5032.2	11.65

	TOTALS PPB	NORM PERCENT
ALL COMP	45001.	
GASOLINE	43193.	
NAPHTHENES	16605.	38.44
C6-7	24327.	56.32

SIG COMP RATIOS

C1/C2	1.75
A /D2	6.89
C1/D2	11.79
CH/MCP	1.15
PENT/IPENT,	1.13

	PPB	NORM PERCENT
MCP	4093.4	29.6
CH	4719.1	34.1
MCH	5032.2	36.3
TOTAL	13844.7	100.0

PARAFFIN INDEX 1	0.904
PARAFFIN INDEX 2	13.907

16 JUN 83

72630R AUSTRALIA WIRRAH-2, 2405 METERS

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

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

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

PARAFFIN INDEX 1	0.000
PARAFFIN INDEX 2	0.000

16 JUN 83

72630P AUSTRALIA WIRRAH-2, 2435 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	6.7	1.30
ETHANE	0.0		1T2-DMCP	9.0	1.76
PROPANE	0.0		3-EPENT	0.0	0.00
IBUTANE	16.6	3.24	224-TMP	0.0	0.00
NBUTANE	24.2	4.71	NHEPTANE	51.8	10.11
IPENTANE	46.5	9.07	1C2-DMCP	0.0	0.00
NPENTANE	64.1	12.49	MCH	97.1	18.92
22-DMB	0.0	0.00			
CPENTANE	0.0	0.00			
23-DMB	0.0	0.00			
2-MP	28.2	5.50			
3-MP	14.0	2.73			
NHEXANE	38.8	7.56			
MCP	32.1	6.25			
22-DMP	0.0	0.00			
24-DMP	0.4	0.07			
223-TMB	0.0	0.00			
CHEXANE	40.1	7.81			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	15.5	3.02			
23-DMP ,	7.5	1.47			
3-MHEX ,	14.7	2.87			
1C3-DMCP	5.7	1.11			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	513.		C1/C2	2.85
GASOLINE	513.		A /D2	6.14
NAPHTHENES	191.	37.16	C1/D2	10.35
C6-7	319.	62.26	CH/MCP	1.25
			PENT/IPENT,	1.38

	PPB	NORM PERCENT
MCP	32.1	19.0
CH	40.1	23.7
MCH	97.1	57.4
TOTAL	169.3	100.0

PARAFFIN INDEX 1	1.411
PARAFFIN INDEX 2	20.880

16 JUN 83

72630N AUSTRALIA WIRRAH-2, 2465 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	6.2	0.63
ETHANE	0.0		1T2-DMCP	12.6	1.28
PROPANE	0.0		3-EPENT	0.0	0.00
IBUTANE	98.2	9.98	224-TMP	0.0	0.00
NBUTANE	111.1	11.29	NHEPTANE	58.9	5.98
IPENTANE	64.1	6.51	1C2-DMCP	0.0	0.00
NPENTANE	101.5	10.32	MCH	99.6	10.12
22-DMB	0.5	0.05			
CPENTANE	0.0	0.00			
23-DMB	10.3	1.05			
2-MP	67.4	6.85			
3-MP	39.6	4.02			
NHEXANE	108.6	11.03			
MCP	71.3	7.24			
22-DMP	0.0	0.00			
24-DMP	2.7	0.28			
223-TMB	0.0	0.00			
CHEXANE	69.5	7.07			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	21.4	2.17			
23-DMP ,	11.1	1.13			
3-MHEX ,	19.4	1.97			
1C3-DMCP	10.3	1.04			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	984.		C1/C2	1.90
GASOLINE	984.		A /D2	8.64
NAPHTHENES	270.	27.38	C1/D2	9.83
C6-7	492.	49.94	CH/MCP	0.98
			PENT/IPENT,	1.58

	PPB	NORM PERCENT
MCP	71.3	29.7
CH	69.5	28.9
MCH	99.6	41.4
TOTAL	240.4	100.0

PARAFFIN INDEX 1	1.399
PARAFFIN INDEX 2	19.065

16 JUN 83

72630L AUSTRALIA WIRRAH-2, 2510 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	22.6	0.64
ETHANE	0.0		1T2-DMCP	36.1	1.02
PROPANE	195.2		3-EPENT	0.0	0.00
IBUTANE	163.7	4.65	224-TMP	0.0	0.00
NBUTANE	470.1	13.34	NHEPTANE	83.8	2.38
IPENTANE	536.2	15.21	1C2-DMCP	0.0	0.00
NPENTANE	624.5	17.72	MCH	67.7	1.92
22-DMB	13.5	0.38			
CPENTANE	64.0	1.82			
23-DMB	0.0	0.00			
2-MP	283.1	8.03			
3-MP	156.9	4.45			
NHEXANE	343.0	9.73			
MCP	308.3	8.75			
22-DMP	0.0	0.00			
24-DMP	7.5	0.21			
223-TMB	1.8	0.05			
CHEXANE	182.0	5.17			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	57.5	1.63			
23-DMP ,	29.9	0.85			
3-MHEX ,	49.1	1.39			
1C3-DMCP	22.8	0.65			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	3719.		C1/C2	0.79
GASOLINE	3524.		A /D2	8.69
NAPHTHENES	703.	19.96	C1/D2	6.26
C6-7	1212.	34.39	CH/MCP	0.59
			PENT/IPENT,	1.16

	PPB	NORM PERCENT
MCP	308.3	55.2
CH	182.0	32.6
MCH	67.7	12.1
TOTAL	558.0	100.0

PARAFFIN INDEX 1	1.308
PARAFFIN INDEX 2	15.191

16 JUN 83

72630J AUSTRALIA WIRRAH-2, 2540 METERS

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	58666.2	
PROPANE	101818.5	
IBUTANE	36651.6	5.10
NBUTANE	96633.2	13.45
IPENTANE	78481.8	10.92
NPENTANE	78437.6	10.92
22-DMB	2781.9	0.39
CPENTANE	9841.7	1.37
23-DMB	7581.8	1.06
2-MP	42363.8	5.90
3-MP	21383.7	2.98
NHEXANE	49637.1	6.91
MCP	44299.5	6.17
22-DMP	0.0	0.00
24-DMP	1337.1	0.19
223-TMB	824.1	0.11
CHEXANE	57554.5	8.01
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	10735.5	1.49
23-DMP ,	9842.2	1.37
3-MHEX ,	12257.6	1.71
1C3-DMCP	6331.9	0.88
1T3-DMCP	6683.4	0.93
1T2-DMCP	9562.8	1.33
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	33114.1	4.61
1C2-DMCP	1317.2	0.18
MCH	100776.4	14.03

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	878914.		C1/C2	2.48
GASOLINE	718429.		A /D2	6.75
NAPHTHENES	236367.	32.90	C1/D2	13.79
C6-7	344273.	47.92	CH/MCP	1.30
			PENT/IPENT,	1.00

	PPB	NORM PERCENT
MCP	44299.5	21.9
CH	57554.5	28.4
MCH	100776.4	49.7
TOTAL	202630.4	100.0

PARAFFIN INDEX 1	1.018
PARAFFIN INDEX 2	13.414

16 JUN 83

72630H AUSTRALIA WIRRAH-2, 2570 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	0.0	0.00
ETHANE	0.0		1T2-DMCP	7.4	0.88
PROPANE	54.3		3-EPENT	0.0	0.00
IBUTANE	24.7	2.95	224-TMP	0.0	0.00
NBUTANE	92.9	11.11	NHEPTANE	74.9	8.94
IPENTANE	57.4	6.86	1C2-DMCP	0.0	0.00
NPENTANE	122.4	14.63	MCH	130.4	15.58
22-DMB	2.7	0.32			
CPENTANE	9.8	1.17			
23-DMB	6.9	0.83			
2-MP	46.3	5.53			
3-MP	25.2	3.01			
NHEXANE	95.5	11.40			
MCP	39.5	4.72			
22-DMP	0.0	0.00			
24-DMP	1.4	0.16			
223-TMB	0.0	0.00			
CHEXANE	48.6	5.81			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	17.5	2.09			
23-DMP ,	8.4	1.01			
3-MHEX ,	18.3	2.19			
1C3-DMCP	6.8	0.82			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	891.		C1/C2	3.66
GASOLINE	837.		A /D2	9.30
NAPHTHENES	243.	28.98	C1/D2	10.73
C6-7	449.	53.61	CH/MCP	1.23
			PENT/IPENT,	2.13

	PPB	NORM PERCENT
MCP	39.5	18.1
CH	48.6	22.3
MCH	130.4	59.7
TOTAL	218.5	100.0

PARAFFIN INDEX 1	2.519
PARAFFIN INDEX 2	23.970

16 JUN 83

72630F AUSTRALIA WIRRAH-2, 2600 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	50.5	1.59
ETHANE	0.0		1T2-DMCP	42.9	1.36
PROPANE	155.4		3-EPENT	0.0	0.00
IBUTANE	78.5	2.48	224-TMP	0.0	0.00
NBUTANE	325.5	10.29	NHEPTANE	173.1	5.47
IPENTANE	229.5	7.25	1C2-DMCP	3.1	0.10
NPENTANE	365.0	11.54	MCH	633.4	20.02
22-DMB	9.5	0.30			
CPENTANE	35.7	1.13			
23-DMB	29.3	0.92			
2-MP	151.4	4.78			
3-MP	86.7	2.74			
NHEXANE	251.0	7.93			
MCP	217.1	6.86			
22-DMP	0.0	0.00			
24-DMP	5.0	0.16			
223-TMB	0.0	0.00			
CHEXANE	286.5	9.06			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	57.7	1.82			
23-DMP ,	37.3	1.18			
3-MHEX ,	61.9	1.96			
1C3-DMCP	33.2	1.05			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	3319.		C1/C2	2.82
GASOLINE	3164.		A /D2	6.85
NAPHTHENES	1302.	41.17	C1/D2	15.78
C6-7	1853.	58.56	CH/MCP	1.32
			PENT/IPENT,	1.59

	PPB	NORM PERCENT
MCP	217.1	19.1
CH	286.5	25.2
MCH	633.4	55.7
TOTAL	1137.0	100.0

PARAFFIN INDEX 1	0.945
PARAFFIN INDEX 2	12.572

16 JUN 83

72630D AUSTRALIA WIRRAH-2, 2630 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	20.8	0.92
ETHANE	0.0		1T2-DMCP	30.8	1.36
PROPANE	215.6		3-EPENT	0.0	0.00
IBUTANE	96.7	4.27	224-TMP	0.0	0.00
NBUTANE	297.0	13.12	NHEPTANE	101.5	4.49
IPENTANE	223.2	9.86	1C2-DMCP	0.0	0.00
NPENTANE	277.9	12.27	MCH	279.4	12.34
22-DMB	4.0	0.18			
CPENTANE	41.9	1.85			
23-DMB	19.0	0.84			
2-MP	101.5	4.49			
3-MP	59.1	2.61			
NHEXANE	175.9	7.77			
MCP	200.9	8.88			
22-DMP	0.0	0.00			
24-DMP	2.3	0.10			
223-TMB	0.0	0.00			
CHEXANE	221.0	9.76			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	39.5	1.75			
23-DMP ,	19.3	0.85			
3-MHEX ,	32.9	1.45			
1C3-DMCP	19.2	0.85			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	2479.		C1/C2	1.99
GASOLINE	2264.		A /D2	8.43
NAPHTHENES	814.	35.95	C1/D2	16.41
C6-7	1144.	50.51	CH/MCP	1.10
			PENT/IPENT,	1.24

	PPB	NORM PERCENT
MCP	200.9	28.7
CH	221.0	31.5
MCH	279.4	39.8
TOTAL	701.3	100.0

PARAFFIN INDEX 1	1.024
PARAFFIN INDEX 2	13.283

16 JUN 83

72630B AUSTRALIA WIRRAH-2, 2660 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	92.5	0.91
ETHANE	0.0		1T2-DMCP	195.7	1.93
PROPANE	322.1		3-EPENT	0.0	0.00
IBUTANE	473.9	4.67	224-TMP	0.0	0.00
NBUTANE	813.6	8.01	NHEPTANE	482.5	4.75
IPENTANE	698.3	6.88	1C2-DMCP	16.0	0.16
NPENTANE	948.9	9.35	MCH	1557.9	15.34
22-DMB	26.8	0.26			
CPENTANE	179.5	1.77			
23-DMB	102.2	1.01			
2-MP	451.4	4.45			
3-MP	270.6	2.67			
NHEXANE	701.7	6.91			
MCP	1427.8	14.06			
22-DMP	0.0	0.00			
24-DMP	23.8	0.23			
223-TMB	6.5	0.06			
CHEXANE	1071.6	10.55			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	188.4	1.86			
23-DMP ,	100.3	0.99			
3-MHEX ,	228.6	2.25			
1C3-DMCP	95.4	0.94			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	10476.		C1/C2	1.54
GASOLINE	10154.		A /D2	5.18
NAPHTHENES	4636.	45.66	C1/D2	12.33
C6-7	6189.	60.95	CH/MCP	0.75
			PENT/IPENT,	1.36

	PPB	NORM PERCENT
MCP	1427.8	35.2
CH	1071.6	26.4
MCH	1557.9	38.4
TOTAL	4057.3	100.0

PARAFFIN INDEX 1	1.087
PARAFFIN INDEX 2	12.024

16 JUN 83

726297 AUSTRALIA WIRRAH-2, 2690 METERS

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	10.3	2.06
NBUTANE	42.9	8.61
IPENTANE	48.2	9.66
NPENTANE	56.7	11.37
22-DMB	0.0	0.00
CPENTANE	8.0	1.60
23-DMB	6.2	1.23
2-MP	34.1	6.84
3-MP	19.6	3.93
NHEXANE	50.2	10.06
MCP	42.1	8.45
22-DMP	0.0	0.00
24-DMP	0.0	0.00
223-TMB	0.0	0.00
CHEXANE	30.6	6.14
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	9.7	1.95
23-DMP ,	6.6	1.33
3-MHEX ,	11.6	2.32
1C3-DMCP	5.3	1.07
1T3-DMCP	4.6	0.91
1T2-DMCP	7.4	1.49
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	41.2	8.26
1C2-DMCP	0.0	0.00
MCH	63.3	12.70

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	499.		C1/C2	1.74
GASOLINE	499.		A /D2	7.91
NAPHTHENES	161.	32.36	C1/D2	8.97
C6-7	273.	54.68	CH/MCP	0.73
			PENT/IPENT,	1.18

	PPB	NORM PERCENT
MCP	42.1	30.9
CH	30.6	22.5
MCH	63.3	46.5
TOTAL	136.0	100.0

PARAFFIN INDEX 1	1.228
PARAFFIN INDEX 2	22.845

16 JUN 83

72629X AUSTRALIA WIRRAH-2, 2720 METERS

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	101.8	7.40
NBUTANE	185.7	13.51
IPENTANE	88.6	6.45
NPENTANE	181.0	13.17
22-DMB	2.9	0.21
CPENTANE	22.6	1.65
23-DMB	10.0	0.73
2-MP	55.2	4.01
3-MP	31.2	2.27
NHEXANE	105.1	7.65
MCP	97.6	7.10
22-DMP	0.0	0.00
24-DMP	0.0	0.00
223-TMB	0.0	0.00
CHEXANE	126.1	9.17
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	17.5	1.27
23-DMP ,	10.1	0.74
3-MHEX ,	21.6	1.57
1C3-DMCP	10.8	0.79
1T3-DMCP	9.9	0.72
1T2-DMCP	17.8	1.29
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	71.6	5.21
1C2-DMCP	0.0	0.00
MCH	207.6	15.10

	TOTALS PPB	NORM PERCENT
ALL COMP	1374.	
GASOLINE	1374.	
NAPHTHENES	492.	35.82
C6-7	696.	50.61

SIG COMP RATIOS

C1/C2	2.58
A /D2	8.19
C1/D2	16.27
CH/MCP	1.29
PENT/IPENT,	2.04

	PPB	NORM PERCENT
MCP	97.6	22.6
CH	126.1	29.2
MCH	207.6	48.1
TOTAL	431.3	100.0

PARAFFIN INDEX 1	1.016
PARAFFIN INDEX 2	14.524

16 JUN 83

72629V AUSTRALIA WIRRAH-2, 2750 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	13.1	0.73
ETHANE	0.0		1T2-DMCP	23.8	1.33
PROPANE	0.0		3-EPENT	0.0	0.00
IBUTANE	71.4	3.98	224-TMP	0.0	0.00
NBUTANE	166.3	9.27	NHEPTANE	119.9	6.68
IPENTANE	136.3	7.60	1C2-DMCP	0.0	0.00
NPENTANE	259.1	14.44	MCH	269.6	15.03
22-DMB	5.3	0.30			
CPENTANE	20.0	1.11			
23-DMB	18.5	1.03			
2-MP	99.9	5.57			
3-MP	58.2	3.24			
NHEXANE	154.6	8.62			
MCP	126.5	7.05			
22-DMP	0.0	0.00			
24-DMP	3.7	0.21			
223-TMB	0.0	0.00			
CHEXANE	134.0	7.47			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	35.4	1.97			
23-DMP ,	23.7	1.32			
3-MHEX ,	39.1	2.18			
1C3-DMCP	15.7	0.88			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	1794.		C1/C2	2.45
GASOLINE	1794.		A /D2	7.01
NAPHTHENES	603.	33.59	C1/D2	11.22
C6-7	959.	53.46	CH/MCP	1.06
			PENT/IPENT,	1.90

	PPB	NORM PERCENT
MCP	126.5	23.9
CH	134.0	25.3
MCH	269.6	50.9
TOTAL	530.1	100.0

PARAFFIN INDEX 1	1.418
PARAFFIN INDEX 2	17.774

16 JUN 83

72629T AUSTRALIA WIRRAH-2, 2780 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	61.0	1.53
ETHANE	0.0		1T2-DMCP	58.3	1.47
PROPANE	400.6		3-EPENT	0.0	0.00
IBUTANE	120.6	3.04	224-TMP	0.0	0.00
NBUTANE	563.5	14.18	NHEPTANE	162.9	4.10
IPENTANE	289.9	7.30	1C2-DMCP	5.5	0.14
NPENTANE	452.9	11.40	MCH	755.2	19.01
22-DMB	12.8	0.32			
CPENTANE	48.2	1.21			
23-DMB	34.1	0.86			
2-MP	186.1	4.68			
3-MP	112.1	2.82			
NHEXANE	277.0	6.97			
MCP	244.4	6.15			
22-DMP	0.0	0.00			
24-DMP	9.3	0.23			
223-TMB	0.0	0.00			
CHEXANE	349.3	8.79			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	73.1	1.84			
23-DMP ,	45.1	1.13			
3-MHEX ,	72.7	1.83			
1C3-DMCP	39.3	0.99			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	4374.		C1/C2	2.88
GASOLINE	3973.		A /D2	6.05
NAPHTHENES	1561.	39.29	C1/D2	16.19
C6-7	2153.	54.19	CH/MCP	1.43
			PENT/IPENT,	1.56

	PPB	NORM PERCENT
MCP	244.4	18.1
CH	349.3	25.9
MCH	755.2	56.0
TOTAL	1348.9	100.0

PARAFFIN INDEX 1	0.920
PARAFFIN INDEX 2	10.073

16 JUN 83

72629R AUSTRALIA WIRRAH-2, 2810 METERS

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	1896.2	
IBUTANE	974.9	2.61
NBUTANE	3388.8	9.07
IPENTANE	2412.2	6.45
NPENTANE	3246.6	8.69
22-DMB	97.1	0.26
CPENTANE	476.0	1.27
23-DMB	287.9	0.77
2-MP	1768.7	4.73
3-MP	973.0	2.60
NHEXANE	2583.7	6.91
MCP	2671.2	7.15
22-DMP	0.0	0.00
24-DMP	76.3	0.20
223-TMB	21.4	0.06
CHEXANE	4091.8	10.95
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	711.6	1.90
23-DMP ,	487.4	1.30
3-MHEX ,	808.0	2.16
1C3-DMCP	387.3	1.04
1T3-DMCP	417.9	1.12
1T2-DMCP	843.1	2.26
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	2098.1	5.61
1C2-DMCP	83.0	0.22
MCH	8467.8	22.66

	TOTALS PPB	NORM PERCENT
ALL COMP	39270.	
GASOLINE	37373.	
NAPHTHENES	17438.	46.66
C6-7	23749.	63.54

SIG COMP RATIOS

C1/C2	3.01
A /D2	5.79
C1/D2	16.42
CH/MCP	1.53
PENT/IPENT,	1.35

	PPB	NORM PERCENT
MCP	2671.2	17.5
CH	4091.8	26.9
MCH	8467.8	55.6
TOTAL	15230.8	100.0

PARAFFIN INDEX 1	0.922
PARAFFIN INDEX 2	11.457

16 JUN 83

72629N AUSTRALIA WIRRAH-2, 2885 METERS

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	335.4	
IBUTANE	273.4	1.28
NBUTANE	8221.8	38.38
IPENTANE	817.5	3.82
NPENTANE	1063.2	4.96
22-DMB	28.9	0.13
CPENTANE	163.6	0.76
23-DMB	114.7	0.54
2-MP	674.3	3.15
3-MP	364.3	1.70
NHEXANE	979.9	4.57
MCP	977.6	4.56
22-DMP	0.0	0.00
24-DMP	21.9	0.10
223-TMB	6.2	0.03
CHEXANE	1836.3	8.57
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	253.5	1.18
23-DMP ,	199.8	0.93
3-MHEX ,	294.6	1.38
1C3-DMCP	168.0	0.78
1T3-DMCP	169.9	0.79
1T2-DMCP	329.2	1.54
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	790.8	3.69
1C2-DMCP	27.8	0.13
MCH	3643.1	17.01

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	21756.		C1/C2	3.43
GASOLINE	21420.		A /D2	6.01
NAPHTHENES	7316.	34.15	C1/D2	19.46
C6-7	9699.	45.28	CH/MCP	1.88
			PENT/IPENT,	1.30

	PPB	NORM PERCENT
MCP	977.6	15.1
CH	1836.3	28.4
MCH	3643.1	56.4
TOTAL	6457.0	100.0

PARAFFIN INDEX 1	0.822
PARAFFIN INDEX 2	10.290

16 JUN 83

72629L AUSTRALIA WIRRAH-2, 2915 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	215.2	0.66
ETHANE	760.5		1T2-DMCP	366.0	1.12
PROPANE	2405.5		3-EPENT	0.0	0.00
IBUTANE	1616.8	4.94	224-TMP	0.0	0.00
NBUTANE	4420.8	13.51	NHEPTANE	1349.7	4.12
IPENTANE	3393.1	10.37	1C2-DMCP	41.6	0.13
NPENTANE	3880.5	11.86	MCH	5481.3	16.75
22-DMB	95.9	0.29			
CPENTANE	384.6	1.18			
23-DMB	313.7	0.96			
2-MP	1798.0	5.49			
3-MP	852.7	2.61			
NHEXANE	2286.0	6.99			
MCP	1426.2	4.36			
22-DMP	0.0	0.00			
24-DMP	48.9	0.15			
223-TMB	15.1	0.05			
CHEXANE	3278.3	10.02			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	435.4	1.33			
23-DMP ,	365.9	1.12			
3-MHEX ,	465.0	1.42			
1C3-DMCP	192.4	0.59			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	35889.		C1/C2	4.10
GASOLINE	32723.		A /D2	7.82
NAPHTHENES	11386.	34.79	C1/D2	19.77
C6-7	15967.	48.79	CH/MCP	2.30
			PENT/IPENT,	1.14

	PPB	NORM PERCENT
MCP	1426.2	14.0
CH	3278.3	32.2
MCH	5481.3	53.8
TOTAL	10185.8	100.0

PARAFFIN INDEX 1	1.164
PARAFFIN INDEX 2	11.109

16 JUN 83

72629J AUSTRALIA WIRRAH-2, 2945 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	94.1	1.10
ETHANE	0.0		1T2-DMCP	65.6	0.77
PROPANE	1339.0		3-EPENT	0.0	0.00
IBUTANE	718.8	8.40	224-TMP	0.0	0.00
NBUTANE	1579.9	18.46	NHEPTANE	357.7	4.18
IPENTANE	988.3	11.55	1C2-DMCP	3.8	0.04
NPENTANE	1169.6	13.67	MCH	662.5	7.74
22-DMB	31.5	0.37			
CPENTANE	102.9	1.20			
23-DMB	95.7	1.12			
2-MP	250.3	2.93			
3-MP	249.7	2.92			
NHEXANE	677.2	7.91			
MCP	459.6	5.37			
22-DMP	0.0	0.00			
24-DMP	18.2	0.21			
223-TMB	3.0	0.03			
CHEXANE	587.3	6.86			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	153.8	1.80			
23-DMP ,	92.7	1.08			
3-MHEX ,	135.1	1.58			
1C3-DMCP	60.6	0.71			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	9897.		C1/C2	2.05
GASOLINE	8558.		A /D2	7.66
NAPHTHENES	2036.	23.80	C1/D2	10.39
C6-7	3371.	39.39	CH/MCP	1.28
			PENT/IPENT,	1.18

	PPB	NORM PERCENT
MCP	459.6	26.9
CH	587.3	34.4
MCH	662.5	38.8
TOTAL	1709.4	100.0

PARAFFIN INDEX 1	1.311
PARAFFIN INDEX 2	16.188

16 JUN 83

72629H AUSTRALIA WIRRAH-2, 2975 METERS

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	1370.6	
PROPANE	991.4	
IBUTANE	1530.4	6.03
NBUTANE	2250.7	8.86
IPENTANE	2587.5	10.19
NPENTANE	4507.3	17.75
22-DMB	55.3	0.22
CPENTANE	2654.1	10.45
23-DMB	25.6	0.10
2-MP	2820.5	11.10
3-MP	561.4	2.21
NHEXANE	1642.1	6.47
MCP	938.9	3.70
22-DMP	0.0	0.00
24-DMP	47.7	0.19
223-TMB	14.0	0.06
CHEXANE	1703.2	6.71
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	319.7	1.26
23-DMP ,	298.1	1.17
3-MHEX ,	302.4	1.19
1C3-DMCP	125.6	0.49
1T3-DMCP	141.7	0.56
1T2-DMCP	210.9	0.83
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	967.3	3.81
1C2-DMCP	15.7	0.06
MCH	1679.3	6.61

	TOTALS PPB	NORM PERCENT
ALL COMP	27761.	
GASOLINE	25399.	
NAPHTHENES	7469.	29.41
C6-7	8407.	33.10

SIG COMP RATIOS

C1/C2	2.58
A /D2	8.63
C1/D2	12.24
CH/MCP	1.81
PENT/IPENT,	1.74

	PPB	NORM PERCENT
MCP	938.9	21.7
CH	1703.2	39.4
MCH	1679.3	38.9
TOTAL	4321.4	100.0

PARAFFIN INDEX 1	1.301
PARAFFIN INDEX 2	16.827

16 JUN 83

72629F AUSTRALIA WIRRAH-2, 3005 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	94.0	0.46
ETHANE	85.8		1T2-DMCP	139.7	0.68
PROPANE	1250.6		3-EPENT	0.0	0.00
IBUTANE	2668.5	12.95	224-TMP	0.0	0.00
NBUTANE	4326.5	20.99	NHEPTANE	709.4	3.44
IPENTANE	2669.5	12.95	1C2-DMCP	6.1	0.03
NPENTANE	2678.3	12.99	MCH	682.5	3.31
22-DMB	64.8	0.31			
CPENTANE	200.8	0.97			
23-DMB	247.1	1.20			
2-MP	1452.2	7.05			
3-MP	510.9	2.48			
NHEXANE	1469.8	7.13			
MCP	763.4	3.70			
22-DMP	0.0	0.00			
24-DMP	45.7	0.22			
223-TMB	10.3	0.05			
CHEXANE	1044.5	5.07			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	261.0	1.27			
23-DMP ,	254.6	1.24			
3-MHEX ,	229.7	1.11			
1C3-DMCP	82.0	0.40			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	21947.		C1/C2	1.83
GASOLINE	20611.		A /D2	9.49
NAPHTHENES	3013.	14.62	C1/D2	8.66
C6-7	5793.	28.10	CH/MCP	1.37
			PENT/IPENT,	1.00

	PPB	NORM PERCENT
MCP	763.4	30.7
CH	1044.5	41.9
MCH	682.5	27.4
TOTAL	2490.4	100.0

PARAFFIN INDEX 1	1.554
PARAFFIN INDEX 2	20.284

16 JUN 83

72629D AUSTRALIA WIRRAH-2, 3035 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	77.0	0.50
ETHANE	1307.6		1T2-DMCP	121.5	0.79
PROPANE	1543.4		3-EPENT	0.0	0.00
IBUTANE	2203.5	14.25	224-TMP	0.0	0.00
NBUTANE	3390.4	21.93	NHEPTANE	555.6	3.59
IPENTANE	1819.6	11.77	1C2-DMCP	9.7	0.06
NPENTANE	1840.9	11.91	MCH	870.2	5.63
22-DMB	45.6	0.29			
CPENTANE	150.9	0.98			
23-DMB	160.0	1.03			
2-MP	907.1	5.87			
3-MP	332.4	2.15			
NHEXANE	938.9	6.07			
MCP	566.2	3.66			
22-DMP	0.0	0.00			
24-DMP	33.8	0.22			
223-TMB	5.6	0.04			
CHEXANE	801.6	5.18			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	184.2	1.19			
23-DMP ,	180.6	1.17			
3-MHEX ,	189.5	1.23			
1C3-DMCP	75.8	0.49			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	18312.		C1/C2	2.18
GASOLINE	15461.		A /D2	7.88
NAPHTHENES	2673.	17.29	C1/D2	9.79
C6-7	4610.	29.82	CH/MCP	1.42
			PENT/IPENT,	1.01

	PPB	NORM PERCENT
MCP	566.2	25.3
CH	801.6	35.8
MCH	870.2	38.9
TOTAL	2238.0	100.0

PARAFFIN INDEX 1	1.362
PARAFFIN INDEX 2	18.179

16 JUN 83

72629B AUSTRALIA WIRRAH-2, 3065 METERS

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	9.3	0.45
ETHANE	0.0		1T2-DMCP	16.9	0.82
PROPANE	127.2		3-EPENT	0.0	0.00
IBUTANE	369.9	17.97	224-TMP	0.0	0.00
NBUTANE	269.1	13.07	NHEPTANE	63.9	3.11
IPENTANE	257.9	12.53	1C2-DMCP	0.0	0.00
NPENTANE	272.3	13.23	MCH	173.3	8.42
22-DMB	3.6	0.18			
CPENTANE	20.7	1.01			
23-DMB	18.8	0.92			
2-MP	102.2	4.97			
3-MP	55.0	2.67			
NHEXANE	138.8	6.74			
MCP	85.8	4.17			
22-DMP	0.0	0.00			
24-DMP	3.0	0.15			
223-TMB	0.0	0.00			
CHEXANE	111.1	5.40			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	24.5	1.19			
23-DMP ,	20.7	1.00			
3-MHEX ,	28.7	1.40			
1C3-DMCP	12.7	0.62			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	2186.		C1/C2	2.48
GASOLINE	2058.		A /D2	7.06
NAPHTHENES	430.	20.88	C1/D2	10.75
C6-7	689.	33.46	CH/MCP	1.29
			PENT/IPENT,	1.06

	PPB	NORM PERCENT
MCP	85.8	23.2
CH	111.1	30.0
MCH	173.3	46.8
TOTAL	370.2	100.0

PARAFFIN INDEX 1	1.369
PARAFFIN INDEX 2	13.859

APPENDIX-2

Detailed Vitrinite Reflectance and Exinite Fluorescence Data -

by A.C. Cook.

25.7.83

APPENDIX-2

WIRRAH No. 2

KK No.	Esso No.	Depth m	$\bar{R}_v$ max %	Range R_v max %	N	Exinite fluorescence (Remarks)
17597	BS/ 72618-M	1964.6 SWC	0.46	0.38-0.54	29	Sparse liptodetrinite, cutinite and sporinite, yellow orange to brown. (Siltstone. D.o.m. abundant, I>V>E. Inertinite abundant, vitrinite common, exinite sparse. Vitrinite shows brown fluorescence. Mineral fluorescence distinct orange. Sparse iron oxides and pyrite.)
17598	BS/ 72617-Z	2119 ?SWC	0.45	0.38-0.54	30	Sparse liptodetrinite, yellow to orange, sparse to common sporinite, yellow to orange, sparse cutinite, orange and rare resinite, yellow. (Siltstone. D.o.m. abundant, I>V>E. Inertinite abundant, vitrinite common, exinite common. Vitrinite has brown fluorescence. Common pyrite.)
17709	72620 -G	2247.56 SWC	-		-	No exinite present (Siltstone and sandstone, some claystone. D.o.m. absent. Abundant pyrrhotite/marcasite, possibly some pyrite, but most of the sulphides have distinct anisotropy. The abundance of sulphides and the absence of organic matter is consistent with severe thermal alteration. The original sedimentary rock must have been poor in organic matter because the humic macerals would normally be preserved either as a coke or a char.)
17708	72517 -U	2349.6 SWC	0.38† †?from mud-cake	0.33-0.44	3	Rare fluorinite, bright green. (Siltstone and sandstone with rare claystone. D.o.m. absent except for rare grains of claystone. These grains may be contaminants from the mud-cake and no similar d.o.m. could be found in association with the coarser clastics. Iron oxides common, sparse pyrite. This sample may also have been thermally altered.)
17599	BS/ 72617-T	2373.01 SWC	0.49	0.41-0.58	25	Sparse liptodetrinite and cutinite, orange to brown and rare sporinite, orange to dull orange. (Silty claystone. D.o.m. abundant, V>I>E. Vitrinite and inertinite abundant, exinite sparse. Some vitrinite shows brown fluorescence. Abundant pyrite.)
17600	BS/ 72617-H	2648.9 SWC	0.52	0.40-0.60	37	Common cutinite orange to dull orange, sparse sporinite, yellow orange to dull orange, rare suberinite, brown. (Silty claystone>> coal. Coal, vitrite>>fusite. D.o.m. abundant, I>V>or=E. Vitrinite and inertinite abundant, exinite common. Pyrite common.)
17601	BS/ 72616-A	3067 ?SWC	0.85	0.66-1.00	15	Rare liptodetrinite, orange to brown and rare cutinite, yellow orange, rare sporinite, orange, rare bitumen orange brown. (Siltstone with carbonate. D.o.m. abundant, I>V>E. Inertinite abundant, vitrinite sparse to common exinite rare. Abundant siderite.)

APPENDIX 6

APPENDIX 6

Synthetic Seismic Trace

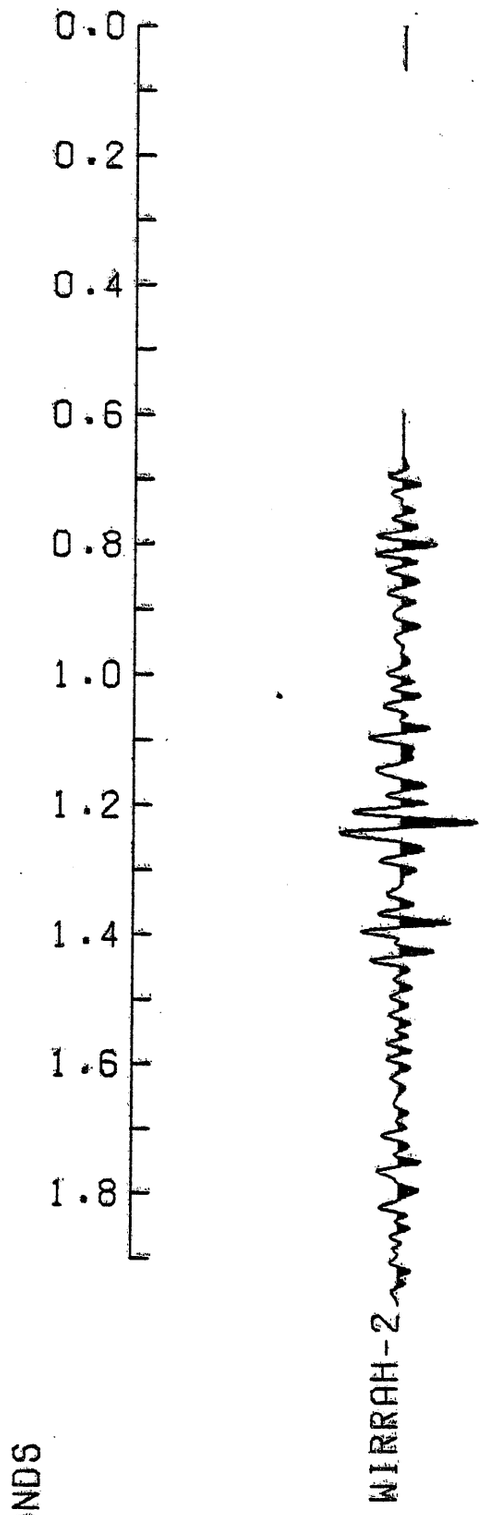
SYNTHETIC SEISMIC TRACE PARAMETERS

WELL	:	Wirrah-2
T.D.	:	3084 mKB
K.B.	:	21m
WATER DEPTH	:	50m
POLARITY	:	Trough on section represents an increase in acoustic impedance.
PULSE TYPE	:	Zero phase
PEAK FREQUENCY	:	25 Hz
SAMPLE FREQUENCY	:	4 metres
CHECK SHOT CORRECTIONS	:	Linear interpolation used for check shot correction. Reflection coefficients are calculated using original (pre-corrected) sonic log data.

0745L

WIRRAH-2

PULSE NO.1
TYPE = 2
FREQ. = 25.00
CYCLE BREADTH = 31.19
TIME OVERLAY 1



Dwg. 2173/OP/15

PE902601

This is an enclosure indicator page.
The enclosure PE902601 is enclosed within the container PE902600 at this location in this document.

The enclosure PE902601 has the following characteristics:

ITEM_BARCODE	PE902601
CONTAINER_BARCODE	PE902600
NAME	Synthetic Seismogram
BASIN	GIPPSLAND
PERMIT	VIC/L2
TYPE	WELL
SUBTYPE	SYNTH_SEISMOGRAM
DESCRIPTION	Synthetic Seismogram (enclosure from WCR vol.2) for Wirrah-2
REMARKS	
DATE_CREATED	10/02/84
DATE_RECEIVED	23/07/84
W_NO	W797
WELL_NAME	Wirrah-2
CONTRACTOR	ESSO
CLIENT_OP_CO	ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE902602

This is an enclosure indicator page.
The enclosure PE902602 is enclosed within the container PE902600 at this location in this document.

The enclosure PE902602 has the following characteristics:

ITEM_BARCODE	= PE902602
CONTAINER_BARCODE	= PE902600
NAME	= Time Depth Curve
BASIN	= GIPPSLAND
PERMIT	= VIC/L2
TYPE	= WELL
SUBTYPE	= VELOCITY_CHART
DESCRIPTION	= Time Depth Curve (enclosure from WCR vol.2) for Wirrah-2
REMARKS	=
DATE_CREATED	= 16/11/83
DATE_RECEIVED	= 7/05/84
W_NO	= W797
WELL_NAME	= Wirrah-2
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

ENCLOSURES

PE905527

This is an enclosure indicator page.
The enclosure PE905527 is enclosed within the container PE902600 at this location in this document.

The enclosure PE905527 has the following characteristics:

ITEM_BARCODE	= PE905527
CONTAINER_BARCODE	= PE902600
NAME	= Structure Map
BASIN	= GIPPSLAND
PERMIT	= VIC/L2
TYPE	= SEISMIC
SUBTYPE	= HRZN_CNTR_MAP
DESCRIPTION	= Structure Map for Top of Latrobe Group ""coarse clastics"" (from WCR vol.2) for Wirrah-2
REMARKS	=
DATE_CREATED	= 28/02/84
DATE_RECEIVED	= 23/07/84
W_NO	= W797
WELL_NAME	= WIRRAH-2
CONTRACTOR	=
CLIENT_OP_CO	= ESSO EXPLORATION AND PRODUCTION AUSTRALIA INC.

(Inserted by DNRE - Vic Govt Mines Dept)

PE902603

This is an enclosure indicator page.
The enclosure PE902603 is enclosed within the container PE902600 at this location in this document.

The enclosure PE902603 has the following characteristics:

ITEM_BARCODE	= PE902603
CONTAINER_BARCODE	= PE902600
NAME	= Structure Map Middle Mdiversus Seismic Marker
BASIN	= GIPPSLAND
PERMIT	= VIC/L2
TYPE	= WELL
SUBTYPE	= HRZN_CNTR_MAP
DESCRIPTION	= Structure Map Middle Mdiversus Seismic Marker (enclosure from WCR vol.2) for Wirrah-2
REMARKS	=
DATE_CREATED	= 28/02/84
DATE_RECEIVED	= 23/07/84
W_NO	= W797
WELL_NAME	= Wirrah-2
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE902604

This is an enclosure indicator page.
The enclosure PE902604 is enclosed within the container PE902600 at this location in this document.

The enclosure PE902604 has the following characteristics:

ITEM_BARCODE	= PE902604
CONTAINER_BARCODE	= PE902600
NAME	= Wirrah Geological Cross Section A-A'
BASIN	= GIPPSLAND
PERMIT	= VIC/L2
TYPE	= WELL
SUBTYPE	= CROSS_SECTION
DESCRIPTION	= Wirrah Geological Cross Section A-A' (enclosure from WCR vol.2) for Wirrah-2
REMARKS	=
DATE_CREATED	= 28/02/84
DATE_RECEIVED	= 23/07/84
W_NO	= W797
WELL_NAME	= Wirrah-2
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE905529

This is an enclosure indicator page.
The enclosure PE905529 is enclosed within the container PE902600 at this location in this document.

The enclosure PE905529 has the following characteristics:

ITEM_BARCODE	= PE905529
CONTAINER_BARCODE	= PE902600
NAME	= Well Completeion Log
BASIN	= GIPPSLAND
PERMIT	= VIC/L2
TYPE	= WELL
SUBTYPE	= COMPLETION_LOG
DESCRIPTION	= Well Completeion Log(from WCR vol.2) for Wirrah-2
REMARKS	=
DATE_CREATED	= 31/05/83
DATE_RECEIVED	= 23/07/84
W_NO	= W797
WELL_NAME	= WIRRAH-2
CONTRACTOR	=
CLIENT_OP_CO	= ESSO EXPLORATION AND PRODUCTION AUSTRALIA INC.

(Inserted by DNRE - Vic Govt Mines Dept)