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WIRRAH-3

WCR VOL. 2

ESSO EXPLORATION AND PRODUCTION
AUSTRALIA INC.

W840

WELL COMPLETION REPORT
WIRRAH-3
VOLUME II
29 NOV 1985
INTERPRETED DATA

GIPPSLAND BASIN
VICTORIA

ESSO AUSTRALIA LIMITED

Compiled by: G.F.BIRCH

NOVEMBER.1985

WIRRAH-3

WELL COMPLETION REPORT

VOLUME II

(Interpreted Data)

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INTRODUCTION

Wirrah-3 is located at shotpoint 2152 on seismic line G74A-1189. The well was drilled on a dome-shaped feature north of the Barracouta-Snapper structural trend, 1.1km south west of Wirrah-1 and 2.1km south west of Wirrah-2.

The Wirrah prospect is segmented by faults and the hydrocarbon distribution in each fault block requires delineation. The main objective of Wirrah-3 was therefore to confirm and define the hydrocarbon accumulation in the south western part of the Wirrah structure.

PREVIOUS DRILLING

Wirrah-1, drilled crestal at the top of the Latrobe Group, intersected eight hydrocarbon zones within the Latrobe Group. Wirrah-2, located 1km north west of Wirrah-1, penetrated gas at the top of the Latrobe Group, but did not intersect the intra-Latrobe Group hydrocarbons observed at Wirrah-1. The lower intra-Latrobe hydrocarbons appear not to extend into the northern part of the Wirrah structure.

GEOLOGY

The interpretations given below summarize detailed investigations by specialist groups. For a comprehensive report on these studies refer to the "Enclosures" section of this Well Completion Report.

Stratigraphy

The section penetrated by Wirrah-3 is separated into two Groups, the Latrobe Group and the Seaspray Group.

The formation tops were intersected close to the predicted depths, as shown in the table presented below (all depths in this section are given mKB) -

GROUP/FORMATION/UNIT	AGE	PREDICTED DEPTH (mKB)	ACTUAL DEPTH (mKB)	ACTUAL DEPTH (mSS)
Seaspray Group				
Gippsland Limestone	Miocene-Recent	70	70	49
Lakes Entrance Fm.	Miocene	1310	1306	1285
Latrobe Group				
Unnamed Unit	Early Oligocene	-	1488.5	1467.5
Gurnard Fm.	Late Eocene	1484	1495	1474
Undifferentiated	Late Cretaceous/ Late Eocene	1507	1509	1488

Latrobe Group. 3257(TD) - 1488.5mKB. Late Cretaceous-Early Oligocene

The age range for the Latrobe Group sediments is N. senectus(TD) to Early N. asperus. Sediments from the top of T. lilliei (approx. 2875m) to TD (N. senectus) are dominated by conglomeratic sandstones. Core 10, recovered from a fairly shaly interval (3116.1 - 3116.0m), comprised interbedded siltstone and shale with sandstone lenses. The sandstone is flint-like, possibly due to silicification, bedding is irregular and clasts are present. Core 11, taken from a sandy section (3143.4 - 3145.0m), comprises a conglomerate of poorly sorted, quartzite pebbles in a well-cemented, fine to coarse sand, and a well indurated sandstone of fine to quartz grains. Although predominantly sandy over this interval, sediments exhibit poor porosity (less than 10% below 3000m). Intrusive volcanics are present between 3091 and 3106m.

The section top L. balmei to top T. lilliei is an alternating sandstone-shale lithology. The interval is characterised by repeated upward-fining units abruptly terminated by sandstone. Six cores (Nos. 3 - 8) recovered towards the bottom of this interval (2597 - 2709m) recovered predominantly well-sorted, medium to coarse quartz sand. Siliceous and dolomitic cement are common, whereas carbonaceous matter, pyrite, mica and coal fragments are also present. Interbedded siltstone and claystone comprise carbonaceous matter, mica and pyrite. Sedimentary structures e.g. starved ripples, parallel laminations, convoluted bedding, cross laminae, trough and planar cross stratification, reported in the core analysis would support a fluvial depositional environment for this interval as interpreted from the character of the log response. The repeated upward-fining units are possibly stacked point bars and the overlying siltstones and shales are possibly crevasse splay, levee, or overbank material of the floodplain.

The sandstone units are typically 5 - 10m thick and the net-to-gross for this interval is approximately 0.60. Although cementation is common and pyrite, feldspar and mica are also present, porosities are reasonable, ranging from 11 to 25% and averaging about 18%. The fine overbank, abandoned channel and other floodplain sediments can attain 20m in thickness, however, because their lateral continuity is probably limited, the sealing quality of these units is doubtful.

Intrusive volcanics are interpreted between 2355 to 2452m. Some side wall cores from this interval are described as dolerite, but the exact nature of these rocks is unknown.

The section from top Upper L. balmei (2032m) to the top of the undifferentiated Latrobe Group (1509m) is characterized by thick, consistent sands, separated by shales of variable thickness (5 - 25m). The shales are commonly overlain by coals ranging from less than a metre to over 20m thick. Coal sequences are most prolific between Upper M. diversus and the end of the Lower M. diverus and from lowermost N. asperus to the top of P. asperopolus, whereas the majority of P. asperopolus is devoid of coaliferous sediments. The sands in the upper portion of this interval contain pyrite and are frequently dolomitic, nevertheless porosities range between 21 and 26%. Sandstones in the lower section are mostly uncemented, but porosities decline to between 23% and 17% over this interval. Net sand over the whole section is approximately 60%. The common abrupt change from shales to sandstone ("box-car" pattern) suggests distributary channels have been cut into floodplain deposits. Repeated cycles of upward-fining sediment, overlying coal, terminated by clean sandstone may represent the development of point bars which are gradually overlain by finer grained floodbasin sediments. However, a repetitive and abrupt transition to clean sand may imply a periodic fall in base level. The shales in this section are fairly thick and may be sufficiently continuous to act as a seal for the thick high-quality, intermediate sands observed within this interval.

Gurnard Formation. 1495-1509m. Latest Late Eocene - earliest Early Ologocene.

The Gurnard Formation is a moderate to very calcareous siltstone containing pyrite. It is distinguished by its pelletal glauconite content which varies in concentration from abundant to rare.

Un-named Unit. 1488.5-1495m. Early Oligocene.

The Gunard Formation is conformably overlain by an un-named unit comprising dark brown to grey argillaceous, carbonate-rich silstone. This unit is identified on an Early Oligocene J-K planktonic foraminiferal assemblage. However, due to poor hole conditions, it was not recognised in either Wirrah-1, or Wirrah-2 wells.

Seaspray Group.
Gippsland Limestone and Lakes Entrance Formation - 70-1488.5m.
Early Miocene - Recent.

The boundary between the Latrobe and Seaspray Groups is made on a separation of the deep and shallow penetration resistivity logs and a change in the character of the density log at 1488.5mKB. Differentiation of the Lakes Entrance and Gippsland Limestone is made primarily on changes in the density and neutron log character and on a caliper shift.

Lakes Entrance Formation sediments are typically olive-grey argillaceous marl, whereas the overlying Gippsland Limestone are packstones and frequently comprise fragments of bryozoan, foraminifera, echinoid spines etc.

GEOCHEMISTRY

Latrobe Group sediments have a very good potential to source gas plus oil. The top of organic maturity for producing significant hydrocarbons is approximately 2900 mKB.

The deep intra-Latrobe oils are intermediate API, high-wax, paraffinic crudes, probably derived from terrestrial organic matter. They are similar in composition to the intra-Latrobe oils discovered in Wirrah-1.

POTENTIAL RESERVOIRS, SEALS AND MIGRATION PATHWAYS

Porosity for discrete sand bodies are given in the Quantitative Log Analysis (Appendix 3) and on the Well Completion Log (Enclosure 4). Typically, porosity decreases from approximately 30% at 1000m to 10% at 3000m. Potential reservoirs at the top of Latrobe coarse clastics (1509m) have porosities in the order of 20% - 30% and interbedded sands within the coaliferous shaly Lower N. asperus (1600m) to top of Lower M. diversus (2025m) are generally about 22% - 28%. Sands in the alternating shale/sand section of the Upper L. balmei (2025m) to top T. lilliei (2875m) generally exhibit porosities of 12% - 20%, whereas the continuous sands below 2875m have porosities ranging from less than 10% to 15%.

The major regional seal is provided by the Gurnard Formation, the marls of the un-named Oligocene unit and the overlying Lakes Entrance Formation. Adequate seals are also provided by some of the thicker and more regionally extensive coals and shales within the Latrobe Group.

As the top of maturation (0.65%) lies below most of the hydrocarbon accumulations, emplacement must involve migration. Numerous deep-seated faults, with the potential of migrating hydrocarbons generated at depth, have been interpreted in the area (see Structure).

SALINITY

The limit of fresh-water flushing is approximately 2040mKB. Below this interval water-bearing sands have an apparent salinity of 30,000ppm NaCl equivalent and this value was used in all log calculations from 1500 - 2400mKB. Water-bearing sands between 2520 and 2538mKB have an apparent water salinity of 17,000ppm NaCl equivalent and this value is accepted for the interval 2440mKB to TD.

HYDROCARBON OCCURANCE

Wirrah-3 penetrated six hydrocarbon zones, one of which corresponds to a reservoir intersected at Wirrah-1. (Depths are in metres subsea to allow comparison with Wirrah-1 and -2.)

N. asperus Reservoirs (N150; N190 & N191)

Reservoir N150 at the Top of the Latrobe Group is intersected by Wirrah-1 and -2 and is interpreted to be full to spill with gas and an associated thin oil leg. A GOC is present at -1510m and an OWC is at -1512.5m within a dolomitised sand in Wirrah-1. At Wirrah-2 the N150 has an OWC at -1514m, however no evidence of a contact at this depth can be found in Wirrah-3, and a contact at -1512.5 m has been accepted for this reservoir.

Two thin oil sands (N190 & N191) encountered in the Lower N. asperus zone in Wirrah-1, do not appear to extend to Wirrah-3.

L. balmei Reservoirs (L420 & L430 & L490)

Two thin (less than 4m) oil accumulations in the Upper L. balmei are designated L420 and L430. The upper L420 sand over the interval -2000.75 to -2010.75m has oil as low as -2004.5m. An OWC can be defined at -2122.75m for the lower L430 sand over the interval -2118.75 to -2128.75m. Both these systems are therefore separate from the L440 and L450 zones in Wirrah-1. This implies that the faulting interpreted between the two wells is sealing.

In the Lower L. balmei, a 4m oil zone (L490) occurs from -2326.75m to -2330.5m with an associated spill point at -2356m. No equivalent zone was intersected in Wirrah-1.

T. longus and T. lilliei Reservoirs (five hydraulically seperate zones)

The main hydrocarbon zone is a series of stacked reservoirs occupying five different hydraulic systems from -2563.5 to about -2919m. Wirrah-1 is thought to have intersected the equivalent zone at -2549m. The reservoirs are believed to occur at about the same stratigraphic level, but antithetic faults between Wirrah-1 and -3 probably separate them. The RFT and production testing programs indicate that there are five fluid systems within the T. longus in Wirrah-3, none of which has a clearly defined contact. The number of hydrocarbon systems is indicated by gas sands within the hydrocarbon column and by pretest pressures.

Cores cut in Wirrah-1 and -3 and testing in Wirrah-3 show the conglomerate in the interval -2829 to -3229 m to contain hydrocarbons. However, due to a lack of permeability, these hydrocarbons probably cannot be produced. The log analysis appendix contains a detailed listing of all hydrocarbon zones.

STRUCTURE

The Wirrah structure is a faulted done. The feature is extensively faulted in an east-west orientation below the M. diversus, but only the major (late Eocene - Mid Miocene) inverted normal fault intersects the top of Latrobe. Because of inadequate seismic density and inferior data quality, the exact nature of the deeper faulting is poorly known. Future 3D seismic planned for this region will greatly improve the present interpretation.

The prospect is approximately 2.5 by 3m with a maximum closure at the top of the Latrobe of 55m (Enclosure 1) and closure increases to 110m at the top of the middle M. diversus horizon. The stratigraphy below the M. diversus is believed to be approximately conformable, but these horizons cannot be mapped seismically due to marked attenuation. Recognition of the fault pattern and delineation of the structure below the M. diversus, is thus questionable. Nevertheless, a normal attached fault is interpreted to intersect Wirrah-1 whereas Wirrah-2 could have intersected a series of associated antithetic faults (Enclosure 3). Dolerite penetrated immediately above the conglomerates in Wirrah-1 may be associated with this faulting.

Current interpretation suggests that Wirrah-1 and -3 penetrated separate fault blocks below M. diversus. In fact, present evidence indicates that antithetic faults may have set up four separate fault blocks and that these may cross- and dip-seal. Additional seismic and drilling will be required to verify this interpretation.

GEOPHYSICS

The mapping of the Wirrah structure was based on a 0.5km grid of G77A, G80A, G81A and G82B seismic. These data were available prior to the drilling of Wirrah-1, 2 and -3. The reflection data quality is fair to good down to and including the Middle M. diversus seismic marker.

The top of the Latrobe Group "coarse clastics" in Wirrah-3 was penetrated at -1488m, 2m deep to prediction. This accurancy in prediction verifies the minor modification carried out with the time interpretation from the top of Latrobe Group to "coarse clastics" in the remapping of the structure after the drilling of Wirrah-2.

The Middle M. diversus seismic marker structure map was produced by isopaching down from the revised top of "coarse clastics" map, using a constant interval velocity of 2900ms^{-1} derived from the Wirrah-1 and -2 velocity surveys. This marker has been correlated with the top of the Middle M. diversus coal which was intersected at -1849m in Wirrah-3, again 2m deep to prediction.

The major oil accumulation in Wirrah-3 is found below the M. diversus in a series of stacked reservoirs between -2536 and -2919m. At present none of these units has been successfully mapped. The main problem is the presence of strong reverberations within the deeper coal-prone Latrobe Group and the associated signal attenuation through this section.

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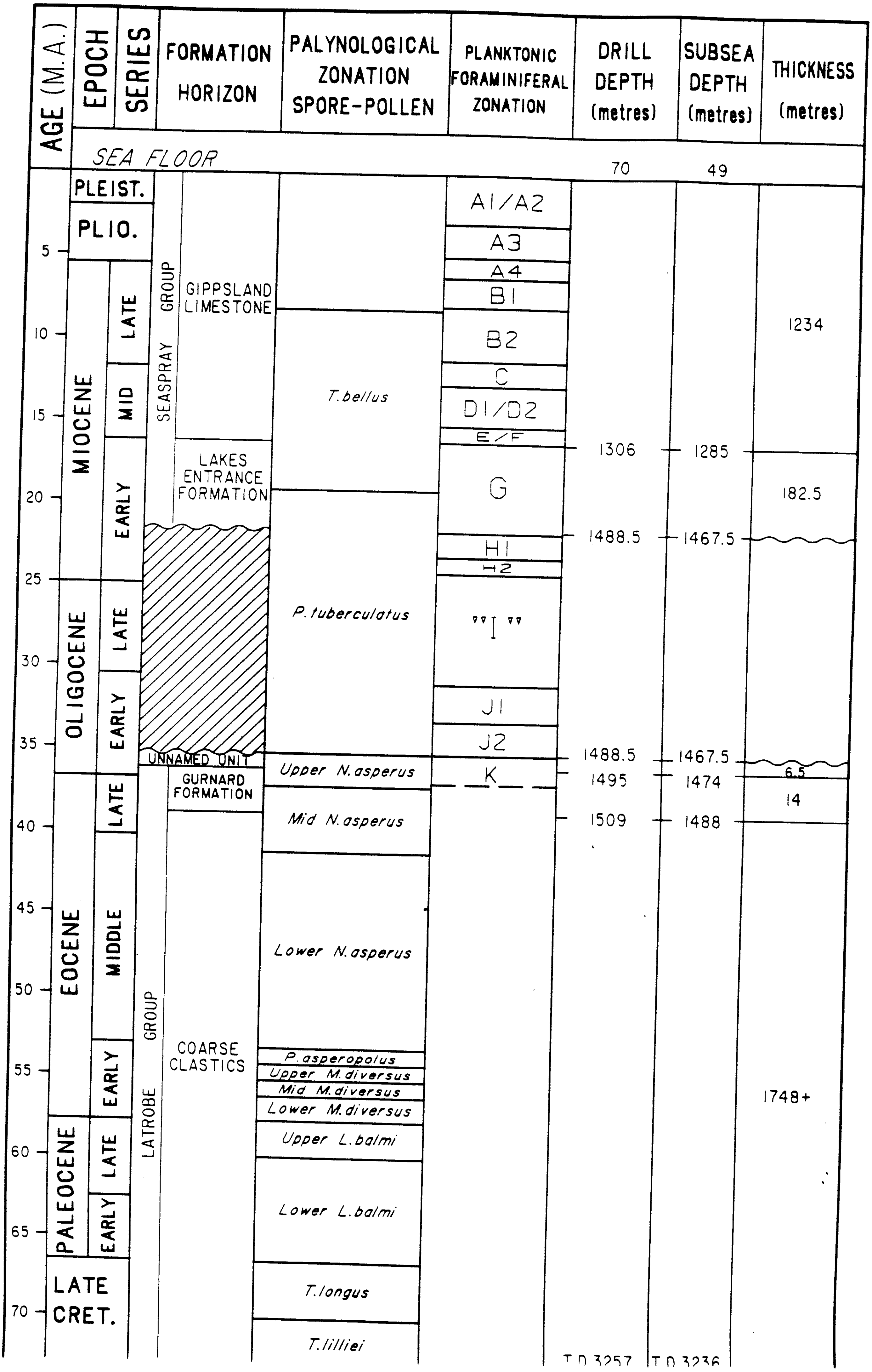
FIGURES

FIGURES

WIRRAH-3
STRATIGRAPHIC TABLE



APPENDIX 1

APPENDIX 1

APPENDIX 1

FORAMINIFERAL ANALYSIS, WIRRAH-3, GIPPSLAND BASIN

by

J.P. REXILIUS

Esso Australia Ltd.

June, 1984

Palaeontological Report, 1984/17

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INTERPRETATIVE DATA

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FORAMINIFERAL DATA SHEET

TABLE 1: INTERPRETATIVE DATA, WIRRAH-3

INTRODUCTION

Eighteen (18) sidewall core samples were processed for foraminiferal analysis in Wirrah-3 from 1375.4 to 1509.0m. Tables 1 and 2 provide a summary (Basic and Interpretative) of the palaeontological analysis in Wirrah-3. A summary of the biostratigraphic breakdown of the stratigraphic units in the well is given below.

AGE	UNIT	ZONE	DEPTH(mKB)
Early Miocene	Lakes Entrance Formation	G	1375.4-1425.6
log break at 1430m (mid-Early Miocene disconformity)			
Early Miocene	Lakes Entrance Formation	G	1435.7-1455.8
Early Miocene		H-1	1465.4-1475.4
log break at 1488.5m (30 Ma event)			
latest Eocene - earliest Oligocene	Un-named carbonate unit (Early "Oligocene Wedge")	K	1491.5
log break at 1495m			
latest Eocene - earliest Oligocene	Gurnard Formation	K	1495.3-1501.0
		Indeterminate	1503.0-1509.0
log break at 1510m			
	Latrobe Group (coarse clastics)	(not studied)	

T.D. 3257mKB

GEOLOGICAL COMMENTS

The Gurnard Formation is assignable to the Middle N. asperus palynological Zone (Macphail, 1984). The top part of the unit (1495.3-1501.0m) contains planktonic foraminifera and is Zone K (early Zone K) in age. Sidewall core 123 at 1485.3m is out of sequence. The sample is a greensand (Gurnard Formation) which has been age-dated as Zone K (early K) and Middle N. asperus. The sample almost certainly was shot in the interval 1495-1510m and probably above 1501.0m.

The Gurnard Formation is conformably (?) overlain by the un-named carbonate unit (Early "Oligocene Wedge"). One sidewall core (SWC 122 at 1491.5m) intersected the unit. The sample contains a very rich, well preserved planktonic foraminiferal fauna and approximately 5% pelletal glauconite. On the basis of log character the base and top of the unit are estimated to be 1488.5 and 1495m. The "wedge" is Zone K (late Zone K) in age. The sample at 1491.5m is assignable to the Middle N. asperus palynological Zone (Macphail, 1984). There is evidence in Wirrah-3 that Zone K has the potential to be sub-divided into two zones (see Discussion of Zones). Further sections need to be examined to refine the planktonic foraminiferal zonation for the time interval Late Eocene-Early Oligocene in the Gippsland Basin.

The Early "Oligocene Wedge" is disconformably overlain by the Lakes Entrance Formation. The basal portion of the Lakes Entrance Formation has been age-dated as Zone H-1 and contains reworked Zone K planktonic foraminifera. Reworking of older assemblages (generally Early Oligocene "Wedge" assemblages) during the Early Miocene (Zone H-1 time) has been noted in most recently drilled Gippsland Basin Wells. The hiatus between the "wedge" and the overlying Lakes Entrance Formation spans most of the Oligocene (approximately 14 my). The disconformity at 1488.5m most probably equates with the mid-Oligocene disconformity (30 Ma event) of Vail et al. (1977). This event is seismically mapped as the "Top of Latrobe" over most of the Gippsland Basin.

There is a probable disconformity within the Lakes Entrance Formation at 1430m. A strong sonic/density log break is present at this depth in Wirrah-3. The break probably equates with a mid-Early Miocene disconformity which has now been recognized in a number of Gippsland Basin wells including Wrasse-1 (see Rexilius, 1984).

DISCUSSION OF ZONES

The Tertiary biostratigraphy in Wirrah-3 is based on the Gippsland Basin planktonic foraminiferal zonal scheme of Taylor (in prep.).

Indeterminate Interval : 1503.0-1509.0m
The interval is barren of planktonic foraminifera but has been assigned to the Middle N. asperus palynological Zone by Macphail (1984).

Zone K : 1491.5-1501.0m
A very rich Zone K assemblage occurs in the sidewall core sample at 1491.5m (un-named carbonate unit). The assemblage includes Globigerina angiporoides, G. brevis, G. euapertura, G. linaperta and Globorotalia gemma. The presence of Globigerina euapertura indicates a position high in Zone K. A more impoverished assemblage at 1493.3m (greensand facies - Gurnard Formation) comprising Globigerina ampliapertura, G. angiporoides, G. linaperta and Globorotalia gemma, is indicative of a position low in Zone K. Globigerina ampliapertura is considered by Taylor (in prep.) to represent the progenitor of G. euapertura. However he documents the evolutionary appearance of Globigerina euapertura later, at the base of Zone J-2, in the Gippsland Basin. Jenkins (1971) also records the entry of the species at the same level in New Zealand, that is, after the extinction of Globigerina linaperta (the defining event for the top of Zone K). The overlap in ranges of Globigerina euapertura and G. linaperta in several recently drilled wells in the Gippsland Basin may enable Zone K to be sub-divided into two zones, Zone K-1 and Zone K-2. Analysis of other sections in the Gippsland Basin is required to confirm the sub-division of Zone K. Zone K-2 is provisionally for now defined by the interval from the appearance of Globigerina brevis (and Globorotalia gemma - based on recent data) to the entry of G. euapertura. Zone K-1 is tentatively defined by the interval from the appearance of Globigerina euapertura to the extinction of G. linaperta. Zone K-2 is also characterized by the presence of Globigerina ampliapertura.

Because reworking of the condensed Gurnard Formation/un-named Early Oligocene carbonate is probable in the Gippsland Basin, care must be taken in establishing that assemblages are in situ. In Wirrah-3 there is good evidence that there are older (Zone K-2) and younger (Zone K-1) Zone K assemblages which are in situ. The richer assemblages in the un-named carbonate unit (1491.5m) contain a minimum amount of pelletal glauconite (Note - the greensand at 1493.3m is very rich in pelletal glauconite) and in addition contain abundant Globigerina euapertura with no record of its progenitor G. ampliapertura. Reworking of foraminiferal assemblages in the sample of the un-named carbonate unit at 1491.5 is totally lacking.

A very sparse Zone K planktonic foraminiferal assemblage comprising rare *Globigerina linaperta* and *Globorotalia gemma* was recorded in the sidewall core sample at 1501.0m. Other samples in the interval at 1497.4 and 1499.3m were barren of planktonic foraminifera.

Zone H-1 : 1465.4m-1475.4m

A Zone H-1 assemblage comprising the index species *Globigerina woodi connecta* with reworked latest Late Eocene-earliest Early Oligocene foraminifera (including *Globigerina angiporoides* and *G. linaperta*) occurs in the sidewall core sample at 1475.4m. A typical Zone H-1 assemblage also occurs at 1465.4m but without a reworked component. Reworking of older faunal elements into the basal portion of Zone H-1 has now been documented in numerous wells in the Gippsland Basin.

Zone G : 1375.4-1455.8m

The uphole appearance of *Globigerinoides trilobus* at 1455.8m defines the base of Zone G in Wirrah-3.

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MICROPALEONTOLOGICAL DATA SHEET

BASIN: GIPPSLAND ELEVATION: KB: +21.0m GL: 49.0m

WELL NAME: WIRRAH-3 TOTAL DEPTH: 3257m KB

AGE		FORAM. ZONULES	HIGHEST DATA Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	LOWEST DATA Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
PLEISTOCENE		A_1										
		A_2										
PLIOCENE		A_3										
		A_4										
		B_1										
MIOCENE	LATE	B_2										
		C										
	MIDDLE	D_1										
		D_2										
		E_1										
		E_2										
	EARLY	F										
		G	1375.4	0				1455.8	1			
		H_1	1465.4	1				1475.4	1			
OLIGOCENE	LATE	H_2										
		I_1										
		I_2										
	EARLY	J_1										
		J_2										
EOCENE		K	1491.5	0				1501.0	2			
		Pre-K										

COMMENTS: SWC 123 at 1485.3m is out of place. It is a greensand which was shot within the Gurnard Formation (1495 - 1510m).

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: J.P. Rexilius DATE: 2/2/84

DATA REVISED BY: J.P. Rexilius DATE: 14/6/84

<u>TABLE 1</u>

SUMMARY OF PALAEONTOLOGICAL ANALYSIS, WIRRAH-3, GIPPSLAND BASIN

INTERPRETATIVE DATA

NATURE OF SAMPLE	DEPTH (mKB)	PLANKTONIC FORAMINIFERAL YIELD	PRESERVATION	PLANKTONIC FORAMINIFERAL DIVERSITY	ZONE	AGE	COMMENTS
SWC 113	1509.0	Barren	-	-	-	-	-
SWC 114	1507.0	Barren	-	-	-	-	-
SWC 115	1505.0	Barren	-	-	-	-	Fish teeth
SWC 116	1503.0	Barren	-	-	-	-	-
SWC 117	1501.0	Very low	Poor	Very low	K	L. Eocene/E. Oligocene	-
SWC 118	1499.3	Barren	-	-	-	-	Fish teeth
SWC 119	1497.4	Barren	-	-	-	-	-
SWC 120	1495.3	Low	Moderate/Poor	Low	K	L. Eocene/E. Oligocene	-
SWC 122	1491.5	High	Good	Moderate	K	Probably E. Oligocene	-
SWC 123	1485.3	Low	Good	Low	K	L. Eocene/L. Oligocene	Sidewall core out of sequence.
SWC 125	1475.4	High	Good	Moderate	H-1	Early Miocene	Contains reworked Zone K assemblages. Fish teeth present.
SWC 126	1465.4	High	Good	Moderate	H-1	Early Miocene	
SWC 127	1455.8	Moderate	Moderate	Moderate/High	G	Early Miocene	-
SWC 128	1445.4	High	Good	Moderate/High	G	Early Miocene	-
SWC 129	1435.7	Moderate/High	Moderate	Moderate	G	Early Miocene	-
SWC 130	1425.6	High	Good	High	G	Early Miocene	-
SWC 131	1400.4	Moderate	Good	Moderate	G	Early Miocene	-
SWC 132	1375.4	High	Good	High	G	Early Miocene	Shell fragments, echinoid spines

BASIC DATA

TABLE 2: FORAMINIFERAL DATA, WIRRAH-3

RANGE CHART: TERTIARY PLANKTONIC FORAMINIFERA

TABLE 1

SUMMARY OF PALAEONTOLOGICAL ANALYSIS, WIRRAH-3, GIPPSLAND BASIN

BASIC DATA

NATURE OF SAMPLE	DEPTH (mKB)	PLANKTONIC FORAMINIFERAL YIELD	PRESERVATION	PLANKTONIC FORAMINIFERAL DIVERSITY
SWC 113	1509.0	Barren	-	-
SWC 114	1507.0	Barren	-	-
SWC 115	1505.0	Barren	-	-
SWC 116	1503.0	Barren	-	-
SWC 117	1501.0	Very low	Poor	Very low
SWC 118	1499.3	Barren	-	-
SWC 119	1497.4	Barren	-	-
SWC 120	1495.3	Low	Moderate/Poor	Low
SWC 122	1491.5	High	Good	Moderate
SWC 123	1485.3	Low	Good	Low
SWC 125	1475.4	High	Good	Moderate
SWC 126	1465.4	High	Good	Moderate
SWC 127	1455.8	Moderate	Moderate	Moderate/High
SWC 128	1445.4	High	Good	Moderate/High
SWC 129	1435.7	Moderate/High	Moderate	Moderate
SWC 130	1425.6	High	Good	High
SWC 131	1400.4	Moderate	Good	Moderate
SWC 132	1375.4	High	Good	High

FOSSIL TYPE : PLANKTONIC FORAMINIFERA

Well Name WIRRAH-3 Basin Gippsland Sheet No. 1 of 1

SAMPLE TYPE OR NO. *	113	114	115	116	117	118	119	120	122	123	125	126	127	128	129	130	131	132
FOSSIL NAMES / DEPTHS	1509.0	1507.0	1505.0	1503.0	1501.0	1499.3	1497.4	1495.3	1491.5	1485.3	1475.4	1465.4	1455.8	1445.4	1435.7	1425.6	1400.4	1375.4
Globigerina linaperta					---			—	■	---	R							
Globorotalia gemma					---			---	■	---								
Globigerina angiporoides								---	—	—	R							
Globigerina ampliapertura								---										
Globigerina euapertura									—									
Globigerina praebulloides									---			---	—	■	■	■	—	■
Globigerina brevis									—									
Chiloguembelina cubensis									---									
Globigerina sp. 1									---									
Globigerina woodi connecta											—	■		—	—	■	—	—
Globorotalia opima nana											■	—	—					
Globorotalia opima opima											---							
Globigerina woodi woodi												—	—	■	—	■	■	—
Globigerina continuosa													—	—	—	■		—
Globorotalia bella													---	---	---	—		—
Catapsudrax dissimilis													---	---		—		
Globigerinoides trilobus													---	—	—	■	—	—
juvenile planktonics													■					
Globorotalia obesa														—		—		---
Globoquadrina dehiscens s.s.															---	—	---	—
Globoquadrina advena																—	---	---
Globoquadrina dehiscens s.l.																	---	

* C=CORE S=SIDEWALL CORE
T=CUTTINGS J=JUNK BASKET

--- RARE
— FEW
▬ COMMON
■ ABUNDANT
REWORKED

PALAEO.CHART-2
DWG.1107/OP/287

APPENDIX 2

APPENDIX 2

APPENDIX 2

PALYNOLOGICAL ANALYSIS
WIRRAH-3, GIPPSLAND BASIN

by

M.K. Macphail

Esso Australia Ltd
Palaeontology Report 1984/19

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0927L

INTERPRETATIVE DATA

INTRODUCTION

One hundred and sixteen (116) sidewall core, six (6) conventional core and six (6) cuttings samples were processed and examined for spore-pollen and dinoflagellates. Despite good sampling densities, recovery was only fair to poor with samples providing confident age determinations often separated by thick intervals of little or no yield. Palynological zones and lithological facies divisions from the base of the Lakes Entrance Formation to the total depth of the well are given below. The occurrence of spore-pollen and dinoflagellate species are tabulated in the accompanying range chart. Anomalous and unusual occurences of species are listed in Table 2.

AGE	UNIT/FACIES	ZONE	DEPTH(m)
Early Miocene	Lakes Entrance Fm	P. tuberculatus	1475.4
	log break at 1488.5m		
Late Eocene	Unnamed marl	Middle N. asperus	1491.5
	log break at 1495.0m		
Late Eocene	Gurnard Formation	Middle N. asperus	1495.3-1507.0
	log break at 1510.0		
Middle Eocene		Early N. asperus	1520.1-1648.1
Early/Middle Eocene		P. asperopolus	1688.2-1804.0
Early Eocene		Upper M. diversus	1873.0
Early Eocene		Middle M. diversus	1881.0-1889.0
Early Eocene	Latrobe Group	Lower M. diversus	1925.1-1950.5
Palaeocene	Coarse Clastics	Upper M. balmei	2035.0-2366.0
Palaeocene		Lowe L. balmei	2397.6-2593.0
Maastrichtian		Upper T. longus	2600.0-2775.0
Late Cretaceous		Lower T. longus	2800.0-2875.0
Late Cretaceous		T. lilliei	2994.4-3159.2
Late Cretaceous		N. senectus	3219.3-3225.0

T.D. 3257

GEOLOGICAL COMMENTS

1. The Wirrah-3 well contains a continuous sequence of sediments from the Late Cretaceous N. senectus Zone to the Late Eocene Middle N. asperus Zone.

2. The P. tuberculatus Zone sample at 1475.4m contains Early Miocene foraminifera (Rexilius 1984), demonstrating erosion or a hiatus in deposition during the Oligocene. The surface represented by the log break at 1488.5m is likely to represent the 30 million year unconformity.

3. The unnamed marl, picked on lithological and log characteristics as occuring between 1488.5 and 1495m Rexilius (ibid) is likely to be Late Eocene, Middle N. asperus Zone in age. Because the unit is represented by one sidewall core sample only, this date must be considered provisional but maximum and minimum ages are Middle N. asperus and Upper N. asperus Zone respectively. It is noted that the equivalent facies in the Sea-Horse Field wells to the west are Eocene-Early Oligocene in age whilst the unit is absent in wells to the east of Wirrah-3, e.g. Whiting-1 (Rexilius unpubl. data). It is unclear whether the equivalent unit occurs in the Wirrah-1 and 2 wells.

4. The Gurnard Formation, picked on lithological and log characteristics as extending from 1495 to 1510m (Rexilius ibid) is wholly Middle N. asperus Zone in age. Sidewall core samples from the lower section of this unit (1503.0 to 1507.0m) contain largely terrestrially-derived palynofloras of high concentration and good diversity. All contain large-diameter palynomorphs from plant groups which are unlikely to have dispersed spore-pollen over long distances, e.g. Triorites magnificus. Palynofloras in sidewall core samples from the upper part of the unit (1495.3 to 1501.0m) are dominated by marine species of dinoflagellates. In these samples the terrestrially derived spore-pollen component mostly comprises types capable of being long-distance transported. A likely explanation is that the Gurnard Formation was deposited during a period of effectively rising sea level, resulting the wellsite becoming progressively more distant from the palaeoshoreline. The sandstone unit at the top of the Latrobe Group coarse clastics (1510.9-1520.1m) lacks dinoflagellates and may represent either shore-face or fluvio-deltaic facies. The former is considered more likely given that the highest coal occurs at 1523m. The timing and direction of change in the palaeo-environment suggests the surface at 1510.0m (the top of the Latrobe Group coarse clastics) represents the 40.5Ma type 1 unconformity recognised by Partridge et al. (unpubl. results).

5. Other samples within the Latrobe Group coarse clastics that contain dinoflagellates are: 1571.5m and 1648.1m (Lower N. asperus Zone), 1804.0m (P. asperopolus Zone), and 2152.1m (Upper L. balmei Zone). Concentrations are low to very low in all cases and the environments represented likely to be marginal marine rather than marine. This is consistent with data showing that the Wirrah-1 and Wirrah-2 wells were unaffected by Palaeocene or Early Eocene marine transgressions.

5. The Middle M. diversus seismic marker occurs immediately below the lowest sample datable as Middle M. diversus Zone in age but almost certainly lies within a section of this age.

7. The well bottomed in sediments of N. senectus Zone age. Whilst this is consistent with its location on the downthrown side of the fault between Wirrah-1 and Wirrah-1, it is noted that sediments of T. lilliei, T. longus and L. balmei Zone ages in Wirrah-3 occur at greater depth than would be anticipated from the predicted structural relationship between this well and Wirrah-2. A possible explanation is the presence of a negative listric fault in the Late Cretaceous/Palaeocene sediments between the wells.

BIOSTRATIGRAPHY

The zone boundaries have been established using criteria proposed by Stover and Evans (1973), Stover and Partridge (1973), and Partridge (1976) and subsequent proprietry revisions including Macphail (1983).

Nothofagidites senectus Zone, 3219.3 to 3225m:
Samples within this zone are dominated by Proteacidites and gymnosperms. An N. senectus Zone age is suggested on the basis of (i) an absence of Gambierina and (ii) relatively frequent occurrences of Nothofagidites and Tricolpites spp. Most of these are undescribed but species able to be recognized include N. endurus (3222.0m), N. senectus (3219m), T. gillii and T. sabulosus sensu lato (3225.3m, 3222m). The last species includes two distinct forms informally named var "gillii"/var A and var "rudata"/var B depending on the absence or presence respectively of well developed thickenings (margines) partially surrounding the colpi. Tricolpites sabulosus (var. A.) most closely resembles T. sabulosus Dettman & Playford sensu stricto.

Tricolporites lilliei Zone, 2994.4 to 3159.2m:
The base of this zone is provisionally picked at 3159.2m, the first occurrence of a single poorly preserved pollen referrable to Gambierina rudata. The sample at 3132.8m contains numerous, well preserved specimens of this species in addition to other species which range no lower than the T. lilliei Zone, e.g. Tricolporites lilliei and Nothofagidites flemingii. Gambierina rudata, Tricolporites lilliei, Proteacidites amolosexinus, Tricolpites sabulosus (vars. A and B) and frequent Nothofagidites occur in samples assigned to this zone as do a number of typically early Cretaceous species, e.g. Foraminisporis asymmetricus, Cicatricosisporites spp., Kraeuselisporites spp. and, at 3107.9m, Pilosisporites notensis. The highest sample assigned to the T. lilliei Zone contains a diverse palynoflora including the first occurrences of species which become common in the T. longus Zone: Australopollis obscurus, Proteacidites otwayensis and Tricolpites wahooensis. The samples at 2934.0 and 2971.8m are no older than T. lilliei Zone in age.

Lower Tricolpites longus Zone, 2800.0 to 2875.0m:
Three samples are assigned to this zone. The lowermost contains the nominate species and is therefore by definition (Macphail, 1983) no older than Lower T. longus in age. The two higher samples at 2823.6 and 2800.0m contain frequent to common Gambierina with Tricolporites lilliei but lack species first appearing in the Upper T. longus Zone. Only in one sample (2823.6m) is Nothofagidites common (58% of count excluding Proteacidites and Podocarpidites). Percentages of Gambierina rudata and Triporopollenites sectilis in this sample are 27% and 5% respectively.

Upper Tricolpites longus Zone, 2600.0 to 2775.0m:
The base of this zone is defined by the first occurrence of Stereisporites punctatus at 2775.0m. Gambierina is abundant and Nothofagidites very rare in this sample. Otherwise palynofloras are diverse only towards the top, but the section contains the first occurrence of a number of important Late Cretaceous species: Proteacidites palisadus (2775.0m), P. clinei and P. wahooensis (2764.0m), P. reticuloconcavus, Ornamentifera sentosa and Tetracolporites verrucosus (2742.5m); Proteacidites protograndis and Stereisporites regium (2713.0m); Protcacidites gemmatus (2650.0m); Quadraplanus brossus (2625.0m); and Tetradopollis securus (2624.38m). The upper boundary of the zone is defined by the last appearance of Tricolpites longus, Tricolporites lilliei, Proteacidites otwayensis, P. palisadus and frequent Gambierina rudata at 2600.0m.

Lower Lygistepollenites balmei Zone, 2397.6 to 2593.0:
The section assigned to this zone comprises palynofloras dominated by Proteacidites and gymnosperms separated by intervals of poor or no recovery. The nominate species is relatively rare. The lower boundary is picked at 2593.0m, based on the first occurrence of Tetracolporites verrucosus and Stereisporites punctatus in an assemblage which lacks species ranging no higher than the Upper T. longus Zone. The sample at 2582.1m contains frequent specimens of Tetracolporites verrucosus and is therefore no younger than Lower L. balmei Zone in age. The presence of multiple specimens of Schizocolpus marlinensis in this sample represents an important extension in the known range of this species. Tetracolporites verrucosus occurs throughout the Lower L. balmei Zone section and its last occurrence in a palynoflora lacking Verrucosisporites kopukuensis at 2397.6m, defines the upper boundary of the zone.

Upper Lygistepollenites balmei Zone, 2035.0 to 2366.0m:
The lower boundary of the zone is defined by the first occurrence of Verrucosisporites kopukuensis at 2366.0m. Occurrences of this species, Australopollis obscurus, Gambierina rudata, common to abundant Lygistepollenites balmei and frequent Gleicheniidites circinidites are continuous throughout the Upper L. balmei Zone section. As is frequently the case in Gippsland wells, a number of species which are known to appear first in the Lower L. balmei Zone are first recorded in this zone, e.g. Haloragacidites harrisii at 2188.3m and Polycolpites langstonii at 2194.18m. Phyllocladidites verrucosus occurs at 2333.1, 2270.0 and 2188.30m, Proteacidites amolosexinus at 2288.0m, and Tetracolporites verrucosus and Malvacipollis diversus at 2096.4m. The upper boundary is provisionally placed at 2035.0m, the highest sample containing Verrucosisporites kopukuensis and relatively frequent Lygistepollenites balmei. The sample immediately above, at 2002.4m, lacks L. balmei, but contains a single specimen of Australopollis obscurus,. a species not known to range above the Upper L. balmei Zone.

Lower Malvacipollis diversus Zone, 1925.1 to 1950.5m
Two samples are assigned to this zone, both with low confidence. The lowermost, at 1950.5m contains frequent to common Proteacidites grandis in a poor diversity, Proteacidites-dominated assemblage. The uppermost, at 1925.1m, is more typically Lower M. diversus Zone in character, being dominated by thick walled spores including Cyathidites splendens and Verrucosisporites kopukuensis.

Middle Malvacipollis diversus Zone, 1881.0 to 1889.0m.
The occurrence of Proteacidites tuberculiformis at 1889.0m demonstrates this sample is no older than Middle M. diversus Zone in age. This sample contains a number of other species which are rarely, or not previously, recorded below the Upper M. diversus Zone, e.g. Proteacidites latrobensis, P. tuberculotumulatus, P. recavus and Gemmatricolporites cf gestus. Nevertheless, in the absence of Myrtaceidites tenuis and Proteacidites pachypolus, an Upper M. diversus Zone age cannot be demonstrated. The spore-pollen assemblage in the second of the two samples assigned a Middle M. diversus Zone age is more typical of the Middle M. diversus Zone, being dominated by Haloragacidites harrisii with several to frequent occurrences of Proteacidites tuberculiformis, P. xestoformis, Malvacipollis diversus, Tricolporites adelaidensis and T. moultonii.

Upper Malvacipollis diversus Zone, 1873.0m:
One sample only is assigned to this zone, based on the occurrence of Myrtaceidites tenuis in an assemblage with frequent Malvacipollis diversus and abundant Haloragacidites harrisii.

Proteacidites asperopolus Zone, 1688.2 to 1804.0m:
As with previous zones, the P. asperopolus Zone comprises samples with good recovery separated by barren intervals. The lower boundary, at 1804.0m, is picked at the first occurrence of Proteacidites asperopolus. The simultaneous occurrence of this species with Myrtaceidites tenuis at 1715.2 demonstrates that this sample is P. asperopolus Zone in age. The upper boundary is provisionally picked at 1688.2m, a coal palynoflora dominated by both Nothofagidites and Proteacidites and containing species which typically first appear within the P. asperopolus Zone, e.g. Proteacidites rugulatus and Beaupreadites trigonalis. Proteacidites asperopolus occurs in a sample containing negligible amounts of spore-pollen at 1662.2m indicating it is either P. asperopolus or Lower N. asperus Zone in age.

Lower Nothofagidites asperus Zone, 1520.1 to 1648.1m:

The lower boundary of this zone is provisionally placed at 1648.1m on the basis of (i) frequent Nothofagidites relative to Proteacidites and (ii) Proteacidites reflexus, a very rare species believed to first appear in the Lower N. asperus Zone. A more confident 'pick' is at 1596.4m, a sample containing species which first appear in this zone, Tricolporites delicatus, T. leuros, Proteacidites recavus and Nothofagidites falcatus, in a Nothofagidites-dominated assemblage. The Lower N. asperus Zone dinoflagellate indicator species Areosphaeridium diktyoplokus occurs at 1571.5m. The upper boundary is porovisionally picked at 1520.5. The occurrence of Verrucatosporites attinatus in this sample shows it is no older than upper Lower N. asperus Zone in age. Middle N. asperus Zone indicators are absent ex except for a caved specimen of Vozzhenikovia extensa.

Middle Nothofagidites asperus Zone 1491.5 to 1507.0m:

The lower boundary is placed at 1507.0m, the first occurrence of the Middle N. asperus Zone pollen indicator species Triorites magnificus (associated with frequent Vozzhenikovia extensa) is at 1507.0m.

The same association occurs at 1505.0m and 1503.0m. Vozzhenikovia extensa occurs upsection to 1495.3m. The upper boundary is provisionally picked at 1491.5m, a sample containing Proteacidites rectomarginis, a species which first appears in the Middle N. asperus Zone, and Proteacidites recavus which typically is last recorded in this zone.

The occurrence of Triorites magnifus and Rugulatisporites trophus at 1485.3m demonstrates this sample is also Middle N. asperus Zone in age, a conclusion supported by the occurrence of Zone K (Eocene) foraminifera. Since this sample is a greensand separated from the Gurnard Formation by a glauconite-free carbonate, it is likely to be incorrectly labelled as to depth. (See also Rexilius, 1984).

Proteacidites tuberculatus Zone, 1475.4m:

The presence of Cyatheacidites annulatus at 1475.4m confirms a P. tuberculatus Zone age for this sample.

REFERENCES

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PALYNOLOGY DATA SHEET

BASIN: GIPPSLAND ELEVATION: KB: +21.0m GL: -49.0m

WELL NAME: WIRRAH-3 TOTAL DEPTH:

AGE	PALYNOLOGICAL ZONES	HIGHEST DATA Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	LOWEST DATA Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
NEOGENE	*T. pleistocenicus*										
	M. lipsis										
	C. bifurcatus										
	T. bellus										
PALEOGENE	*P. tuberculatus*	1475.4	0				1475.0	0			
	Upper *N. asperus*										
	Mid *N. asperus*	1491.5	2	1495.3	1		1507.0	0			
	Lower *N. asperus*	1520.1	2	1553.6	1		1648.1	2	1596.4	1	
	P. asperopolus	1688.2	2	1715.2	0		1804.0	1			
	Upper *M. diversus*	1873.0	1				1873.0	1			
	Mid *M. diversus*	1881.0	2				1889.0	2			
	Lower *M. diversus*	1925.1	2				1950.5	2			
	Upper *L. balmei*	2035.0	1				2366.0	1			
	Lower *L. balmei*	2397.6	1				2593.0	2	2558.5	1	
LATE CRETACEOUS	*T. longus*	2600.0	0				2875.0	1			
	T. lilliei	2994.4	2				3159.2	2	3132.8	1	
	N. senectus	3219.3	2				3225.0	3	3222.0	2	
	U. *T. pachyexinus*										
	L. *T. pachyexinus*										
	C. triplex										
	A. distocarinatus										
EARLY CRET.	*C. paradoxus*										
	C. striatus										
	F. asymmetricus										
	F. wonthaggiensis										
	C. australiensis										
PRE-CRETACEOUS											

COMMENTS: Upper T. longus Zone 2600.0 - 2775.0m; Lower T. longus Zone 2800 - 2875.0m. Please note that the T. longus Zone as recognized in pre-1983 wells corresponds approximately to the Upper T. longus Zone.

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

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

DATA RECORDED BY: M.K. Macphail DATE: 8 June 1984

DATA REVISED BY: DATE:

TABLE I : SUMMARY OF PALYNOLOGICAL ANALYSIS WIRRAH-3

INTERPRETATIVE DATA

SAMPLE NO.	DEPTH (m)	YIELD	DIVERSITY SPORE POLLEN	LITHOLOGY	ZONE	AGE	CONFIDENCE RATING	COMMENTS
SWC 125	1475.4	Good	V. low	Calcilut.	P.tuberculatus		0	C. annulata
SWC 123	1485.3	V. good	Low	Sh.,calc.	Indeterminate	-	-	Misplaced sample containing R.trophus & T.magnificus (Middle N.asperus Zone indicator species).
SWC 122	1491.5	V. good	Low	Slst.,calc., glau.	Indeterminate	-	-	Early Oligocene foram assemblage with reworked glauconite and Upper-Middle N. asperus palynoflora.
SWC 120	1495.3	V. good	Fair	S.st., glau.	Middle N.asperus	Late Eocene	1	V. extensa.
SWC 119	1497.4	Good	Fair	Sh., glau.	Middle N.asperus	Late Eocene	2	S.punctatus, P.reticulatus.
SWC 118	1499.3	Good	Fair	Slst., glau.	Middle N.asperus	Late Eocene	1	V.extensa frequent, M.verrucosus.
SWC 117	1501.0	Good	V. low	Slst., glau.	Middle N.asperus	Late Eocene	1	V.extensa.
SWC 116	1503.0	Good	High	Slst., glau.	Middle N.asperus	Late Eocene	0	T.magnificus, R.trophus, P.recavus, V.extensa.
SWC 115	1505.0	Good	Fair	Slst., glau.	Middle N.asperus	Late Eocene	0	T.magnificus, frequent V.extensa.
SWC 114	1507.0	Good	Fair	Slst., glau.	Middle N.asperus	Late Eocene	0	T.magnificus, P.pachypolus, P.rectomarginis, V.extensa
SWC 113	1509.9	Negligible		Slst., glau.	Indeterminate	-	-	
SWC 112	1510.9	Barren		Ss.	Indeterminate	-	-	
SWC 111	1512.9	Barren		Ss.	Indeterminate	-	-	
SWC 110	1515.0	V. low	V. low	Ss.	No younger than Middle N. asperus			B. elegansiformis.
SWC 109	1516.7	V. low	V. low	Ss.	Indeterminate	-	-	
SWC 108	1520.1	Fair	Fair	Ss.	Lower N.asperus	Middle Eocene	2	N.falcatus, V.attinatus.
SWC 107	1525.5	Good	Low	Slst., carb.	Lower N.asperus	Middle Eocene	2	N.falcatus.

TABLE I : SUMMARY OF PALYNOLOGICAL ANALYSIS WIRRAH-3

INTERPRETATIVE DATA

SAMPLE NO.	DEPTH (m)	YIELD	DIVERSITY SPORE POLLEN	LITHOLOGY	ZONE	AGE	CONFIDENCE RATING	COMMENTS
SWC 106	1531.5	V. low	V. low	Sh.	Lower N.asperus	Middle Eocene	2	N.falcatus.
SWC 105	1539.9	Barren		Ss.	Indeterminate	-	-	
SWC 104	1553.6	Low	Fair	Ss.	Lower N.asperus	Middle Eocene	1	T.leuros, P.vesicus, N.falcatus
SWC 103	1571.5	V. low	Low	Ss.	Lower N.asperus	Middle Eocene	1	T.leuros, N.falcatus, A.diktyoplokus
SWC 102	1596.4			Slst., carb.	Lower N.asperus	Middle Eocene	1	T.leuros, T.delicatus, N.falcatus, P.pachypolus, P.recavus
SWC 101	1614.6	Negligible		Ss.	Indeterminate	-	-	
SWC 100	1648.1	Low	Low	Slst.	Lower N.asperus	Middle Eocene	2	P.reflexus, frequent Nothofagidites
SWC 99	1662.2	Negligible		Ss.	No younger than Lower N.asperus			P.asperopolus
SWC 98	1688.2	Fair	Fair	Coal	P.asperopolus	Early Eocene	2	P.rugulatus, abundant Proteacidites
SWC 97	1715.2	Good	High	Sh.,carb.	P.asperopolus	Early Eocene	0	P.asperopolus, M.tenuis
SWC 96	1742.6	Barren		Slst.	Indeterminate	-	-	
SWC 95	1770.1	Negligible		Sh.	Indeterminate	-	-	
SWC 94	1787.0	Barren	-	Slst.	Indeterminate	-	-	
SWC 93	1804.0	Good	High	Sh.	P.asperopolus	Early Eocene	1	P.asperopolus, P.pachypolus
SWC 92								
SWC 91	1858.2	Barren		Slst.	Indeterminate	-	-	
SWC 90	1873.0	Fair	Low	Coal	Upper M.diversus	Early Eocene	1	M.diversus frequent, M.tenuis
SWC 89	1881.0	V. good	High	Sh., carb.	Middle M.diversus	Early Eocene	1	P.tuberculiformis, P.xestoformis, T.moultonii, T.adelaidensis
SWC 88	1889.0	Good	V. high	Sh.	Middle M.diverus	Early Eocene	1	P.tuberculiformis
SWC 87	1909.1	Negligible		Ss.	Indeterminate	-	-	
[redacted] SWC [redacted]	192[redacted]	Goo[redacted]	[redacted]w [redacted]	[redacted]	[redacted] M.d[redacted]sus [redacted]	Ea[redacted]Ece[redacted]	2[redacted]	[redacted]ore-[redacted]hate[redacted]ynof[redacted]
SWC 85	1950.5	Good	Low	Sh.	Lower M.diversus	Early Eocene	2	P.grandis common, T.adelaidensis

TABLE 1 : SUMMARY OF PALYNOLOGICAL ANALYSIS WIRRAH-3

INTERPRETATIVE DATA

SAMPLE NO.	DEPTH (m)	YIELD	DIVERSITY SPORE POLLEN	LITHOLOGY	ZONE	AGE	CONFIDENCE RATING	COMMENTS
SWC 84	1972.0	Barren		Sh.	Indeterminate	-	-	
SWC 83	2002.4	Low	V. Low	Sh.	Upper L. balmei	Paleocene	2	A.obscurus, abundant C.splendens
SWC 82	2035.0	Low	Fair	Slst.	Upper L. balmei	Paleocene	1	Frequent L.balmei & V.kopukeunsis
SWC 81	2070.1	Good	Fair	Slst.	Upper L. balmei	Paleocene	1	L. balmei & Gleichenildites common, V. kopukuensis
SWC 80	2096.4	Good	Fair	Sh., carb.	Upper L. balmei			
SWC 79	2128.0	Good	Fair	Slst.	Upper L. balmei	Paleocene	1	G rudata, V.kopukuensis
SWC 78	2152.1	V. Low	V. Low	Sh.	Upper L. balmei	Paleocene	1	L.balmei common, V.kopukuensis, A.homomorpha
Core 2	2188.3	Fair	High	Sh.	Upper L. balmei	Paleocene	1	G.rudata, V.kopukuensis, A.obscurus, N.endurus
Core 2	2194.18	V. good	High	Sh.	Upper L. balmei	Paleocene	-	as above
SWC 76	2255.5	Fair	Low	Slst.	Upper L. balmei	Paleocene	1	L.balmei & Gleichenildites frequent, V. kopukuensis
SWC 75	2270.0	Fair	Low	Slst.	L. balmei	Paleocene	-	L. balmei frequent
SWC 74	2288.0	V. good	Fair	Sh.	Upper L. balmei	Paleocene	2	Gleichenildites frequent
SWC 73	2309.2	Negligible	-	Slst.	Indeterminate	-	-	
SWC 72	2333.1	Low	V. low	Slst.	L. balmei	Paleocene	-	L.balmei common, P.verrucosus
SWC 71	2358.0	Barren		Ss.	Indeterminate	-	-	
SWC 70	2366.0	Good	Fair	Slst.	Upper L. balmei	Paleocene	1	L.balmei common, V.kopukuensis
SWC 69	2375.4	Barren	-	Ss.	Indeterminate	-	-	
SWC 68	2392.6	V. low	Low	Ss.	Indeterminate	-	-	
SWC 67	2397.6	Good	Fair	Slst.	Lower L. balmei	Paleocene	-	L.balmei common, T.verrucosus, H.elliotii

TABLE I : SUMMARY OF PALYNOLOGICAL ANALYSIS WIRRAH-3

INTERPRETATIVE DATA

SAMPLE NO.	DEPTH (m)	YIELD	DIVERSITY SPORE POLLEN	LITHOLOGY	ZONE	AGE	CONFIDENCE RATING	COMMENTS
SWC 66	2405.0	Barren		Volcanic	-		-	
SWC 64	2424.0	Low	Fair	Slst.	Lower L. balmei	Paleocene	1	L.balmei, T.verrucosus
SWC 62	2435.6	Barren		Slst.	Indeterminate	-	-	
Ctg	2460-65	Low	V. Low	-	Lower L. balmei	Paleocene	3	L.balmei, T.verrucosus
SWC 61	2449.9	Good	Low	Dol.	Indeterminate	-	-	M.diversus Zone palynoflora
SWC 58	2467.5	Low	Low	Sh.	Indeterminate	-	-	
SWC 57	2474.5	Barren		Ss.	Indeterminate	-	-	
Ctgs	2470-75	V. Low	V. Low		L. balmei	Paleocene	-	H.harrisii, A.obscurus
SWC 55	2484.7	Low	Low	Sh.	Lower L. balmei	Paleocene	2	L.balmei, abundant Proteacidites
SWC 54	2491.5	Barren	-	Ss.	Indeterminate	-	-	
SWC 53	2495.7	Barren	-	Ss.	Indeterminate	-	-	
SWC 52	2498.5	Good	Low	Sh.	Lower L. balmei	Paleocene	1	L.balmei, T.verrucosus
SWC 51	2502.1	Fair	Low	Slst.	Lower L. balmei	Paleocene	2	L.balmei, reworked Early Cretaceous spp.
Ctgs	2510-15	V. Low	V. Low		Lower L. balmei	Paleocene	3	H.harrisii, T.verrucosus
SWC 48	2512.6	Barren	-	Ss.	Indeterminate		-	
SWC 47	2517.0	Barren	-	Slst.	Indeterminate		-	
SWC 42	2539.2	V. Low	V. Low	Slst.	Lower L. balmei	Paleocene	1	L.balmei, T.verrucosus
SWC 39	2552.5	Fair	Fair	Slst.	Lower L. balmei	Paleocene	1	L.balmei, frequent T.verrucosus
SWC 38	2555.9	V. Low	Fair	Ss.	Lower L. balmei	Paleocene	2	Frequent T. verrucosus
SWC 37	2557.0	Barren	-	Ss.	Indeterminate	-	-	
SWC 36	2558.5	Fair	High	Sh.	Lower L. balmei	Paleocene	1	H.harrisii, L.balmei, T.verrucosus, N.endurus, T.gillii, G.rudata, T.confessus, A.obscurus
SWC 50	2580.2	Barren	-	Ss.	Indeterminate	-	-	

TABLE I : SUMMARY OF PALYNOLOGICAL ANALYSIS WIRRAH-3

INTERPRETATIVE DATA

SAMPLE NO.	DEPTH (m)	YIELD	DIVERSITY SPORE POLLEN	LITHOLOGY	ZONE	AGE	CONFIDENCE RATING	COMMENTS
SWC 29	2582.1	Low	Fair	Sh.	Lower L. balmei	Paleocene	2	T.verrucosus, P.adenanthoides
SWC 27	2593.0	Good	Fair	Sh.	Lower L. balmei	Paleocene	2	L.balmei, T.verucosus
SWC 26	2600.0	Fair	High	Sh.	Upper T. longus	Maastrichtian	0	S.punctatus, T.longus, T.lilliei, frequent G.rudata, P.otwayensis, P.palisadus
Core	2600.15	Fair	Low	Sh.	Upper T. longus	Maastrichtian	1	P.reticuloconcavus, T.lilliei, T. apoxyexinus
Core	2601.3	Fair	Low	Sh.	Upper T. longus	Maastrichtian	0	T.longus, S.punctatus
SWC 25	2604	Low	High	Sh.	Upper T. longus	Maastrichtian	0	as above plus G.rudata (common), T. waiparensis, P.reticuloconcavus, P.wahooensis
Core 7	2624.38	Good	High	Sh.	Upper T. longus	Maastrichtian	0	S.punctatus, T.verrucosus, T.longus, T.securus
SWC 24	2625.0	Fair	Fair	Sh.	Upper T. longus	Maastrichtian	0	T.longus, Q.brossus, S.punctatus, P.otwayensis
Core 7	2633.87	V. good	Low	Sh.	Upper T. longus	Maastrichtian	0	T.longus, S.punctatus, palynoflora dominated by G.rudata.
Core 5	2648.62	V. good	Fair	Sh.	Upper T. longus	Maastrichtian	0	T.longus; S.punctatus and G.rudata frequent
SWC 23	2650.0	Good		Slst.	Upper T. longus	Maastrichtian	1	T.longus, S.Punctatus
Core 7	2678.38	Barren		Sh.	Indeterminate	-	-	
Core 7	2681.09	Negligible		Sh.	Indeterminate	-	-	
SWC 19	2713	Low	Fair	Sh.	T. longus	Maastrichtian	-	T.longus, G.rudata, S.regium. T.sectilis
SWC 18	2719.9	V. Low	Low	Sh.	T. longus	Maastrichtian	-	T.longus, G.rudata, P.otwayensis

TABLE I : SUMMARY OF PALYNOLOGICAL ANALYSIS WIRRAH-3

INTERPRETATIVE DATA

SAMPLE NO.	DEPTH (m)	YIELD	DIVERSITY SPORE POLLEN	LITHOLOGY	ZONE	AGE	CONFIDENCE RATING	COMMENTS
SWC 17	2722.1	Negligible		Sh.	Indeterminate	-	-	
SWC 16	2737.0	Negligible		Ss.	Indeterminate	-	-	G.rudata
SWC 15	2742.5	Good	Fair	Coal	Upper T. longus	Maastrichtian	1	abundant G.rudata; T.verrucoous; S.punctatus, P.reticuloconcavus, O.sentosa
SWC 14	2744.6	Low	V. low	Slst.	T. longus	Maastrichtian	-	G.rudata frequent
SWC 10	2764.0	V. good	High	Sh.	Upper T. longus	Maastrichtian	0	G.rudata common, S.punctatus, P.cleinei, P.wahooensis, T.waiparensis
SWC 9	2775.0	Fair	Low	Sh.	Upper T. longus	Maastrichtian	0	G.rudata abundant, S.punctatus
SWC 8	2789.0	V. Low	V. Low	Slst.	No older than T. lilliei Zone		-	G. rudata
SWC 7	2800.0	Fair	Low	Slst.	Lower T. longus	Late Cretaceous	2	G.rudata common, T.lilliei
SWC 6	2823,6	Low	Fair	Sh.	No older than T.lilliei Zone			T.lilliei; abundant Nothofagidites
SWC 3	2875.0	Low	Low	Ss./Sh.	Lower T.longus	Late Cretaceous	1	T.longus, G.rudata
SWC 1	2934.0	V. Low	V. Low		No older than T.lilliei Zone		-	G.rudata
SWC 162	2961.0	Barren		Conglom.	Indeterminate		-	
SWC 161	2971.8	Negligible		Slst.	No older than T.lilliei Zone			N.flemingii, P.angulatus
SWC 160	2978.2	Negligible		Conglom.	Indeterminate			
SWC 159	2994.4	V. good	High	Slst.	T. lilliei	Late Cretaceous	2	N.flemingii, T.lilliei, T.waiparensis, T.sectilis
SWC 158	3002.0	Barren		Conglom.	Indeterminate		-	
SWC 156	3026.4	V. Low	V. Low	Slst.	No older than T.lilliei Zone		-	G.rudata, T.sabulosus
SWC 155	3039.0	V. Low	Low	Conglom.	Indeterminate		-	N.senectus, N.brachyspinulosus
SW[redacted]	30[redacted]	Ne[redacted]ible	[redacted]	Slst.[redacted]	No older [redacted] T.[redacted]ei Zone	[redacted]	[redacted]	G.ru[redacted]
SWC 151	3081.5	Barren		Conglom.	Indeterminate		-	

TABLE I : SUMMARY OF PALYNOLOGICAL ANALYSIS WIRRAH-3

INTERPRETATIVE DATA

SAMPLE NO.	DEPTH (m)	YIELD	DIVERSITY SPORE POLLEN	LITHOLOGY	ZONE	AGE	CONFIDENCE RATING	COMMENTS
SWC 150	3088.0	Low	Low	Slst.	T. lilliei	Late Cretaceous	1	G.rudata frequent, T.lilliei, T.sectilis
SWC 149	3088.6	Negligible		Slst.	Indeterminate			
SWC 147	3097.0	V. Low	V. Low	Slst.	T. lilliei	Late Cretaceous	2	G.rudata
SWC 145	3107.9	Fair	High	Slst.	T. lilliei	Late Cretaceous	1	G.rudata, T.lilliei, N.flemingii
SWC 143	3127.4	Barren		Slst.	Indeterminate		-	
SWC 142	3132.8	Fair	High	Slst.	T. lilliei	Late Cretaceous	1	T.lilliei, N.flemingii, freq. G.rudata
SWC 141	3141.0	Negligible		Conglom.	No older than N.senectus Zone		-	
SWC 140	3159.2	V. Low	Low	Slst.	No older than N.senectus Zone		-	
SWC 137	3219.3	Fair	Low	Slst.	N. senectus	Late Cretaceous	2	N.senectus
SWC 136	3222.0	Low	Fair	Ss.	N. senectus	Late Cretaceous	2	N.senectus, N.endurus. T.sabulosus
Ctgs	3225.30	Low	Low		N. senectus	Late Cretaceous	3	Nothofagidites spp., T.sabulosus
Ctgs	3230.35	Good	Low		Indeterminate	-	-	Caved Eocene taxa
SWC 134	3241.9	V. Low	Low	Slst.	Indeterminate	-	-	Long-ranging Cretaceous spores only
SWC 133	3242.5	Low	V. Low	?	N. senectus	Late Cretaceous	2	N.cf.endurus, T.cf.sabulosus

TABLE 2

ANOMALOUS AND UNUSUAL OCCURRENCES OF SPORE-POLLEN TAXA IN WIRRAH-3

SAMPLE NO.	DEPTH(m)	ZONE	TAXON	COMMENTS
SWC 127	1485.3	Middle N. asperus	Rugulatisporites trophus	Rare sp. (Gurnard Fm), with Triorites magnificus
SWC 119	1497.4	Upper-Middle N. asperus (2)	Stereisporites punctatus	Rare late appearance
SWC 118	1499.3	Middle N. asperus (1)	Myrtaceidites verrucosus	Rare sp.
SWC 116	1503.1	Middle N. asperus	M. eucalyptoides	Rare sp. in Eocene
SWC 116	"	"	Phyllocladidites paleogenicus	Rare sp.
SWC 114	1507.0	Middle N. asperus (0)	Proteacidites pachypolus	Last appearance. T. magnificus present
SWC 114	"	"	Dyphes colligerum	Rare dinoflagellate
SWC 114	"	"	Wetzeliella cf tabulatum	First record
SWC 108	1520.1	Lower N. asperus (2)	Phyllocladidites paleogenicus	Rare sp.
SWC 108	"	"	Podosporites erugatus	Rare sp. in Eocene
SWC 108	"	"	Haloragacidites verrucatoharrisii	Rare ms sp. (Machphail)
SWC 108	"	"	Verrucatosporites attinatus	Rare sp.
SWC 102	1596.4	Lower N. asperus (1)	Proteacidites callosus	Rare sp.
SWC 101	1614.6	Lower N. asperus (2)	Clavatipollenites glarius	Very rare sp.
SWC 100	1648.1	Lower N. asperus (2)	Proteacidites lapis	Not recorded above P. asperopolus Zone
SWC 100	"	"	P. reflexus	Rare sp.
SWC 97	1715.2	P. asperopolus (0)	Nothofagidites	Common in assemblage
SWC 97	"	"	Tricolpites phillipsii f. durus	Rare var.
SWC 97	"	"	"Tricolpites reticulatus"	Rare sp. (Stover & Evans)
SWC 90	1873.0	Upper M. diversus (1)	Proteacidites recavus	Very rarely recorded below P. asperopolus Zone
SWC 89	1881.0	Middle M. diversus (1)	Foveotriletes balteus	Rare occurrence below Upper M. diversus Zone
SWC 88	1889.0	Middle M. diversus (2)	Proteacidites tuberculotumulatus	Very rare species, not usually found below Upper M. diversus Zone
SWC 88	"	"	Gemmatricolporites cf gestus	G. gestus ranges no lower than Lower N. asperus Zone

TABLE 2

ANOMALOUS AND UNUSUAL OCCURRENCES OF SPORE-POLLEN TAXA IN WIRRAH-3

SAMPLE NO.	DEPTH(m)	ZONE	TAXON	COMMENTS
SWC 88	1889.0	Middle M. diversus (2)	Proteacidites latrobensis	Not recorded below Upper M. diversus
SWC 88	"	"	P. rugulatus	Not recorded below P. asperopolus Zone
SWC 88	"	"	Tricolporites circumlumenus	Rare ms sp. (Macphail)
SWC 88	"	"	Tricolpites phillipsii f. durus	Rare var.
SWC 88	"	"	Proteacidites sp. nov.	Echinate, resembles P. parvus but much larger
SWC 83	2002.4	(Lower M. diversus)	Australopollis obscurus	Reworked (?) in sample dated as Lower M. diversus Zone on geological data
SWC 82	2035.0	Upper L. balmei (1)	Cupanieidites orthoteichus	Not previously recorded below M. diversus Zone
SWC 82	"	"	Tricolporites adelaidensis	Not previously recorded below Middle M. diversus Zone
SWC 80	2096.4	Upper L. balmei (1)	Tricolporites adelaidensis	As for SWC 82
SWC 80	"	"	Tetracolporites verrucosus	Rare occurrence with V. kopukuensis
SWC 79	2128.0	Upper L. balmei (1)	Tricolporites marginatus	Uncommon sp.
Core 2	2188.30	Upper L. balmei (1)	Phyllocladidides verrucosus	Rare above Lower L. balmei Zone
Core 2	"	"	Polycolpites langstonii	Var. with minute apiculae
Core 2	2194.18	Upper L. balmei (1)	Foveotriletes balteus	As for SWC 89
SWC 74	2288.0	Upper L. balmei (2)	Proteacidites amolosexinus	Late Cretaceous sp.
SWC 68	2392.6	Upper L. balmei (2)	Phyllocladidites reticulosaccatus	Rare sp.
SWC 64	2424.0	Lower L. balmei (1)	Proteacidites palisadus	Late Cretaceous sp.
SWC 64	"	"	Verrucosisporites cf kopukuensis	Ancestral form of V. kopukuensis?
SWC 59	2467.5	Lower L. balmei (2)	Tricolpites marginatus	As for SWC 79
SWC 59	"	"	Proteacidites grandis	Caved specimen?
SWC 39	2552.5	Lower L. balmei (1)	P. grandis	Caved specimen?
SWC 36	2558.5	Lower L. balmei (1)	Gleicheniidites spp.	Not usually abundant in this zone
SWC 36	"	"	Schizaea digitatoides	Uncommon sp.
SWC 36	"	"	Verrucosisporites cf kopukuensis	As for SWC 64
SWC 29	2582.1	Lower L. balmei (1)	Schizocolpus marlinensis	Not previously recorded below Lower M. diversus. Important record.

TABLE 2

ANOMALOUS AND UNUSUAL OCCURRENCES OF SPORE-POLLEN TAXA IN WIRRAH-3

SAMPLE NO.	DEPTH(m)	ZONE	TAXON	COMMENTS
Core	2600.15	Upper T. longus (1)	Tricolporites apoxyexinus	?Rare sp.
Core 7	2624.38	Upper T. longus (0)	Proteacidites protograndis	Ms sp. (Macphail)
SWC 19	2713.0	Upper T. longus (2)	Proteacidites protograndis	Ms sp. (Macphail)
SWC 15	2742.5	Upper T. longus (0)	Ornamentifera sentosa	V. rare sp.
SWC 6	2823.6	Lower T. longus (2)	Abundant Nothofagidites	58%, (Gambierina 27%)
SWC 3	2875.0	Lower T. longus (1)	Tricolpites vergillus	Rare ms sp. (Partridge)
SWC 159	2994.4	T. lilliei (1)	Aglaoreidia sp. nov.	Genus not previously recorded below Middle N. asperus Zone
SWC 159	"	"	Nothofagidites flemingii	Rare occurrence close to first appearance of sp.
SWC 159	"	"	Gephryapollenites wahooensis	Rare sp.
SWC 159	"	"	Tricolpites confragosus	New ms sp. with Proteacidites conflagrous-style ornamentation
SWC 150	3088.0	T. lilliei (1)	Foveotriletes balteus	V. rare in Late Cretaceous
SWC 142	3132.8	T. lilliei (1)	Nothofagidites flemingii	As for SWC 159
SWC 140	3159.2	N. senectus (?)	Basopollis otwayensis	
SWC 136	3222.0	N. senectus (1)	Basopollis mutabilis	

APPENDIX 3

APPENDIX 3

APPENDIX 3

WIRRAH-3
QUANTITATIVE LOG ANALYSIS

Interval: 1500-3250m KB
Analyst : W.J. Mudge
Date : April, 1984

WIRRAH-3 QUANTITATIVE LOG ANALYSIS

Wirrah-3 wireline logs have been analysed for effective porosity and water saturation over the interval 1500-3250m 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, Caliper, RHOB (LDTC and LDTA), NPHI (CNTH and CNTA).

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.

The LDTA-CNTA combination was used in preference to the LDTC-CNTH over the interval 2630-2768m KB. This is due to to the better match of log derived porosities from the LDTA-CNTA with data obtained from core analysis. For the remainder of the well the LDTC-CNTH is the only density-neutron combination available.

Analysis Parameters

Apparent shale density and shale neutron porosities were derived from crossplots while shale resistivities were read directly from the logs. A summary of analysis parameters is included in Table 1.

Shale Volume

An initial estimate of VSH was calculated from the density neutron separation:

$$VSH = \frac{NPHI - \frac{2.65 - RHOB}{1.65}}{NPHISH - \frac{2.65 - RHOBSH}{1.65}} \qquad - 1$$

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

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

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

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)

Free Water Salinities

Apparent free water salinities were calculated using the following relationships:

$$Rw = \frac{Rt * PHIT^{m}}{a} \qquad -6$$

$$Salinity\ (ppm) = \frac{300{,}000}{Rw\ (Ti + 7) - 1}^{1.05} \qquad -7$$

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

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

Rwb and Swb were calculated using the following relationships:

$$Rwb = \frac{RSH * PHISH^{m}}{a} \qquad -8$$

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

$$Swb = \frac{VSH * PHISH}{PHIT} \qquad -9$$

Water Saturations

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

$$\frac{1}{Rt} = SwT^{n} * \frac{PHIT^{m}}{aRw} + SwT^{(n-1)} \frac{Swb * PHIT^{m}}{a} \frac{1}{Rwb} - \frac{1}{Rw} \qquad -10$$

and

$$\frac{1}{Rxo} = SxoT^{n} * \frac{PHIT^{m}}{aRw} + SxoT^{(n-1)} \frac{Swb * PHIT^{m}}{a} \frac{1}{Rwb} - \frac{1}{Rmf} \qquad -11$$

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:

$$RHOBHC = RHOB + 1.07\ PHIT\ (1-SxoT)\ [(1.11-0.15P)\ RHOF - 1.15\ RHOH] \qquad -12$$

$$NPHIHC = NPHI + 1.3\ PHIT\ (1-SxoT) \frac{RHOF\ (1-P) - 1.5\ RHOH + 0.2}{RHOF\ (1-P)} \qquad -13$$

where RHOBHC = hydrocarbon corrected RHOB
NPHIHC = hydrocarbon corrected NPHI
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:

$$RHOBC = \frac{RHOBHC - VSH * RHOBSH}{1 - VSH} \qquad -14$$

$$NPHIC = \frac{PHINHC - VSH * NPHISH}{1 - VSH} \qquad -15$$

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

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:

$$PHIE = PHIT - VSH * PHISH \qquad -16$$

$$Swe = 1 - \frac{PHIT}{PHIE} (1-SwT) \qquad -17$$

If the calculated grain density fell outside the limits, VSH was adjusted in appropriate increments or decrements, and PHIT, SwT, SxoT and RHOG 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 2.

COMMENTS

1. Below the limit of fresh water flushing (approximately 2040m KB) water bearing sands have an apparent salinity of 30,000 ppm NaCl equivalent. This salinity was used in all hydrocarbon zones within the interval 1500-2440m KB.

   Water bearing sands over the interval 2520-2538m KB yield apparent water salinities of 17,000 ppm NaCl equivalent. This salinity was used over the interval 2440-3250m KB.

   Formation water recovered from production test #1 (2994-2883m KB) suggests water salinities at this depth are in the order of 4,000 ppm NaCl equivalent. An RFT sample taken at 2936.8m KB recovered 39.1 cu.ft. gas, .65 litre oil and 34.6 litres of filtrate/water. If a salinity of 4000 ppm NaCl equivalent is used in the log analysis over this interval, the entire interval will calculate out to be water wet. We believe an apparent salinity of 17,000 ppm NaCl equivalent is therefore more realistic.

2. A GOC is present at 1531m KB. An OWC is interpreted at 1533.50m KB, within a dolomitized sand. This corresponds to the OWC in Wirrah-1. Wirrah-2 had an OWC at 1535m KB, however no evidence supporting a contact at this depth can be found in Wirrah-3.

3. A sand over the interval 2021.75-2031.75m KB has oil as low as 2025.50m KB. An OWC can be defined in a sand over the interval 2139.75-2149.75m KB at 2143.75m. A sand over the interval 2347.75-2351.50m contains oil however no contact can be defined.

4. Core descriptions indicate a GOC could exist at 2622.50m KB. The log analysis has however assumed the entire sand over the interval 2610.75-2623.00m KB to be gas bearing.

5. Formation testing proved hydrocarbons as high as 2622.00m KB and as low as 2936.8m KB. We believe this proves the interval 2610.75m KB to 2936.8m KB to be hydrocarbon bearing, however producibility of these hydrocarbons varies with permiability. Hydrocarbons are also present in the interval 2583.00m KB to 2598.00m KB.

6. Log analysis indicates that apparent oil water contacts are present at 3834.5m KB and 2845.00m KB however these may not be true oil water contacts but rather an effect of conductive minerals such as pyrite.

7. The interval 2850-3250m KB consists predominantly of conglomerate. Cores cut in Wirrah-1 and Wirrah-3 and testing in Wirrah-3 prove the conglomerate does contain hydrocarbons however due to lack of permeability, these hydrocarbons cannot be produced. Sidewall cores recovered over this interval exhibit good shows and water saturations calculated over this interval are probably in the right order however the hydrocarbons present are not producible.

8. A detailed comparison was made between log derived porosities and core porosities and permeabilities over the interval 2590-2715m KB.

   Compared were:
   1. Effective porosity derived from the LDTC-CNTH
   2. Effective porosity derived from the LDTA-CNTA
   3. Core porosities and permeabilities

   Plots of the comparison are included in Enclosure 2.

   The results indicate porosities derived from the LDTC-CNTH are pessimistic with respect to core analysis and if used will lead to gross under estimation of net sand. The porosities derived from the LDTA-CNTA however show reasonable agreement with core porosities.

   A net cut off relationship of 10% porosity and 10 md permeability was derived from core data. If the 10% cut off is used with the LDTA-CNTA porosity net estimates agree very closely to net estimates from permeability data. The LDTC-CNTH porosity however shows poor agreement.

   In the unflushed water bearing sands (2040-2450m) an apparent water salinity of 30,000 ppm NaCl equivalent is derived using the LDTC-CNTH porosity. The Apparent water salinity in Wirrah-1 and Wirrah-2 for the equivalent interval was 22,000 ppm NaCl equivalent. This further suggests the porosity derived from the LDTC-CNTH is too low.

   A relationship was derived between PHIE (LDTA-CNTA) and PHIE (LDTC-CNTH) in an attempt to normalise the LDTC-CNTH porosity. Normalisation involved adding 1.5 pu. to the LDTC-CNTH porosity. This was done over the entire well except where LDTA-CNTA porosities were available. LDTA-CNTA derived porosities were only available over the interval 2420-2769m KB.

9. Enclosure 3 contains comparisons of log derived porosities and core analysis porosities and permeabilities over the intervals 2126-2210m KB, 2800-2815m KB and 3140-3150m KB.

<u>List of Tables and Enclosures</u>

Note: All core analysis porosities are at overburden conditions.

TABLE 1 WIRRAH-3

Depth (m)	RHOBSH	NPHISH	RSH
1500 - 1875	2.55	.29	25
1875 - 2002	2.55	.29	15
2002 - 2112	2.55	.29	10
2112 - 2135	2.55	.29	15
2135 - 2450	2.58	.29	15
2450 - 2582	2.60	.27	20
2582 - 2875	2.60	.27	30
2875 - 3250	2.63	.25	30

a	1
m	2
n	2
Rmf at 108° C	0.62 ohm.m
Grain Density - lower limit	2.65 gm/cc
Grain density - upper limit	2.69 gm/cc
Mud filtrate density (RHOF)	1.00 gm/cc
Bottom Hole Temperature	108° C
Hydrocarbon density	0.25 gm/cc gas
	0.75 gm/cc oil

Apparent Free Water Salinities

Depth (m)	Salinity [ppm (NaCl equiv.)]
1500.0 - 1533.0	30,000
1533.0 - 1562.0	2,600
1562.0 - 1640.0	3,000
1640.0 - 1656.0	1,800
1656.0 - 1680.0	2,600
1680.0 - 1738.0	2,100
1738.0 - 1777.0	1,800
1777.0 - 1820.0	1,100
1820.0 - 1854.0	900
1854.0 - 1870.0	1,100
1870.0 - 1934.0	1,000
1934.0 - 1948.0	9,000
1948.0 - 2020.0	15,000
2020.0 - 2026.5	30,000
2026.5 - 2040.0	15,000
2040.0 - 2440.0	30,000
2440.0 - 3250.0	17,000

TABLE 2 (a) WIRRAH-3

Hydrocarbon Bearing Sands

Depth Interval (m KB)	Gross Thickness (m)	Net Thickness (m)	Porosity Average	Swe Average	Fluid Content
1510.75 - 1531.00*	20.25	17.50	.285±.048	.223±.066	Gas
1531.00 - 1533.50*	2.50	1.50	.242±.014	.132±.039	Oil
2021.75 - 2025.50*	3.75	1.50	.131±.010	.595±.178	Oil
2139.75 - 2143.75*	4.00	3.50	.177±.030	.686±.203	Oil
2347.75 - 2351.50*	3.75	2.25	.138±.027	.488±.146	Oil
2584.50 - 2590.25	5.75	1.00	.114±.010	.408±.122	Oil
2610.75 - 2623.00	12.25	8.25	.142±.030	.234±.071	Gas
2627.00 - 2632.00	5.00	2.25	.119±.020	.455±.140	Oil
2635.00 - 2647.00	12.00	1.00	.116±.011	.372±.110	Oil
2654.00 - 2655.75	1.75	0.25	.101±.001	.780±.230	Oil
2658.00 - 2658.50	0.50	-	-	-	Oil
2661.00 - 2662.50	1.50	0.50	.113±.010	.644±.190	Oil
2664.25 - 2674.00	9.75	3.75	.136±.020	.336±.100	Oil
2676.25 - 2678.50	2.25	0.50	.132±.005	.449±.130	Oil
2683.75 - 2694.75	11.00	6.50	.127±.017	.282±.080	Oil
2698.25 - 2711.00	12.75	5.75	.145±.030	.318±.100	Oil
2726.00 - 2738.50	12.50	9.75	.128±.017	.364±.110	Oil
2745.00 - 2749.00	4.00	2.25	.168±.024	.206±.060	Gas
2753.00 - 2763.00	10.00	4.75	.117±.010	.359±.110	Oil
2765.50 - 2768.25	2.75	1.75	.112±.007	.486±.150	Oil
2777.50 - 2787.00*	9.50	6.25	.145±.027	.391±.121	Oil
2790.50 - 2793.00*	2.50	1.50	.130±.021	.484±.150	Oil
2804.00 - 2808.25*	4.25	3.25	.133±.021	.379±.110	Oil
2814.00 - 2820.50*	6.50	4.00	.125±.017	.431±.130	Oil
2828.00 - 2834.75*	6.75	1.75	.118±.017	.353±.110	Oil
2838.50 - 2845.50*	7.00	-	-	-	Oil
2849.50 - 2872.50*	23.00	10.75	.119±.017	.445±.130	Oil
2876.50 - 2954.00*	77.75	11.75	.129±.022	.511±.150	Oil
2957.00 - 2971.50*	14.50	3.00	.115±.012	.506±.150	Oil
2972.50 - 2993.75*	21.25	4.00	.156±.029	.400±.120	Oil
2995.00 - 3025.75*	30.75	1.75	.125±.009	.495±.148	Oil
3028.25 - 3051.00*	22.75	-	-	-	Oil
3052.50 - 3086.75*	34.25	-	-	-	Oil
3109.50 - 3115.00*	5.50	-	-	-	Oil
3117.25 - 3125.25*	8.00	-	-	-	Oil
3128.50 - 3131.50*	3.00	-	-	-	Oil
3133.50 - 3223.00*	89.50	-	-	-	Oil

* Refers LDT-CNTH derived porosities.

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TABLE 2 (b) WIRRAH-3

Water Bearing Sands

Depth Interval (m KB)	Gross Thickness (m)	Net Thickness (m)	Porosity Average	Swe Average
1533.50 - 1541.25	7.75	7.50	.256	.972
1542.75 - 1573.00	30.25	29.75	.232	.975
1574.25 - 1588.75	14.50	14.25	.250	.977
1590.00 - 1592.50	2.50	2.25	.201	1.00
1600.25 - 1601.50	1.25	1.25	.238	0.892
1615.25 - 1630.00	14.75	13.25	.235	0.966
1630.75 - 1639.25	8.50	8.25	.247	0.984
1643.25 - 1647.75	4.50	4.50	.215	0.919
1650.50 - 1653.50	3.00	3.00	.278	0.983
1658.25 - 1675.75	17.50	15.25	.244	0.942
1706.25 - 1708.50	2.25	2.25	.244	0.989
1711.50 - 1712.75	1.25	1.00	.244	1.000
1718.00 - 1721.25	3.25	3.25	.251	1.000
1724.75 - 1737.00	12.25	12.25	.253	0.999
1745.25 - 1753.25	8.00	8.00	.245	0.978
1778.00 - 1782.00	4.00	4.00	.261	1.000
1783.50 - 1786.25	2.75	2.50	.246	0.956
1789.25 - 1812.25	23.00	17.00	.235	1.000
1829.75 - 1834.75	5.00	5.00	.257	0.923
1838.25 - 1841.25	3.00	3.00	.259	0.963
1843.50 - 1852.75	9.25	3.25	.250	0.924
1859.50 - 1868.75	9.25	9.25	.252	1.000
1897.00 - 1900.00	3.00	3.00	.228	0.994
1901.25 - 1915.50	14.25	13.50	.222	1.000
1942.75 - 1946.75	4.00	4.00	.222	1.000
1959.50 - 1965.50	6.00	4.00	.194	1.000
1974.75 - 1983.00	8.25	7.75	.228	1.000
1997.25 - 1999.75	2.50	2.00	.176	1.000
2026.25 - 2031.75	5.50	5.25	.160	1.000
2048.50 - 2060.50	12.00	11.25	.188	0.974
2062.00 - 2065.75	3.75	3.50	.175	0.999
2068.50 - 2069.50	1.00	1.00	.254	1.000
2075.25 - 2081.75	6.50	6.50	.207	0.992
2090.25 - 2095.00	4.75	4.25	.195	0.996
2097.25 - 2103.00	5.75	4.75	.152	0.946
2104.50 - 2110.50	6.00	6.00	.222	0.993
2112.75 - 2126.00	13.25	11.75	.156	0.983
2129.75 - 2133.00	3.25	2.25	.210	0.970
2143.75 - 2149.75	6.00	5.50	.190	0.970

Depth Interval (m KB)	Gross Thickness (m)	Net Thickness (m)	Porosity Average	Swe Average
2153.00 - 2157.75	4.75	3.00	.152	0.973
2166.50 - 2169.50	3.00	1.50	.132	0.903
2175.00 - 2178.25	3.25	2.50	.152	0.918
2185.00 - 2200.75	15.75	14.75	.185	0.898
2203.00 - 2204.50	1.50	1.50	.151	0.909
2220.75 - 2225.50	4.75	3.75	.151	0.907
2227.50 - 2232.50	5.00	4.75	.173	0.945
2240.75 - 2245.75	5.00	4.75	.174	0.984
2271.25 - 2285.25	14.00	8.50	.119	0.962
2290.25 - 2330.75	40.50	31.75	.165	0.982
2334.75 - 2343.75	9.00	9.00	.199	1.000
2391.25 - 2396.50	5.25	5.00	.177	0.894
2478.25 - 2480.50	2.25	2.00	.164	1.000
2509.00 - 2511.25	2.25	1.50	.148	1.000
2520.50 - 2538.25	17.75	13.25	.155	0.950

APPENDIX 4

APPENDIX 4

APPENDIX 4

WIRELINE TEST REPORT

The Wireline Test Report had not been finalised by the time the present Well Completion Report was compiled. The raw data sheets are included herewith and the final Wireline Report will be distributed on its completion.

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RFT SAMPLE TEST REPORT

WELL: Wirrah-3
OBSERVER: Fittall/Palmer

DATE: December 12, 1983 (6623f/3)
RUN: RFT-2

		CHAMBER 1 (22.7 litres)		CHAMBER 2 (3.8 litres)	
SEAT NO.	2/25	2/26		2/26	
DEPTH	2348.7m	2349.2m		2349.2m	
A. RECORDING TIMES					
Tool Set	1221:30	1228:30			
Pretest Open	1224:25	1232:15			
Time Open		5:00			
Chamber Open		1237:15	51:45	1257:30	
Chamber Full		1237:45			
Fill Time		0:30			
Start Build-up		1237:45			
Finish Build-up		1242:45			
Build-Up Time		5:00			
Seal Chamber		1242:45	56:50	1307:00	
Tool Retract	1227:25			1309:50	hrs
Total Time					hr
B. SAMPLE PRESSURES					
IHP	3922.7	3921.1	psia	-	
ISIP		3599.9	psia	-	
Initial Flowing Press.	200	3480.1	psia	3575	psia
Final Flowing Press.		3570	psia	3998	psia
Sampling Press. Range			psia	23	psia
FSIP		3599.9	psia		psia
FHP	3924.8		psia		
Form. Press. (Horner)		-	psia	-	
C. TEMPERATURE					
Depth Tool Reached	2378.3		m		m
Max. Rec. Temp.	200.5		°F		°C
Time Circ. Stopped	0915 hrs 11-12		hrs		hrs
Time since Circ.			hrs		hrs
Form. Temp. (Horner)		-		-	
D. SAMPLE RECOVERY		PLUGGED		PLUGGED	
Surface Pressure					
Amt Gas					
Amt Oil					
Amt Water					
Amt Others					

E. SAMPLE PROPERTIES

Gas Composition
- C1
- C2
- C3
- 1C4/nC4
- C5
- C6+
- CO_2/H_2S

Oil Properties
- Colour
- Fluorescence
- GOR

Water Properties
- Resistivity
- NaCl Equivalent
- Cl-titrated
- NO_3
- Est. Water Type pH

Mud Properties

Resistivity	0.246 @ 19.9°C
NaCl Equivalent	-
Cl - titrated/No. 3	19,000 /250 ppm

Calibration

Calibration Press.	-
Calibration Temp.	-
Hewlett Packard No.	
Mud Weight	9.7
Calc. Hydrostatic	- -
RFT Chokesize	1 x 0.02 in

Remarks: Schlumberger strain Gauge used
TIGHT/SUPERCHARGED SUPERCHARGED

RFT SAMPLE TEST REPORT

WELL: Wirrah-3
OBSERVER: Fittall/Palmer DATE: December 12, 1983 (6623f/4) RUN: RFT-2

	CHAMBER 1 ( )		CHAMBER 2 ( )
SEAT NO.	3/27		
DEPTH	2349.1 m		
A. RECORDING TIMES			
Tool Set	1710:25		
Pretest Open	1711:25		
Time Open			
Chamber Open	13:05	30:15	
Chamber Full			
Fill Time			
Start Build-up			
Finish Build-up			
Build-Up Time			
Seal Chamber	28:45	31:00	
Tool Retract		32:05	
Total Time	-	21:40 mins	hr
B. SAMPLE PRESSURES			
IHP	3929.1		
ISIP	3601.8	psia	
Initial Flowing Press.	95.0	psia	
Final Flowing Press.	179.9	psia	
Sampling Press. Range			
FSIP	3315.4	psia	
FHP	3925.6		
Form. Press. (Horner)			
C. TEMPERATURE			
Depth Tool Reached			
Max. Rec. Temp.			
Time Circ. Stopped			
Time since Circ.			
Form. Temp. (Horner)			
D. SAMPLE RECOVERY			
Surface Pressure			
Amt Gas			
Amt Oil			
Amt Water			
Amt Others			
E. SAMPLE PROPERTIES			
Gas Composition			
C1			
C2			
C3			
1C4/nC4			
C5			
C6+			
CO_2/H_2S			
Oil Properties			
Colour			
Fluorescence			
GOR			
Water Properties			
Resistivity			
NaCl Equivalent			
Cl-titrated			
NO_3			
Est. Water Type pH			
Mud Properties			
Resistivity	0.246 @°C	19.9°C	
NaCl Equivalent			
Cl - titrated	19,000 / 250	ppm	
Calibration			
Calibration Press.			
Calibration Temp.			
Hewlett Packard No.			
Mud Weight			
Calc. Hydrostatic			
RFT Chokesize	1 x .02 inch		
Remarks:	VERY TIGHT		

RFT SAMPLE TEST REPORT

WELL: Wirrah-3 (6623f/5)
OBSERVER: Fittall/Palmer DATE: December 12, 1983 RUN: 3

	CHAMBER 1 (22.7 litres)		CHAMBER 2 (0.4 litres)	
SEAT NO.	3/28		3/30	
DEPTH	2349.2		2349.0	
A. RECORDING TIMES				
Tool Set	1734:10		18:00:00	
Pretest Open	1734:80		18:00:00	
Time Open				
Chamber Open	1735:55			
Chamber Full				
Fill Time				
Start Build-up				
Finish Build-up				
Build-Up Time				
Seal Chamber	1750:35			
Tool Retract	1755:00		18:02:20	
Total Time				
B. SAMPLE PRESSURES				
IHP	3925.6	psia	3921.1	psia
ISIP	3338.6	psia		
Initial Flowing Press.	136.8	psia		
Final Flowing Press.	778	psia	973.6	psia
Sampling Press. Range				
FSIP	2457.0	psia		
FHP	3922.2	psia	3923.4	psia
Form. Press. (Horner)	-		-	
C. TEMPERATURE				
Depth Tool Reached				
Max. Rec. Temp.				
Time Circ. Stopped				
Time since Circ.				
Form. Temp. (Horner)	-		-	
D. SAMPLE RECOVERY				
Surface Pressure	380	psig		
Amt Gas	18.60	cu. ft.		
Amt Oil	3.75	litre		
Amt Water	11.0	litre		
Amt Others	-			
E. SAMPLE PROPERTIES				
Gas Composition				
C1	701,759	ppm		
C2	89,407	ppm		
C3	25,746	ppm		
1C4/nC4	5,054	ppm		
C5	2,025	ppm		
C6+	841	ppm		
CO_2/H_2S	1.4% / 0	ppm		
Oil Properties	37.5 API @	°C		
Colour	Dark Brown (waxy)			
Fluorescence	Cream Yellow			
GOR				
Water Properties	Pour Point 26.0°C			
Resistivity	0.208 @ 71°F			
NaCl Equivalent	31,500	ppm		
Cl-titrated	17,500	ppm		
NO_3	88	ppm		
Est. Water Type pH	pH = 8.1			
Mud Properties				
Resistivity				
NaCl Equivalent				
Cl - titrated	19,000	ppm		
Calibration	NO_2 250, pH = 10.0			
Calibration Press.				
Calibration Temp.				
Hewlett Packard No.				
Mud Weight				
Calc. Hydrostatic				
RFT Chokesize	0.03 inch			
Remarks:	Tight - 6 gallon partially filled		Tight	

RFT SAMPLE TEST REPORT

WELL: Wirrah-3 (6623f/6)
OBSERVER: Fittall/Palmer DATE: December 12, 1983 RUN: 3

	CHAMBER 1 (22.1 litres)		CHAMBER 2 (10.4 litres)	
SEAT NO.	3/31		3/32	
DEPTH	2349.2		2142.0	
A. RECORDING TIMES				
Tool Set	18:04:00			
Pretest Open	18:04:15		18:29:30	
Time Open				
Chamber Open	18:06:10		18:34:10	
Chamber Full			18:41:05	
Fill Time				
Start Build-up			18:41:05	
Finish Build-up			18:45:15	
Build-Up Time				
Seal Chamber	1817:36		18:45:15	
Tool Retract	18:20		18:46:10	
Total Time	18.20 mins		1	hr
B. SAMPLE PRESSURES				
IHP	3922.2	psia	3562.4	psia
ISIP	2548.3	psia	3029.9	psia
Initial Flowing Press.	270.3	psia	2208.3	psia
Final Flowing Press.	691.4	psia	1678.5	psia
Sampling Press. Range			2208.3-1678.5	psia
FSIP	2264.4	psia	3036.6	psia
FHP			3576.6	psia
Form. Press. (Horner)	-		-	
C. TEMPERATURE				
Depth Tool Reached			2349.2	m
Max. Rec. Temp.				
Time Circ. Stopped				
Time since Circ.				
Form. Temp. (Horner)	-		-	
D. SAMPLE RECOVERY				
Surface Pressure			400	psig
Amt Gas			1.54	cu. ft.
Amt Oil			0.20	litre
Amt Water			9.00	litre
Amt Others	-			
E. SAMPLE PROPERTIES				
Gas Composition				
C1			426,423	ppm
C2			62,529	ppm
C3			16,580	ppm
1C4/nC4			3,375	ppm
C5			1,403	ppm
C6+			655	ppm
CO_2/H_2S			1.6%/0	ppm
Oil Properties			36.4 °API @ °C	
Colour			Medium brown (waxy)	
Fluorescence			Bright cream yellow	
GOR				
Water Properties				
Resistivity			0.218 @ 71°F	
NaCl Equivalent			30,000	ppm
Cl-titrated		ppm	20,000	ppm
NO_3			100	ppm
Est. Water Type pH			pH = 7.5	
Mud Properties				
Resistivity	-			
NaCl Equivalent	-			
Cl - titrated			19,000	ppm
Calibration			NO_3 250 pH = 10.0	
Calibration Press.	-			
Calibration Temp.	-			
Hewlett Packard No.				
Mud Weight				
Calc. Hydrostatic				
RFT Chokesize	0.02 inches			
Remarks:	Tight		Sampled	

RFT SAMPLE TEST REPORT

WELL: Wirrah-3 (6623f/7)

OBSERVER: Fittall/Palmer DATE: December 12, 1983 RUN: 4

	CHAMBER 1 (22.7 litre)		CHAMBER 2 ( )
SEAT NO.	4/33		
DEPTH	2022.0		
A. RECORDING TIMES			
Tool Set	22:54:10		
Pretest Open	22:55:55		
Time Open			
Chamber Open	22:59:15		
Chamber Full	23:12:59		
Fill Time			
Start Build-up			
Finish Build-up			
Build-Up Time			
Seal Chamber			
Tool Retract	23:13:07		
Total Time			
B. SAMPLE PRESSURES			
IHP	3380	psia	
ISIP	2876.1		
Initial Flowing Press.	88.3	psia	
Final Flowing Press.			
Sampling Press. Range			
FSIP			
FHP	3380.0		
Form. Press. (Horner)			
C. TEMPERATURE			
Depth Tool Reached			
Max. Rec. Temp.			
Time Circ. Stopped			
Time since Circ.			
Form. Temp. (Horner)	-		-
D. SAMPLE RECOVERY	See 4/35		
Surface Pressure			
Amt Gas			
Amt Oil			
Amt Water			
Amt Others			
E. SAMPLE PROPERTIES			
Gas Composition			
C1			
C2			
C3			
1C4/nC4			
C5			
C6+			
CO_2/H_2S			
Oil Properties			
Colour			
Fluorescence			
GOR			
Water Properties			
Resistivity			
NaCl Equivalent			
Cl-titrated			
NO_3			
Est. Water Type pH			
Mud Properties			
Resistivity			
NaCl Equivalent			
Cl - titrated			
Calibration			
Calibration Press.			
Calibration Temp.			
Hewlett Packard No.	2120A-00876		
Mud Weight			
Calc. Hydrostatic			
RFT Chokesize	1 x .02 inch		

Remarks: Very slow build up: Close chamber re-open at 2022.2m (1/34)

RFT SAMPLE TEST REPORT

WELL: Wirrah-3 (6623f/8)
OBSERVER: Fittall/Palmer DATE: December 12, 1983 RUN: 4

	CHAMBER 1 (22.7 litres)		CHAMBER 2 ( )
SEAT NO.	4/34		
DEPTH	2022.2		
A. RECORDING TIMES			
Tool Set	23:15:45		
Pretest Open	23:15:45		
Time Open			
Chamber Open	23:24:50		
Chamber Full			
Fill Time			
Start Build-up			
Finish Build-up			
Build-Up Time			
Seal Chamber	23:40:00		
Tool Retract	23:		
Total Time			hr
B. SAMPLE PRESSURES			
IHP	3080.5	psia	
ISIP	2869.9		
Initial Flowing Press.	114.4		
Final Flowing Press.			
Sampling Press. Range			
FSIP	3080.1		
FHP			
Form. Press. (Horner)			
C. TEMPERATURE			
Depth Tool Reached			
Max. Rec. Temp.			
Time Circ. Stopped			
Time since Circ.			
Form. Temp. (Horner)			
D. SAMPLE RECOVERY			
Surface Pressure			
Amt Gas			
Amt Oil			
Amt Water			
Amt Others			
E. SAMPLE PROPERTIES			
Gas Composition			
C1			
C2			
C3			
1C4/nC4			
C5			
C6+			
CO_2/H_2S			
Oil Properties			
Colour			
Fluorescence			
GOR			
Water Properties			
Resistivity			
NaCl Equivalent			
Cl-titrated			
NO_3			
Est. Water Type pH			
Mud Properties			
Resistivity			
NaCl Equivalent			
Cl - titrated			
Calibration			
Calibration Press.			
Calibration Temp.			
Hewlett Packard No.	2120A-00876		
Mud Weight			
Calc. Hydrostatic			
RFT Chokesize	1 x .02 inch		

Remarks: Very slow filling sealed chamber, moved to 2023.7 (4/35).

RFT SAMPLE TEST REPORT

WELL: Wirrah-3 (6623f/9)
OBSERVER: Fittall/Palmer/JR DATE: December 12-13, 1983 RUN: 4

	CHAMBER 1 (22.7 litres)		CHAMBER 2 (10.4 litres)	
SEAT NO.	4/35		4/35	
DEPTH	2023.7		2023.7	
A. RECORDING TIMES				
Tool Set	23:50:05			
Pretest Open	23:50:05			
Time Open				
Chamber Open	23:53:01		00:05:15	
Chamber Full	00:01:15		Fill point undeterminable	
Fill Time				
Start Build-up	01:01:15			
Finish Build-up	Did not finish buildup		Did not wait for buildup	
Build-Up Time				
Seal Chamber	00:04:43		00:22:05	
Tool Retract			00:23:50	
Total Time				
B. SAMPLE PRESSURES				
IHP	3380.3	psi	-	
ISIP	2872.3	psi	-	
Initial Flowing Press.	97.1	psi	442.0	psig
Final Flowing Press.	841	psi	Fill point undeterminable	
Sampling Press. Range	97.1 - 841	psi	-	
FSIP	Did not write for build-up		Did not wait for build up	
FHP	-		3380.5	
Form. Press. (Horner)				
C. TEMPERATURE				
Depth Tool Reached	2023.7	m	2023.7	m
Max. Rec. Temp.				
Time Circ. Stopped				
Time since Circ.				
Form. Temp. (Horner)				
D. SAMPLE RECOVERY				
Surface Pressure	210	psig	640	psig
Amt Gas	1.15	cu. ft.	4.37	cu. ft.
Amt Oil	Thin oil scum	litre	4.5	litre
Amt Water	21.5	litre	3.98	litre
Amt Others				
E. SAMPLE PROPERTIES				
Gas Composition				
C1	323,094	ppm	684,901	ppm
C2	147,397	ppm	197,712	ppm
C3	73,098	ppm	89,521	ppm
1C4/nC4	15,680	ppm	25,033	ppm
C5	1,522	ppm	3,027	ppm
C6+	-	ppm	-	ppm
CO_2/H_2S insuffecent sample	-10	ppm	5.3%/0	ppm
Oil Properties	- °API @ -	°C	37.14°API @ 60°F	
Colour	Medium dark yellow brown		Medium dark yellow brown	
Fluorescence	Bright cream yellow		Bright cream yellow	
GOR		SCF/STB		
Water Properties	pour point - 22°C			
Resistivity	0.226 @ 67.5°F		0224 @ 66.5°F	
NaCl Equivalent	30,000	ppm		
Cl-titrated	22,000	ppm	19,000	ppm
NO_3	120	ppm	140	ppm
Est. Water Type pH	pH = 7.4		pH = 7.2	
Mud Properties	NO_3 = pH =			
Resistivity	0.246 @°C 19.9°C		0246@°C 19.9°C	
NaCl Equivalent				
Cl - titrated/No 3	19,000/250	ppm	19,000/250	ppm
Calibration				
Calibration Press.				
Calibration Temp.				
Hewlett Packard No.	2120A-00876		2120A-00876	
Mud Weight				
Calc. Hydrostatic				
RFT Chokesize	1 x .02 inch			

Remarks: Reopened 6 gallon chamber
See 4/33 & 4/34

RFT SAMPLE TEST REPORT

WELL: Wirrah-3 (6623f/10)
OBSERVER: JR/PP DATE: December 13, 1983 RUN: 5

	CHAMBER 1 (22.7 litres)		CHAMBER 2 (10.4 litres)	
SEAT NO.	5/38		5/38	
DEPTH	2029.0		2029.0	
A. RECORDING TIMES				
Tool Set	04:04:30			
Pretest Open	04:04:30			
Time Open	00:05:05		04:34:00	
Chamber Open	04:32:30		04:45:05	
Chamber Full			10:05	
Fill Time				
Start Build-up				
Finish Build-up				
Build-Up Time				
Seal Chamber	04:33:20		04:45:50	
Tool Retract	-		04:47:20	
Total Time				
B. SAMPLE PRESSURES				
IHP	3390.3	psia		
ISIP	2879.1	psia		
Initial Flowing Press.	105.0	psia	217.4	psia
Final Flowing Press.	2746	psia	2529.7	psia
Sampling Press. Range	105.0-2746.	psia	817.4-2529.7	psia
FSIP		psia	2876.8	psia
FHP				
Form. Press. (Horner)				
C. TEMPERATURE				
Depth Tool Reached	2029.1	m	2029.1	m
Max. Rec. Temp.				
Time Circ. Stopped				
Time since Circ.				
Form. Temp. (Horner)				
D. SAMPLE RECOVERY				
Surface Pressure	260	psig	150	psig
Amt Gas	0.35	cu. ft.	0.35	cu. ft.
Amt Oil	-	litre	-	litre
Amt Water	21.25	litre	9.25	litre
Amt Others				
E. SAMPLE PROPERTIES				
Gas Composition				
C1	248,729	ppm	244,948	ppm
C2	17,361	ppm	24,802	ppm
C3	5,711	ppm	7,994	ppm
1C4/nC4	1,416	ppm	2,833	ppm
C5	923	ppm	1,847	ppm
C6+	383	ppm	766	ppm
CO_2/H_2S	7.5%/-	ppm	5.3%	ppm
Oil Properties				
Colour				
Fluorescence				
GOR				
Water Properties				
Resistivity	0.235 @ 69°F		0.235 @ 69°F	
NaCl Equivalent	29,500	ppm	29,500	ppm
Cl-titrated	19,000	ppm	22,00	ppm
NO_3	150 pH 7.4	ppm	120 pH 7.1	ppm
Est. Water Type pH	Filtrate			
Mud Properties				
Resistivity				
NaCl Equivalent				
Cl - titrated				
Calibration				
Calibration Press.				
Calibration Temp.				
Hewlett Packard No.				
Mud Weight				
Calc. Hydrostatic				
RFT Chokesize	1 x .02 inch			

Remarks:

RFT SAMPLE TEST REPORT

WELL: Wirrah-3
OBSERVER: JR

(6623f/11)
DATE: December 13, 1983
RUN: 6

	CHAMBER 1 (22.7 litres)		CHAMBER 2 (10.4 litres)	
SEAT NO.	6/39		6/39	
DEPTH	1600.7		1600.7	
A. RECORDING TIMES				
Tool Set	07:23:15			
Pretest Open	07:23:15			
Time Open				
Chamber Open	07:31:30		07:46:30	
Chamber Full	07:43:35		07:51:70	
Fill Time				
Start Build-up	07:43:35		07:53:20	
Finish Build-up	07:45:50		07:54:40	
Build-Up Time				
Seal Chamber	07:46:03		07:55:10	
Tool Retract			07:56:50	
Total Time				
B. SAMPLE PRESSURES				
IHP	2676.3	psia		
ISIP	2472.6	psia		
Initial Flowing Press.	113.1	psia	2067.2	psia
Final Flowing Press.	1992.6	psia	2089.78	psia
Sampling Press. Range	113.1-1992.6	psia	2067.2-2089.78	psia
FSIP		psia	2255.0	psia
FHP			2676.2	psia
Form. Press. (Horner)				
C. TEMPERATURE				
Depth Tool Reached				
Max. Rec. Temp.				
Time Circ. Stopped				
Time since Circ.				
Form. Temp. (Horner)				
D. SAMPLE RECOVERY				
Surface Pressure	400	psig	0	psig
Amt Gas	0.95	cu. ft.	0.43	cu. ft.
Amt Oil	-	litre	-	litre
Amt Water	21.75	litre	9.6	litre
Amt Others				
E. SAMPLE PROPERTIES				
<u>Gas Composition</u>				
C1	139,288	ppm	323,348	ppm
C2	24,944	ppm	40,250	ppm
C3	1,218	ppm	6,243	ppm
1C4/nC4	339	ppm	1,529	ppm
C5	138	ppm	923	ppm
C6+	10	ppm	306	ppm
CO_2/H_2S	2.7/0	ppm	10.8/8	ppm
<u>Oil Properties</u>				
Colour				
Fluorescence				
GOR				
<u>Water Properties</u>				
Resistivity				
NaCl Equivalent				
Cl-titrated	12,000	ppm	10,000	ppm
NO_3	60 pH = 7.5	ppm	40 pH = 7.4	ppm
Est. Water Type pH	Fresh fmt water/filtrate		Fresh fmt water	
<u>Mud Properties</u>				
Resistivity				
NaCl Equivalent				
Cl - titrated				
<u>Calibration</u>				
Calibration Press.				
Calibration Temp.				
Hewlett Packard No.				
Mud Weight				
Calc. Hydrostatic				
RFT Chokesize				

Remarks:

RFT SAMPLE TEST REPORT

WELL: Wirrah-3 (6623f/12)

OBSERVER: R. Neumann/L. Finlayson DATE: December 24, 1983 RUN: 8

		CHAMBER 1 (22.7 litres)		CHAMBER 2 (10.4 litres)	
SEAT NO.		8/65			
DEPTH		2748.0			
A. RECORDING TIMES					
Tool Set	(PM)	10:30:24			
Pretest Open		10:30:29			
Time Open		4 mins 55 secs		3 mins 49 secs.	
Chamber Open		10:35:24		11:19:51	
Chamber Full	Not full	11:15:05		Not Full 11:48:19	
Fill Time					
Start Build-up					
Finish Build-up					
Build-Up Time					
Seal Chamber		11:16:05		11:50:07	
Tool Retract		-		11:55:00	
Total Time		45 mins 4 sec		38 mins 95 secs	
B. SAMPLE PRESSURES					
IHP		4575.52	psia	-	psia
ISIP		3953.93	psia	3953.64	
Initial Flowing Press.		802	psia	817	psi
Final Flowing Press.		1152	psia	1952.82	psia
Sampling Press. Range		352	psi	1134.82	psi
FSIP		-	psia	3954.26	psia
FHP		-		4570.75	
Form. Press. (Horner)					
C. TEMPERATURE					
Depth Tool Reached		2748.0	m	2748	m
Max. Rec. Temp.		193	°F	203.9	°F
Time Circ. Stopped		14.50	hrs	14.50 hrs 24/12	hrs
Time since Circ.		-	hrs	-	hrs
Form. Temp. (Horner)		-		-	
D. SAMPLE RECOVERY					
Surface Pressure		680.0	psig	1200	psig
Amt Gas		17.6	cu. ft.	26.9	cu. ft.
Amt Oil		-	litre	-	litre
Amt Water		-	litre	3.25	litre
Amt Others		Scum Condensate		Condensate	
E. SAMPLE PROPERTIES					
Gas Composition					
C1		329728	ppm	329730	ppm
C2		23511	ppm	26459	ppm
C3		8763	ppm	730	ppm
1C4/nC4		3625	ppm	330	ppm
C5		1089	ppm	120	ppm
C6+		969	ppm	23	ppm
CO_2/H_2S		13%	ppm	16%	ppm
Oil Properties					
Colour					
Fluorescence					
GOR			SCF/STB		
Water Properties					
Resistivity		pH = 8	°C	pH = 7	°C
NaCl Equivalent					
Cl-titrated		22K	ppm	22K	ppm
NO_3		40 ml/m	ppm	70 ml/m	ppm
Est. Water Type pH					
Mud Properties					
Resistivity		pH = 10.5		pH = 10.5	
NaCl Equivalent		NO_3 = 200	ppm	NO_3 = 200	ppm
Cl - titrated		10,000	ppm	20,000	ppm
Calibration					
Calibration Press.					
Calibration Temp.					
Hewlett Packard No.		2120A		2120A	
Mud Weight		9.7	psia	9.7	psia
Calc. Hydrostatic					
RFT Chokesize		0.03		0.02	

Remarks: 6 gallon chamber not full after 45 minutes open.

RFT SAMPLE TEST REPORT

WELL: Wirrah-3 (6623f/13)

OBSERVER: O'Byrne/Finlayson/Newmann DATE: December 25, 1983 RUN: 9

	Chamber 1 (22.7 litre)		Chamber 2 (10.9 litre)	
SEAT NO.	9/67			
DEPTH 2371.0				
A. RECORDING TIMES				
Tool Set AM	3:25:51			
Pretest Open	3:25:53		U:15:10	
Time Open	5 mins 18 secs		4 mins 33 secs.	
Chamber Open	3:31:11		4:19:43	
Chamber Full	Not full 4:15:10		Not full 4:39:02	
Fill Time				
Start Build-up				
Finish Build-up				
Build-Up Time				
Seal Chamber	4:15:10		4:31:02	
Tool Retract				
Total Time	49 mins 19 secs		35.46	
B. SAMPLE PRESSURES				
IHP	4538.24	psia		
ISIP	3920.14	psia	3920.14	psia
Initial Flowing Press.	100	psia	157	psia
Final Flowing Press.	1500	psia	166.26	psia
Sampling Press. Range	1400	psia	11	psia
FSIP	didn't wait	psia	3909.48	psia
FHP			4533.13	psia
Form. Press. (Horner)				
C. TEMPERATURE				
Depth Tool Reached	2731.0	m	2731	m
Max. Rec. Temp.	209	°F	211	°F
Time Circ. Stopped	14.50 hrs 24/12	hrs	14.50 hrs 24/12	hrs
Time since Circ.		hrs		hrs
Form. Temp. (Horner)				
D. SAMPLE RECOVERY				
Surface Pressure	390	psig	100	psig
Amt Gas	0.6	cu. ft.	1.5	cu. ft.
Amt Oil	10cc waxy oil	litre	.25	litre
Amt Water	3.75	litre	0.75	litre
Amt Others				
E. SAMPLE PROPERTIES				
Gas Composition				
C1	52,756	ppm	240,215	ppm
C2	14,694	ppm	35,266	ppm
C3	339	ppm	15,022	ppm
1C4/nC4	141	ppm	896	ppm
C5	80	ppm	226	ppm
C6+	tr	ppm	tr	ppm
CO_2/H_2S	4.3%/NIL	ppm	5.8%/NIL	ppm
Oil Properties	Too small	°C	Too small	
Colour	Brown		Brown	
Fluorescence	Bright yellow/white		Bright yellow/white	
GOR	Too small		954	
Water Properties				
Resistivity				
NaCl Equivalent				
Cl-titrated	16,000	ppm	16,000	ppm
NO_3			40	ppm
Est. Water Type pH	pH = 8		pH = 7.5	
Mud Properties	NO_3 = pH =			
Resistivity	pH = 10.3		pH = 10.3	
NaCl Equivalent	NO_3 = 100	ppm	NO_3 = 200	ppm
Cl - titrated	20,000	ppm	20,000	ppm
Calibration				
Calibration Press.				
Calibration Temp.				
Hewlett Packard No.	2120A		2120A	
Mud Weight	9.7		9.7	
Calc. Hydrostatic				
RFT Chokesize	0.03		0.02	
Remarks:	Chamber not full when closed after 49 minutes.		Chamber sealed 4:26:12 then reopened 4:27:31 to check for plugging OK Oil is brown & waxy.	

RFT SAMPLE TEST REPORT

(6623f/14)

WELL: Wirrah-3
OBSERVER: Neumann/Finlayson
DATE: December 12, 1983
RUN: 10

	CHAMBER 1 (22.7 litre)		CHAMBER 2 (10.4 litre)	
SEAT NO. 10/68				
DEPTH 2707.8				
A. RECORDING TIMES				
Tool Set	9.26.55 (AM)			
Pretest Open	9.26.57		10.01.01	
Time Open	5 mins 7 secs.		29 secs.	
Chamber Open	9.35.06		10.01.30	
Chamber Full	9.55.30		9 mins. 2 secs.	
Fill Time	20 mins 24 secs.		10.10.32	
Start Build-up	9.55.30		10.10.32	
Finish Build-up	10.00.55		10.15.03	
Build-Up Time	5 mins 25 secs		4 mins 29 secs.	
Seal Chamber	10.01.01		10.17.13	
Tool Retract	-		10.17.13	
Total Time	34 mins		16 mins	
B. SAMPLE PRESSURES				
IHP	4498.4	psia		
ISIP	3879.83	psia	3874.59	psia
Initial Flowing Press.	250	psi	956	psia
Final Flowing Press.	1580	psia	1489	psia
Sampling Press. Range	1330	psia	533	psia
FSIP	3574.59	psia	3875.8	psia
FHP			4494.48	
Form. Press. (Horner)				
C. TEMPERATURE				
Depth Tool Reached	2707.8	m	2707.8	m
Max. Rec. Temp.	210	°F	212	°F
Time Circ. Stopped	14.50 hrs 24/12	hrs	14.50 24/12	hrs
Time since Circ.		hrs		hrs
Form. Temp. (Horner)				
D. SAMPLE RECOVERY				
Surface Pressure	960	psia	1130	psig
Amt Gas	5.82	cu. ft.	8	cu. ft.
Amt Oil	1.00	litre	2.00	litre
Amt Water	21.05	litre	6.00	litre
Amt Others				
E. SAMPLE PROPERTIES				
Gas Composition				
C1	204431	ppm	609996	ppm
C2	41144	ppm	47022	ppm
C3	16691	ppm	10432	ppm
1C4/nC4	2124	ppm	192	ppm
C5	1935	ppm	45	ppm
C6+	736	ppm	14	ppm
CO_2/H_2S	27/NIL	ppm	8/NIL	ppm
Oil Properties		°C		
Colour	Brown Waxy		Brown waxy	
Fluorescence	Bright yellow/white		Bright yellow/white	
GOR	972		636	
Water Properties				
Resistivity				
NaCl Equivalent				
Cl-titrated	21,000	ppm	21,000	ppm
NO_3	60	ppm	40	ppm
Est. Water Type pH	pH = 7.5		pH = 7.5	
Mud Properties				
Resistivity				
NaCl Equivalent	NO_3 = 200		NO_3 = 200	
Cl - titrated	20,000		20,000	
Calibration				
Calibration Press.				
Calibration Temp.				
Hewlett Packard No.	2120 A		2120 A	
Mud Weight	9.7		9.7	
Calc. Hydrostatic				
RFT Chokesize	0.03		0.02	

Remarks: K 100 m darcy.

RFT SAMPLE TEST REPORT

WELL: Wirrah-3 (6623f/15)
OBSERVER: Neumann/Finlayson DATE: December 12, 1983 RUN: 11

	CHAMBER 1 (22.7 litres)		CHAMBER 2 (10.4 litres)	
SEAT NO. 11/69				
DEPTH 2687.5				
A. RECORDING TIMES				
Tool Set PM	2.16.37			
Pretest Open	2.16.45			
Time Open	2 mins 15 secs			
Chamber Open	2.19.00		2.44.43	
Chamber Full	2.22.00		2.53.57	
Fill Time	19 mins 53 secs.		9 mins 14 secs	
Start Build-up	2.41.53		2.53.57	
Finish Build-up	2.44.43		2.57.57	
Build-Up Time	2 mins 50 secs.		2 mins	
Seal Chamber	2.44.43		2.57.57	
Tool Retract			2.59.52	
Total Time	28 mins 5 secs.		15 mins 9 secs	
B. SAMPLE PRESSURES				
IHP	4464.38	psia		
ISIP	3854.88	psia	3852.38	
Initial Flowing Press.	214	psia	1834.5	psia
Final Flowing Press.	2308	psia	1842.501	psia
Sampling Press. Range	2000	psia	8	psia
FSIP	3852.38	psia	3851.07	psia
FHP			4462.03	psia
Form. Press. (Horner)				
C. TEMPERATURE				
Depth Tool Reached	2687.5	m	2687.5	m
Max. Rec. Temp.	211	°F	211.5	°F
Time Circ. Stopped	14.50 hrs 24/12	hrs	14.50 24/12	hrs
Time since Circ.		hrs		hrs
Form. Temp. (Horner)				
D. SAMPLE RECOVERY				
Surface Pressure	1510	psig	1420	psig
Amt Gas	23.8	litre	19.0	cu. ft.
Amt Oil	4.0	litre	3	litre
Amt Water	15.75	litre	4	litre
Amt Others				
E. SAMPLE PROPERTIES				
Gas Composition				
C1	659,456	ppm	296,755	ppm
C2	33,328	ppm	20,577	ppm
C3	6,676	ppm	4,173	ppm
1C4/nC4	170	ppm	453	ppm
C5	30	ppm	32	ppm
C6+	7	ppm	23	ppm
CO_2/H_2S	7%/	ppm	5/2	ppm
Oil Properties	35 °API @ 66	°C	35 °API @ 66	°C
Colour	Olive brown waxy		Olive brown waxy	
Fluorescence	Bright yellow/white		Bright yellow/white	
GOR	946		1007	
Water Properties				
Resistivity	pH = 11.70		pH = 7.3	
NaCl Equivalent				
Cl-titrated	19,000	ppm	18,000	ppm
NO_3	80	ppm	60	ppm
Est. Water Type pH				
Mud Properties				
Resistivity	pH = 10.5		pH = 10.5	
NaCl Equivalent	NO_3 = 200		NO_3 = 200	
Cl - titrated	20,000	ppm	20,000	ppm
Calibration				
Calibration Press.				
Calibration Temp.				
Hewlett Packard No.	2120A		2120A	
Mud Weight	9.7	ppg	9.7	ppg
Calc. Hydrostatic				
RFT Chokesize	0.03		0.02	
Remarks:	Checked seal			

RFT SAMPLE TEST REPORT

WELL: Wirrah-3 (6623f/16)
OBSERVER: L. Finlayson DATE: December 12, 1983 RUN: 12

	CHAMBER 1 (22.7 litres)		CHAMBER 2 (3. litres)	
SEAT NO.	12/70		12/70	
DEPTH	2672.0 m		2672.0 m	
A. RECORDING TIMES				
Tool Set PM	7.34.10		-	
Pretest Open	7.34.31		-	
Time Open	2.23		-	
Chamber Open	7.37.24		7.54.22	
Chamber Full	7.52.30		7.54.44	
Fill Time	15.06		3.22	
Start Build-up	7.52.30		7.57.44	
Finish Build-up	7.53.27		7.58.00	
Build-Up Time	.53		.16	
Seal Chamber	7.53.27		8.00.30	
Tool Retract			8.01.52	
Total Time			.27.42	
B. SAMPLE PRESSURES				
IHP	4440.8	psia	-	
ISIP	2839.7	psia	-	
Initial Flowing Press.	1156.5	psia	2114.7	psia
Final Flowing Press.	1934.3	psia	1951.2	psia
Sampling Press. Range	777.8	psia	163.5	psia
FSIP	-	psia	3835.4	psia
FHP	-		4434.2	psia
Form. Press. (Horner)	-			
C. TEMPERATURE				
Depth Tool Reached	2672	m	2672.0	m
Max. Rec. Temp.	213.5	°F	213.5	°F
Time Circ. Stopped	14.50 hrs 24/12	hrs	14.50 hrs 24/12	hrs
Time since Circ.		hrs		hrs
Form. Temp. (Horner)				
D. SAMPLE RECOVERY				
Surface Pressure	280	psig	280	psig
Amt Gas	1.7	cu. ft.	0.4	cu. ft.
Amt Oil	-	litre	-	litre
Amt Water (filtrate)	21.0	litre	3.5	litre
Amt Others	-		-	
E. SAMPLE PROPERTIES				
Gas Composition				
C1	105,512	ppm	171,458	ppm
C2	13,959	ppm	14,694	ppm
C3	4,381	ppm	3,171	ppm
1C4/nC4	952	ppm	1,246	ppm
C5	702	ppm	1,028	ppm
C6+	100	ppm	200	ppm
CO_2/H_2S	5 %/NIL	ppm	8%/N/P	ppm
Oil Properties	°API @	°C		
Colour				
Fluorescence				
GOR		SCF/STB		
Water Properties				
Resistivity	8.1		7.5	
NaCl Equivalent				
Cl-titrated	18,200	ppm	200	ppm
NO_3	40	ppm	40	ppm
Est. Water Type pH				
Mud Properties				
Resistivity	pH = 10.5		pH = 10.5	
NaCl Equivalent	NO_3 = 200		NO_3 = 200	
Cl - titrated	20,000	ppm	20,000	ppm
Calibration				
Calibration Press.				
Calibration Temp.				
Hewlett Packard No.	2120A		2120A	
Mud Weight	9.7	ppg	9.7	ppg
Calc. Hydrostatic				
RFT Chokesize	0.03		0.02	

Remarks:

RFT SAMPLE TEST REPORT

WELL: Wirrah-3 (6623f/17)
OBSERVER: L. Finlayson DATE: December 26, 1983 RUN: 13

	CHAMBER 1 (22.7 litres)		CHAMBER 2 (10.4 litres)	
SEAT NO.	13/72		13/72	
DEPTH	2672.0 m		2672.0 m	
A. RECORDING TIMES				
Tool Set	12.18.10		-	
Pretest Open	12.18.30		-	
Time Open	2.15		-	
Chamber Open	17.10.45		1.19.00	
Chamber Full	-		1.33.00	
Fill Time	-		14.00	
Start Build-up	-		1.33.00	
Finish Build-up	-		-	
Build-Up Time	-		-	
Seal Chamber	AM 1.17.10		1.34.00	
Tool Retract	-		1.36.00	
Total Time	59.00 hrs.		1.17.30 hrs.	
B. SAMPLE PRESSURES				
IHP	4433.7	psia	-	psia
ISIP	3831.7	psia	-	psia
Initial Flowing Press.	2025.9	psia	1068.9	psia
Final Flowing Press.	2367.6	psia	3682.3	psia
Sampling Press. Range	281.7	psia	2613.4	psia
FSIP		psia	3835.8	psia
FHP			4434.5	psia
Form. Press. (Horner)				
C. TEMPERATURE				
Depth Tool Reached		m		m
Max. Rec. Temp.	221	°C	224	°C
Time Circ. Stopped	14.50 hrs 24/12	hrs	14.50 hrs 24/12	hrs
Time since Circ.	-	hrs	-	hrs
Form. Temp. (Horner)				
D. SAMPLE RECOVERY				
Surface Pressure	190	psig	1000	psig
Amt Gas	1.70	cu. ft.	5.00	cu. ft.
Amt Oil	0.10	litre	0.50	litre
Amt Water	-	litre	8.0	litre
Amt Others				
E. SAMPLE PROPERTIES				
Gas Composition				
C1	16486	ppm	34621	ppm
C2	60122	ppm	64655	ppm
C3	1090	ppm	1335	ppm
1C4/nC4	790	ppm	996	ppm
C5	326	ppm	526	ppm
C6+	96	ppm	106	ppm
CO_2/H_2S	40/NIL	ppm	70/NIL	ppm
Oil Properties	°API @	°C		
Colour	Brown waxy		Brown waxy	
Fluorescence	Bright yellow/white		Bright yellow/white	
GOR	too small		1590	
Water Properties				
Resistivity	pH = 7.3		pH = 7.0	
NaCl Equivalent				
Cl-titrated	18k	ppm	17k	ppm
NO_3	40	ppm	30	ppm
Est. Water Type pH				
Mud Properties	Seawater Gel			
Resistivity	pH = 10.5		pH = 10.5	
NaCl Equivalent	NO_3 = 100		NO_3 = 100	
Cl - titrated	20,000	ppm	20,000	ppm
Calibration				
Calibration Press.				
Calibration Temp.				
Hewlett Packard No.	2120A		2120A	
Mud Weight	9.7	ppg	9.7	ppg
Calc. Hydrostatic				
RFT Chokesize	0.03		0.02	
Remarks:	Chamber closed and reopened at 1.03			

RFT SAMPLE TEST REPORT

WELL: Wirrah-3
OBSERVER: Finlayson/Neumann DATE: December 26, 1983 (6623f/18) RUN: 14

	CHAMBER 1 (22.7 litres)		CHAMBER 2 (10.4 litres)	
SEAT NO.	14/77		14/77	
DEPTH	2644.7		2644.7	
A. RECORDING TIMES				
Tool Set AM	6.12.14		-	
Pretest Open	6.12.18		-	
Time Open	2 mins 49 secs.		-	
Chamber Open	6.15.07		7.04.00	
Chamber Full	Not filled		Not filled	
Fill Time	-		-	
Start Build-up	-		-	
Finish Build-up	-		-	
Build-Up Time	-		-	
Seal Chamber	7.01.00		7.22.00	
Tool Retract	48		7.27.00	
Total Time	48 mins 46 secs.		38.46	
B. SAMPLE PRESSURES				
IHP	4393.72	psia	-	
ISIP	3805.07	psia	-	
Initial Flowing Press.	260.0	psia	98.7	psia
Final Flowing Press.	603.9	psia	117.7	psia
Sampling Press. Range	343.9	psia	19.0	psia
FSIP	-	psia	3794.5	psia
FHP	-		4396.8	psia
Form. Press. (Horner)				
C. TEMPERATURE				
Depth Tool Reached	2744.7	m		m
Max. Rec. Temp.	218	°F	220.5	°F
Time Circ. Stopped	14.50 hrs 24/12	hrs	14.50 hrs 24/12	hrs
Time since Circ.		hrs		hrs
Form. Temp. (Horner)				
D. SAMPLE RECOVERY				
Surface Pressure	53.0	psig	15	psig
Amt Gas	0.2	cu. ft.	.25	litre
Amt Oil		litre	-	litre
Amt Water	4.5	litre	3	litre
Amt Others	-		-	
E. SAMPLE PROPERTIES				
Gas Composition				
C1	325133	ppm	310696	ppm
C2	41144	ppm	40691	ppm
C3	6800	ppm	5200	ppm
1C4/nC4	230	ppm	160	ppm
C5	60	ppm	30	ppm
C6+	44	ppm	12	ppm
CO_2/H_2S	16%/NIL	ppm	14%/NIL	ppm
Oil Properties	°API @	°C		ppm
Colour	-		-	
Fluorescence	-		-	
GOR	-		-	
Water Properties				
Resistivity				
NaCl Equivalent				
Cl-titrated	17,000	ppm	17,000	ppm
NO_3	60	ppm	60	ppm
Est. Water Type pH	pH = 8.5		pH = 8.3	
Mud Properties				
Resistivity	pH = 10.5		pH = 10.5	
NaCl Equivalent	NO_3 = 200		NO_3 = 200	
Cl - titrated		ppm		ppm
Calibration				
Calibration Press.				
Calibration Temp.				
Hewlett Packard No.	2120A		2120A	
Mud Weight	9.7	ppg	4.7	ppg
Calc. Hydrostatic				
RFT Chokesize	0.03		0.02	
Remarks:	Chamber sealed & reopened twice to enhance flow		Chamber sealed and reopened to enhance flow	

RFT SAMPLE TEST REPORT

WELL: Wirrah-3 (6623f/19)

OBSERVER: Fittall/Neumann DATE: December 26, 1983 RUN: 15

	CHAMBER 1 (22.7 litres)		CHAMBER 2 (10.4 litres)	
SEAT NO. 15/79				
DEPTH 2622.0				
A. RECORDING TIMES				
Tool Set	10.37.00		-	
Pretest Open	AM 10.37.04		-	
Time Open	1 min 32 secs.		-	
Chamber Open	10.31.36		11.08.20	
Chamber Full			11.10.12	
Fill Time	19 mins 44 secs.		5 mins 52 secs.	
Start Build-up	10.38.20		11.13.42	
Finish Build-up	11.03.01		didn't wait	
Build-Up Time	-		-	
Seal Chamber	11.03.01		11.13.43	
Tool Retract	-		11.15.08	
Total Time	26.01 hrs		10.48 hrs.	
B. SAMPLE PRESSURES				
IHP	4356.74	psia	-	
ISIP	3777.63	psia	3771.09	
Initial Flowing Press.	483	psi	3101.49	psia
Final Flowing Press.	3477	psia	3048.21	psia
Sampling Press. Range	-	psia	-	psia
FSIP	3771.09	psia	3770.65	psia
FHP	-		4357.34	psia
Form. Press. (Horner)				
C. TEMPERATURE				
Depth Tool Reached	2622.0	m	2622.0	m
Max. Rec. Temp.	210	°F	219	°F
Time Circ. Stopped	14.50 hrs 24/12	hrs	14.50 hrs 24/12	hrs
Time since Circ.		hrs		hrs
Form. Temp. (Horner)				
D. SAMPLE RECOVERY				
Surface Pressure	1950.0	psig	1900	psig
Amt Gas	74	cu. ft.	51.3	litre
Amt Oil	-	litre		litre
Amt Water	11.2	litre	2.25	litre
Amt Others	0.2 cond/emulsion		0.2 cond/emulsion	
E. SAMPLE PROPERTIES				
Gas Composition				
C1	675942	ppm	651212	ppm
C2	33944	ppm	63185	ppm
C3	15856	ppm	18360	ppm
1C4/nC4	2412	ppm	3398	ppm
C5	410	ppm	1698	ppm
C6+	70	ppm	200	ppm
CO_2/H_2S	95/0	ppm	121/0	ppm
Oil Properties	°API @	°C		
Colour				
Fluorescence				
GOR				
Water Properties				
Resistivity	pH = 6.2		pH = 6.3	
NaCl Equivalent				
Cl-titrated	6000	ppm	16000	ppm
NO_3	20	ppm	20	ppm
Est. Water Type pH				
Mud Properties				
Resistivity	pH = 10.5		pH = 10.5	
NaCl Equivalent	NO_3 = 200		NO_3 = 200	
Cl - titrated				
Calibration				
Calibration Press.				
Calibration Temp.				
Hewlett Packard No.	2120A		2120A	
Mud Weight	9.7	ppg	9.7	ppg
Calc. Hydrostatic				
RFT Chokesize	0.03		0.02	

Remarks:

RFT SAMPLE TEST REPORT

WELL: Wirrah-3 (6623f/20)

OBSERVER: Finlayson/Newmann DATE: December 26, 1983 RUN: 16

	CHAMBER 1 (22.7 litre)		CHAMBER 2 (10.4 litre)	
SEAT NO.				
DEPTH 16/83	2627.2		2627.2	
A. RECORDING TIMES				
Tool Set PM	3.16.04		-	
Pretest Open	3.16.08		-	
Time Open	2 mins 28 secs.		-	
Chamber Open	3.		4.04.40	
Chamber Full	3.44.41		4.15.20	
Fill Time	26.11		10.40	
Start Build-up	3.44.41		4.15.0	
Finish Build-up	4.02.50		4.23.20	
Build-Up Time	18.09		8.00	
Seal Chamber	4.0 .50		4.23.20	
Tool Retract	-		4.29.00	
Total Time	46.46		14.20	
B. SAMPLE PRESSURES				
IHP	4369.80	psia		
ISIP	didn't wait	psia	3721	psia
Initial Flowing Press.	150	psia	315.06	psia
Final Flowing Press.	800	psia	566.00	psia
Sampling Press. Range	650	psia	251.	psia
FSIP	377	psia	didn't wait 3651.61	psia
FHP				
Form. Press.				
C. TEMPERATURE				
Depth Tool Reached	2637	m	2637	m
Max. Rec. Temp.	216	°F	216	°F
Time Circ. Stopped	14.50 hrs 24/12	hrs	14.50 hrs 24/12	hrs
Time since Circ.		hrs		hrs
Form. Temp. (Horner)				
D. SAMPLE RECOVERY				
Surface Pressure	570	psig	290	psig
Amt Gas	2.4	cu. ft.	0.3	litre
Amt Oil		litre		
Amt Water	22.3	litre	9.75	litre
Amt Others				
E. SAMPLE PROPERTIES				
Gas Composition				
C1	306647	ppm	310274	ppm
C2	35104	ppm	24385	ppm
C3	13314	ppm	12184	ppm
1C4/nC4	2604	ppm	835	ppm
C5	1899	ppm	771	ppm
C6+	37	ppm		ppm
CO_2/H_2S	1.4%/NIL	ppm	1/3%/NIL	
Oil Properties	°API @	°C		
Colour				
Fluorescence				
GOR		SCF/STB		
Water Properties				
Resistivity				
NaCl Equivalent				
Cl-titrated	ppm			
NO_3	60	ppm	40	ppm
Est. Water Type pH				
Mud Properties				
Resistivity	pH = 10.5		pH = 10.5	
NaCl Equivalent	NO_3 = 200		NO_3 = 200	
Cl - titrated	20,000	ppm	20,000	ppm
Calibration				
Calibration Press.				
Calibration Temp.				
Hewlett Packard No.	2120A		2120A	
Mud Weight	9.7	ppg	9.7	ppg
Calc. Hydrostatic				
RFT Chokesize	0.03		0.02	

Remarks:

RFT SAMPLE TEST REPORT

WELL: Wirrah-3
OBSERVER: Finlayson/Neumann DATE: December 27, 1983 (6623f/21) RUN: 17

	CHAMBER 1 (22.7 litres)		CHAMBER 2 (10.4 litres)
SEAT NO. 17/93A			
DEPTH 2569.0			
A. RECORDING TIMES			
Tool Set AM	7.86		
Pretest Open	7.44		
Time Open	2 mins		
Chamber Open	7.47		
Chamber Full	Not full		
Fill Time	-		
Start Build-up	-		
Finish Build-up	-		
Build-Up Time	-		
Seal Chamber	8.07		
Tool Retract	8.04		
Total Time	20 mins		
B. SAMPLE PRESSURES			
IHP	4254.79	psig	
ISIP	didn't wait		
Initial Flowing Press.	100	psig	
Final Flowing Press.	180	psig	
Sampling Press. Range	80	psig	
FSIP	didn't wait		
FHP	4254.78		
Form. Press. (Horner)			
C. TEMPERATURE			
Depth Tool Reached	2619	m	m
Max. Rec. Temp.	186°F	°F	°F
Time Circ. Stopped	23.40 26/12	hrs	hrs
Time since Circ.		hrs	hrs
Form. Temp. (Horner)			
D. SAMPLE RECOVERY			
Surface Pressure	18	psia	
Amt Gas	-	cu. ft.	
Amt Oil	-	litre	
Amt Water/Filtrite	100 m	litre	
Amt Others			
E. SAMPLE PROPERTIES			
Gas Composition			
C1	-	ppm	
C2	-	ppm	
C3	-	ppm	
1C4/nC4	-	ppm	
C5	-	ppm	
C6+	-	ppm	
CO_2/H_2S	-	ppm	
Oil Properties	°API @	°C	
Colour			
Fluorescence			
GOR		SCF/STB	
Water Properties			
Resistivity			
NaCl Equivalent			
Cl-titrated	6K	ppm	
NO_3	20	ppm	
Est. Water Type pH	pH = 9.0		
Mud Properties			
Resistivity	pH = 9.8		
NaCl Equivalent	NO_3 = 160		
Cl - titrated	16,000	ppm	
Calibration			
Calibration Press.			
Calibration Temp.			
Hewlett Packard No.	2120A		
Mud Weight	9.6		
Calc. Hydrostatic	-		
RFT Chokesize	0.03		
Remarks:	Very tight - given as free sample		Not opened

RFT SAMPLE TEST REPORT

WELL: Wirrah-3 (6623f/22)

OBSERVER: Finlayson/Neumann DATE: December 28, 1983 RUN: 18

	CHAMBER 1 (22.7 litres)		CHAMBER 2 (10.4 litres)	
SEAT NO. 18/97	18/97		18/97	
DEPTH	2645.0		2645.0	
A. RECORDING TIMES				
Tool Set AM	3.01.24		-	
Pretest Open	3.03.28		-	
Time Open	1.23		-	
Chamber Open	3.10.31		4.11.08	
Chamber Full	Not filled		4.23.00	
Fill Time	-		11.56	
Start Build-up	-			
Finish Build-up	-		didn't wait	
Build-Up Time	-		-	
Seal Chamber	4.09.56		4.35.28	
Tool Retract			4.19.16	
Total Time	1 hr 32 secs.		28 mins 16 secs	
B. SAMPLE PRESSURES				
IHP	4393.35	psia		
ISIP	3808.19	psia		
Initial Flowing Press.	736.0	psia	242.00	psia
Final Flowing Press.	1600.61	psia	430.00	psia
Sampling Press. Range	1366.61	psia	198.00	psia
FSIP		psia		psia
FHP			4395.03	
Form. Press. (Horner)				
C. TEMPERATURE				
Depth Tool Reached	2640.0	m		m
Max. Rec. Temp.	190	°F		°F
Time Circ. Stopped	1700 hrs 27/12	hrs		hrs
Time since Circ.	10 hrs 10 mins		10 hrs 10 mins	
Form. Temp. (Horner)				
D. SAMPLE RECOVERY				
Surface Pressure	200	psig	375	psig
Amt Gas	0.6	cu. ft.	0.3	cu. ft.
Amt Oil	-	litre	-	litre
Amt Water	17	litre	1.5	litre
Amt Others				
E. SAMPLE PROPERTIES				
Gas Composition				
C1	65,945	ppm	64,071	ppm
C2	7,347	ppm	6,903	ppm
C3	1,669	ppm	1,246	ppm
1C4/nC4	56	ppm	36	ppm
C5	Trace	ppm	Trace	ppm
C6+	-	ppm	-	ppm
CO_2/H_2S	2%/Nil	ppm	2%/Nil	ppm
Oil Properties	°API @	°C		
Colour				
Fluorescence				
GOR				
Water Properties				
Resistivity	pH = 7.1		pH = 8.3	
NaCl Equivalent	-		-	
Cl-titrated	16,000	ppm	16,000	ppm
NO_3	66	ppm	40	ppm
Est. Water Type pH				
Mud Properties				
Resistivity	pH = 9.8		pH = 9.8	
NaCl Equivalent	NO_3 = 120		NO_3 = 120	
Cl - titrated	16,000	ppm	16,000	ppm
Calibration				
Calibration Press.	-		-	
Calibration Temp.	-		-	
Hewlett Packard No.	21.9			
Mud Weight	9.6	ppg	9.6	ppg
Calc. Hydrostatic				
RFT Chokesize	0.03		0.02	
Remarks:			Tool stuck 25 mins. after taking sample.	

RFT SAMPLE TEST REPORT

WELL: Wirrah-3 (6623f/23)

OBSERVER: Finlay/Neumann DATE: December 28, 1983 RUN: 19

	CHAMBER 1 (22.7 litres)		CHAMBER 2 (10.4 litres)	
SEAT NO.	19/98		19/98	
DEPTH	2645.0		2645.0	
A. RECORDING TIMES				
Tool Set AM	8.08.54		-	
Pretest Open			-	
Time Open	6.27		-	
Chamber Open	15.37		9 .55	
Chamber Full	915.00		940.00	
Fill Time	59.23		17.05	
Start Build-up	9.15.00		9.40.00	
Finish Build-up	didn't wait		-	
Build-Up Time	-		-	
Seal Chamber	9.21.0		9.47.45	
Tool Retract	-		9.50.30	
Total Time	1.12.26 hrs		27.35 hrs.	
B. SAMPLE PRESSURES				
IHP	4398.14	psia	-	
ISIP	3807.43	psia	-	
Initial Flowing Press.	78	psia	288	psia
Final Flowing Press.	1300	psia	300	psia
Sampling Press. Range	-	psia	17	psia
FSIP	-	psia	didn't wait	psia
FHP	-		4393.23	
Form. Press. (Horner)	-		-	
C. TEMPERATURE				
Depth Tool Reached	2645.0	m	3644.0	m
Max. Rec. Temp.	197	°F	197	°F
Time Circ. Stopped	1700 hrs 27/12	hrs	1700 hrs 27/12	hrs
Time since Circ.		hrs		hrs
Form. Temp. (Horner)				
D. SAMPLE RECOVERY				
Surface Pressure	460	psig	500	psig
Amt Gas	1.5	cu. ft.	2.5	cu. ft.
Amt Oil	-	litre		
Amt Water	21.5	litre	9.78	litre
Amt Others				
E. SAMPLE PROPERTIES				
Gas Composition				
C1	184,647	ppm		
C2	9,184	ppm		
C3	1,752	ppm		
1C4/nC4	269	ppm		
C5	30	ppm		
C6+	-	ppm		
CO_2/H_2S	0.8%/Nil	ppm		
Oil Properties	°API @	°C		
Colour				
Fluorescence				
GOR				
Water Properties				
Resistivity	pH = 6.7		pH = 6.7	
NaCl Equivalent				
Cl-titrated	16,000	ppm	17,000	ppm
NO_3	40	ppm	32	ppm
Est. Water Type pH				
Mud Properties				
Resistivity	pH = 9.8		pH = 9.8	
NaCl Equivalent	NO_3 = 120		NO_3 = 120	
Cl - titrated	16,000	ppm	16,000	ppm
Calibration				
Calibration Press.				
Calibration Temp.				
Hewlett Packard No.	2120A		2120A	
Mud Weight	ppg		ppg	
Calc. Hydrostatic				
RFT Chokesize	0.03		0.02	

Remarks:

RFT SAMPLE TEST REPORT

WELL: Wirrah-3 (6623f/24)
OBSERVER: L. Finlayson DATE: December 29, 1983 RUN: 20

	CHAMBER 1 (22.7 litres)		CHAMBER 2 (10.4 litres)	
SEAT NO. 20/99				
DEPTH	2753.1		2753.1	
A. RECORDING TIMES				
Tool Set	6.29.00		-	
Pretest Open	6.29.15		-	
Time Open	0.15		-	
Chamber Open	6.30.30		6.49.00	
Chamber Full	5.44.45		6.56.00	
Fill Time	14.15		7.00	
Start Build-up	6.44.45		6.56.00	
Finish Build-up	-		-	
Build-Up Time	-		-	
Seal Chamber	6.47.30		6.50.00	
Tool Retract	-		7.04.00	
Total Time			0.35.00	hrs
B. SAMPLE PRESSURES				
IHP	4576.0	psia	-	
ISIP	3941.9	psia	-	
Initial Flowing Press.	102.8	psia	2030.2	psia
Final Flowing Press.	2441.7	psia	2020.3	psia
Sampling Press. Range	2338.9	psia	9.9	psia
FSIP		psia	3933.4	psia
FHP			4575.0	psia
Form. Press. (Horner)	-		-	
C. TEMPERATURE				
Depth Tool Reached	2753.1	m	2753.1	m
Max. Rec. Temp.		°F		°F
Time Circ. Stopped		hrs		hrs
Time since Circ.	65	hrs		hrs
Form. Temp. (Horner)				
D. SAMPLE RECOVERY				
Surface Pressure	600	psia	1190	psia
Amt Gas	2.0	cu. ft.	4.0	cu. ft.
Amt Oil	oil scum	litre	2.0	litre
Amt Water	22.0	litre	7.5	litre
Amt Others				
E. SAMPLE PROPERTIES				
Gas Composition				
C1	253,890	ppm	260,485	ppm
C2	24,245	ppm	26,817	ppm
C3	2,235	ppm	6,676	ppm
1C4/nC4	962	ppm	1,242	ppm
C5	574	ppm	393	ppm
C6+	44	ppm	30	ppm
CO_2/H_2S	0.3%/Nil	ppm	0.4%/Nil	ppm
Oil Properties	°API @	°C		
Colour	Dark Brown			
Fluorescence	Bright yellow/white			
GOR				
Water Properties				
Resistivity	pH = 7.0		pH = 6.7	
NaCl Equivalent				
Cl-titrated	14,000	ppm	13,000	ppm
NO_3	80	ppm	60	ppm
Est. Water Type pH				
Mud Properties	NO_3 = pH =			
Resistivity				
NaCl Equivalent				
Cl - titrated				
Calibration	pH = 10.1		pH = 10.1	
Calibration Press.				
Calibration Temp.				
Hewlett Packard No.				
Mud Weight	9.6	ppg	9.6	ppg
Calc. Hydrostatic				
RFT Chokesize	0.03		0.02	

Remarks:

RFT SAMPLE TEST REPORT

WELL: Wirrah-3 (6623f/25)

OBSERVER: L. Finlayson DATE: December 29, 1983 RUN: 21

	CHAMBER 1 (22.7 litres)		CHAMBER 2 (10.4 litres)	
SEAT NO.	21/101		21/101	
DEPTH	2627.1		2627.1	
A. RECORDING TIMES				
Tool Set	10.44.00		-	
Pretest Open	10.44.15		-	
Time Open	2.45		-	
Chamber Open	12.43.00		11.48.15	
Chamber Full	-		12.22.05	
Fill Time	-		33.45	
Start Build-up	-		12.22.00	
Finish Build-up	-		-	
Build-Up Time	-		-	
Seal Chamber	11.47.30		12.24.15	
Tool Retract	-		-	
Total Time				
B. SAMPLE PRESSURES				
IHP	4370.5	psia	-	psia
ISIP	3798.4	psia	-	psia
Initial Flowing Press.	710.3	psia	185.3	psia
Final Flowing Press.	687.9	psia	1355.8	psia
Sampling Press. Range	22.4	psia	1167.5	psia
FSIP	-	psia	-	psia
FHP	-		4370.8	psia
Form. Press. (Horner)				
C. TEMPERATURE				
Depth Tool Reached		m		m
Max. Rec. Temp.	200	°F	200	°F
Time Circ. Stopped		hrs		hrs
Time since Circ.		hrs		hrs
Form. Temp. (Horner)				
D. SAMPLE RECOVERY				
Surface Pressure	80	psia	470	psia
Amt Gas	0.5	cu. ft.	0.4	cu. ft.
Amt Oil	TR Oil Scum	litre	TR Oil Scum	
Amt Water	18.5	litre	9.75	litre
Amt Others	-		-	
E. SAMPLE PROPERTIES				
Gas Composition				
C1	Sample Too Small	ppm	12,256	ppm
C2		ppm	1041	ppm
C3		ppm	202	ppm
1C4/nC4		ppm	86	ppm
C5		ppm	Trace	
C6+		ppm	-	
CO_2/H_2S		ppm	0.32	
Oil Properties	°API @	°C		
Colour				
Fluorescence				
GOR				
Water Properties				
Resistivity	pH = 8.7		pH = 8.7	
NaCl Equivalent				
Cl-titrated	16,000	ppm	16,000	ppm
NO_3	70	ppm	70	ppm
Est. Water Type pH				
Mud Properties				
Resistivity	pH = 10.1 NO_3 = 140			
NaCl Equivalent				
Cl - titrated	5,000	ppm		
Calibration				
Calibration Press.				
Calibration Temp.				
Hewlett Packard No.	2120A		2120A	
Mud Weight	9.6	ppg	9.6	ppg
Calc. Hydrostatic				
RFT Chokesize	0.03		0.02	

Remarks:

RFT SAMPLE TEST REPORT

WELL: Wirrah-3 (6623f/26)
OBSERVER: L. Finlayson DATE: December 29, 1983 RUN: 22

	CHAMBER 1 (22.7 litres)		CHAMBER 2 (10.4 litres)	
SEAT NO.	22/103		22/103	
DEPTH	2627.3		2627.3	
A. RECORDING TIMES				
Tool Set	3.34.00		-	
Pretest Open	3.39.15		-	
Time Open	-		-	
Chamber Open	3.40.45		4.41.30	
Chamber Full	-		5.23.00	
Fill Time	-		35.50	
Start Build-up	-		5.23.00	
Finish Build-up	-		-	
Build-Up Time	-		-	
Seal Chamber	4.40.30		2.23.30	
Tool Retract	-		5.24.30	
Total Time				
B. SAMPLE PRESSURES				
IHP	4357.9	psia	-	
ISIP	3795.2	psia	-	
Initial Flowing Press.	73.0	psia	170.3	psia
Final Flowing Press.	637.4	psia	2717.4	psia
Sampling Press. Range	564.4	psia	2547.1	psia
FSIP	-	psia	-	psia
FHP	-		4369.4	
Form. Press. (Horner)				
C. TEMPERATURE				
Depth Tool Reached	2627	m	2627	m
Max. Rec. Temp.	102	°F	209	°F
Time Circ. Stopped		hrs		hrs
Time since Circ.		hrs		hrs
Form. Temp. (Horner)				
D. SAMPLE RECOVERY				
Surface Pressure	800	psig	400	psig
Amt Gas	0.6	cu. ft.	0.5	cu. ft.
Amt Oil	Slight Oil Scum	litre	-	litre
Amt Water	16.25	litre	9.5	litre
Amt Others				
E. SAMPLE PROPERTIES				
Gas Composition				
C1	184846	ppm	333025	ppm
C2	23959	ppm	36266	ppm
C3	3546	ppm	6050	ppm
1C4/nC4	165	ppm	623	ppm
C5	TR	ppm	30	ppm
C6+	-	ppm	-	ppm
CO_2/H_2S	0/-	ppm	0.1%/-	
Oil Properties	°API @	°C		
Colour				
Fluorescence				
GOR		SCF/STB		
Water Properties				
Resistivity	pH = 74		pH = 6.9	
NaCl Equivalent				
Cl-titrated	16000	ppm	16000	ppm
NO_3	66	ppm	50	ppm
Est. Water Type pH				
Mud Properties				
Resistivity	pH = 10.1 NO_3 = 140		pH = 10.1 NO_3 = 140	
NaCl Equivalent				
Cl - titrated	16,000	ppm	16,000	ppm
Calibration				
Calibration Press.				
Calibration Temp.				
Hewlett Packard No.	2120A		2120A	
Mud Weight	ppg		ppg	
Calc. Hydrostatic				
RFT Chokesize	0.02		0.02	

Remarks: Good pretest

(6623f/27)

WELL: Wirrah-3
OBSERVER: M. Fittall/M.J. O'Byrne DATE: January 1, 1984 RUN: RFT-25

	CHAMBER 1 (22.7 litres)		CHAMBER 2 (10.4 litres)	
SEAT NO.	25/170		25/170	
DEPTH	2785.5m		2785.5m	
A. RECORDING TIMES				
Tool Set	3.45.00			
Pretest Open	3.51.00			
Time Open	6.00			
Chamber Open	3.53.30		4.14.30	
Chamber Full	4.07.00		4.16.45	
Fill Time	14.30		2.15	
Start Build-up	4.07.00		4.16.45	
Finish Build-up	4.13.00		4.26.15	
Build-Up Time	6.00		9.30	
Seal Chamber	4.13.00		4.26.15	
Tool Retract			4.27.25	
Total Time	22.00 mins		12.45 mins	
B. SAMPLE PRESSURES				
IHP	4573.2	psia	-	
ISIP	3988.2	psia	-	
Initial Flowing Press.	145.2	psia	1281.09	psia
Final Flowing Press.	3977.0	psia	1300.42	psia
Sampling Press. Range	3831.8	psia	119.33	psia
FSIP	3977.2	psia	3975.36	psia
FHP			4568.60	psia
Form. Press. (Horner)				
C. TEMPERATURE				
Depth Tool Reached	2785.5	m		m
Max. Rec. Temp.	215	°F		°F
Time Circ. Stopped	0915 (2/1/84)	hrs		hrs
Time since Circ.		hrs		hrs
Form. Temp. (Horner)				
D. SAMPLE RECOVERY				
Surface Pressure	1250	psig	1100	psig
Amt Gas	24.82	cfg	15.30	cfg
Amt Oil	4.50	litre	4.50	litre
Amt Water	12.40	litre	2.20	litre
Amt Others				
E. SAMPLE PROPERTIES				
Gas Composition				
C1	228380	ppm	296570	ppm
C2	43084	ppm	51701	ppm
C3	2957	ppm	3415	ppm
1C4/nC4	163	ppm	294	ppm
C5	TR	ppm	TR	ppm
C6+	-	ppm	-	ppm
CO_2/H_2S	1.3%/4	ppm	1.4%/8	ppm
Oil Properties	36.0 °API @ 60	°F	35.4 °API 60	°F
Colour	Red brown, waxy		Red brown, waxy	
Fluorescence	Bright cream yellow		Bright cream yellow	
GOR/Pour Point	877/26.0 °C		540/21°C	
Water Properties				
Resistivity	0.264 @ 73°F		0.251 @ 73°F	
NaCl Equivalent				
Cl-titrated	12000	ppm	12000	ppm
NO_3	40	ppm	45	ppm
Est. Water Type pH	pH = 6.5		pH = 6.5	
Mud Properties	NO_3 = pH =			
Resistivity	0.225 @ 86°F			
NaCl Equivalent				
Cl - titrated	16,000/160	ppm		
Calibration				
Calibration Press.				
Calibration Temp.				
Hewlett Packard No.				
Mud Weight	9.6	ppg		ppg
Calc. Hydrostatic				
RFT Chokesize	0.02 inch			

Remarks:

ERVICE COMPANY: Schlumberger

RFT RUN NO.: 1, 2, 3

WELL: Wirrah-3
DATE: December 12, 1983
OBSERVERS: M. Fittall/P. Priest

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP		FORMATION PRESSURE		FHP		TEST RESULT
							psi	ppg	psi	ppg	psi	ppg	
1/22	2147.3	2126.3	PT	HP	Y	psia	3586.8	9.77	3044.0	8.33	3587.9	9.77	Valid
				SCH	Y	psig	3571.0	9.73	3028.0	8.33	3570.0	9.73	
1/23	2144.5	2123.5	PT	HP	Y	psia	3583.1	9.77	3040.1	8.33	308.0		Valid
				SCH	Y	psig	3566.0	9.72	3024.0	8.33	3566.0	9.72	
1/24	2142.0	2121.0	PT	HP	Y	psia	3578.9	9.77	3037.5	8.38	3578.9	9.77	Valid
				SCH	Y	psig	3561.0	9.72	3021.0	8.33	3560.0	9.72	
2/25	2348.7	2327.7	SPT	HP	Y	psia	3922.7				3924.8		Tight
				SCH	Y	psig	3905.0		(270 FP)		3906.0		
2/26	2349.2	2328.2	SPT	HP	Y	psia	3921.7		3599.9				Supercharged. Opened chambers - did not fill.
				SCH	Y	psig	3907.0		3584.0				
3/27	2349.1	2328.1	SPT	HP	Y	psia	3929.1		3601.8		3925.6		Tight
				SCH	Y	psig	3904.0		3583.0		3906.0		
3/28	2349.2	2328.2	SPT	HP	Y	psia	3925.6		3338.6		3922.2		Tight, partially filled 6 gallons.
				SCH	Y	psig	3905.5		3319.0				

. Pressure Test = PT
Sample and Pressure Test = SPT
. Gauges = SCH = Schlumberger Strain Gauge
= HP = Hewlett Packard

3. Yes = Y
No = N
4. PSIA = A
PSIG = G

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi higher than HP gauge at surface.

RFT PRETEST PRESSURES

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 3, 4

WELL: Wirrah-3
DATE: December 13, 1983
OBSERVERS: M. Fittall/P. Priest

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
3/29	2349.3	2328.3	SPT	HP	Y	psia	3922.2				3921.1		Seal failure
				SCH	Y	psig	3906.0						
3/30	2349.0	2328.0	SPT	HP	Y	psia	3921.1				3923.4		Tight
				SCH	Y	psig	3902.0		(800 FP)				
3/31	2349.2	2328.2	SPT	HP	Y	psia	3922.2		2548.3				Tight, opened 6 gallon chamber.
				SCH	Y	psig	3904.0		(1760 FP)				
3/32	2142.0	2121.0	SPT	HP	Y	psia	3562.4		3029.8		3576.6		Opened 2-3/4 gallon chamber.
				SCH	Y	psig	3565.0		3028.5		3565.0		
4/33	2022.0	2001.0	SPT	HP	Y	psia	3380.0		2876.1		3380.0		Tight - 6 gallon chamber not building up.
				SCH	Y	psig	3362.0		2858.5		3363.0		
4/34	2022.2	2001.2	SPT	HP	Y	psia	3080.5		2869.9		3080.1		Valid pre-test. Very slow. 6 gallon chamber build-up.
				SCH	Y	psig	3365.0		2852.5				
4/34A	2024.7			HP	Y	psia			2873.5				Did not sample due to tightness.
				SCH	Y	psig			2860.0				
4/35	2023.7	2002.7	SPT	HP	Y	psia	3380.3		2872.3				Valid pre-test. Filled 6 gallon
chamber.				SCH	Y	psig	3368.5		2869.5				

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

KB = 21 m (Southern Cross)

Note: Schlumberger gauge reading up to 1000 psi higher than HP gauge at surface.

RFT PRETEST PRESSURES

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 10, 11, 12, 13, 14

WELL: Wirrah-3
DATE: December 25, 1983
OBSERVERS: Finlayson/Neumann

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON [1] FOR TEST	GAUGE [2]	TEMP [3] CORR.	UNITS [4]	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
10/68	2207.8	2686.8	SPT	HP	Y	psia	4498.05	9.7	3879.83	8.4	4494.48	9.8	Sample
				SCH	Y	psig							
11/69	2687.5	2666.5	SPT	HP	Y	psia	4464.38	9.7	3854.88	8.46	4462.03	9.7	Sample
				SCH	Y	psig							
12/70	2672.0	2651.0	SPT	HP	Y	psia	4440.8	9.7	3839.7	8.5	4434.2	9.7	Sample
				SCH	Y	psig							
13/71	2694.5	2673.5	PT	HP	Y	psia	4475.7	9.7	3859.6	8.4	4474.9	9.7	Valid
				SCH	Y	psig	4454.0	9.7	3820.0	8.4	4454.0	9.7	
13/72	2672.0	2651.0	SPT	HP	Y	psia	4433.7	9.7	3831.7	8.5	4434.5	9.7	Valid
				SCH	Y	psig							
14/73	2644.5	2623.5	SPT	HP	Y	psia	4395.83	9.7			4395.41	9.7	Seal failure
				SCH	Y	psig							
14/74	2644.5	2623.5	SPT	HP	Y	psia	4396.0	9.7			4395.5	9.7	Tight
				SCH	Y	psig							

1. Pressure Test = PT
   Sample and Pressure Test = SPT
2. Gauges = SCH = Schlumberger Strain Gauge
   = HP = Hewlett Packard

3. Yes = Y
   No = N
4. PSIA = A
   PSIG = G

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi higher than HP gauge at surface.

RFT PRETEST PRESSURES (6/9/1)

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 14, 15, 16

WELL: Wirrah-3
DATE: December 26, 1983
OBSERVERS: Finlayson/Neumann

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP		FORMATION PRESSURE		FHP		TEST RESULT
							psi	ppg	psi	ppg	psi	ppg	
14/75	2645.0	2624.0	SPT	HP	Y	psia	4395.16	9.7			4395.24	9.7	Tight
				SCH	Y	psig							
14/76	2684.5	2623.5	SPT	HP	Y	psia	4393.61	9.7	3798.21	8.5	4393.76	9.7	Tight
				SCH	Y	psig							
14/77	2644.7	2623.7	SPT	HP	Y	psia	4393.72	9.7	3805.07	8.5	4396.6	9.7	Sample
				SCH	Y	psig							
15/78	2622.0	2601.0	SPT	HP	Y	psia	4357.51	9.7			4357.26	9.7	Seal failure
				SCH	Y	psig							
15/79	2622.0	2601.0	SPT	HP	Y	psia	4356.74	9.7	3777.63	8.5	4357.39	9.7	Sample
				SCH	Y	psig							
16/80	2557.5	2536.5	PT	HP	Y	psia	4252.96	9.7			4252.89	9.7	Seal failure
				SCH	Y	psig							
16/81	2551.6	2536.6	PT	HP	Y	psia	4253.89	9.7			4255.10	9.7	Tight
				SCH	Y	psig							

1. Pressure Test = PT
   Sample and Pressure Test = SPT
2. Gauges = SCH = Schlumberger Strain Gauge
   = HP = Hewlett Packard

3. Yes = Y
   No = N
4. PSIA = A
   PSIG = G

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi higher than HP gauge at surface.

RFT PRETEST PRESSURES

(6797f)

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 17, 18

WELL: Wirrah-3
DATE: December 27, 1983
OBSERVERS: Finlayson/Neumann

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
17/89	2569.1	2548.1	PT	HP	Y	psia	4253.41	9.7			4253.84	9.7	Tight
				SCH	Y	psig							
17/90	2569.5	2548.5	SPT	HP	Y	psia	4254.07	9.7			4255.93	9.7	Tight
				SCH	Y	psig							
17/91	2569.4	2548.9	SPT	HP	Y	psia	4253.64	9.7			4255.15	9.7	Tight
				SCH	Y	psig							
17/92	2575.0	2355.0	SPT	HP	Y	psia	4263.72	9.7			4262.76	9.7	Seal failure
				SCH	Y	psig							
17/93	2573.5	2322.5	SPT	HP	Y	psia	4259.71	9.7			4261.50	9.7	Seal failure
				SCH	Y	psig							
17/93A	2569.0	2548.0	SPT	HP	Y	psia	4254.79	9.7			4254.78	9.7	Partial sample in 6 gallon chamber - tight.
				SCH	Y	psig							
18/94	2644.5	2623.5	SPT	HP	Y	psia	4394.16	9.7			4394.20	9.7	Tight
				SCH	Y	psig							

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

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi higher than HP gauge at surface.

SERVICE COMPANY: Schlumberger   RFT RUN NO.: 18, 19, 20, 21   WELL: Wirrah-3
DATE: December 28, 1983
OBSERVERS: Finlayson/Neumann

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
18/95	2644.7	2623.7	SPT	HP	Y	psia	4393.85	9.7			4393.86	9.7	Tight
				SCH	Y	psig							
18/96	2644.6	2623.6	SPT	HP	Y	psia	4392.45	9.7			4393.38	9.7	Tight
				SCH	Y	psig							
18/97	2645.0	2624.0	SPT	HP	Y	psia	4393.35	9.7	3808.19	8.5	4395.03	9.7	Sample
				SCH	Y	psig							
19/98	2645.0	2624.0	SPT	HP	Y	psia	4398.14	9.7	3807.43	8.5	4393.23	9.7	Sample
				SCH	Y	psig							
20/99	2753.1	2732.1	SPT	HP	Y	psia	4576.03	9.7	3941.9	8.4	4575.0	9.7	Sample
				SCH	Y	psig							
21/100	2627.0	2606.0	SPT	HP	Y	psia	4369.4	9.7	3820.0	8.5	4370.7	9.7	Valid
				SCH	Y	psig							
21/101	2627.1	2606.1	SPT	HP	Y	psia	4370.5	9.7	3748.4	8.5	4370.8	9.7	Sample
				SCH	Y	psig							

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

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi higher than HP gauge at surface.

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 22, 23

WELL: Wirrah-3
DATE: December 28, 1983
OBSERVERS: Finlayson/Neumann

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP		FORMATION PRESSURE		FHP		TEST RESULT
							psi	ppg	psi	ppg	psi	ppg	
22/102	2627.1	2606.1	SPT	HP	Y	psia	4367.6	9.7	3796.1	8.5	4368.3	9.7	Valid - tight
				SCH	Y	psig							
22/103	2627.2	2606.2	SPT	HP	Y	psia	4367.7	9.7	3795.2	8.5	4369.4	9.7	Valid - sample
				SCH	Y	psig							
23/104	2944.0	2923.0	PT	HP	Y	psia	4826.5	9.6					Seal failure
				SCH	Y	psig	4809.0						
23/105	2943.5	2922.5	PT	HP	Y	psia	4827.7	9.6					Seal failure
				SCH	Y	psig	4805.0						
23/106	2943.7	2922.7	PT	HP	Y	psia	4830.2	9.6					Seal failure
				SCH	Y	psig	4807.0						
23/107	2785.5	2764.5	PT	HP	Y	psia	4540.5						Seal failure
				SCH	Y	psig							
23/108	2785.3	2764.3	PT	HP	Y	psia	4555.6	9.56	3976.1	8.38	4564.3		Valid
				SCH	Y	psig			3984.0		4552.0		

1. Pressure Test = PT
   Sample and Pressure Test = SPT
2. Gauges = SCH = Schlumberger Strain Gauge
   = HP = Hewlett Packard

3. Yes = Y
   No = N
4. PSIA = A
   PSIG = G

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi higher than HP gauge at surface.

RFT PRETEST PRESSURES

(6797f)

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 1

WELL: Wirrah-3
DATE: December 12, 1983
OBSERVERS: M. Fittall/P. Priest

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
1/1	2395.4	2374.4	PT	HP	Y	psia	4007.7	9.78	3402.1	8.34	4005.9	9.78	Valid
				SCH	Y	psig	3989.0	9.74	3387.0	8.34	3989.0	9.74	
1/2	2349.1	2328.1	PT	HP	Y	psia	3923.6	9.77	3616.8	9.05	3924.1	9.77	Tight Supercharged
				SCH	Y	psig	3910.0	9.73	3602.0	9.05	3909.0	9.73	
1/3	2339.5	2318.5	PT	HP	Y	psia	3908.4	9.77	3317.1	8.33	3910.3	9.77	Valid
				SCH	Y	psig	3894.0		3302.0		3984.0		
1/4	2314.3	2293.3	PT	HP	Y	psia	3868.2	9.77	3280.4	8.33	3867.5	9.77	Valid
				SCH	Y	psig	3852.0		3267.0		3853.0		
1/5	2282.6	2261.6	PT	HP	Y	psia	3813.9	9.77	3238.1	8.33	3814.2	9.77	Valid
				SCH	Y	psig	3800.0		3225.0		3800.0		
1/6	2274.2	2253.2	PT	HP	Y	psia	3800.7	9.77	3300.1	8.53	3799.4	9.77	Supercharged?
				SCH	Y	psig	3785.0		3287.0		3785.0		
1/7	2243.6	2222.6	PT	HP	Y	psia	3747.8	9.77	3179.3	8.33	3747.6	9.77	Valid
				SCH	Y	psig	3735.0	9.74	3169.0	8.34	3734.0	9.73	

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

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi higher than HP gauge at surface.

RFT PRETEST PRESSURES (6797f)

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 1

WELL: Wirrah-3
DATE: December 12, 1983
OBSERVERS: M. Fittall/P. Priest

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
1/8	2080.8	2059.8	PT	HP	Y	psia	3476.5	9.77	2947.13	8.33	347.0	9.77	Valid
				SCH	Y	psig	3468.0	9.75	2940.0	8.35	3469.0	9.75	
1/9	2052.5	2031.5	PT	HP	Y	psia	3430.5	9.77	2908.5	8.33	3430.5	9.77	Valid
				SCH	Y	psig	3419.0	9.74	2899.0	8.35	3419.0	9.74	
1/10	2030.8	2009.8	PT	HP	Y	psia	3394.4	9.77	2877.7	8.33	3394.3	9.77	Valid
				SCH	Y	psig	3385.0	9.75	2868.0	8.35	3385.0	9.75	
1/11	2028.1	2007.1	PT	HP	Y	psia	3390.8	9.78	2874.8	8.33	3390.2	9.78	Valid
				SCH	Y	psig	3382.0	9.75	2866.0	8.35	3382.0	9.75	
1/12	2023.7	2002.7	PT	HP	Y	psia	3383.6	9.78	2872.7	8.35			Valid
				SCH	Y	psig	3372.0	9.74	2862.0	8.36	3372.0	9.74	
1/13	1810.5	1789.5	PT	HP	Y	psia	3028.3	9.78	2551.4	8.29			Valid
				SCH	Y	psig	3019.0	9.75	2544.0	8.31	3020.0	9.75	
1/14	1798.6	1777.6	PT	HP	Y	psia	3009.0	9.78	2535.7	8.29	3009.3	9.78	Valid
				SCH	Y	psig	2998.0	9.75	2525.0	8.31	2997.0	9.74	

1. Pressure Test = PT
   Sample and Pressure Test = SPT
2. Gauges = SCH = Schlumberger Strain Gauge
   = HP = Hewlett Packard

3. Yes = Y
   No = N
4. PSIA = A
   PSIG = G

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi higher than HP gauge at surface.

RFT PRETEST PRESSURES (6797f)

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 1

WELL: Wirrah-3
DATE: December 12, 1983
OBSERVERS: M. Fittall/P. Priest

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
1/15	1780.2	1759.2	PT	HP	Y	psia	2978.1	9.78	2509.7	8.29	2978.2	9.78	Valid
				SCH	Y	psig	2966.0	9.74	2500.0	8.31	2966.0	9.74	
1/16	1600.7	1579.7	PT	HP	Y	psia	2679.3	9.79					Blockage in sampling line?
				SCH	Y	psig	2667.0						
1/17	1600.7	1579.7	PT	HP	Y	psia			2255.3	8.29	2679.5	9.79	Valid
				SCH	Y	psig			2242.0	8.30	2663.0	9.73	
1/18	1577.8	1556.8	PT	HP	Y	psia	2641.0	9.79	2220.4	8.29			Valid
				SCH	Y	psig	2627.0	9.74	2208.0	8.29	2626.0	9.73	
1/19	1535.0	1514.0	PT	HP	Y	psia	2569.6	9.79	2160.4	8.29	2569.7	9.79	Valid
				SCH	Y	psig	2555.0	9.73	2153.0	8.32	2555.0	9.73	
1/20	1532.2	1511.2	PT	HP	Y	psia	2564.9	9.79	2157.1	8.29	2564.9	9.79	Valid
				SCH	Y	psig	2549.0	9.73	2156.0	8.34	2549.0	9.73	
1/21	2278.5	2257.5	PT	HP	Y	psia	3804.5	9.77	3241.7	8.36	3804.7	9.77	Valid
				SCH	Y	psig	3782.0	9.71	3221.0	8.34	3782.0	9.71	

1. Pressure Test = PT
   Sample and Pressure Test = SPT
[redacted] Gauges [redacted] SCH [redacted] Schlumberger Strain Gauge [redacted]
= HP = Hewlett Packard

3. Yes = Y
   No = N
[redacted] PSIA = A [redacted]
PSIG = G

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading [redacted] to 1000 psi [redacted]
higher than HP gauge at surface.

RFT PRETEST PRESSURES (6797f)

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 1, 2, 3

WELL: Wirrah-3
DATE: December 12, 1983
OBSERVERS: M. Fittall/P. Priest

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
1/22	2147.3	2126.3	PT	HP	Y	psia	3586.8	9.77	3044.0	8.33	3587.9	9.77	Valid
				SCH	Y	psig	3571.0	9.73	3028.0	8.33	3570.0	9.73	
1/23	2144.5	2123.5	PT	HP	Y	psia	3583.1	9.77	3040.1	8,33	308.0		Valid
				SCH	Y	psig	3566.0	9.72	3024.0	8.33	3566.0	9.72	
1/24	2142.0	2121.0	PT	HP	Y	psia	3578.9	9.77	3037.5	8.38	3578.9	9.77	Valid
				SCH	Y	psig	3561.0	9.72	3021.0	8.33	3560.0	9.72	
2/25	2348.7	2327.7	SPT	HP	Y	psia	3922.7				3924.8		Tight
				SCH	Y	psig	3905.0		(270 FP)		3906.0		
2/26	2349.2	2328.2	SPT	HP	Y	psia	3921.7		3599.9				Supercharged. Opened chambers - did not fill.
				SCH	Y	psig	3907.0		3584.0				
3/27	2349.1	2328.1	SPT	HP	Y	psia	3929.1		3601.8		3925.6		Tight
				SCH	Y	psig	3904.0		3583.0		3906.0		
3/28	2349.2	2328.2	SPT	HP	Y	psia	3925.6		3338.6		3922.2		Tight, partially filled 6 gallons.
				SCH	Y	psig	3905.5		3319.0				

1. Pressure Test = PT
   Sample and Pressure Test = SPT
2. Gauges = SCH = Schlumberger Strain Gauge
   = HP = Hewlett Packard

3. Yes = Y
   No = N
4. PSIA = A
   PSIG = G

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi higher than HP gauge at surface.

RFT PRETEST PRESSURES

(6797f)

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 1

WELL: Wirrah-3
DATE: December 12, 1983
OBSERVERS: M. Fittall/P. Priest

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
1/1	2395.4	2374.4	PT	HP	Y	psia	4007.7	9.78	3402.1	8.34	4005.9	9.78	Valid
				SCH	Y	psig	3989.0	9.74	3387.0	8.34	3989.0	9.74	
1/2	2349.1	2328.1	PT	HP	Y	psia	3923.6	9.77	3616.8	9.05	3924.1	9.77	Tight Supercharged
				SCH	Y	psig	3910.0	9.73	3602.0	9.05	3909.0	9.73	
1/3	2339.5	2318.5	PT	HP	Y	psia	3908.4	9.77	3317.1	8.33	3910.3	9.77	Valid
				SCH	Y	psig	3894.0		3302.0		3984.0		
1/4	2314.3	2293.3	PT	HP	Y	psia	3868.2	9.77	3280.4	8.33	3867.5	9.77	Valid
				SCH	Y	psig	3852.0		3267.0		3853.0		
1/5	2282.6	2261.6	PT	HP	Y	psia	3813.9	9.77	3238.1	8.33	3814.2	9.77	Valid
				SCH	Y	psig	3800.0		3225.0		3800.0		
1/6	2274.2	2253.2	PT	HP	Y	psia	3800.7	9.77	3300.1	8.53	3799.4	9.77	Supercharged?
				SCH	Y	psig	3785.0		3287.0		3785.0		
1/7	2243.6	2222.6	PT	HP	Y	psia	3747.8	9.77	3179.3	8.33	3747.6	9.77	Valid
				SCH	Y	psig	3735.0	9.74	3169.0	8.34	3734.0	9.73	

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

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi higher than HP gauge at surface.

RFT PRETEST PRESSURES (6797f)

SERVICE COMPANY: Schlumberger   RFT RUN NO.: 1

WELL: Wirrah-3
DATE: December 12, 1983
OBSERVERS: M. Fittall/P. Priest

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
1/8	2080.8	2059.8	PT	HP	Y	psia	3476.5	9.77	2947.13	8.33	347.0	9.77	Valid
				SCH	Y	psig	3468.0	9.75	2940.0	8.35	3469.0	9.75	
1/9	2052.5	2031.5	PT	HP	Y	psia	3430.5	9.77	2908.5	8.33	3430.5	9.77	Valid
				SCH	Y	psig	3419.0	9.74	2899.0	8.35	3419.0	9.74	
1/10	2030.8	2009.8	PT	HP	Y	psia	3394.4	9.77	2877.7	8.33	3394.3	9.77	Valid
				SCH	Y	psig	3385.0	9.75	2868.0	8.35	3385.0	9.75	
1/11	2028.1	2007.1	PT	HP	Y	psia	3390.8	9.78	2874.8	8.33	3390.2	9.78	Valid
				SCH	Y	psig	3382.0	9.75	2866.0	8.35	3382.0	9.75	
1/12	2023.7	2002.7	PT	HP	Y	psia	3383.6	9.78	2872.7	8.35			Valid
				SCH	Y	psig	3372.0	9.74	2862.0	8.36	3372.0	9.74	
1/13	1810.5	1789.5	PT	HP	Y	psia	3028.3	9.78	2551.4	8.29			Valid
				SCH	Y	psig	3019.0	9.75	2544.0	8.31	3020.0	9.75	
1/14	1798.6	1777.6	PT	HP	Y	psia	3009.0	9.78	2535.7	8.29	3009.3	9.78	Valid
				SCH	Y	psig	2998.0	9.75	2525.0	8.31	2997.0	9.74	

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

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi higher than HP gauge at surface.

RFT PRETEST PRESSURES

(6797f)

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 1

WELL: Wirrah-3
DATE: December 12, 1983
OBSERVERS: M. Fittall/P. Priest

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
1/15	1780.2	1759.2	PT	HP	Y	psia	2978.1	9.78	2509.7	8.29	2978.2	9.78	Valid
				SCH	Y	psig	2966.0	9.74	2500.0	8.31	2966.0	9.74	
1/16	1600.7	1579.7	PT	HP	Y	psia	2679.3	9.79					Blockage in sampling line?
				SCH	Y	psig	2667.0						
1/17	1600.7	1579.7	PT	HP	Y	psia			2255.3	8.29	2679.5	9.79	Valid
				SCH	Y	psig			2242.0	8.30	2663.0	9.73	
1/18	1577.8	1556.8	PT	HP	Y	psia	2641.0	9.79	2220.4	8.29			Valid
				SCH	Y	psig	2627.0	9.74	2208.0	8.29	2626.0	9.73	
1/19	1535.0	1514.0	PT	HP	Y	psia	2569.6	9.79	2160.4	8.29	2569.7	9.79	Valid
				SCH	Y	psig	2555.0	9.73	2153.0	8.32	2555.0	9.73	
1/20	1532.2	1511.2	PT	HP	Y	psia	2564.9	9.79	2157.1	8.29	2564.9	9.79	Valid
				SCH	Y	psig	2549.0	9.73	2156.0	8.34	2549.0	9.73	
1/21	2278.5	2257.5	PT	HP	Y	psia	3804.5	9.77	3241.7	8.36	3804.7	9.77	Valid
				SCH	Y	psig	3782.0	9.71	3221.0	8.34	3782.0	9.71	

1. Pressure Test = PT
   Sample and Pressure Test = SPT
2. Gauges = SCH = Schlumberger Strain Gauge
   [redacted] = [redacted]

3. Yes = Y
   No = N
4. PSIA = A
   [redacted] = G

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi [redacted]er [redacted] H[redacted] gauge [redacted] sur[redacted]

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 1, 2, 3

WELL: Wirrah-3
DATE: December 12, 1983
OBSERVERS: M. Fittall/P. Priest

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON FOR TEST 1	GAUGE 2	TEMP CORR. 3	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
1/22	2147.3	2126.3	PT	HP	Y	psia	3586.8	9.77	3044.0	8.33	3587.9	9.77	Valid
				SCH	Y	psig	3571.0	9.73	3028.0	8.33	3570.0	9.73	
1/23	2144.5	2123.5	PT	HP	Y	psia	3583.1	9.77	3040.1	8.33	308.0		Valid
				SCH	Y	psig	3566.0	9.72	3024.0	8.33	3566.0	9.72	
1/24	2142.0	2121.0	PT	HP	Y	psia	3578.9	9.77	3037.5	8.38	3578.9	9.77	Valid
				SCH	Y	psig	3561.0	9.72	3021.0	8.33	3560.0	9.72	
2/25	2348.7	2327.7	SPT	HP	Y	psia	3922.7				3924.8		Tight
				SCH	Y	psig	3905.0		(270 FP)		3906.0		
2/26	2349.2	2328.2	SPT	HP	Y	psia	3921.7		3599.9				Supercharged. Opened chambers - did not fill.
				SCH	Y	psig	3907.0		3584.0				
3/27	2349.1	2328.1	SPT	HP	Y	psia	3929.1		3601.8		3925.6		Tight
				SCH	Y	psig	3904.0		3583.0		3906.0		
3/28	2349.2	2328.2	SPT	HP	Y	psia	3925.6		3338.6		3922.2		Tight, partially filled 6 gallons.
				SCH	Y	psig	3905.5		3319.0				

1. Pressure Test = PT
   Sample and Pressure Test = SPT
2. Gauges = SCH = Schlumberger Strain Gauge
   = HP = Hewlett Packard

3. Yes = Y
   No = N
4. PSIA = A
   PSIG = G

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi higher than HP gauge at surface.

RFT PRETEST PRESSURES (6797f)

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 3, 4

WELL: Wirrah-3
DATE: December 13, 1983
OBSERVERS: M. Fittall/P. Priest

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
3/29	2349.3	2328.3	SPT	HP	Y	psia	3922.2				3921.1		Seal failure
				SCH	Y	psig	3906.0						
3/30	2349.0	2328.0	SPT	HP	Y	psia	3921.1				3923.4		Tight
				SCH	Y	psig	3902.0		(800 FP)				
3/31	2349.2	2328.2	SPT	HP	Y	psia	3922.2		2548.3				Tight, opened 6 gallon chamber.
				SCH	Y	psig	3904.0		(1760 FP)				
3/32	2142.0	2121.0	SPT	HP	Y	psia	3562.4		3029.8		3576.6		Opened 2-3/4 gallon chamber.
				SCH	Y	psig	3565.0		3028.5		3565.0		
4/33	2022.0	2001.0	SPT	HP	Y	psia	3380.0		2876.1		3380.0		Tight - 6 gallon chamber not building up.
				SCH	Y	psig	3362.0		2858.5		3363.0		
4/34	2022.2	2001.2	SPT	HP	Y	psia	3080.5		2869.9		3080.1		Valid pre-test. Very slow. 6 gallon chamber build-up.
				SCH	Y	psig	3365.0		2852.5				
4/34A	2024.7			HP	Y	psia			2873.5				Did not sample due to tightness.
				SCH	Y	psig			2860.0				
4/35	2023.7	2002.7	SPT	HP	Y	psia	3380.3		2872.3				Valid pre-test. Filled 6 gallon chamber.
				SCH	Y	psig	3368.5		2869.5				

1. Pressure Test = PT
[redacted] Sa [redacted] an [redacted] ess [redacted] Te [redacted] SP [redacted]
2. Gauges = SCH = Schlumberger Strain Gauge

3. Yes = Y
[redacted] N [redacted]
4. PSIA = A

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi

RFT PRETEST PRESSURES

(6/97f)

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 5, 6

WELL: Wirrah-3
DATE: December 13, 1983
OBSERVERS: JR/P. Priest

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
5/36	2029.1	2008.1	SPT	HP	Y	psia	3391.3	9.77					Pre-test seal failure.
				SCH	Y	psig	3374.0	9.72					
5/37	2029.1	2008.1	SPT	HP	Y	psia					3390.6	9.77	Invalid pre-test.
				SCH	Y	psig					3380.0	9.74	
5/38	2029.0	2008.0	SPT	HP	Y	psia	3390.3	9.77	2879.1	8.38			Valid pre-test. Filled 6 gallon and 2-3/4 gallon chambers.
				SCH	Y	psig	3375.0	9.73	2863.0	8.34			
6/39	1600.7	1679.7	SPT	HP	Y	psia	2676.3	9.78	2472.6		2676.2		Valid pre-test. Filled 6 gallon and 2-3/4 gallon chamber.
				SCH	Y	psig	2664.0		2462.0		2667.0		

1. Pressure Test = PT
   Sample and Pressure Test = SPT
2. Gauges = SCH = Schlumberger Strain Gauge
   = HP = Hewlett Packard

3. Yes = Y
   No = N
4. PSIA = A
   PSIG = G

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi higher than HP gauge at surface.

RFT PRETEST PRESSURES

(6797f)

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 7

WELL: Wirrah-3
DATE: December 24, 1983
OBSERVERS: O'Byrne/Finlayson/Neumann

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
7/40	2766.0	2745.0	PT	HP	Y	psia	4594.8	9.7			4597.65	9.7	Tight
				SCH	Y	psig	4572.0	9.7			4571.0	9.7	
7/41	2767.0	2746.0	PT	HP	Y	psia	4597.65	9.7			4599.35	9.7	Tight
				SCH	Y	psig	4571.0	9.7			4571.0	9.7	
7/42	2766.5	2745.5	PT	HP	Y	psia	4594.41	9.7			4595.3	9.7	Seal failure
				SCH	Y	psig	4570.0	9.7			4570.0	9.7	
7/43	2759.3	2738.3	PT	HP	Y	psia	4581.07	9.7	3950.45	8.44	4581.7	9.7	Valid
				SCH	Y	psig	4559.0	9.7	3927.0	8.38	4558.0	9.7	
7/44	2748.0	2727.0	PT	HP	Y	psia	4561.23	9.7	3953.34	8.47	4561.34	9.7	Valid
				SCH	Y	psig	4540.0	9.7	3932.0	8.43	4539.0	9.7	
7/45	2730.2	2709.2	PT	HP	Y	psia	4531.57	9.7	3911.25	8.44	4532.63	9.7	Valid
				SCH	Y	psig	4512.0	9.7	3891.0	8.40	4513.0	9.7	
7/46	2710.5	2689.5	PT	HP	Y	psia	4497.6	9.7	3876.38	8.43	4497.38	9.7	Valid
				SCH	Y	psig	4483.0	9.7	3865.0	8.40	4483.0	9.7	

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

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi higher than HP gauge at surface.

RFT PRETEST PRESSURES

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 7

WELL: Wirrah-3
DATE: December 24, 1983
OBSERVERS: O'Byrne/Finlayson/Neumann

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
7/47	2707.8	2686.8	PT	HP	Y	psia	4493.51	9.7	3874.30	8.13	4493.57	9.7	Valid
				SCH	Y	psig	4479.0	9.7	3862.0	8.10	4479.0	9.7	
7/48	2691.0	2670.0	PT	HP	Y	psia	4465.02	9.7	3854.06	8.44	4468.0	9.7	Supercharged
				SCH	Y	psig	4452.0	9.7	3845.0	8.42	4455.0	9.7	
7/49	2687.5	2666.5	PT	HP	Y	psia	4459.52	9.7	3848.2	8.44	4460.52	9.7	Valid
				SCH	Y	psig	4451.0	9.7	3836.0	8.41	4449.0	9.7	
7/50	2672.0	2651.0	PT	HP	Y	psia	4432.96	9.7	3839.62	8.46	4436.1	9.7	Valid
				SCH	Y	psig	4429.0	9.7	3827.0	8.44	4428.0	9.7	
7/51	2644.5	2623.5	PT	HP	Y	psia	4481.37	9.7	3800.39	8.47			Valid
				SCH	Y	psig	4365.0	9.7	3405.0	7.6			
7/52	2630.5	2619.5	PT	HP	Y	psia	4365.3	9.7	3927.68	8.8	4366.46	9.7	Supercharged
				SCH	Y	psig	4350.0	9.7	3906.0	8.7	4350.0	9.7	
7/53	2627.2	2606.2	PT	HP	Y	psia	4361.77	9.7	3800.14	8.5	4362.89	9.7	Supercharged
				SCH	Y	psig	4345.0	9.7	3781.0	8.5	4344.0	9.7	

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

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi higher than HP gauge at surface.

RFT PRETEST PRESSURES

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 7

WELL: Wirrah-3
DATE: December 24, 1983
OBSERVERS: O'Byrne/Finlayson/Neumann

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
7/54	2622.0	2601.0	PT	HP	Y	psia	4354.1	9.7	3270.48	8.5	4353.38	9.7	Valid
				SCH	Y	psig	4336.0	9.7	3753.0	8.4	4336.0	9.7	
7/55	2617.0	2596.0	PT	HP	Y	psia	4346.42	9.7	3769.48	8.5	4346.21	9.7	Valid
				SCH	Y	psig	4328.0	9.7	3961.0	8.4	4327.0	9.7	
7/56	2569.5	2548.5	PT	HP	Y	psia	4267.04	9.7	3684.95	8.5	4269.22	9.7	Valid
				SCH	Y	psig	4253.0	9.7	3668.0	8.4	4251.0	9.7	
7/57	2536.0	2325.0	PT	HP	Y	psia	4212.65	9.7	3596.83	8.3	4417.35	10.2	Valid
				SCH	Y	psig	4189.0	9.7	3584.0	8.3	4197.0	9.7	
7/58	2479.3	2458.3	PT	HP	Y	psia	4121.04	9.7	3519.05	8.4	4123.19	9.7	Valid
				SCH	Y	psig	4106.0	9.7	3500.0	8.3	4106.0	9.7	
7/59	2294.5	2373.5	PT	HP	Y	psia	3984.88	9.7	3398.64	8.4	3985.20	9.7	Valid
				SCH	Y	psig	3969.0	9.7	3387.0	8.3	3969.0	9.7	
7/60	2339.0	2318.0	PT	HP	Y	psia	3893.20	9.7	3393.20	8.4	3895.27	9.7	Valid
				SCH	Y	psig	3879.0	9.7	3299.0	8.3	3877.0	9.7	

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

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi higher than HP gauge at surface.

RFT PRETEST PRESSURES

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 8, 9

WELL: Wirrah-3
DATE: December 24, 1983
OBSERVERS: O'Byrne/Finlayson/Neumann

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON [1] FOR TEST	GAUGE [2]	TEMP [3] CORR.	UNITS [4]	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
8/61	2755.5	2734.5	SPT	HP	Y	psia	4883.7	10.4			4587.72	9.7	Tight
				SCH	Y	psig							
8/62	2756.5	2735.5	SPT	HP	Y	psia	4887.72	10.4			4587.25	9.7	Tight
				SCH	Y	psig							
8/63	2753.5	2732.5	SPT	HP	Y	psia	4584.02	9.7			4584.02	9.7	Seal failure
				SCH	Y	psig							
8/64	2753.5	2757.5	SPT	HP	Y	psia	4583.86	9.7			4583.0	9.7	Tight
				SCH	Y	psig					4563.0	9.7	
8/65	2748.0	2727.0	SPT	HP	Y	psia	4575.52	9.7	3953.93	8.5	4570.0	9.7	Sample
				SCH	Y	psig							
9/66	2730.5	2769.5	SPT	HP	Y	psia	4540.08	9.7	3924.54	8.5	4539.66	9.7	Valid
				SCH	Y	psig							
9/67	2731.0	2710.0	SPT	HP	Y	psia	4538.24	9.7	3920.14	8.5	4533.73	9.7	Sample
				SCH	Y	psig							

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

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi higher than HP gauge at surface.

RFT PRETEST PRESSURES

(0/911)

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 10, 11, 12, 13, 14

WELL: Wirrah-3
DATE: December 25, 1983
OBSERVERS: Finlayson/Neumann

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
10/68	2207.8	2686.8	SPT	HP	Y	psia	4498.05	9.7	3879.83	8.4	4494.48	9.8	Sample
				SCH	Y	psig							
11/69	2687.5	2666.5	SPT	HP	Y	psia	4464.38	9.7	3854.88	8.46	4462.03	9.7	Sample
				SCH	Y	psig							
12/70	2672.0	2651.0	SPT	HP	Y	psia	4440.8	9.7	3839.7	8.5	4434.2	9.7	Sample
				SCH	Y	psig							
13/71	2694.5	2673.5	PT	HP	Y	psia	4475.7	9.7	3859.6	8.4	4474.9	9.7	Valid
				SCH	Y	psig	4454.0	9.7	3820.0	8.4	4454.0	9.7	
13/72	2672.0	2651.0	SPT	HP	Y	psia	4433.7	9.7	3831.7	8.5	4434.5	9.7	Valid
				SCH	Y	psig							
14/73	2644.5	2623.5	SPT	HP	Y	psia	4395.83	9.7			4395.41	9.7	Seal failure
				SCH	Y	psig							
14/74	2644.5	2623.5	SPT	HP	Y	psia	4396.0	9.7			4395.5	9.7	Tight
				SCH	Y	psig							

1. Pressure Test = PT
   Sample and Pressure Test = SPT
2. Gauges = SCH = Schlumberger Strain Gauge
   = HP = Hewlett Packard

3. Yes = Y
   No = N
4. PSIA = A
   PSIG = G

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi higher than HP gauge at surface.

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 14, 15, 16

WELL: Wirrah-3
DATE: December 26, 1983
OBSERVERS: Finlayson/Neumann

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
14/75	2645.0	2624.0	SPT	HP	Y	psia	4395.16	9.7			4395.24	9.7	Tight
				SCH	Y	psig							
14/76	2684.5	2623.5	SPT	HP	Y	psia	4393.61	9.7	3798.21	8.5	4393.76	9.7	Tight
				SCH	Y	psig							
14/77	2644.7	2623.7	SPT	HP	Y	psia	4393.72	9.7	3805.07	8.5	4396.6	9.7	Sample
				SCH	Y	psig							
15/78	2622.0	2601.0	SPT	HP	Y	psia	4357.51	9.7			4357.26	9.7	Seal failure
				SCH	Y	psig							
15/79	2622.0	2601.0	SPT	HP	Y	psia	4356.74	9.7	3777.63	8.5	4357.39	9.7	Sample
				SCH	Y	psig							
16/80	2557.5	2536.5	PT	HP	Y	psia	4252.96	9.7			4252.89	9.7	Seal failure
				SCH	Y	psig							
16/81	2551.6	2536.6	PT	HP	Y	psia	4253.89	9.7			4255.10	9.7	Tight
				SCH	Y	psig							

1. Pressure Test = PT
   Sample and Pressure Test = SPT
2. Gauges = SCH = Schlumberger Strain Gauge
   = HP = Hewlett Packard

3. Yes = Y
   No = N
4. PSIA = A
   PSIG = G

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi higher than HP gauge at surface.

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 16, 17

WELL: Wirrah-3
DATE: December 26, 1983
OBSERVERS: Finlayson/Neumann

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
16/82	2557.5	2536.5	PT	HP	Y	psia	4254.36	9.7			4254.5	9.7	Seal failure
				SCH	Y	psig							
16/83	2672.2	2606.2	SPT	HP	Y	psia	4369.80	9.7	3651.69	8.2			Sample
				SCH	Y	psig					4349.0	9.7	
17/84	2583.3	2562.3	SPT	HP	Y	psia	4274.64	9.7			4275.41	9.7	Seal failure
				SCH	Y	psig							
17/85	2583.2	2562.2	SPT	HP	Y	psia	4277.06	9.7			4277.06	9.7	Seal failure
				SCH	Y	psig							
17/86	2583.2	2562.2	SPT	HP	Y	psia	4276.14	9.7			4276.48	9.7	Seal failure
				SCH	Y	psig							
17/87	2583.3	2563.3	SPT	HP	Y	psia	4276.81	9.7			4276.6	9.7	Seal failure
				SCH	Y	psig							
17/88	2569.3	2548.3	SPT	HP	Y	psia	4250.97	9.7			4251.81	9.7	Tight
				SCH	Y	psig							

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

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi higher than HP gauge at surface.

RFT PRETEST PRESSURES

(6797f)

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 17, 18

WELL: Wirrah-3
DATE: December 27, 1983
OBSERVERS: Finlayson/Neumann

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
17/89	2569.1	2548.1	PT	HP	Y	psia	4253.41	9.7			4253.84	9.7	Tight
				SCH	Y	psig							
17/90	2569.5	2548.5	SPT	HP	Y	psia	4254.07	9.7			4255.93	9.7	Tight
				SCH	Y	psig							
17/91	2569.4	2548.9	SPT	HP	Y	psia	4253.64	9.7			4255.15	9.7	Tight
				SCH	Y	psig							
17/92	2575.0	2355.0	SPT	HP	Y	psia	4263.72	9.7			4262.76	9.7	Seal failure
				SCH	Y	psig							
17/93	2573.5	2322.5	SPT	HP	Y	psia	4259.71	9.7			4261.50	9.7	Seal failure
				SCH	Y	psig							
17/93A	2569.0	2548.0	SPT	HP	Y	psia	4254.79	9.7			4254.78	9.7	Partial sample in 6 gallon chamber - tight.
				SCH	Y	psig							
18/94	2644.5	2623.5	SPT	HP	Y	psia	4394.16	9.7			4394.20	9.7	Tight
				SCH	Y	psig							

1. Pressure Test = PT
Sample and Pressure Test = SPT
2. Gauges = SCH = Schlumberger Strain Gauge
= HP = Hewlett Packard

3. Yes = Y
No = N
4. PSIA = A
PSIG = G

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi higher than HP gauge at surface.

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 18, 19, 20, 21

WELL: Wirrah-3
DATE: December 28, 1983
OBSERVERS: Finlayson/Neumann

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
18/95	2644.7	2623.7	SPT	HP	Y	psia	4393.85	9.7			4393.86	9.7	Tight
				SCH	Y	psig							
18/96	2644.6	2623.6	SPT	HP	Y	psia	4392.45	9.7			4393.38	9.7	Tight
				SCH	Y	psig							
18/97	2645.0	2624.0	SPT	HP	Y	psia	4393.35	9.7	3808.19	8.5	4395.03	9.7	Sample
				SCH	Y	psig							
19/98	2645.0	2624.0	SPT	HP	Y	psia	4398.14	9.7	3807.43	8.5	4393.23	9.7	Sample
				SCH	Y	psig							
20/99	2753.1	2732.1	SPT	HP	Y	psia	4576.03	9.7	3941.9	8.4	4575.0	9.7	Sample
				SCH	Y	psig							
21/100	2627.0	2606.0	SPT	HP	Y	psia	4369.4	9.7	3820.0	8.5	4370.7	9.7	Valid
				SCH	Y	psig							
21/101	2627.1	2606.1	SPT	HP	Y	psia	4370.5	9.7	3798.4	8.5	4370.8	9.7	Sample
				SCH	Y	psig							

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

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi higher than HP gauge at surface.

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 22, 23

WELL: Wirrah-3
DATE: December 28, 1983
OBSERVERS: Finlayson/Neumann

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
22/102	2627.1	2606.1	SPT	HP	Y	psia	4367.6	9.7	3796.1	8.5	4368.3	9.7	Valid - tight
				SCH	Y	psig							
22/103	2627.2	2606.2	SPT	HP	Y	psia	4367.7	9.7	3795.2	8.5	4369.4	9.7	Valid - sample
				SCH	Y	psig							
23/104	2944.0	2923.0	PT	HP	Y	psia	4826.5	9.6					Seal failure
				SCH	Y	psig	4809.0						
23/105	2943.5	2922.5	PT	HP	Y	psia	4827.7	9.6					Seal failure
				SCH	Y	psig	4805.0						
23/106	2943.7	2922.7	PT	HP	Y	psia	4830.2	9.6					Seal failure
				SCH	Y	psig	4807.0						
23/107	2785.5	2764.5	PT	HP	Y	psia	4540.5						Seal failure
				SCH	Y	psig							
23/108	2785.3	2764.3	PT	HP	Y	psia	4555.6	9.56	3976.1	8.38	4564.3		Valid
				SCH	Y	psig			3984.0		4552.0		

1. Pressure Test = PT
   Sample and Pressure Test = SPT
2. Gauges = SCH = Schlumberger Strain Gauge
   = HP = Hewlett Packard

3. Yes = Y
   No = N
4. PSIA = A
   PSIG = G

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi higher than HP gauge at surface.

RFT PRETEST PRESSURES (6904f)

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 23

WELL: Wirrah-3
DATE: January 1, 1984
OBSERVERS: Fittall/O'Byrne

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
23/109	2937.0	2916.0	PT	HP	Y	psia	4842.6						Seal failure
				SCH	Y	psig							
23/110	2937.0	2916.0	PT	HP	Y	psia	4827.6	9.6			4835.7		Seal failure
				SCH	Y	psig							
23/111	2936.8	2915.8	PT	HP	Y	psia	4822.1				4823.2		Seal failure
				SCH	Y	psig							
23/112	2937.2	2716.2	PT	HP	Y	psia	4822.0				4822.4		Seal failure
				SCH	Y	psig							
23/113	2905.2	2884.2	PT	HP	Y	psia	4760.7	9.6	(27)		4766.0		Tight
				SCH	Y	psig							
23/114	2905.5	2884.5	PT	HP	Y	psia	4769.5				4770.7		Seal failure
				SCH	Y	psig							
23/115	2905.5	2884.5	PT	HP	Y	psia	4768.9	9.6					Seal failure
				SCH	Y	psig							

1. Pressure Test = PT
   Sample and Pressure Test = SPT
2. Gauges = SCH = Schlumberger Strain Gauge
   [redacted] = [redacted] = H[redacted]tt [redacted]kar[redacted]

3. Yes = Y
   No = N
4. PSIA = A
   [redacted]SIG [redacted] G

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi hi[redacted]r t[redacted] HP [redacted] a[redacted]urf[redacted]

RFT PRETEST PRESSURES

(6904f)

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 23

WELL: Wirrah-3
DATE: January 3, 1984
OBSERVERS: Fittall/O'Byrne

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
23/116	2885.0	2864.0	PT	HP	Y	psia	4726.0	9.53			4727.0		Seal failure
				SCH	Y	psig							
23/117	2884.8	2863.8	PT	HP	Y	psia	4726.1						Seal failure
				SCH	Y	psig							
23/118	2869.8	2848.8	PT	HP	Y	psia	4700.2	9.5			4700.9		Seal failure
				SCH	Y	psig							
23/119	2859.5	2838.5	PT	HP	Y	psia	4680.8				4685.0		Seal failure
				SCH	Y	psig							
23/120	2859.4	2838.4	PT	HP	Y	psia	4681.7	9.55			4680.0		Seal failure
				SCH	Y	psig							
23/121	2850.5	2829.5	PT	HP	Y	psia	4671.0	9.55					Seal failure
				SCH	Y	psig							
23/122	2834.4	2813.4	PT	HP	Y	psia	4640.2	9.6					Seal failure
				SCH	Y	psig							

1. Pressure Test = PT
   Sample and Pressure Test = SPT
2. Gauges = SCH = Schlumberger Strain Gauge
   [redacted] = [redacted] = [redacted]ett[redacted]kar[redacted]

3. Yes = Y
   No = N
4. PSIA = A
   [redacted]SIG[redacted] G

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi
h[redacted]r t[redacted] HP [redacted]ge [redacted]urf[redacted]

RFT PRETEST PRESSURES

(6904f)

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 23

WELL: Wirrah-3
DATE: January 3, 1984
OBSERVERS: Fittall/O'Byrne

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
23/123	2781.0	2760.0	PT	HP	Y	psia	4549.5	9.56			4555.7		Seal failure
				SCH	Y	psig							
23/124	2781.5	2760.5	PT	HP	Y	psia	4550.8		(8)		4556.6		Tight
				SCH	Y	psig							
23/125	2828.8	2807.8	PT	HP	Y	psia	4635.9	9.58			4637.0		Seal failure
				SCH	Y	psig							
23/126	2829.5	2808.5	PT	HP	Y	psia	4638.9	9.58					Seal failure
				SCH	Y	psig							
23/127	2816.0	2795.0	PT	HP	Y	psia	4618.1	9.58			4620.2		Seal failure
				SCH	Y	psig							
23/128	2816.1	2795.1	PT	HP	Y	psia	4614.0	9.58			4614.9		Seal failure
				SCH	Y	psig							
23/129	2804.8	2783.8	PT	HP	Y	psia	4597.1	9.58					Seal failure
				SCH	Y	psig							

1. Pressure Test = PT
   Sample and Pressure Test = SPT
2. Gauges = SCH = Schlumberger Strain Gauge
   [redacted]

3. Yes = Y
   No = N
4. PSIA = A
   [redacted] G

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi [redacted]

RFT PRETEST PRESSURES (6904f)

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 23

WELL: Wirrah-3
DATE: January 3, 1984
OBSERVERS: Fittall/O'Byrne

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
23/130	2748.0	2727.0	PT	HP	Y	psia	4494.1	9.58					Seal failure
				SCH	Y	psig							
23/131	2748.5	2727.5	PT	HP	Y	psia	4495.9						Seal failure
				SCH	Y	psig							
23/132	2730.2	2709.2	PT	HP	Y	psia	4470.6	9.58			4469.5		Seal failure
				SCH	Y	psig							
23/133	2792.2	2771.2	PT	HP	Y	psia	4580.5	9.58			4578.5		Seal failure
				SCH	Y	psig							
23/134	2766.0	2745.0	PT	HP	Y	psia	4529.7	9.58					Seal failure
				SCH	Y	psig							
23/135	2766.0	2745.0	PT	HP	Y	psia	4537.6	9.58			4536.4		Seal failure
				SCH	Y	psig							
23/136	2767.0	2746.0	PT	HP	Y	psia	4537.2	9.58			4536.0		NF 9
				SCH	Y	psig							

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

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi higher than HP gauge at surface

(6904f)

RFT PRETEST PRESSURES

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 23, 24

WELL: Wirrah-3
DATE: January 3, 1984
OBSERVERS: Fittall/O'Byrne

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
23/137	2536.0	2515.0	PT	HP	Y	psia	4158.5	9.59	3596.5	8.33	4158.3		Valid
				SCH	Y	psig	4150.0						
24/138	2536.0	2515.0	PT	HP	Y	psia	4171.9	9.5	3603.7	8.31	4172.3		Valid
				SCH	Y	psig	4147.0		3584.0		4150.0		
24/139	2536.0	2515.0	PT	HP	Y	psia	4172.3	9.62	3602.2	8.31	4172.6		Valid
				SCH	Y	psig	4180.0		3583.0		4181.0		
24/140	2535.0	2514.0	PT	HP	Y	psia	4167.8	9.6	3399.1	8.3	4169.1		Valid
				SCH	Y	psig	4152.0				4152.0		
24/141	2748.0	2727.0	PT	HP	Y	psia	4519.9	9.61	3956.5	3.42	4514.3		Valid
				SCH	Y	psig	4402.0				4494.0		
24/142	2766.0	2745.0	PT	HP	Y	psia		9.58			4548.9		Tight
				SCH	Y	psig	4522.0						
24/143	2766.0	2743.0	PT	HP	Y	psia	4537.9	9.6			4539.3		NF 9
				SCH	Y	psig	4568.0				4519.0		

1. Pressure Test = PT
   Sample and Pressure Test = SPT
2. Gauges = SCH = Schlumberger Strain Gauge
   [redacted]

3. Yes = Y
   No = N
4. PSIA = A
   [redacted]

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi [redacted]

RFT PRETEST PRESSURES

(6904f)

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 24

WELL: Wirrah-3
DATE: January 3, 1984
OBSERVERS: Fittall/O'Byrne

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON [1] FOR TEST	GAUGE [2]	TEMP [3] CORR.	UNITS [4]	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
24/144		2745.2	PT	HP	Y	psia	4539.5	9.59			4542.6		Tight
				SCH	Y	psig	4518.0				4519.0		
24/145		2760.0	PT	HP	Y	psia	4570.0	9.61	3998.7	8.44	4567.1		Valid
				SCH	Y	psig	4541.0		3973.0		4501.0		
24/146	2785.5	2764.5	PT	HP	Y	psia	4581.2	9.6	3978.5	8.38	4570.0		Valid
				SCH	Y	psig	4551.0		3958.0		4549.0		
24/147	2792.2	2771.2	PT	HP	Y	psia	4584.4	9.6			4584.3		Seal failure
				SCH	Y	psig	4561.0				4561.0		
24/148	2792.3	2771.3	PT	HP	Y	psia	4580.3	9.61			4583.8		Seal failure
				SCH	Y	psig	4558.0				4561.0		
24/149	2792.4	2771.4	PT	HP	Y	psia	4581.5	9.6			4577.6		Seal failure
				SCH	Y	psig	4559.0				4560.0		
24/150	2804.8	2783.8	PT	HP	Y	psia	4599.3	9.6					Seal failure
				SCH	Y	psig	4580.0						

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

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi higher than HP gauge at surface.

<u>RFT PRETEST PRESSURES</u> (6904f)

SERVICE COMPANY: Schlumberger RFT RUN NO.: 24

WELL: Wirrah-3
DATE: January 3, 1984
OBSERVERS: Fittall/O'Byrne

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
24/151	2804.7	2783.8	PT	HP	Y	psia	4597.2	9.58			4601.4		Seal failure
				SCH	Y	psig					4519.0		
24/152	2816.0	2795.0	PT	HP	Y	psia	4632.6	9.58	(4129.0)				Leaking
				SCH	Y	psig	4598.0				4598.0		
24/153	2816.1	2795.1	PT	HP	Y	psia	4624.4	9.60	4126.2	8.60	4620.0		Valid/slow leak?
				SCH	Y	psig	4598.0		4106.0		4599.0		
24/154	2828.8	2807.8	PT	HP	Y	psia	4640.5	9.60	(91)		464.1		Tight
				SCH	Y	psig	4619.0				4618.0		
24/155	2829.5	2808.5	PT	HP	Y	psia	4644.3	9.60	4329.6	8.98			Valid/slow leak?
				SCH	Y	psig	4620.0		4308.0		4618.0		
24/156	2834.4	2813.4	PT	HP	Y	psia	4646.8	9.58	4202.8	8.71	4646.2		Valid/slow leak?
				SCH	Y	psig			4183.0		4626.0		
24/157	2850.5	2829.5	PT	HP	Y	psia	4677.4	9.58			4678.0		Seal failure
				SCH	Y	psig					4651.0		

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

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi higher than HP gauge at surface

RFT PRETEST PRESSURES (6904f)

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 24

WELL: Wirrah-3
DATE: January 3, 1984
OBSERVERS: Fittall/O'Byrne

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
24/158	2850.8	2829.8	PT	HP	Y	psia	4682.3	9.6	4397.8	9.0	4675.4		Slow leak?
				SCH	Y	psig	4648.0		4373.0		4651.0		
24/159	2859.5	2838.3	PT	HP	Y	psia	4690.8	9.58			4689.5		Seal failure
				SCH	Y	psig	4664.0				4667.0		
24/160	2859.3	2838.3	FTD	HP	Y	psia	4685.7	9.60			4686.7		Seal failure
				SCH	Y	psig					4665.0		
24/161	2869.8	2848.8	WT	HP	Y	psia	4701.7	9.58			4706.1		Seal failure
				SCH	Y	psig					4681.0		
24/162	2869.0	2848.0	WMFT	HP	Y	psia	4701.7	9.63	(14)		4706.0		Tight
				SCH	Y	psig					4680.0		
24/163	2885.0	2864.0	FTD	HP	Y	psia	4735.3	9.60			4735.9		Seal failure
				SCH	Y	psig	4679.0				4705.0		
24/164	2884.8	2863.8	WT	HP	Y	psia	4731.9	9.59					Seal failure
				SCH	Y	psig	4704.0						

1. Pressure Test = PT
   Sample and Pressure Test = SPT
[redacted] Gau[redacted] = [redacted] = Sc[redacted]umb[redacted]r St[redacted]in Gauge [redacted]
   = HP = Hewlett Packard

3. Yes = Y
   No = N
4. [redacted] = A
   PSIG = G

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi [redacted] higher th[redacted] HP [redacted]ge a[redacted] surf[redacted]

RFT PRETEST PRESSURES

(6904f)

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 24, 25

WELL: Wirrah-3
DATE: January 3, 1984
OBSERVERS: Fittall/O'Byrne

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
24/165	2905.2	2884.2	DK	HP	Y	psia	4774.5	9.6	(1894.0)		4773.9		Tight
				SCH	Y	psig	4738.0				4737.0		
24/166	2937.0	2916.0		HP	Y	psia	4834.6	9.62			4832.4		Seal failure
				SCH	Y	psig	4785.0				4782.0		
24/167	2936.7	2915.7	TTA	HP	Y	psia	4823.0	9.60					Seal failure
				SCH	Y	psig	4784.0						
24/168	2944.0	2923.0	OLA	HP	Y	psia	4836.7	9.61			4833.2		SFA
				SCH	Y	psig	4795.0				4797.0		
24/169	2944.5	2923.5	LFT	HP	Y	psia	4830.1	9.6			4828.7		Tight, then, seal failure
				SCH	Y	psig	4797.0				4798.0		
25/170	2785.5	2764.0	SPT	HP	Y	psia	4573.2	9.60	3988.2	8.37	4568.0		Opened 6 gallon chamber x 2-3/4 gallon chamber.
				SCH	Y	psig	4537.0						
25/171	2816.0		PT	HP	Y	psia	4624.0	9.59					Seal failure
				SCH	Y	psig	4595.0						

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

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi hi[illegible] th[illegible] HP [illegible]e a[illegible]rfa[illegible]

RFT PRETEST PRESSURES

(6904f)

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 25, 26

WELL: Wirrah-3
DATE: January 3, 1984
OBSERVERS: Fittall/O'Byrne (25)
R. Neumann (26)

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
25/172	2834.5		PT	HP	Y	psia	4656.4	9.6					Seal failure
				SCH	Y	psig	4624.0				4623.0		
25/173	2869.8		PT	HP	Y	psia	4726.6	9.6			4721.2		Seal failure
				SCH	Y	psig	4682.0						
25/174	2937.0		PT	HP	Y	psia	4848.4	9.7					Seal failure
				SCH	Y	psig					4795.0		
26/175	3242.4		SPT	HP	Y	psia							Seal failure
				SCH	Y	psig	6811.0	12.3			6804.0		
26/176	3243.0		SPT	HP	Y	psia							Seal failure
				SCH	Y	psig	6804.0	12.8			6801.0		
26/177	3241.0		SPT	HP	Y	psia							Seal failure
				SCH	Y	psig	6784.0	12.2			6873.0		
26/178	3240.5		SPT	HP	Y	psia							Seal failure
				SCH	Y	psig	6773.0	12.2			6771.0		

1. Pressure Test = PT
[redacted] Sample and Pressure Test = SPT [redacted]
2. Gauges = SCH = Schlumberger Strain Gauge
= HP = Hewlett Packard

3. Yes = Y
No = N
4. PSIA = A
PSIG = G

KB = 21 m (Southern Cross)

Note: Schlumberger gauge reading up to [redacted] psi [redacted]
higher than HP gauge at surface.

RFT PRETEST PRESSURES (6904f)

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 26, 27

WELL: Wirrah-3
DATE: January 18, 1984
OBSERVERS: R. Neumann

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON FOR TEST [1]	GAUGE [2]	TEMP CORR. [3]	UNITS [4]	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
26/179	3241.5		SPT	HP	Y	psia							Seal failure
				SCH	Y	psig	6771.0	12.2			6765.0		
26/180	3771.2		SPT	HP	Y	psia							Seal failure
				SCH	Y	psig	6570.0	12.2			6571.0		
26/181	3161.6		PT	HP	Y	psia							Seal failure
				SCH	Y	psig	6555.0	12.1			6556.0		
26/182	3163.2		SPT	HP	Y	psia							Seal failure
				SCH	Y	psig	6563.0	12.1			6562.0		
26/183	3170.2		SPT	HP	Y	psia							Seal failure
				SCH	Y	psig	6581.0	12.1			6577.0		
26/184	3176.2		SPT	HP	Y	psia							Seal failure
				SCH	Y	psig	6596.0	12.1			6594.0		
27/185	3242.4		SPT	HP	Y	psia							Seal failure
				SCH	Y	psig	6782.0	12.2			6782.0		

1. Pressure Test = PT
   Sample and Pressure Test = SPT
2. Gauges = SCH = Schlumberger Strain Gauge
   [redacted] = [redacted] = [redacted]
3. Yes = Y
   No = N
4. PSIA = A
   [redacted]

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi higher than HP gauge at surface.

RFT PRETEST PRESSURES (6904f)

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 26, 27

WELL: Wirrah-3
DATE: January 18, 1984
OBSERVERS: R. Neumann

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
27/186	3241.0		SPT	HP	Y	psia							Seal failure
				SCH	Y	psig	6775.0	12.2			6774.0		
27/187	3241.5		SPT	HP	Y	psia							Tight
				SCH	Y	psig	6776.0	12.2			6777.0		
27/188	3241.8		PT	HP	Y	psia							Seal failure
				SCH	Y	psig	6776.0	12.2			6774.0		
27/189	3241.2		SPT	HP	Y	psia							Seal failure
				SCH	Y	psig	6770.0	12.2			6771.0		
27/190	3242.0		SPT	HP	Y	psia							Seal failure (tight)
				SCH	Y	psig	6773.0	12.2			6770.0		
27/191	3171.2		SPT	HP	Y	psia							Seal failure (tight)
				SCH	Y	psig	6570.0	12.1			6572.0		
27/193	3170.2		SPT	HP	Y	psia							Seal failure
				SCH	Y	psig	6568.0	12.1			6571.0		

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

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi higher than HP gauge at surface.

RFT PRETEST PRESSURES

(6904f)

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 27

WELL: Wirrah-3
DATE: January 19, 1984
OBSERVERS: R. Neumann

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
27/193	3161.6		SPT	HP	Y	psia							Seal failure
				SCH	Y	psig	6547.0	12.1			6551.0		
27/194	3176.2		SPT	HP	Y	psia							Seal failure
				SCH	Y	psig	6598.0	12.2			6598.0		
27/195	3176.5		SPT	HP	Y	psia							Seal failure (tight)
				SCH	Y	psig	6599.0	12.2			6599.0		
27/196	3176.5		SPT	HP	Y	psia							Seal failure (tight)
				SCH	Y	psig	6599.0	12.2			6600.0		
27/197	3163.2		SPT	HP	Y	psia							Seal failure (tight)
				SCH	Y	psig	6560.0	12.2			6560.0		
27/198	3172.2		SPT	HP	Y	psia							Seal failure (tight)
				SCH	Y	psig	6592.0	12.2			6590.0		
27/199	3045.9		SPT	HP	Y	psia							Seal failure
				SCH	Y	psig	6306.0	12.1			6312.0		

1. Pressure Test = PT
   Sample and Pressure Test = SPT
2. Gauges = SCH = Schlumberger Strain Gauge
   [redacted] = [redacted] = [redacted]ett[redacted]ckar[redacted]

3. Yes = Y
   No = N
4. PSIA = A
   PSIG [redacted] G

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi h[redacted]r t[redacted] HP [redacted]ge [redacted]surf[redacted].

RFT PRETEST PRESSURES

(6904f)

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 27

WELL: Wirrah-3
DATE: January 19, 1984
OBSERVERS: R. Neumann

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP		FORMATION PRESSURE		FHP		TEST RESULT
							psi	ppg	psi	ppg	psi	ppg	
27/200	3068.5		SPT	HP	Y	psia							Seal failure (tight)
				SCH	Y	psig	6322.0	12.1			6323.0		
27/201	3046.4		SPT	HP	Y	psia							Seal failure
				SCH	Y	psig	6316.0	12.1			6318.0		
27/202	3041.8		SPT	HP	Y	psia							Seal failure
				SCH	Y	psig	6305.0	12.1			6307.0		
27/203	3046.5		SPT	HP	Y	psia							Seal failure
				SCH	Y	psig	6314.0	12.1			6315.0		

1. Pressure Test = PT
   Sample and Pressure Test = SPT
2. Gauges = SCH = Schlumberger Strain Gauge
   = HP = Hewlett Packard

3. Yes = Y
   No = N
4. PSIA = A
   PSIG = G

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi higher than HP gauge at surface.

APPENDIX 5

WIRRAH - 3

CASED HOLE REPEAT FORMATION TEST (RFT) AND PRODUCTION TEST REPORT

S.T. Koh
March 1984

WIRRAH-3

CASED HOLE RFT AND PRODUCTION TEST REPORT

(6367f)

WIRRAH-3 CASED HOLE RFT AND PRODUCTION TEST REPORT

A. SUMMARY OF RESULTS

Eight cased hole RFT sample runs and seven production tests with one retest were made in the Wirrah-3 exploration well over the period from January 20 to February 21, 1984. The objectives of this cased hole RFT and production test program were to investigate and test hydrocarbon sands indicated by mudlogs, open hole wireline logs and open hole RFT tests. Table 1 summarises the sequence of events of the cased hole RFT runs made relative to the production tests conducted in this program.

Of the eight cased hole RFT runs attempted, four were successful in recovering hydrocarbon, two runs resulted in no recovery due to plugged flowline, one run recovered mud due to communication with mud hydrostatic behind the casing through a previous perforation 4.1m higher and one run (at 2936.8m) resulted in seal failure due to the close proximity of the 9-5/8 inch casing shoe at 2943 m MDKB. Seven of the eight runs attempted were successful in providing formation pressures. The Hewlett-Packard (HP) gauge pressures were considered valid and were used in subsequent analyses. Results and details of the samples recovered from the cased hole RFT program are given in the Figure 1 and Table 2.

The seven production tests with one re-test were carried out over the period from January 29 to February 21, 1984. Test numbers 1, 1A and 2 did not produce formation fluids to surface and the tested intervals were concluded to be of very low productivity. Reverse circulation of the fluids in the test-string at the end of test numbers 1, 1A and 2 respectively, indicated no oil recovery with 23 barrels of water and filtrate from test number 1; 5 barrels of waxy oil with 18 barrels of water and filtrate from test number 1A and 22 barrels of waxy oil with 2.3 barrels of filtrate from test number 2. The remaining production tests (numbers 2A, 3, 3A, 4 and 4 repeat) flowed hydrocarbon to surface with flow periods ranging from 5.4 to 17.1 hours. Test numbers 2A, 3 and 3A flowed waxy oil with no water cut at 441, 1277 and 2039 STB/D respectively. Test number 4 produced gas with no liquid hydrocarbon or water recovered at surface during the 6 hour flow period. However, during the re-test (test number 4 repeat), when the well was flowed for a further period of 5.4 hours, slugs of waxy oil with rates ranging from 121 to 338 STB/D were produced with the gas. Results of the production tests indicated:

- o The oil zone evaluated in test 2A has limited reservoir volume within the Wirrah-3 fault block.
- o Lack of lateral continuity of permeable sands within the Wirrah-3 fault block as evidenced by pressure depletion during test 2A and the presence of parallel linear boundaries indicated in tests 3 and 3A.
- o Average permeabilities in the range of 0.3 to 45 md were obtained from the zones tested.
- o The low permeabilities, flow boundaries and lack of Gippsland aquifer pressure drawdown indicate that there will be limited or non-existent aquifer support.
- o The produced gas in test numbers 4 and 4 repeat, were considered not representative of the perforated interval 2635-2646 m MDKB. The oil produced in test number 4 repeat was probably representative of the zone perforated based on core shows.
- o The zones located below 2800 m MDKB (test numbers 1, 1A and 2) were demonstrated to be of very low productivity.

- Nitrogen and diesel fluids were successfully used for the first time in Bass Strait to underbalance the well in test numbers 1, 1A, 2, 2A, 3 and 4. The use of nitrogen to initiate flow eliminated the necessity of swabbing the well in test numbers 1, 1A and 2. Considerable rig time was saved and conclusive test results were obtained as a result of using nitrogen to underbalance the test string in the three tests.

- The Otis downhole shut-in tool with the HP gauge were successfully used in test numbers 2A, 3 and 3A. The downhole shut-in tool used successfully minimised the effect of afterflow and other wellbore effects on pressure build-up during the final shut-in periods in the three tests.

A detailed summary of the production test results is given in Table 3.

B. CASED HOLE RFT NUMBERS 1-8, 2645.0-2942.0 m MDKB

Background and Objectives

The cased hole RFT program commenced immediately after running the second series of open hole RFT's in the 8-1/2 inch open hole section from 2960 m MDKB to the final total depth at 3257 m MDKB. Prior to drilling the final 297 m of 8-1/2 inch hole section, wireline logs (including previous series of open hole RFT's) and a 9-5/8 inch casing string with the casing shoe at 2943 m MDKB were run. Results and interpretation of the Wirrah-3 open hole RFT programs are excluded from this report and have been separately documented and reported.

The cased hole RFT program was developed to complement the Wirrah-3 production test program. The main objective of the cased hole RFT program was to minimise the number of production tests by obtaining fluid recoveries using the Schlumberger cased hole RFT tool in intervals where hydrocarbon was interpreted to be present. To meet this objective, the eight cased hole RFT runs were made in sequence with the seven production tests. The sequence of cased hole RFT runs relative to the production tests conducted is shown in Table 1.

Results and Interpretation

The main results from the RFT program, which are illustrated in Figure 1 and Table 2 are:

(a) The presence of a 1.75 m net oil zone with a log interpreted water saturation and porosity of 50.6 and 13.1 percent respectively in the interval 2936.25-2940.0 m MDKB, was confirmed with the recovery of 650 cc of waxy oil from 2936.8 m MDKB. As shown in Figure 1, water gradient lines above or below this interval could not be confirmed because of the lack of water seats and likely gradient changes within the overpressured zone. A segregated sample taken at this depth was later transferred to a shipping container and kept for PVT and compositional analysis.

(b) The presence of a 5.0m of net oil with log interpreted water saturation and porosity of 55.7 and 12.3 percent respectively within the interval 2876.5-2933.5 m MDKB was confirmed with the recovery of 220 cc of waxy oil from 2884.8 m MDKB. Due to the lack of water seats and likely gradient changes within the overpressure zone, water gradient lines above or below this interval could not be confirmed.

(c) The presence of a 1.25 m gross oil column with a log interpreted water saturation and porosity of 79.0 and 8.5 percent respectively in the interval 2833.5-2834.75 m MDKB was confirmed with the recovery of 90 cc of waxy oil from 2834.5 m MDKB. Again, no water gradient could be established above or below this interval in the overpressured zone.

(d) The presence of a 1.0 m net gas and possibly oil bearing interval with a log interpreted water saturation and porosity of 35.3 and 11.6 percent respectively between the interval 2828.0-2833.5 m MDKB was confirmed with the recovery of 58.0 ft^3 gas and scums of oil from 2828.6 m MDKB. No contacts could be established due to the limited vertical thickness of the interval as well as the lack of water seats in the overpressured intervals above and below.

(e) Based on the cased hole RFT pressures, the interval below about 2800 m MDKB appeared to be progressively overpressured with formation pressures in excess of the original Gippsland Basin aquifer pressure gradient. The pressures in this interval are located to the right of the original Gippsland Basin aquifer gradient line in Figure 1.

(f) The open and cased hole RFT program could not establish the existence of any water gradient because of no confirmed water seats and the likely gradient changes in the overpressure zone below 2800 m MDKB.

(g) The hydrocarbon intervals confirmed by the cased hole RFT program appeared to be in each separate fluid systems.

In sample run numbers 1, 2, 3 and 7 where there was sufficient rat-hole sections to accommodate the full 22 m tool length (from the packer seat to the bottom of the tool), 45.6 litres (12 gallon) lower chambers and 10.5 litres (2-3/4 gallon) segregated chambers with their respective water cushions were used to increase the probability of success and maximise fluid recoveries. For the remainder of the cased hole RFT sample runs (numbers 4, 5, 6 and 8) where no water cushions were used because of limited rat-hole sections, a flow restricter was installed in the RFT tool flowline. On the basis of fluid recoveries, a 50 percent success rate was achieved when the flow restrictor was used with plugged flowline at the flow restricter being the sole factor contributing to failure. In the four sample runs where water cushions were used, failures in recovering formation fluids were due to poor cement behind casing resulting in a success rate of also 50 percent. Despite the overall 50 percent failure rate, significant cost savings were made by using the cased hole RFT when the alternative means of fluid recovery would be by production tests.

Formation pressures from the HP gauge were obtained in seven of the eight cased hole RFT runs attempted. These pressures are considered valid while the Schlumberger strain gauge pressures were considered invalid due to the 900 to 1000 psi shift from zero calibration which occurred during the first cased hole RFT attempted. The strain gauge was severely affected by shock waves associated with the firing of the shaped charge due to its close proximity to the packer seat. Detailed pressure data and sample fluid recoveries from the eight cased hole RFT's are given in Tables 4 and 5 respectively.

C. PRODUCTION TEST PROGRAM

C.1 Production Test Number 1, 2883.0-2894.0 m MDKB

Background and Objectives

Prior to conducting production test number 1, cased hole RFT sample run number 3 with seat located at 2884.8m MDKB within the proposed test interval confirmed the presence of oil with the recovery of 220 cc of waxy oil. Open hole wireline logs indicated the presence of 57 m of gross hydrocarbon section from 2876.5-2933.5 m MDKB in a conglomeritic section with 5.0 m of possible net hydrocarbon sand with an interpreted average net porosity and water saturation of 12.3 and 55.7 percent respectively. Based on the results of this cased hole RFT, it was decided to production test the selected interval for reservoir description, productivity and pressure depletion.

Test Description and Results

The interval 2883.0-2894.0 m MDKB was perforated underbalanced with 53 barrels (1856.7 m) of diesel and 27 barrels of (945.9 m) nitrogen using the Schlumberger 2-1/8 inch Enerjet gun at 13 shots per metre. The wellhead pressure increased by 27 psi seven minutes after the well was perforated. The perforating gun was retrieved and the Schlumberger HP gauge in tandem with two Otis Amerada gauges were run to bottom with the HP gauge hung at 2885.0 m MDKB. After a shut-in period of 10.1 hours a wellhead pressure of 1471 psig and a bottomhole pressure of 4003.0 psia at 2885.0 m MDKB were measured. Relative to the cased hole RFT number 3 formation pressure of 4500.8 psia at 2884.8 m MDKB, the bottomhole pressure was lower by 497.8 psi but still increasing, indicating influx into the wellbore was continuing due to the compressibility of the nitrogen in the test string. Prior to flowing the well at 1740 hours, January 29, 1984, the wellhead pressure had increased by 151 psi over the corresponding shut-in period.

The well was opened for flow over a period of 16.7 hours without producing fluids to the surface. Wellhead pressure was bled to zero 30 minutes after the well was opened on 30/64 inch choke, and remained at zero throughout the remaining flow period. An estimated total influx of about 23 barrels of water and filtrate were recovered at the surface when the test string was reverse circulated at the end of the flow period. Reverse circulation of the wellbore fluids indicated no oil recovery. Average influx rate from the time the well was perforated to the end of the flow period (26.8 hours) was estimated to be 21 barrels per day. Based on the 21 STB/D influx rate, calculated average permeability and productivity index was 0.6 md and 0.019 STB/D/psi respectively. Analysis of water samples recovered at surface (chlorides: 2600-8000 ppm, nitrates: 0-20 ppm, resistivity: 1.53-0.38 ohms) during reverse circulation indicated formation water and filtrate were recovered. The rat-hole mud filtrate chlorides, nitrates and resistivity measurements were 18000 ppm, 80 ppm and 0.33 ohms respectivity.

Conclusion

Based on the oil recovered from cased hole RFT number 3 and water samples recovered from the production test, the perforated interval 2883.0-2894.0 m MDKB in the oil bearing - high water saturation conglomeritic section of the Wirrah-3 exploration well was concluded to be non-productive.

C.2 Production Test Number 1A, 2861.5-2872.5 and 2883.0-2894.0 m MDKB

Background and Objectives

Based on the conclusion that the perforated interval 2883.0-2894.0 m MDKB was non-productive, it was decided to production test the interval 2861.5-2872.5 m MDKB as an add-on perforation for reservoir description, productivity and pressure depletion. For the add-on zone open hole wireline logs indicated the presence of 23.0 m of gross hydrocarbon column from 2849.5-2872.5 m MDKB with 5.25 m of possible net hydrocarbon sand with an average net porosity and water saturation of 11.5 and 45 percent respectively.

Test Description and Results

The test string was displaced with 53 barrels (1856.7 m) of diesel and 27 barrels (945.9 m) of nitrogen. The add-on interval 2861.5-2872.5 m MDKB was perforated 300 psi underbalanced using the Schlumberger 2-1/8 inch Enerjet gun at 13 shots per metre. The wellhead pressure was observed to increase by 10 psi nine minutes after the add-on interval was perforated. The perforating gun was retrieved and the Schlumberger HP gauge in tandem with two Otis Amerada gauges were run in tandem to bottom with the HP gauge hung at 2865.0 m MDKB. After a shut-in period of 4.6 hours, a wellhead pressure of 1472 psig and a bottomhole pressure of 3858.0 psia at 2865.0 m MDKB were measured. At the time the well was open for flow the measured bottomhole pressure was increasing, indicating influx into the wellbore was still continuing due to the compressibility of the nitrogen in the test string. At the end of the 4.6 hour shut-in period, and prior to flowing the well, the wellhead pressure had increased by 182 psi.

The well was opened for flow at 1328 hours on January 31, 1984 for a period of 18.7 hours without producing fluids to the surface. Wellhead pressure was bled to zero 17 minutes after the well was opened on 20/64 inch choke increasing to 64/64 inch choke and remained at zero wellhead pressure throughout the remaining flow period. An estimated total influx of about 18 barrels of water and filtrate with 5.0 barrels of waxy oil were recovered at surface when the test string was reverse circulated. Measured gravity and pour point of the oil samples were 26 °API and 84 °F respectively. Average influx rate from the time the add-on interval was perforated to the end of the flow period (23.3 hours) was estimated to be 24 barrels per day. Based on the 24 STB/D influx rate calculated average permeability and productivity index was 0.2 md and 0.017 STB/D/psi respectively. Analysis of the water samples (chlorides: 4500-9000 ppm, nitrates: 0-15 ppm and resistivity: 0.689-0.404 ohms) recovered with the oil samples during reverse circulation indicated formation water and filtrate were recovered at surface. The rat hole mud filtrate chlorides, nitrates and resistivity measurements were 18000 ppm, 80 ppm and 0.33 ohms respectively.

Conclusion

Results from this production test indicated the intervals 2861.5-2872.5 and 2883.0-2894.0 m MDKB with a total of 10.25 m of possible net oil-sand were very low or non-productive.

C.3 Production Test Number 2, 2813.0-2822.0 m MDKB

Background and Objectives

Two cased hole RFT sample runs (numbers 6 and 7) located within the proposed test interval 2813.0-2822.0 m MDKB failed to confirm open hole wireline log interpretation indicating the presence of 10.75 m of gross oil column from 2804.0-2820.5 m MDKB with 5.25 m of possible net oil sand with an interpreted average net porosity and water saturation of 12.1 and 41 percent respectively. The decision was then made to production test the interval 2813.0-2822.0 m MDKB for fluid type, productivity, reservoir description and pressure depletion.

Test Description and Results

After displacing the test string with 51.5 barrels (1804 m) of diesel and 26.3 barrels (921 m) of nitrogen, the interval 2813.0-2822.0 m MDKB was perforated 300 psi underbalanced with the Schlumberger 2-1/8 inch Enerjet gun at 13 shots per metre. The wellhead pressure increased by 12 psi four minutes after the well was perforated. The perforating gun was retrieved and the Otis HP gauge in tandem with two Amerada gauges were run to bottom with the HP gauge hung at 2815 m MDKB. After a shut-in period of 16.1 hours, a wellhead pressure of 1295 psig and a bottomhole pressure of 3976.2 psia at 2815 m MDKB were measured. As measured bottomhole pressures were still increasing relative to the cased hole RFT pressure of 4087.1 psia at 2816.0 m MDKB, it was concluded influx into the wellbore was continuing because of the compressibility of the nitrogen in the test string. Prior to flowing the well at 0600 hours, February 5, 1984, the wellhead pressure had increased by 147 psi during the shut-in period.

The well was opened for flow over a period of 11.8 hours without producing fluids to surface. Wellhead pressure was bled to zero twelve minutes after the well was opened on 20/64 inch choke increasing to 64/64 inch and remained at zero throughout the remaining flow period. An estimated total influx of about 22 barrels of waxy oil with 2-3 barrels of filtrate were recovered at the surface when the test string was reverse circulated. Measured gravity and pour point of the oil samples were 31 °API and 86 °F respectively. Average influx rate from the time the interval was perforated to the end of the flow period (27.9 hours) was estimated to be 21 barrels per day. Based on the 21 STB/D influx rate calculated average permeability and productivity index was 1.2 md and 0.023 STB/D/psi respectively. Analysis of the water samples (chlorides: 5500 ppm, trace nitrates and resistivity: 0.467 ohms) recovered with the oil samples during reverse circulation indicated formation water and filtrate were recovered. The rat hole mud filtrate chlorides, nitrates and resistivity measurements were 18000 ppm, 40 ppm and 0.31 ohms respectively.

Conclusion

Results from the production test confirmed open hole wireline logs interpretation, the existence of an oil column in the interval from 2804.0-2830.5 m MDKB. The perforated interval from 2813.0-2822.0 m MDKB which included the 3.0 m of possible net oil sand was concluded to be very low or non-productive.

C.4 Production Test Number 2A, 2779.5-2788.0 and 2813.0-2822.0 m MDKB

Summary

Production test number 2A was carried out over the intervals 2779.5-2788.0 and 2813.0-2822.0 m MDKB on February 6-9, 1984. The well flowed waxy oil at an average rate of 441 STB/D through a 32/64 inch positive choke with FWHP and FWHT of 272 psig and 83°F respectively. Gravity of the produced oil was 34° API with a measured GOR of 867 SCF/STB and a pour point of 86°F. No water was produced to surface during the 17.1 hours of flow period. Measured productivity index for the well was 0.19 STB/D/psi with a corresponding flow efficiency of 1.29. A static bottomhole pressure of 3976.3 psia at 2767.4 m MDKB was measured prior to flowing the well for clean-up.

The use of the Otis downhole shut-in tool to close the well in for major build-up effectively reduced afterflow and other wellbore effects on the build-up to four minutes after shut-in. Horner plot analysis of the MTR build-up data gave an average formation permeability ranging from 3.4 md to 5.5 md assuming an effective contributing net sand thickness of 5.75m. The 4.5 md permeability estimated from McKinley analysis for the same MTR period and the average calculated permeability of 5.5 md based on the productivity index of 0.19 STB/D/psi measured during the test were in good agreement with the permeability range of 3.4-5.5 md obtained from the Horner build-up analysis.

Muskat plot analysis of the pressure build-up data gave an average reservoir pressure of 3920 psia at 2767.4 m MDKB. Relative to the initial reservoir pressure of 3976.3 psia at 2767.4 m MDKB, the two sands tested were drawndown by 56.3 psi in response to a cumulative oil production of 574.1 STB. From material balance calculations, the original OIP for the upper zone was estimated to be 434 kSTB and corresponds to an oil drainage area of 56 acres with an average radius of 880 ft. Total pore volume examined in the test was 1.1 MRB. Based on pressure depletion observed from declining FWHP and declining average reservoir pressure, the oil sands tested were concluded to be discontinuous, limited in volume and have limited or no aquifer support.

A detailed summary of the test results is given in the attached Table 3. Details of data gathered during test number 2A are included in the attached Otis Services Well Test Report and the Otis Electric Line Survey Report.

Background and Objectives

At the conclusion of test number 2, 22 barrels of waxy oil with zero watercut were recovered at surface from the perforated interval 2813.0-2822.0 m MDKB by reverse circulation. In order to increase well productivity, it was decided to perforate the interval 2779.5-2788.0 m MDKB as an add-on and production test the two oil zones concurrently for productivity, pressure depletion, barriers and fluid type. For the add-on interval to be perforated, open hole wireline logs indicated the presence of 9.5 m gross oil column from 2777.5-2787.0 m MDKB with 5.75 m of net oil column with an interpreted average net porosity and water saturation of 13.4 and 39.1 percent respectively. Open hole RFT sample run 25/170 located at 2785.5 m MDKB confirmed the existence of the oil column by recovering a total of 8 litres of 34° API waxy oil.

Test Description

The add-on interval 2779.5-2788.0 m MDKB was perforated 300 psi underbalanced with 51.5 barrels (1804 m) of diesel and 26.3 barrels (921 m) of nitrogen using the Schlumberger 2-1/8 inch Enerjet gun at 13 shots per metre. The perforating gun was then retrieved and the Schlumberger HP gauge in tandem with two Otis Amerada gauges were run to bottom and the HP gauge hung at 2781 m MDKB.

Prior to opening the well for clean-up flow, the measured static bottomhole pressure was 3976.3 psia at 2767.4 m MDKB. At 1020 hours on February 6, 1984, the well was open for flow and clean-up for 3.5 hours. Mud was flowed to surface approximately 1.5 hours after the well was opened. At 1352 hours on February 6, 1984, the well was shut-in for 20 minutes at the choke manifold to rig-down the Schlumberger HP and Otis Amerada pressure gauges prior to running downhole shut-in tool equipment. While preparations were being made to run the Otis selective locking mandrel, receptacle and Amerada gauges by wireline and because of the high pour point and waxy nature of the oil produced, the well was kept flowing for as long as possible between 1412 hours and 2105 hours on February 6, 1984 respectively. After shutting-in the well, the Otis DHSI tool with the HP gauge was run to bottom and hung at 2767.4 m MDKB on Otis electric line. The DHSI tool was then closed and successfully pressure tested from below prior to flowing the well for major flow.

The well was opened for 11 hours of continuous final flow period at 2329 hours on February 6, 1984, on 32/64 inch choke. At 0130 hours on February 7, 1984, the flow was directed to the test separator where the oil and gas rates were measured. During the 9 hours of separator flow period, measured oil rate declined from 733 STB/D to 381 STB/D. Average measured oil rate was 441 STB/D with an average GOR of 867 SCF/STB and an oil gravity of 34° API. Average separator operating pressure and temperature were 87 psig and 140°F respectively. Prior to closing the DHSI tool for final build-up at 1026 hours on February 7, 1984, separator oil and gas samples were taken for PVT and compositional analysis. Cumulative oil produced at the time of shut-in was 574.1 STB.

Total major build-up period was 46.6 hours during which time the pressure increased from 1637 psia to 3905.2 psia at 2764.4 m MDKB. Prior to concluding test number 2A at 0859 hours on February 8, 1984, three gradient stops were made at 2764.9 m, 2729.5 m and 2694.6 m MDKB which gave an average oil gradient of 1.03 psi/m (0.31 psi/ft).

Discussion of Test Results

1. Reservoir Pressure

The static bottomhole pressure measured prior to flowing the well for clean-up was 3990.3 psia at run depth of 2781 m MDKB or 3976.3 psia at 2767.4 m MDKB (HP reference depth during final build-up) based on the measured average wellbore gradient of 1.03 psi/m. The RFT HP pressure from run 25/170 taken within the test interval and adjusted to the HP gauge run depth of 2781 m MDKB gave a reservoir pressure of 3983.6 psia which is considered to be in good agreement with the production test pressure. Relative to the measured static bottomhole pressure of 3990.3 psia, the RFT formation pressure was was lower by 6.7 psi and may have been due to measurement differences such as the use of a different HP pressure gauge or other factors such as wellbore effects between the two pressure surveys. At the end of the test, the final bottomhole build-up pressure was measured to be 3905.2 psia at 2767.4 m MDKB. Muskat plot analysis of the pressure build-up data gave an estimated average reservoir pressure of 3920 psia at 2767.4 m MDKB indicating the reservoirs at the end of the test were drawndown by 56.3 psi. Based on the 56.3 psi drawdown observed at the end of the test and the small pressure drawdown of about 10 psi between measured initial reservoir pressure and the estimated original Gippsland Aquifer pressure, the reservoirs tested were believed to be either in poor or not in hydraulic communication with the Gippsland Aquifer.

2. Radius of Investigation

The average radius of investigation at the end of the final build-up period was 635 ft. Based on the pressure build-up performance shown in Figure 2, the closest possible boundary was estimated to be 119 ft from the wellbore. The use of the Otis downhole shut-in tool to shut-in the well effectively minimised the effect of afterflow and other wellbore effects on pressure build-up by restricting the ETR to less than four minutes after shut-in. This was equivalent to a radius of investigation at the beginning of the MTR of 24 ft.

Based on the apparent pressure depletion of 56.3 psi and from material balance calculations, an original OIP of 434 kSTB was estimated. This corresponds to an oil drainage area of 56 acres with an equivalent average radius of 880 ft from the wellbore. Total pore volume of 1.1M RB examined in the test indicated the sands tested were discontinuous and limited in volume.

3. Build-up Analysis

A Horner plot of the HP bottomhole build-up pressure data from test number 2A is shown in Figure 2.

The early time bottomhole pressure data were expected to be affected by wellbore effects during the first four minutes after the downhole tool was shut-in. As shown in Figure 2, the MTR region consisted of two straight line sections with slopes of 595 and 372 psi/cycle and took 36 minutes to build-up from 2050 psia to 2550 psia. During the LTR period, it took 12.9 hours to build-up from 2550 psia to 3750 psia with a slope of 1345 psi/cycle and a further 33 hours or to gradually build-up from 3750 psia to 3905.2 psia. The pressure build-up performance is complex and is analogous to the theoretical pressure build-up curve for a heterogeneous reservoir with multiple boundaries superimposed by the effect reservoir pressure depletion. Ratio of the second slope to the first slope in the middle-time region was 0.63 indicating an improvement in reservoir porosity and permeability about 50 ft from the wellbore. At about 119 ft from the wellbore, the ratio of the third slope to the second slope was 3.62 indicating the presence of multiple boundaries such as sand discontinuities or faults. The levelling off in pressure build-up towards the end of the late-time region distinctively indicated the effects of reservoir depletion. Obviously, conventional extrapolation to obtain a value for the extrapolated pressure cannot be carried out for this type of reservoir. The trial-and-error type of analysis by the Muscat plot of log ($P-P_{ws}$) versus shut-in time was used to determine the average reservoir pressure.

Although the overall shape of the buildup resembled the type curve for a two layered reservoir, computer simulation indicated that this was not the case. Analysis of the MTR region build-up pressure data indicated the presence of two straight line sections shown in Figure 2. The reduction in slope from 595 psi/cycle during the early portion of the MTR to 372 psi/cycle during the later portion of the MTR, is indicative of the improvement in formation properties as reflected by the increase in calculated permeability from 3.4 md to 5.5 md assuming an effective contributing net sand thickness of 18.9 ft (5.75 m). This is in good agreement with the 4.5 md estimated from McKinley analysis using the MTR pressure data time match of between 5 and 70 minutes after shut-in and is also consistent with the calculated average permeability of 5.5 md based on the productivity index of 0.19 STB/D/psi measured during the test. The average permeability thickness product calculated from the Horner plot MTR build-up data was 104 md-ft. A negative skin factor of 2.1 with a corresponding damage ratio of 0.77 was calculated, indicating near wellbore stimulation. McKinley analysis of the ETR pressure data indicated an equivalent near wellbore formation permeability of 9 md. The wellbore stimulation effect was probably due to the difference in near wellbore permeabilities between the two perforated zones and the near wellbore formation having a higher permeability-thickness product than the MTR permeability-thickness product as a result of perforating the less permeable lower zone at 13 shots per metre using the Schlumberger 2-1/8 inch Enerjet gun.

4. Productivity Index

Based on the average reservoir pressure of 3920 psia, the productivity index measured during the test was 0.19 STB/D/psi. The measured PI was higher than the theoretical PI determined from the average MTR permeability of 4.5 md by 13 percent. This confirmed the negative skin calculated from the Horner build-up analysis method which indicated the well was stimulated by 29 percent with a flow efficiency of 1.29. Calculation steps for the theoretical PI of 0.17 STB/D/psi are shown below:

$$PI = \frac{0.00708\ (k)\ (h)}{(B)\ (u)\ [\ln (\frac{r_e}{r_w}) - 0.5]}$$

$$= \frac{0.00708\ (4.5)\ (18.9)}{(1.54)\ (0.35)\ [\ln (\frac{635}{0.4}) - 0.5]} = 0.17 \text{ STB/D/psi}$$

C.5 Production Test Number 3, 2666.0-2675.0 m MDKB

Summary

Production test number 3 was carried out over the interval 2666.0-2675.0 m MDKB on February 12-15, 1984. The well flowed waxy oil at an average rate of 1277 STB/D through a 40/64 inch positive choke with FWHP and FWHT of 460 psig and 111°F respectively. Gravity of the produced oil was 38° API with a measured GOR of 620 SCF/STB and a pour point of 84°F. No water was produced to surface during the twelve hours of flow period. Measured productivity index for the well was 0.88 STB/D/psi with a corresponding flow efficiency of 1.10. A static bottomhole pressure of 3815.8 psia at 2658.3 m MDKB was measured prior to flowing the well for clean-up.

The use of the Otis downhole shut-in tool to close the well in for major build-up, effectively reduced afterflow and other wellbore effects on the build-up to less than one minute after shut-in. Horner plot analysis of the MTR build-up data gave an average formation permeability of 45.1 md assuming an effective contributing net sand thickness of 12.3 ft (3.75 m). The 69.7 md permeability estimated from McKinley analysis for the same MTR time match from one to ten minutes after shut-in and the calculated average permeability of 43 md based on the productivity index of 0.88 STB/D/psi measured during the test were in reasonable agreement with the permeability of 45.1 md obtained from the Horner build-up analysis.

The production test number 3 test results were successfully matched with a computer simulation model.

The computer results indicated that:

1. The reservoir has two parallel boundaries with linear flow dominating the late time region of the buildup.

2. The average formation permeability is between 42 to 50 md.

3. The minimum oil in place required to achieve a pressure match is approximately 170 KSTB, and

4. A pressure match could be achieved with or without hydraulic communication with the Gippsland aquifer.

A detailed summary of the test results is given in the attached Table 3. Details of data gathered during test number 3 are included in the attached Otis Services Well Test Report and the Otis Electric Line Survey Report.

Background and Objectives

Open hole wireline logs and RFTs indicated the presence of 46.75 m gross oil zone from 2664.25-2711.0 m MDKB with 16.5 m of net oil sand with average net porosities and water saturations in the range of 12.7-14.5 percent and 28.2-44.9 percent respectively. Openhole RFT sample run numbers 10/68 at 2707.8 m MDKB, 11/69 at 2687.5 m MDKB and 13/72 at 2672.0 m MDKB respectively recovered 3 litres, 7 litres and 0.6 litres of waxy oil. Pretest pressures located within this interval gave an oil gradient of 0.31 psi/ft (1.02 psi/m) and indicated the four net sands within 2664.25-2711.0 m MDKB were in the same hydraulic fluid system. Reservoir parameters for the four sand intervals are:

Interval (m MDKB)	Gross Thickness (m MDKB)	Net Thickness (m MDKB)	Average Porosity (%)	Average Water Saturation (%)
2664.25-2674.0	9.75	3.75	13.6	33.6
2676.25-2678.5	2.25	0.5	13.2	44.9
2683.75-2694.75	11.0	6.5	12.7	28.2
2698.25-2711.0	12.75	5.75	14.5	31.8

To evaluate the three major oil sands defined above by production tests, it was decided to initially conduct a production test (number 3) in the top and possibly poorest sand interval 2664.25-2674.0 m MDKB for reservoir depletion, productivity and barriers. The results and conclusions from this test were expected to complement the results obtained from the second production test (number 3A) when all three major sand intervals would be evaluated concurrently.

Test Description

Production test number 3 commenced when the interval 2666.0-2675.0 m MDKB was perforated 300 psi underbalanced with 49.5 barrels (1734 m) of diesel and 25.3 barrels (886 m) of nitrogen using the Schlumberger 2-1/8 inch Enerjet gun at 13 shots per metre. After retrieving the perforating gun, the Schlumberger HP gauge in tandem with two Otis Amerada gauges were run to bottom and the HP gauge hung at 2672 m MDKB. Prior to opening the well for clean-up flow, the measured static bottomhole pressure was 3829.8 psia at 2672 m MDKB.

At 0215 hours on February 13, 1984, the well was open for flow and clean-up for 4.3 hours. Mud and formation fluids were flowed to surface approximately 43 minutes after the well was opened. At 0631 hours on February 13, 1984, the well was shut-in for 4.5 hours to run the Otis selective locking mandrel, receptacle and Amerada gauges by 0.092 inch slick line. The Otis downhole shut-in tool with HP gauge was then run on electric line and the HP gauge hung at 2658.3 m MDKB. The DHSI tool was closed and successfully pressure tested from below prior to opening the well for major flow.

The well was opened for 12 hours of continuous final flow period at 1102 hours on February 13, 1984, on 32/64 inch positive choke increasing to 40/64 inch positive choke at 1135 hours. At 1230 hours on February 13, the flow was directed to the test separator where the oil and gas rates were measured. During the 10.5 hours of separator flow, measured oil rates decline from 1483 STB/D to 1181 STB/D resulting in an average measured rate of 1277 STB/D with an average GOR of 620 SCF/STB and an oil gravity of 38° API. Average separator operating pressure and temperature were 174 psig and 146°F respectively. Prior to closing the DHSI tool at 2301 hours on February 13, separator oil and gas samples were taken for PVT and compositional analysis. Cumulative oil produced at the time the well was shut-in was 845.4 STB.

Total major build-up period was 30.9 hours during which time pressure increased from 2156.9 psia to 3554.0 psia at 2658.3 m MDKB, as shown in Figure 3. Prior to concluding test number 3 at 0555 hours on February 15, two gradient stops were made at 2625.0 and 2554.0 m MDKB which gave an oil gradient of 1.02 psi/m (0.31 psi/ft).

Discussion of Test Results

1. Reservoir Pressure

The static bottomhole pressure measured prior to flowing the well for clean-up was 3829.8 psia at run depth of 2672 m MDKB or 3815.8 psia at 2658.3 m MDKB (final build-up HP reference depth) based on the measured wellbore gradient of 1.02 psi/m. The open hole RFT (run 7/50) HP pressure taken within the test interval at 2672.0 m MDKB was 3834.6 psia. Relative to the RFT pressure of 3834.6 psia, the measured static pressure was lower by 4.8 psi and was not considered significant. At the end of the test, the final bottomhole build-up pressure was measured to be 3554.0 psia at 2658.3 m MDKB. Muskat plot analysis of the pressure build-up data gave an average reservoir pressure of 3600 psia at the end of the test, some 216 psi below initial pressure. However, the presence of parallel flow boundaries, as indicated by the form of the pressure buildup, indicates that this need not represent pressure depletion of the reservoir.

2. Radius of Investigation

The radius of investigation at the end of the major flow period was 894 ft. The use of the Otis downhole shut-in tool to shut-in the well effectively minimised the effect of afterflow and other wellbore effects on pressure build-up by restricting the ETR to less than one minute after shut-in. The radius of investigation at the beginning of the MTR was 33 ft from the wellbore.

3. Build-up Analysis

A Horner plot of the HP bottomhole build-up pressure data is shown in Figure 3.

The early time bottomhole pressures were expected to be affected by wellbore effects during the first minute after the DHSI tool was shut-in. As shown in Figure 3, the MTR region consisted of a single straight line section with a slope of 202 psi/cycle and took about 4.2 hours to build-up from 2725 psia to 3220 psia. During the LTR period, it took 26.7 hours to build-up from 3220 psia to 3554 psia with a slope 685 psi/cycle. The pressure build-up performance is analagous to the theoretical build-up curve for a heterogeneous reservoir with two parallel boundaries such as sand discontinuities, faults or due to changes in porosity and permeability.

Analysis of the MTR region build-up pressure data gave an average formation permeability of 45.1 md assuming an effective contributing net sand thickness of 12.3 ft (3.75 m). For the same MTR time match from one to ten minutes after shut-in, the McKinley plot analysis gave an average formation permeability of 69.7 md for the MTR region and 13.9 md for the ETR with a time match of 0.5 to one minute after shut-in. Based on the productivity index of 0.88 STB/D/psi measured during the test, the calculated permeability of 42 md was about 6 percent lower relative to the 45.1 md calculated from the Horner plot analysis. The average permeability thickness product calculated from the Horner plot MTR was 554.1 md-ft. A negative skin factor of 0.8 with a corresponding damage ratio of 0.91 was calculated, indicating slight near wellbore stimulation.

Computer simulation of the pressure data was successful using a model with two parallel boundaries and no aquifer support (i.e. a long but narrow rectangle). Successful matching was achieved over a range of reservoir permeabilities and areal dimensions. The quality of a typical match is illustrated in Figure 4. The successful models indicated that the average reservoir permeability was in the range 42 to 50md with these values corresponding to a distance between parallel boundaries of 350 to 225 ft (107 to 69m) respectively. Good matches could be obtained with an oil in place volume of 170 k STB or more corresponding to a modelled reservoir length of 1277m. A good match was not achieved, especially for later times, when the oil in place was reduced by 35% to 110 k STB (Figure 5).

4. Productivity Index

Based on the average reservoir pressure of 3600 psia at the end of the test, the productivity index measured during the test was 0.88 STB/D/psi. The measured PI was lower than the theoretical PI determined from the MTR permeability of 45.1 by 12 percent. Calculation steps for the theoretical PI of 1.0 STB/D/psi are shown below:

$$PI = \frac{0.00708\ (k)\ (h)}{(B)\ (u)\ [\ln (\frac{r_e}{r_w}) - 0.5]}$$

$$= \frac{0.00708\ (45.1)\ (12.3)}{(1.54)\ (0.35)\ [\ln (\frac{894}{0.4}) - 0.5]} = 1.0 \text{ STB/D/psi}$$

C.6 Production Test Number 3A, 2666.0-2675.0, 2686.0-2695.5 and 2702.0-2711.0 m MDKB

Summary

Production test number 3A was carried out over the three intervals 2666.0-2675.0, 2686.0-2695.5 and 2702.0-2711.0 m MDKB on February 15-17, 1984. The well flowed waxy oil at an average rate of 2039 STB/D through a 40/64 inch positive choke with FWHP and FWHT of 693 psig and 121°F respectively. Gravity of the produced oil was 38° API with a measured GOR of 579 SCF/STB and a pour point of 82°F. No water was produced to surface during the 12 hours of flow period. Measured productivity index for the well was 2.14 STB/D/psi with a corresponding flow efficiency of 1.26.

The use of the Otis downhole shut-in tool to close the well in for major build-up effectively eliminated afterflow and other wellbore effects on the build-up. Multi-rate analysis of the MTR build-up data gave an average formation permeability of 18.1 md assuming an effective total contributing net sand thickness of 52.5 ft (16 m). The calculated average permeability of 20.9 md based on the productivity index of 2.14 STB/D/psi measured during the test was higher by 15.5 percent relative to the average permeability of 18.1 md estimated from build-up data.

Based on the results from production test numbers 3 and 3A, and in conjunction with the results from the Schlumberger Production Logging Tool (PLT) survey conducted at the beginning of test number 3A, the performance of the two lower add-on sand intervals relative to the perforated top interval 2666.0-2675.0 m MDKB were evaluated. Relative flow contributions from each of the three zones during test number 3A final flow period were:

Zone	Perforated Interval (m MDKB)	Estimated Rate (STB/D)	Estimated Rate (Percent)	Net Sand Interval (ft)	Average Permeability (md)
1	2666.0-2675.0	776	38.1	12.3	45.1
2	2686.0-2695.5	524	25.7	21.3	9.8
3	2702.0-2711.0	739	36.2	18.9	
TOTAL		2039	100.0	52.5	

A detailed summary of the test results is given in Table 3. Details of data gathered during test number 3A are included in the attached Otis Services Well Test Report and the Otis Electric Line Survey Report.

Background and Objectives

The main objective of test number 3A was to evaluate the three sand intervals 2664.25-2674.0, 2683.75-2694.75 and 2698.25-2711.0 m MDKB concurrently for average well productivity index, reservoir depletion and description. The results from this test, in conjunction with the test results obtained in test number 3 where the upper sand interval was evaluated, would then be used to determine the performance of the two lower sand intervals. In order to determine the relative flow rate contribution between the three zones tested, the Schlumberger production logging tool was run after the two add-on intervals were perforated.

Test Description

Production test number 3A commenced when the two add-on intervals 2686.0-2695.5 and 2702.0-2711.0 m MDKB were perforated in sequence using the Schlumberger 2-1/8 inch Enerjet guns at 13 shots per metre immediately after conclusion of test number 3.

The two add-on intervals were perforated with an underbalance of about 200-300 psi by bleeding down the shut-in wellhead pressures immediately prior to perforating the intervals. The well was then opened on 24/64 inch choke for two hours of clean-up flow at 2009 hours on February 15, 1984. Five minutes after the well was opened, choke size was increased to 40/64 inch positive. The well was shut-in at 2215 hours on February 15 at the choke manifold for 2.9 hours to rig up and run the Schlumberger production logging tool (PLT) to bottom. At 0110 hours on February 16, 1984, the well was open for flow at 40/64 inch choke for 1.75 hours of PLT survey from 2740 m MDKB to the tubing muleshoe depth at 2664 MDKB. Average flow rate measured by the PLT for the two lowest perforated intervals was 2374 STB/D (3656 RB/D). Total average flow rate for the three perforated intervals was not measured by the PLT because the distance between the top perforation and the muleshoe was 5.5 m. Minimum distance required to measure the total flow rate from the three intervals was about 20 m. After the PLT was retrieved, the Otis selective locking mandrel, receptacle and Amerada gauges were run by wireline and the Otis DHSI tool with HP gauge were run and hung at 2658.3 m MDKB by electric line. Total shut-in time from the time the well was shut-in to retrieve the PLT was 6.3 hours.

After pressure testing the DHSI tool from below, the well was opened at 0910 hours on February 16, 1984 for 12 hours of continuous final flow on 24/64 inch choke increasing to 40/64 inch positive choke at 0917 hours. At 0942 hours on February 16 the flow was directed to the test separator where the oil and gas rates were measured. During the 11.5 hours of separate flow, measured oil rate declined from 2141 STB/D to 1914 STB/D resulting in an average measured rate of 2039 STB/D with an average GOR of 579 SCF/STB, and an oil gravity of 38° API. Average separator operating pressure and temperature were 167 psig and 137°F respectively. Prior to closing the DHSI tool at 2109 hours on February 16, separator oil and gas samples were taken for PVT and compositional analysis. Total cumulative oil produced during test numbers 3 and 3A were 2221.8 STB of which about 62 percent or 1376.4 STB were produced during test number 3A.

Total major build-up period was 23.9 hours during which time bottomhole pressure increased from 2717.7 psia to 3642.4 psia at 2658.3 m MDKB. As shown in Figure 6, about 83 percent of the total build-up pressure of 924.7 psi occurred during the first 2.8 hours or 12 percent of total shut-in period. The remaining pressure build-up of 152.4 psi occurred during the last 21.1 hours of the shut-in period. Prior to concluding test number 3A at 2109 hours on February 17, 1984, two gradient stops were made at 2655.5 m MDKB and 2620.5 m MDKB which gave an average oil gradient of 0.99 psi/m (0.30 psi/ft).

Discussion of Test Results

1. Production Logging Tool Survey

The Schlumberger PLT was successfully run from 2740 to 2664 m MDKB immediately after the two add-on intervals were perforated and the well opened for clean-up flow. Flowing bottomhole pressure, temperature, oil gravity and rate measurements over the two lowest perforated intervals were during the 1.8 hours of PLT flow period. During the flow period, average FWHP was 780 psig at 40/64 inch positive choke. Total average flow from the three perforated intervals could not be computed from PLT measurements because of insufficient logging distance available between the top perforation and tubing muleshoe. Details of results obtained from the PLT survey are as follows:

Flow Interval (m MDKB)	Average Flowing BHP (HP) (psia)	Average Flowing BHT (°F)	Average Flowing Oil Gravity (gm/cc)	Average Flow Oil Rate (RB/D)	Average Flow Oil Rate (STB/D)
2702.0-2711.0	3700	238.0	0.83	2138	1388
2686.0-2695.5	3630	238.2	0.74	1518	986
2666.0-2675.0	Not Measured	Not Measured	Not Measured	Not Measured	

The PLT survey indicated the flow contribution from the middle perforated interval 2686.0-2695.5 m MDKB was 29 percent lower relative to the 2138 RB/D rate contribution from the lowest perforated interval 2702.0-2711.0 m MDKB. The PLT survey also indicated flow from the 9.5 m middle interval (2686.0-2695.5 m MDKB) was from the top 5 m of the perforated interval while flow from the lowest interval (2702.0-2711.0 m MDKB) was from the whole 9 m of perforated interval.

2. Reservoir pressure

Based on the initial reservoir pressure of 3815.8 psia at 2658.3 m MDKB measured during test number 3 and the average reservoir pressure of 3670 psia at 2658.3 m MDKB estimated from test number 3A build-up data, the average reservoir pressure for the three perforated zones immediately prior to opening the well for clean-up flow in test number 3A was estimated to be 3740 psia at 2658.3 m MDKB. Based on the maximum measured shut-in wellhead pressure of 1050 psig observed after the first add-on interval was perforated and assuming an oil gradient of 1.0 psi/m, the shut-in bottomhole pressure was estimated to be 3723.0 psia at 2658.3 m MDKB or within 0.5 percent of estimated bottomhole average pressure of 3740 psia.

At the end of the major build-up period, the final measured bottomhole build-up pressure was 3642.4 psia at 2658.3 m MDKB. Muskat plot analysis of the pressure build-up data gave an average reservoir pressure of 3670 psia at 2658.3 m MDKB, 145.8 psi below the original pressure. As discussed relative to test 3, this is not necessarily an indication of pressure depletion due to the presence of parallel flow boundaries.

3. Radius of Investigation

The radius of investigation at the end of the final build-up period was 788 ft. The use of the Otis DHSI tool to shut-in the well effectively eliminated the effect of afterflow and other wellbore effects on pressure build-up by restricting the ETR to less than 15 seconds after shut-in. The radius of investigation at the beginning of the MTR was calculated to be less than 10 ft from the wellbore.

Based on the apparent pressure depletion of 145.8 psi and from material balance calculations, the original OIP for the three zones perforated was estimated to be 685 kSTB. This corresponds to an oil drainage area of 28 acres with an equivalent average radius of 618 ft from the wellbore. Total pore volume of 1.52M RB examined in the test indicated the three sand intervals tested were discontinuous and limited in volume. Based on the original OIP of 170 kSTB calculated in test number 3 for the interval 2666.0-2675.0 m MDKB, an original OIP of 515 kSTB was estimated for the two add-on intervals perforated. The 515 kSTB original OIP volume for the intervals 2686.0-2695.5 and 2782.0-2711.0 m MDKB was equivalent to an average oil drainage area of 26.5 acres.

4. Build-up Analysis

A multi-rate analysis plot of the HP bottomhole build-up pressure data is shown in Figure 6.

The observed afterflow effects on build-up data was negligble relative to the estimated ETR period of less than two minutes calculated from the wellbore storage value of 0.00021 RB/psi. As shown in Figure 6, the MTR region consisted of a single straight line section with a slope of 188 psi/cycle and took about 23 minutes to build-up from 2910 psia to 3320 psia. Up to 98.4 percent of the total build-up time of 23.9 hours occurred after the MTR period. During the LTR period, it took 23.5 hours to build-up from 3320 psia to 3642.4 psia with a slope of 286 psi/cycle. The pressure build-up performance is analogous to the theoretical build-up curve for a heterogeneous reservoir with multiple boundaries such as sand discontinuities, faults and differing geological depositional units due to changes in porosity and permeability. Ratio of the late-time slope to the middle-time slope was 1.52 indicating either a reduction in reservoir porosity and permeability or the existence of boundaries such as sand discontinuities or faults about 272 ft from the wellbore. With test number 3, the late time region was dominated by linear flow due to parallel flow boundaries as evidenced by plotting the pressure data on a SQRT(T) plot.

Analysis of the MTR region build-up pressure data gave an average formation permeability of 18.1 md assuming an effective contributing total net sand thickness for the three intervals of 52.5 ft (16 m). The calculated average permeability of 20.9 md based on the productivity index of 2.14 STB/D/psi measured during the test was in good agreement with the permeability calculated from build-up data. Based on the permeabilities of 45.1 md with an effective net thickness of 12.3 ft (3.75 m) from test number 3 and 18.1 md with an effective net thickness of 52.5 ft, an average permeability of 9.8 md was estimated for the two add-on intervals with an average net thickness of 40.2 ft (12.25 m). The average permeability thickness product based on the MTR build-up analysis was 950.5 md-ft. A negative skin factor of 1.5 with a corresponding damage ratio of 0.80 was calculated; indicating near wellbore stimulation.

5. Productivity Index

Based on the average reservoir pressure of 3670 psia, the average productivity index measured for the three intervals during the test was 2.14 STB/D/psi. The measured PI of 2.14 STB/D/psi was higher than the theoretical PI determined from the MTR permeability of 18.1 md by 21.6 percent. This confirmed the negative skin calculated from the multi-rate analysis method which indicated the well was stimulated by up to 26 percent with a flow efficiency of 1.26. Calculation steps for the theoretical PI of 1.76 STB/D/psi are shown below:

$$PI = \frac{0.00708\ (k)\ (h)}{(B)\ (u)\ [\ln\ (\frac{r_e}{r_w}) - 0.5]}$$

$$= \frac{0.00708\ (18.1)\ (52.5)}{(1.54)\ (0.35)\ [\ln\ (\frac{788}{0.4}) - 0.5]} = 1.76\ STB/D/psi$$

C.7 Production Test Number 4, 2635.0-2646.0 m MDKB

Summary

Production test number 4 was carried out over the interval 2635.0-2646.0 m MDKB on February 20-21, 1984. The well flowed dry gas at an average rate of 1971 kSCF/day through a 32/64 inch positive choke with FWHP and FWHT of 516 psig and 90°F respectively. Flowing bottom-hole pressure was 1061 psia. No water or liquid hydrocarbon was produced at the surface during the six hours of flow period. Calculated skin factor from the abbreviated pressure build-up data was 23.5 with a corresponding damage ratio of 4.5 indicating severe near wellbore damage. The produced gas was concluded to be not representative of the zone perforated and were suspected to have channelled behind the casing from the gas zone 2610.5-2623.0 m MDKB located 12 m above the perforated interval. The high near wellbore damage ratio of 4.5 measured in the test and the large amount of gas produced relative to the 1 m of net sand in this interval indicated a high probability of gas channelling. As a result of the effect of gas channelling, the formation permeability-thickness product based on build-up analysis and on measured productivity index may not be representative of the zone perforated. A bottomhole pressure of 3765 psia at 2640 m MDKB was measured prior to flowing the well.

At the end of the flow period, the well was shut-in at the surface choke manifold for 2.6 hours of abbreviated build-up. At the end of the build-up period, measured wellhead pressure was 2529 psig and bottomhole pressure was 3720.8 psia at 2640 m MDKB which gave a gradient of 0.45 psi/m (0.14 psi/ft) indicating the test string was essentially filled with gas. Extrapolation of the MTR slope in the abbreviated build-up data gave an extrapolated bottomhole pressure of 3769 psia at 2640 m MDKB indicating no pressure drawdown at the end of the test despite the high flowing bottomhole pressure drawdown of 2704 psi measured during the flow period.

A detailed summary of the test results is given in Table 3. Details of data gathered during test number 4 are included in the attached Otis Services Well Test Report.

Background and Objectives

Two RFT sample runs with seats located at at 2644.5 m MDKB (open hole run number 14/77) and 2645.0 m MDKB (cased hole RFT run number 8) failed to confirm open hole wireline log interpretation indicating the presence of 12 m of gross oil column from 2635-2647 m MDKB with up to 1.0 m of net oil column with an interpreted average net porosity and water saturation of 11.6 and 37.2 percent respectively. Because of the failure of the cased hole RFT to recover any formation fluids due to flowline plugging, the decision was made to production test the interval 2635-2646 m MDKB for fluid content.

Test Description and Results

Production test number 4 commenced when the interval 2635-2646 m MDKB was perforated 300 psi underbalanced with 49 barrels (1717 m) of diesel and 24.9 barrels (872 m) of nitrogen using the Schlumberger 2-1/8 inch Enerjet gun at 13 shots per metre. The perforating gun was retrieved and the Schlumberger HP gauge in tandem with two Otis Amerada gauges were run to bottom and the HP gauge hung at 2640 m MDKB. After approximately 4.2 hours of shut-in, the wellhead pressure and bottomhole pressure were measured to be 1324 psig and 3765 psia at 2640 m MDKB respectively.

At 2133 hours on February 20, 1984, the well was open for flow and clean up for up to six hours. After 32 minutes of flow, diesel was flowed to surface. Between 2245-2355 hours, on February 20, the well was shut-in and re-flowed numerous times to re-light the pilot flare and keep the produced gas burning due to unstable gas flow when attempts were made to increase the choke size. The flow was finally stabilised at 32/64 inch positive choke for up to 60 minutes prior to diverting the flow through the test separator at 0122 hours on February 21, for up to two hours. Measured FWHP and flowing bottomhole pressure stabilised at 516 psig and 1061 psia at 2640 m MDKB respectively. During the flow period, flowing bottomhole temperature decreased from 224.8°F to 206.9°F indicating severe gas expansion across the perforated interval with pressure drawdown of about 2704 psi. No liquid hydrocarbons were recovered at surface during the six hours of flow period and the well was shut-in for build-up immediately after two separator gas samples were taken for compositional analysis. Cumulative gas produced at the time of shut-in was 441 kSCF.

Total build-up period was 2.6 hours during which time the pressure increased from 1061 psia to 3720.8 psia at 2640 m MDKB. As shown in Figure 7, up to 99 percent of the total build-up pressures of 2660 psi occurred during the first 1.6 hours or 61 percent of total shut-in period. The remaining One hour of build-up period was regarded as the MTR period with a slope of 103 psi/cycle. Horner analysis of the MTR build-up data gave an average formation permeability of 17.4 md assuming an effective net sand contributing thickness of 3.3 ft. Average permeability based on the measured productivity index of 0.729 kSCF/D/psi was 4 md indicating severe near wellbore formation damage. Because of suspected gas channelling, the estimated permeabilities may not be representative of the perforated interval. Skin factor calculated from build-up data was 23.5 confirming the high formation damage with an estimated damage ratio of 4.5. The high near wellbore damage measured was probably due to restriction to flow behind casing from the gas zone 2610.5-2623.0 m MDKB located approximately 12 m above the top perforated interval. The produced gas was believed to be not representative of the interval perforated and were suspected to have channelled behind casing from the gas zone above. No measurable quantities of liquids were produced at surface throughout the separator flow period. At the end of the test, the test separator was found to contain waxy oil emulsion. The test separator was then flushed with diesel prior to repeating the production test. The test results failed to confirm open hole wireline and mud logs indicating the presence of an oil column within the interval perforated. It was then decided to repeat this test by re-flowing the well through the test separator at a higher choke size.

Production Test No. 4R, 2635.0-2646.0 m MDKB

Summary of Results and Objectives

Production test number 4 repeat, successfully produced oil from the perforated interval. Slugs of waxy oil with rates ranging from 121-338 STB/D/psi were produced intermittently with 2.4 MSCF/D of gas. The produced gas was considered not representative of the zone perforated and was suspected, as in test number 4, to be from the gas zone located 12 m above the perforated interval. The slugs of oil produced during test number 4R were believed to be representative of the zone perforated. Results of test number 4R confirmed the presence of oil in the interval perforated and also indicated that the dry gas produced in the previous test were not representative of the interval perforated.

Due to gas channelling behind casing from the gas zone located 12 m above the perforated interval, test number 4R was concluded after oil was recovered at surface in the 5.4 hours of flow through the test separator. As the main objective of the repeat test was to confirm the presence of oil in the perforated interval, no bottomhole pressure gauges were run in the test.

A summary of the test results is given in Table 1. Details of data gathered during test 4R are included in the attached Otis Services Well Test Report.

TABLE 1
CASED HOLE RFT AND PRODUCTION TEST PROGRAM SEQUENCE

1. CRFT No. 1 @ 2936.8 m.

2. CRFT No. 2 @ 2942.0 m.

3. CRFT No. 3 @ 2884.8 m.

4. PT No. 1 interval, 2883.0-2894.0 m.

5. PT No. 1A intervals, 2861.5-2872.5 m
   and 2883.0-2894.0 m.

6. CRFT No. 4 @ 2834.5 m.

7. CRFT No. 5 @ 2828.6 m.

8. CRFT No. 6 @ 2816.0 m.

9. CRFT No. 7 @ 2820.1 m.

10. PT No. 2 interval, 2813.0-2822.0 m.

11. PT No. 2A intervals, 2779.5-2788.0 m
    and 2813.0-2822.0 m.

12. PT No. 3 interval, 2666.0-2675.0 m.

13. PT No. 3A intervals, 2686.0-2695.5 m, 2702.0-2711.0 m
    and 2666.0-2675.0 m.

14. CRFT No. 8 @ 2645.0 m.

15. PT No. 4 interval, 2635.0-2646.0 m.

15. PT No. 4 repeat interval, 2635.0-2646.0 m.

(6367f)

TABLE 2

SUMMARY OF WIRRAH NO. 3 WELL CASED HOLE RFT RESULTS

CRFT No.	Depth (m MDKB)	Formation Pressure (psia)	Formation Temperature (ºF)	Recoveries: Lower Chambers (45.6 litres)	Recoveries: Upper Chamber (10.5 litres)
1	2936.8	4787.8*	239	39.1 ft^3 gas, 650 cc waxy oil, 34.6 litres, water/filtrate.	Preserved for analysis.
2	2942.0	-	-	Recorded mud hydrostatic behind casing. No recovery.	Recorded mud hydrostatic behind casing. No recovery.
3	2884.8	4500.8	236	10.5 ft^3 gas, 220 cc waxy oil, 40.75 litres water/filtrate.	0.6 ft^3 gas, 50 cc scum oil, 2.13 litres water/filtrate. Chamber not filled.
4	2834.5	4181.0	232	6.1 ft^3 gas, 90 cc waxy oil, 43.3 litres water/filtrate. (Flow restricter used).	0 ft^3 gas, scum oil, 3.75 litres water/filtrate. (3.8 litre chamber used with flow restricter).
5	2828.6	4154.9	234	54.5 ft^3 gas, scum oil, 40.8 litres muddy filtrate. (Flow restricter used).	3.5 ft^3 gas, scum oil, 9.2 litres water/filtrate. (Flow restricter used).
6	2816.0	4087.1	236	No recovery due to plugged flowline. (Flow restricter used).	No recovery due to plugged flowline. (Flow restricter used).
7	2820.1	4074.0	237	Terminated sampling due to communication from mud hydrostatic behind casing. Recovered 6 litres mud.	Terminated sampling in lower chamber due to communication from mud hydrostatic behind casing.
8	2645.0	3806.6	202	No recovery due to plugged flowline. (Flow restricter used).	No recovery due to plugged flowline. (Flow restricter used).

Notes:
1. Southern Cross KB = 21 m.
2. Pressures marked with an asterisk, not stabilised due to slow build-up observed.
3. Unless otherwise specified, all lower and upper chambers were run with water cushions. Where no water cushions are used, a flow restricter was used.

TABLE 3

SUMMARY OF WIRRAH NO. 3 WELL PRODUCTION TEST RESULTS

Test Number	1	1A	2	2A	3	3A	4	4R
Date (1984)	January 29-30	January 31 - February 1	February 4-5	February 6-9	February 12-15	February 15-17	February 20-21	February 21
Perforation Interval (m MDKB)	2883.0-2894.0	2861.5-2872.5 and 2883.0-2894.0	2813.0-2822.0	2779.5-2788.0 and 2813.0-2822.0	2666.0-2675.0	2686.0-2695.5, 2702.0-2711.0 and 2666.0-2675.0	2635.0-2646.0	2635.0-2646.0
Production Fluid	Water and Filtrate	Oil and Water/ Filtrate	Oil	Oil	Oil	Oil	Gas	Gas/Oil
Flow Time (Hours)	16.7	18.7	11.8	17.1	16.3	12.0	6.0	5.4
Cumulative Oil Production (STB)	23 (Water/ Filtrate)	5 (Oil) and 18 (Water/ Filtrate)	22	574.1	845.4	2221.8 (Incl. Test No. 3)	441 (kSCF)	570 (kSCF)/34
Average Oil Rate (STB/D)	21 (Total Influx)	24 (Total Influx)	21 (Total Influx)	441	1277	2039	0	121-338 (Slugging)
(kSCF/D)	-	-	-	-	-	-	1971	2438
Choke Size (64th)	30	64	64	32	40	40	32	40
Oil Gravity (° API)	-	26	31	34	38	38	-	35
Pour Point (°F)	-	84	86	86	84	82	-	84
Wax Content	High	High	High	High	High	High	-	High
Watercut (%)	100	78	Nil	Nil	Nil	Nil	Nil	Nil
GOR (SCF/STB)	Not Measured	Not Measured	Not Measured	867 @ 87 psig and 140°F	620 @ 174 psig and 146°F	579 @ 167 psig and 137°F	-	12949 @ 230 psig and 142°F
Flowing WHP (psig)	0	0	0	272	460	693	516	504
Initial Formation Pressure (psia)	4500.8 @ 2884.8 m MD	4500.8 @ 2884.8 m MD	4087.1 @ 2816 m MD	3976.3 @ 2767.4 m MD	3815.8 @ 2658.3 m MD	3815.8 @ 2658.3 m MD	3765 @ 2640 m MD	3765 @ 2640 m MD
Average Reservoir Pressure (psia)	Not Measured	Not Measured	Not Measured	3920 @ 2767.4 m MD	3600 @ 2658.3 m MD	3670 @ 2658.3 m MD	3769 @ 2640 m MD	Not Measured
Maximum BHT (°F)	230 @ 2884.1 m MD	234 @ 2864.1 m MD	242 @ 2814.1 m MD	245 @ 2767 m MD	241 @ 2658 m MD	241 @ 2658 m MD	226 @ 2640 m MD	Not Measured
Productivity Index (Measured) (STB/D/psi)	0.019 (Est.)	0.017 (Est.)	0.023 (Est.)	0.19	0.88	2.14	-	Not Measured
Permeability-Thickness (md-ft)	5.2 (Est.)	6.0 (Est.)	14.2 (Est.)	65-104	554.1	950.5	57.1	Not Measured
Permeability (md)	0.6 (Est.)	0.2 (Est.)	1.2 (Est.)	3.4-5.5	45.1	18.1	17.4	-
Skin/Damage Ratio	Not Measured	Not Measured	Not Measured	-2.1/0.77	-0.8/0.91	-1.5/0.80	23.5/4.5	Not Measured
Depth of Investigation (ft)	Not Measured	Not Measured	Not Measured	635	894	788	293	Not Measured
Apparent Depletion (psi)	Not Measured	Not Measured	Not Measured	56.3	(4)	(4)	Nil	Not Measured
OOIP Volume (kSTB)	-	-	-	434	(4)	(4)	-	-
Area (Acres)	-	-	-	56	(4)	(4)	-	-
Average Radius (ft)	-	-	-	880	-	-	-	-

Note: 1. All depths relative to KB (KB Southern Cross = 21 m).

2. In test number 4, the well produced gas with no measurable liquid produced at surface. The produced gas was concluded to be not representative of the zone perforated and it was then decided to re-test (test number 4R) this zone by flowing the well at a higher rate through the test separator.

3. Test number 4R flowed slugs of oil with gas at surface. The produced gas was still considered not representative of the perforated interval and the oil produced was probably representative of the zone perforated.

4. See discussion of these aspects in the report text.

TABLE 4

CASED HOLE RFT PRETEST PRESSURES

SERVICE COMPANY: Schlumberger

RFT RUN NO.: 1-7

WELL: Wirrah-3
DATE: January 27, 1984
OBSERVERS: RB/STK

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT	BHT (ºF)
1	2936.8	2915.8	Cased SPT	SCH	Y	G	6107.0	12.2	5730.0*	-	7010.0*	-	V	239.0
				HP	Y	A	6115.3	12.1	4787.8	11.5	6057.0	12.1		
2	2942.0	2921.0	Cased SPT	SCH	Y	G	-	-	-	-	-	-	Communication of hydrostatic behind casing during sampling.	241.0
				HP	Y	A	6116.6	12.2	-	-	6101.3	12.1		
3	2884.8	2863.8	Cased SPT	SCH	Y	G*	5580.0	-	-	-	-	-	V	234.9
				HP	Y	A	4604.7	9.3	4500.8	9.2	4588.0	9.3		
4	2834.5	2813.5	Cased SPT	SCH	Y	G*	5498.0	-	-	-	-	-	V	231.9
				HP	Y	A	4516.2	9.3	4181.0	8.7	4495.9	9.3		
5	2828.6	2807.6	Cased SPT	SCH	Y	G	-	-	-	-	-	-	V	234.0
				HP	Y	A	4509.5	9.3	4154.9	8.6	4487.0	9.3		
6	2816.0	2795.0	Cased SPT	SCH	Y	G	-	-	-	-	-	-	V. Flow restricter plugged during sampling.	236.0
				HP	Y	A	4482.4	9.3	4087.1	8.5	4473.5	9.3		
7	2820.1	2799.1	Cased SPT	SCH	Y	G	-	-	-	-	-	-	V. Communication of hydrostatic behind casing during sampling.	241.0
				HP	Y	A	4487.6	9.3	4074.0	8.5	4470.9	9.3		

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

KB = 21 m (Southern Cross)

* Note: Schlumberger gauge reading up to 1000 psi higher than HP gauge at surface.

(6367f/29)

TAB[redacted] (C[redacted])

CASED HOLE RFT PRETEST PRESSURES

ERVICE COMPANY: Schlumberger

RFT RUN NO.: 8

WELL: Wirrah-3
DATE: February 2, 1984
OBSERVERS: MF/STK

SEAT NO.	DEPTH (m)	DEPTH (m SS)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT	BHT (°F)
8	2645.0	2624.0	Cased SPT	SCH	Y	G	4210.0	9.3	3818.0	8.5	4214.0	9.3	V. Plugging at restricter in flow-line during sampling.	202.0
				HP	Y	A	4213.2	9.3	3806.6	8.5	4200.4	9.3		

Pressure Test = PT
Sample and Pressure Test = SPT

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

3. Yes = Y
No = N

4. PSIA = A
PSIG = G

KB = 21 m

3367f/30)

TABLE 5 - CASED HOLE RFT SAMPLE TEST REPORT

(6367f/31)

WELL: Wirrah-3
OBSERVER: O'Byrne/Neumann
DATE: January 20, 1984
RUN: 1

	CHAMBER 1 (45.4 litres)		CHAMBER 2 (10.4 litres)	
SEAT NO. 28/204	28/204		28/204	
DEPTH	2936.8		2936.8	
A. RECORDING TIMES				
Tool Set	2112	hrs	-	
Pretest Open	-		-	
Time Open	Fire Charge 2118	hrs	-	
Chamber Open	2137	hrs	2110	hrs
Chamber Full	2159		2215	hrs
Fill Time	22	mins	5	mins
Start Build-up	2159		2215	
Finish Build-up	-		-	
Build-Up Time	-		-	
Seal Chamber	2208		2220	hrs
Tool Retract	-		2229	hrs
Total Time	-		77	mins
B. SAMPLE PRESSURES				
IHP	6115.26	psia	-	
ISIP	4787.8	psia	-	
Initial Flowing Press.	2550.56	psia	3721.8	psia
Final Flowing Press.	3034.7	psia	3069.19	psia
Sampling Press. Range	484.14	psia	652.61	psia
FSIP	4165.14	psia	4338.4	psia
FHP	-		6057.0	psia
Form. Press. (Horner)	-		-	
C. TEMPERATURE				
Depth Tool Reached	2936.8	m	2936.8	m
Max. Rec. Temp.	237	°F	239	°F
Time Circ. Stopped	0300 19/1	hrs	0300 19/1	hrs
Time since Circ.	42.12	hrs	43.10	hrs
Form. Temp. (Horner)	-		-	
D. SAMPLE RECOVERY				
Surface Pressure	1300	psig	-	
Amt Gas	39.1	cu. ft.	-	
Amt Oil	650	litre	-	
Amt Water	34.6	litre	-	
Amt Others	-		-	
E. SAMPLE PROPERTIES				
Gas Composition				
C1	280739	ppm	-	
C2	37703	ppm	-	
C3	7540	ppm	-	
1C4/nC4	1340	ppm	-	
C5	326	ppm	-	
C6+	15	ppm	-	
CO_2/H_2S	1%/10	ppm	-	
Oil Properties	25° °API @ 20	°C	-	
Colour	Dark Brown			
Fluorescence	Bright Light Yellow			
GOR	9564	SCF/STB		
Water Properties				
Resistivity	-		-	
NaCl Equivalent	-		-	
Cl-titrated	16,500	ppm	-	
NO_3	30		-	
Est. Water Type pH	8.6		-	
Mud Properties	NO_3 = 200 pH = 10.0			
Resistivity	-		-	
NaCl Equivalent	-		-	
Cl - titrated	16,000		-	
Calibration				
Calibration Press.	-		-	
Calibration Temp.	-		-	
Hewlett Packard No.	2120A-00876		2120A-00876	
Mud Weight	12.3	ppg	12.3	ppg
Calc. Hydrostatic	-		-	
RFT Chokesize	0.02		0.02	
Remarks:				
RFT Gauge No.	55097		2-3/4 gallon chamber preserved.	

TABLE 5 (Cont.) - CASED HOLE RFT SAMPLE TEST REPORT

(6367f/32)

WELL: Wirrah-3

OBSERVER: O'Byrne/Neumann | DATE: January 21, 1984 | RUN: 2

	CHAMBER 1 (12 gall.)		CHAMBER 2 (2-3/4 gall.)
SEAT NO.	29/205		29/205
DEPTH (m MDKB)	2942.0		2942.0
A. RECORDING TIMES			
Tool Set	-		-
Pretest Open	-		-
Time Open	-		-
Chamber Open	-		-
Chamber Full	-		-
Fill Time	-		-
Start Build-up	-		-
Finish Build-up	-		-
Build-Up Time	-		-
Seal Chamber	-		-
Tool Retract	-		-
Total Time	-		-
B. SAMPLE PRESSURES			
IHP	6116.6		-
ISIP (prior to flow)	-		-
Initial Flowing Press.	-		-
Final Flowing Press.	-		-
Sampling Press. Range	-		-
FSIP	-		-
FHP	6101.3		-
Form. Press. (Horner)	-		-
C. TEMPERATURE			
Depth Tool Reached	-		-
Max. Rec. Temp.	-		-
Time Circ. Stopped	-		-
Time since Circ.	-		-
Form. Temp. (Horner)	-		-
D. SAMPLE RECOVERY			
Surface Pressure	No Recovery		No Recovery
Amt Gas	-		-
Amt Oil	-		-
Amt/Muddy Filtrate	-		-
Amt ~~Others~~ (Whole Mud)	-		-
E. SAMPLE PROPERTIES			
Gas Composition			
C1	-		-
C2	-		-
C3	-		-
1C4/nC4	-		-
C5	-		-
C6+	-		-
CO_2/H_2S	-		-
Oil Properties	-		-
Colour	-		-
Fluorescence	-		-
GOR	-		-
Water Properties (Whole Mud)			
Resistivity	-		-
NaCl Equivalent	-		-
Cl-titrated	-		-
NO_3/Ca	-		-
Est. Water Type pH	-		-
Mud Properties			
Resistivity	-		-
NaCl Equivalent	-		-
Cl - titrated/No. 3	-		-
Calibration			
Calibration Press.	-		-
Calibration Temp.	-		-
Hewlett Packard No.	2120A-00876		-
Mud Weight	9.3	ppg	-
Calc. Hydrostatic	-		-
RFT Chokesize	0.02		0.02
Remarks	Communication from hydrostatic column from behind casing.		

TABLE 5 (Cont.) - CASED HOLE RFT SAMPLE TEST REPORT

WELL: Wirrah-3 (6367f/33)

OBSERVER: RN/S.T. Koh DATE: January 27, 1984 RUN: 3

	CHAMBER 1 (45.6 litres)		CHAMBER 2 (10.5 litres)	
SEAT NO.	30/206		30/206	
DEPTH	2884.8		2884.8	
A. RECORDING TIMES				
Tool Set	0757	hrs	-	
Pretest Open	-		-	
Time Open	0803/0808	hrs	0839/0841	hrs
Chamber Open	0808	hrs	0839/0841	hrs
Chamber Full	0829	hrs	Not filled	
Fill Time	-		-	
Start Build-up	0829	hrs	-	
Finish Build-up	0833	hrs	-	
Build-Up Time	-		-	
Seal Chamber	0833	hrs	0854	hrs
Tool Retract	-		0855	hrs
Total Time	-		-	hr
B. SAMPLE PRESSURES				
IHP	4604.7	psia	-	
ISIP	4500.8	psia	4316.6	psia
Initial Flowing Press.	3500-3600	psia	150 (Suspect Blocking)	psia
Final Flowing Press.	3850	psia	280 (not filled)	psia
Sampling Press. Range	3500-3850	psia	-	
FSIP	4316.6 (Not Stabilised)	psia	4348.1 (Not Stabilised)	psia
FHP	-		4588	psia
Form. Press. (Horner)	-		-	
C. TEMPERATURE				
Depth Tool Reached	2885	m MDKB	2855	m MDKB
Max. Rec. Temp.	236	°F	236	°F
Time Circ. Stopped	1815 26/1	hrs	1815 26/1	hrs
Time since Circ.	13.5	hrs	13.5	hrs
Form. Temp. (Horner)	-		-	
D. SAMPLE RECOVERY				
Surface Pressure	680	psig	2	psig
Amt Gas	10.5	cu. ft.	0.6	cu. ft.
Amt Oil (Waxy)	220	cc	50 (scum)	cc
Amt Water	40.75	litres	2.13	litres
Amt Others	-		-	
E. SAMPLE PROPERTIES				
Gas Composition				
C1	439420	ppm	-	
C2	7325	ppm	-	
C3	3825	ppm	-	
1C4/nC4	140	ppm	-	
C5	-	ppm	-	
C6+	-	ppm	-	
CO_2/H_2S	15.5%/Nil	ppm	-	
Oil Properties (210° API)	21 °API @ 15	°C	-	
Colour	Dark Brown		Dark Brown	
Fluorescence	Bright Milky White			
GOR	7590	SCF/STB		
Water Properties				
Resistivity	0.69 @ 72	°F	0.696 @ 69	°F
NaCl Equivalent	8500	ppm	8900	ppm
Cl-titrated	3200	ppm	3350	ppm
NO_3	Nil		Nil	
Est. Water Type pH	7		7	
Mud Properties				
Resistivity	0.365 @ °C 21.1		0.365 @ °C 21.1	
NaCl Equivalent	29700	ppm	29700	ppm
Cl - titrated/No. 3	18000	ppm	18000	ppm
Calibration				
Calibration Press.	-		-	
Calibration Temp.	-		-	
Hewlett Packard No.	876		876	
Mud Weight	9.3	ppg	9.3	ppg
Calc. Hydrostatic	4592	psia	4592	psia
RFT Chokesize	1 x 0.02		1 x 0.03	
Remarks	Pour point oil 30°C		Chamber not filled plugging or tight.	

TABLE 5 (Cont.) - CASED HOLE RFT SAMPLE TEST REPORT

WELL: Wirrah-3 (6367f/34)

OBSERVER: AL/S.T. Koh DATE: February 2, 1984 RUN: 4

	CHAMBER 1 (45.6 litres)		CHAMBER 2 (3.8 litres)	
SEAT NO.	31/207		31/207	
DEPTH (m MDKB)	2834.5		2834.5	
A. RECORDING TIMES				
Tool Set	0730	hrs	-	
Pretest Open	-		-	
Time Open	0736	hrs	0846	hrs
Chamber Open	0736	hrs	0846	hrs
Chamber Full	0800	hrs	0848	
Fill Time	24	mins	2	mins
Start Build-up	0800	hrs	0848	hrs
Finish Build-up	0845	hrs	0917	hrs
Build-Up Time	-		-	
Seal Chamber	0816	hrs	0852	hrs
Tool Retract	-		0917	hrs
Total Time	-		-	hr
B. SAMPLE PRESSURES				
IHP	4516.2	psia	-	
ISIP (prior to flow)	4181	psia	4060.4	psia
Initial Flowing Press.	3000	psia	3100	psia
Final Flowing Press.	2200	psia	3200	psia
Sampling Press. Range	2230-3000	psia	3100-3200	psia
FSIP	4060.4 (Not Stabilised)		4082.2 (Not Stabilised)	psia
FHP	-		4495.9	psia
Form. Press. (Horner)	-		-	
C. TEMPERATURE				
Depth Tool Reached	2836	m MDKB	2836	m MDKB
Max. Rec. Temp.	232	°F	232	°F
Time Circ. Stopped	1145 1/2	hrs	1145 1/2	hrs
Time since Circ.	20.5	hrs	21.5	hrs
Form. Temp. (Horner)	-		-	
D. SAMPLE RECOVERY				
Surface Pressure	920	psig	690	psig
Amt Gas	6.1	cu. ft.	0	cu. ft.
Amt Oil (Waxy)	90	cc	(scum)	cc
Amt Water	43.3	litres	3.75	litres
Amt Others	-		-	
E. SAMPLE PROPERTIES				
Gas Composition				
C1	58700	ppm	-	
C2	20690	ppm	-	
C3	12120	ppm	-	
1C4/nC4	6530	ppm	-	
C5	330	ppm	-	
C6+	TR	ppm	-	
CO_2/H_2S	0.2%/Nil	ppm	-	
Oil Properties (210° API)	23 °API @ 15.6	°C	-	
Colour	Dark Brown (inc. sediment)			
Fluorescence	Bright Milky White			
GOR	10,777	SCF/STB		
Water Properties				
Resistivity	0.402 @ 76	°F	0.387 @ 75	°F
NaCl Equivalent	14000	ppm	15500	ppm
Cl-titrated	13000	ppm	16000	ppm
NO_3/Ca	Nil/-		10/Nil	
Est. Water Type pH	10.5		11.4	
Mud Properties				
Resistivity	0.357 @ 69 °F		0.357 @ 69 °F	
NaCl Equivalent	-		-	
Cl - titrated/No. 3	18000	ppm	18000	ppm
Calibration				
Calibration Press.	-		-	
Calibration Temp.	-		-	
Hewlett Packard No.	876		876	
Mud Weight	9.3	ppg	9.3	ppg
Calc. Hydrostatic	4512	psia	4512	psia
RFT Chokesize	0.03 (Flow rest.)		0.03 (flow rest.)	
Remarks	No water cushion. Pour point 33°C.		No water cushion.	

TABLE 5 (Cont.) - CASED HOLE RFT SAMPLE TEST REPORT

WELL: Wirrah-3 (6367f/35)

OBSERVER: AL/S.T. Koh DATE: February 2, 1984 RUN: 5

	CHAMBER 1 (45.6 litres)		CHAMBER 2 (10.4 litres)	
SEAT NO.	32/208		32/208	
DEPTH (m MDKB)	2828.6		2828.6	
A. RECORDING TIMES				
Tool Set	1314	hrs	-	
Pretest Open	-		-	
Time Open	1320	hrs	1420	hrs
Chamber Open	1320	hrs	1420	hrs
Chamber Full	1400	hrs	1431	
Fill Time	40	mins	-	
Start Build-up	1400	hrs	1431	hrs
Finish Build-up	1420	hrs	1449	hrs
Build-Up Time	-		-	
Seal Chamber	1415	hrs	1444	hrs
Tool Retract	-		1449	hrs
Total Time	-		-	hr
B. SAMPLE PRESSURES				
IHP	4509.5	psia	-	
ISIP (prior to flow)	4154.9	psia	3829.6	psia
Initial Flowing Press.	3435	psia	3400	psia
Final Flowing Press.	1895-3600	psia	2497-3742	psia
Sampling Press. Range	1895-3600	psia	3871.4	psia
FSIP	3829.6 (not stab.)	psia	2497-3742	psia
FHP	-		4487	psia
Form. Press. (Horner)	-		-	
C. TEMPERATURE				
Depth Tool Reached	2830	m MDKB	2830	m MDKB
Max. Rec. Temp.	-		-	
Time Circ. Stopped	1145 1/2	hrs	1145 1/2	hrs
Time since Circ.	-		-	
Form. Temp. (Horner)	-		-	
D. SAMPLE RECOVERY				
Surface Pressure	1550	psig	1300	psig
Amt Gas	54.5	cu. ft.	3.5	cu. ft.
Amt Oil (Waxy)	(scum)		(scum)	
Amt Muddy Filtrate	40.8	litres	9.2	litres
Amt Others	-		-	
E. SAMPLE PROPERTIES				
Gas Composition				
C1	317360	ppm	195300	ppm
C2	11850	ppm	18300	ppm
C3	7320	ppm	4040	ppm
1C4/nC4	2650	ppm	1880	ppm
C5	1110	ppm	1270	ppm
C6+	160	ppm	1070	ppm
CO_2/H_2S	3.2%/Nil	ppm	2.8%/Nil	ppm
Oil Properties	-		-	
Colour	-		-	
Fluorescence	-		-	
GOR	-		-	
Water Properties/muddy filt.				
Resistivity	0.311 @ 76	°F	0.322 @ 74	°F
NaCl Equivalent	20000	ppm	19000	ppm
Cl-titrated	11000	ppm	12000	ppm
NO_3/Ca	Nil		Trace	
Est. Water Type pH	8.3		7.4	
	Brown Colour		Brown Colour	
Mud Properties				
Resistivity	0.357 @ 69 °F		0.357 @ 69 °F	
NaCl Equivalent	-		-	
Cl - titrated/No. 3	18000	ppm	18000	ppm
Calibration				
Calibration Press.	-		-	
Calibration Temp.	-		-	
Hewlett Packard No.	876		876	
Mud Weight	9.3	ppg	9.3	ppg
Calc. Hydrostatic	4502.7	psia	4502.7	psia
RFT Chokesize	0.03		0.03	
Remarks	No water cushion. Flow restricter used.		No water cushion. Flow restricter used.	

TABLE 5 (Cont.) - CASED HOLE RFT SAMPLE TEST REPORT

WELL: Wirrah-3 (6367f/36)

OBSERVER: AL/S.T. Koh DATE: February 2, 1984 RUN: 6

	CHAMBER 1 (45.6 litres)		CHAMBER 2 (10.4 litres)	
SEAT NO.	33/209		33/209	
DEPTH (m MDKB)	2816.0		2816.0	
A. RECORDING TIMES				
Tool Set	1849	hrs	-	
Pretest Open	-		-	
Time Open	1855	hrs	-	
Chamber Open	1855	hrs	-	
Chamber Full	-		-	
Fill Time	-		-	
Start Build-up	-		-	
Finish Build-up	-		-	
Build-Up Time	-		-	
Seal Chamber	-		-	
Tool Retract	-		-	
Total Time	-		-	
B. SAMPLE PRESSURES				
IHP	4482.4	psia	-	
ISIP (prior to flow)	4087.1	psia	-	
Initial Flowing Press.	-		-	
Final Flowing Press.	-		-	
Sampling Press. Range	-		-	
FSIP	-		-	
FHP	4473.5		-	
Form. Press. (Horner)	-		-	
C. TEMPERATURE				
Depth Tool Reached	2830	m MDKB	2830	m MDKB
Max. Rec. Temp.	-		236	
Time Circ. Stopped	1145 1/2	hrs	1145 1/2	hrs
Time since Circ.	-		-	
Form. Temp. (Horner)	-		-	
D. SAMPLE RECOVERY				
Surface Pressure	-		-	
Amt Gas	-		-	
Amt Oil (Waxy)	-		-	
Amt/Muddy Filtrate	-		-	
Amt Others	-		-	
E. SAMPLE PROPERTIES				
Gas Composition				
C1	Tool Blocked		Tool Blocked	
C2	No Recovery		No Recovery	
C3	-		-	
1C4/nC4	-		-	
C5	-		-	
C6+	-		-	
CO_2/H_2S	-		-	
Oil Properties	-		-	
Colour	-		-	
Fluorescence	-		-	
GOR	-		-	
Water Properties				
Resistivity	-		-	
NaCl Equivalent	-		-	
Cl-titrated	-		-	
NO_3/Ca	-		-	
Est. Water Type	-		-	
Mud Properties				
Resistivity	0.357 @ 69 °F		0.357 @ 69 °F	
NaCl Equivalent	-		-	
Cl - titrated/No. 3	18000	ppm	18000	ppm
Calibration				
Calibration Press.	-		-	
Calibration Temp.	-		-	
Hewlett Packard No.	876		876	
Mud Weight	9.3	ppg	9.3	ppg
Calc. Hydrostatic	4483	psia	4483	psia
RFT Chokesize	0.03		0.03	
Remarks	No water cushion. Flow restricter used.		No water cushion. Flow restricter used.	

TABLE 5 (Cont.) - CASED HOLE RFT SAMPLE TEST REPORT

WELL: Wirrah-3 (6367f/37)

OBSERVER: AL/S.T. Koh DATE: January 21, 1984 RUN: 7

	CHAMBER 1 (12 gall.)		CHAMBER 2 (2-3/4 gall.)	
SEAT NO.	34/210		34/210	
DEPTH (m MDKB)	2820.1		2820.1	
A. RECORDING TIMES				
Tool Set	001344	hrs/min/sec	-	
Pretest Open	001936	hrs/min/sec	-	
Time Open	-		-	
Chamber Open	-		-	
Chamber Full	-		-	
Fill Time	-		-	
Start Build-up	-		-	
Finish Build-up	-		-	
Build-Up Time	-		-	
Seal Chamber	-		-	
Tool Retract	-		-	
Total Time	-		-	
B. SAMPLE PRESSURES				
IHP	4487.6	psia	-	
ISIP (prior to flow)	4074.0	psia	-	
Initial Flowing Press.	4211-4280	psia	-	
Final Flowing Press.	-		-	
Sampling Press. Range	-		-	
FSIP	-		-	
FHP	4470.9		-	
Form. Press. (Horner)	-		-	
C. TEMPERATURE				
Depth Tool Reached	2830	m MDKB	-	
Max. Rec. Temp.	237		-	
Time Circ. Stopped	1145 1/2	hrs	-	
Time since Circ.	-		-	
Form. Temp. (Horner)	-		-	
D. SAMPLE RECOVERY				
Surface Pressure	0		-	
Amt Gas	Nil		-	
Amt Oil	Nil		-	
Amt/Muddy Filtrate	Nil		-	
Amt Others (Whole Mud)	60		-	
E. SAMPLE PROPERTIES				
Gas Composition				
C1	-		-	
C2	-		-	
C3	-		-	
1C4/nC4	-		-	
C5	-		-	
C6+	-		-	
CO_2/H_2S	-		-	
Oil Properties	-		-	
Colour	-		-	
Fluorescence	-		-	
GOR	-		-	
Water Properties (Whole Mud)				
Resistivity	0.43 @ 66 °F		-	
NaCl Equivalent	-		-	
Cl-titrated	15000		-	
NO_3/Ca	Nil		-	
Est. Water Type pH	10.8		-	
Mud Properties				
Resistivity	0.357 @ 69 °F		-	
NaCl Equivalent	-		-	
Cl - titrated/No. 3	18000	ppm	-	
Calibration				
Calibration Press.	-		-	
Calibration Temp.	-		-	
Hewlett Packard No.	876		-	
Mud Weight	9.3	ppg	-	
Calc. Hydrostatic	4483.3	psia	4483.3	psia
RFT Chokesize	0.02		0.02	
Remarks	Communication from hydrostatic column from behind casing.			

TABLE 5 (Cont.) - CASED HOLE RFT SAMPLE TEST REPORT

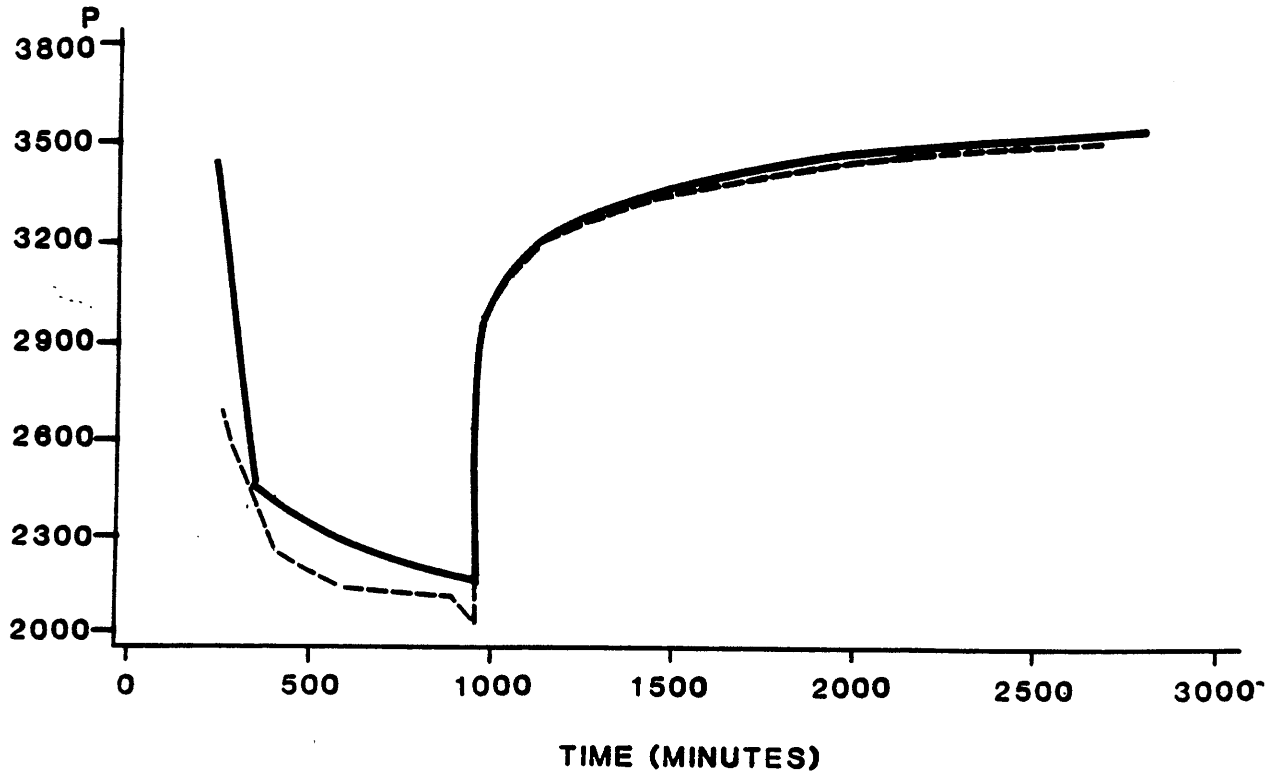
WELL: Wirrah-3 (6367f/38)

OBSERVER: MF/S.T. Koh DATE: February 19, 1984 RUN: 8

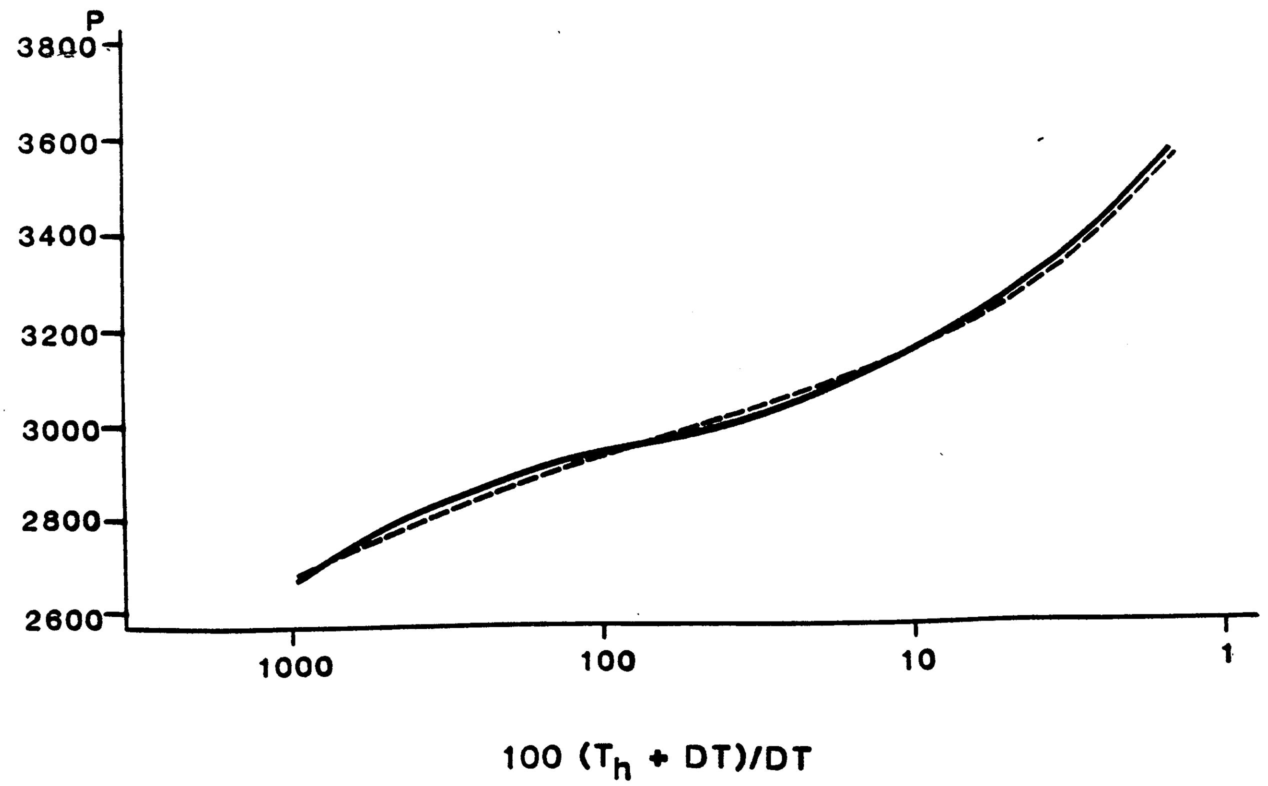
	CHAMBER 1 (45 litres)		CHAMBER 2 (litres)
SEAT NO.	35/211		-
DEPTH (m MDKB)	2645		-
A. RECORDING TIMES			
Tool Set	1615	hrs	-
Pretest Open	-		-
Time Open	-	hrs	-
Chamber Open	1633/1638	hrs	-
Chamber Full	1643/1651 (Suspect Plugging)	hrs	
Fill Time	-		-
Start Build-up	1643/1651	hrs	-
Finish Build-up	-		-
Build-Up Time	-		-
Seal Chamber	1707	hrs	-
Tool Retract	1712	hrs	-
Total Time	-		-
B. SAMPLE PRESSURES			
IHP	4213.2	psia	-
ISIP (prior to flow)	3806.6	psia	-
Initial Flowing Press.	2870-3750	psia	-
Final Flowing Press.	3799	psia	-
Sampling Press. Range	3750-3799	psia	-
FSIP	3807.0	psia	-
FHP	4200.4	psia	-
Form. Press. (Horner)	-		-
C. TEMPERATURE			
Depth Tool Reached	2646.5	m MDKB	-
Max. Rec. Temp.	-		-
Time Circ. Stopped	-		-
Time since Circ.	-		-
Form. Temp. (Horner)	-		-
D. SAMPLE RECOVERY			
Surface Pressure	0		-
Amt Gas	0.1	cu. ft.	-
Amt Oil	0		-
Amt/Muddy Filtrate	0		-
Amt Others (Whole Mud)	0		-
E. SAMPLE PROPERTIES			
Gas Composition			
C1	-		-
C2	-		-
C3	-		-
1C4/nC4	-		-
C5	-		-
C6+	-		-
CO_2/H_2S	-		-
Oil Properties	-		-
Colour	-		-
Fluorescence	-		-
GOR	-		-
Water Properties (Whole Mud)			
Resistivity	-		-
NaCl Equivalent	-		-
Cl-titrated	-		-
NO_3/Ca	-		-
Est. Water Type	-		-
Mud Properties			
Resistivity	-		-
NaCl Equivalent	-		-
Cl - titrated/No. 3	12000	ppm	-
Calibration			
Calibration Press.	-		-
Calibration Temp.	-		-
Hewlett Packard No.	876		-
Mud Weight	9.3	ppg	-
Calc. Hydrostatic	4211	psia	-
RFT Chokesize	-		-
Remarks	Ran 2 x 6 gal. with flow restricter Suspect plugging at restricter in flowline. Maximum tool length run.		

FIGURE 4: *Wirrah-3 W.C.R. Vol 2*

WIRRAH - 3 TEST 3 COMPUTER SIMULATION - GOOD MATCH
(PERMEABILITY 46.2md WIDTH 312.5 ft LENGTH 4188 ft)



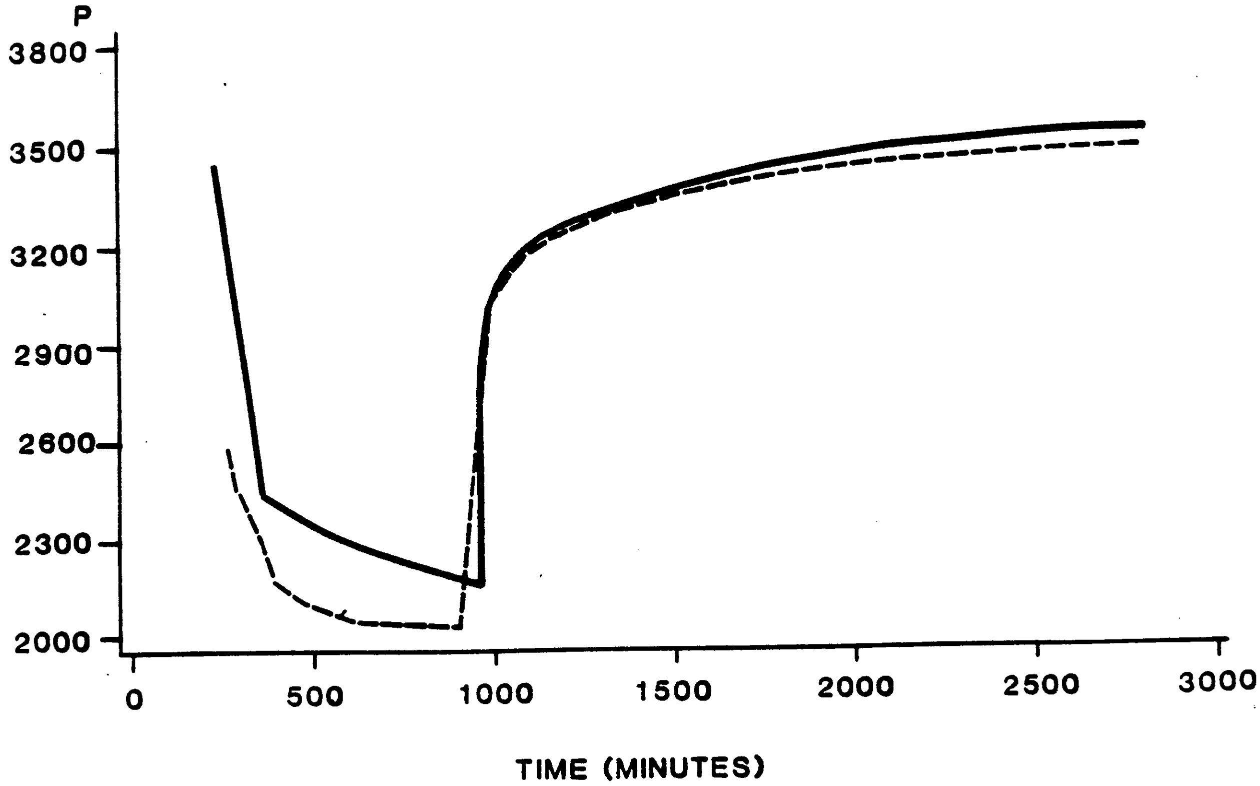
A. PRESSURE VS TIME (—— ACTUAL ---- SIMULATION)



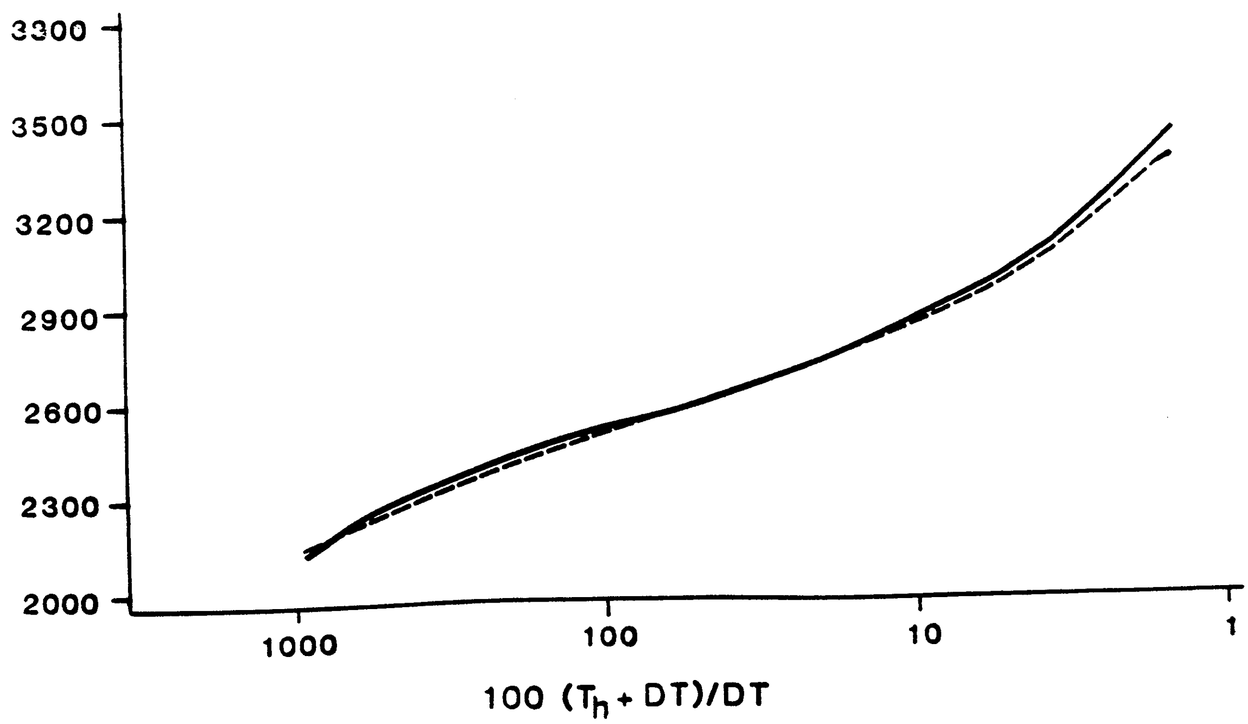
B. HORNER PLOT (—— ACTUAL ---- SIMULATION)

FIGURE 5: *Wirrah-3 W.C.R. Vol 2*

WIRRAH - 3 TEST 3 COMPUTER SIMULATION - REDUCED OIP
(PERMEABILITY 46.2md WIDTH 312.5ft LENGTH 2722ft)

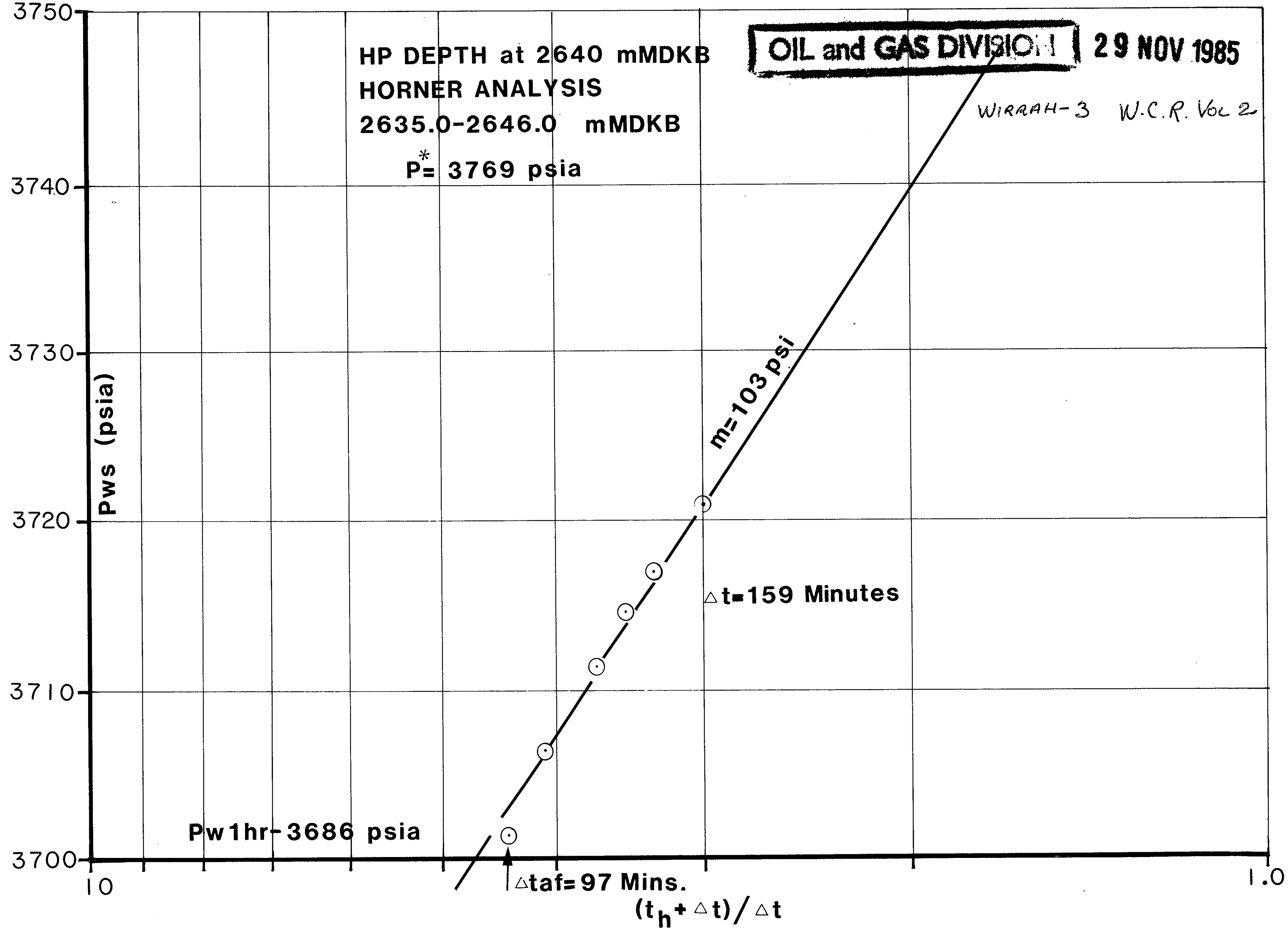


A. PRESSURE VS TIME (—— ACTUAL - - - SIMULATION)



B. HORNER PLOT (— ACTUAL - - - SIMULATION)

FIGURE 7 **WIRRAH 3- TEST 4** Feb. 21,1984



WIRRAH-3 W.C.R. Vol 2

PE905531

This is an enclosure indicator page.
The enclosure PE905531 is enclosed within the container PE902506 at this location in this document.

The enclosure PE905531 has the following characteristics:

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     ITEM_BARCODE = PE905531
CONTAINER_BARCODE = PE902506
             NAME = Well Depth vs Formation Pressure Plot
            BASIN = GIPPSLAND
           PERMIT = VIC/L2
             TYPE = WELL
          SUBTYPE = DIAGRAM
      DESCRIPTION = Wirrah-3 Well Depth vs Formation
                    Pressure Plot, Fig 1 from WCR vol 2
          REMARKS =
     DATE_CREATED =
    DATE_RECEIVED = 29/11/85
             W_NO = W840
        WELL_NAME = WIRRAH-3
       CONTRACTOR =
     CLIENT_OP_CO = ESSO AUSTRALIA LIMITED
```

(Inserted by DNRE - Vic Govt Mines Dept)

PE905533

This is an enclosure indicator page.
The enclosure PE905533 is enclosed within the container PE902506 at this location in this document.

The enclosure PE905533 has the following characteristics:

ITEM_BARCODE =	PE905533
CONTAINER_BARCODE =	PE902506
NAME =	Horner Plot
BASIN =	GIPPSLAND
PERMIT =	VIC/L2
TYPE =	WELL
SUBTYPE =	DIAGRAM
DESCRIPTION =	Wirrah-3 Horner Plot, test 3, Fig 3 from WCR vol 2
REMARKS =	
DATE_CREATED =	
DATE_RECEIVED =	29/11/85
W_NO =	W840
WELL_NAME =	WIRRAH-3
CONTRACTOR =	
CLIENT_OP_CO =	ESSO AUSTRALIA LIMITED

(Inserted by DNRE - Vic Govt Mines Dept)

PE905532

This is an enclosure indicator page.
The enclosure PE905532 is enclosed within the container PE902506 at this location in this document.

The enclosure PE905532 has the following characteristics:

ITEM_BARCODE = PE905532
CONTAINER_BARCODE = PE902506
NAME = Horner Analysis Plot
BASIN = GIPPSLAND
PERMIT = VIC/L2
TYPE = WELL
SUBTYPE = DIAGRAM
DESCRIPTION = Wirrah-3 Horner Analysis Plot, test 2A, Fig 2 from WCR vol 2
REMARKS =
DATE_CREATED = 7/02/84
DATE_RECEIVED = 29/11/85
W_NO = W840
WELL_NAME = WIRRAH-3
CONTRACTOR =
CLIENT_OP_CO = ESSO AUSTRALIA LIMITED

(Inserted by DNRE - Vic Govt Mines Dept)

PE905534

This is an enclosure indicator page.
The enclosure PE905534 is enclosed within the container PE902506 at this location in this document.

The enclosure PE905534 has the following characteristics:

ITEM_BARCODE = PE905534
CONTAINER_BARCODE = PE902506
NAME = Multi Rate Analysis Plot
BASIN = GIPPSLAND
PERMIT = VIC/L2
TYPE = WELL
SUBTYPE = DIAGRAM
DESCRIPTION = Wirrah-3 Multi Rate Analysis Plot, PT 3A, Fig 6 from WCR vol 2
REMARKS =
DATE_CREATED = 17/02/84
DATE_RECEIVED = 29/11/85
W_NO = W840
WELL_NAME = WIRRAH-3
CONTRACTOR =
CLIENT_OP_CO = ESSO AUSTRALIA LIMITED

(Inserted by DNRE - Vic Govt Mines Dept)

APPENDIX 6

APPENDIX 6

APPENDIX 6

WIRRAH-3

ABNORMAL PRESSURE STUDY

(I) CONCLUSION

Comparison and correlation of various drilling parameters, RFT results and electric logs data, suggests the onset of abnormally pressured formation at around 2800mKB (2779mSS).

(II) METHODS

a) In order to calculate the pore pressure of the Latrobe Group, a Wireline Log Pore Pressure Plot was produced. The transit time readings from the Sonic (BHC) log, the bulk shale density readings from density (LDTC) log and the conductivity values converted from DLL resistivity logs were plotted on 2-cycle logarithmic graph paper versus depth (graph 1). All depth readings are from Density logs (Table 1).

The plots indicate that the sediments appear to be normally compacted to about 2696mKB, where there is an abrupt decrease in both the velocity and the shale density values indicating the possible presence of abnormal pressure. The transit time increases from 230 usec/m to 270 usec/m (at 2723mKB and at 2837mKB respectively), while the shale density values decrease from 2.65 gm/cc to 2.47 gm/cc (at 2681mKB and 2941mKB respectively). An increase in both shale density and in interval velocity in the lower part of the well, should be considered as a lithological effect rather than a compaction effect. It should be noted that the low slope of the shale density curve between 2850mKB to 2910mKB maybe due to wash-out effect at the measured points, which results in low density values of the shale in that inteval.

(b) The "Drill Data Plot" shows a number of parameters such as ROP, mud gas, 'd'c exponent and mud weight, all related to lithology. In the case of Wirrah-3, the ROP, temperature, and 'd'c exponent plots show normal trend down to the total depth of the well (at 3257mKB) T.D. The rate of penetration (ROP) shows a negative drill-off or "Dulling" trend from 2990mKB to total depth (plots 1 and 2). Below 3000mKB trip gas levels are high despite the elevation of mud weight from 9.6ppg to 12.2ppg. These parameters confirm the presence (plot 3) of abnormal pressure.

The pore pressure plot, shows a shift in trend at 3040mKB. The calculated pore pressure increases to 9.0ppg below 3041mKB, to 10ppg below 3138mKB and reaches 11.9ppg at 3211mKB. From 3220mKB the calculated pore pressure decreases to 11.7ppg and remains at that level to T.D. This calculated trend indicates the presence of abnormal pressure below 3000m depth.

(c) The RFT data plot shows a shift in the normal trend of formation pressure at 2800mKB (2779mSS), where the formation pressure increases from 3975psi (mud weight equivalent 8.4ppg) to 4800psi (M.W. eq. 9.6ppg) at 2930mKB (2909mSS) (Plot 4). If the formation pressure plot is normalised (Plot 5) a 45 psi deviation from normal trend is obvious from 2600mKB to 2800mKB, where the formation pressure increases, possibly indicating the onset of abnormal pressure.

(d) The failure of the Core Laboratories drill data plots to accurately pinpoint the top of abnormal pressure (shown from 2700mKB to 2800mKB by both the electric log Pore Pressure Plot and the RFT pressure plot) may be attributed to the fluctuation of drilling parameters (mud weight, weight on bit, mud circulation density). The plots probably only detected the presence of abnormal pressure when the differential between mud weight and the higher pore pressures became overwhelming (Plots 1, 2, 3 and 3a).

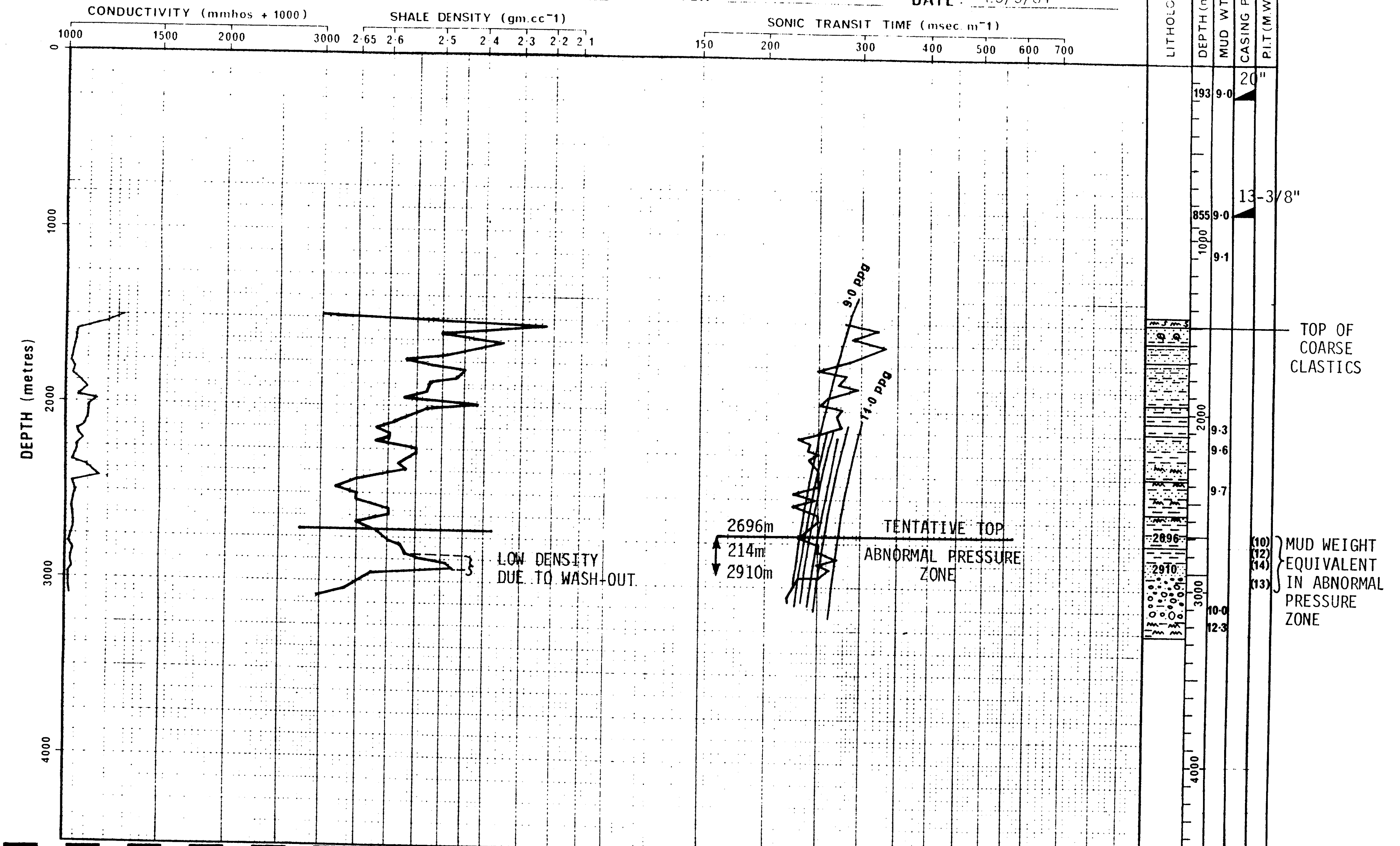
S. SHOGHI

TABLE #1

Depth	Conductivity + 1,000	Shale Density	Sonic	Depth	Shale Density	Sonic
1509.0	1277	2.77	280	2994.5	2.63	230
1553.5	1117	2.23	310	3052.0	2.68	220
1597.5	1050	2.50	290	3088.0	2.71	220
1649.0	1043	2.36	320			
1717.0	1033	2.49	285			
1743.0	1033	2.57	270			
1776.0	1025	2.52	250			
1804.0	1041	2.45	280			
1858.0	1031	2.47	270			
1887.0	1055	2.52	295			
1930.0	1100	2.53	260			
1959.0	1055	2.57	250			
1988.0	1143	2.42	275			
2013.0	1100	2.53	270			
2096.0	1100	2.59	275			
2127.0	1083	2.62	250			
2152.0	1058	2.60	230			
2182.0	1066	2.60	240			
2216.0	1071	2.62	240			
2250.0	1058	2.55	250			
2286.0	1058	2.55	240			
2333.0	1035	2.58	250			
2369.5	1100	2.57	250			
2419.0	1153	2.65	250			
2468.0	1029	2.68	225			
2502.0	1058	2.65	245			
2540.0	1043	2.65	225			
2605.0	1033	2.60	250			
2633.0	1040	2.60	250			
2681.0	1034	2.65	240			
2763.5	1020	2.60	250			
2789.5	1011	2.58	250			
2837.0	1030	2.57	270			
2875.0	1020	2.54	250			
2908.5	1020	2.49	260			
2941.0	1028	2.47	250			

PORE PRESSURE PLOT

WELL: WIRRAH - 3 **PLOTTER:** S. SHOGHI **DATE:** 23/3/84



Graph 1

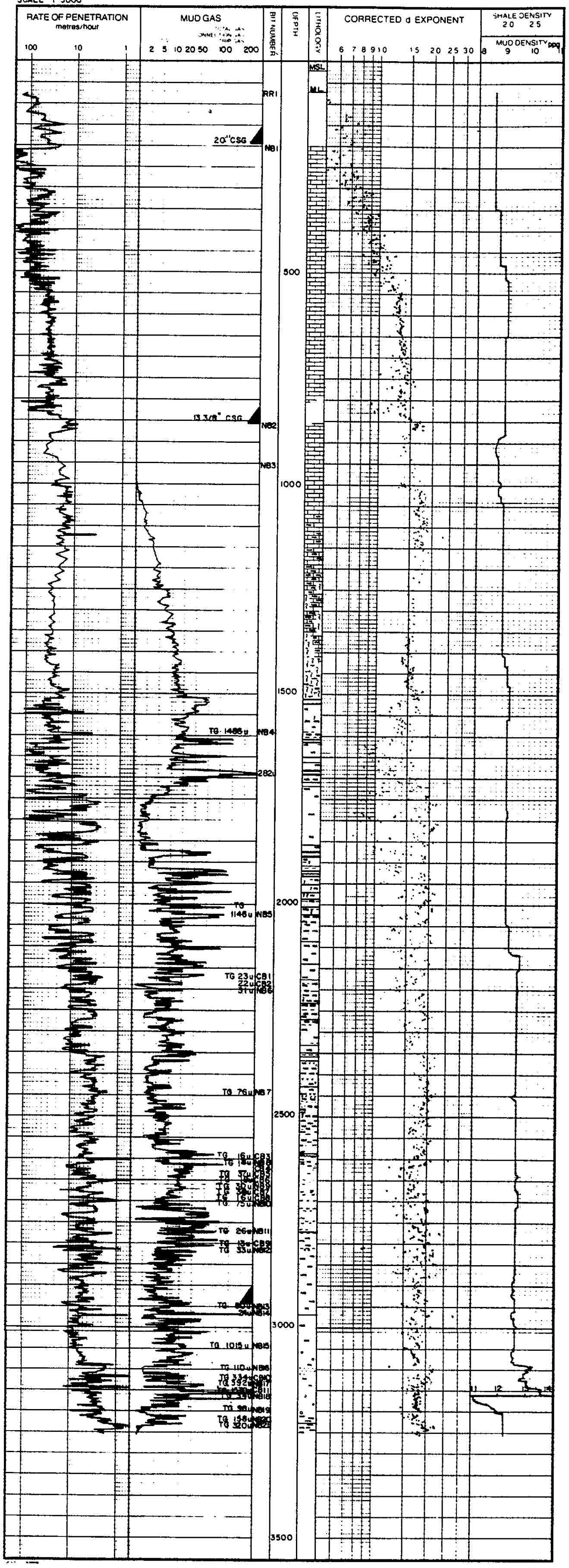
LAB DRILL DATA PLOT

EXTENDED SERVICE PACKAGE - ESP

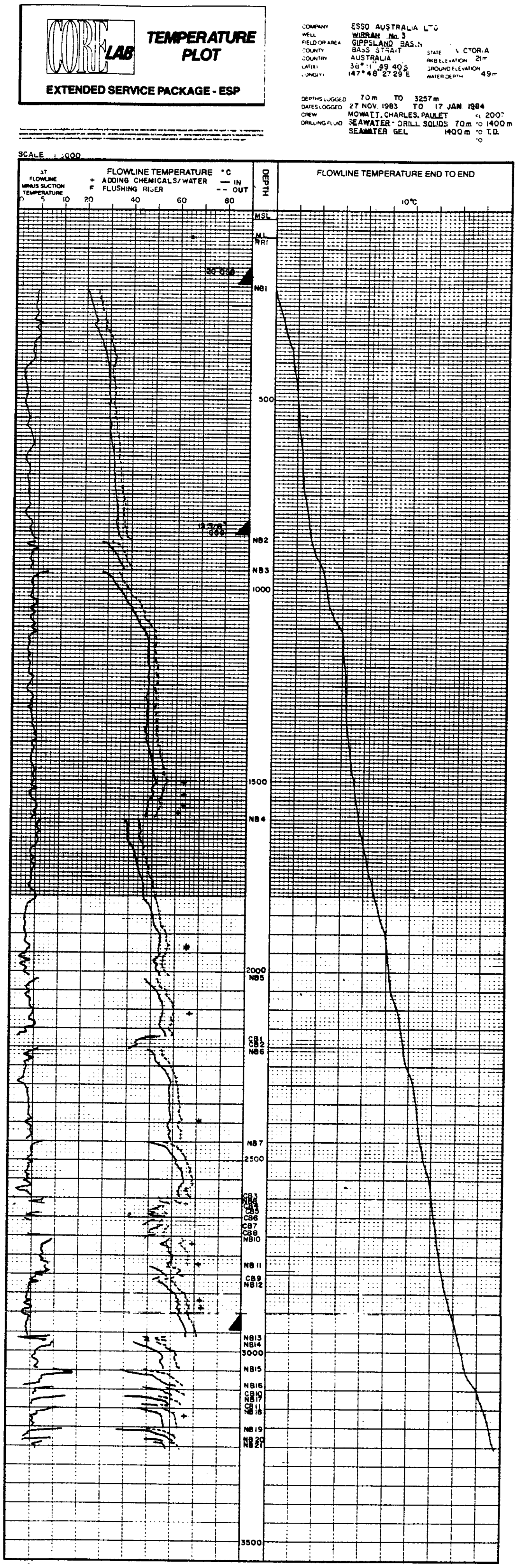
ESSO AUSTRALIA LTD
WIRRAH No 3
GIPPSLAND BASIN
BASS STRAIT VICTORIA
AUSTRALIA 21m
38° 11' 49.40 S
147° 48' 27.29 E 49m

70m TO 3257m
27 NOV 1983 TO 17 JAN 1984
MOWATT, CHARLES, PAULET 2007
SEAWATER 70m 208m
SEAWATER - DRILL SOLIDS 208m 1400m
SEAWATER GEL 1400m 3257m

SCALE 1 : 5000



Plot 1


CORE LAB
TEMPERATURE PLOT
EXTENDED SERVICE PACKAGE - ESP
COMPANY ESSO AUSTRALIA LTD
WELL WIRRAH No. 3
FIELD OR AREA GIPPSLAND BASIN
COUNTY BASS STRAIT
STATE VICTORIA
COUNTRY AUSTRALIA
RKB ELEVATION 21m
LAT(X) 38° 11' 49 40 S
GROUND ELEVATION
LONG(Y) 147° 48' 27 29 E
WATER DEPTH 49m
DEPTHS LOGGED 70m TO 3257m
DATES LOGGED 27 NOV. 1983 TO 17 JAN. 1984
CREW MOWATT, CHARLES, PAULET
SEAWATER - DRILL SOLIDS 70m to 1400m
SEAWATER GEL 1400m to T.D.
SCALE
ΔT FLOWLINE MINUS SUCTION TEMPERATURE
FLOWLINE TEMPERATURE °C
+ ADDING CHEMICALS/WATER
F FLUSHING RISER
— IN
-- OUT
DEPTH
FLOWLINE TEMPERATURE END TO END
10°C
MSL
ML
RRI
NB1
500
NB2
NB3
1000
1500
NB4
2000
NB5
CB1
CB2
NB6
NB7
2500
CB6
CB7
CB8
NB10
NB11
CB9
NB12
NB13
NB14
3000
NB15
NB16
NB18
NB19
3500

Plot 2

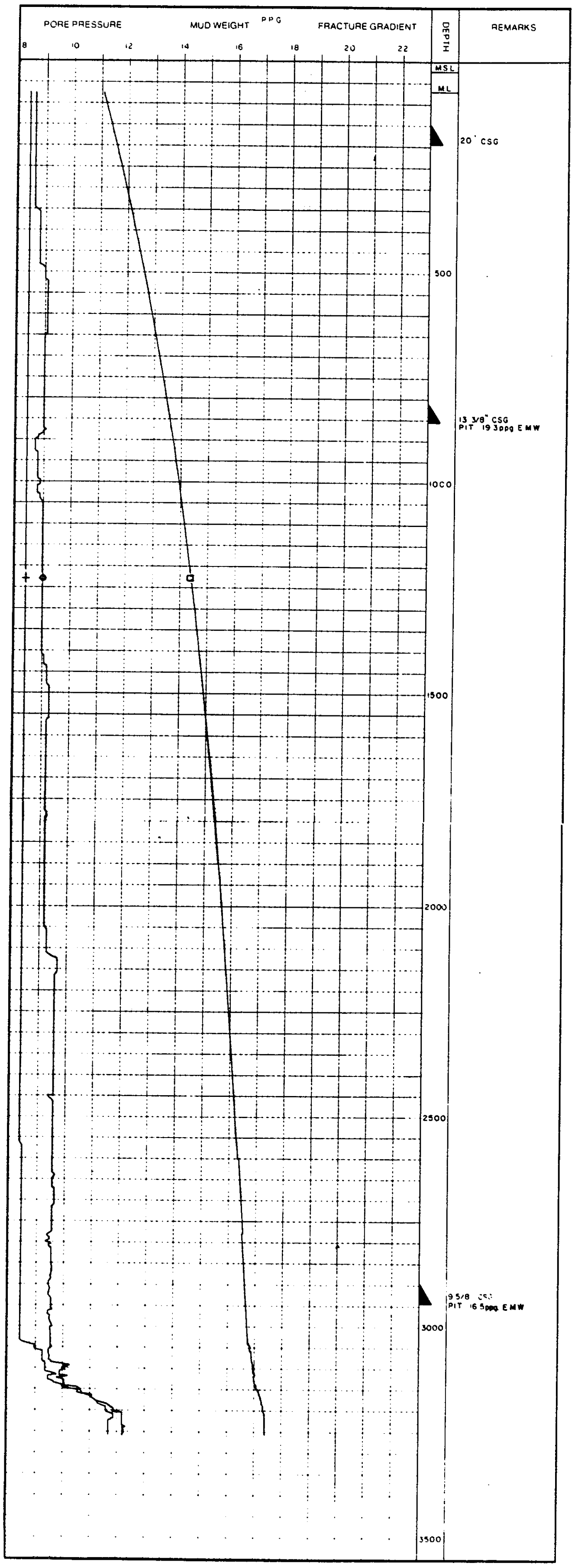
LAB PRESSURE PLOT

EXTENDED SERVICE PACKAGE - ESP

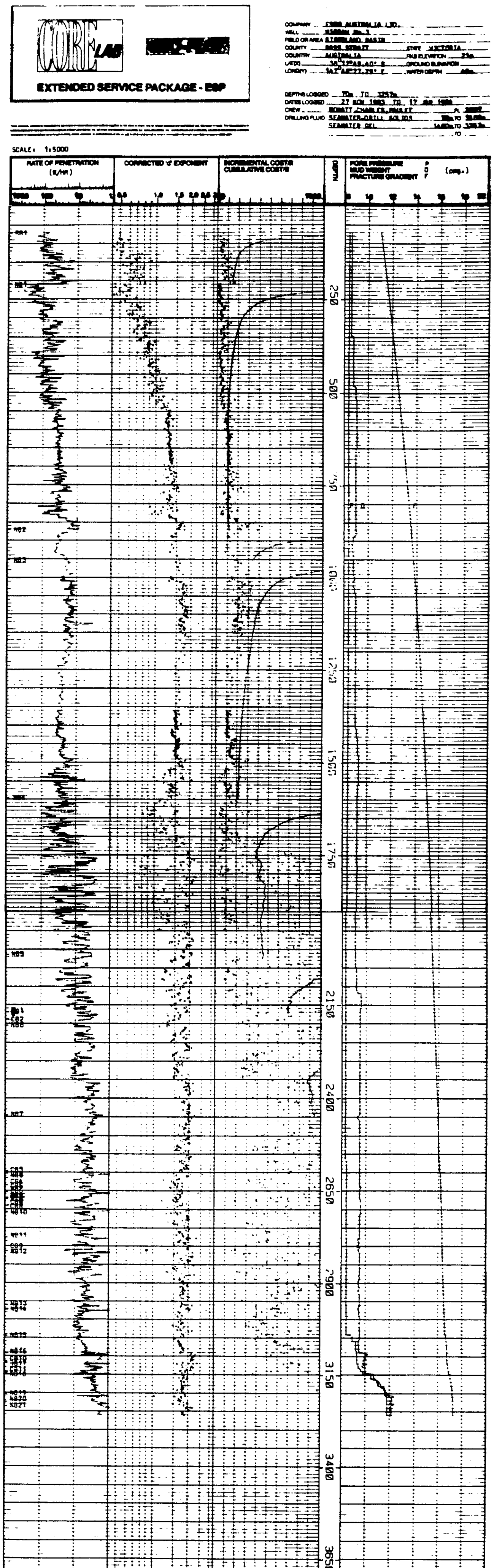
ESSO AUSTRALIA LTD
WIRRAH NO 3
GIPPSLAND BASIN
BASS STRAIT VICTORIA
AUSTRALIA 21m
38° 11 49 40 S
147° 48 27 29 E 49m

70m TO 3257m
27 NOV 1983 TO 17 JAN 1984
CHARLES. MOWATT.PAULET 2007
SEAWATER-DRILL SOLIDS 70 1400m
SEAWATER GEL 1400m TD

SCALE 1:5000

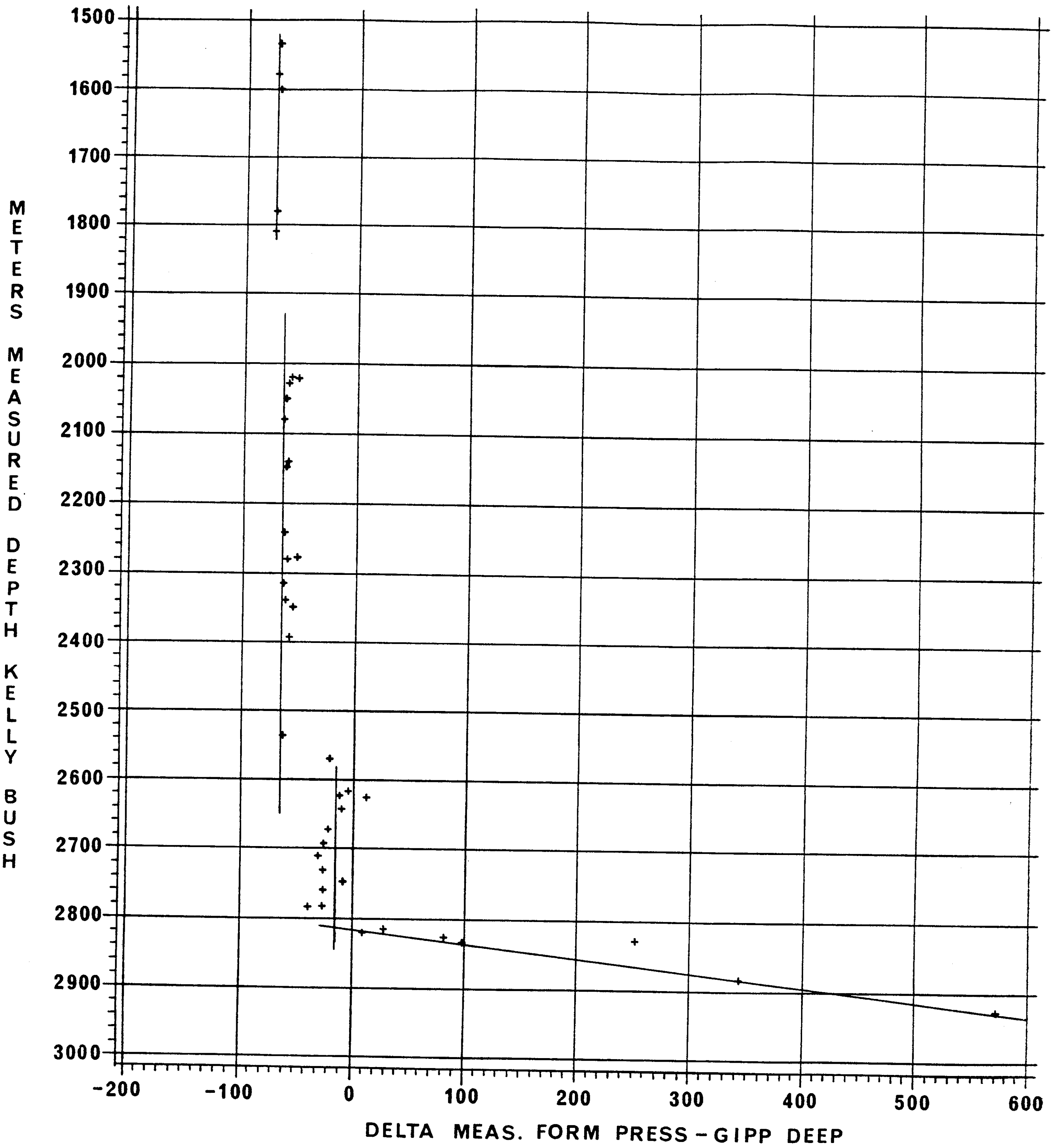


Plot 3


EXTENDED SERVICE PACKAGE - ESP
COMPANY
WELL
FIELD OR AREA
COUNTY
STATE
COUNTRY
AUSTRALIA
DEPTHS LOGGED
DATES LOGGED
CREW
DRILLING FLUID
SCALE: 1:5000
RATE OF PENETRATION
CORRECTED 'd' EXPONENT
DEPTH
PORE PRESSURE
MUD WEIGHT
FRACTURE GRADIENT
250
500
2150
2400
2650
2900
3150
3400
3650

Plot 3A

WELL: WIRRAH-3



NORMALISED PRESSURE DEPTH PLOT

PLOT 5.

PE905535

This is an enclosure indicator page.
The enclosure PE905535 is enclosed within the container PE902506 at this location in this document.

The enclosure PE905535 has the following characteristics:

ITEM_BARCODE =	PE905535
CONTAINER_BARCODE =	PE902506
NAME =	Pressure Depth- Plot
BASIN =	GIPPSLAND
PERMIT =	VIC/L2
TYPE =	WELL
SUBTYPE =	DIAGRAM
DESCRIPTION =	Wirrah-3 Pressure/Depth Plot from WCR vol 2
REMARKS =	
DATE_CREATED =	
DATE_RECEIVED =	29/11/85
W_NO =	W840
WELL_NAME =	WIRRAH-3
CONTRACTOR =	
CLIENT_OP_CO =	ESSO AUSTRALIA LIMITED

(Inserted by DNRE - Vic Govt Mines Dept)

APPENDIX 7

APPENDIX 7

APPENDIX 7

GEOCHEMICAL REPORT

WIRRAH-3 WELL, GIPPSLAND BASIN

VICTORIA

by

J.K. EMMETT

Sample handling and Analyses by:

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Esso Australia Ltd.
Geochemical Report

November 1984

CONTENTS

WIRRAH-3

INTRODUCTION

Samples of wet canned cuttings, sidewall cores and conventional cores collected during drilling of the Wirrah-3 well, Gippsland Basin, were subjected to various geochemical analyses. Canned cuttings composited over 15-metre intervals were collected from 210m (KB) down to Total Depth (T.D.) at 3255m (KB). Light hydrocarbon (C_{1-4}) headspace gases were determined on alternate 15-metre intervals from 1365m (KB) to T.D. Other samples were selected 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 measurements were performed by A.C. Cook of Wollongong.

A number of oil samples were analysed for API gravity, "whole oil" gas chromatography, C_{15+} liquid and gas chromatography, and carbon isotopes were determined on the saturate and aromatic fractions.

DISCUSSION OF RESULTS

The detailed headspace C_{1-4} cuttings gas data are presented in Table 1. These data are more conveniently represented in well-log form in Figures 1(a) and 1(b). Total cuttings gas is moderately rich in the Lakes Entrance Formation sediments, although methane is the most predominant component. This indicates a fair hydrocarbon source potential, for dry gas only at present maturity levels. Cuttings gas values for the Latrobe Group sediments are generally rich with wet gas percentages usually between 15-25%. The Latrobe Group sediments are rated as having a good hydrocarbon source potential.

Total Organic Carbon (T.O.C.) values (Table 2) for the Lakes Entrance Formation (av. T.O.C. = 0.52%) and the Gurnard Formation (av. T.O.C. = 0.95%) are poor and fair respectively, whereas the undifferentiated Latrobe Group sediments which are rich in T.O.C. (av. T.O.C. = 2.15%). These data again indicate a very good hydrocarbon source potential for the Latrobe Group.

Vitrinite reflectance ($\bar{R}_V$ max) data are presented in Table 3 and $R_V\bar{}$max values have been plotted with depth in Figure 2. Using the straight line maturation profile plotted in Figure 2, the top of organic maturity (taken to be $\bar{R}_V$ max = 0.65%) is at approximately 2900m (KB). Detailed vitrinite reflectance and exinite fluorescence data are presented in Appendix-1.

Rock-Eval pyrolysis results are listed in Table 4. Figure 3 is a maturation and organic matter type plot of Hydrogen Index (HI) vs T_{max} (^{o}C) on which fields delineating the basic kerogen types and the oil generation window (indicated by equivalent vitrinite reflectance curves) are shown. Figure 3 indicates that the major organic matter types in the Latrobe Group sediments composed of predominantly Type III, terrestrially derived material, however there also exists a significant amount of more oil-prone Type II (i.e. exinite-rich) detritus. T_{max} values indicate that the top of organic maturity (i.e. T_{max} of 435-440^{o}c) occurs in the vicinity of about 2750m (KB), which is less than the depth predicted by vitrinite reflectance data.

Table 5 lists elemental analyses of selected kerogen concentrates isolated from Latrobe Group sidewall cores. Approximate Hydrogen:Carbon (H/C), Oxygen:Carbon (O/C) and Nitrogen:Carbon (N/C) atomic ratios are given in Table 6. These ratios are 'approximate' since the oxygen % is calculated by difference, and the naturally occurring organic sulphur content (which may be up to a few percent) was not determined. Figure 4 is a modified Van Krevelen Plot of atomic H/C vs atomic O/C ratio, again showing fields defining the basic kerogen types. Comparison of Figure 4 with Figure 5, a similar diagram showing the principal products of kerogen evolution, basically confirms the Rock-Eval pyrolysis results, again indicating a good gas plus oil source potential for the Latrobe Group sediments.

The C_{15+} liquid chromatography results for selected conventional core samples (all samples from the Latrobe Group) are listed in Table 7. Total extract values are very rich and generally composed of 50% or more hydrocarbon material which is indicative of significant oil source potential. The corresponding C_{15+} chromatograms are shown in Figures 6-9 and are typical of predominantly terrestrial organic detritus as indicated by remnant odd over even predominance present, to varying degree, in the high molecular weight (C_{23+}) waxy n-alkane region. High pristane (peak 'a') to phytane (peak 'b') ratios also indicate deposition in an oxic environment. Indications from the chromatograms of the degree of maturation are slightly confused by the relatively mature saturate distribution from 2653.76 - 2653.77m (KB) Fig. 7, compared to the samples from 2807.1m (KB) Fig. 8, and 3116.6m (KB) Fig. 9, which are regarded as being early mature and mature respectively. It is possible that the sample at 2653.76 - 2653.77m (KB) is oil stained. As will be exemplified later (Figures 10-18), several deep intra-Labtrobe oil shows were present in the Wirrah-3 well. Based on the saturate chromatograms the top of organic maturity for significant hydrocarbon generation, is in the vicinity of 2800m.

Figures 10-18 are representative whole oil chromatograms of various intra-Latrobe oil zones encountered in Wirrah-3 . Oil Samples at 2023.7m (KB), 2635 - 2646m (KB), 2861.5 - 2872.5m (KB) and 2936.8m (KB) were fractionated by liquid chromatography and the results, together with saturate and aromatic fraction carbon isotopic compositions, are presented in Table 8. The corresponding C_{15+} saturate chromatograms are shown in Figures 19-22. The Wirrah-3 oils have fairly similar hydrocarbon distributions with API gravities ranging from 31.0 to 40.8 degrees (Table 9). They are high wax, paraffinic-based crudes, all of which show some remnant odd/even carbon preference in the high molecular weight n-alkanes. Clearly, they are sourced from predominantly terrestrial organic matter. The Wirrah-3 oils are very similar to the deep intra-Latrobe Group oils discovered in Wirrah-1.

CONCLUSIONS

1) The top of organic maturity for significant hydrocarbon generation in Wirrah-3 is at approximately 2900m (KB).

2) The Latrobe Group sediments have a very good gas plus oil source potential.

3) The deep intra-Latrobe oil shows encountered are intermediate API, high wax paraffinic crudes derived from terrestrial organic matter and are similar to the deep intra-Latrobe Group oils discovered in Wirrah-1.

1210L:13

TABLE 1

C1-C4 HYDROCARBON ANALYSES

REPORT A - HEADSPACE GAS

BASIN - GIPPSLAND
WELL - WIRRAH 3

SAMPLE NO.	DEPTH	METHANE C1	ETHANE C2	PROPANE C3	IBUTANE IC4	NBUTANE C4	WET C2-C4	TOTAL C1-C4	WET/TOTAL PERCENT	TOTAL GAS M	TOTAL GAS E	TOTAL GAS P	TOTAL GAS IB	TOTAL GAS NB	WET GAS E	WET GAS P	WET GAS IB	WET GAS NB
		GAS CONCENTRATION (VOLUME GAS PER MILLION VOLUMES CUTTINGS)								GAS COMPOSITION (PERCENT)								
'2891 A	1380.00	4299	197	77	13	11	298	4597	6.48	94.	4.	2.	0.	0.	66.	26.	4.	4.
'2891 C	1410.00	4573	236	115	17	16	384	4957	7.75	92.	5.	2.	0.	0.	61.	30.	4.	4.
'2891 E	1440.00	4451	203	85	16	18	322	4773	6.75	93.	4.	2.	0.	0.	63.	26.	5.	6.
'2891 G	1470.00	5550	337	184	32	57	610	6160	9.90	90.	5.	3.	1.	1.	55.	30.	5.	9.
'2891 I	1500.00	3703	360	302	68	145	875	4578	19.11	81.	8.	7.	1.	3.	41.	35.	8.	17.
'2891 K	1530.00	2866	1046	998	237	357	2638	5504	47.93	52.	19.	18.	4.	6.	40.	38.	9.	14.
'2891 M	1560.00	0	0	0	0	0	0	0	.00	0.	0.	0.	0.	0.	0.	0.	0.	0.
'2891 O	1590.00	250	77	22	4	5	108	358	30.17	70.	22.	6.	1.	1.	71.	20.	4.	5.
'2891 Q	1620.00	47867	20810	4233	508	562	26113	73980	35.30	65.	28.	6.	1.	1.	80.	16.	2.	2.
'2891 S	1650.00	32844	8853	254	214	83	9404	42248	22.26	78.	21.	1.	1.	0.	94.	3.	2.	1.
'2891 U	1680.00	33038	8123	694	119	81	9017	42055	21.44	79.	19.	2.	0.	0.	90.	8.	1.	1.
'2891 W	1710.00	29346	8506	1369	116	102	10093	39439	25.59	74.	22.	3.	0.	0.	84.	14.	1.	1.
'2891 Y	1740.00	10879	1729	682	129	135	2675	13554	19.74	80.	13.	5.	1.	1.	65.	25.	5.	5.
'2892 A	1770.00	4590	823	582	150	154	1709	6299	27.13	73.	13.	9.	2.	2.	48.	34.	9.	9.
'2892 C	1800.00	663	188	130	30	35	383	1046	36.62	63.	18.	12.	3.	3.	49.	34.	8.	9.
'2892 E	1830.00	2144	319	146	32	39	536	2680	20.00	80.	12.	5.	1.	1.	60.	27.	6.	7.
'2892 G	1860.00	3135	554	269	54	63	940	4075	23.07	77.	14.	7.	1.	2.	59.	29.	6.	7.
'2892 I	1890.00	23723	7272	1759	174	180	9385	33108	28.35	72.	22.	5.	1.	1.	77.	19.	2.	2.
'2892 K	1920.00	20902	8068	1821	130	146	10165	31067	32.72	67.	26.	6.	0.	0.	79.	18.	1.	1.
'2892 M	1950.00	35245	12368	2343	238	271	15220	50465	30.16	70.	25.	5.	0.	1.	81.	15.	2.	2.
'2892 O	1980.00	25636	9359	2054	195	226	11834	37470	31.58	68.	25.	5.	1.	1.	79.	17.	2.	2.
'2892 Q	2010.00	8411	1379	411	51	53	1894	10305	18.38	82.	13.	4.	0.	1.	73.	22.	3.	3.
'2892 S	2040.00	20994	4220	1851	324	442	6837	27831	24.57	75.	15.	7.	1.	2.	62.	27.	5.	6.
'2892 U	2070.00	12715	2638	1174	149	172	4133	16848	24.53	75.	16.	7.	1.	1.	64.	28.	4.	4.
'2892 W	2100.00	5231	1081	788	266	331	2466	7697	32.04	68.	14.	10.	3.	4.	44.	32.	11.	13.
'2892 Y	2130.00	447	163	129	97	93	482	929	51.88	48.	18.	14.	10.	10.	34.	27.	20.	19.
'2893 A	2160.00	19863	2734	939	139	201	4013	23876	16.81	83.	11.	4.	1.	1.	68.	23.	3.	5.
'2893 C	2220.00	10160	3272	2082	431	497	6282	16442	38.21	62.	20.	13.	3.	3.	52.	33.	7.	8.
'2893 E	2250.00	16423	2732	659	98	89	3578	20001	17.89	82.	14.	3.	0.	0.	76.	18.	3.	2.
'2893 G	2280.00	28133	5029	1650	192	278	7149	35282	20.26	80.	14.	5.	1.	1.	70.	23.	3.	4.
'2893 I	2310.00	21482	6770	2881	503	459	10613	32095	33.07	67.	21.	9.	2.	1.	64.	27.	5.	4.
'2893 K	2340.00	46534	8869	2314	315	282	11780	58314	20.20	80.	15.	4.	1.	0.	75.	20.	3.	2.
'2893 M	2370.00	8849	1654	341	59	31	2085	10934	19.07	81.	15.	3.	1.	0.	79.	16.	3.	1.
'2893 O	2400.00	40678	4440	1301	187	167	6095	46773	13.03	87.	9.	3.	0.	0.	73.	21.	3.	3.
'2893 Q	2430.00	758	115	58	10	13	196	954	20.55	79.	12.	6.	1.	1.	59.	30.	5.	7.
'2893 S	2460.00	8500	1755	743	159	178	2835	11335	25.01	75.	15.	7.	1.	2.	62.	26.	6.	6.
'2893 U	2490.00	4676	598	252	64	78	992	5668	17.50	82.	11.	4.	1.	1.	60.	25.	6.	8.
'2893 W	2520.00	11994	2934	1327	373	342	4976	16970	29.32	71.	17.	8.	2.	2.	59.	27.	7.	7.
'2893 Y	2550.00	2763	570	225	75	68	938	3701	25.34	75.	15.	6.	2.	2.	61.	24.	8.	7.
'2894 A	2580.00	43091	4078	993	106	164	5341	48432	11.03	89.	8.	2.	0.	0.	76.	19.	2.	3.
'2894 C	2610.00	34263	2509	802	95	169	3575	37838	9.45	91.	7.	2.	0.	0.	70.	22.	3.	5.
'2894 E	2715.00	0	0	0	0	0	0	0	.00	0.	0.	0.	0.	0.	0.	0.	0.	0.
'2894 G	2745.00	36860	5532	1794	261	296	7883	44743	17.62	82.	12.	4.	1.	1.	70.	23.	3.	4.
'2894 I	2775.00	53807	10394	2178	316	284	13172	66979	19.67	80.	16.	3.	0.	0.	79.	17.	2.	2.
'2894 K	2805.00	13835	1503	625	105	110	2343	16178	14.48	86.	9.	4.	1.	1.	64.	27.	4.	5.
'2894 M	2835.00	11044	1230	385	57	70	1742	12786	13.62	86.	10.	3.	0.	1.	71.	22.	3.	4.

TABLE 1 (CONT'D)

C1-C4 HYDROCARBON ANALYSES

REPORT A - HEADSPACE GAS

BASIN - GIPPSLAND
WELL - WIRRAH 3

		GAS CONCENTRATION (VOLUME GAS PER MILLION VOLUMES CUTTINGS)								GAS COMPOSITION (PERCENT)								
SAMPLE NO.	DEPTH	METHANE C1	ETHANE C2	PROPANE C3	IBUTANE IC4	NBUTANE C4	WET C2-C4	TOTAL C1-C4	WET/TOTAL PERCENT	TOTAL GAS M	TOTAL GAS E	TOTAL GAS P	TOTAL GAS IB	TOTAL GAS NB	WET GAS E	WET GAS P	WET GAS IB	WET GAS NB
72894 Q	2895.00	1225	213	119	45	49	426	1651	25.80	74.	13.	7.	3.	3.	50.	28.	11.	12.
72894 S	2925.00	1317	227	77	26	20	350	1667	21.00	79.	14.	5.	2.	1.	65.	22.	7.	6.
72894 U	2955.00	9400	788	115	23	17	943	10343	9.12	91.	8.	1.	0.	0.	84.	12.	2.	2.
72894 W	2985.00	1509	144	43	9	12	208	1717	12.11	88.	8.	3.	1.	1.	69.	21.	4.	6.
72894 Y	3015.00	5166	245	36	6	6	293	5459	5.37	95.	4.	1.	0.	0.	84.	12.	2.	2.
72895 A	3045.00	901	67	35	16	15	133	1034	12.86	87.	6.	3.	2.	1.	50.	26.	12.	11.
72895 C	3075.00	5372	194	81	25	24	324	5696	5.69	94.	3.	1.	0.	0.	60.	25.	8.	7.
72895 E	3105.00	1238	169	109	54	57	389	1627	23.91	76.	10.	7.	3.	4.	43.	28.	14.	15.
72895 G	3135.00	2851	246	49	7	8	310	3161	9.81	90.	8.	2.	0.	0.	79.	16.	2.	3.
72895 I	3165.00	2640	170	45	14	13	242	2882	8.40	92.	6.	2.	0.	0.	70.	19.	6.	5.
72895 K	3195.00	770	101	31	6	4	142	912	15.57	84.	11.	3.	1.	0.	71.	22.	4.	3.
72895 M	3225.00	1331	239	68	16	12	335	1666	20.11	80.	14.	4.	1.	1.	71.	20.	5.	4.
72895 O	3255.00	480	100	89	33	40	262	742	35.31	65.	13.	12.	4.	5.	38.	34.	13.	15.

TABLE 2

TOTAL ORGANIC CARBON REPORT

BASIN - GIPPSLAND
WELL - WIRRAH 3

SAMPLE NO.	DEPTH	AGE	FORMATION	AN	TOC%	AN	TOC%	AN	T/CO3	DESCRIPTION
72890 C	1425.60	MIOCENE-OLIGOCENE	LAKES ENTRANCE	1	.33			1	45.07	GRN\GY.SLTY.CALCILULITE
72890 B	1435.70	MIOCENE-OLIGOCENE	LAKES ENTRANCE	1	.25			1	45.16	GRN\GY SLTY CALCILULITE
72889 Z	1455.80	MIOCENE-OLIGOCENE	LAKES ENTRANCE	1	.43			1	45.05	GRN\GY.SLTY CALCILULITE
72889 W	1485.30	MIOCENE-OLIGOCENE	LAKES ENTRANCE	1	1.07			1	16.22	DK.OL.GY.SLTST;GLAUC.

===> DEPTH : 1306.00 TO 1495.00 METRES. <=== 1 ===> AVERAGE TOC : .52 % EXCLUDING VALUES GREATER THAN 10.00 % <===

SAMPLE NO.	DEPTH	AGE	FORMATION	AN	TOC%	AN	TOC%	AN	T/CO3	DESCRIPTION
72889 T	1497.40	EARLY OLIG.-LATE EOC	LATROBE GROUP-GURNARD FM.	1	1.24			1	17.73	OL.GY.SLTY SH;SL.GLAUC
72889 O	1507.00	EARLY OLIG.-LATE EOC	LATROBE GROUP-GURNARD FM.	1	.81			1	5.19	GRN.GY.SLTST;GLAUC,V.PYR
72889 M	1509.00	EARLY OLIG.-LATE EOC	LATROBE GROUP-GURNARD FM.	1	.80			1	51.86	GRN.GY.SLTST;GLAUC,V.PYR

===> DEPTH : 1495.00 TO 1509.00 METRES. <=== I ===> AVERAGE TOC : .95 % EXCLUDING VALUES GREATER THAN 10.00 % <===

SAMPLE NO.	DEPTH	AGE	FORMATION	AN	TOC%	AN	TOC%	AN	T/CO3	DESCRIPTION
72889 G	1531.50	EOCENE-LATE CRET.	LATROBE GROUP	1	3.33			1	2.06	OL.GY.SLTST;CARB.SPECKS
72889 C	1569.40	EOCENE-LATE CRET.	LATROBE GROUP	1	1.17			1	3.54	OL.GY.SANDY SLTST;ORG SP
72889 A	1646.10	EOCENE-LATE CRET.	LATROBE GROUP	1	3.70			1	3.13	V.CARB.SH.+SLTST LAYERS
72888 X	1715.20	EOCENE-LATE CRET.	LATROBE GROUP	1	2.02			1	4.39	OLIVE GREY SILTY SHALE
72888 T	1804.00	EOCENE-LATE CRET.	LATROBE GROUP	1	.74			1	1.74	MED.GREY SILTY SHALE
72888 O	1889.00	EOCENE-LATE CRET.	LATROBE GROUP	1	2.31			1	1.97	LT.OL.GREY SILTY SHALE
72888 L	1950.50	EOCENE-LATE CRET.	LATROBE GROUP	1	9.26			1	2.18	GREYISH BLACK SHALE
72888 G	2096.40	EOCENE-LATE CRET.	LATROBE GROUP	1	2.31			1	2.45	DARK GREY SILTY SHALE
72888 F	2154.10	EOCENE-LATE CRET.	LATROBE GROUP	1	.42			1	3.33	MED. GREY SILTY SHALE
72895 H	2180.72	EOCENE-LATE CRET.	LATROBE GROUP	2	15.94					DK GY-MED DK GY CLAYST.
72888 D	2255.50	EOCENE-LATE CRET.	LATROBE GROUP	1	.40			1	4.29	MD.GY.SLTST;FINE ORG.SPS
72888 B	2298.00	EOCENE-LATE CRET.	LATROBE GROUP	1	5.39			1	2.29	DK.GY.SLTY SH;COALY LAM.
72887 Z	2333.10	EOCENE-LATE CRET.	LATROBE GROUP	1	.42			1	3.22	MD.GY.SLTST;FINE ORG SPS
72887 X	2366.00	EOCENE-LATE CRET.	LATROBE GROUP	1	.57			1	4.48	MD.GY.SLTST;FINE ORG.SPS
72887 H	2459.50	EOCENE-LATE CRET.	LATROBE GROUP	1	.27			1	1.61	MD.GY.SLTLY SLTY SHALE
72887 J	2484.70	EOCENE-LATE CRET.	LATROBE GROUP	1	.32			1	1.58	MD.GY.SLTLY. SILTY SHALE
72887 F	2502.10	EOCENE-LATE CRET.	LATROBE GROUP	1	.26			1	1.25	MEDIUM GREY SHALE
72886 Y	2539.20	EOCENE-LATE CRET.	LATROBE GROUP	1	.38			1	3.04	LT.OL.GY.CLYST;ORG.SPCKS
72886 S	2558.50	EOCENE-LATE CRET.	LATROBE GROUP	1	.60			1	1.93	OL.GY.CLAYSTONE,ORG.MAT.
72886 N	2582.10	EOCENE-LATE CRET.	LATROBE GROUP	1	2.57			1	4.79	V.PYRITIC,MD.DK.GY.SLTST
72886 I	2604.90	EOCENE-LATE CRET.	LATROBE GROUP	1	1.52			1	2.06	DARK GREY SHALE
72886 H	2625.00	EOCENE-LATE CRET.	LATROBE GROUP	1	1.97			1	2.17	MED.DK.GY.SLTY.SH;+SST.
72886 G	2650.00	EOCENE-LATE CRET.	LATROBE GROUP	1	.75			1	2.94	MD.DK.GY.SILTSTONE
72895 V	2653.77	EOCENE-LATE CRET.	LATROBE GROUP	2	4.05					MED DK GY CLAYSTONE
72886 F	2695.56	EOCENE-LATE CRET.	LATROBE GROUP	1	.46			1	2.11	LT.GY SILTSTONE,DOLOMITE
72886 C	2719.90	EOCENE-LATE CRET.	LATROBE GROUP	1	2.92			1	2.87	MED.GY.SLTY SHALE,CARB.
72885 V	2764.00	EOCENE-LATE CRET.	LATROBE GROUP	1	3.04			1	2.19	DK.GY.SHALE;CARB.VEINS
72885 T	2789.00	EOCENE-LATE CRET.	LATROBE GROUP	1	1.19			1	1.16	MED.LT.GY.SNDY.SILTSTONE
72895 H	2807.10	EOCENE-LATE CRET.	LATROBE GROUP	2	5.09					MED DK GY CLAYSTONE
72885 R	2823.60	EOCENE-LATE CRET.	LATROBE GROUP	1	6.20			1	1.68	CARBONACEOUS DK.GY.SHALE

TABLE 2 (CONT'D)

TOTAL ORGANIC CARBON REPORT

BASIN - GIPPSLAND
WELL - WIRRAH 3

SAMPLE NO.	DEPTH	AGE	FORMATION	AN	TOC%	AN	TOC%	AN	T/CO3	DESCRIPTION
72885 Q	2875.00	EOCENE-LATE CRET.	LATROBE GROUP	1	2.84			1	5.05	65%MD.DK.GY.SLTST;CARB.
72885 O	2934.00	EOCENE-LATE CRET.	LATROBE GROUP	1	2.98			1	2.84	CARB.MED.GY.SLTST;25%SST
72895 S	2971.80	EOCENE-LATE CRET.	LATROBE GROUP	1	1.68			1	4.55	DK GY SLTST
72895 O	2994.40	EOCENE-LATE CRET.	LATROBE GROUP	1	1.24			1	2.22	OL/GY SLTY CLYST
72890 Z	3026.40	EOCENE-LATE CRET.	LATROBE GROUP	1	1.53			1	2.75	M-DK GY CARB SLTST
72890 X	3051.80	EOCENE-LATE CRET.	LATROBE GROUP	1	2.06			1	3.75	M-DK GY CARB SLTST
72890 T	3068.00	EOCENE-LATE CRET.	LATROBE GROUP	1	2.07			1	2.52	M-DK GY CARB SLTST
72890 R	3097.00	EOCENE-LATE CRET.	LATROBE GROUP	1	1.23			1	4.00	M-DK GY CARB SLTST
72890 P	3107.90	EOCENE-LATE CRET.	LATROBE GROUP	1	.40			1	3.20	LT OL/GY CARB SDY SLTST
72890 O	3116.00	EOCENE-LATE CRET.	LATROBE GROUP	1	4.33			1	6.97	DK GY CARB SLTY SH
72895 X	3116.60	EOCENE-LATE CRET.	LATROBE GROUP	2	3.98					OL GY CLAYSTONE,COALY
72890 N	3132.80	EOCENE-LATE CRET.	LATROBE GROUP	1	1.33			1	5.21	M-DK GY SLTST
72890 K	3159.20	EOCENE-LATE CRET.	LATROBE GROUP	1	2.01			1	2.65	DK GY CARB SLTST
72890 G	3222.00	EOCENE-LATE CRET.	LATROBE GROUP	1	2.73			1	3.25	DK GY SH,V CARB,W SLTST
72890 F	3241.90	EOCENE-LATE CRET.	LATROBE GROUP	1	.39			1	14.04	M GY SLTY CLYST

===> DEPTH : 1509.00 TO 3241.90 METRES. <=== I ===> AVERAGE TOC : 2.15 % EXCLUDING VALUES GREATER THAN 10.00 % <===

1/11/84

ESSO AUSTRALIA LTD.

TABLE 3

VITRINITE REFLECTANCE REPORT

ASIN - GIPPSLAND
ELL - WIRRAH 3

SAMPLE NO.	DEPTH	AGE	FORMATION	AN	MAX. RO	FLUOR. COLOUR	NO.CNTS.	MACERAL TYPE
72888 Y	1688.20	EOCENE-LATE CRET.	LATROBE GROUP	5	.39	GRN-YEL-OR	26	V>E>I,COAL
72888 Q	1873.00	EOCENE-LATE CRET.	LATROBE GROUP	5	.48	GRN-YEL-OR	27	V>E>I,COAL
72888 G	2096.40	EOCENE-LATE CRET.	LATROBE GROUP	5	.53	YEL-OR	27	V>E>I,DOM ABUNDANT
72888 B	2288.00	EOCENE-LATE CRET.	LATROBE GROUP	5	.57	GRN-YEL-BRN	26	V>E>I,DOM ABUNDANT
72887 N	2459.50	EOCENE-LATE CRET.	LATROBE GROUP	5	.55	OR-DULL OR	4	I>E>V,DOM SPARSE
72886 I	2604.90	EOCENE-LATE CRET.	LATROBE GROUP	5	.63	OR-DULL OR	4	I>E>V,DOM ABUNDANT
72885 Z	2742.50	EOCENE-LATE CRET.	LATROBE GROUP	5	.64	YEL-OR-BRN	27	V>E>I,COAL+DOM ABUND'T
72885 Q	2875.00	EOCENE-LATE CRET.	LATROBE GROUP	5	.63	OR-WEAK BRN	27	I>V>E,DOM ABUNDANT
72895 S	2971.80	EOCENE-LATE CRET.	LATROBE GROUP	5	.48	GRN-YEL-BRN	25	I>V>E,DOM ABUNDANT
72890 T	3088.00	EOCENE-LATE CRET.	LATROBE GROUP	5	.51	YEL-OR	25	I>E>V,DOM ABUNDANT
72890 R	3097.00	EOCENE-LATE CRET.	LATROBE GROUP	5	.52	YEL-DULL OR	25	I>E>V,DOM ABUNDANT
72890 Q	3116.00	EOCENE-LATE CRET.	LATROBE GROUP	5	.68	YEL-WEAK BRN	29	V>E>I,COAL+DOM ABUND'T
72890 G	3222.00	EOCENE-LATE CRET.	LATROBE GROUP	5	.68	YEL-OR-BRN	29	V>E>I,DOM ABUNDANT
72890 F	3241.90	EOCENE-LATE CRET.	LATROBE GROUP	5	.73	DULL OR	26	I>V=/>E,DOM COMMON

TABLE 4

ROCK EVAL ANALYSES

BASIN - GIPPSLAND
WELL - WIRRAH 3

REPORT A - SULPHUR & PYROLYZABLE CARBON

SAMPLE NO.	DEPTH	SAMPLE TYPE	AGE	TMAX	S1	S2	S3	PI	S2/S3	PC	COMMENTS
72889 W	1485.3	SWC	MIOCENE-OLIGOCENE	418.	.08	.42	.56	.15	.75	.04	
72889 T	1497.4	SWC	EARLY OLIG.-LATE EOC	419.	.16	.67	.60	.19	1.11	.07	
72889 O	1507.0	SWC	EARLY OLIG.-LATE EOC	412.	.16	.28	.50	.36	.57	.04	
72889 N	1509.0	SWC	EARLY OLIG.-LATE EOC	407.	.19	.27	.33	.41	.83	.04	
72889 G	1531.5	SWC	EOCENE-LATE CRET.	406.	3.52	12.83	.96	.22	13.37	1.36	
72889 C	1569.4	SWC	EOCENE-LATE CRET.	413.	.61	1.19	.53	.34	2.24	.15	
72889 A	1648.1	SWC	EOCENE-LATE CRET.	420.	.56	7.17	1.02	.07	7.05	.64	
72888 X	1715.2	SWC	EOCENE-LATE CRET.	416.	1.28	4.85	.35	.21	13.70	.51	
72888 T	1804.0	SWC	EOCENE-LATE CRET.	411.	.31	.70	.42	.31	1.65	.08	
72888 O	1889.0	SWC	EOCENE-LATE CRET.	423.	.73	3.73	.44	.16	8.44	.37	
72888 L	1950.5	SWC	EOCENE-LATE CRET.	431.	5.10	86.84	1.43	.06	60.81	7.63	
72888 G	2096.4	SWC	EOCENE-LATE CRET.	434.	1.14	5.40	.53	.17	10.26	.54	
72888 E	2154.1	SWC	EOCENE-LATE CRET.	429.	.49	.11	.48	.82	.22	.05	
72888 D	2255.5	SWC	EOCENE-LATE CRET.	423.	.84	.42	.44	.67	.96	.10	
72888 B	2288.0	SWC	EOCENE-LATE CRET.	426.	2.12	23.82	.69	.08	34.34	2.15	
72887 X	2366.0	SWC	EOCENE-LATE CRET.	427.	.41	.51	.41	.45	1.23	.08	
72886 S	2558.5	SWC	EOCENE-LATE CRET.	427.	.47	.35	.24	.57	1.50	.07	
72886 M	2582.1	SWC	EOCENE-LATE CRET.	435.	1.77	.99	.65	.64	1.53	.23	
72886 I	2604.9	SWC	EOCENE-LATE CRET.	437.	.61	.71	.63	.46	1.14	.11	
72886 H	2625.0	SWC	EOCENE-LATE CRET.	440.	1.28	1.64	.45	.44	3.65	.24	
72886 G	2650.0	SWC	EOCENE-LATE CRET.	429.	.79	.33	.29	.70	1.13	.09	
72886 C	2719.9	SWC	EOCENE-LATE CRET.	433.	1.84	5.95	.31	.24	19.16	.65	
72885 V	2764.0	SWC	EOCENE-LATE CRET.	433.	1.69	8.89	.36	.16	24.57	.88	
72885 T	2789.0	SWC	EOCENE-LATE CRET.	437.	.65	1.22	.30	.35	4.10	.16	
72885 R	2823.6	SWC	EOCENE-LATE CRET.	435.	2.97	24.32	.73	.11	33.43	2.27	
72885 Q	2875.0	SWC	EOCENE-LATE CRET.	434.	2.48	5.15	.35	.33	14.65	.63	
72885 O	2934.0	SWC	EOCENE-LATE CRET.	438.	1.63	2.49	.49	.40	5.12	.34	
72895 S	2971.8	SWC	EOCENE-LATE CRET.	433.	.45	.99	.42	.31	2.36	.12	
72895 Q	2994.4	SWC	EOCENE-LATE CRET.	438.	.54	1.47	.30	.27	4.84	.17	
72890 Z	3026.4	SWC	EOCENE-LATE CRET.	439.	.73	1.58	.08	.32	20.25	.19	
72890 X	3051.8	SWC	EOCENE-LATE CRET.	440.	.34	.64	.33	.34	1.97	.08	
72890 T	3088.0	SWC	EOCENE-LATE CRET.	438.	.90	2.97	.27	.23	10.89	.32	
72890 R	3097.0	SWC	EOCENE-LATE CRET.	442.	.42	1.18	.31	.26	3.84	.13	
72890 P	3107.9	SWC	EOCENE-LATE CRET.	441.	.14	.14	.14	.50	1.00	.02	
72890 O	3116.0	SWC	EOCENE-LATE CRET.	438.	1.00	13.30	.28	.07	47.67	1.19	
72890 M	3132.8	SWC	EOCENE-LATE CRET.	440.	1.03	1.30	.50	.44	2.58	.19	
72890 K	3159.2	SWC	EOCENE-LATE CRET.	441.	.36	1.39	.27	.21	5.11	.15	
72890 G	3222.0	SWC	EOCENE-LATE CRET.	449.	.37	1.90	.30	.16	6.32	.19	
72890 F	3241.9	SWC	EOCENE-LATE CRET.	423.	.50	.15	.12	.76	1.29	.05	

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

TABLE 4 (CONT'D)

ROCK EVAL ANALYSES

BASIN - GIPPSLAND
WELL - WIRRAH 3

REPORT B - TOTAL CARBON,H/O INDICES

SAMPLE NO.	DEPTH	SAMPLE TYPE	FORMATION	TC	HI	OI	HI/OI	COMMENTS
72889 W	1485.3	SWC	LAKES ENTRANCE	1.07	39.	52.	.75	
72889 T	1497.4	SWC	LATROBE GROUP-GURNARD FM	1.24	54.	48.	1.11	
72889 O	1507.0	SWC	LATROBE GROUP-GURNARD FM	.81	35.	62.	.57	
72889 N	1509.0	SWC	LATROBE GROUP-GURNARD FM	.80	34.	42.	.83	
72889 G	1531.5	SWC	LATROBE GROUP	3.33	385.	29.	13.28	
72889 C	1569.4	SWC	LATROBE GROUP	1.17	102.	45.	2.27	
72889 A	1648.1	SWC	LATROBE GROUP	3.70	194.	27.	7.19	
72888 X	1715.2	SWC	LATROBE GROUP	2.02	240.	18.	13.33	
72888 T	1804.0	SWC	LATROBE GROUP	.74	94.	57.	1.65	
72888 O	1869.0	SWC	LATROBE GROUP	2.31	161.	19.	8.47	
72888 L	1950.5	SWC	LATROBE GROUP	9.26	938.	15.	62.53	
72888 G	2096.4	SWC	LATROBE GROUP	2.31	234.	23.	10.17	
72888 E	2154.1	SWC	LATROBE GROUP	.42	25.	115.	.22	
72888 D	2255.5	SWC	LATROBE GROUP	.40	105.	110.	.95	
72888 B	2288.0	SWC	LATROBE GROUP	5.39	442.	13.	34.00	
72887 X	2366.0	SWC	LATROBE GROUP	.57	89.	72.	1.23	
72886 S	2558.5	SWC	LATROBE GROUP	.60	59.	39.	1.51	
72886 M	2582.1	SWC	LATROBE GROUP	2.57	39.	25.	1.56	
72886 I	2604.9	SWC	LATROBE GROUP	1.52	47.	41.	1.15	
72886 H	2625.0	SWC	LATROBE GROUP	1.97	83.	23.	3.61	
72886 G	2650.0	SWC	LATROBE GROUP	.75	44.	39.	1.13	
72886 C	2719.9	SWC	LATROBE GROUP	2.92	204.	11.	18.55	
72885 V	2764.0	SWC	LATROBE GROUP	3.04	292.	12.	24.33	
72885 T	2789.0	SWC	LATROBE GROUP	1.19	102.	25.	4.08	
72885 R	2823.6	SWC	LATROBE GROUP	6.20	392.	12.	32.67	
72885 Q	2875.0	SWC	LATROBE GROUP	2.84	181.	12.	15.08	
72885 O	2934.0	SWC	LATROBE GROUP	2.98	83.	16.	5.19	
72895 S	2971.8	SWC	LATROBE GROUP	1.68	59.	25.	2.36	
72895 Q	2994.4	SWC	LATROBE GROUP	1.24	118.	24.	4.84	
72890 Z	3026.4	SWC	LATROBE GROUP	1.24	127.	6.	20.25	
72890 X	3051.8	SWC	LATROBE GROUP	2.06	31.	16.	1.97	
72890 T	3088.0	SWC	LATROBE GROUP	2.07	144.	13.	10.89	
72890 R	3097.0	SWC	LATROBE GROUP	1.23	96.	25.	3.84	
72890 P	3107.9	SWC	LATROBE GROUP	.40	34.	34.	1.00	
72890 O	3116.0	SWC	LATROBE GROUP	4.33	307.	6.	47.67	
72890 M	3132.8	SWC	LATROBE GROUP	1.33	98.	38.	2.58	
72890 K	3159.2	SWC	LATROBE GROUP	2.01	69.	14.	5.11	
72890 G	3222.0	SWC	LATROBE GROUP	2.73	69.	11.	6.32	
72890 F	3241.9	SWC	LATROBE GROUP	.39	40.	31.	1.29	

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

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

TABLE 5

KEROGEN ELEMENTAL ANALYSIS REPORT

BASIN - GIPPSLAND
WELL - WIRRAH 3

SAMPLE NO.	DEPTH	SAMPLE TYPE	N%	C%	H%	S%	O%	ASH%	COMMENTS
			--- ELEMENTAL % (ASH FREE) ---						
72889 S	1499.30	SWC	1.86	70.27	5.06	.00	22.82	4.72	
72889 Q	1503.00	SWC	2.89	65.95	5.50	.00	25.65	12.56	HIGH ASH
72889 H	1525.50	SWC	.63	68.31	5.74	.00	25.31	6.52	
72889 G	1531.50	SWC	.65	62.23	5.15	.00	31.96	6.49	
72889 F	1539.90	SWC	.97	65.96	4.80	.00	28.27	8.08	
72889 E	1553.60	SWC	.80	66.61	5.15	.00	27.44	12.00	HIGH ASH
72889 C	1569.40	SWC	.88	65.90	5.06	.00	28.16	8.25	
72889 A	1648.10	SWC	1.09	65.13	4.88	.00	28.90	10.83	
72888 X	1715.20	SWC	.91	68.36	5.57	.00	25.15	10.26	
72888 T	1804.00	SWC	.93	71.39	5.60	.00	22.07	10.02	HIGH ASH
72888 P	1881.00	SWC	.75	76.10	7.63	.00	15.53	16.91	HIGH ASH
72888 O	1889.00	SWC	.88	73.69	5.85	.00	19.58	10.43	HIGH ASH
72888 L	1950.50	SWC	.86	74.74	7.23	.00	17.18	4.69	
72888 G	2096.40	SWC	1.09	74.91	5.80	.00	18.20	7.36	
72885 A	2170.12	COR	.89	69.95	4.96	.00	24.20	2.00	
72885 B	2180.66	COR	.88	77.34	6.83	.00	14.95	13.89	HIGH ASH
72885 C	2188.30	COR	.80	75.66	5.10	.00	18.44	1.70	
72885 D	2194.18	COR	.95	75.13	5.43	.00	18.49	6.02	
72885 E	2203.25	COR	.95	75.44	5.97	.00	17.63	6.66	
72888 C	2270.00	SWC	1.01	77.50	5.40	.00	16.09	4.99	
72888 B	2288.00	SWC	.88	77.41	5.85	.00	15.85	3.31	
72887 X	2366.00	SWC	1.16	80.17	4.28	.00	14.39	4.50	
72887 V	2392.60	SWC	1.75	76.94	5.16	.00	16.15	5.01	
72887 U	2397.60	SWC	1.16	81.27	4.80	.00	12.77	2.52	
72887 R	2424.00	SWC	1.34	80.11	5.35	.00	13.20	4.32	
72886 V	2552.50	SWC	.89	78.91	5.72	.00	14.48	11.00	HIGH ASH
72886 U	2555.90	SWC	.79	77.81	5.57	.00	15.83	5.33	
72886 S	2558.50	SWC	1.10	80.50	4.77	.00	13.63	8.21	
72886 M	2582.10	SWC	.95	78.45	5.65	.00	14.95	5.09	
72886 K	2593.00	SWC	1.29	80.09	5.64	.00	12.98	8.63	
72885 F	2597.10	COR	1.23	80.63	4.82	.00	13.32	2.63	
72885 G	2599.46	COR	.74	81.86	6.27	.00	11.14	2.48	
72886 J	2600.00	SWC	1.39	81.66	4.25	.00	12.70	2.50	
72885 H	2600.15	COR	.52	79.34	5.71	.00	14.43	2.38	
72885 I	2601.30	COR	.79	82.95	4.20	.00	12.06	2.75	
72886 I	2604.90	SWC	1.31	82.61	4.26	.00	11.81	3.39	
72885 J	2624.38	COR	.51	81.95	4.55	.00	13.00	3.45	
72886 H	2625.00	SWC	1.63	81.21	4.70	.00	12.46	2.01	
72885 K	2633.87	COR	.51	81.95	4.55	.00	13.00	3.45	
72885 L	2648.62	COR	1.46	81.49	4.07	.00	12.99	3.15	
72886 G	2650.00	SWC	1.73	80.98	4.02	.00	13.28	4.94	
72885 M	2678.38	COR	.95	81.44	4.29	.00	13.33	2.23	
72885 N	2681.09	COR	1.36	84.89	3.73	.00	10.02	3.11	
72886 C	2719.90	SWC	1.19	82.21	5.21	.00	11.40	8.23	
72886 A	2737.00	SWC	.68	82.36	4.94	.00	12.01	2.09	

TABLE 5 (CONT'D)

KEROGEN ELEMENTAL ANALYSIS REPORT

BASIN - GIPPSLAND
WELL - WIRRAH 3

SAMPLE NO.	DEPTH	SAMPLE TYPE	N%	C%	H%	S%	O%	ASH%	COMMENTS
			ELEMENTAL % (ASH FREE)						
72885 Z	2742.50	SWC	1.01	79.56	5.62	.00	13.82	2.51	
72885 Y	2744.60	SWC	1.03	82.46	4.62	.00	11.89	5.86	
72885 V	2764.00	SWC	1.25	80.61	5.82	.00	12.32	5.60	
72885 U	2775.00	SWC	1.26	83.55	4.83	.00	10.36	7.86	
72885 T	2789.00	SWC	1.47	81.08	4.90	.00	12.54	9.04	
72885 S	2800.00	SWC	1.04	82.83	5.70	.00	10.43	9.78	
72885 R	2823.60	SWC	.95	80.58	6.50	.00	11.96	13.99	HIGH ASH
72885 Q	2875.00	SWC	1.22	83.89	4.82	.00	10.06	5.00	
72885 P	2900.00	SWC	.82	80.52	5.59	.00	13.07	3.27	
72885 O	2934.00	SWC	1.28	82.34	4.71	.00	11.67	2.99	
72895 S	2971.80	SWC	1.32	78.48	4.78	.00	15.43	1.40	
72895 Q	2994.40	SWC	1.29	77.01	5.52	.00	16.19	12.97	HIGH ASH
72890 Z	3026.40	SWC	1.19	74.51	4.69	.00	19.61	1.15	
72890 X	3051.80	SWC	1.40	84.48	4.46	.00	9.66	4.07	
72890 T	3088.00	SWC	1.49	82.08	5.27	.00	11.15	12.31	HIGH ASH
72890 S	3088.60	SWC	1.63	77.97	3.83	.00	16.57	.17	
72890 R	3097.00	SWC	1.66	82.10	5.08	.00	11.15	5.69	
72890 M	3132.80	SWC	1.67	81.49	5.50	.00	11.34	14.37	HIGH ASH
72890 K	3159.20	SWC	1.07	53.58	3.11	.00	42.24	24.52	HIGH ASH
72890 H	3219.30	SWC	1.44	83.72	4.67	.00	10.17	8.10	
72890 G	3222.00	SWC	1.43	82.63	4.53	.00	11.41	7.37	
72895 Y	3225.00	SWC	1.09	80.59	4.18	.00	14.15	7.11	
72895 Z	3235.00	SWC	1.50	77.62	4.35	.00	16.53	3.46	

TABLE 6

KEROGEN ELEMENTAL ANALYSIS REPORT

BASIN - GIPPSLAND
WELL - WIRRAH 3

SAMPLE NO.	DEPTH	SAMPLE TYPE	AGE	FORMATION	ATOMIC RATIOS H/C	ATOMIC RATIOS O/C	ATOMIC RATIOS N/C	COMMENTS
72889 S	1499.30	SWC	EARLY OLIG.-LATE EOC	LATROBE GROUP-GURNARD FM	.86	.24	.02	
72889 Q	1503.00	SWC	EARLY OLIG.-LATE EOC	LATROBE GROUP-GURNARD FM	1.00	.29	.04	HIGH ASH
72889 N	1525.50	SWC	EOCENE-LATE CRET.	LATROBE GROUP	1.01	.28	.01	
72889 G	1531.50	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.99	.39	.01	
72889 F	1539.90	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.87	.32	.01	
72889 E	1553.60	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.93	.31	.01	HIGH ASH
72889 C	1569.40	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.92	.32	.01	
72889 A	1648.10	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.90	.33	.01	
72888 X	1715.20	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.98	.28	.01	
72888 T	1804.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.94	.23	.01	HIGH ASH
72888 P	1881.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	1.20	.15	.01	HIGH ASH
72888 O	1889.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.95	.20	.01	HIGH ASH
72888 L	1950.50	SWC	EOCENE-LATE CRET.	LATROBE GROUP	1.16	.17	.01	
72888 G	2096.40	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.93	.18	.01	
72885 A	2170.12	COR	EOCENE-LATE CRET.	LATROBE GROUP	.85	.26	.01	
72885 B	2180.66	COR	EOCENE-LATE CRET.	LATROBE GROUP	1.06	.14	.01	HIGH ASH
72885 C	2188.30	COR	EOCENE-LATE CRET.	LATROBE GROUP	.81	.18	.01	
72885 D	2194.18	COR	EOCENE-LATE CRET.	LATROBE GROUP	.87	.18	.01	
72885 E	2203.25	COR	EOCENE-LATE CRET.	LATROBE GROUP	.95	.18	.01	
72888 C	2270.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.84	.16	.01	
72888 B	2288.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.91	.15	.01	
72887 X	2366.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.64	.13	.01	
72887 V	2392.60	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.80	.16	.02	
72887 U	2397.60	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.71	.12	.01	
72887 R	2424.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.80	.12	.01	
72886 V	2552.50	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.87	.14	.01	HIGH ASH
72886 U	2555.90	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.86	.15	.01	
72886 S	2558.50	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.71	.13	.01	
72886 M	2582.10	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.86	.14	.01	
72886 K	2593.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.84	.12	.01	
72885 F	2597.10	COR	EOCENE-LATE CRET.	LATROBE GROUP	.72	.12	.01	
72885 G	2599.46	COR	EOCENE-LATE CRET.	LATROBE GROUP	.92	.10	.01	
72886 J	2600.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.62	.12	.01	
72885 H	2600.15	COR	EOCENE-LATE CRET.	LATROBE GROUP	.86	.14	.01	
72885 I	2601.30	COR	EOCENE-LATE CRET.	LATROBE GROUP	.61	.11	.01	
72886 I	2604.90	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.62	.11	.01	
72885 J	2624.38	COR	EOCENE-LATE CRET.	LATROBE GROUP	.67	.12	.01	
72886 H	2625.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.70	.12	.02	
72885 K	2633.87	COR	EOCENE-LATE CRET.	LATROBE GROUP	.67	.12	.01	
72885 L	2648.62	COR	EOCENE-LATE CRET.	LATROBE GROUP	.60	.12	.02	
72886 G	2650.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.60	.12	.02	
72885 M	2678.38	COR	EOCENE-LATE CRET.	LATROBE GROUP	.63	.12	.01	
72885 N	2681.09	COR	EOCENE-LATE CRET.	LATROBE GROUP	.53	.09	.01	
72886 C	2719.90	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.76	.10	.01	
72886 A	2737.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.72	.11	.01	

TABLE 6 (CONT'D)

KEROGEN ELEMENTAL ANALYSIS REPORT

BASIN - GIPPSLAND
WELL - WIRRAH 3

SAMPLE NO.	DEPTH	SAMPLE TYPE	AGE	FORMATION	ATOMIC RATIOS H/C	ATOMIC RATIOS O/C	ATOMIC RATIOS N/C	COMMENTS
72885 Z	2742.50	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.85	.13	.01	
72885 Y	2744.60	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.67	.11	.01	
72885 V	2764.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.87	.11	.01	
72885 U	2775.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.69	.09	.01	
72885 T	2789.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.73	.12	.02	
72885 S	2800.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.83	.09	.01	
72885 R	2823.60	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.97	.11	.01	HIGH ASH
72885 Q	2875.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.69	.09	.01	
72885 P	2900.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.83	.12	.01	
72885 O	2934.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.69	.11	.01	
72895 S	2971.80	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.73	.15	.01	
72895 O	2994.40	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.86	.16	.01	HIGH ASH
72890 Z	3026.40	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.76	.20	.01	
72890 X	3051.80	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.63	.09	.01	
72890 T	3088.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.77	.10	.02	HIGH ASH
72890 S	3088.60	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.59	.16	.02	
72890 R	3097.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.74	.10	.02	
72890 M	3132.80	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.81	.10	.02	HIGH ASH
72890 K	3159.20	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.70	.59	.02	HIGH ASH
72890 H	3219.30	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.67	.09	.01	
72890 G	3222.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.66	.10	.01	
72895 Y	3225.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.62	.13	.01	
72895 Z	3235.00	SWC	EOCENE-LATE CRET.	LATROBE GROUP	.67	.16	.02	

TABLE 7

C15+ EXTRACT ANALYSES

BASIN - GIPPSLAND
WELL - WIRRAH 3

REPORT A - EXTRACT DATA (PPM)

SAMPLE NO.	DEPTH	TYPE	AN	AGE	TOTAL EXTRACT	HYDROCARBONS SATS.	HYDROCARBONS AROMS.	HYDROCARBONS TOTAL H/CARBS	NON-HYDROCARBONS ASPH.	NON-HYDROCARBONS FLUTED NSO	NON-HYDROCARBONS NON-FLT NSO	NON-HYDROCARBONS TOTAL NSO	SULPHUR	TOTAL NON/HCS
72895 U	2180.72	COR	2	EOCENE-LATE CRET.	9019.	468.	2570.	3038.	3318.	1247.	1415.	2662.	0.	5980.
72895 V	2653.77	COR	2	EOCENE-LATE CRET.	1380.	259.	502.	761.	251.	213.	155.	368.	0.	619.
72895 W	2807.10	COR	2	EOCENE-LATE CRET.	1630.	157.	463.	620.	620.	191.	199.	390.	0.	1010.
72895 X	3116.60	COR	2	EOCENE-LATE CRET.	1408.	330.	364.	694.	529.	166.	19.	185.	0.	714.

C15+ EXTRACT ANALYSES

BASIN - GIPPSLAND
WELL - WIRRAH 3

REPORT B - EXTRACTS % OF TOTAL

SAMPLE NO.	DEPTH	FORMATION	HYDROCARBONS SAT. %	HYDROCARBONS AROM.%	NON-HYDROCARBONS NSO. %	NON-HYDROCARBONS ASPH.%	NON-HYDROCARBONS SULPH%	SAT/AR	HC/NHC	COMMENTS
72895 U	2180.72	LATROBE GROUP	5.2	28.5	29.5	36.8	.0	.2	.5	IMMATURE,TERRESTRIAL
72895 V	2653.77	LATROBE GROUP	18.8	36.4	26.7	18.2	.0	.5	1.2	MATURE,TERRESTRIAL
72895 W	2807.10	LATROBE GROUP	9.6	28.4	23.9	38.0	.0	.3	.6	IMMATURE,TERRESTRIAL
72895 X	3116.60	LATROBE GROUP	23.4	25.9	13.1	37.6	.0	.9	1.0	MATURE,TERRESTRIAL

TABLE 8

LIQUID CHROMATOGRAPHY FOR WIRRAH-3 OILS

SAMPLE NO.	DEPTH m (KB)	% SATURATES	% AROMATICS	% NSO	% ASPHALTENES
72957-B	2023.7	78.6	8.5	11.9	1.0
72957-D	2635-2646	73.7	9.4	9.4	7.5
72957-L	2861.5-2872.5 and 2883-2894	74.1	18.7	6.5	0.8
72957-K	2936.8	65	24.2	9.7	0.7

CARBON ISOTOPIC COMPOSITION FOR WIRRAH-3 OILS

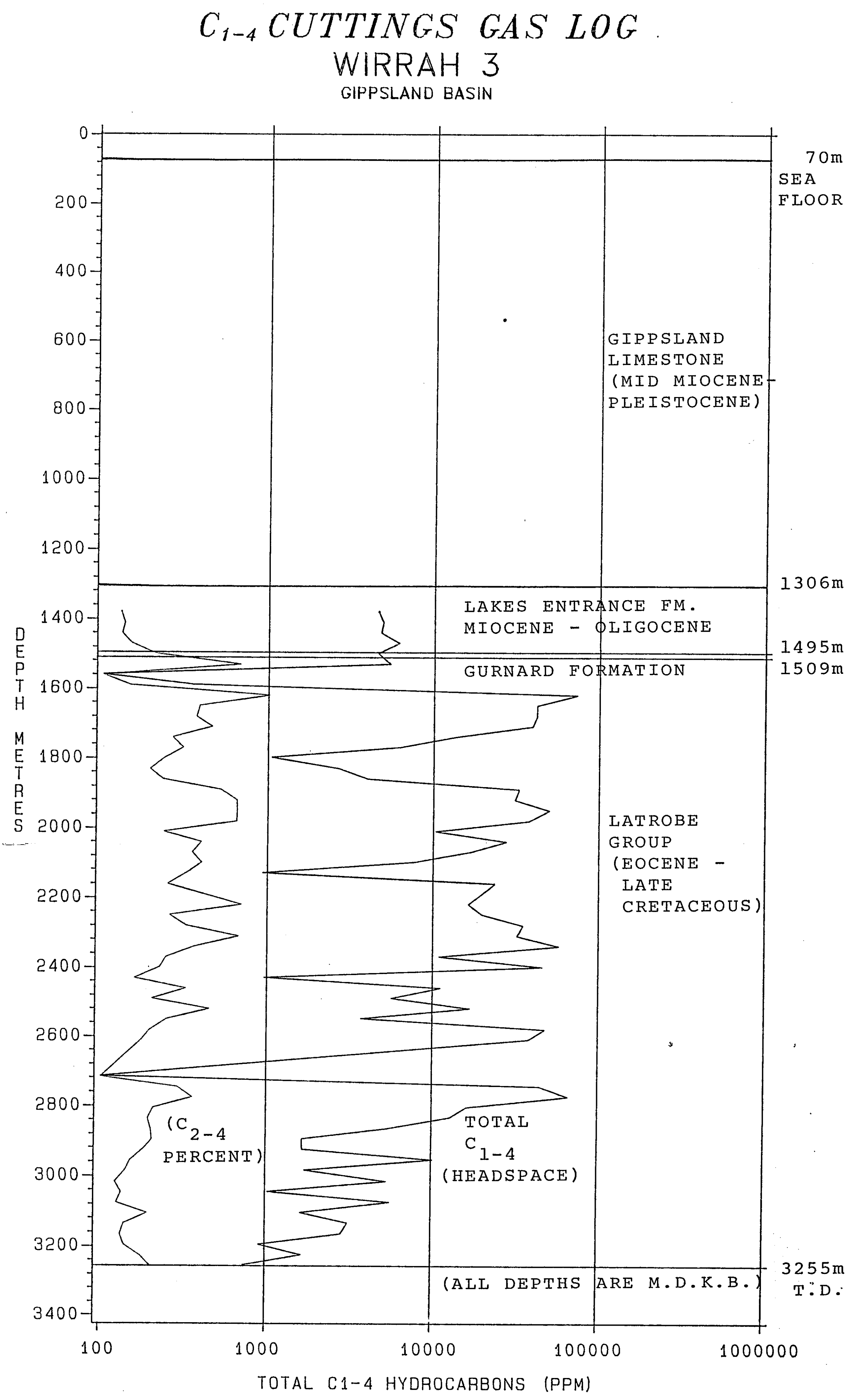
SAMPLE NO.	DEPTH	$\delta^{13}C$ ‰ vs PDB	
	m (KB)	SATURATES	AROMATICS
72957-B	2023.7	-27.33	-25.04
72957-D	2635-2640	-27.70	-25.47
72957-L	2861.5-2872.5 and 2883-2894	-27.11	-24.78
72957-K	2936.8	-27.39	-25.40

TABLE 9

API GRAVITIES OF WIRRAH-3 OILS

SAMPLE	DEPTH m(KB)	°API
RFT 4/35	2023.7	38.2
RFT 3/28	2349.2	39.7
Production Test No. 4	2635-2646	40.8
RFT-10	2707.8	34.7
RFT-9	2731.0	36.9
RFT-25/170	2785.5	35.4
CRFT-4/4	2834.5	35.1
Production Test 1A	2861.5-2872.5 & 2883-2894	36.8
RFT 28/204	2936.8	31.0

FIGURE 1 (a)



C1-4 CUTTINGS GAS LOG
WIRRAH 3
GIPPSLAND BASIN
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200
3400
DEPTH METRES
70m SEA FLOOR
GIPPSLAND LIMESTONE (MID MIOCENE-PLEISTOCENE)
1306m
LAKES ENTRANCE FM. MIOCENE - OLIGOCENE
1495m
GURNARD FORMATION
1509m
LATROBE GROUP (EOCENE - LATE CRETACEOUS)
(C2-4 PERCENT)
TOTAL C1-4 (HEADSPACE)
3255m T.D.
(ALL DEPTHS ARE M.D.K.B.)
100
1000
10000
100000
1000000
TOTAL C1-4 HYDROCARBONS (PPM)

FIGURE 1 (b)

C_{1-4} CUTTINGS GAS LOG

WIRRAH 3

GIPPSLAND BASIN

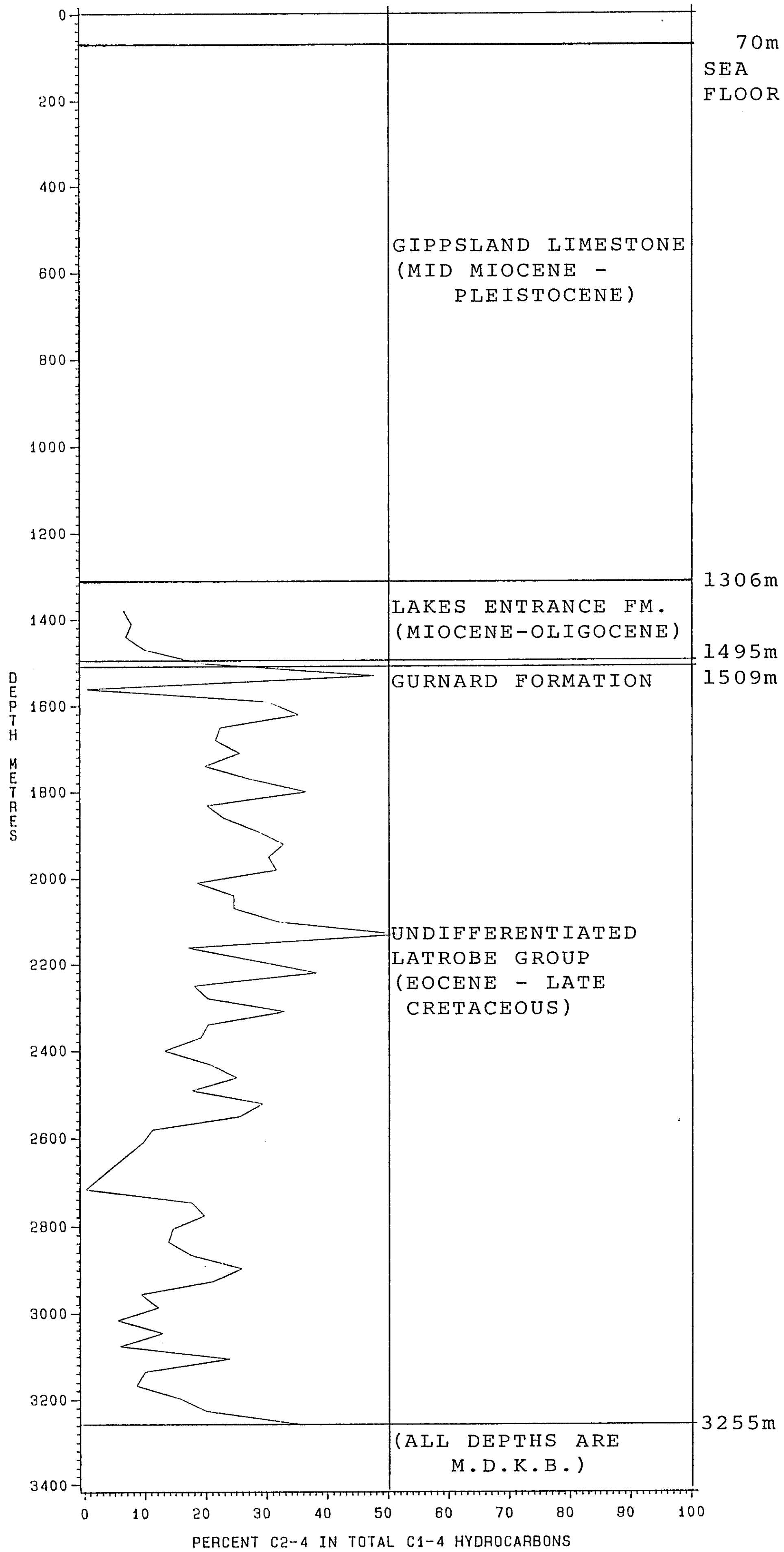


FIGURE 2

VITRINITE REFLECTANCE vs. DEPTH
WIRRAH 3
GIPPSLAND BASIN

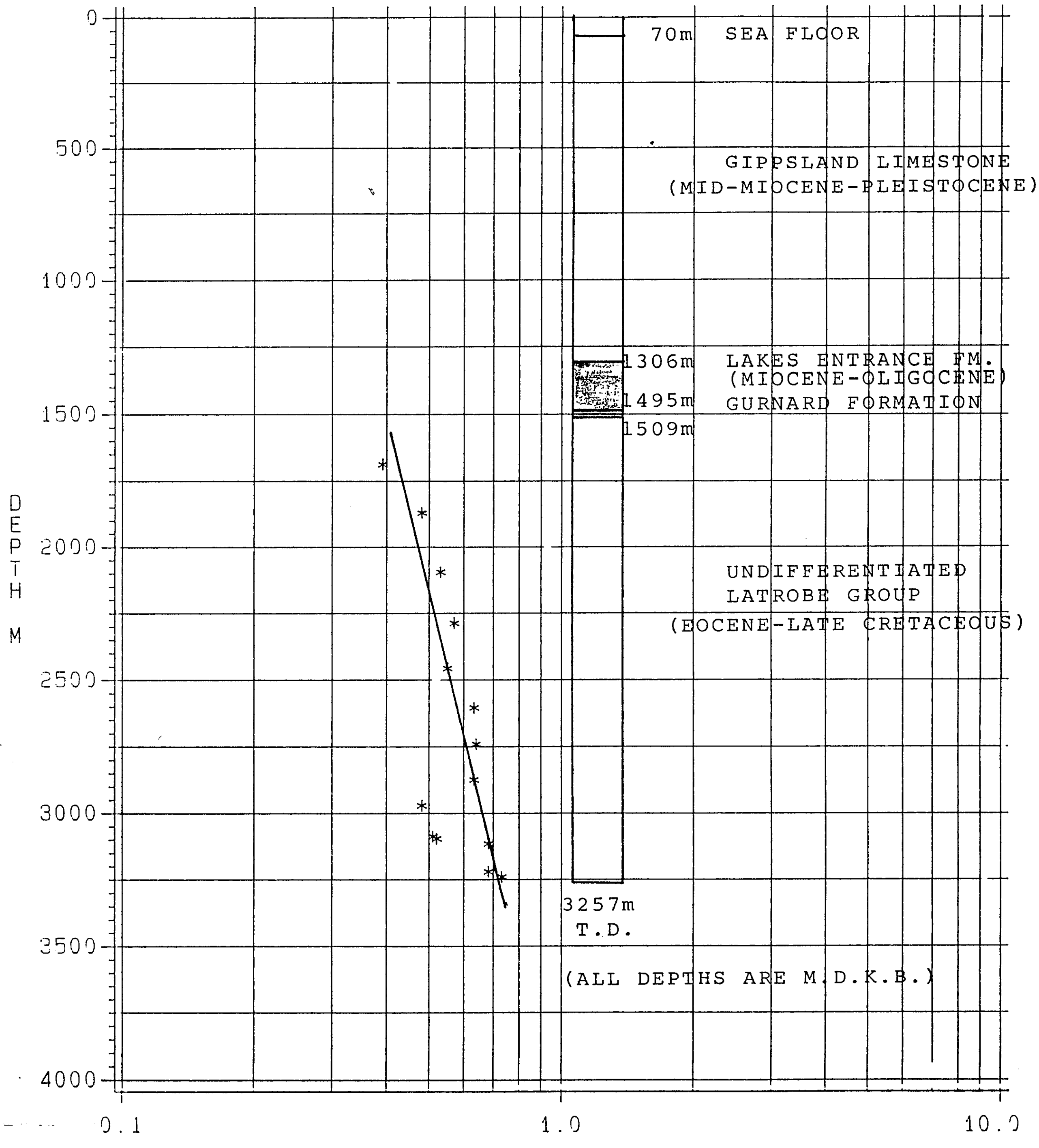


FIGURE 3

ROCKEVAL MATURATION PLOT

Tmax vs HYDROGEN INDEX

WIRRAH 3

GIPPSLAND BASIN

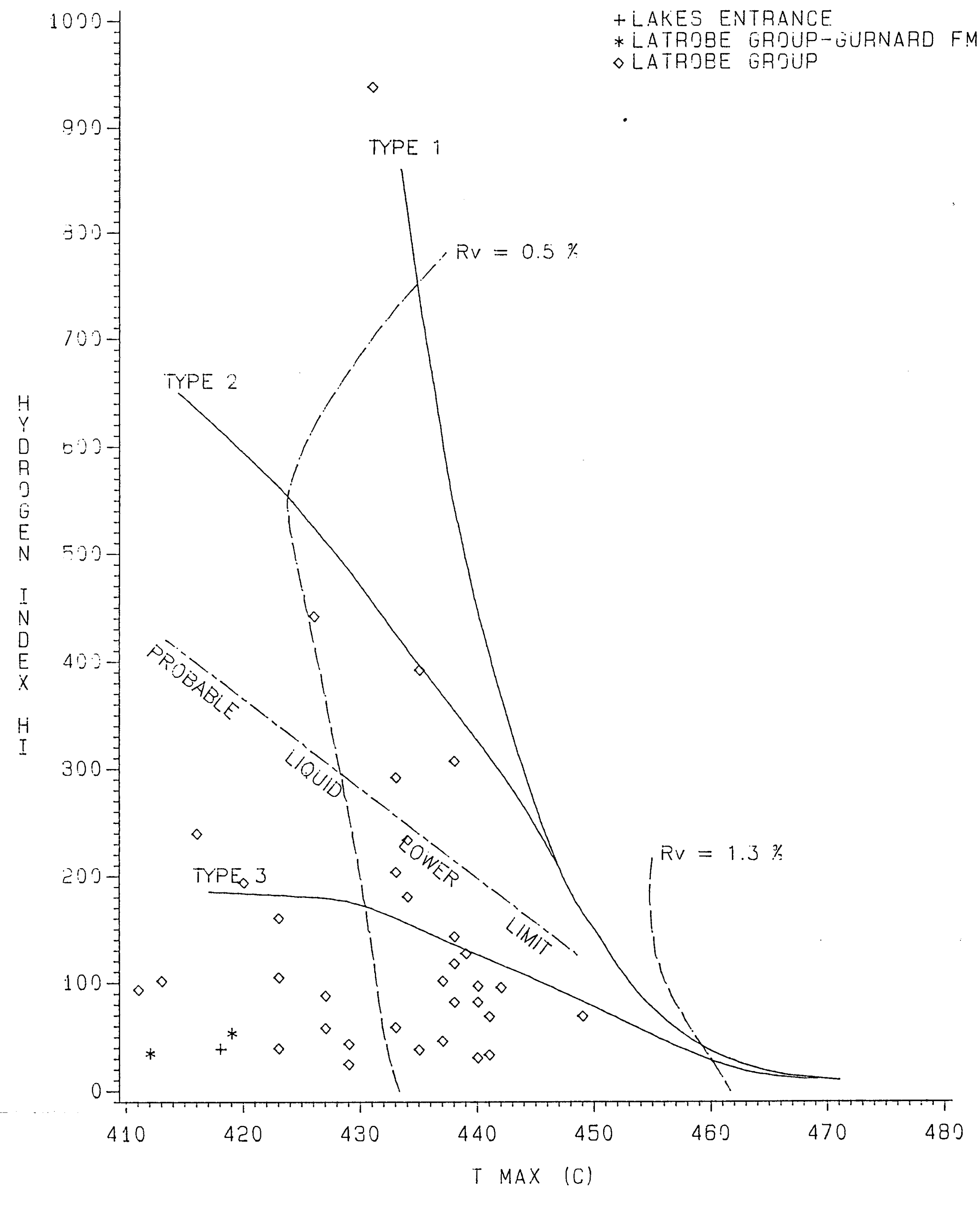


FIGURE 4

KEROGEN TYPE
WIRRAH 3
GIPPSLAND BASIN

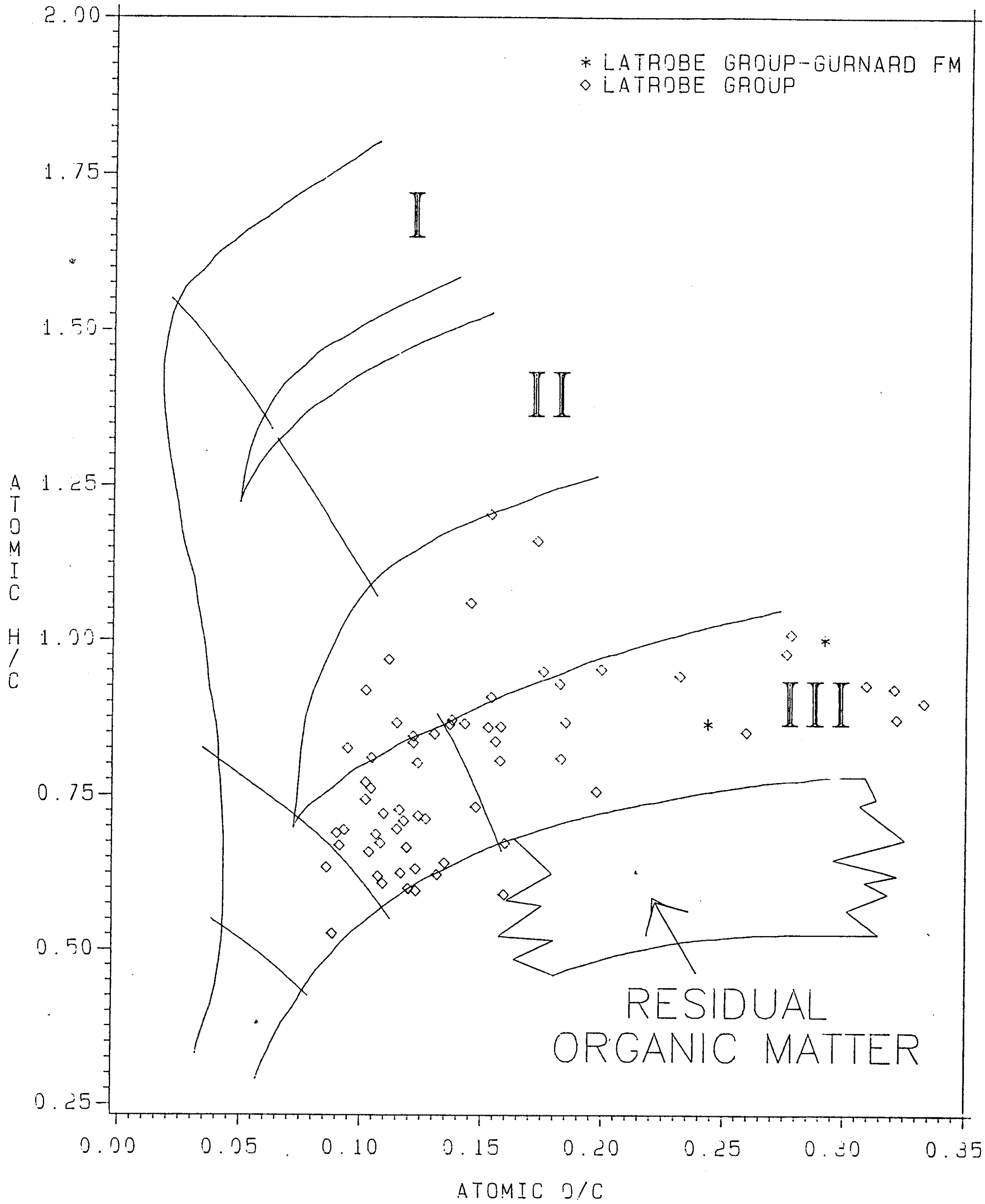
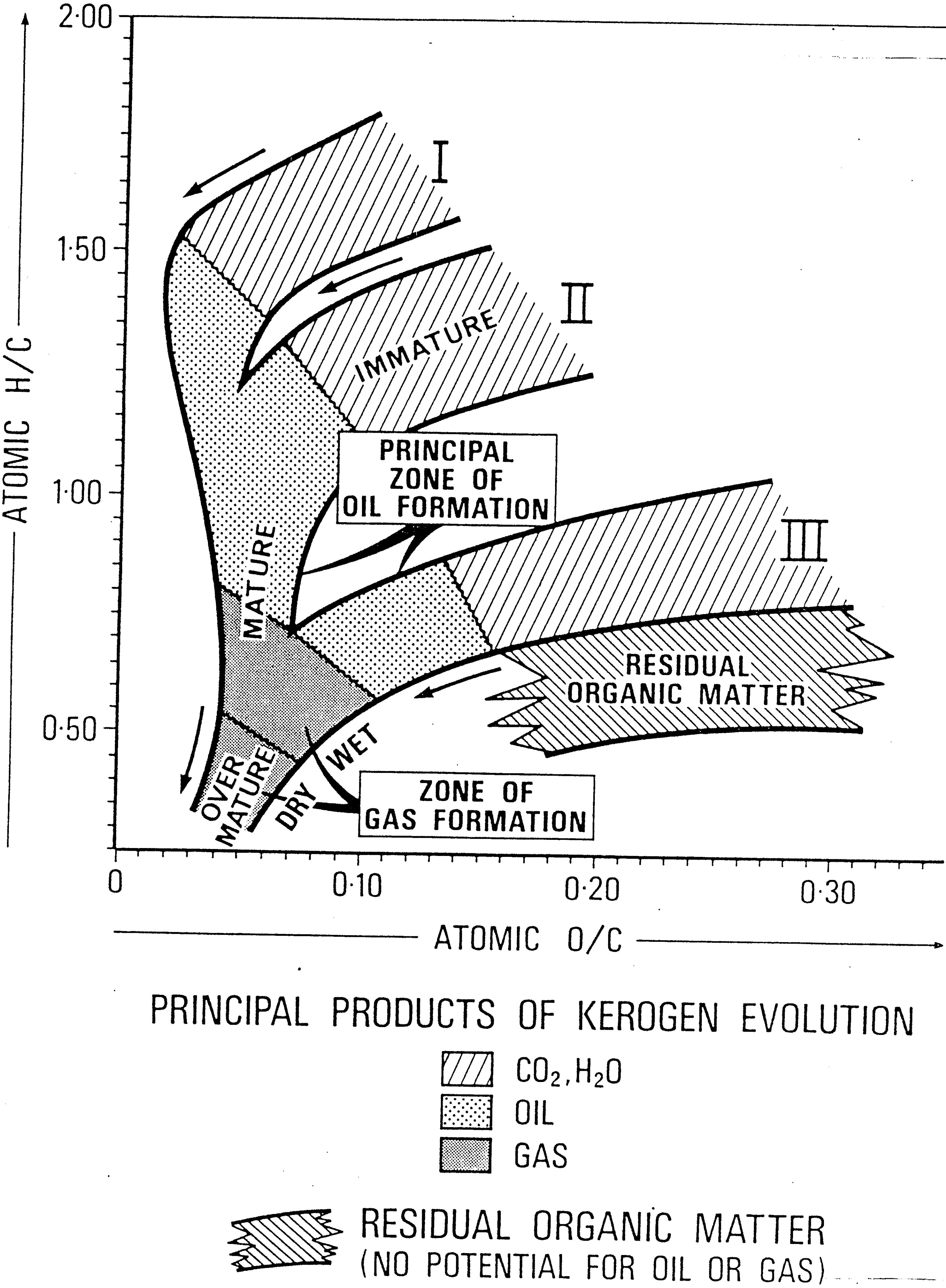


FIGURE 5



1380/BS/75

C_{15+} Paraffin-Naphthene Hydrocarbon

GeoChem Sample No. E593-001

Exxon Identification No. 72895-U

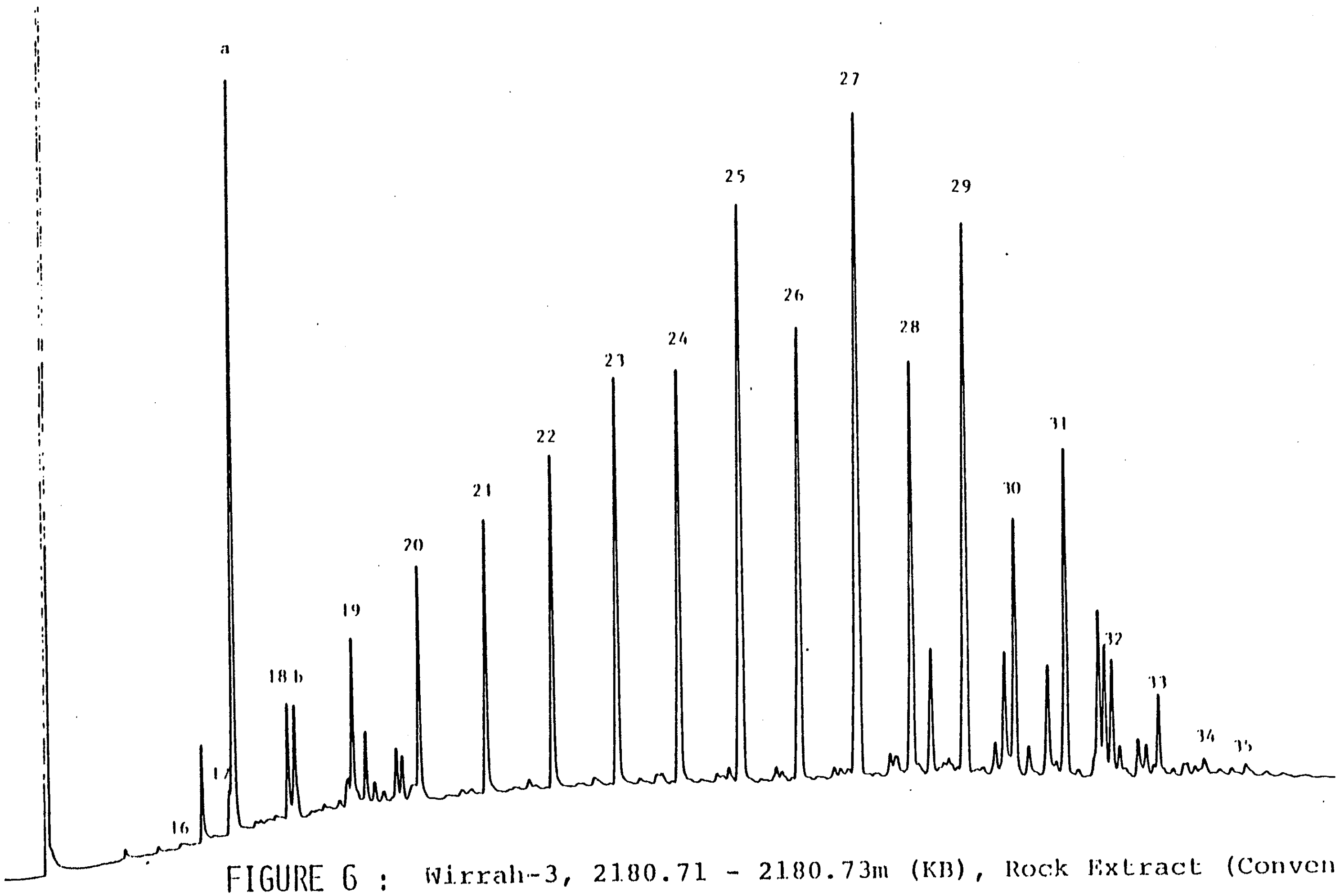


FIGURE 6 : Wirrah-3, 2180.71 - 2180.73m (KB), Rock Extract (Conventional Core) - Latrobe Group

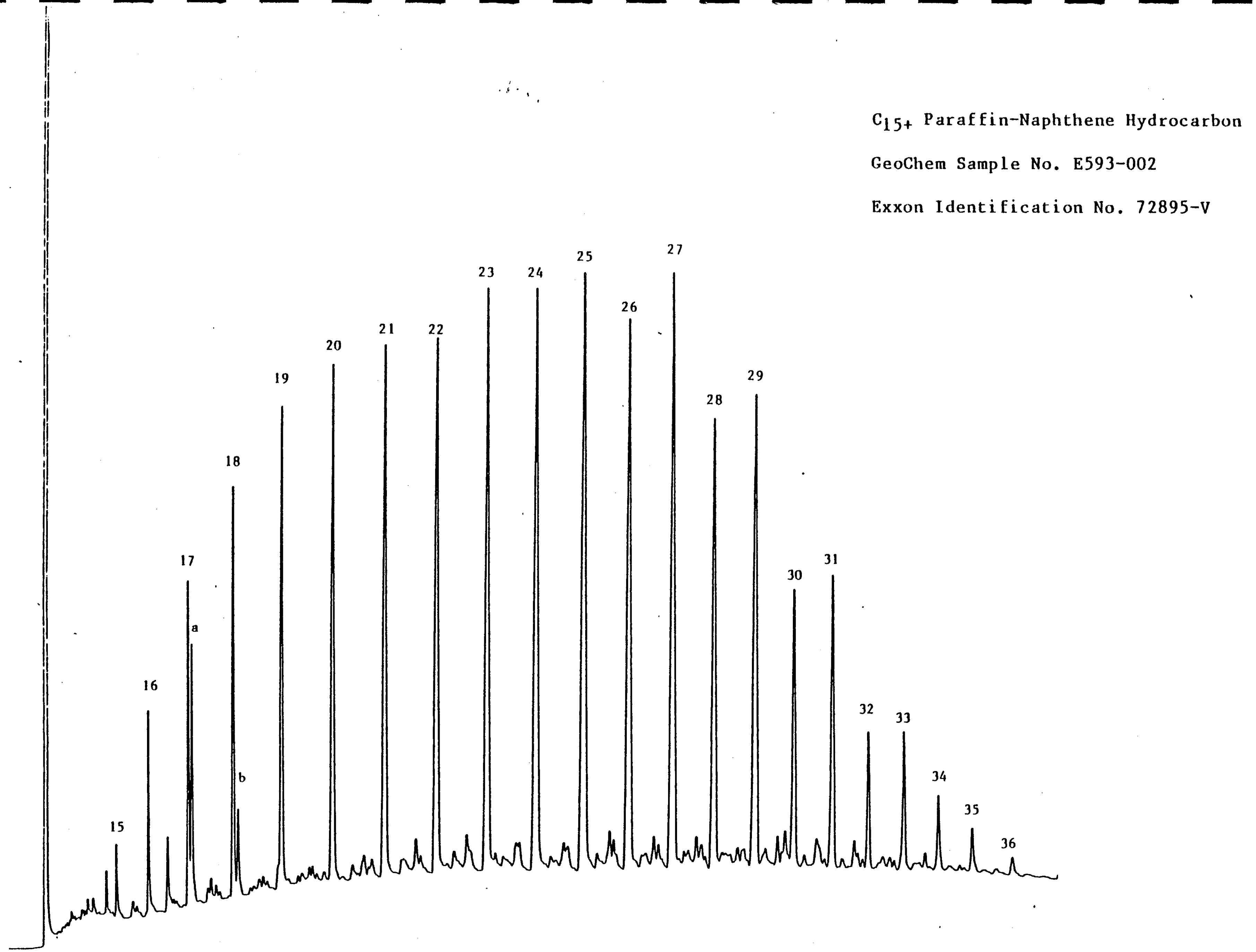


FIGURE 7 : Wirrah-3, 2653.76 - 2653.77m (KB), Rock Extract (Convential Core), - Latrobe Group

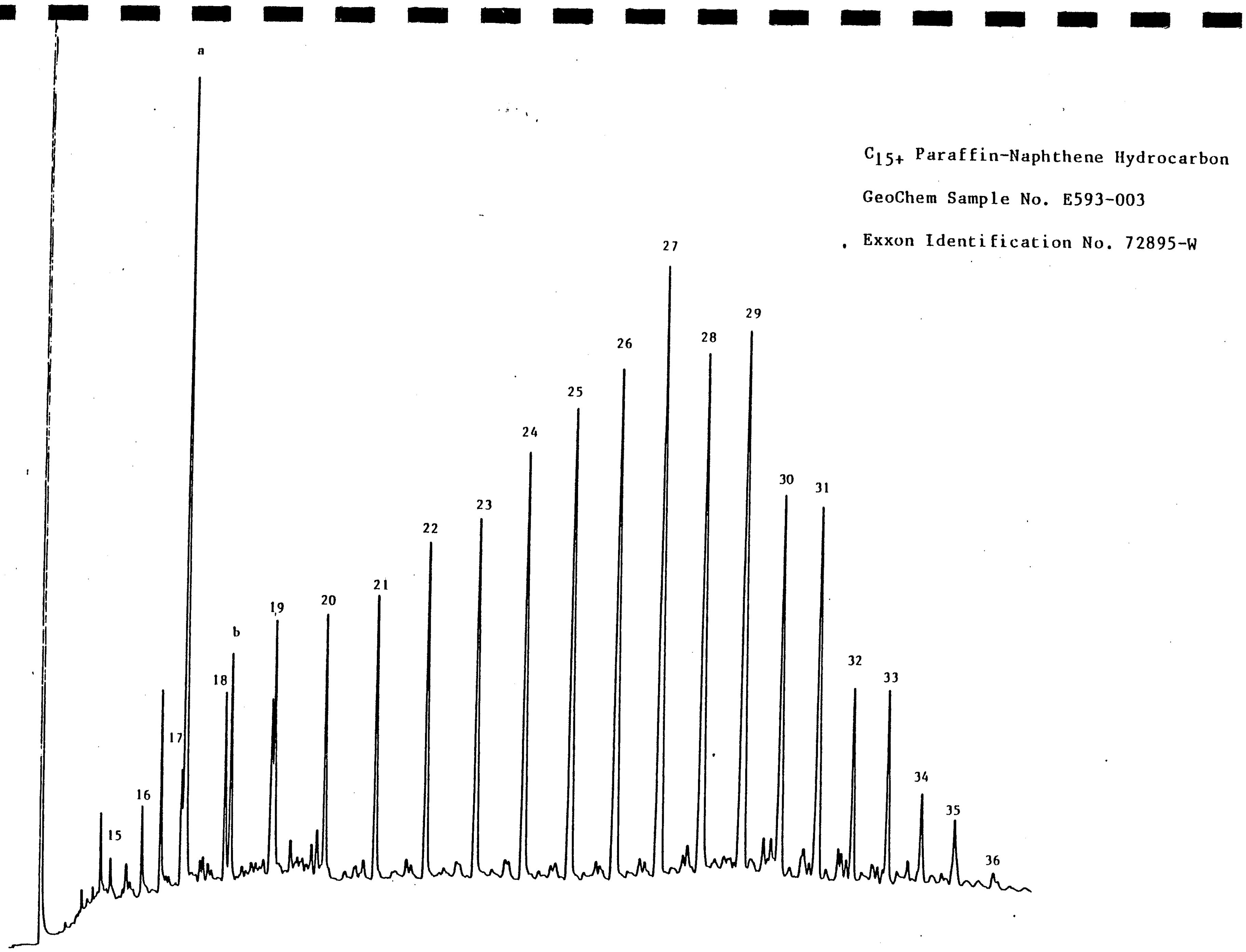


FIGURE 8 : Wirrah-3, Core, 2807.1m (KB), Rock Extract - Latrobe Group

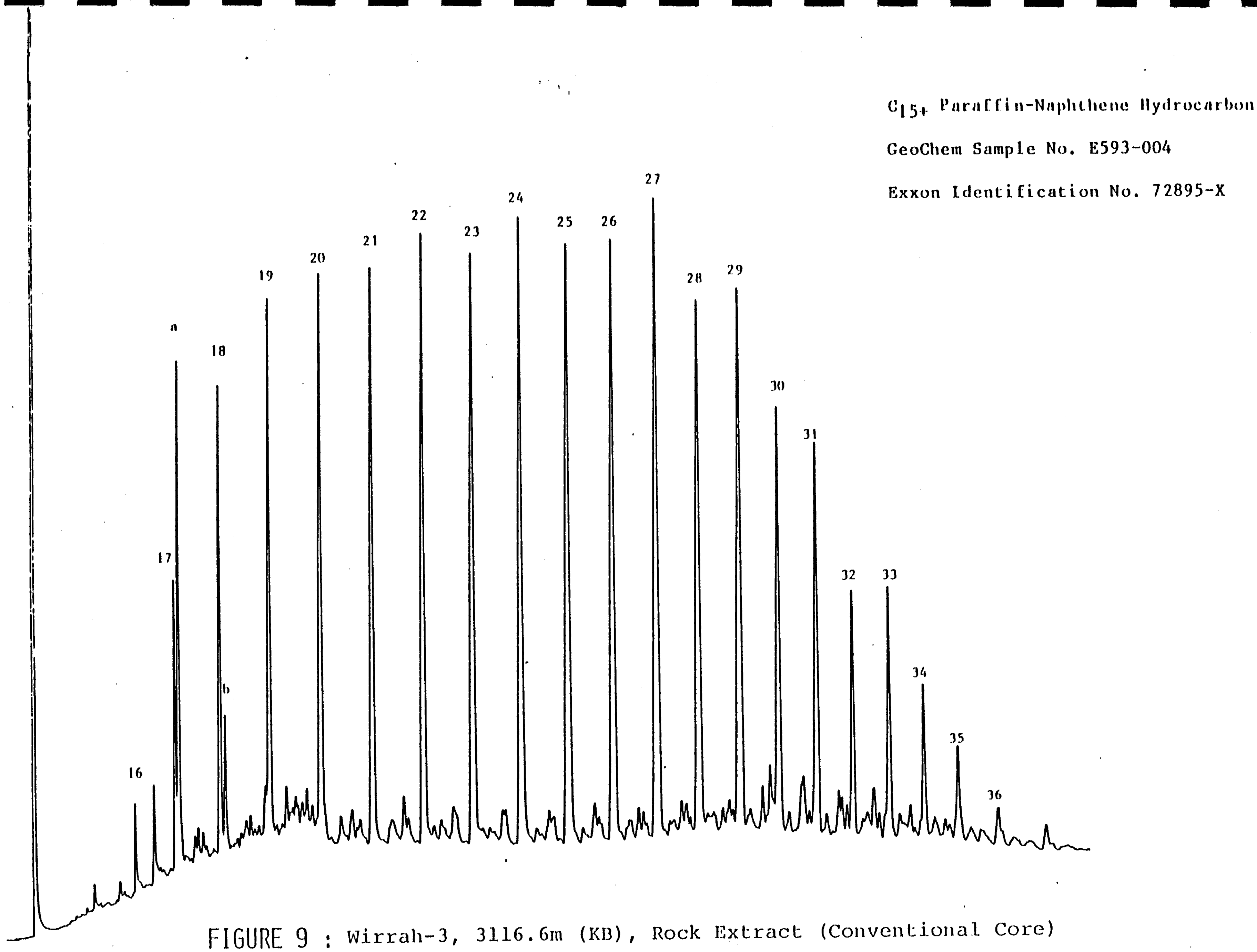


FIGURE 9 : Wirrah-3, 3116.6m (KB), Rock Extract (Conventional Core) - Latrobe Group

FIGURE 10
WHOLE OIL CHROMATOGRAM
WIRRAH-3 OIL
RFT-4/35
2023.7m (KB)

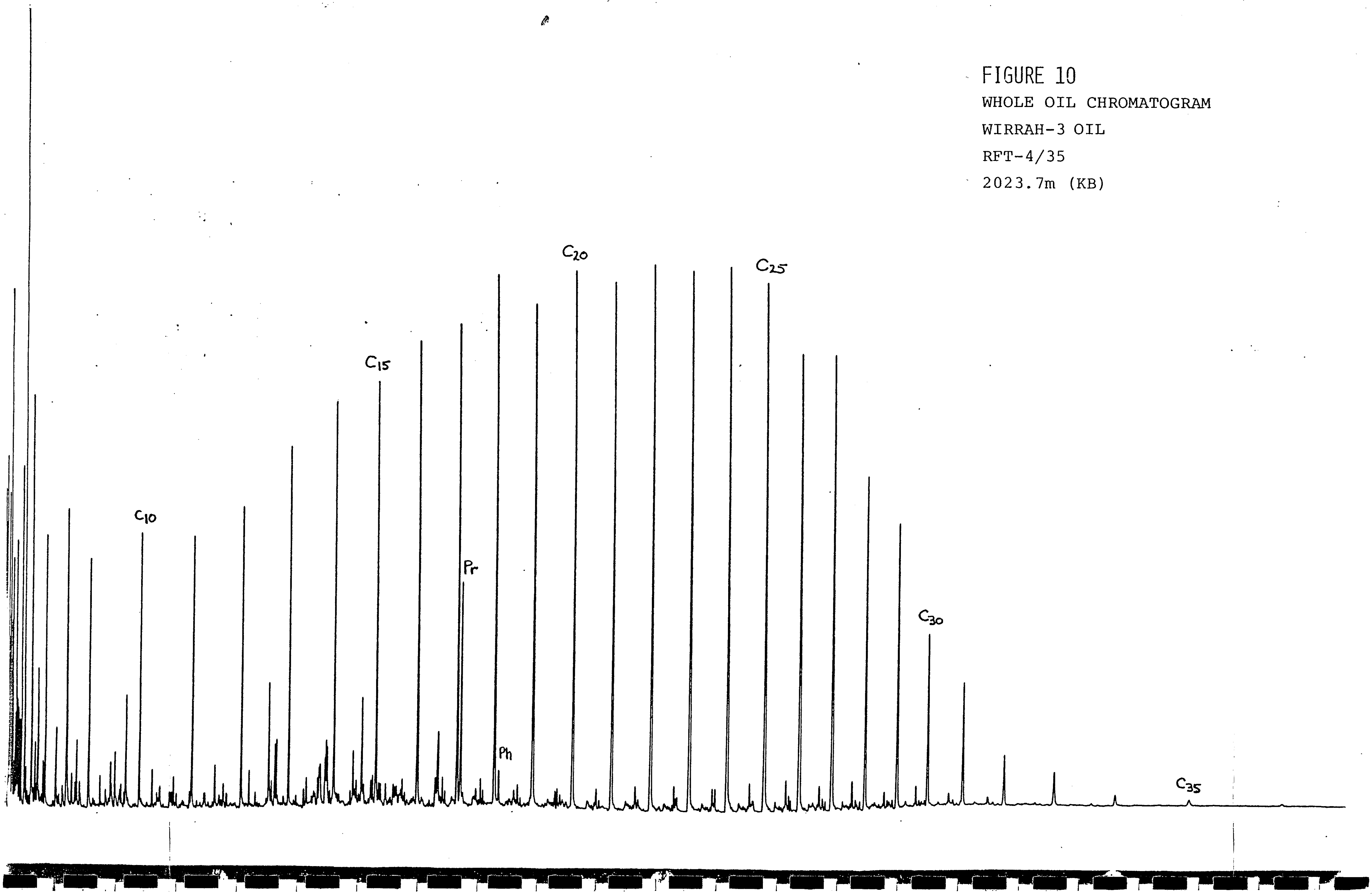


FIGURE 11

WHOLE OIL CHROMATOGRAM

WIRRAH-3 OIL

RFT-3/28

2349.2m (KB)

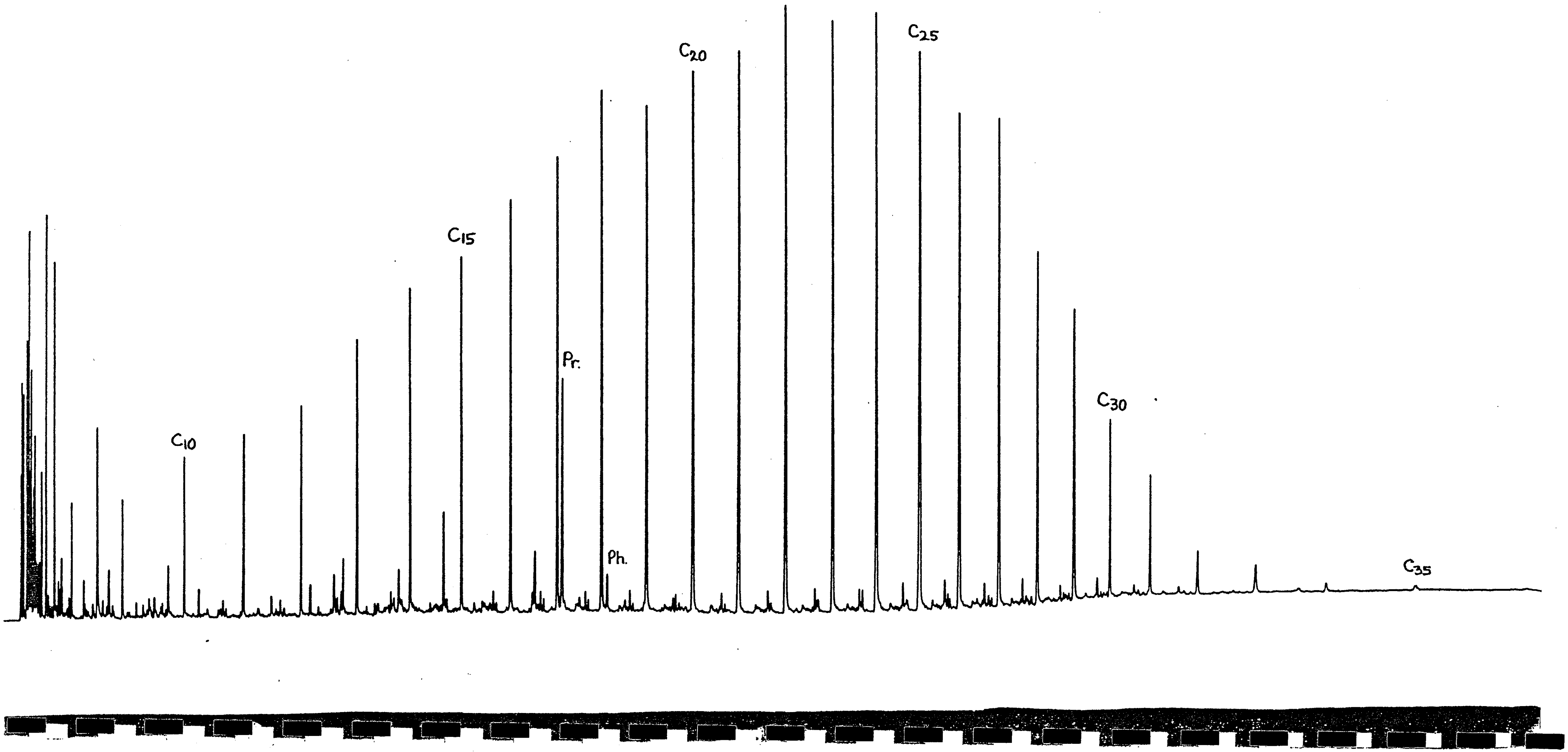


FIGURE 12

WHOLE OIL CHROMATOGRAM

WIRRAH-3 OIL

PRODUCTION TEST No.4

2635 - 2646m (KB)

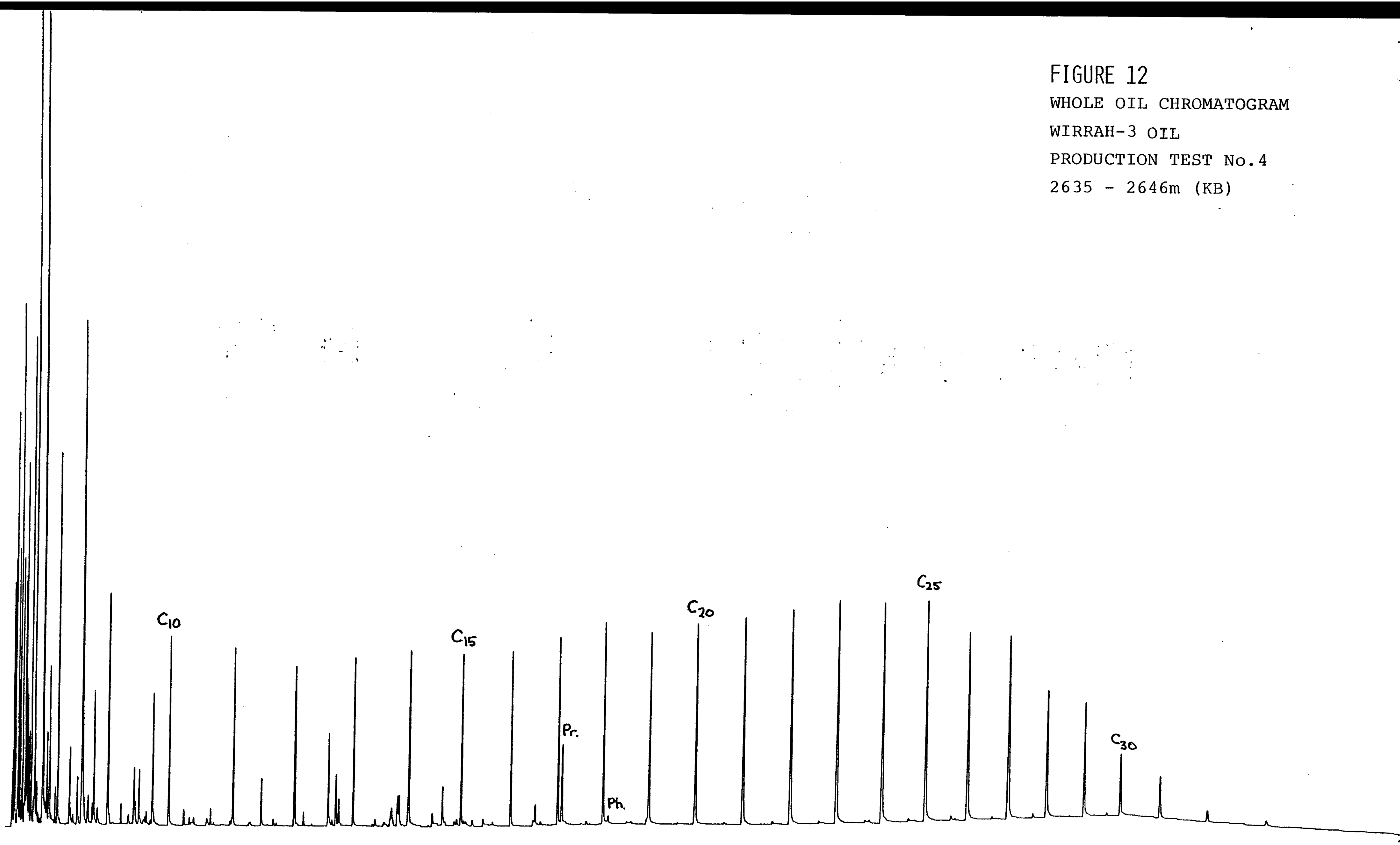


FIGURE 13
WHOLE OIL CHROMATOGRAM
WIRRAH-3 OIL
RFT-10
2707.8m (KB)

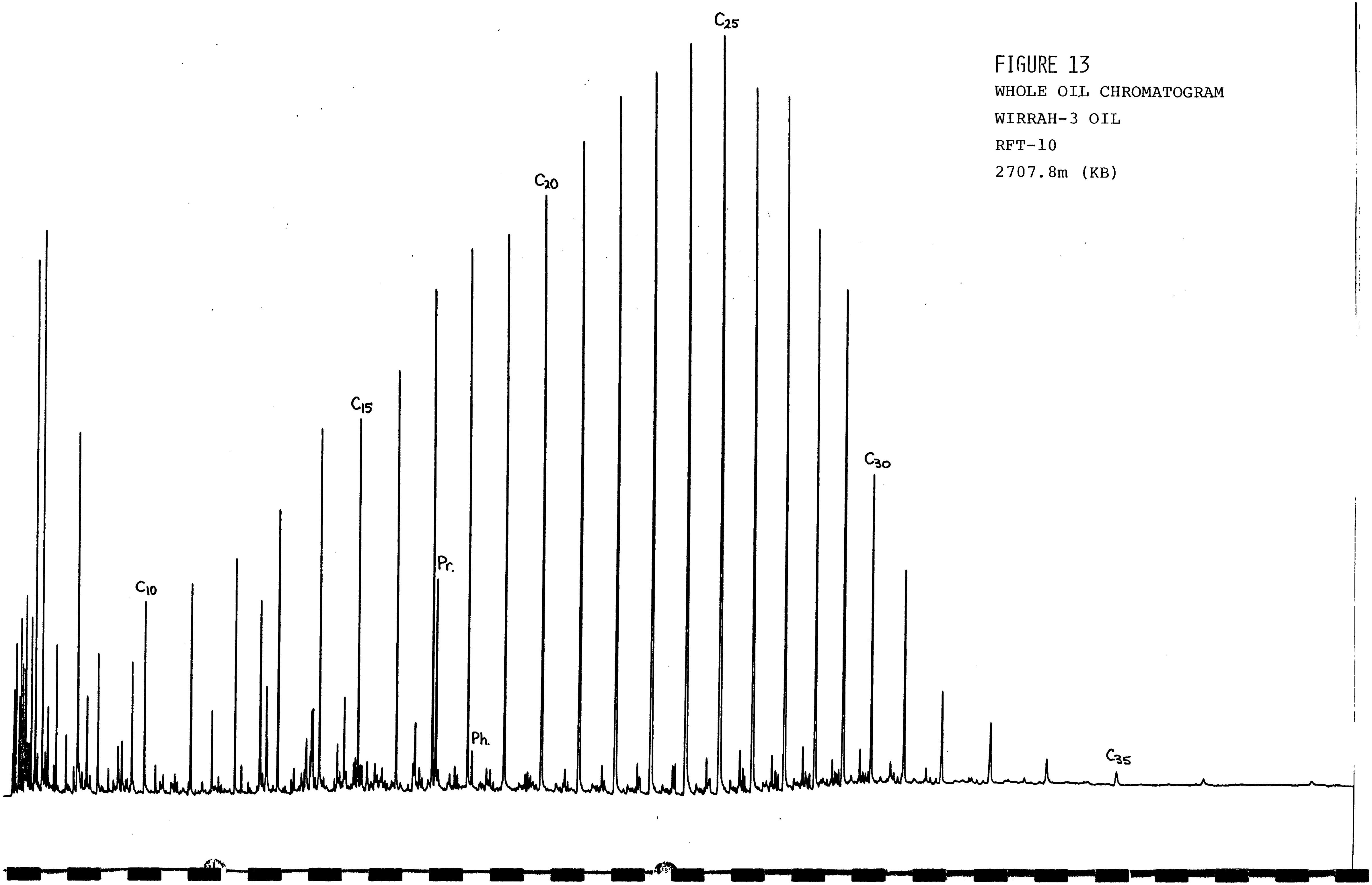


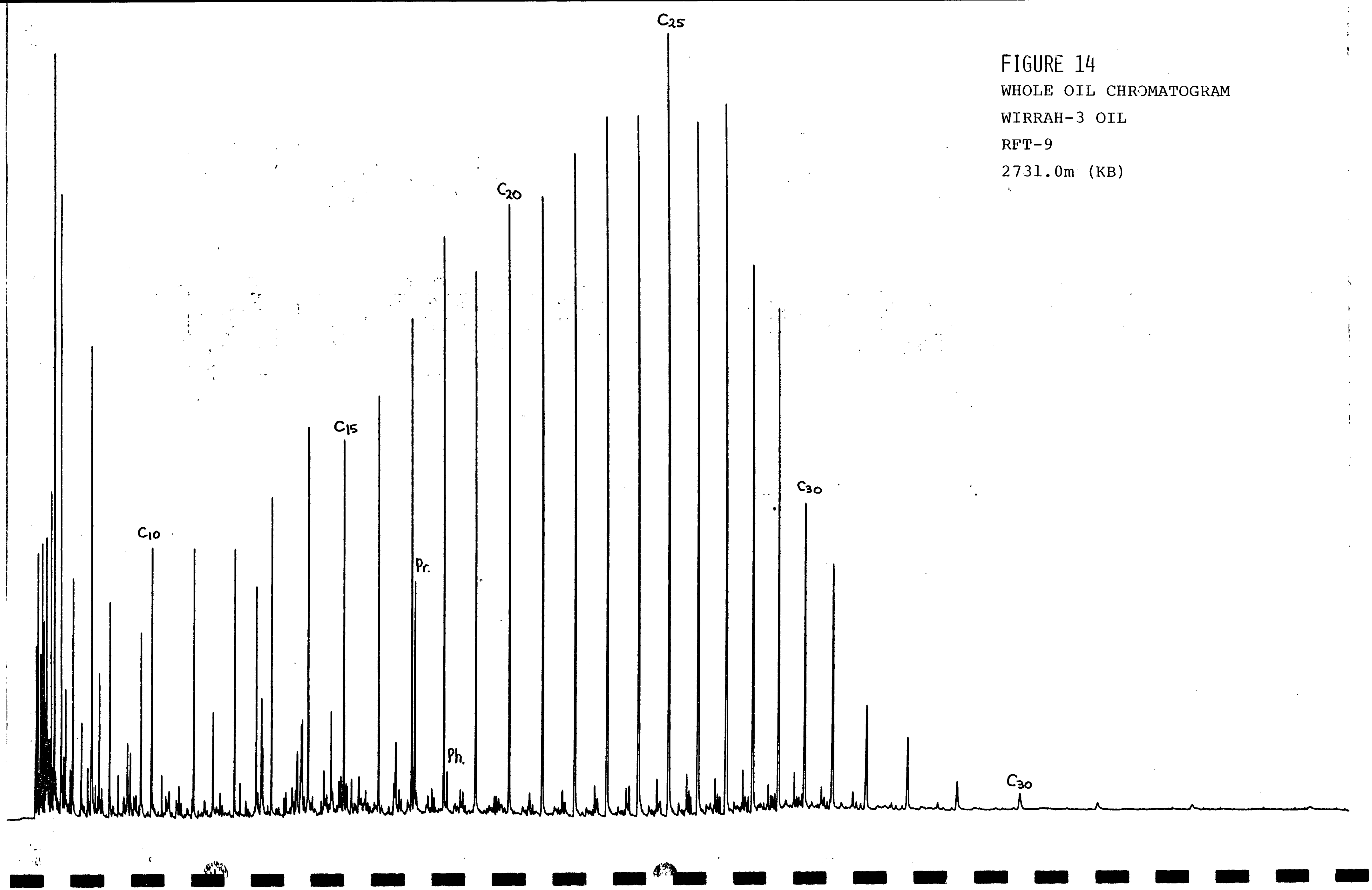
FIGURE 14

WHOLE OIL CHROMATOGRAM

WIRRAH-3 OIL

RFT-9

2731.0m (KB)



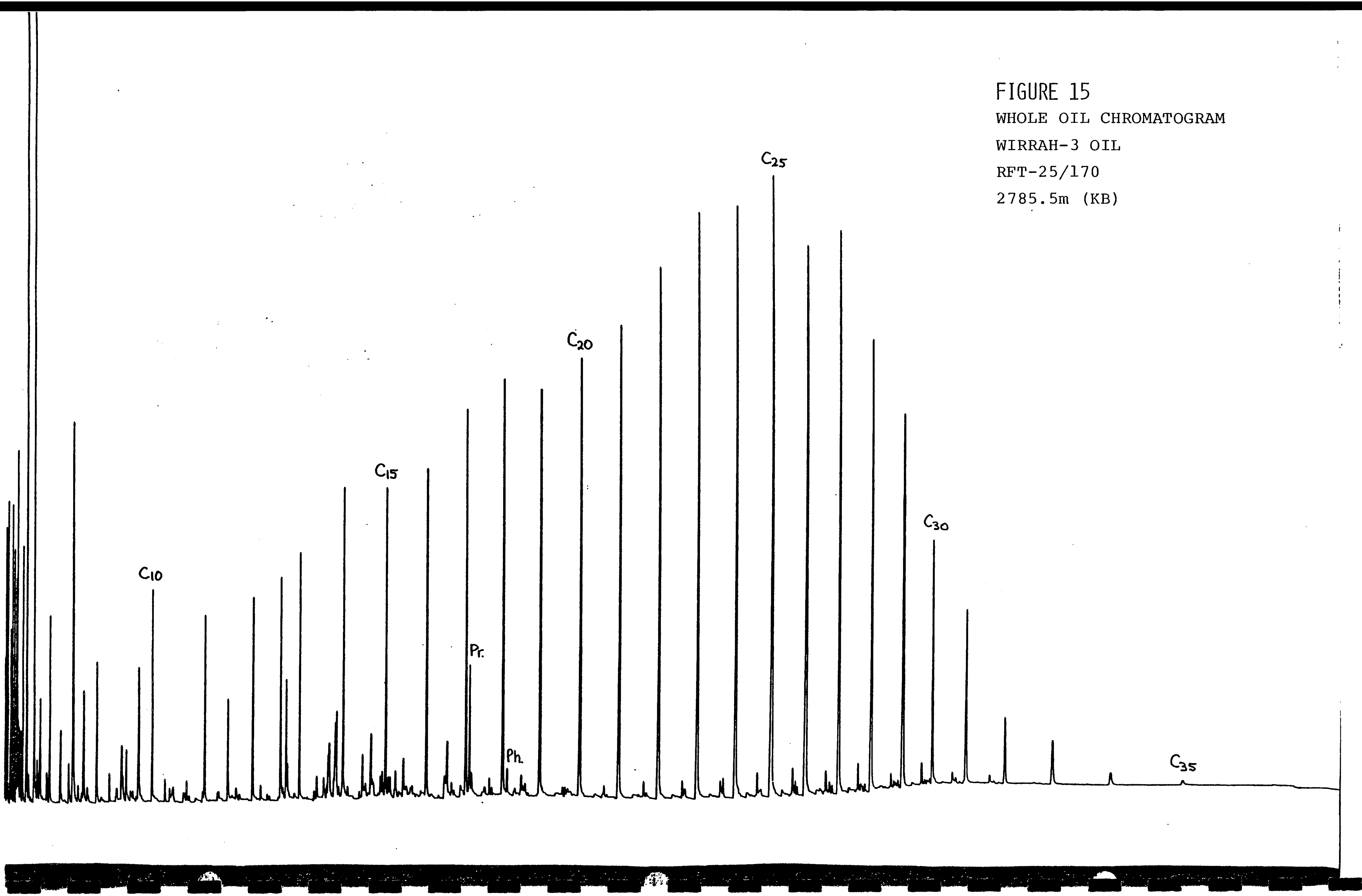


FIGURE 15
WHOLE OIL CHROMATOGRAM
WIRRAH-3 OIL
RFT-25/170
2785.5m (KB)

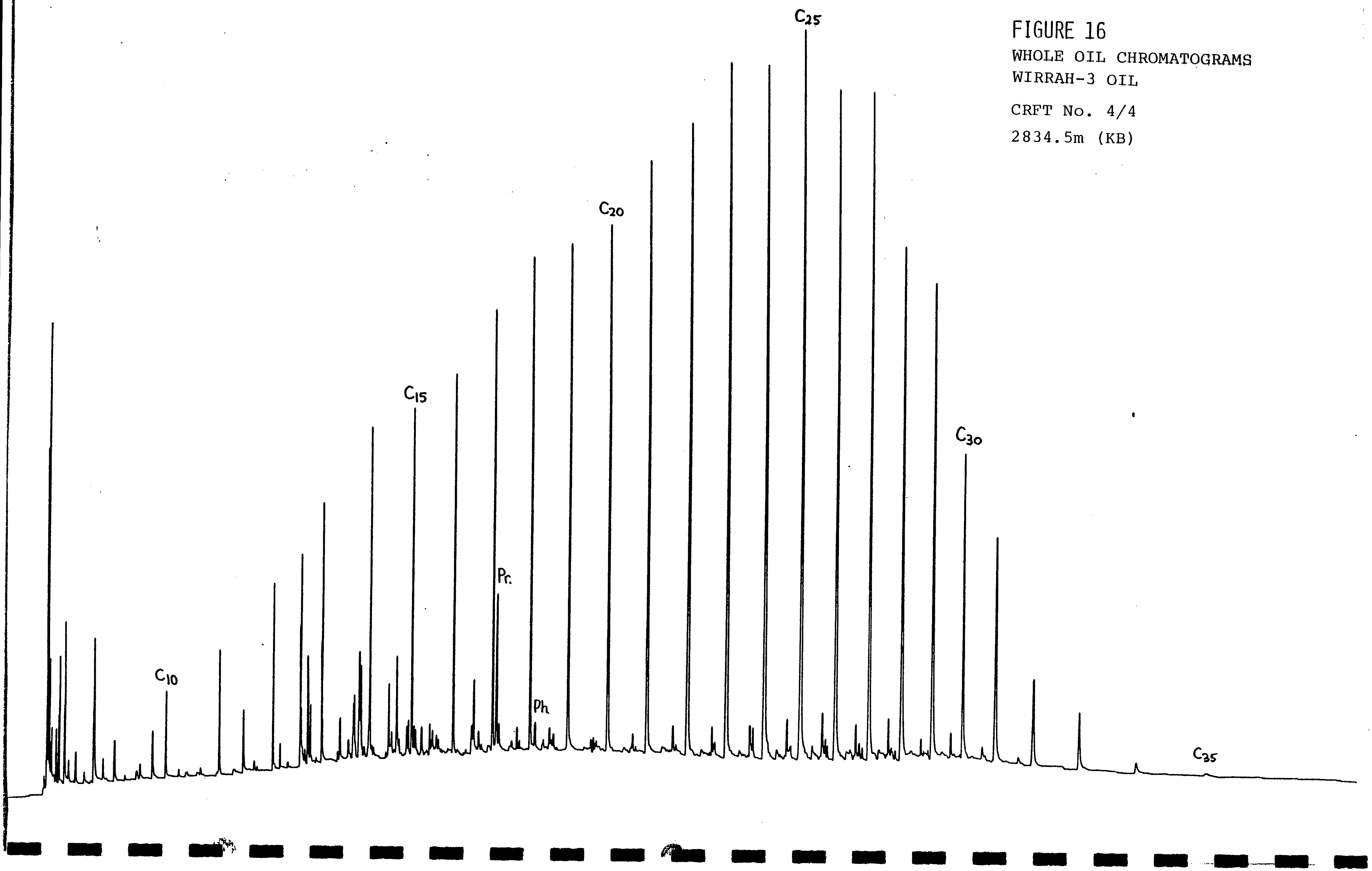


FIGURE 16

WHOLE OIL CHROMATOGRAMS
WIRRAH-3 OIL

CRFT No. 4/4

2834.5m (KB)

FIGURE 17

WHOLE OIL CHROMATOGRAMS

WIRRAH-3 OIL

PRODUCTION TEST 1A

2861 - 2872.5 and

2883 - 2894m (KB)

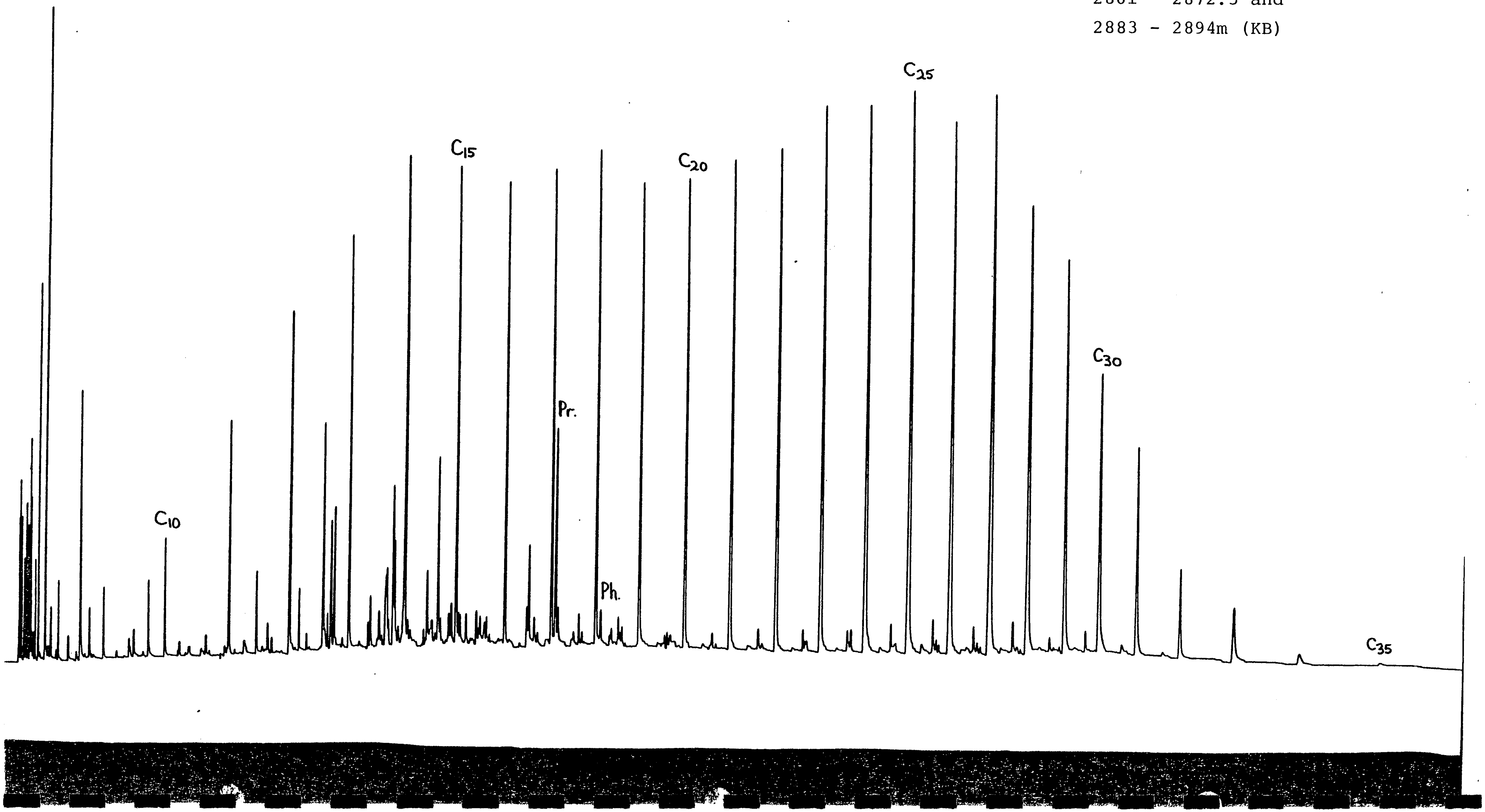


FIGURE 18

WHOLE OIL CHROMATOGRAMS

WIRRAH-3 OIL

RFT-28/204

2936.8m (KB)

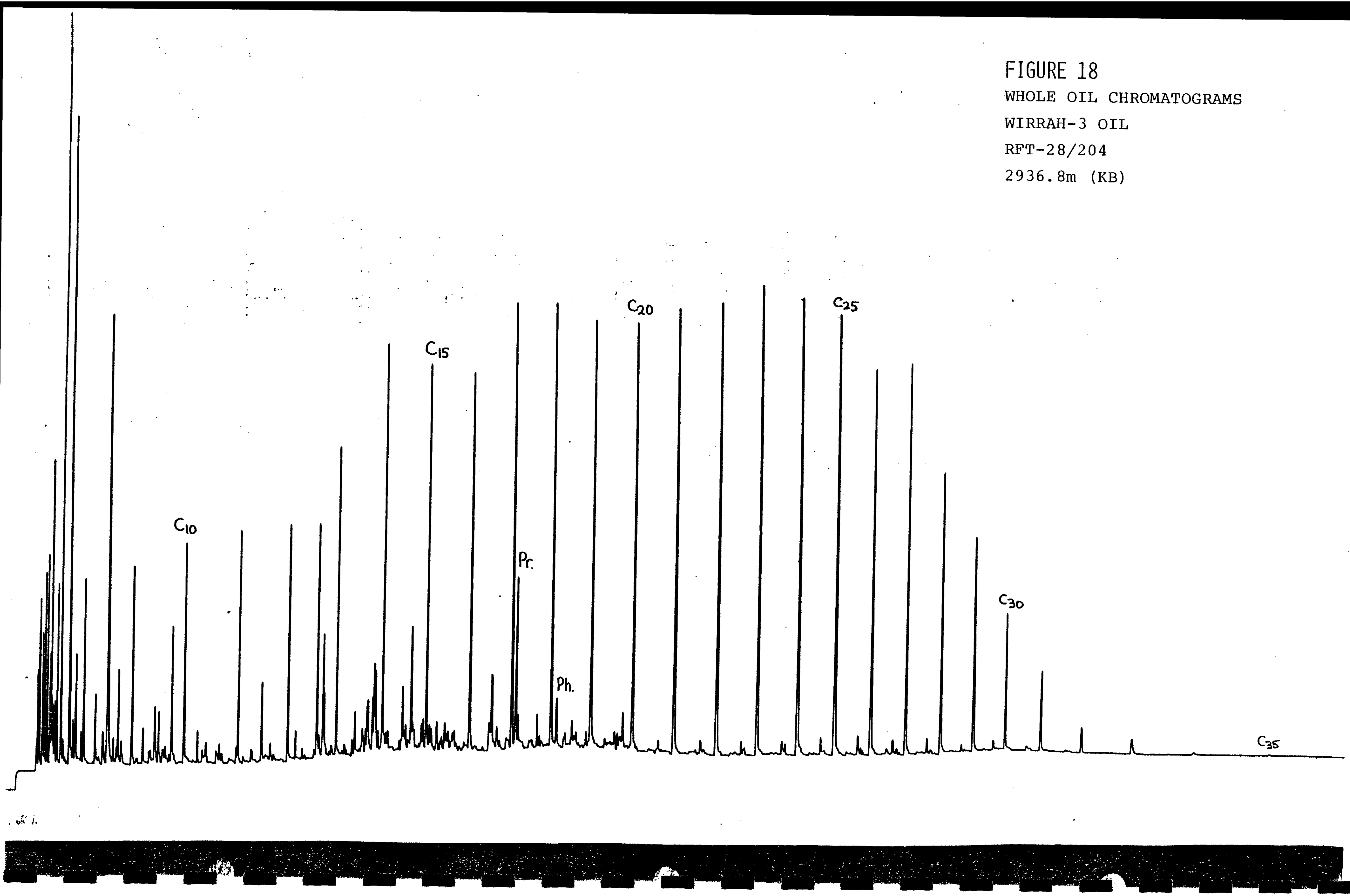


FIGURE 19

WIRRAH-3 OIL
72957-B
2023.7 m
SATURATE CHROMATOGRAM

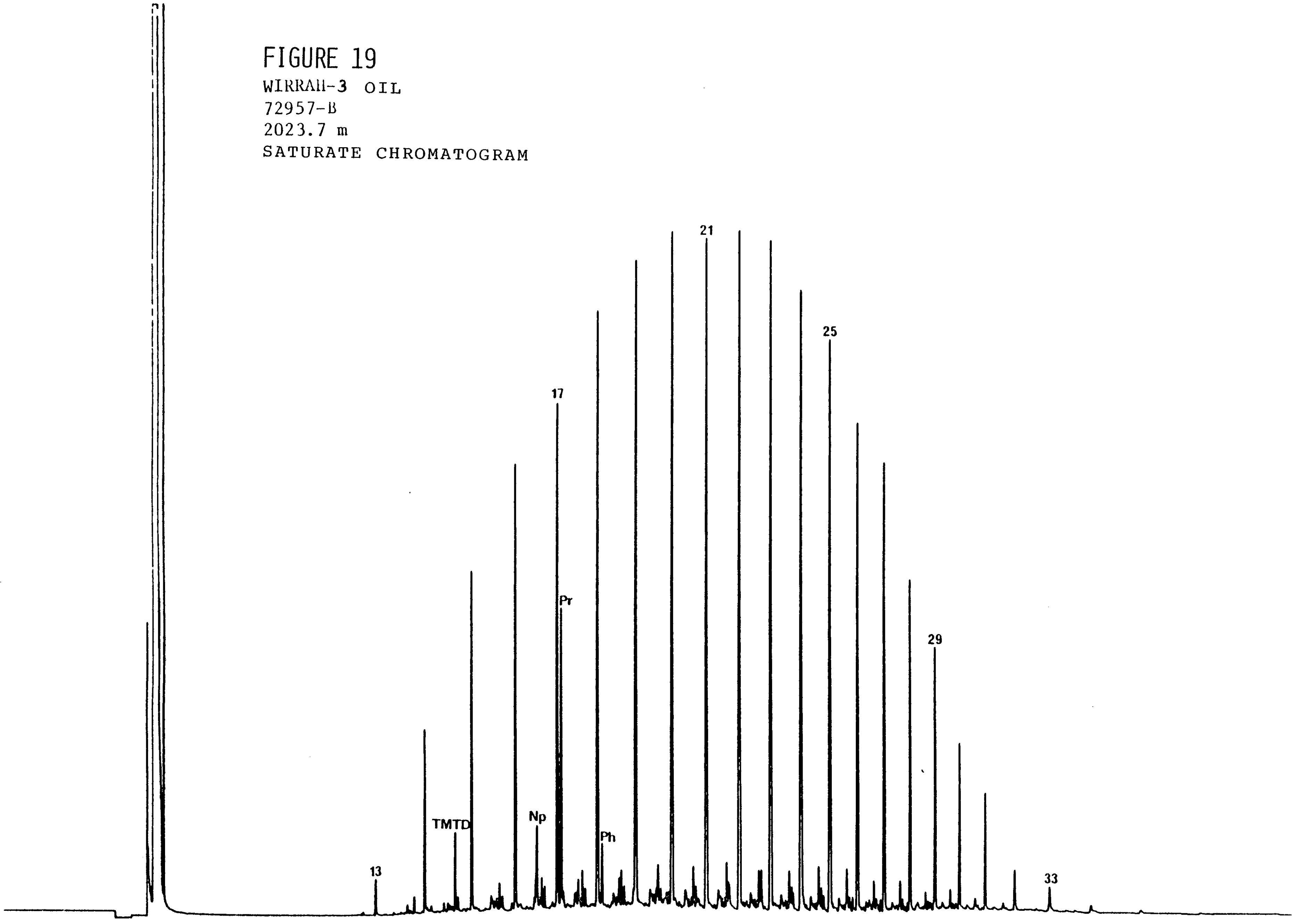


FIGURE 20
WIRRAH-3 OIL
72957-D
2635-2646 m
SATURATE CHROMATOGRAM

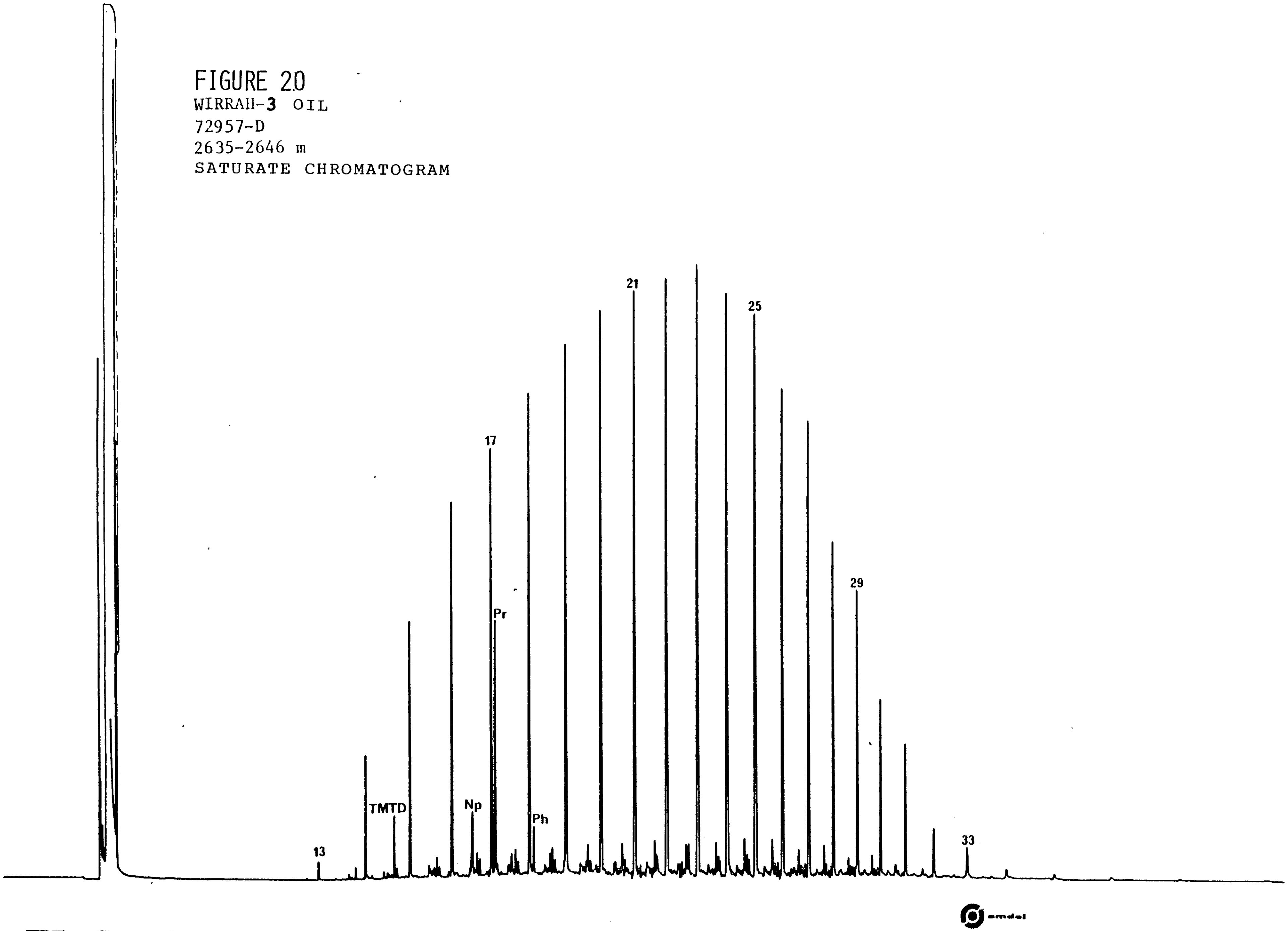
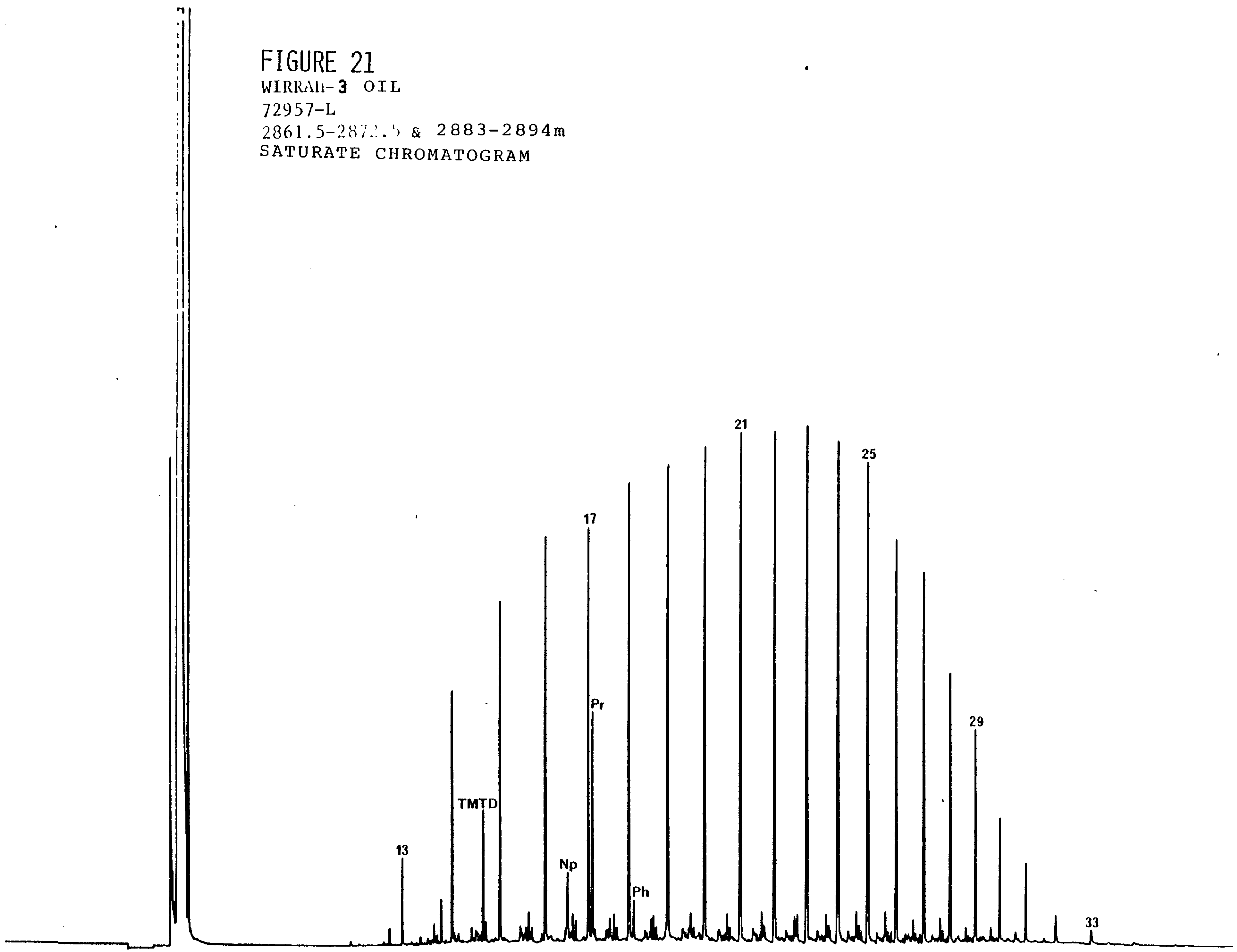


FIGURE 21
WIRRAH-3 OIL
72957-L
2861.5-2872.5 & 2883-2894m
SATURATE CHROMATOGRAM



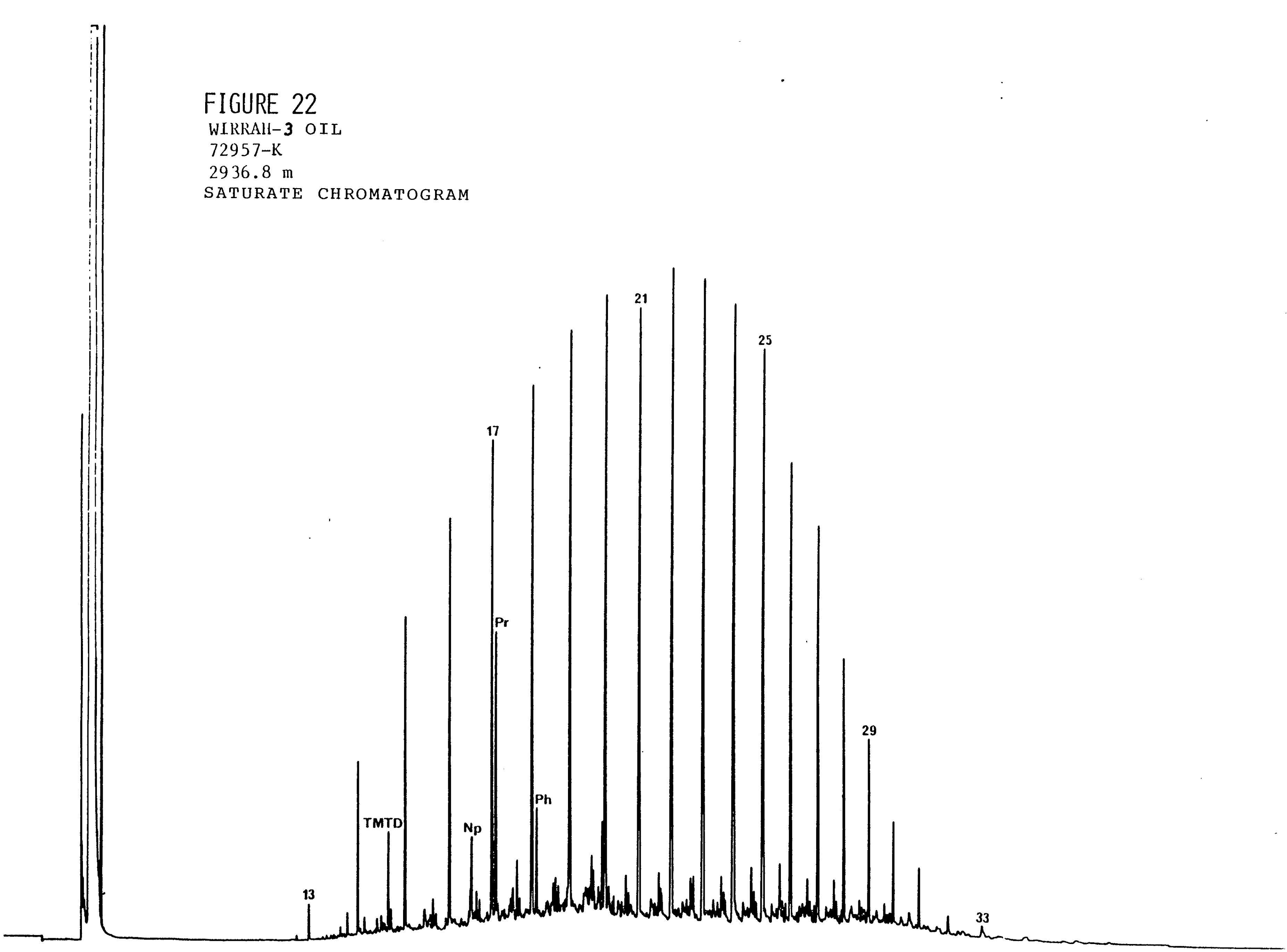


FIGURE 22
WIRRAH-3 OIL
72957-K
2936.8 m
SATURATE CHROMATOGRAM

APPENDIX-1

Detailed Vitrinite Reflectance and Exinite Fluorescence Data - Report by A.C. Cook

WIRRAH NO. 3

KK No.	Esso No.	Depth m	$\bar{R}_v$ max %	Range R_v max %	N	Exinite fluorescence (Remarks)
19741	72888 -Y	1688.2 SWC	0.39	0.32-0.45	26	Abundant liptodetrinite, greenish yellow and dull yellow, abundant suberinite, dull orange, common sporinite, greenish yellow and dull yellow, common resinite, greenish yellow, sparse cutinite, yellow, rare to sparse fluorinite, green. (Coal, vitrite>clarite>duroclarite, V>E>I. Weak green oil cuts common.)
19742	72888 -Q	1873 SWC	0.48	0.33-0.55	27	Abundant liptodetrinite, yellow to orange, abundant suberinite, dull orange, common sporinite, yellow, common fluorinite/resinite, greenish yellow and yellow, sparse cutinite, yellow. (Coal, vitrite>clarite>Duroclarite, V>E>I. Rare sclerotinite in duroclarite. Abundant carbonate in clasts.)
19743	72888 -G	2096.4 SWC	0.53	0.43-0.64	27	Common to abundant sporinite, yellow to orange, common to abundant cutinite, orange, common liptodetrinite, yellow to orange, rare to sparse resinite, bright yellow. (Siltstone. D.o.m. abundant, V>E>I. Vitrinite and exinite abundant, inertinite sparse. Common pyrite.)
19744	72888 -B	2288 SWC	0.57	0.52-0.64	26	Abundant sporinite, cutinite and liptodetrinite yellow to orange, sparse resinite, greenish yellow, sparse suberinite, dull orange, abundant vitrinite, weak brown. (Shaly coal with minor siltstone and coal. Coal abundant, vitrite>clarite, V>E. D.o.m. abundant, V>E>I. Vitrinite and exinite abundant, inertinite sparse to common. Common pyrite.)
19745	72887 -N	2459.5 SWC	0.55	0.44-0.68	4	Sparse sporinite and liptodetrinite, orange to dull orange, rare to sparse cutinite, orange to dull orange, rare telalginite, orange. (Siltstone. D.o.m. sparse, I>E>V. Inertinite and exinite sparse, vitrinite rare. Rare pyrite.)
19746	72886 -I	2604 SWC	0.63	0.49-0.75	4	Sparse sporinite and liptodetrinite, orange to dull orange. (Shaly coal and siltstone. D.o.m. abundant, I>E>V. Inertinite abundant, exinite sparse to common, vitrinite rare. Sparse pyrite.)
19747	7885 -Z	2742.5 SWC	0.64	0.51-0.74	27	Abundant sporinite and liptodetrinite, orange to dull orange, common cutinite, yellow to dull orange, sparse resisnite, orange, sparse suberinite, dull orange, abundant vitrinite, weak brown. (Shaly coal and coal. Coal abudant, vitrite> clarite>duroclarite>inertite, V>E>I. D.o.m. abundant, V>E>I. Vitrinite, exinite and inertinite abundant. Sparse pyrite.)

WIRRAH NO. 3

KK No.	Esso No.	Depth m	$\bar{R}_v$ max %	Range R_v max %	N	Exinite fluorescence (Remarks)
19748	72885 -Q	2875 SWC	0.63	0.52-0.80	27	Common to abundant sporinite, orange to dull orange, common cutinite and liptodetrinite, orange to dull orange, abundant vitrinite, weak brown. (Shaly coal and siltstone. D.o.m. abundant, I>V>E. All three maceral groups abundant. Vitrinite commonly resinous. Sparse pyrite.)
20118	72895 -S	2971.8 SWC	0.48	0.37-0.62	25	Sparse sporinite aand liptodetrinite, bright yellow and yellow, sparse vitinite, greenish yellow and yellow to orange, rare to sparse suberinite, dull orange, common vitrinite, weak brown. (Siltstone and silty sandstone. D.o.m. abundant, I>V>E. Inertinite abundant, vitrinite common to abundant and exinite common. Abundant pyrite.)
20119	72890 -R	3088 SWC	0.51	0.42-0.63	25	Common sporinite and sparse liptodetrinite, yellow to orange, sparse vitrinite, orange to dull orange, rare telalginite, bright orange. (Siltstone. D.o.m. abundant, I>E>V. Inertinite abundant, exinite common to abundant, and vitrinite common. Sparse pyrite.)
20120	72890 -R	3097 SWC	0.52	0.42-0.65	25	Sparse sporinite, orange, rare to sparse cutinite, orange to dull orange, rare telalginite, yellow. (Sandstone and siltstone. D.o.m. abundant, I>V>E. Inertinite abundant, vitrinite common and exinite sparse. Common iron oxides and sparse pyrite.)
20121	72890 -Q	3116 SWC	0.68	0.57-0.77	29	Common sporinite, yellow and orange to dull orange, sparse cutinite, orange to dull orange, suberinite sparse in coal, weak brown, rare fluorinite, green. (Siltstone, sandstone and coal. Coal abundant, vitrite>>clarite, V>>E. D.o.m. abundant, V>E>I. Vitrinite abundant, exinite common to abundant and inertinite sparse. Rare pyrite.)
20122	72890 -G	3222 SWC	0.72	0.61-0.89	28	Sparse sporinite, yellow orange to dull orange, rare to sparse cutinite, orange to dull orange, suberinite sparse in coal, dull orange to weak brown. (Sandstone, siltstone and coal. Coal abundant, inertite>vitrite>clarite, I>V>E. D.o.m. abundant, I>V>E. Inertinite and vitrinite abundant, exinite sparse to common. Rare pyrite.)
20123	72890 -F	3241.9 SWC	0.73	0.57-0.89	26	Rare to sparse sporinite, dull orange. (Calcareous or sideritic siltstone. D.o.m. common, I>V=or>E. Inertinite common, vitrinite and exinite rare to sparse. Sparse pyrite and iron oxides.)

ENCLOSURES

ENCLOSURES

PE902507

This is an enclosure indicator page.
The enclosure PE902507 is enclosed within the container PE902506 at this location in this document.

The enclosure PE902507 has the following characteristics:

ITEM_BARCODE =	PE902507
CONTAINER_BARCODE =	PE902506
NAME =	Structure Map - Top of Latrobe Group Coarse Clastics
BASIN =	GIPPSLAND
PERMIT =	VIC/L2
TYPE =	WELL
SUBTYPE =	HRZN_CNTR_MAP
DESCRIPTION =	Structure Map - Top of Latrobe Group Coarse Clastics (enclosure from WCR vol.2) for Wirrah-3
REMARKS =	
DATE_CREATED =	28/02/84
DATE_RECEIVED =	29/11/85
W_NO =	W840
WELL_NAME =	Wirrah-3
CONTRACTOR =	ESSO
CLIENT_OP_CO =	ESSO EXPLORATION AND PRODUCTION

(Inserted by DNRE - Vic Govt Mines Dept)

PE902508

This is an enclosure indicator page.
The enclosure PE902508 is enclosed within the container PE902506 at this location in this document.

The enclosure PE902508 has the following characteristics:

ITEM_BARCODE =	PE902508
CONTAINER_BARCODE =	PE902506
NAME =	Structure Map - Middle M diversus marker
BASIN =	GIPPSLAND
PERMIT =	VIC/L2
TYPE =	WELL
SUBTYPE =	HRZN_CNTR_MAP
DESCRIPTION =	Structure Map - Middle M diversus marker (enclosure from WCR vol.2) for Wirrah-3
REMARKS =	
DATE_CREATED =	28/02/84
DATE_RECEIVED =	29/11/85
W_NO =	W840
WELL_NAME =	Wirrah-3
CONTRACTOR =	ESSO
CLIENT_OP_CO =	ESSO EXPLORATION AND PRODUCTION

(Inserted by DNRE - Vic Govt Mines Dept)

PE902509

This is an enclosure indicator page.
The enclosure PE902509 is enclosed within the container PE902506 at this location in this document.

The enclosure PE902509 has the following characteristics:

ITEM_BARCODE =	PE902509
CONTAINER_BARCODE =	PE902506
NAME =	Geological Cross Section A-A
BASIN =	GIPPSLAND
PERMIT =	VIC/L2
TYPE =	WELL
SUBTYPE =	CROSS_SECTION
DESCRIPTION =	Geological Cross Section A-A (enclosure from WCR vol.2) for Wirrah-3
REMARKS =	
DATE_CREATED =	28/02/84
DATE_RECEIVED =	29/11/85
W_NO =	W840
WELL_NAME =	Wirrah-3
CONTRACTOR =	ESSO
CLIENT_OP_CO =	ESSO EXPLORATION AND PRODUCTION

(Inserted by DNRE - Vic Govt Mines Dept)

PE601242

This is an enclosure indicator page.
The enclosure PE601242 is enclosed within the container PE902506 at this location in this document.

The enclosure PE601242 has the following characteristics:

ITEM_BARCODE =	PE601242
CONTAINER_BARCODE =	PE902506
NAME =	Well Completion Log
BASIN =	GIPPSLAND
PERMIT =	VIC/L2
TYPE =	WELL
SUBTYPE =	COMPLETION_LOG
DESCRIPTION =	Well Completion Log (enclosure from WCR vol.2) for Wirrah-3
REMARKS =	
DATE_CREATED =	27/02/84
DATE_RECEIVED =	29/11/85
W_NO =	W840
WELL_NAME =	Wirrah-3
CONTRACTOR =	ESSO
CLIENT_OP_CO =	ESSO EXPLORATION AND PRODUCTION

(Inserted by DNRE - Vic Govt Mines Dept)