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WCR VOL 2

LUDERICK - 1

ESSO EXPLORATION AND PRODUCTION
AUSTRALIA INC.

156 pages
+ 8 enclosures

W819

WELL COMPLETION REPORT
LUDERICK-1
VOLUME II

21 SEP 1984
OIL and GAS DIVISION

GIPPSLAND BASIN
VICTORIA

ESSO AUSTRALIA LIMITED

Compiled by: P.A. ARDITTO FEBRUARY, 1984

LUDERICK-1

WELL COMPLETION REPORT

VOLUME II

(Interpretative Data)

CONTENTS

FIGURES

APPENDICES

ENCLOSURES

ATTACHMENTS

GEOLOGICAL AND GEOPHYSICAL ANALYSIS

AGE	FORMATION	Predicted (mKB)	DEPTH (mKB)	Drilled (mSS)
Miocene to Recent	Gippsland Limestone	73-1051	73-1190	52-1169
Miocene	Lakes Entrance Formation	1051-1777	1190-1777	1169-1756
Late Cretaceous to Palaeocene & Oligocene	Latrobe Group	1777-T.D.	1777-T.D.	1756-T.D.
	TOTAL DEPTH	3021	3021	3000

INTRODUCTION

The primary objective of Luderick-1 was to test the hydrocarbon potential of a large intra-Latrobe Group anticlinal closure 7km to the NW of the Bream Field. Luderick-1 encountered an oil leg with a gas cap at the top of Latrobe Group "coarse clastics" and a thin oil sand within the Latrobe Group section.

PREVIOUS DRILLING HISTORY

No previous wells had been drilled on the Luderick structure. The closest wells are Bream-4A 8.0km SSE, within the Bream oil and gas field, and Tarwhine-1 17.0km WNW, a small oil field.

GEOLOGICAL SUMMARY

Structure

Predrill the Luderick structure was interpreted as a northeast - southwest trending faulted anticline which lies on a south-easterly plunging nose between the Bream and Tarwhine. The results of Luderick-1 did not significantly change the structural interpretation although it did verify the existence of a small top of "coarse clastics" closure which was doubtful predrill. The well is interpreted to have tested a valid Latrobe Group closure to T.D.

Closure height increases with depth although so does the degree of faulting. Some degree of fault independent closure exists at deeper levels however all larger structures are fault dependent. Faulting in the deeper intra-Latrobe Group is generally less intense than at Bream.

Stratigraphy

Latrobe Group

The stratigraphy encountered in the Luderick-1 well was generally as predicted. All depths referred to are in metres KB. The top of Latrobe Group (Gurnard Formation) was picked at 1777m corresponding on the logs to a slight increase in the gamma log response and a dramatic reduction of calcium carbonate below this depth. The top of "coarse clastics" (base Gurnard Formation) was picked at 1803m which corresponds to a dramatic reduction of glauconite pellet material (abundant in the overlying Gurnard Formation) and a pronounced increase in the gamma log response. This top portion of the "coarse clastics" section is essentially non-net, consisting of argillaceous siltstones with thin sand stringers, down to 1832.0m (top of reservoir section). This portion of the sequence is interpreted as being deposited at the lower shoreface, near storm wave base.

Facies analysis of available conventional core material combined with electric log analysis of the interval 1860.0m to 1770.0m reveals a transition zone from essentially fluviatile sedimentation in the lowermost section to distinctly marine sedimentation at the top. This sequence represents the onset of the final major marine transgression into the Gippsland Basin from the Eocene to the present day.

The sequence between 1860m and 1856.5m, consisting of carbonaceous shale and flaser bedded siltstones, is interpreted as a tidally influenced? lagoonal facies, overlain by an upward coarsening strand plain to upper shore face facies from 1856.5m to 1844m. The interval from 1844m to 1832m, consisting of relatively intensely bioturbated, fine to very fine grained sandstones, becoming glauconitic towards the top. This is interpreted as a middle to lower shoreface environment. The overlying interval, 1832m to 1777m, consisting of glauconitic siltstones with thin sandstone stringers, is interpreted as being deposited in a lower shoreface to offshore environment. The overlying Gurnard Formation represent very slow deposition in the offshore environment.

Below 1860m the Latrobe Group sequence comprises lower delta plain sediments of amalgamated fining upward cycles of sand-shale-coal point bar units interspersed with flood plain shales. Below 1950m the point bar sandstones are more commonly stacked although fining upward trends may still be recognised.

Seaspray Group

The marls and limestones of the Lakes Entrance Formation and Gippsland limestones were encountered as expected. An unnamed marl was recognised between 1777m and 1750m. Although lithologically similar to the Lakes Entrance Formation, it is separated from it by a significant hiatus. How this interval relates to the current stratigraphic nomenclature is still being investigated.

HYDROCARBONS

The Luderick-1 well was plugged and abandoned as a small oil and gas field. Two separate hydrocarbon accumulations, one at the top of "coarse clastics" and the other within the Latrobe Group, were intersected by the well.

The reservoir at the top of the Latrobe Group contains a 5.5m oil column with a gas cap. The uppermost, non-net, section of the "coarse clastics" appears to provide the seal for the accumulation. The O.W.C. is -1847.5m and the G.O.C. is at -1842.0m. The top of the reservoir section is taken at 1832.0m. Gas and condensate (70^{o} API) was recovered by RFT at 1838.5mKB and oil (45.9^{o} API) was recovered by RFT at 1843mKB.

The intra-Latrobe Group reservoir comprised a 2m sand between 2018mKB and 2020mKB. Top seal is provided by a thin shale and coal and base seal is provided by an 8m siltstone/shale unit. An inferred O.W.C., based on pressure plot data using a laboratory measured oil gradient of 0.79 psi/m, is inferred at -2009.5m. Oil (61^{o} API) was recovered by RFT from 2018mKB.

GEOPHYSICAL ANALYSIS

The Luderick structure is covered by a grid of seismic lines from the G74A, G77A and G81A surveys. All of the G74A and G77A lines have been reprocessed and migrated since 1980. All ofthe G81A lines have been migrated.

Data quality is good down to the *M. diversus* Seismic Marker, and correlation of seismic events above this level is reliable. Below the *M. diversus* seismic marker, complex faulting and lack of seismic event continuity render the structural interpretation and correlation of seismic events less reliable.

Five seismic horizons were mapped before drilling the structure. These were:-

Top of Latrobe
Top of "coarse clastics"
P. asperopolus Marker
M. diversus Marker
Upper *L. balmei*

The Top of "coarse clastics" horizon was penetrated at 1803 mKB, being 9m low to prediction. The coarse clastics reservoir is present below 1832.0mKB. Post drill interpretation of the check shot data indicated that changes to the regional TWT Lag map were required. The regional TWT log trend ranges from zero at Tarwhine to 15 msec at Bream. A log of 5ms was applied at Luderick. The V_{NMO} conversion factor for the Top of coarse clastics remained at 95%.

The Top of Latrobe was penetrated at the depth predicted and the seismic markers below are consistent with the palaeontological data from the well.

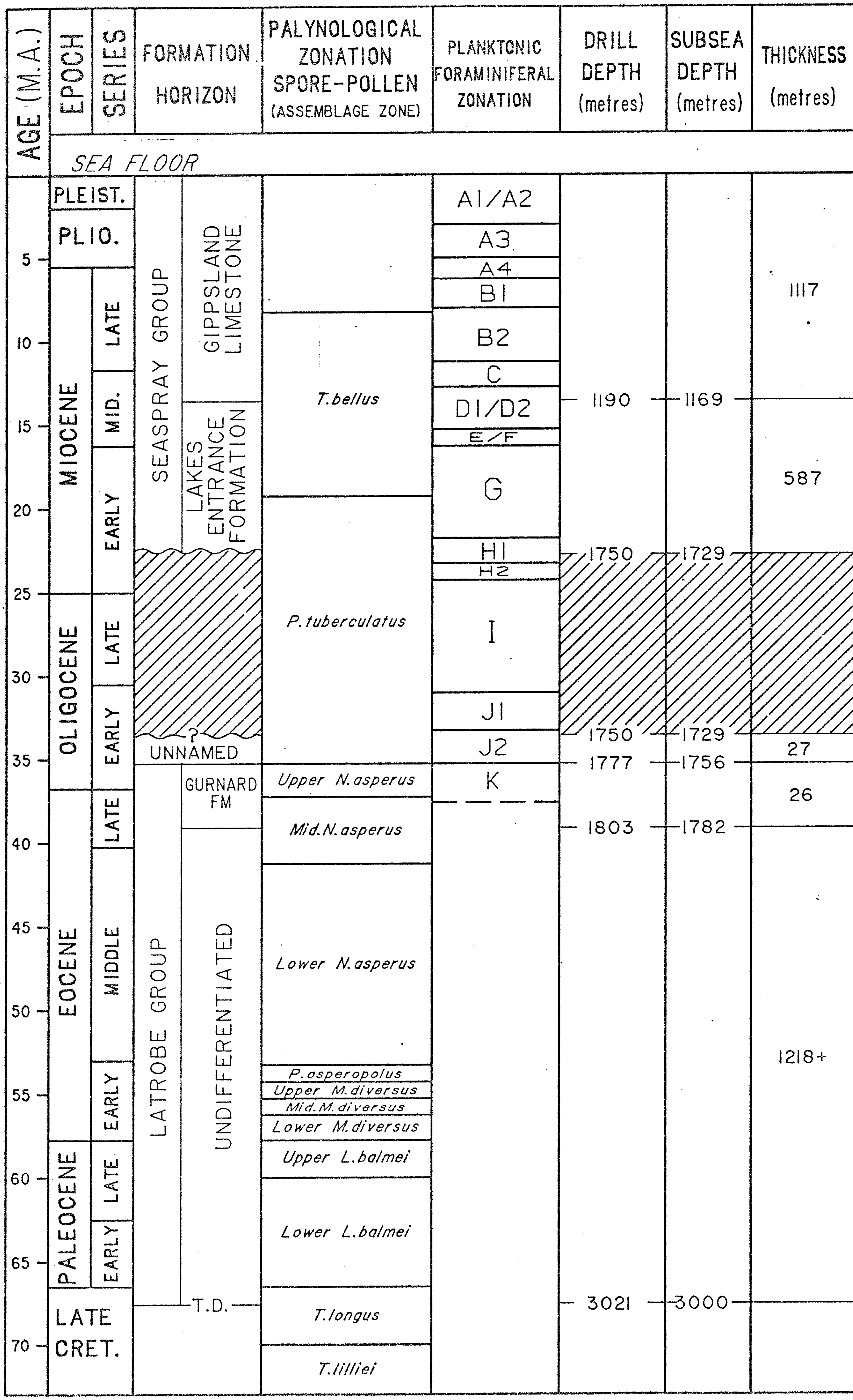
The two horizons which have been remapped post-drill are the Top of coarse clastics reservoir (Enclosure 1), and the upper M. diversus seismic marker (Enclosure 2). Reinterpretation of the coarse clastics reservoir indicates that Luderick-1 was drilled 16m below the crest of structure which lies to the north-east of the well location. The Upper *M. diversus* seismic marker is the closest mappable horizon above the Intra-Latrobe hydrocarbon accumulation, which is present approximately 15m below this marker. This Upper *M. diversus* seismic marker horizon lies between the *P. asperopolus* and *M. diversus* markers. A post-drill regional TWT Lag map and V_{NMO} conversion factor of 95% have been used to make depth maps.

FIGURES

FIGURES

LUDERICK-1

STRATIGRAPHIC TABLE



APPENDIX - 1

MICROPALAEONTOLOGICAL ANALYSIS

APPENDIX 1

Micropalaeontological Analysis

PLANKTONIC FORAMINIFERAL ANALYSIS

OF LUDERICK-1, GIPPSLAND BASIN

by

M.J. HANNAH

Esso Australia Ltd.
Palaeontology Report 1983/27 September, 1983
0576L

PART 1 - INTERPRETATIVE DATA

INTRODUCTION

GEOLOGICAL COMMENTS

BIOSTRATIGRAPHY

INTERPRETIVE DATA

DATA SHEET

SUMMARY: LUDERICK-1

AGE	FORMATION	ZONATION
LATE MIOCENE	GIPPSLAND LIMESTONE	Zone B2 860.6 - 922.0
		Zone C 944.9 - 1041.5
MID MIOCENE	.......1190.0...........	Zone D1 1100.0 - 1218.9
		Zone D2 1249.1 - 1339.9
	LAKES ENTRANCE FORMATION	Zone E2 1370.0
		Zone F 1398.5 - 1486.9
EARLY MIOCENE		Zone G 1516.1 - 1665.0
		Zone H1 1694.9 - 1745.0
EARLY OLIGOCENE	(Strong reworking of Gurnard Formation)	Zone Indeterminate 1754.0 - 1766.5 (P. tuberculatus)
	1777.0	
LATE EOCENE/ EARLIEST OLIGOCENE	GURNARD FORMATION	Zone K 1777.0 - 1799.0 (Upper Middle N. asperus)
	1803.0	

T.D. 3021.0m

INTRODUCTION

Marine sediments from Luderick-1 range in age from Late Eocene (Zone K) to Late Miocene (Zone B2). Palaeontological and lithological evidence indicate that the Latrobe Group/Lakes Entrance Formation boundary should be placed at 1777.0m.

A disconformity occurs between sidewall cores 120 and 121 (at 1754.0m and 1745.0m respectively). The exact duration of the hiatus involved is uncertain due to extensive reworking of Gurnard material into the basal part of the Lakes Entrance formation. However, the best estimate is that the break is between the Early Oligocene and Early Miocene.

GEOLOGICAL COMMENTS

1. GURNARD FORMATION

The Gurnard Formation in Luderick-1 is about 25m thick. Lithologically the basal sample contains a large percentage of both weathered and unweathered glauconite, which is in sharp contrast to the low glauconite levels of the underlying sands. The top of the unit is more difficult to define as it has been reworked into the basal Lakes Entrance Formation. The boundary is placed at 1777.0m and is reflected in a sudden decrease in glauconite content and a parallel increase in carbonate.

Lithologically the Gurnard Formation at Luderick-1 is not homogeneous. Levels of mica, carbonate and even glauconite fluctuate from sample to sample. Glauconite abundance, however, always remains high relative to samples from either side of the unit.

In situ foraminifera first appear in SWC 108, and consists of fragments of deepwater calcareous benthonics. Upsection (1801.5m) samples yield reasonable planktonic assemblages which are assigned to Zone K. Gurnard samples from below the last appearance upsection of *Globigerinathecka index* in SWC 115 at 1787.0m are almost certainly Late Eocene in age. Above this level, however, an earliest Oligocene age becomes a possibility. Palynology dates the Gurnard Formation as Upper Middle *N. asperus* which is consistent with a Zone K determination.

2. BASAL LAKES ENTRANCE FORMATION

Significant reworking appears to have occurred across the top of the Latrobe Group. The basal two samples from the Lakes Entrance Formation. (SWC's 120, 119 at 1754.0m and 1766.5m respectively) yield what appears to be a Zone K fauna. However, this is inconsistent with the younger P. tuberculatus age derived from palynology. Apparently reworked Zone K faunas are swamping the younger assemblage. Zone K. contaminants are still present in SWC 121 at 1745.0m which is undoubtedly Early Miocene in age.

Lithologically the higher than expected glauconite level in SWC's 120 and 119 also indicates reworking.

An Early Oligocene (? Zone J) age is assigned to the basal two SWC's because they lack any Late Oligocene/Miocene faunas. This age determination suggests that a significant hiatus exists between the Early Oligocene in SWC 120 at 1754.0m, and the Early Miocene in SWC 121 at 1745.0m.

BIOSTRATIGRAPHY

1. Zone K: Late Eocene/earliest Oligocene (1799.0 to 1777.0m)

The presence of Globigerina linaperta in most samples from the Gurnard Formation is a strong indication of Zone K. However, as G. linaperta is the only identifiable species in the basal part of the formation (SWC's 110 and 112, at 1799.0m and 1797.0m respectively), at this level the zonal determination carries only a low degree of confidence.

Upsection, faunal diversity improves-most samples yielding a moderate assemblage. Species present include Globigerina angiporoides, Globorotalia postcretacea, Chiloguembelina cubensis and Globigerinatheka index. Corresponding with increased faunal diversity is a similar increase in confidence in the age determination.

The last in situ appearance of Globigerinatheka index in SWC 115 at 1787.0m indicates that this sample, and those underlying it, are Late Eocene in age whereas those from the remainder of the Gurnard may be earliest Oligocene in age. Palynology dates this interval as Upper N. asperus in age in agreement with the foraminiferal determinations.

2. ? Early Ologicene; Zone: ? (1766.5 to 1754.0)

Reworking of the Gurnard Formation into the basal Lakes Entrance Formation makes dating of this interval imprecise. Comparison of foraminiferal and palynological dates shows the reworking of older Zone K faunas into younger P. tuberculatus zone sediments.

Because of the presence of so much Zone K faunas, it is impossible to recognise any Zone J faunas. However, the lack of marker species of Zones I and H indicate that Early Oligocene is the most likely age for the interval.

3. Zone H1. Early Miocene (1745.0m to 1694.9m)

The presence of Globigerina woodi connecta without Globigerinoides quadrilobatus trilobus is indicative of a Zone H1 age.

SWC 121 at 1745.0m contains elements of a reworked Zone K fauna (Globigernia linaperta and Globorotalia postcretacea). At this level, however, the appearance of Miocene species enables the age to be fixed and the reworking recognised.

Samples from Zone H1 yielded an assemblage of moderate to poor preservation and varying degrees of diversity. The most consistent members of the assemblage are, apart from the zonal species, Globorotalia mayeri, Globigerina euapentura and both the s.s. and s.l. forms of Globoquadrina dehiscens.

4. Zone G: Early Miocene (1665.0m to 1516.1m)

The appearance of Globigerinoides quadrilobatus trilobus in SWC 124 at 1665.0m marks the base of Zone G. Assemblages from this zone are, in general, moderately diverse and poorly preserved.

In previous wells Catapsydrax dissimilis has been reported only from the base of Zone G. In Luderick-1, however, this species is found throughout Zone G and also the basal part of Zone F.

5. Zone F. Middle Miocene (1486.9m to 1398.5m)

The addition of Globigerinoides sicanus to an otherwise unchanged assemblage in SWC 132 at 1425.0m indicates the base of Zone F. The zonal species is rare throughout the zone and is, in fact, absent from SWC 131 at 1453.4 which is listed as indeterminate on the Summary Chart.

The assemblages obtained from Zone F samples increase in both quality of preservation and diversity upsection. Diversity reaches a peak in SWC 132 at 1425.0m where 13 species are present.

As noted previously the presence of Catapsydrax dissimilis near the base of this zone is unusual.

6. Zone E2. Middle Miocene (1370.0m)

A single sample is assigned to this zone because it contains Praeorbulina glomerosa without either form of Orbulina. The absence of Zone E1 is probably the result of a sample gap.

7. Zone D. Middle Miocene
a) Zone D2. 1339.9m to 1249.0m
b) Zone D1. 1218.9m to 1100.0m

Samples assigned to Zone D contain Orbulina universa without Globorotalia miotumida miotumida. The presence of Globorotalia miozea, Globorotalia praescitula and Globorotalia conica in many of the Orbulina bearing samples confirms the age.

Globorotalia praemenardii is present throughout this interval often in unusually high numbers. Specimens of this species from this interval often have a highly inflated umbilical side.

The boundary between D2 and D1 is placed between SWC's 138 (at 1249.1) and 139 (at 1218.9m) based on the first appearance of Globorotalia peripheroacuta in the latter sample.

Zone C. Late Miocene. (1041.5m to 980.0m)

In Luderick-1 the base of Zone C is marked by the first appearance of Globorotalia miotumida miotumida. Samples are assigned to this zone if they contain this species and no Globorotalia acostaensis.

Zone B2. Late Miocene. (922.0m to 860.6m)

Samples yielding Globorotalia acostaenis but no convincing Globorotalia miotumida conomiozea are assigned to B2. Unfortunately upsection deterioration of the assemblages means only a low degree of confidence can be applied.

TABLE 2 INTERPRETATIVE DATA, LUDERICK-1

SIDEWALL CORE NO.	DEPTH (m)	MICROFOSSIL YIELD	MICROFOSSIL PRESERVATION	PLANKTON DIVERSITY	ZONE RATING	AGE
152	824.5	VERY LOW	VERY POOR	VERY LOW	INDETERMINATE	
151	860.6	VERY LOW	VERY POOR	LOW	B2 (2)	LATE MIOCENE
150	888.0	MODERATE	POOR	MODERATE	B2 (1)	LATE MIOCENE
149	929.0	VERY LOW	POOR	LOW	B2 (2)	LATE MIOCENE
148	944.9	MODERATE	POOR	MODERATE	C (1)	LATE MIOCENE
147	980.0	VERY LOW	ABYSSMAL	LOW	C (1)	LATE MIOCENE
146	1010.1	VERY LOW	ABYSSMAL	MODERATE	C (1)	LATE MIOCENE
145	1041.5	LOW	VERY POOR	LOW	C (1)	LATE MIOCENE
143	1100.0	MODERATE	LOW	MODERATE	D1 (1)	MID MIOCENE
142	1129.9	MODERATE	POOR	MODERATE	D1 (1)	MID MIOCENE
141	1160.9	HIGH	MODERATE	HIGH	D1 (1)	MID MIOCENE
140	1190.5	HIGH	MODERATE	HIGH	D1 (1)	MID MIOCENE
139	1218.9	HIGH	POOR	HIGH	D1 (1)	MID MIOCENE
138	1249.1	HIGH	GOOD	HIGH	D2 (0)	MID MIOCENE
137	1280.0	HIGH	GOOD	HIGH	D2 (0)	MID MIOCENE
136	1301.0	HIGH	GOOD	HIGH	D2 (0)	MID MIOCENE
135	1339.9	MODERATE	GOOD	MODERATE	D2 (1)	MID MIOCENE
134	1370.0	MODERATE	POOR	HIGH	E2 (0)	MID MIOCENE
133	1398.5	GOOD	GOOD	HIGH	F (0)	MID MIOCENE
132	1425.0	HIGH	MODERATE	HIGH	F (0(	MID MIOCENE
131	1453.4	LOW	POOR	HIGH	INDETERMINATE	
130	1486.9	MODERATE	POOR	MODERATE	F (1)	MID MIOCENE
129	1516.1	MODERATE	POOR	MODERATE	G (1)	EARLY MIOCENE

TABLE 2 INTERPRETATIVE DATA, LUDERICK-1

SIDEWALL CORE NO.	DEPTH (m)	MICROFOSSIL YIELD	MICROFOSSIL PRESERVATION	PLANKTON DIVERSITY	ZONE RATING	AGE
128	1545.0	MODERATE	GOOD	MODERATE	G (1)	EARLY MIOCENE
127	1574.0	MODERATE	POOR	MODERATE	G (1)	EARLY MIOCENE
126	1605.0	LOW	POOR	LOW	G (1)	EARLY MIOCENE
125	1635.0	LOW	POOR	MODERATE	G (1)	EARLY MIOCENE
124	1665.0	HIGH	GOOD	MODERATE	G (1)	EARLY MIOCENE
123	1694.9	LOW	POOR	MODERATE	H1 (1)	EARLY MIOCENE
122	1720.0	MODERATE	MODERATE	LOW	H1 (1)	EARLY MIOCENE
121	1745.0	MODERATE	MODERATE	HIGH	H1 (0)	EARLY MIOCENE
120	1754.0	MODERATE	GOOD	MODERATE	?	? EARLY OLIGOCENE
119	1766.5	LOW	VERY POOR	MODERATE	?	? EARLY OLIGOCENE
118	1777.0	VERY LOW	VERY POOR	LOW	K (1)	LATE EOCENE/EARLIEST OLIGOCENE
117	1780.0	POOR	POOR	VERY LOW	K (2)	LATE EOCENE/EARLIEST OLIGOCENE
116	1783.0	VERY LOW	POOR	VERY LOW	K (2)	LATE EOCENE/EARLIEST OLIGOCENE
115	1787.0	LOW	POOR	LOW	K (0)	LATE EOCENE
114	1791.0	LOW	POOR	LOW	K (1)	LATE EOCENE
112	1797.0	VERY LOW	VERY POOR	VERY LOW	K (2)	LATE EOCENE
110	1799.0	VERY LOW	VERY POOR	VERY LOW	K (2)	LATE EOCENE
108	1801.5	VERY LOW	VERY POOR	NIL	BENTHONICS ONLY	
107	1802.5	VERY LOW	VERY GOOD	LOW	INDETERMINATE	CONTAMINANTS ONLY
106	1803.5	NIL		NFF		
105	1810.4	NIL		NFF		

NFF: NO FORAMINIFERA FOUND SWC 44: 1069.0m MISPLACED.

MICROPALEONTOLOGICAL DATA SHEET

BASIN: GIPPSLAND ELEVATION: KB: 21.0 GL: -52.0

WELL NAME: LUDERICK-1 TOTAL DEPTH:

AGE		FORAM. ZONULES	HIGHEST DATA Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	LOWEST DATA Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
PLEISTOCENE		A_1										
		A_2										
PLIOCENE		A_3										
		A_4										
		B_1										
MIOCENE	LATE	B_2	860.0	2				922.0	2			
		C	944.9	1				1041.5	1			
	MIDDLE	D_1	1100.0	1				1219.0	1			
		D_2	1249.0	0				1339.9	1			
		E_1										
		E_2	1370.0	0				1370.0	0			
	EARLY	F	1398.5	0				1486.9	1			
		G	1516.1	1				1665.0	1			
		H_1	1694.9	1				1745.0	0			
OLIGOCENE	LATE	H_2										
		I_1										
		I_2										
	EARLY	J_1										
		J_2										
EOCENE		K	1777.0	1				1799.0	2	1791.0	1	
		Pre-K										

COMMENTS: SWC's 120 and 119 (at 1754.97 and 1766.5) are tentatively dated Early Oligocene. The lack of Zone E1 is probably a result of a sample gap.

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

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

DATA RECORDED BY: M.J. Hannah. DATE: September, 1983.

DATA REVISED BY: DATE:

PART 2

BASIC DATA

RANGE CHART

TABLE 2 BASIC DATA, LUDERICK-1

SIDEWALL CORE NO.	DEPTH (m)	MICROFOSSIL YIELD	MICROFOSSIL PRESERVATION	PLANKTON DIVERSITY
152	824.5	VERY LOW	VERY POOR	VERY LOW
151	860.6	VERY LOW	VERY POOR	LOW
150	888.0	MODERATE	POOR	MODERATE
149	929.0	VERY LOW	POOR	LOW
148	944.9	MODERATE	POOR	MODERATE
147	980.0	VERY LOW	ABYSSMAL	LOW
146	1010.1	VERY LOW	ABYSSMAL	MODERATE
145	1041.5	LOW	VERY POOR	LOW
143	1100.0	MODERATE	LOW	MODERATE
142	1129.9	MODERATE	POOR	MODERATE
141	1160.9	HIGH	MODERATE	HIGH
140	1190.5	HIGH	MODERATE	HIGH
139	1218.9	HIGH	POOR	HIGH
138	1249.1	HIGH	GOOD	HIGH
137	1280.0	HIGH	GOOD	HIGH
136	1301.0	HIGH	GOOD	HIGH
135	1339.9	MODERATE	GOOD	MODERATE
134	1370.0	MODERATE	POOR	HIGH
133	1398.5	GOOD	GOOD	HIGH
132	1425.0	HIGH	MODERATE	HIGH
131	1453.4	LOW	POOR	HIGH
130	1486.9	MODERATE	POOR	MODERATE
129	1516.1	MODERATE	POOR	MODERATE
128	1545.0	MODERATE	GOOD	MODERATE
127	1574.0	MODERATE	POOR	MODERATE
126	1605.0	LOW	POOR	LOW
125	1635.0	LOW	POOR	MODERATE
124	1665.0	HIGH	GOOD	MODERATE
123	1694.9	LOW	POOR	MODERATE
122	1720.0	MODERATE	MODERATE	LOW
121	1745.0	MODERATE	MODERATE	HIGH
120	1754.0	MODERATE	GOOD	MODERATE
119	1766.5	LOW	VERY POOR	MODERATE

TABLE 2 BASIC DATA, LUDERICK-1

SIDEWALL CORE NO.	DEPTH (m)	MICROFOSSIL YIELD	MICROFOSSIL PRESERVATION	PLANKTON DIVERSITY	
118	1777.0	VERY LOW	VERY POOR	LOW	
117	1780.0	POOR	POOR	VERY LOW	
116	1783.0	VERY LOW	POOR	VERY LOW	
115	1787.0	LOW	POOR	LOW	
114	1791.0	LOW	POOR	LOW	
112	1797.0	VERY LOW	VERY POOR	VERY LOW	
110	1799.0	VERY LOW	VERY POOR	VERY LOW	
108	1801.5	VERY LOW	VERY POOR	NIL	
107	1802.5	VERY LOW	VERY GOOD	LOW	
106	1803.5	NIL			NFF
105	1810.4	NIL			NFF

NFF: NO FORAMINIFERA FOUND

SWC 44: 1069.0m MISPLACED.

PE900478

This is an enclosure indicator page.
The enclosure PE900478 is enclosed within the container PE902540 at this location in this document.

The enclosure PE900478 has the following characteristics:

ITEM_BARCODE = PE900478
CONTAINER_BARCODE = PE902540
NAME = Foraminifera Range Chart
BASIN = GIPPSLAND
PERMIT = VIC/P1
TYPE = WELL
SUBTYPE = DIAGRAM
DESCRIPTION = Foraminifera Range Chart for Luderick-1.
REMARKS =
DATE_CREATED =
DATE_RECEIVED =
W_NO = W819
WELL_NAME = LUDERICK-1
CONTRACTOR =
CLIENT_OP_CO = ESSO AUSTRALIA LIMITED

(Inserted by DNRE - Vic Govt Mines Dept)

APPENDIX - 2

PALYNOLOGICAL ANALYSIS

APPENDIX 2

Palynological Analysis

APPENDIX

PALYNOLOGICAL ANALYSIS

LUDERICK-1, GIPPSLAND BASIN

by

M.K. Macphail.

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INTERPRETATIVE DATA

INTRODUCTION

Seventy six (76) sidewall core and four conventional cores were processed and examined for spore-pollen and dinoflagellates. Whilst recovery was usually fair to good, indicator species were very rare in the Late Cretaceous and Paleocene sections and uncommon in the Eocene section. Consequently many of the zone boundaries must be treated as provisional. 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 occurrences of taxa are listed in Table 2.

SUMMARY

UNIT/FACIES	ZONE	DEPTH (m)
Lakes Entrance Formation	P. tuberulatus	1745.0 - 1766.5
	log break at 1777.0m	
Gurnard Formation	Upper N. asperus	1777.0 - 1783.0
	Middle N. asperus	1787.0 - 1801.5
	log break at 1803.0m	
Latrobe Group coarse clastics	Middle N. asperus	1803.5 - 1816.0
	Lower N. asperus	1820.0 - 1914.4
	P. asperopolus	1919.0 - 1950.9
	Upper M. diversus	1981.0 - 2068.4
	Middle M. diversus	2081.7 - 2227.1
	Lower M. diversus	2270.0
	Upper L. balmei	2291.5 - 2445.0
	Lower L. balmei	2480.0 - 2935.0
	Upper T. longus	2995.0

T.D. 3021m.

GEOLOGICAL COMMENTS

1. The Luderick-1 well contains a continuous sequence of sediments from the Late Cretaceous Upper T. longus Zone to at least the Middle Eocene upper Middle N. asperus Zone.

2. The samples at 1754.0 and 1745.0 contain essentially the same (P. tuberculatus Zone) palynoflora despite foraminiferal data for a hiatus in deposition from the early Oligocene to the early Miocene in this interval (Hannah 1983).

3. Spore-pollen recovered from the Gurnard Formation, picked on lithological and log characteristics as occurring between 1803.0 to 1777.0m (Hannah ibid) demonstrates this unit is upper Middle N. asperus to (?) Upper N. asperus Zone in age. Despite lithological evidence for reworking of the Gurnard formation into the overlying calcareous sediments between 1777.0 and 1754.0m (Hannah ibid) no spore-pollen diagnostic of the Middle N. asperus Zone were recovered from this section. This indicates reworking was confined to the top of the Gurnard Formation.

4. Dinoflagellates are common to abundant from the highest sample analysed (1745.0m) down to 1812.0m and from 1820.0 to 1831.0m. This indicates the top 28m of the Latrobe Group coarse clastics were deposited in a marine environment during Lower and Middle N. asperus Zone times. This environment is represented by a marked change in the resistivity log character above 1833m. The highest coal is at 1873m, indicating that the isolated occurrence of a diverse dinoflagellate assemblage at 1896.0m represents a minor marine transgression during early Lower N. asperus Zone times.

5. An earlier (Lower M. diversus Zone) marine transgression is recorded at 2270.0m. The spore-pollen and dinoflagellate assemblage closely resembles that recorded from the Rivernook Bed of the onshore Princetown section, Otway Basin (Cookson & Eisenack 1967) and is likely to represent the same (Apectodinium hyperacantha Zone) event (Partridge 1976).

6. Relative depths of Upper N. asperus to Lower L. balmei Zone sediments in Luderick-1 correspond well with those recorded at Tarwhine-1 (Macphail 1982). The P. asperopolus and M. diversus 'seismic markers' lie within sediments of these ages in Luderick-1. As in Bream-3, the M. diversus

'seismic marker' is likely to be Middle M. diversus Zone in age. The lower L. balmei Zone 'seismic marker' in Luderick-1 lies within, but relatively close to the picked lower boundary of the Lower L. balmei Zone.

7. The lowest sidewall core sample at 2995.0m, contained a diverse Upper T. longus Zone palynoflora. This sample is approximately 26m above T.D. but given the occurrence of approximately 500m of T. longus Zone sediments in Tarwhine-1, it is probable that the Luderick-1 well also bottomed in Maastrichtian T. longus Zone sediments.

BIOSTRATIGRAPHY

The zone boundaries have been established using the criteria of Stover & Evans (1973), Stover & Partridge (1973) and subsequent proprietry revisions.

Upper T. longus Zone: 2995.0m.
The occurrence of Tetracolporites verrucosus, Proteacidites reticuloconcavus, P. otwayensis and P. amolosexinus in a Gambierina rudata - dominated palynoflora confirm an Upper T. longus Zone age for the basal sidewall core sample.

Samples within the interval 2935.0 to 2322.0m are characterised by the general L. balmei Zone indicators such as abundant Lygistepollenites balmei and Australopollis obscurus in gymnosperm and Proteacidites - dominated assemblages. Relatively few of these contained indicator species for either of the L. balmei Zone subdivisions, and in several instances probable reworking has resulted in occurrences of Lower L. balmei Zone indicators such as Tetracolporites verrucosus and Jaxtacolpus pieratus above the lowest occurrence of species which first appear in the Upper L. balmei Zone, eg. Verrucosisporites kopukuensis.

Lower L. balmei Zone: 2935.0 - 2480.0m.
The lower boundary is provisionally placed at 2935.0m, a coal containing Tetracolporites verrucosus and Lygistepollenites balmei but not species ranging higher than the T. longus Zone. Proteacidites gemmatus which ranges no higher than the Lower L. balmei Zone occurs at 2881.3m. The lowest occurrence of Halragacidites harrisii, a species which first appears in the L. balmei Zone, is at 2800m but this sample is contaminated with the Eocene species Proteacidites pachypolus. The lowest unequivocal occurrences of Haloragacidites harrisii and Tetracolporites verrucosus with frequent to abundant Lygistepollenites balmei are at 2580.0 and 2539.0m respectively. The upper boundary is picked on the highest unequivocal occurrences of these taxa, at 2480.0m.

Upper L. balmei Zone: 2445.0 - 2291.5m.

The lower boundary of this zone is provisionally placed at 2445.0m, based on the occurrence of Verrucosisporites kopukuensis. This sample is one of a small number containing both this species and Tetracolporites verrucosus; hence it is likely to lie close to the Upper/Lower L. balmei Zone boundary. Tetracolporites verrucosus also occurs at 2427.5m and Jaxtacolpus pieratus at 2322.0m. The highest occurrence of Verrucosisporites kopukuensis (a single poorly preserved grain) is at 2359.0m. Abundance of Lygistepollenites balmei in a coal at 2291.5m is used to define the upper boundary of the zone, but it is noted that coal palynofloras of M. diversus age in the Otway Basin do occasionally contain abundant Lygistepollenites balmei (A.D. Partridge, pars. comm).

Lower M. diversus Zone : 2270m.

One sample, at 2270m, is assigned to this zone. This contains abundant Malvacipollis diversus and dinoflagellates with Spinizonocolpites prominatus, Crassiretitriletes vanraadshoovenii and Polypodiaceoisporites varus.

Middle M. diversus Zone : 2227.1 - 2081.7m.

Two samples are provisionally assigned to this zone. The lower at 2227.1m contains Polycolpites esobalteus (which rarely extends below this zone) in a palynoflora dominated by Malvacipollis subtilis and Proteacidites grandis. Abundance of the last species is more typical of the Lower M. diversus Zone and it is probable the sample lies close to the Lower/Middle M. diversus Zone boundary. The upper sample, at 2081.7m, is a coal containing abundant Malvacipollis diversus and frequent Tricolporites adelaidensis, a species which first appears in the Middle M. diversus Zone. Proteacidites species and other taxa characteristic of this and the Upper M. diversus Zone are absent. The sample contains Proteacidites recavus and Periporopollenites vesicus, probably representing a real downward extension of the known range of these taxa (see Table 2).

Upper M. diversus Zone : 2068.4 - 1981.0m.

Samples within this interval are characterised by Myrtaceidites tenuis and Proteacidites pachypolus, species which first appear in this zone, in Haloragacidites harrisii - Proteacidites dominated palynofloras which lack indicator species of the P. asperopolus Zone. Malvacipollis diversus was present but always less common than M. subtilis. The upper boundary at 1981.0m is provisional since the sample is a coal.

P. asperopolus Zone : 1950.9 - 1919.0m.

Three samples, including two coals, are assigned to this zone. All lack

Proteacidites asperopolus, the major indicator species which first appears in this zone. The lower boundary at 1950.9m is picked on the first occurrence of Sapotaceoidaepollenites rotundus in an assemblage dominated by Proteacidites pachypolus. Myrtaceidites tenuis demonstrates this sample is no younger than P. asperopolus Zone in age. The coal at 1946.5m also contains relatively abundant P. pachypolus but in this instance in association with Tricolpites incisus, a species which first appears in the Upper M. diversus Zone. The coal at 1919.0m is provisionally picked as P. asperopolus Zone in age, based on the slightly greater abundance (34%) of Proteacidites, including P. annularis and P. pachypolus, relative to Nothofagidites (29%) pollen. Beaupreadites trigonalis and Proteacidites rugulatus indicate the sample is no older than P. asperopolus Zone in age.

Lower N. asperus Zone : 1914.4 - 1818.0m.

Unlike deeper sections, the interval upwards from 1914.4m contained diverse, well-preserved palynofloras enabling confident age-determinations to be made. The lower boundary of the Lower N. asperus Zone, at 1914.4m, is defined by (i) dominance of palynoflora by Nothofagidites; (ii) the occurrence of Tricolporites leuros, a species which first appears in this zone; and (iii) occurrences of Proteacidites asperopolus and (large diameter) Intratriporopollenites notabilis which are not known to occur above this zone. Proteacidites asperopolus is frequent at 1896.0, 1879.0 and 1861.4m and occurs less frequently in samples up to 1821.5m. First occurrences of other taxa which first appear in the Lower N. asperus Zone are Nothofagidites falcatus (1896.0m), Tricolporites delicatus (1879.0m) and Tricolpites simatus (1838.9m). The dinoflagellate species Areosphaeridium diktyoplokus, which is diagnostic of the Zone, occurs at 1826.0m. The upper boundary is picked at 1820.0, based on the occurrence of Tricolpites simatus and T. delicatus with frequent Proteacidites pachypolus.

Middle N. asperus Zone : 1816.0 -

The zone is characterised by Nothofagidites dominated palynofloras, many of which include one to several specimens of Proteacidites pachypolus a species which last appears in this zone. The lower boundary is picked at 1816.0m, based on the occurrence of the very rare species Tricolpites arcilineatus. This species is not known to occur below the Middle N. asperus Zone but in view of its rarity and the occurrence of a small (32 μm diameter) specimen of Intratriporopollenites notabilis, this boundary should be regarded as provisional. The first appearance of the zone indicator species Triorites magnificus is at 1810.4m. Verrucatosporites attinatus which typically first appears in the upper Middle N. asperus Zone occurs at 1808.0m. The sample at 1804.5m contains a rare Eocene occurrence of the Oligocene-Miocene species Cyathidites subtilis. The dinoflagellate indicator species for this zone, Vozzhenikovia extensa, occurs at 1800.5m (with Verrucatosporites attinatus), up to 1719.0m. This interval containing sporadic occurrences of Tricolpites simatus, Verrucatosporites attinatus, Tricolpites thomasii, Anacolosidites sectus and Proteacidites pachypolus. The upper boundary of the zone at 1791.0m is defined by the highest occurrence of Triorites magnificus. This sample contains Anacolosidites luteoides which is not known to range above the Lower N. asperus Zone and Polypodiaceoisporites cf. tumulus, a T. bellus Zone species.

Upper N. asperus Zone : 1783.0 - 1777.0m.
Two samples are provisionally assigned to this zone. Both are dominated by Nothofagidites pollen, including N. falcatus, but lack species restricted to the Middle N. asperus Zone. The sample at 1777.0m contains Proteacidites incurvatus, a species not known to range higher than the Lower N. asperus Zone.

P. tuberculatus Zone : 1766.5 - 1745.0m.
The occurrence of 5-10 specimens of Cyatheacidites annulatus in samples at 1745.0 and 1754.0m confirm a P. tuberculatus Zone age for these calcareous sediments. The sample at 1766.5m lacks C. annulatus but is included in this zone on the basis of (i) its general similarity to the above samples and (ii) the occurrence of Polyporina chenopodiaceoides, a snecies which is rare below the T. bellus Zone and not previously recorded from Eocene sediments.

PALYNOLOGY DATA SHEET

BASIN: Gippsland ELEVATION: KB: 21.0 GL: -52.0

WELL NAME: LUDERICK-1 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*	1745.0	0				1766.5	2	1754.0	0	
	Upper *N. asperus*	1777.0	2				1783.0	2			
	Mid *N. asperus*	1791.0	0				1816.0	2	1810.4	0	
	Lower *N. asperus*	1820.0	1				1914.4	0			
	P. asperopolus	1919.0	2				1950.9	1			
	Upper *M. diversus*	1981.0	2				2068.4	0			
	Mid *M. diversus*	2081.7	2				2227.1	2			
	Lower *M. diversus*	2270.0	0				2270.0	0			
	Upper *L. balmei*	2291.5	2	2359.0	1		2445.0	2			
	Lower *L. balmei*	2480.0	1				2935.0	2			
LATE CRETACEOUS	*T. longus*	2995.0	1				2995.0	1			
	T. lilliei										
	N. senectus										
	U. *T. pachyexinus*										
	L. *T. pachyexinus*										
	C. triplex										
	A. distocarinatus										
EARLY CRET.	*C. paradoxus*										
	C. striatus										
	F. asymmetricus										
	F. wonthaggiensis										
	C. australiensis										
	PRE-CRETACEOUS										

COMMENTS:

CONFIDENCE RATING:

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

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

DATA RECORDED BY: M.K. Macphail. DATE: October 13, 1983.

DATA REVISED BY: DATE:

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TABLE 1 : SUMMARY OF PALYNOLOGICAL ANALYSIS LUDERICK-1, GIPPSLAND BASIN

INTERPRETATIVE DATA

SAMPLE NO.	DEPTH (m)	YIELD	DIVERSITY SPORE POLLEN	LITHOLOGY	ZONE	AGE	CONFIDENCE RATING	COMMENTS
SWC 121	1745.0	Good	Low	Mdst.calc.	P.tuberculatus	Early Miocene	0	C.annulatus freq., F.lacunosus.
SWC 120	1754.0	Fair	Low	Slst.glau.calc.	P.tuberculatus	Oligocene	0	C.annulatus freq.
SWC 119	1766.5	Good	Low	Mdst.calc.	P.tuberculatus	Oligocene	2	P.chenopodiaceoides, P.simplex.
SWC 118	1777.0	Good	Moderate	Mdst.calc.	Upper N.asperus	Late Eocene	2	P.incurvatus, P.rectomarginis, P.stipplatus.
SWC 117	1780.0	V. low	V. low	Slst.glau.	Indeterminate		-	
SWC 116	1783.0	Good	Moderate	Slst.glau.	Upper N.asperus	Late Eocene	2	P.incurvatus, P.stipplatus, H.spinata.
SWC 115	1787.0	Good	Low	Slst.glau	N.asperus	Late Eocene		S.dilwynense.
SWC 114	1791.0	V. good	Good	Slst.calc.	Upper Middle N.asperus	Late Eocene	0	T.magnificus, V.attinatus.
SWC 113	1795.0	Good	Low	Slst.calc.	Middle N.asperus	Late Eocene	1	T.thomasii, P.esobalteus, V.extensa.
SWC 112	1797.0	Good	Moderate	Slst.calc.	Middle N.asperus	Late Eocene	1	P.pachypolus, S.punctatus, V.extensa.
SWC 111	1798.0	Good	Low	Slst.calc.glau	Middle N.asperus	Late Eocene	0	A.sectus, V.extensa.
SWC 110	1799.0	Fair	Moderate	Slst.calc.glau	Middle N.asperus	Late Eocene	0	T.magnificus, P.pachypolus, S.asymmetricum.
SWC 109	1800.5	Good	Moderate	Slst.clac.	Upper Middle N.asperus	Late Eocene	1	P.pachypolus, V.attinatus, V.extensa.
SWC 108	1801.5	Fair	Moderate	Slst.calc.	Middle N.asperus	Late Eocene	2	N.vansteenii, P.crassus.
SWC 106	1803.5	Good	Moderate	Slst.	Middle N.asperus	Mid/Late Eocene	2	T.ambiguus, P.unicus, S.asymmetricum
SWC 102	1804.5	V. good	High	Slst	Middle N.asperus	Mid/Late Eocene	2	P.pachypolus, P.reticuloscabratus.
SWC 101	1808.0	Fair	Low	Slst.glau.	Middle N.asperus	Mid/Late Eocene	2	P.recavus, D.heterophylcta.
SWC 105	1810.4	Good	Moderate	Slst.	Middle N.asperus	Mid/Late Eocene	0	T.magnificus, P.recavus, D.heterophylcta
SWC 104	1812.0	Good	High	Ss.	Middle N.asperus	Mid/Late Eocene	2	P.pachypolus, P.rugulatus, D.heterophylcta.

TABLE 1 : SUMMARY OF PALYNOLOGICAL ANALYSIS LUDERICK-1, GIPPSLAND BASIN

INTERPRETATIVE DATA

SAMPLE NO.	DEPTH (m)	YIELD	DIVERSITY SPORE POLLEN	LITHOLOGY	ZONE	AGE	CONFIDENCE RATING	COMMENTS
SWC 98	1813.5	Good	High	Slst.glau.	Middle N.asperus	Middle Eocene	2	P.pachypolus, T.delicatus.
SWC 97	1816.0	V. low	V. low	Slst.pyr.	Middle N.asperus	Middle Eocene	2	T.arcilineatus, P.pachypolus.
SWC 96	1818.0	Low	Low	Slst.glau.	N.asperus	Middle Eocene	-	P.pachypolus.
SWC 103	1820.0	Good	Moderate	Slst.	Lower N.asperus	Middle Eocene	1	P.pachypolus freq, T.delicatus, T.simatus, T.pelligera.
SWC 94	1821.5	Fair	Moderate	Slst.glau.	Lower N.asperus	Middle Eocene	1	P.cf.asperopolus, P.tuberculiformis, T.pelligera.
SWC 92	1826.0	Fair	Moderate	Slst.	Lower N.asperus	Middle Eocene	1	Abundant Nothofagidites, A.diktyoplokus.
SWC 91	1827.9	Good	High	Slst.	Lower N.asperus	Middle Eocene	2	Abundant Nothofagidites, H.tricornus, D.heterophylcta.
SWC 90	1831.0	Low	Moderate	Slst.	Lower N.asperus	Middle Eocene	1	P.asperopolus, abundant Nothofagidites.
SWC 89	1833.0	Barren	-	Ss.	-	-	-	
Core 3	1839.0	V. good	V. high	-	Lower N.asperus	Middle Eocene	0	P.asperopolus, abundant Nothofagidites, T.leuros.
Core 9	1842.2	Fair	Moderate	-	Lower N.asperus	Middle Eocene	1	T.leuros, P.asperopolus, P.pachypolus, H.spinata.
Core -	1857.25	Fair	Low	Coal	Lower N.asperus	Middle Eocene	1	P.asperopolus, common Nothofagidites.
Core 3	1861.42	Good	High	-	Lower N.asperus	Middle Eocene	1	P.asperopolus frequent, Nothofagidites abundant.
SWC 83	1879.0	Good	High	Ss.	Lower N.asperus	Middle Eocene	0	P.asperopolus frequent, Nothofagidites abundant, T.leuros, T.delicatus.

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SAMPLE NO.	DEPTH (m)	YIELD	DIVERSITY SPORE POLLEN	LITHOLOGY	ZONE	AGE	CONFIDENCE RATING	COMMENTS
SWC 79	1896.0	V. good	High	Ss.	Lower N.asperus	Middle Eocene	0	P.asperopolus frequent, Nothofagidites abundant, N.falcatus, P.recavus.
SWC 75	1914.4	Good	High	Slst.	Lower N.asperus	Middle Eocene	0	T.leuros, P.asperopolus, abundant Nothofagidites.
SWC 74	1919.0	Good	Moderate	Coal	P.asperopolus	Early/Mid Eocene	2	B.trigonalis, P.rugulatus, 34% Proteacidites.
SWC 73	1923.2	Barren	-	Ss.	-	-	-	
SWC 69	1946.5	Good	Low	Coal	P.asperopolus	Early/Mid Eocene	2	Frequent P.pachypolus, M.subtilis.
SWC 68	1950.9	V. good	Moderate	Sh.	P.asperopolus	Early/Mid Eocene	1	M.tenuis, S.rotundus, abundant P.pachypolus.
SWC 65	1981.0	Good	Low	Coal	Upper M.diversus	Early Eocene	2	M.tenuis, P.'apis.
SWC 64	1984.0	Fair	V. low	Slst.	Upper M.diversus	Early Eocene	2	Abundant P.pachypolus and M.subtilis.
SWC 46	2000.9	Fair	Low	Slst.	Upper M.diversus	Early Eocene	1	Abundant P.pachypolus, M.subtilis, M.tenuis, T.moultonii.
SWC 63	2012.9	Barren	-	Ss.	-	-	-	
SWC 41	2022.5	Barren	-	Mdst.	-	-	-	
SWC 40	2068.4	Good	Low	Ss.	Upper M.diversus	Early Eocene	0	M.diversus common, M.tenuis, P.pachypolus.
SWC 38	2081.7	V. good	Moderate	Coal	Middle M.diversus	Early Eocene	2	M.diversus abundant, T.adelaidensis.
SWC 37	2092.0	V. low	Low	Ss.	-	Early Eocene	-	No older than Lower M.diversus.
SWC 35	2100.5	Negligible	-	-	-	-	-	

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SAMPLE NO.	DEPTH (m)	YIELD	DIVERSITY SPORE POLLEN	LITHOLOGY	ZONE	AGE	CONFIDENCE RATING	COMMENTS
SWC 34	2135.5	Negligible	-	-	-	-	-	
SWC 32	2171.0	V. low	V. low	Ss.	-	Early Eocene	-	No older than Lower M.diversus.
SWC 61	2200.0	Barren	-	-	-	-	-	
SWC 60	2227.1	Fair	Moderate	Clyst.	Middle M.diversus	Early Eocene	2	Abundant M.subtilis, P.esobalteus, P.leightonii.
SWC 59	2270.0	Low	Low	Slst.	Lower M.diversus	Early Eocene (marine)	0	Abundant M.diversus, C.vanraadshoovenii, S.prominatus, P.varus.
SWC 58	2291.5	V. good	Moderate	Sh. coaly	Upper L.balmei	Paleocene	2	G.rudata, N.endurus, frequent L.balmei.
SWC 57	2322.0	Fair	Moderate	Ss.	Upper L.balmei	Paleocene	2	A.obscurus, P.langstonii, P.grandis.
SWC 56	2339.0	Good	Low	Sh.	L.balmei	Paleocene	-	A.obscurus, L.balmei common, H.harrisii.
SWC 55	2359.0	Low	Low	Sh. carb.	Upper L.balmei	Paleocene	1	V.kopukuensis, H.harrisii, G.rudata.
SWC 54	2383.0	Low	Low	Ss.	L.balmei	Paleocene	-	L.balmei, H.harris.i.
SWC 53	2403.0	Barren	-	-	-	-	-	
SWC 50	2427.5	Low	Low	Slst.	L.balmei	Paleocene	-	T.verrucosus, I.integricorpus.
SWC 31	2445.0	Good	Moderate	Slst.	Upper L.balmei	Paleocene	2	V.kopukuensis, T.verrucosus.
SWC 30	2461.0	V. low	V. low	Ss.	L.balmei	Paleocene	-	L.balmei, H.harrisii, T.cf.verrucosus.
SWC 29	2480.0	Good	Moderate	Slst.	Lower L.balmei	Paleocene	1	T.verrucosus, H.harrisii, abundant L.balmei.
SWC 28	2501.1	V. low	V. low	Ss.	Indeterminate	-	-	
SWC 27	2539.0	Fair	Moderate	Ss.	Lower L.balmei	Paleocene	1	frequent L.balmei, T.verrucosus.
SWC 26	2553.5	Fair	Low	Slst.	L.balmei	Paleocene	-	L.balmei common.

TABLE 1 : SUMMARY OF PALYNOLOGICAL ANALYSIS LUDERICK-1, GIPPSLAND BASIN

INTERPRETATIVE DATA

SAMPLE NO.	DEPTH (m)	YIELD	DIVERSITY SPORE POLLEN	LITHOLOGY	ZONE	AGE	CONFIDENCE RATING	COMMENTS
SWC 25	2580.0	Good	Low	Slst.	L.balmei	Paleocene	-	L.balmei common.
SWC 24	2611.0	Good	Low	Slst.	L.balmei	Paleocene	-	
SWC 23	2650.0	Low	Low	Slst.	L.balmei	Paleocene	-	
SWC 22	2681.0	Barren	-	Slst.	-	-	-	
SWC 21	2710.0	Fair	Low	Sh.	Lower L.balmei	Paleocene	2	P.verrucosus.
SWC 17	2800.0	Good	Moderate	Ss.	Lower L.balmei	Paleocene	2	frequent S.punctatus.
SWC 12	2841.0	V. low	V. low	Ss.	Indeterminate	-	-	No younger than Lower L.balmei.
SWC 9	2857.0	Low	V. low	Ss.	Lower L.balmei	Paleocene	-	L.balmei, abundant T.verrucosus.
SWC 8	2881.3	Low	Low	Sh.	Lower L.balmei	Paleocene	2	T.verrucosus, P.gemmatus, P.angulatus.
SWC 5	2935.0	Good	High	Ss.	Lower L.balmei	Paleocene	2	T.verrucosus, abundant Proteacidites.
SWC 4	2944.0	Barren	-	Ss.	-	-	-	
SWC 3	2952.3	V. low	Low	Ss.	Indeterminate	-	-	No older than Upper T.longus.
SWC 1	2995.0	V. low	Moderate	Slst.	Upper T.longus	Maastrichtian	1	Abundant G.rudata, P.otwayensis, P.reticuloconcavus.

TABLE 2

ANOMALOUS AND UNUSUAL OCCURRENCES OF SPORE-POLLEN TAXA IN LUDERICK-1

SAMPLE NO.	DEPTH(m)	ZONE	TAXON	COMMENTS
SWC 119	1766.5	P.tuberculatus (2)	Polyporina chenopodiaceoides	Rarely recorded in sediments older than Miocene.
SWC 116	1783.9	(Upper) Mid N.asperus (2)	Proteacidites incurvatus	Not recorded above Middle N.asperus Zone.
SWC 116	1783.0	(Upper) Mid N.asperus (2)	Hologinella spinata	Rare dinoflagellate species.
SWC 114	1791.0	(Upper) Mid N.asperus (0)	Hologinella spinata	Rare dinoflagellate species.
SWC 114	1791.0	(Upper) Mid N.asperus (0)	Anacolosidites luteoides	Not recorded above Lower N.asperus Zone.
SWC 114	1791.0	(Upper) Mid N.asperus (0)	Polypodiaceoisporites cf. tumulatus	T.bellus Zone species.
SWC 112	1797.0	Middle N.asperus (1)	Quintinia psilatispora	Rare sp. in Eocene.
SWC 110	1799.0	Middle N.asperus (0)	Proteacidites callosus	Rare sp.
SWC 106	1803.5	Middle N.asperus (2)	Proteacidites unicus	Rare ms sp. (Harris).
SWC 102	1804.5	Middle N.asperus (2)	Cyathidites subtilis	Rare below P.tuberculatus Zone.
SWC 104	1812.0	(Lower) Mid N.asperus (2)	Haloragacidites verrucatoharrisii	Rare ms. sp. (Macphail).
SWC 104	1812.0	(Lower) Mid N.asperus (2)	Elphredripites notensis	Rare sp.
SWC 104	1812.0	(Lower) Mid N.asperus (2)	Tricolpites cf. T.vergilius	Rare Late Cretaceous ms. sp. (Partridge).
SWC 98	1913.5	Middle N.asperus (2)	Beaupreadites trigonalis	Rare ms. sp. (Stough).
SWC 97	1816.0	Middle N.asperus (2)	Tricolpites arcilineatus	Very rare ms. sp. (Partridge).
SWC 97	1816.0	Middle N.asperus (2)	Intratriporopollenites notabilis	Appears to extend range of sp. into Middle N.asperus Zone - Specimen 32 u in diameter..
SWC 103	1820.0	Lower N.asperus (1)	Crassiretitriletes vanraadshoovenii	Rarely recorded in Middle Eocene.
SWC 103	1820.0	Lower N.asperus (1)	Proteacidites unicus	Rare ms. sp. (Harris).
SWC 103	1820.0	Lower N.asperus (1)	Dryptopollenites semilunatus	V. rare sp.
SWC 91	1827.9	Lower N.asperus (2)	Cunoniaceae (tricoporate)	Modern taxon.
SWC 91	1827.9	Lower N.asperus (2)	Dodonaea	Modern taxon.

TABLE 2

ANOMALOUS AND UNUSUAL OCCURRENCES OF SPORE-POLLEN TAXA IN LUDERICK-1

SAMPLE NO.	DEPTH(m)	ZONE	TAXON	COMMENTS
Core 3	1838.9	Lower N.asperus (0)	Dryptopollenites semilunatus	Rarely recorded in Middle Eocene.
Core 3	1838.9	Lower N.asperus (0)	Lidiacidites sp.	Echinate, aff. Astelia.
Core 3	1838.9	Lower N.asperus (0)	Tricolporites confragosus	Rare ms. sp. (Macphail).
SWC 75	1914.4	Lower N.asperus (1)	Tricolpites reticulatus	Rare ms. sp. (Cookson).
SWC 75	1914.4	Lower N.asperus (1)	Tricolpites reticulatus	Rare ms. sp. (Stover & Evans).
SWC 65	1981.0	Upper M.diversus (2)	Proteacidites lapis	abundant in H.harrisii coal palynoflora.
SWC 40	2068.4	Upper M.diversus (1)	Schizaea digitatoides	Unusually abundant occurrence of rare sp.
SWC 40	2068.4	Upper M.diversus (1)	Schizocolpus rarus	Rare sp.
SWC 38	2081.7	Middle M.diversus (2)	Proteacidites recavus	Not recorded before Lower N.asperus Zone (coal palynoflora).
SWC 38	2081.7	Middle M.diversus (2)	Periporopollenites vesicus	Not recorded before Lower N.asperus Zone (coal palynoflora).
SWC 37	2092.0	Lower (?) M.diversus	Haloragacidites verrucatoharrisii	Rare ms. sp. (Macphail).
SWC 60	2227.1	Lower M.diversus (2)	Polycolpites esobalteus	Rare below Middle M.diversus Zone.
SWC 60	2227.1	Lower M.diversus (2)	Gamblerina rudata	Rarely reworked into non-marine M.diversus sediments.
SWC 59	2270.0	Lower M.diversus (0)	Kuylisporites waterbolkii	Rare below Middle M.diversus Zone (marine sample).
SWC 57	2322.0	Upper L.balmei (2)	Jaxtacolpus pieratus	Lower L.balmei/Upper T.longus Zone indicator sp.
SWC 57	2322.0	Upper L.balmei (2)	Tricolpites gigantis	Ms. sp. (Macphail).
SWC 31	2445.0	Upper L.balmei (2)	Example of rare simultaneous occurrence of V.kopukuensis and T.verrucosus.	
SWC 31	2445.0	Upper L.balmei (2)	Ilexpollenites anguloclavatus	Eocene sp.
SWC 23	2650.0	Lower L.balmei (2)	Proteacidites grandis	V. rare below Upper L.balmei Zone.
SWC 8	2881.3	Lower L.balmei (2)	Proteacidites gemmatus	Rare above T.longus Zone.
SWC 1	2995.0	Upper T.longus (1)	Proteacidites cf. grandis	V. rare occurrence of this morphotype.

APPENDIX 3

QUANTITATIVE LOG ANALYSIS

APPENDIX - 3

APPENDIX 3

Quantitative Log Analysis

LUDERICK #1

QUANTITATIVE LOG INTERPRETATION

Interval: 1800-3015m KB

Analyst : T.M. Frankham

Date : September, 1983

LUDERICK #1 QUANTITATIVE LOG INTERPRETATION

The Luderick #1 wireline logs have been analysed over the interval 1800m to 3015m KB for shale volume, effective porosity and effective water saturation. 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.

LOG DATA

Logs Used

LLD, LLS, MSFL, GR, RHOB (FDC 1800-2450m, LDT 2450-3015m), NPHI (CNL), CALIPER.

The resistivity, gamma ray and neutron porosity logs were corrected for environmental and borehole effects. The corrected resisitivity logs were then used to derive invasion diameter and Rt logs.

Coals and carbonaceous shales were edited for an output of:

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

Log Quality

The field recorded LDT/CNL log exhibited excessive apparent gas crossover in clean water sands. Comparison with the FDC/CNL run over the upper half of the analysed interval indicated that the CNT (H) run with the LDT was in error. Schlumberger have since claimed that the neutron calibrating tank had been damaged, and have subsequently provided a "recalibrated" CNT (H) neutron log, which effectively eliminates most of the apparent gas crossover.

The RHOB and MSFL logs are affected in some sections by washouts. In these intervals, the RHOB log was edited such that a "most likely" bulk density was inserted through the bad washouts, and a "minimum value" limit was placed on MSFL readings before environmental corrections.

OTHER DATA

RFT sample recoveries suggest the following formation fluid types at the indicated depths.

1838.5m KB	Gas
1843.0m KB	Oil
1879.0m KB	Water
1934.0m KB	Water
2013.0m KB	Water
2018.0m KB	Oil

GOC - 1842m
OWC - 1847.5m

12m gas
5.5m oil

RFT pressure data indicates a Gas/Oil contact at 1842m KB and an Oil/Water contact at 1847.5m KB.

ANALYSIS METHODOLOGY

Salinity

Apparent free water salinities and resistivities were derived from clean water bearing sands via the following relationships:

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

where PHIT = total porosity determined from density-neutron crossplot algorithms outlined below

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

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

The top of Latrobe hydrocarbons are immediately underlain by water bearing sands (1852-1873m) which have apparent salinities in the order of 8000-14000 ppm NaCl. From 1873m to 1942m, the sands have increased resistivities and hydrocarbons were initially suspected. However RFT sample and pressure data indicate that these sands are, in fact, water bearing. As such, apparent salinities in the range 1500-2000 NaCleq. are calculated. The sand from 1952m-1980m has calculated apparent salinities grading from 3500 ppm NaCleq. at the top, to 14000 ppm NaCleq. at 1980m. 14000 ppm NaCleq. is also calculated for the next underlying sand (1987-2004m). The following two sands, 2012.5m-2014m and 2017m-2019.5m respectively, both have resistivities considerably higher than surrounding sands again suggesting possible hydrocarbon. RFT data indicates that the former is water bearing, in which case an apparent water salinity of 5000 ppm NaCleq. is calculated, and that the latter is oil bearing. Below this, calculated apparent water salinities grade from 20000 ppm NaCleq. at 2030m to 28000 NaCleq. at 2130m and then gradually freshen again to approximately 24000 ppm NaCleq. by 2560m. Below 2560m the calculated apparent formation water salinity decrease more rapidly, being approximately 13500 ppm NaCleq. at 3000m (T.D.).

An equivalent formation water salinity of 30000 ppm NaCleq. was assumed for all hydrocarbon zones.

A depth plot of salinities used in the interpretation is shown in Figure #1.

Shale Volume

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

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

Total Porosities

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

$$h = 2.71 - RHOB + PHIN\ (RHOF - 2.71) \qquad - 1$$

if h is greater than 0, then

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

if h is less than 0, then

apparent matrix density, RHOMa $= 2.71 - 0.64h$ - 3

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

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

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

Rwb and Swb were calculated using the following relationships:

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

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

$$Swb = \frac{VSH * PHITSH^m}{PHIT}$$

Water Saturations

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

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

and

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

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

Grain Density

Grain density was calculated by first correcting density and neutron logs for shale using the following relationships:

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

$$PHINC = \frac{PHINHC - VSH * PHINSH}{1 - VSH}$$

The shale corrected density and neutron values were then used in the density-neutron crossplot algorithms (1, 2 and 3, above) to derive apparent grain density.

(ie. RHOGa = RHOMa calculated from RHOBC and PHINC).

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

$$PHIE = PHIT - VSH * PHITSH$$

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

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

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

Analysis Parameters

	1800-2100m	2100-2650m	2650-3000m
a	1	1	1
m	2	2	2
n	2	2	2
Grain Density - lower bound	2.650 gm/cc	2.65 gm/cc	2.65 gm/cc
Grain Density - upper bound	2.665 gm/cc	2.665 gm/cc	2.665 gm/cc
Apparent Shale Density	2.550 gm/cc	2.600 gm/cc	2.620 gm/cc
Apparent Shale Neutron Porosity	0.330	0.320	0.320
Apparent Shale Resistivity	12 ohm.m	15 ohm.m	30 ohm.m

A hydrocarbon density of 0.75 gms/cc was assumed for the oil bearing zones and 0.25 gms/cc for the gas bearing zones.

Figure #1 is a plot of the salinity profile used in this analysis.

RESULTS

Results are presented as follows:

a) A summary of the major sands is presented in Table #1.

b) A listing of log derived values at 0.25m intervals is attached.

c) A depth-porosity plot is given in Figure #2.

d) A two track depth plot showing effective porosity calculated water saturation, and shale volume, is enclosed.

LUDERICK #1 - MAJOR SANDS SUMMARY

TABLE 1

(i) Hydrocarbon Bearing Sands

Depth Interval (m KB)	Gross Thickness (m)	Net* Thickness (m)	Average* Porosity	Average* Sw	Fluid Type
1830.0 - 1842.0	10.0	10.0	.199	.168	Gas
1842.0 - 1847.5	5.0	3.5	.194	.315	Oil
1852.0 - 1860.0	8.0	7.0	.191	1.000	Water
1867.0 - 1872.0	5.0	4.0	.207	1.000	Water
1875.0 - 1950.0	75.0	22.5	.210	1.000	Water
1952.0 - 1979.0	27.0	24.5	.244	1.000	Water
1987.0 - 2008.0	21.0	29.5	.237	1.000	Water
2012.0 - 2014.0	1.5	1.5	.205	1.000	Water
2018.0 - 2020.0	2.0	2.0	.241	.200	Oil
2027.5 - 2053.0	25.5	23.5	.231	1.000	Water
2057.0 - 2059.5	2.5	2.0	.236	1.000	Water
2069.5 - 2073.0	3.5	1.0	.176	1.000	Water
2090.0 - 2126.0	35.5	33.5	.224	1.000	Water
2132.0 - 2143.5	11.5	3.0	.229	1.000	Water
2146.0 - 2149.0	3.0	3.0	.240	1.000	Water
2160.0 - 2167.0	7.0	6.0	.253	1.000	Water
2172.0 - 2193.0	21.0	18.0	.222	1.000	Water
2207.5 - 2209.5	2.0	1.5	.227	1.000	Water
2218.0 - 2221.0	3.0	2.5	.211	1.000	Water
2234.0 - 2263.0	29.0	27.0	.216	1.000	Water
2277.0 - 2290.0	13.0	10.0	.178	1.000	Water
2297.5 - 2301.5	4.0	2.0	.198	1.000	Water
2306.0 - 2319.5	13.5	9.0	.195	1.000	Water
2325.0 - 2334.0	9.0	7.5	.146	1.000	Water
2342.0 - 2353.5	11.5	9.0	.184	1.000	Water
2363.0 - 2370.5	7.5	5.0	.175	1.000	Water
2384.0 - 2426.0	42.0	36.0	.163	1.000	Water
2430.0 - 2436.0	6.0	5.0	.185	1.000	Water
2448.0 - 2467.0	19.0	16.0	.179	1.000	Water
2487.0 - 2564.0	77.0	68.0	.202	1.000	Water
2573.5 - 2578.0	4.5	4.5	.190	1.000	Water
2585.0 - 2590.0	5.0	3.5	.165	1.000	Water
2605.0 - 2609.5	4.5	4.5	.146	1.000	Water
2617.0 - 2628.0	11.0	11.0	.193	1.000	Water
2637.0 - 2649.0	12.0	12.0	.175	1.000	Water
2662.0 - 2675.0	13.0	13.0	.170	1.000	Water
2682.0 - 2700.0	18.0	15.0	.167	1.000	Water
2755.0 - 2767.0	12.0	12.0	.162	1.000	Water
2809.0 - 2813.0	4.0	3.5	.144	1.000	Water
2831.0 - 2834.5	3.5	3.5	.148	1.000	Water
2840.0 - 2845.5	5.5	5.5	.152	1.000	Water
2850.0 - 2855.0	5.0	5.0	.141	1.000	Water
2878.0 - 2880.0	2.0	1.5	.160	1.000	Water
2890.0 - 2902.0	12.0	7.0	.151	1.000	Water
2925.0 - 2945.0	20.0	20.0	.145	1.000	Water
2955.0 - 2961.0	6.0	5.0	.134	1.000	Water
2984.0 - 2990.0	6.0	6.0	.158	1.000	Water

Total Interval

1800.09 - 3000.0m

* Net thickness, average porosity and average Sw refer only to those levels with effective porosity in excess of 0.1.

0932L/49

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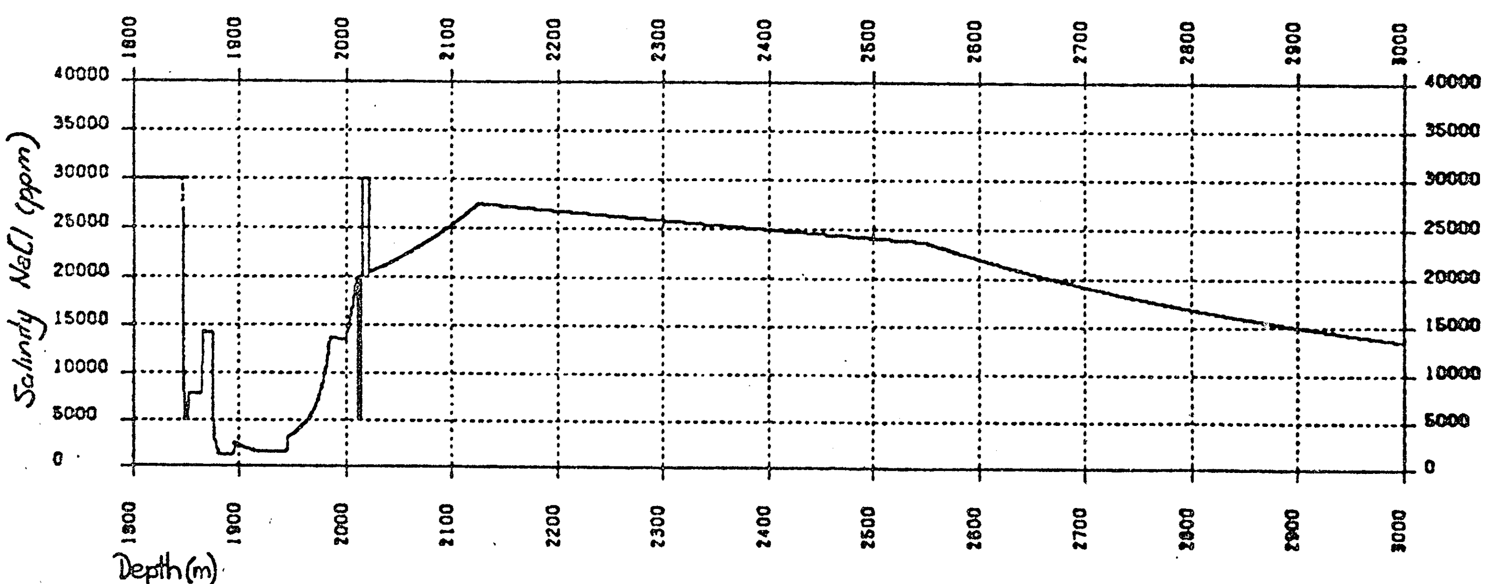
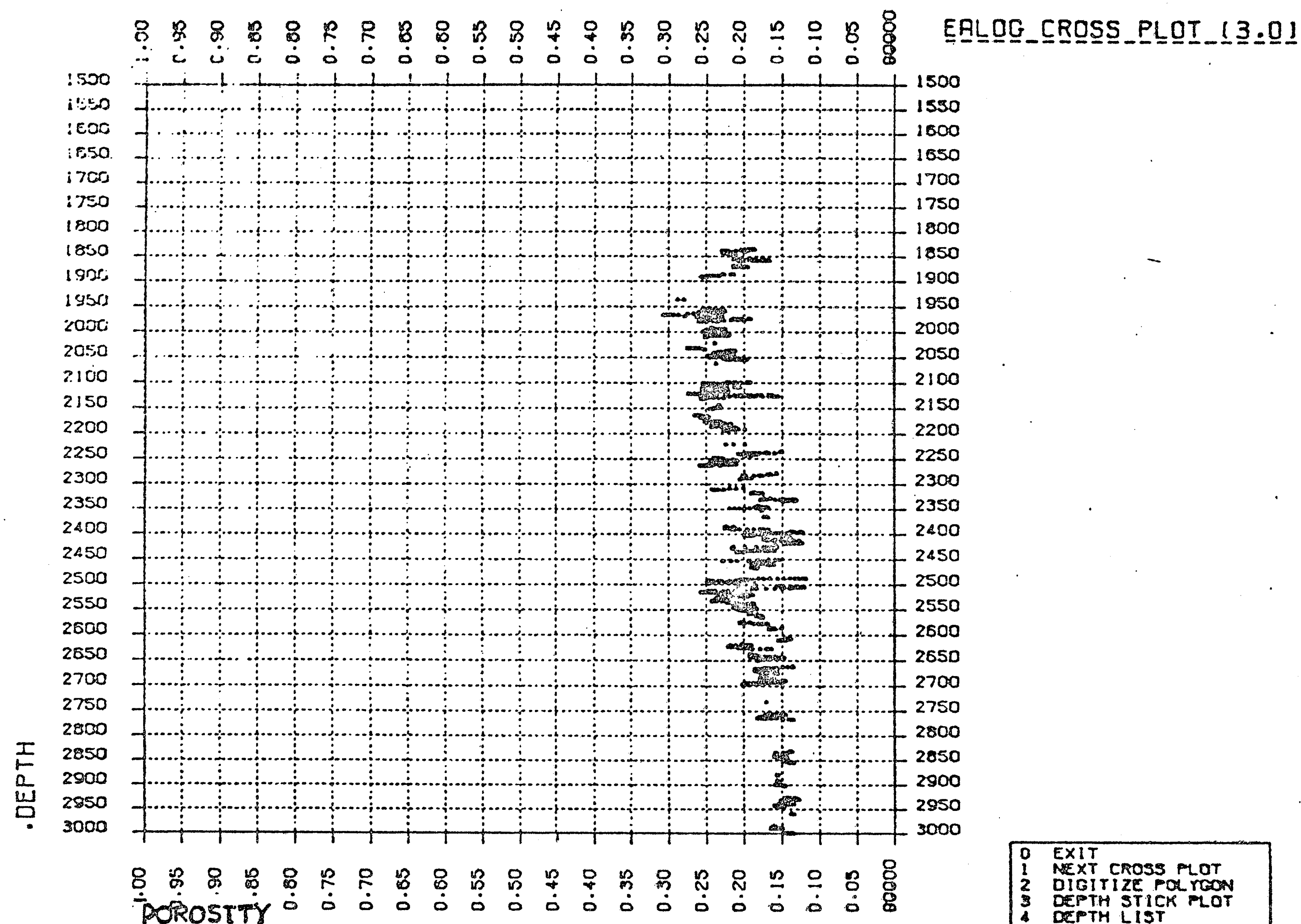


LUDERICK #1. SALINITY PROFILE

Figure #1



LUDERICK #1. POROSITY-DEPTH PLOT.

Figure #2.

PE601266

This is an enclosure indicator page.
The enclosure PE601266 is enclosed within the container PE902540 at this location in this document.

The enclosure PE601266 has the following characteristics:

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CONTAINER_BARCODE = PE902540
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            BASIN = GIPPSLAND
           PERMIT =
             TYPE = WELL
          SUBTYPE = WELL_LOG
      DESCRIPTION = Luderick-1 Porosity-SW Log. From
                    Appendix 3 - Quantitative log Analysis
                    of WCR volume 2.
          REMARKS =
     DATE_CREATED =
    DATE_RECEIVED = 21/09/1984
             W_NO = W819
        WELL_NAME = Luderick-1
       CONTRACTOR = ESSO
     CLIENT_OP_CO = ESSO
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(Inserted by DNRE - Vic Govt Mines Dept)

APPENDIX 4

WIRELINE TEST REPORT

APPENDIX - 4

APPENDIX 4

Wireline Test Report

WIRELINE TEST REPORT

LUDERICK-1 RFT RESULTS

Seven RFT runs were made in the Luderick-1 exploration well on June 16, 1983 to confirm log interpretation of hydrocarbon zones, provide estimates of contact depths and to recover reservoir fluid samples. The program:

(i) confirmed a gas accumulation with an underlying 5.5m (RFT interpretation) oil column at the top of the coarse clastics; and

(ii) confirmed an oil accumulation at 2018m TVDKB with an RFT interpreted OWC at 2031m TVDKB (2000m SS)

Discussion

A total of 42 pressure seats were taken as detailed in Table 1. The program was particularly successful operationally, with 41 of the seats being valid tests. The pressure data is plotted in Figure 1, with detailed plots of the hydrocarbon accumulations provided in Figures 2 and 3. Fluid samples were taken in runs two through seven and the results are summarised in Table 2. The main results are discussed below.

1. The pressure data between 1850m and 2015m TVDKB lies on a water gradient with a slope of 1.41 psi/m. The water sands at 1850m TVDKB are drawndown 55 psi from the original aquifer pressure, which is in close agreement with the prediction of the Gippsland aquifer model, confirming that they are in communication with the Gippsland aquifer system. (Refer to Figure 1).

2. Samples taken in RFT-2 and RFT-6 confirmed the oil and gas accumulation at the top of the coarse clastics. As indicated in Table 2, RFT-2 recovered 125 scf of gas and RFT-6 recovered 590cc of oil. The segregated gas sample was preserved for analysis. The segregated oil sample leaked during transfer.

   The pressure data within the oil column cannot be used to establish an oil pressure gradient. Assuming an oil gradient of 0.95 psi/m, the OWC is indicated at 1847.5m TVDKB and the GOC at 1842m TVDKB, giving an oil column of 5.5m. (Refer to Figure 2).

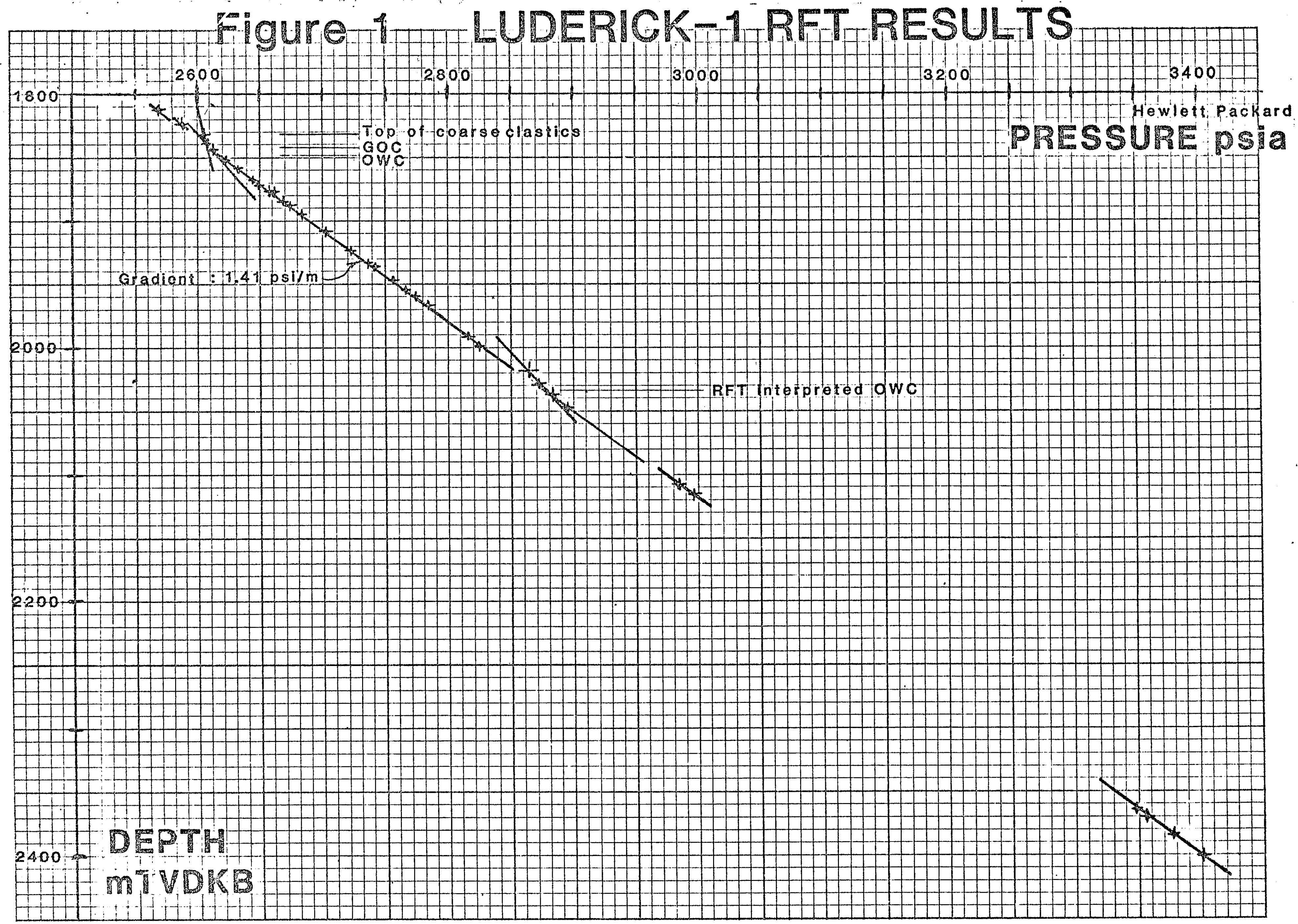
   The estimates of contact depths are dependent on oil gradient. For example, for an oil gradient of 1.0 psi/m, the OWC and GOC depth are 1848 and 1842.5m TVDKB, respectively. Similarly, for an oil gradient of 0.90 psi/m the OWC and GOC depths are 1847.25m and 1841.75m TVDKB, respectively.

3. The pressure at 1861.2m TVDKB, seat 1/28, lies above the water gradient. However, it is interpreted as being supercharged, and not as an indication of a hydrocarbon zone. (Refer to Figure 2).

4. The pressure tests at 1823.5m and 1812m TVDKB, above the gas accumulation, indicate these intervals are not in communication with the gas accumulation. (Refer to Figure 2).

5. As shown in Figure 3, an oil accumulation at 2018m TVDKB was confirmed by RFT-7, which sampled 7,920 cc of oil. The pressure data cannot be used to determine the oil gradient. The Laboratory measurements on the oil sample gave a density at reservoir conditions (199°F, 2863 psia) of 34.6 lbs/ft^3 (.555 gms/cc .788 psi/ft). The OWC based on this oil density is at 2031 metres TVDKB.

6. The pressures measured in sands at 2400m TVDKB show a drawdown of 20 psi from the initial Gippsland aquifer pressure and suggest these sands are in communication with the aquifer. (Refer to Figure 1).



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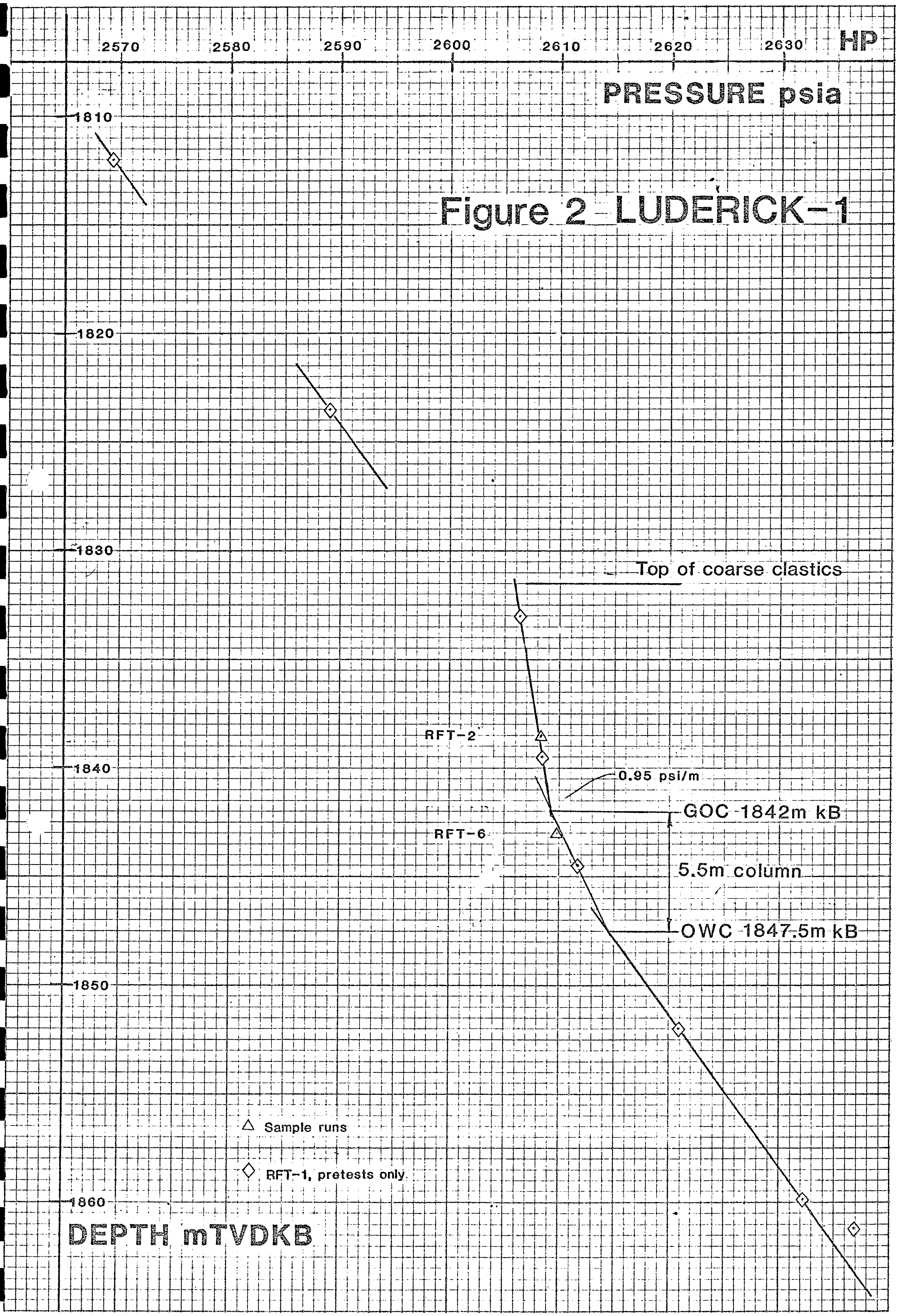

HP
PRESSURE psia
2570
2580
2590
2600
2610
2620
2630
Figure 2 LUDERICK-1
1810
1820
1830
1840
1850
1860
Top of coarse clastics
RFT-2
0.95 psi/m
GOC 1842m kB
RFT-6
5.5m column
OWC 1847.5m kB
△ Sample runs
◇ RFT-1, pretests only
DEPTH mTVDKB

Figure 3 LUDERICK-1

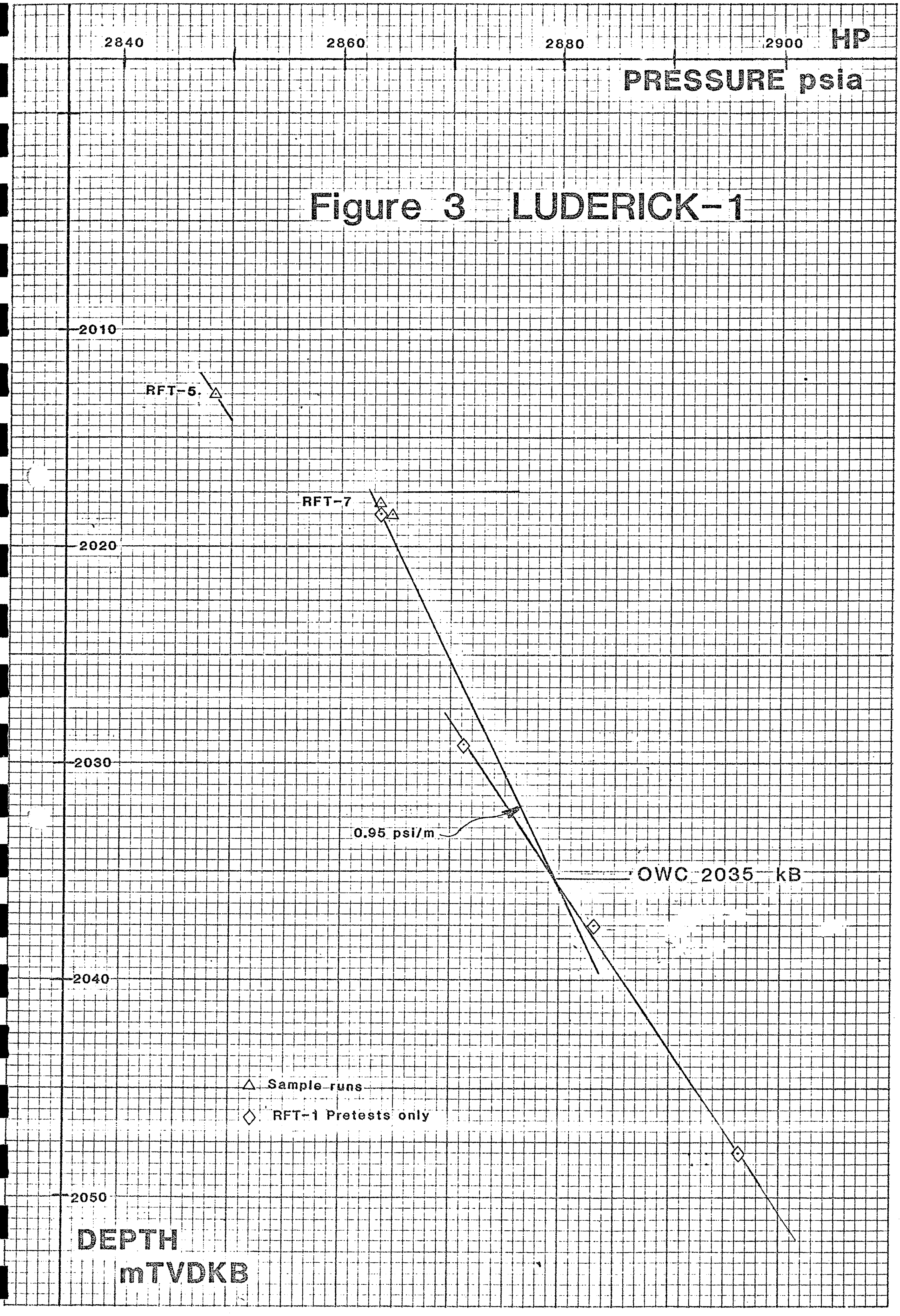


FIGURE 3

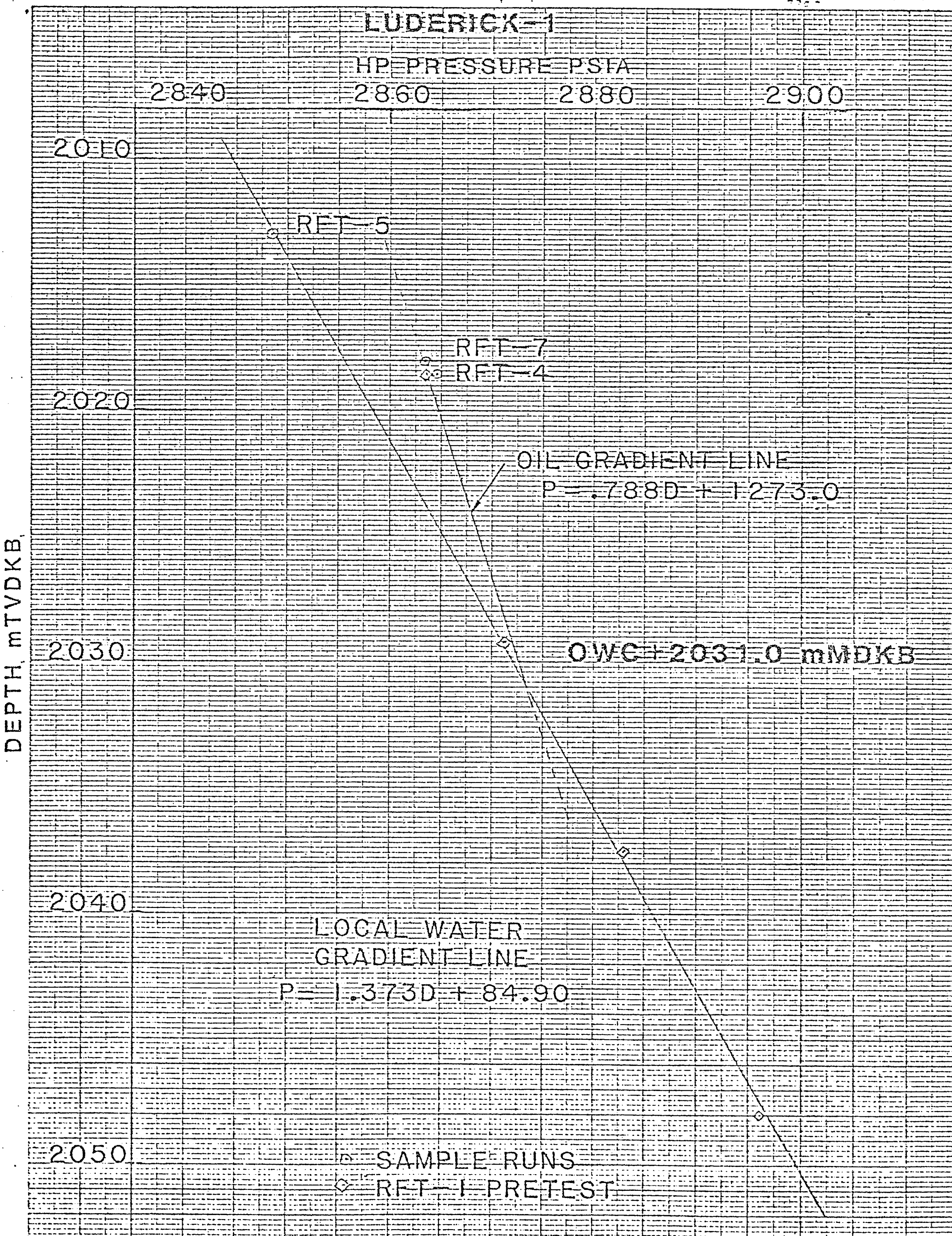

LUDERICK-1
HP PRESSURE PSIA
2840
2860
2880
2900
2010
2020
2030
2040
2050
DEPTH mTVDKB
RFT-5
RFT-7
RFT-4
OIL GRADIENT LINE
P=.788D+1273.0
OWC+2031.0 mMDKB
LOCAL WATER
GRADIENT LINE
P=1.373D+84.90
SAMPLE RUNS
RFT-1 PRETEST

FIGURE 3

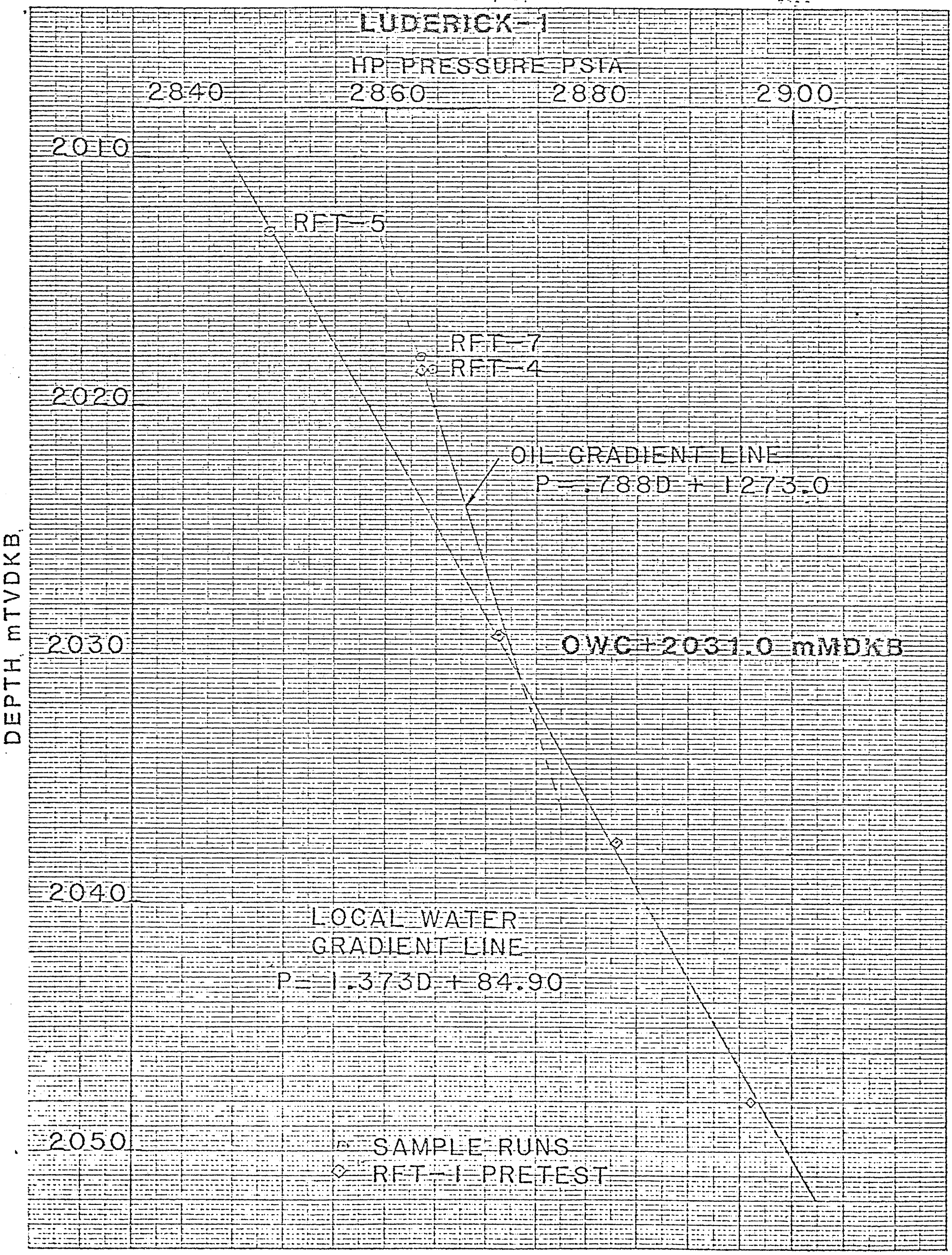
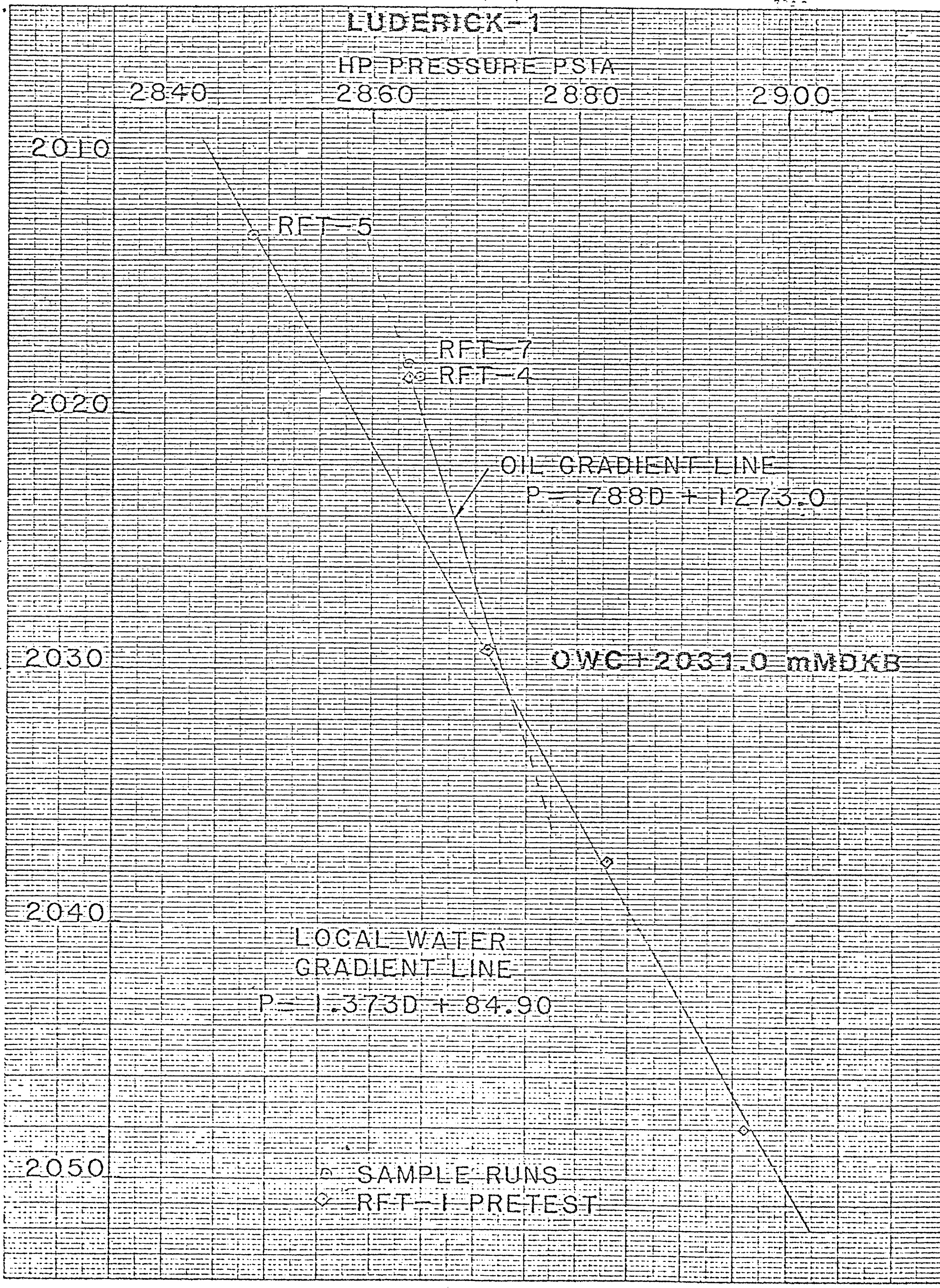

LUDERICK-1
HP PRESSURE PSIA
2840
2860
2880
2900
2010
2020
2030
2040
2050
DEPTH mTVDKB
RFT-5
RFT-7
RFT-4
OIL GRADIENT LINE
P = .788D + 1273.0
OWC + 2031.0 mMDKB
LOCAL WATER
GRADIENT LINE
P = 1.373D + 84.90
SAMPLE RUNS
RFT-1 PRETEST

FIGURE 3



LUDERICK-1
HP PRESSURE PSIA
2840
2860
2880
2900
2010
2020
2030
2040
2050
DEPTH mTVDKB
RFT-5
RFT-7
RFT-4
OIL GRADIENT LINE
P = .788D + 1273.0
OWC+2031.0 mMDKB
LOCAL WATER
GRADIENT LINE
P= 1.373D + 84.90
SAMPLE RUNS
RFT-1 PRETEST

FIGURE 3

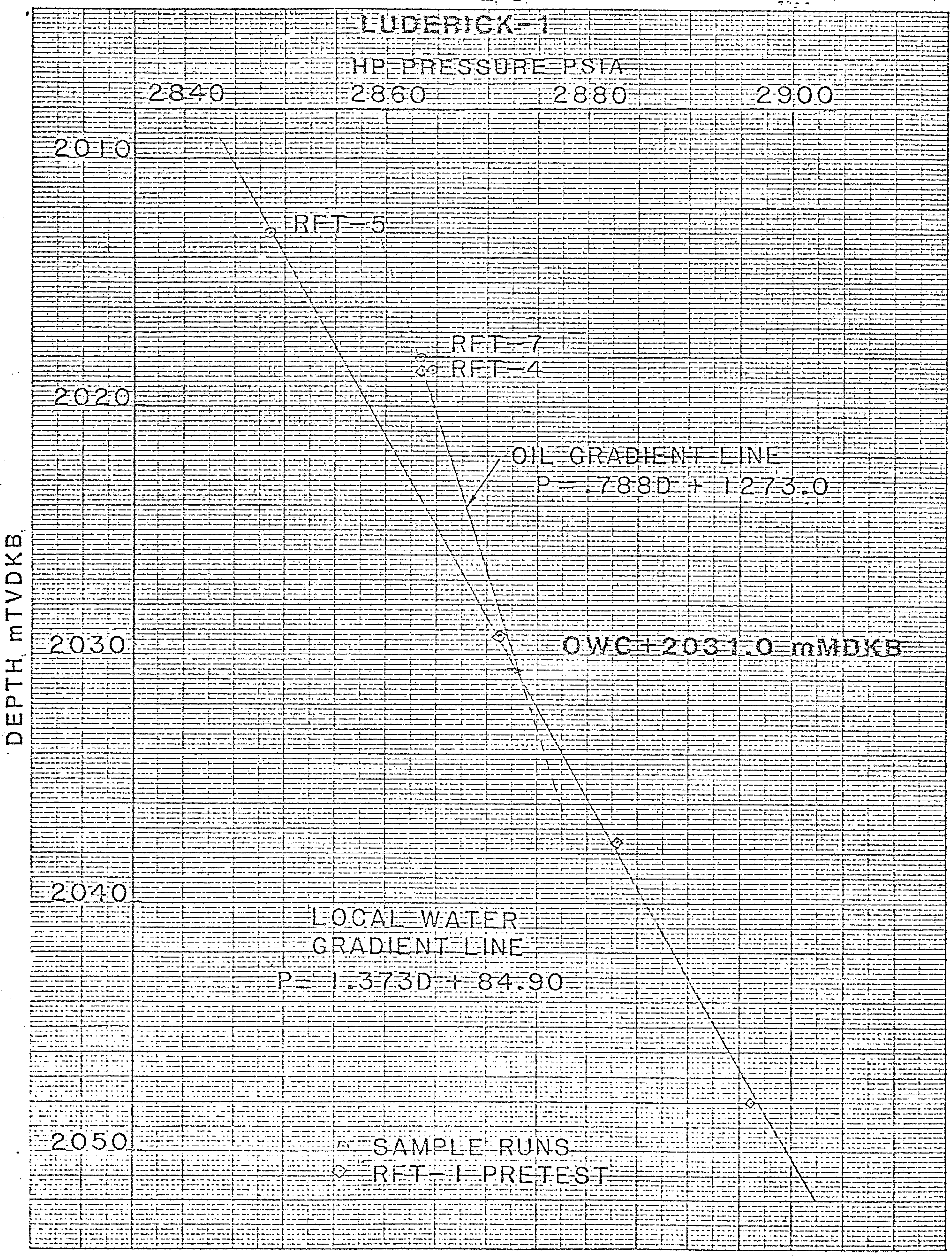

LUDERICK-1
HP PRESSURE PSIA
2840
2860
2880
2900
2010
2020
2030
2040
2050
DEPTH mTVDKB
RFT-5
RFT-7
RFT-4
OIL GRADIENT LINE
P = .788D + 1273.0
OWC 2031.0 mMDKB
LOCAL WATER
GRADIENT LINE
P= 1.373D + 84.90
SAMPLE RUNS
RFT-1 PRETEST

FIGURE 3

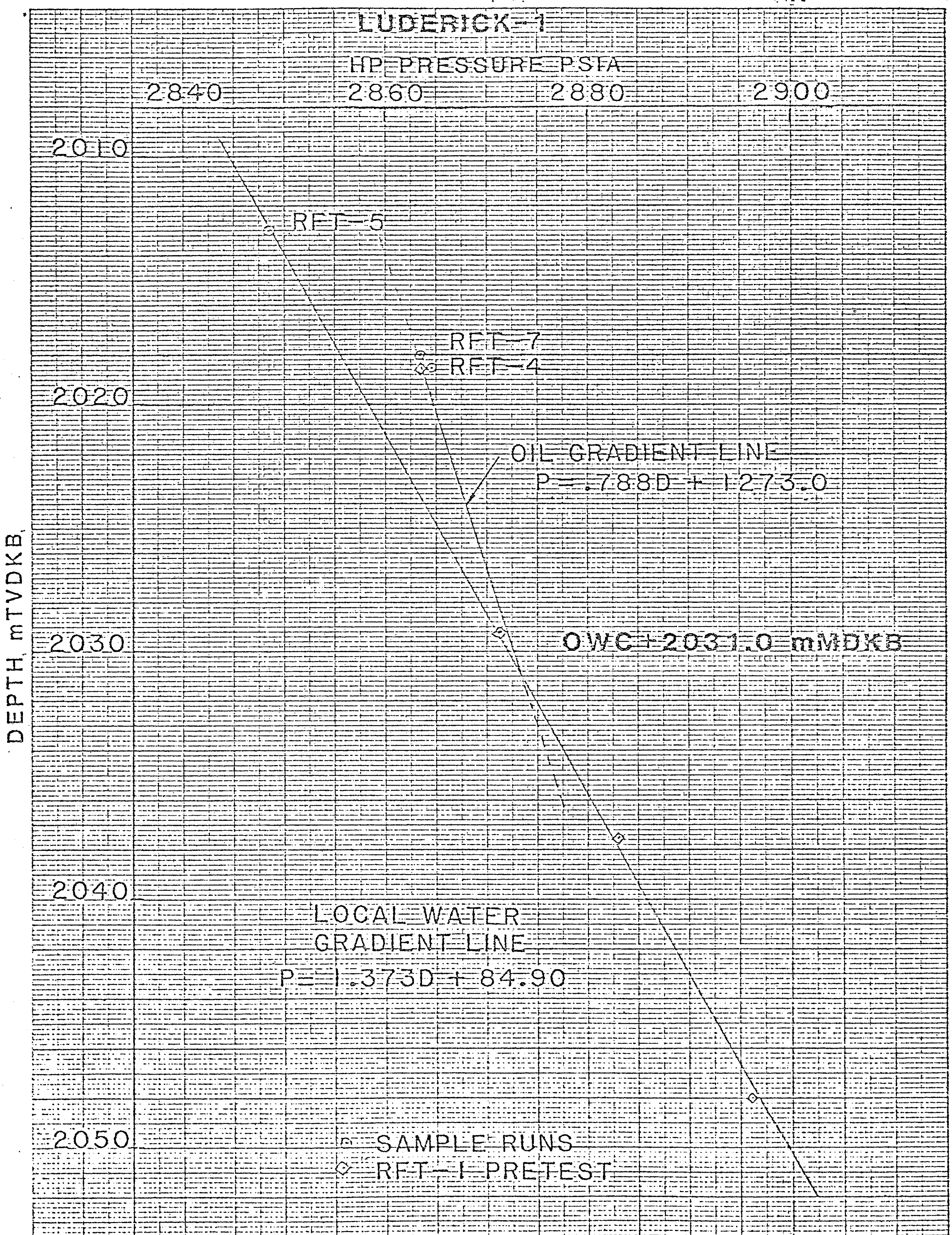
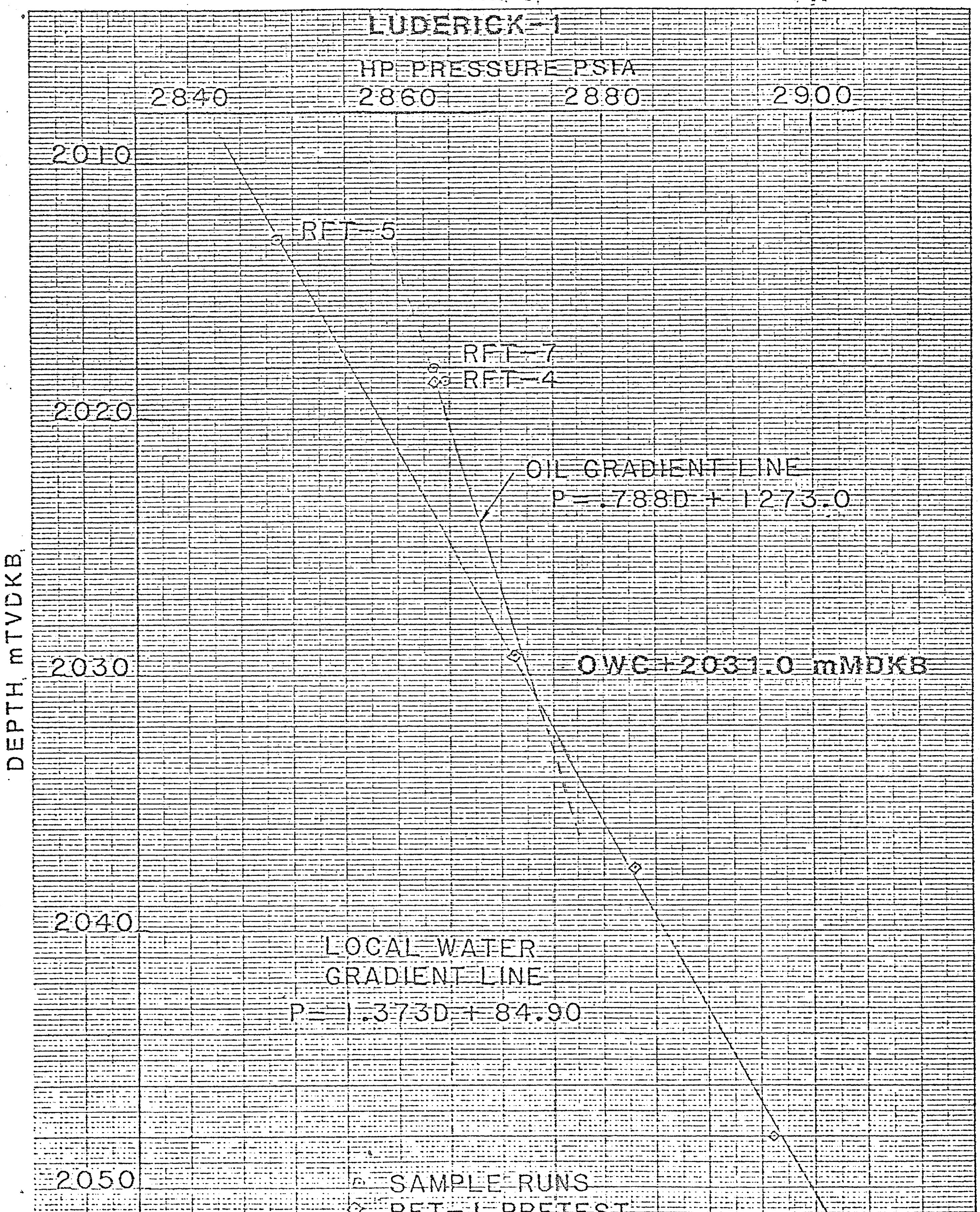

LUDERICK-1
HP PRESSURE PSIA
2840
2860
2880
2900
2010
2020
2030
2040
2050
DEPTH mTVDKB
RFT-5
RFT-7
RFT-4
OIL GRADIENT LINE
P = .788D + 1273.0
OWC + 2031.0 mMDKB
LOCAL WATER
GRADIENT LINE
P = 1.373D + 84.90
SAMPLE RUNS
RFT-1 PRETEST

FIGURE 3



LUDERICK-1
HP PRESSURE PSIA
2840
2860
2880
2900
2010
2020
2030
2040
2050
DEPTH mTVDKB
RFT-5
RFT-7
RFT-4
OIL GRADIENT LINE
P=.788D + 1273.0
OWC+2031.0 mMDKB
LOCAL WATER
GRADIENT LINE
P=1.373D + 84.90
SAMPLE RUNS
RFT-1 PRETEST

FIGURE 3

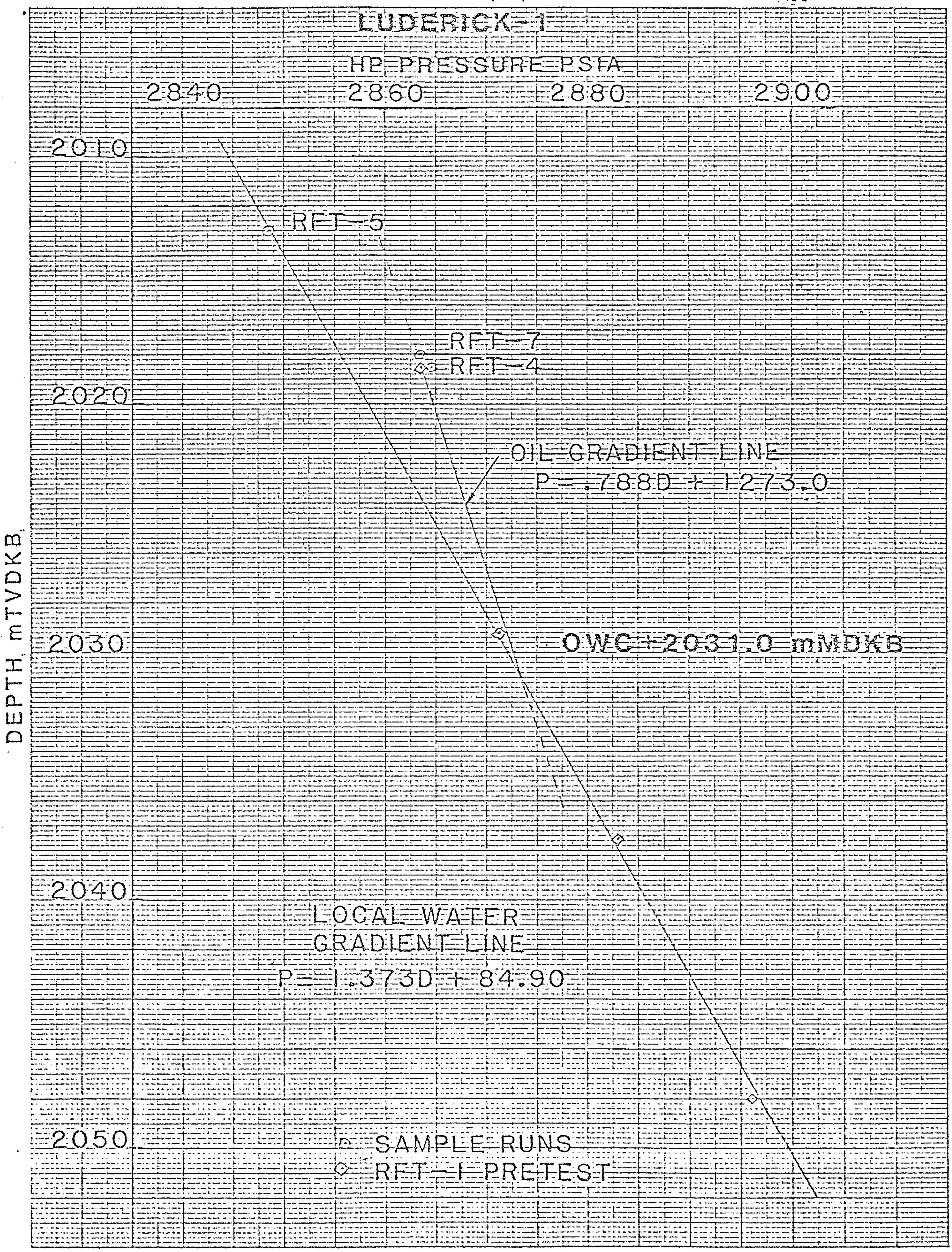

LUDERICK-1
HP PRESSURE PSIA
2840
2860
2880
2900
DEPTH mTVDKB
2010
2020
2030
2040
2050
RFT-5
RFT-7
RFT-4
OIL GRADIENT LINE
P = .788D + 1273.0
OWC + 2031.0 mMDKB
LOCAL WATER
GRADIENT LINE
P = 1.373D + 84.90
SAMPLE RUNS
RFT-1 PRETEST

FIGURE 3

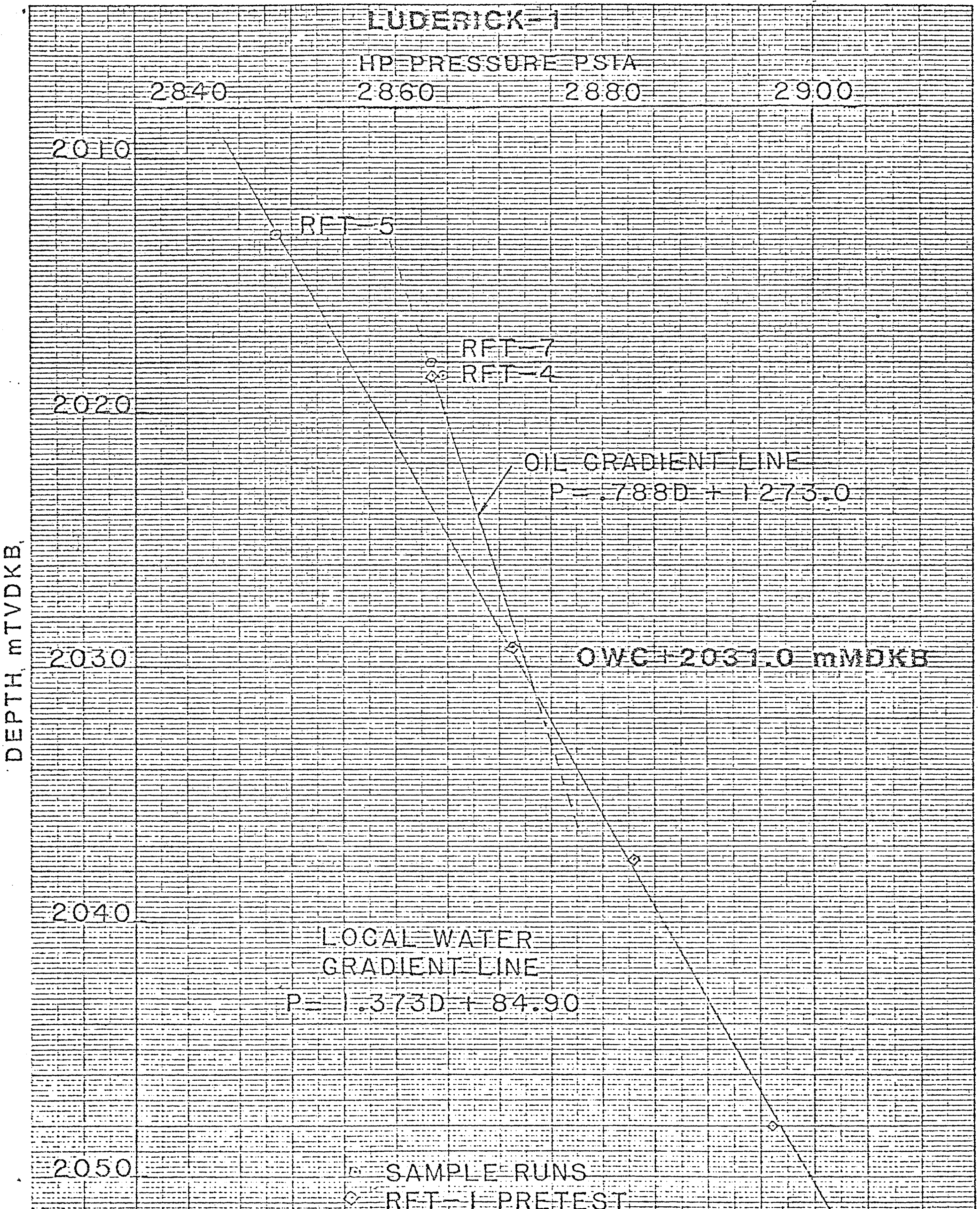


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FIGURE 3

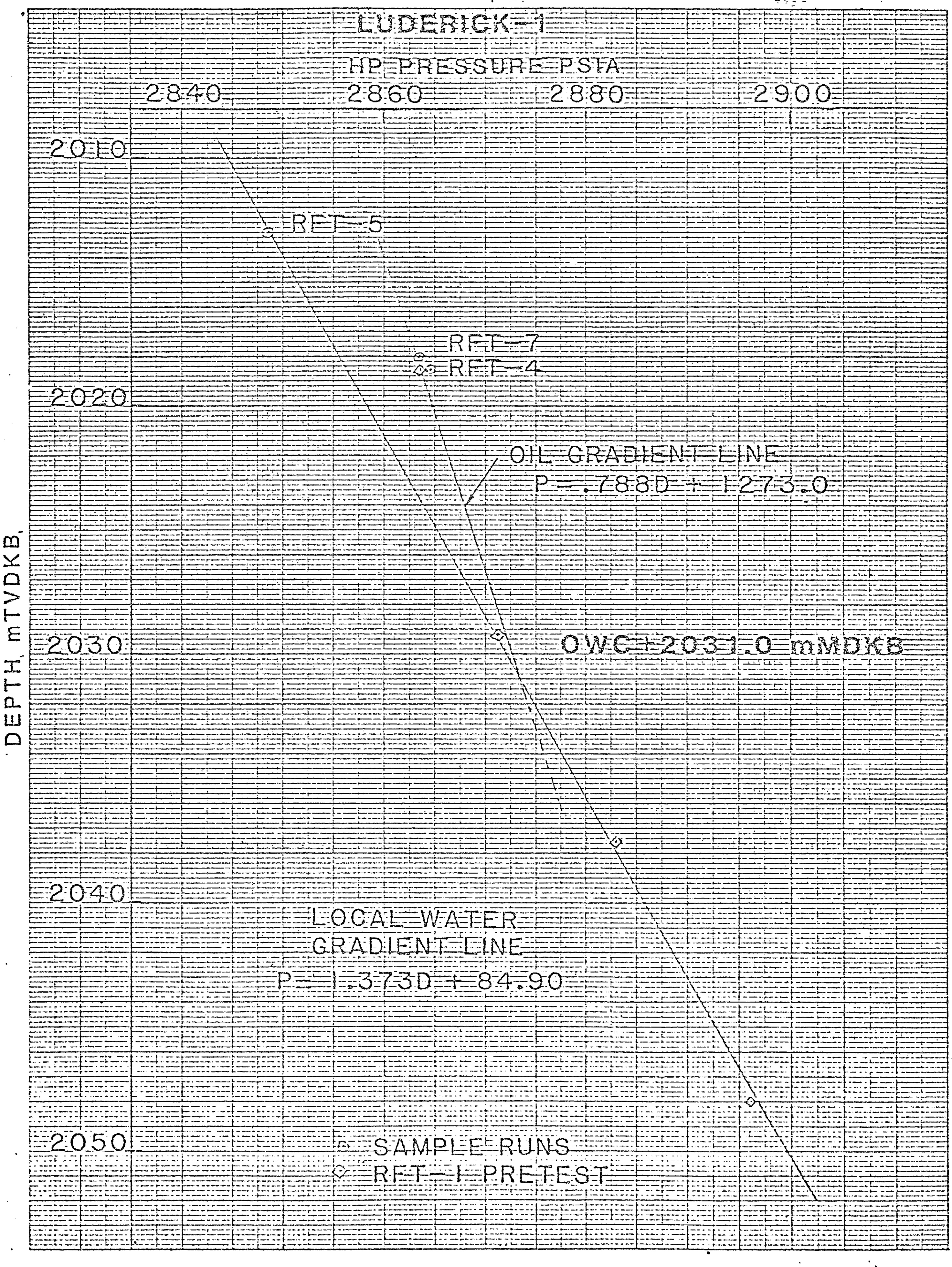
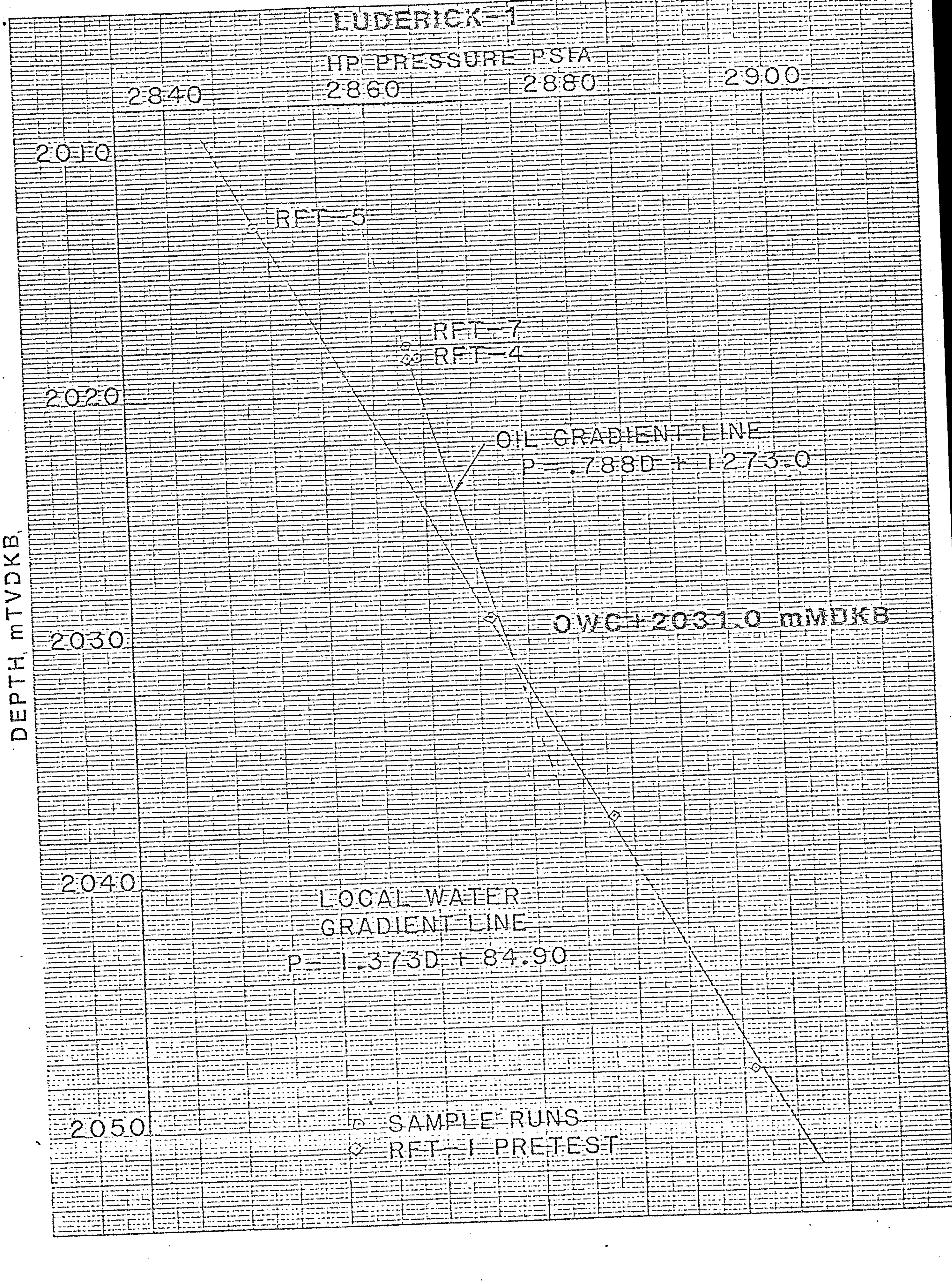

LUDERICK-1
HP PRESSURE PSIA
2840
2860
2880
2900
2010
2020
2030
2040
2050
DEPTH, mTVDKB
RFT-5
RFT-7
RFT-4
OIL GRADIENT LINE
P=.788D+1273.0
OWC+2031.0 mMDKB
LOCAL WATER
GRADIENT LINE
P=1.373D+84.90
SAMPLE RUNS
RFT-I PRETEST

FIGURE 3



46 1521
10 X 10 TO THE CENTIMETER 18 X 25 CM.
KEUFFEL & ESSER CO. MADE IN U.S.A.

APPENDIX - 5

APPENDIX - 5

GEOCHEMICAL REPORT

APPENDIX 5

Geochemical Report

GEOCHEMICAL REPORT
LUDERICK-1 WELL, GIPPSLAND BASIN
VICTORIA

by

J.K. EMMETT

Sample handling and analyses by:

- D.M. Hill)
- D.M. Ford) Esso Australia Ltd.
- J. Maccoll)
- Exxon Production Research Company
- Geochem. Laboratories

Esso Australia Ltd.
Geochemical Report

February, 1984

0732L

CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES:

INTRODUCTION

Samples of wet canned cuttings, sidewall cores and conventional cores collected during drilling of Luderick-1 were subjected to various geochemical analyses. Canned cuttings composited over 15-metre intervals were collected from 200m (KB) down to Total Depth (T.D.) at 3021m (KB). Light hydrocarbon (C_{1-4}) headspace gases were determined on alternate 15-metre intervals from 230m (KB) down to T.D. Succeeding alternate 15-metre intervals were analysed for C_{4-7} gasoline range hydrocarbons between 1490m (KB) and 3005m (KB). Samples were then handpicked 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 Professor A.C. Cook of Wollongong.

Two oil samples (RFT 6/41 at 1843m (KB) and RFT 7/42 from 2018 m (KB)) and one condensate sample (RFT 2/36 from 1838.5m (KB)) were analysed for API gravity, % Sulphur, C_{4-7} gasoline-range hydrocarbons, by "whole oil" gas chromatography, liquid chromatography and C_{15+} saturate fraction chromatography, and C_{15+} saturate and aromatic fraction carbon isotopes.

DISCUSSION OF RESULTS

The detailed headspace C_{1-4} cuttings gas data are presented in Table 1. This data is more conveniently represented in log form in Figures 1(a) and 1(b). Total cuttings gas values in the Gippsland and Lakes Entrance Formations are generally poor to moderately rich only, (Fig. 1(a)) and are indicative of a poor to fair potential to source dry gas. Cuttings gas values in the Latrobe Group on the other hand are moderately rich to rich with a few intervals between 2450m (KB) and 2750m (KB) in particular, registering above 30% wet gas components (Fig. 1(b)). Hence on the basis of cuttings gas, the Latrobe Group sediments are rated as having good hydrocarbon source potential for gas plus oil.

The detailed C_{4-7} gasoline range hydrocarbon data sheets are given in Appendix-1. Again, for convenience pertinent values and parameters have been plotted in Figure 2. Total gasoline values in the Lakes Entrance Formation analysed are poor, confirming little or no hydrocarbon source potential for this unit. There are several zones in the Latrobe Group sediments containing moderately rich to very rich total gasoline values with commonly greater than 50% C_{6-7} compounds, again confirming good source potential for oil and gas. Zones very rich in gasolines are generally coaly or stained by insitu oil and condensate, particularly directly below the top of coarse clastics, i.e. between 1803m (KB) and about 1845m (KB).

Total Organic Carbon values for the Latrobe Group sediments are generally moderately rich to rich (average T.O.C. = 1.33%), again indicating good hydrocarbon source potential. T.O.C. values in the overlying Lakes Entrance Formation are poor (average T.O.C. = 0.36%).

Vitrinite reflectance ($\bar{R}_v$max) data are presented in Table 3 and have been plotted against depth in Figure 3. The maturation gradient conforms fairly well to a straight line as shown in Figure 3, with the top of organic maturity (taken to be $\bar{R}_v$ max = 0.65%) occurring in the Latrobe Group at approximately 2750m (KB). Detailed vitrinite reflectance and exinite fluorescence data are given in Appendix 2 - Report by A.C. Cook.

Elemental analyses of selected kerogen concentrates isolated from conventional and sidewall cores from the Latrobe Group, are listed in Table 4. Approximate Hydrogen : Carbon (H/C), Oxygen : Carbon (O/C) and Nitrogen : Carbon (N/C) atomic ratios are given in Table 5. These ratios are labelled 'approximate' since the Oxygen % is calculated by difference and the naturally occurring organic sulphur % (which may be up to a few percent) was not determined. Figure 4 is a modified Van Krevelen Plot of atomic H/C ratio versus atomic O/C ratio. Comparison of Figure 4 with Figure 5, a similar plot showing the principal products of kerogen evolution, shows that the organic matter in the Latrobe Group sediments varies from modal Type III to intermediate Type II-III (i.e. predominantly woody-coaly-herbaceous kerogen), and this again supports a good gas plus oil source potential for this unit.

The results of Rock-Eval pyrolysis analyses of samples with T.O.C. values of 0.5% or more, are listed in Table 6. In Figure 6 Hydrogen Index has been plotted against T_{max} (^{o}C), and again fields delineating the basic kerogen types and their degree of maturation (indicated by equivalent vitrinite reflectance values) are also shown. As would be expected the marine Lakes Entrance Formation contains oil-prone modal Type I and Type II kerogen. (Fig. 6), but as indicated earlier T.O.C. values are poor in this unit and it is interpreted as having poor hydrocarbon source potential. Rock-Eval pyrolysis results for the Latrobe Group concur with the previous organic matter type classification from kerogen elemental analysis. Confirmation that the top of organic maturity occurs at about 2750m (KB) can also be derived from the location of the relevant data points in Figure 6, i.e. via T_{max} values

(Table 6) whilst elemental atomic ratio results displayed in Figure 5, similarly locate samples occurring below this designated top of maturity within the oil generation window.

The C_{15+} liquid chromatography results from selected canned cuttings are listed in Table 7. The total extract value for the Lakes Entrance Formation sample is poor and insufficient material was isolated for more detailed separation to be performed. A C_{15+} saturate chromatogram was obtained however (Fig. 7), and shows a mixture of marine and terrestrially derived organic matter which is presently immature. The marine component is indicated by the envelope of lower molecular weight naphthenes, and n-alkanes in the range n-C_{16} to n-C_{25} maximizing at n-C_{23}, whilst the non-marine/terrestrial organic matter is characterized by the typical strong odd-over-even carbon number preference exhibited in the higher molecular weight (n-C_{26} to n-C_{35}) n-alkanes in this instance maximizing at n-C_{29}. The mixture of terrestrial and marine organic matter in this sample indicates that while the Lakes Entrance Formation was deposited in a marine environment, there was occurring at the time of deposition, a significant influx of land derived organic material.

The remaining four samples are from the Latrobe Group, with three samples having moderately rich total extract values and one sample at 2330-2345m (KB) being very rich in total extract (3191 ppm). All of the Latrobe Group samples are composed of predominantly non-hydrocarbon material (i.e. asphaltenes and N.S.O. - compounds) which usually indicates present day immaturity. The corresponding C_{15+} saturate chromatograms are shown in Figures 8 - 11. Figure 8 (1865 - 1880 m(KB)) is similar to Figure 7 again showing a bi-modal hydrocarbon distribution, although the non-marine organic input predominates. The remaining C_{15+} saturate chromatograms (Figures 9 - 11) show hydrocarbon distributions typical of non-marine organic material grading from immature to early mature (Figure 11), indicated mainly by the increases in the n - C_{17} : pristane (peak 'a') and n-C_{18} : phytane (peak 'b') ratios from Figure 9 through Figure 11.

In Table 8, API gravity, liquid chromatography and carbon isotope results are listed for one condensate sample (RFT 2/36, 1838.5m (KB)) and two oil samples (RFT 6/41, 1843m(KB) and RFT 7/42, 2018m(KB)). C_{4-7} gasoline-range hydrocarbon data for the same condensate and oil samples are given in Tables 9-11 respectively. "Whole oil" chromatograms with sulphur compound trace for these samples are shown in figures 12 - 14, and C_{15+} saturate chromatograms for the oil samples are displayed in figures 15 and 16 respectively.

The condensate at 1838.5 m(KB) and the oil at 1843 m(KB) are from the Top of Latrobe Group "Coarse Clastics" reservoir section, and the deeper oil at 2018 m(KB) is from an intra-Latrobe Group reservoir. Liquid chromatography data shows that the oils are chemically fairly similar although they vary markedly in API gravity. The intra-Latrobe Group sample is a lighter oil (59.9^{0} API) with a higher proportion of gasolines (compare Tables 10 and 11), which indicates that this oil is probably more mature. The "whole oil" chromatograms show that both oils have similar hydrocarbon distributions, and are mature paraffinic-based crudes. The C_{15+} saturate chromatograms are also similar in appearance, but the deeper Intra-Latrobe sample appears slightly more mature as indicated by the occurrence of the n-alkane maxima at n-C_{15} compared to n-C_{17} in the Top of Latrobe Group sample at 1843 m(KB). This variance in the saturate n-alkane distributions could however, be due to more severe evaporation during sample work-up of the shallower sample, but as stated previously there are other indications that the Intra-Latrobe Group oil is more mature than that at 1843m (KB).

CONCLUSIONS

1. The top of organic maturity for significant hydrocarbon generation in Luderick-1 occurs at approximately 2750 m(KB).

2. The Latrobe Group sediments have good hydrocarbon source potential for both oil and gas.

3. Oil and condensate located in the Top of Latrobe Group reservoir and oil encountered in an Intra-Latrobe Group reservoir are mature, medium to light API, paraffinic-based crudes belonging to the same oil family.

0732L

TABLE 1

C1-C4 HYDROCARBON ANALYSES

REPORT A - HEADSPACE GAS

BASIN - GIPPSLAND
WELL - LUDERICK 1

SAMPLE NO.	DEPTH	GAS CONCENTRATION (VOLUME GAS PER MILLION VOLUMES CUTTINGS) METHANE C1	ETHANE C2	PROPANE C3	IBUTANE IC4	NBUTANE C4	WET C2-C4	TOTAL C1-C4	WET/TOTAL PERCENT	GAS COMPOSITION (PERCENT) ---- TOTAL GAS ---- M	E	P	IB	NB	--- WET GAS --- E	P	IB	NB
72697 B	260.00	293	2	2	0	1	5	298	1.68	98.	1.	1.	0.	0.	40.	40.	0.	20.
72697 D	320.00	168	3	1	0	1	5	173	2.89	97.	2.	1.	0.	1.	60.	20.	0.	20.
72697 F	380.00	548	7	2	2	0	11	559	1.97	98.	1.	0.	0.	0.	64.	18.	18.	0.
72697 H	440.00	598	5	1	0	0	6	604	.99	99.	1.	0.	0.	0.	83.	17.	0.	0.
72697 J	500.00	1208	21	5	2	1	29	1237	2.34	98.	2.	0.	0.	0.	72.	17.	7.	3.
72697 L	560.00	872	16	6	1	0	23	895	2.57	97.	2.	1.	0.	0.	70.	26.	4.	0.
72697 N	620.00	669	22	8	3	2	35	704	4.97	95.	3.	1.	0.	0.	63.	23.	9.	6.
72697 P	680.00	865	42	9	3	1	55	920	5.98	94.	5.	1.	0.	0.	76.	16.	5.	2.
72697 R	740.00	1127	64	11	5	2	82	1209	6.78	93.	5.	1.	0.	0.	78.	13.	6.	2.
72697 T	800.00	2377	98	31	10	4	143	2520	5.67	94.	4.	1.	0.	0.	69.	22.	7.	3.
72697 V	830.00	4404	105	36	11	5	157	4561	3.44	97.	2.	1.	0.	0.	67.	23.	7.	3.
72697 X	860.00	6305	159	40	13	7	219	6524	3.36	97.	2.	1.	0.	0.	73.	18.	6.	3.
72697 Z	890.00	7893	263	82	33	15	393	8286	4.74	95.	3.	1.	0.	0.	67.	21.	8.	4.
72698 B	920.00	5484	188	44	14	7	253	5737	4.41	96.	3.	1.	0.	0.	74.	17.	6.	3.
72698 D	950.00	4271	148	45	14	6	213	4484	4.75	95.	3.	1.	0.	0.	69.	21.	7.	3.
72698 F	980.00	2991	104	34	12	5	155	3146	4.93	95.	3.	1.	0.	0.	67.	22.	8.	3.
72698 H	1010.00	2425	81	44	18	8	151	2576	5.86	94.	3.	2.	1.	0.	54.	29.	12.	5.
72698 J	1040.00	2685	73	41	18	7	139	2824	4.92	95.	3.	1.	1.	0.	53.	29.	13.	5.
72698 L	1070.00	2411	65	41	19	8	133	2544	5.23	95.	3.	2.	1.	0.	49.	31.	14.	6.
72698 N	1100.00	2583	63	52	25	11	151	2734	5.52	94.	2.	2.	1.	0.	42.	34.	17.	7.
72698 P	1130.00	3369	87	77	34	15	213	3582	5.95	94.	2.	2.	1.	0.	41.	36.	16.	7.
72698 R	1160.00	3565	84	69	31	13	197	3762	5.24	95.	2.	2.	1.	0.	43.	35.	16.	7.
72698 T	1190.00	4609	111	97	42	18	268	4877	5.50	95.	2.	2.	1.	0.	41.	36.	16.	7.
72698 V	1220.00	3444	88	68	33	14	203	3647	5.57	94.	2.	2.	1.	0.	43.	33.	16.	7.
72698 X	1250.00	2512	68	65	24	10	167	2679	6.23	94.	3.	2.	1.	0.	41.	39.	14.	6.
72698 Z	1280.00	2781	69	80	29	15	193	2974	6.49	94.	2.	3.	1.	1.	36.	41.	15.	8.
72699 B	1310.00	3262	71	84	28	16	199	3461	5.75	94.	2.	2.	1.	0.	36.	42.	14.	8.
72699 D	1340.00	2912	57	67	21	11	156	3068	5.08	95.	2.	2.	1.	0.	37.	43.	13.	7.
72699 F	1370.00	3351	66	81	26	15	188	3539	5.31	95.	2.	2.	1.	0.	35.	43.	14.	8.
72699 H	1400.00	3535	64	74	22	12	172	3707	4.64	95.	2.	2.	1.	0.	37.	43.	13.	7.
72699 J	1430.00	3174	65	75	23	12	175	3349	5.23	95.	2.	2.	1.	0.	37.	43.	13.	7.
72699 L	1460.00	3061	57	68	22	11	158	3219	4.91	95.	2.	2.	1.	0.	36.	43.	14.	7.
72699 N	1490.00	2891	50	62	21	12	145	3036	4.78	95.	2.	2.	1.	0.	34.	43.	14.	8.
72699 P	1520.00	3229	63	79	27	14	183	3412	5.36	95.	2.	2.	1.	0.	34.	43.	15.	8.
72699 R	1550.00	3221	67	78	27	12	184	3405	5.40	95.	2.	2.	1.	0.	36.	42.	15.	7.
72699 T	1580.00	2488	51	58	22	10	141	2629	5.36	95.	2.	2.	1.	0.	36.	41.	16.	7.
72699 V	1595.00	1512	37	41	17	8	103	1615	6.38	94.	2.	3.	1.	0.	36.	40.	17.	8.
72699 W	1625.00	1840	44	44	20	8	116	1956	5.93	94.	2.	2.	1.	0.	38.	38.	17.	7.
72699 Z	1670.00	2249	70	61	25	11	167	2416	6.91	93.	3.	3.	1.	0.	42.	37.	15.	7.
72700 B	1700.00	3285	143	91	35	14	283	3568	7.93	92.	4.	3.	1.	0.	51.	32.	12.	5.
72700 D	1730.00	1493	96	54	17	7	174	1667	10.44	90.	6.	3.	1.	0.	55.	31.	10.	4.
72700 F	1760.00	1978	173	146	29	21	369	2347	15.72	84.	7.	6.	1.	1.	47.	40.	8.	6.
72700 H	1790.00	2580	683	705	103	147	1638	4218	38.83	61.	16.	17.	2.	3.	42.	43.	6.	9.
72700 J	1820.00	5170	1261	1202	250	396	3109	8279	37.55	62.	15.	15.	3.	5.	41.	39.	8.	13.
72700 L	1865.00	9097	1136	898	122	177	2333	11430	20.41	80.	10.	8.	1.	2.	49.	38.	5.	8.
72700 N	1895.00	10325	1306	403	43	43	1795	12120	14.81	85.	11.	3.	0.	0.	73.	22.	2.	2.
72700 P	1925.00	30351	3310	553	42	23	3928	34279	11.46	89.	10.	2.	0.	0.	84.	14.	1.	1.

TABLE 1 (Contd)

C1-C4 HYDROCARBON ANALYSES

REPORT A - HEADSPACE GAS

BASIN - GIPPSLAND
WELL - LUDERICK 1

GAS CONCENTRATION (VOLUME GAS PER MILLION VOLUMES CUTTINGS) | GAS COMPOSITION (PERCENT)

SAMPLE NO.	DEPTH	METHANE C1	ETHANE C2	PROPANE C3	IBUTANE IC4	NBUTANE C4	WET C2-C4	TOTAL C1-C4	WET/TOTAL PERCENT	TOTAL GAS M	TOTAL GAS E	TOTAL GAS P	TOTAL GAS IB	TOTAL GAS NB	WET GAS E	WET GAS P	WET GAS IB	WET GAS NB
72700 R	1955.00	13281	1867	609	89	74	2639	15920	16.58	83.	12.	4.	1.	0.	71.	23.	3.	3.
72700 T	1985.00	24062	2881	878	92	83	3934	27996	14.05	86.	10.	3.	0.	0.	73.	22.	2.	2.
72700 V	2015.00	102511	12554	3131	212	347	16244	118755	13.68	86.	11.	3.	0.	0.	77.	19.	1.	2.
72700 X	2045.00	3505	932	665	132	164	1893	5398	35.07	65.	17.	12.	2.	3.	49.	35.	7.	9.
72700 Z	2075.00	19480	2309	615	66	52	3042	22522	13.51	86.	10.	3.	0.	0.	76.	20.	2.	2.
72701 B	2105.00	3533	769	276	38	31	1114	4647	23.97	76.	17.	6.	1.	1.	69.	25.	3.	3.
72701 D	2135.00	36116	4043	1243	120	107	5513	41629	13.24	87.	10.	3.	0.	0.	73.	23.	2.	2.
72701 F	2165.00	29313	3572	1316	185	178	5251	34564	15.19	85.	10.	4.	1.	1.	68.	25.	4.	3.
72701 I	2210.00	21967	1953	643	87	73	2756	24723	11.15	89.	8.	3.	0.	0.	71.	23.	3.	3.
72701 K	2240.00	5881	1211	614	95	91	2011	7892	25.48	75.	15.	8.	1.	1.	60.	31.	5.	5.
72701 M	2270.00	2079	429	252	47	42	770	2849	27.03	73.	15.	9.	2.	1.	56.	33.	6.	5.
72701 O	2300.00	17729	1592	588	93	70	2343	20072	11.67	88.	8.	3.	0.	0.	68.	25.	4.	3.
72701 Q	2330.00	8771	1529	783	151	126	2589	11360	22.79	77.	13.	7.	1.	1.	59.	30.	6.	5.
72701 S	2360.00	32857	3234	1231	200	165	4830	37687	12.82	87.	9.	3.	1.	0.	67.	25.	4.	3.
72701 U	2390.00	2893	400	186	42	29	657	3550	18.51	81.	11.	5.	1.	1.	61.	28.	6.	4.
72701 W	2420.00	1071	204	115	23	21	363	1434	25.31	75.	14.	8.	2.	1.	56.	32.	6.	6.
72701 Y	2450.00	1245	314	256	65	60	695	1940	35.82	64.	16.	13.	3.	3.	45.	37.	9.	9.
72702 A	2480.00	2094	1220	1625	351	500	3696	5790	63.83	36.	21.	28.	6.	9.	33.	44.	9.	14.
72702 C	2510.00	3790	936	631	123	119	1809	5599	32.31	68.	17.	11.	2.	2.	52.	35.	7.	7.
72702 E	2540.00	1631	444	342	69	70	925	2556	36.19	64.	17.	13.	3.	3.	48.	37.	7.	8.
72702 G	2570.00	9596	1405	790	142	127	2464	12060	20.43	80.	12.	7.	1.	1.	57.	32.	6.	5.
72702 I	2600.00	2442	515	443	87	103	1148	3590	31.98	68.	14.	12.	2.	3.	45.	39.	8.	9.
72702 K	2630.00	4600	686	409	57	61	1213	5813	20.87	79.	12.	7.	1.	1.	57.	34.	5.	5.
72702 M	2660.00	2384	431	342	57	59	889	3273	27.16	73.	13.	10.	2.	2.	48.	38.	6.	7.
72702 O	2690.00	627	223	220	30	34	507	1134	44.71	55.	20.	19.	3.	3.	44.	43.	6.	7.
72702 Q	2720.00	2191	495	633	108	124	1360	3551	38.30	62.	14.	18.	3.	3.	36.	47.	8.	9.
72702 S	2750.00	1507	219	215	38	36	508	2015	25.21	75.	11.	11.	2.	2.	43.	42.	7.	7.
72702 U	2780.00	72409	4907	2361	404	277	7949	80358	9.89	90.	6.	3.	1.	0.	62.	30.	5.	3.
72702 W	2810.00	17984	2226	1752	267	231	4476	22460	19.93	80.	10.	8.	1.	1.	50.	39.	6.	5.
72702 Y	2840.00	13548	1397	1158	204	160	2919	16467	17.73	82.	8.	7.	1.	1.	48.	40.	7.	5.
72703 A	2870.00	54354	6069	5128	861	468	12526	66880	18.73	81.	9.	8.	1.	1.	48.	41.	7.	4.
72703 C	2900.00	16572	1281	775	130	79	2265	18837	12.02	88.	7.	4.	1.	0.	57.	34.	6.	3.
72703 E	2930.00	52583	3406	1514	278	156	5354	57937	9.24	91.	6.	3.	0.	0.	64.	28.	5.	3.
72703 G	2960.00	88169	6125	2517	383	281	9306	97475	9.55	90.	6.	3.	0.	0.	66.	27.	4.	3.
72703 I	2990.00	17875	1539	874	109	112	2634	20509	12.84	87.	8.	4.	1.	1.	58.	33.	4.	4.
72703 K	3020.00	6404	912	672	80	112	1776	8180	21.71	78.	11.	8.	1.	1.	51.	38.	5.	6.

TABLE 2

TOTAL ORGANIC CARBON REPORT

BASIN - GIPPSLAND
WELL - LUDERICK 1

SAMPLE NO.	DEPTH	AGE	FORMATION	AN	TOC%	AN	TOC%	AN	TOC%	DESCRIPTION
72699 O	1505.00	EARLY MIOCENE	LAKES ENTRANCE	2	.38					GREENISH GREY SHALE;CALC
72699 Q	1535.00	EARLY MIOCENE	LAKES ENTRANCE	2	.34					GRN.GY.-MED.GRN.GY.SHALE
72699 S	1565.00	EARLY MIOCENE	LAKES ENTRANCE	2	.34					GRN.GY.-MED.GRN.GY.SHALE
72699 U	1595.00	EARLY MIOCENE	LAKES ENTRANCE	2	.36					GRN.GY.-MED.GRN.GY.SHALE
72699 W	1625.00	EARLY MIOCENE	LAKES ENTRANCE	2	.42					GREENISH GREY SHALE;CALC
72699 X	1640.00	EARLY MIOCENE	LAKES ENTRANCE	2	.42					GRN-GY CALCAREOUS SHALE
72699 Y	1655.00	EARLY MIOCENE	LAKES ENTRANCE	2	.36					MED.GRN.GY.SHALE;CALC.
72700 A	1685.00	EARLY MIOCENE	LAKES ENTRANCE	2	.33					GRN.GY.-MED.GRN.GY.SHALE
72700 C	1715.00	EARLY MIOCENE	LAKES ENTRANCE	2	.33					GRN.GY.-MED.GRN.GY.SHALE
72672 A	1720.00	EARLY MIOCENE	LAKES ENTRANCE	1	.25					MED GRY CLAYSTONE.V CALC
72671 Z	1745.00	EARLY MIOCENE	LAKES ENTRANCE	1	.39					MED-DK GRY CLYST.V CALC.
72700 E	1745.00	EARLY MIOCENE	LAKES ENTRANCE	2	.39					MED.LT.GY.SHALE;CALC.
72700 G	1775.00	EARLY OLIGOCENE	LAKES ENTRANCE	2	.42					MED.GREY CLAYSTONE;CALC

===> DEPTH : 1190.00 TO 1776.00 METRES. <=== I ===> AVERAGE TOC : .36 % EXCLUDING VALUES GREATER THAN 10.00 % <===

SAMPLE NO.	DEPTH	AGE	FORMATION	AN	TOC%	AN	TOC%	AN	TOC%	DESCRIPTION
72671 W	1777.00	EARLY OLIGOC.-EOCENE	LATROBE GROUP-GURNARD FM.	1	.51					MED-DK GRY CLYST.V CALC.
72671 S	1791.00	EARLY OLIGOC.-EOCENE	LATROBE GROUP-GURNARD FM.	1	1.29					DK BRN-GRY SLTST.V CALC.
72671 N	1800.50	EARLY OLIGOC.-EOCENE	LATROBE GROUP-GURNARD FM.	1	.89					BRN-GRY SLST.GLAU.V CALC

===> DEPTH : 1776.00 TO 1803.00 METRES. <=== I ===> AVERAGE TOC : .90 % EXCLUDING VALUES GREATER THAN 10.00 % <===

SAMPLE NO.	DEPTH	AGE	FORMATION	AN	TOC%	AN	TOC%	AN	TOC%	DESCRIPTION
72700 I	1805.00	EOCENE	LATROBE GROUP	2	.44					LT.OL.GY.-GRN.GY.SH;CALC
72671 F	1808.00	EOCENE	LATROBE GROUP	1	1.16					BRN-GRY SLTST.GLAU.CALC.
72671 J	1810.40	EOCENE	LATROBE GROUP	1	.10					OL GY SLST.COALY.SL CALC
72671 C	1818.00	EOCENE	LATROBE GROUP	1	.75					MD-DK GY SLTST.GLAU.PYR.
72671 H	1820.00	EOCENE	LATROBE GROUP	1	1.13					OL GRY/LT GRY SLTST. NC.
72671 A	1823.50	EOCENE	LATROBE GROUP	1	1.43					VF SST.OIL STAINED.COALY
72670 X	1831.00	EOCENE	LATROBE GROUP	1	1.13					OL GRY SLST.GLAU.MICA.NC
72700 K	1835.00	EOCENE	LATROBE GROUP	2	.42					LT.OL.GY.CLAYSTONE;CALC.
72673 G	1856.55	EOCENE	LATROBE GROUP	1	4.32					OLIVE GREY SHALE.N CALC.
72673 H	1860.40	EOCENE	LATROBE GROUP	1	5.32					DK GRY SH.TH CARB LAM.NC
72700 M	1880.00	EOCENE	LATROBE GROUP	2	.44					LT.OL.GY.SH.&CLYST;CALC.
72700 O	1910.00	EOCENE	LATROBE GROUP	2	.48					LT.OL.GY.SH.&CLYST;CALC.
72670 I	1914.40	EOCENE	LATROBE GROUP	1	4.65					DK BRN-GRY SILTSTONE.NC.
72700 Q	1940.00	EOCENE	LATROBE GROUP	2	50.11					COAL
72670 B	1950.90	EOCENE	LATROBE GROUP	1	2.30					OL GRY SLTST.COALY. N.C.
72700 S	1970.00	EOCENE	LATROBE GROUP	2	.53					LT.OL.GREY SHALE;CALC.
72669 X	1984.00	EOCENE	LATROBE GROUP	1	2.41					MED-DK GRY CLAYSTONE.NC.
72700 U	2000.00	EOCENE	LATROBE GROUP	2	.54					LT.OL.GY.-LT.GY.SH;CALC.
72700 W	2030.00	EOCENE	LATROBE GROUP	2	.45					LT.OL.GY.-LT.GY.SH;CALC.
72700 Y	2060.00	EOCENE	LATROBE GROUP	2	63.98					COAL;VITRINITE
72701 A	2090.00	EOCENE	LATROBE GROUP	2	.56					GRN.GREY CLAYSTONE;CALC.

TABLE 2 (Cont'd) TOTAL ORGANIC CARBON REPORT

BASIN - GIPPSLAND
WELL - LUDERICK 1

SAMPLE NO.	DEPTH	AGE	FORMATION	AN	TOC%	AN	TOC%	AN	TOC%	DESCRIPTION
72701 C	2120.00	EOCENE	LATROBE GROUP	2	.53					LT.OL.GY.CLAYSTONE;V.CAL
72701 E	2150.00	EOCENE	LATROBE GROUP	2	.52					LT.OL.GY.-GRN.GY.SH;CALC
72701 G	2180.00	EOCENE	LATROBE GROUP	2	.47					LT.OL.GY.-GRN.GY.SH;CALC
72701 H	2195.00	EOCENE	LATROBE GROUP	2	64.18					COAL
72701 J	2225.00	EOCENE	LATROBE GROUP	2	.53					GRN.GREY SHALE;CALC.
72669 T	2227.10	EOCENE	LATROBE GROUP	1	.34					MED-DK GRY CLAYSTONE.NC.
72701 N	2285.00	PALEOCENE	LATROBE GROUP	2	.49					V.LT.OL.GY.-GRN.GY.CLYST
72701 P	2315.00	PALEOCENE	LATROBE GROUP	2	.54					L.OL.GY-M.L.GY.SH.&CLYST
72669 P	2339.00	PALEOCENE	LATROBE GROUP	1	4.41					DK GRY CARB SHALE.N CALC
72701 R	2345.00	PALEOCENE	LATROBE GROUP	2	.77					L.OL.GY-M.L.GY.SH.&CLYST
72669 O	2359.00	PALEOCENE	LATROBE GROUP	1	7.42					DK BRN-GY CARB SH.COALY.
72701 T	2375.00	PALEOCENE	LATROBE GROUP	2	42.24					COAL;MUCH VITRINITE
72701 V	2405.00	PALEOCENE	LATROBE GROUP	2	11.59					MED.DK.GY.SHALE;V.COALY
72669 L	2427.50	PALEOCENE	LATROBE GROUP	1	1.62					OL GRY SILTSTONE.N CALC.
72701 X	2435.00	PALEOCENE	LATROBE GROUP	2	.56					LT.GY.&V.LT.BRN.GY.SST.
72701 Z	2465.00	PALEOCENE	LATROBE GROUP	2	.84					LT.GY.&V.LT.BRN.GY.SST.
72669 A	2480.00	PALEOCENE	LATROBE GROUP	1	.90					MED-DK GRY SILTSTONE.NC.
72702 B	2495.00	PALEOCENE	LATROBE GROUP	2	.45					LT.-V.LT.OL.GY.CLYST.&SH
72702 D	2525.00	PALEOCENE	LATROBE GROUP	2	.77					DK.GY.&LT.OL.GY.CLYST.
72668 X	2553.50	PALEOCENE	LATROBE GROUP	1	5.32					DK GRY SLST.MICA.N CALC.
72702 F	2555.00	PALEOCENE	LATROBE GROUP	2	.59					V.LT.OL.GY.&M.GY.CLYST.
72668 W	2580.00	PALEOCENE	LATROBE GROUP	1	.36					OL GRY SILTSTONE.N CALC.
72702 H	2585.00	PALEOCENE	LATROBE GROUP	2	.37					LIGHT GREY SANDSTONE
72668 V	2611.00	PALEOCENE	LATROBE GROUP	1	1.66					OL GRY SILTSTONE.N CALC.
72702 J	2615.00	PALEOCENE	LATROBE GROUP	2	.93					GRN.GY.-V.LT.OL.GY.SHALE
72702 L	2645.00	PALEOCENE	LATROBE GROUP	2	.51					GRN.GY.-L.OL.GY.SH&CLYST
72668 U	2650.00	PALEOCENE	LATROBE GROUP	1	.38					MED-DK GRY SLTY SH. N.C.
72702 N	2675.00	PALEOCENE	LATROBE GROUP	2	.47					GRN.GY.-L.OL.GY.SH&CLYST
72668 T	2681.00	PALEOCENE	LATROBE GROUP	1	.56					MED-DK GRY SLTY SH. N.C.
72668 S	2710.00	PALEOCENE	LATROBE GROUP	1	.65					MED-DK GRY SLTY SH. N.C.
72702 R	2735.00	PALEOCENE	LATROBE GROUP	2	.67					LT.GY.-V.LT.GY.SANDSTONE
72702 T	2765.00	PALEOCENE	LATROBE GROUP	2	62.00					COAL,VITRINITE
72702 X	2825.00	PALEOCENE	LATROBE GROUP	2	.44					LT.GY SANDSTONE&SILTST.
72702 Z	2855.00	PALEOCENE	LATROBE GROUP	2	.44					LT.-V.LT.GY.SST;CARB.LAM
72668 G	2881.30	LATE CRETACEOUS	LATROBE GROUP	1	5.15					DK GRY CARB SHALE.N CALC
72703 B	2885.00	LATE CRETACEOUS	LATROBE GROUP	2	1.04					MED.LT.GY.&GRN.GY.SHALE
72703 D	2915.00	LATE CRETACEOUS	LATROBE GROUP	2	.69					LT.OLIVE GREY SHALE;CALC
72703 F	2945.00	LATE CRETACEOUS	LATROBE GROUP	2	.53					MED.LT.GY.-LT.OL.GY.SH.
72703 H	2975.00	LATE CRETACEOUS	LATROBE GROUP	2	.65					LT.OLIVE GREY CLAYSTONE
72668 A	2995.00	LATE CRETACEOUS	LATROBE GROUP	1	3.33					MED-DK GRY SILTSTONE.NC.
72703 J	3005.00	LATE CRETACEOUS	LATROBE GROUP	2	.25					LT.GY.-PINK/GY.SST;CARB

===> DEPTH : 1803.00 TO 3005.00 METRES. <=== I ===> AVERAGE TOC : 1.33 % EXCLUDING VALUES GREATER THAN 10.00 % <===

TABLE 3 VITRINITE REFLECTANCE REPORT

BASIN - GIPPSLAND
WELL - LUDERICK 1

SAMPLE NO.	DEPTH	AGE	FORMATION	AN	MAX. RO	FLUOR. COLOUR	NO.CNTS.	MACERAL TYPE
72670 S	1873.00	EOCENE	LATROBE GROUP	5	.53	YEL-BRN	32	V>E>I,COAL
72670 F	1928.00	EOCENE	LATROBE GROUP	5	.56	YEL-BRN	30	V>E>I,COAL
72669 H	2081.70	EOCENE	LATROBE GROUP	5	.57	YEL-BRN	32	V>E>I,COAL
72669 R	2291.50	EOCENE	LATROBE GROUP	5	.56	YEL-BRN	29	V>>E>I,SHALY-COAL
72668 G.	2881.30	PALEOCENE	LATROBE GROUP	5	.74	YEL-DULL OR	28	E>I>V,DOM ABUNDANT
72668 A	2995.00	PALEOCENE	LATROBE GROUP	5	.63	YEL-OR-BRN	29	I>E>V,DOM ABUNDANT

TABLE 4

KEROGEN ELEMENTAL ANALYSIS REPORT

BASIN - GIPPSLAND
WELL - LUDERICK 1

SAMPLE NO.	DEPTH	SAMPLE TYPE	N%	C%	H%	S%	O%	ASH%	COMMENTS
			--- ELEMENTAL % (ASH FREE) ---						
72671 Q	1797.00	SWC	2.09	67.09	4.58	.00	26.24	14.68	ASH MORE THAN 10%
72671 O	1799.00	SWC	1.85	58.83	4.83	.00	34.49	32.93	ASH MORE THAN 10%
72671 K	1803.50	SWC	1.61	70.43	4.51	.00	23.44	5.84	
72671 G	1804.50	SWC	1.56	68.71	4.63	.00	25.09	5.04	
72671 J	1810.40	SWC	2.29	69.06	5.30	.00	23.35	7.02	
72671 I	1812.00	SWC	1.24	70.09	5.08	.00	23.59	7.89	
72671 E	1813.50	SWC	1.84	66.42	4.75	.00	26.99	1.64	
72671 D	1816.00	SWC	1.34	69.63	5.20	.00	23.83	8.20	
72671 B	1821.50	SWC	1.27	68.58	5.31	.00	24.84	13.57	ASH MORE THAN 10%
72671 A	1823.50	SWC	.83	72.80	5.85	.00	20.52	6.00	
72670 Z	1826.00	SWC	.75	70.78	5.50	.00	22.98	10.52	
72670 X	1831.00	SWC	.84	68.91	5.76	.00	24.49	15.83	ASH MORE THAN 10%
72673 I	1852.30	COR	.44	69.02	5.64	.00	24.91	10.92	
72673 J	1861.42	COR	.56	71.65	5.86	.00	21.93	7.83	
72670 R	1874.00	SWC	.47	69.41	5.16	.00	24.96	7.30	
72670 Q	1879.00	SWC	.66	69.48	5.55	.00	24.31	8.07	
72670 N	1893.50	SWC	.49	70.21	5.37	.00	23.92	10.50	
72670 M	1896.00	SWC	.74	67.20	5.10	.00	26.96	13.56	ASH MORE THAN 10%
72670 L	1901.50	SWC	.61	70.42	5.60	.00	23.37	11.40	ASH MORE THAN 10%
72670 K	1906.00	SWC	.58	71.36	5.60	.00	22.46	7.93	
72670 I	1914.40	SWC	.68	65.09	4.74	.00	29.50	2.56	
72670 G	1923.20	SWC	.67	71.16	5.20	.00	22.97	8.01	
72670 B	1950.90	SWC	.57	74.25	6.91	.00	18.27	20.70	ASH MORE THAN 10%
72669 Y	1984.00	SWC	.40	71.70	8.09	.00	19.81	14.80	ASH MORE THAN 10%
72699 K	2009.40	SWC	.65	75.08	5.74	.00	18.54	4.35	
72669 J	2022.50	SWC	.37	77.55	7.09	.00	14.99	22.59	ASH MORE THAN 10%
72669 F	2100.50	SWC	.93	79.02	6.10	.0.0	13.95	6.57	
72669 S	2270.00	SWC	1.05	74.46	5.67	.00	18.83	10.35	
72669 Q	2322.00	SWC	.61	73.89	5.55	.00	19.95	7.14	
72669 P	2339.00	SWC	.22	73.58	6.75	.00	19.45	14.22	ASH MORE THAN 10%
72669 O	2359.00	SWC	.43	78.38	6.46	.00	14.74	5.98	
72669 L	2427.50	SWC	.81	73.18	6.20	.00	19.81	13.65	ASH MORE THAN 10%
72669 C	2445.00	SWC	.00	75.27	5.77	.00	18.96	10.41	
72669 B	2461.00	SWC	.63	76.43	5.32	.00	17.62	6.06	
72668 X	2553.50	SWC	.75	76.62	5.50	.00	17.13	5.52	
72668 V	2511.00	SWC	.64	74.06	5.83	.00	19.47	3.14	
72668 T	2681.00	SWC	.34	80.57	4.01	.00	15.08	5.93	
72668 P	2768.00	SWC	.60	81.93	5.24	.00	12.23	6.37	
72668 K	2841.00	SWC	.81	78.43	5.82	.00	14.94	4.86	
72668 H	2856.96	SWC	1.02	79.35	5.60	.00	14.04	10.66	
72668 G	2881.30	SWC	1.20	82.01	5.71	.00	11.07	2.66	
72668 D	2935.02	SWC	.85	82.01	5.68	.00	11.46	1.03	
72668 C	2943.98	SWC	1.02	78.95	5.84	.00	14.19	4.98	
72668 B	2952.00	SWC	.79	82.99	5.23	.00	10.98	6.59	
72668 A	2995.00	SWC	.89	84.26	5.08	.00	9.77	3.74	

TABLE 5

KEROGEN ELEMENTAL ANALYSIS REPORT

BASIN - GIPPSLAND
WELL - LUDERICK 1

SAMPLE NO.	DEPTH	SAMPLE TYPE	AGE	FORMATION	ATOMIC RATIOS H/C	ATOMIC RATIOS O/C	ATOMIC RATIOS N/C	COMMENTS
72671 Q	1797.00	SWC	EARLY OLIGOC.-EOCENE	LATROBE GROUP-GURNARD FM	.82	.29	.03	ASH MORE THAN 10%
72671 O	1799.00	SWC	EARLY OLIGOC.-EOCENE	LATROBE GROUP-GURNARD FM	.99	.44	.03	ASH MORE THAN 10%
72671 K	1803.50	SWC	EOCENE	LATROBE GROUP	.77	.25	.02	
72671 G	1804.50	SWC	EOCENE	LATROBE GROUP	.81	.27	.02	
72671 J	1810.40	SWC	EOCENE	LATROBE GROUP	.92	.25	.03	
72671 I	1812.00	SWC	EOCENE	LATROBE GROUP	.87	.25	.02	
72671 E	1813.50	SWC	EOCENE	LATROBE GROUP	.86	.30	.02	
72671 D	1816.00	SWC	EOCENE	LATROBE GROUP	.90	.26	.02	
72671 B	1821.50	SWC	EOCENE	LATROBE GROUP	.93	.27	.02	ASH MORE THAN 10%
72671 A	1823.50	SWC	EOCENE	LATROBE GROUP	.96	.21	.01	
72670 Z	1826.00	SWC	EOCENE	LATROBE GROUP	.93	.24	.01	
72670 X	1831.00	SWC	EOCENE	LATROBE GROUP	1.00	.27	.01	ASH MORE THAN 10%
72673 I	1852.30	COR	EOCENE	LATROBE GROUP	.98	.27	.01	
72673 J	1861.42	COR	EOCENE	LATROBE GROUP	.98	.23	.01	
72670 R	1874.00	SWC	EOCENE	LATROBE GROUP	.89	.27	.01	
72670 Q	1879.00	SWC	EOCENE	LATROBE GROUP	.96	.26	.01	
72670 N	1893.50	SWC	EOCENE	LATROBE GROUP	.92	.26	.01	
72670 M	1896.00	SWC	EOCENE	LATROBE GROUP	.91	.30	.01	ASH MORE THAN 10%
72670 L	1901.50	SWC	EOCENE	LATROBE GROUP	.95	.25	.01	ASH MORE THAN 10%
72670 K	1906.00	SWC	EOCENE	LATROBE GROUP	.94	.24	.01	
72670 I	1914.40	SWC	EOCENE	LATROBE GROUP	.87	.34	.01	
72670 G	1923.20	SWC	EOCENE	LATROBE GROUP	.88	.24	.01	
72670 B	1950.90	SWC	EOCENE	LATROBE GROUP	1.12	.18	.01	ASH MORE THAN 10%
72669 X	1984.00	SWC	EOCENE	LATROBE GROUP	1.35	.21	.00	ASH MORE THAN 10%
72699 K	2009.40	SWC	EOCENE	LATROBE GROUP	.92	.19	.01	
72669 J	2022.50	SWC	EOCENE	LATROBE GROUP	1.10	.14	.00	ASH MORE THAN 10%
72669 F	2100.50	SWC	EOCENE	LATROBE GROUP	.93	.13	.01	
72669 S	2270.00	SWC	PALEOCENE	LATROBE GROUP	.91	.19	.01	
72669 Q	2322.00	SWC	PALEOCENE	LATROBE GROUP	.90	.20	.01	
72669 P	2339.00	SWC	PALEOCENE	LATROBE GROUP	1.10	.20	.00	ASH MORE THAN 10%
72669 O	2359.00	SWC	PALEOCENE	LATROBE GROUP	.99	.14	.00	
72669 L	2427.50	SWC	PALEOCENE	LATROBE GROUP	1.02	.20	.01	ASH MORE THAN 10%
72669 C	2445.00	SWC	PALEOCENE	LATROBE GROUP	.92	.19	.00	
72669 B	2461.00	SWC	PALEOCENE	LATROBE GROUP	.84	.17	.01	
72668 X	2553.50	SWC	PALEOCENE	LATROBE GROUP	.86	.17	.01	
72668 V	2611.00	SWC	PALEOCENE	LATROBE GROUP	.95	.20	.01	
72668 T	2681.00	SWC	PALEOCENE	LATROBE GROUP	.60	.14	.00	
72668 P	2768.00	SWC	PALEOCENE	LATROBE GROUP	.77	.11	.01	
72668 K	2841.00	SWC	PALEOCENE	LATROBE GROUP	.89	.14	.01	
72668 H	2856.96	SWC	PALEOCENE	LATROBE GROUP	.85	.13	.01	
72668 G	2881.30	SWC	LATE CRETACEOUS	LATROBE GROUP	.84	.10	.01	
72668 D	2935.02	SWC	LATE CRETACEOUS	LATROBE GROUP	.83	.10	.01	
72668 C	2943.98	SWC	LATE CRETACEOUS	LATROBE GROUP	.89	.13	.01	
72668 B	2952.00	SWC	LATE CRETACEOUS	LATROBE GROUP	.76	.10	.01	
72668 A	2995.00	SWC	LATE CRETACEOUS	LATROBE GROUP	.72	.09	.01	

TABLE 6

ROCK EVAL ANALYSES

BASIN - GIPPSLAND
WELL - LUDERICK 1

REPORT A - SULPHUR & PYROLYZABLE CARBON

SAMPLE NO.	DEPTH	SAMPLE TYPE	AGE	TMAX	S1	S2	S3	PI	S2/S3	PC	COMMENTS
72699 L	1460.0	CANNED CTS	EARLY MIOCENE	426.	1.26	4.04	.17	.24	23.76	.44	
72699 O	1505.0	CANNED CTS	EARLY MIOCENE	426.	4.79	43.52	.81	.10	53.72	4.02	
72699 P	1520.0	CANNED CTS	EARLY MIOCENE	424.	2.80	21.70	.55	.11	39.45	2.04	
72699 X	1640.0	CANNED CTS	EARLY MIOCENE	427.	2.50	13.97	.54	.15	25.87	1.37	
72671 W	1777.0	SWC	EARLY OLIGOC.-EOCENE	404.	.09	.11	.20	.45	.55	.01	
72671 S	1791.0	SWC	EARLY OLIGOC.-EOCENE	411.	.13	.26	.65	.34	.40	.03	
72671 N	1800.5	SWC	EARLY OLIGOC.-EOCENE	411.	.08	.18	.31	.31	.58	.02	
72671 F	1808.0	SWC	EOCENE	413.	.40	.30	.35	.57	.85	.05	
72671 C	1818.0	SWC	EOCENE	405.	.07	.14	.23	.35	.60	.01	
72671 H	1820.0	SWC	EOCENE	412.	.23	.65	.35	.26	1.85	.07	
72671 A	1823.5	SWC	EOCENE	433.	1.80	1.70	.25	.51	6.80	.29	
72670 X	1831.0	SWC	EOCENE	399.	.56	1.05	.19	.35	5.52	.13	
72673 G	1856.6	CORE	EOCENE	410.	2.28	17.99	1.08	.11	16.65	1.68	
72673 H	1860.4	CORE	EOCENE	409.	1.50	15.37	.82	.09	18.74	1.40	
72670 I	1914.4	SWC	EOCENE	418.	.92	11.17	.72	.08	15.51	1.00	
72670 B	1950.9	SWC	EOCENE	424.	.85	10.36	.46	.08	22.52	.93	
72669 A	2480.0	SWC	PALEOCENE	421.	.71	1.28	.27	.36	4.74	.16	
72668 X	2553.5	SWC	PALEOCENE	426.	2.14	16.65	.39	.11	42.69	1.56	
72668 V	2611.0	SWC	PALEOCENE	431.	.65	2.94	.23	.18	12.78	.29	
72668 T	2681.0	SWC	PALEOCENE	430.	.24	.13	.16	.67	.81	.03	
72668 S	2710.0	SWC	PALEOCENE	427.	.20	.21	.23	.50	.91	.03	
72668 G	2881.3	SWC	LATE CRETACEOUS	437.	1.51	11.68	.33	.11	35.39	1.09	
72668 A	2995.0	SWC	LATE CRETACEOUS	440.	1.15	5.61	.21	.17	26.71	.56	

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

25/01/84 ESSO AUSTRALIA LTD.

TABLE 6 (Cont'd)

ROCK EVAL ANALYSES

BASIN - GIPPSLAND
WELL - LUDERICK 1

REPORT B - TOTAL CARBON,H/O INDICES

SAMPLE NO.	DEPTH	SAMPLE TYPE	FORMATION	TC	HI	OI	HI/OI	COMMENTS
72699 L	1460.0	CANNED CTS	LAKES ENTRANCE	1.62	249.	10.	24.90	
72699 O	1505.0	CANNED CTS	LAKES ENTRANCE	7.42	586.	10.	58.60	
72699 P	1520.0	CANNED CTS	LAKES ENTRANCE	4.41	492.	12.	41.00	
72699 X	1640.0	CANNED CTS	LAKES ENTRANCE	2.41	579.	22.	26.32	
72671 W	1777.0	SWC	LATROBE GROUP-GURNARD FM	.51	21.	39.	.54	
72671 S	1791.0	SWC	LATROBE GROUP-GURNARD FM	1.29	20.	50.	.40	
72671 N	1800.5	SWC	LATROBE GROUP-GURNARD FM	.89	20.	34.	.59	
72671 F	1808.0	SWC	LATROBE GROUP	1.16	25.	30.	.83	
72671 C	1818.0	SWC	LATROBE GROUP	.75	18.	30.	.60	
72671 H	1820.0	SWC	LATROBE GROUP	1.13	57.	30.	1.90	
72671 A	1823.5	SWC	LATROBE GROUP	1.43	118.	17.	6.94	
72670 X	1831.0	SWC	LATROBE GROUP	1.13	92.	16.	5.75	
72673 G	1856.6	CORE	LATROBE GROUP	4.32	416.	25.	16.64	
72673 H	1860.4	CORE	LATROBE GROUP	5.32	288.	15.	19.20	
72670 I	1914.4	SWC	LATROBE GROUP	4.65	240.	15.	16.00	
72670 B	1950.9	SWC	LATROBE GROUP	2.30	450.	20.	22.50	
72669 A	2460.0	SWC	LATROBE GROUP	.90	142.	30.	4.73	
72668 X	2553.5	SWC	LATROBE GROUP	5.32	312.	7.	44.57	
72668 V	2611.0	SWC	LATROBE GROUP	1.66	177.	13.	13.62	
72668 T	2681.0	SWC	LATROBE GROUP	.56	23.	28.	.82	
72668 S	2710.0	SWC	LATROBE GROUP	.65	32.	35.	.91	
72668 G	2881.3	SWC	LATROBE GROUP	5.15	226.	6.	37.67	
72668 A	2995.0	SWC	LATROBE GROUP	3.33	168.	6.	28.00	

T.O.C.	=	Total organic carbon, wt. %
S1	=	Free hydrocarbons, mg HC/g of rock
S2	=	Residual hydrocarbon potential (mg HC/g of rock)
S3	=	CO2 produced from kerogen pyrolysis (mg CO2/g of rock)
PC*	=	$0.083 (S_1 + S_2)$
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 7

C15+ EXTRACT ANALYSES

BASIN - GIPPSLAND
WELL - LUDERICK 1

REPORT A - EXTRACT DATA (PPM)

						*--- HYDROCARBONS	---*		*---	NON-HYDROCARBONS			---*
SAMPLE NO.	DEPTH	TYPE	AN	AGE	TOTAL EXTRACT	SATS.	AROMS.	TOTAL H/CARBS	ASPH.	ELUTED NSO	NON-ELT NSO	TOTAL NSO	SULPHUR	TOTAL NON/HCS
72699 Q	1535.00	CTS	2	EARLY MIOCENE	237.	0.	0.	0.	161.	0.	0.	0.	0.	161.
72700 M	1880.00	CTS	2	EOCENE	493.	20.	61.	81.	317.	57.	29.	86.	9.	412.
72701 R	2345.00	CTS	2	PALEOCENE	3191.	324.	628.	952.	1744.	402.	93.	495.	0.	2239.
72702 L	2645.00	CTS	2	PALEOCENE	393.	46.	64.	110.	209.	45.	9.	54.	20.	283.
72703 D	2915.00	CTS	2	LATE CRETACEOUS	454.	36.	55.	91.	313.	41.	2.	43.	7.	363.

C15+ EXTRACT ANALYSES

BASIN - GIPPSLAND
WELL - LUDERICK 1

REPORT B - EXTRACTS % OF TOTAL

			HYDROCARBONS		*- NON-HYDROCARBONS -*					
SAMPLE NO.	DEPTH	FORMATION	SAT. %	AROM.%	NSO. %	ASPH.%	SULPH%	SAT/AR	HC/NHC	COMMENTS
72699 Q	1535.00	LAKES ENTRANCE	.0	.0	.0	67.9	.0	.0	.0	IMMATURE,MARINE+NON-MAR.
72700 M	1880.00	LATROBE GROUP	4.1	12.4	17.4	64.3	1.8	.3	.2	IMMATURE,PREDOM.NON-MAR.
72701 R	2345.00	LATROBE GROUP	10.2	19.7	15.5	54.7	.0	.5	.4	IMMATURE,NON-MARINE
72702 L	2645.00	LATROBE GROUP	11.7	16.3	13.7	53.2	5.1	.7	.4	IMMATURE,NON-MARINE
72703 D	2915.00	LATROBE GROUP	7.9	12.1	9.5	68.9	1.5	.7	.3	EARLY MATURE,NON MARINE

TABLE 8

LUDERICK-1 OILS - API GRAVITY, LIQUID CHROMATOGRAPHY AND CARBON ISOTOPES

SAMPLE NO.	RFT NO.	DEPTH M(KB)	SAMPLE TYPE	° API	LIQUID CHROMATOGRAPHY SUMMARY						C^{13}/C^{12} ISOTOPES (Vs PDB)	
					% SULPHUR	% SATS	% AROM	% NSO	% N-EL	% ASPH	SATS	AROM
77006-A	2/36	1838.5	CONDENSATE	66.2	0.02	-	-	-	-	-	-	-
77006-B	6/41	1843	OIL	47.3	0.11	63.9	15.9.	5.1	14.1	14.1	-26.4	-24.9
77006-C	7/42	2018	OIL	59.9	0.12	63.6	12.5	5.8	17.3	17.3	-27.3	-27.6

0732L

C4-C7 OIL   TABLE 9   01 NOV 83

77006A   AUSTRALIA, LUDERICK-1, RFT 2/36 SUITE 2, 1838.5 M.

	TOTAL PERCENT	NORM PERCENT
METHANE	0.000	
ETHANE	0.000	
PROPANE	0.458	
IBUTANE	1.303	2.35
NBUTANE	4.285	7.74
IPENTANE	4.342	7.84
NPENTANE	5.753	10.39
22-DMB	0.170	0.31
CPENTANE	0.571	1.03
23-DMB	0.561	1.01
2-MP	3.208	5.79
3-MP	1.718	3.10
NHEXANE	5.579	10.08
MCP	3.348	6.05
22-DMP	0.000	0.00
24-DMP	0.267	0.48
223-TMB	0.077	0.14

	TOTAL PERCENT	NORM PERCENT
CHEX	3.068	5.54
33-DMP	0.000	0.00
11-DMCP	0.271	0.49
2-MHEX	1.489	2.69
23-DMP	0.491	0.89
3-MHEX	1.408	2.54
1C3-DMCP	0.081	0.15
1T3-DMCP	0.675	1.22
1T2-DMCP	1.147	2.07
3-EPENT	0.000	0.00
224-TMP	0.000	0.00
NHEPTANE	5.166	9.33
1C2-DMCP	0.143	0.26
MCH	8.386	15.15
ECP	0.441	0.80
BENZENE	0.124	0.22
TOLUENE	1.284	2.32

TOTALS

ALL COMP	55.815
GASOLINE	55.357

SIG COMP RATIOS

C1/C2	2.45
A /D2	7.63
D1/D2	1.00
C1/D2	9.38
PENT/IPENT	1.32
CH/MCP	0.92

PARAFFIN INDEX 1	1.522
PARAFFIN INDEX 2	23.287

INTERPRETER - R.E. METTER
ANALYST - H.M. FRY

C4-C7 OIL

TABLE 10

01 NOV 83

77006B AUSTRALIA, LUDERICK-1, RFT 6/41, 1843M.

	TOTAL PERCENT	NORM PERCENT		TOTAL PERCENT	NORM PERCENT
METHANE	0.000		CHEX	1.495	7.71
ETHANE	0.002		33-DMP	0.000	0.00
PROPANE	0.003		11-DMCP	0.136	0.70
IBUTANE	0.060	0.31	2-MHEX	0.695	3.59
NBUTANE	0.017	0.09	23-DMP	0.238	1.23
IPENTANE	0.069	0.35	3-MHEX	0.679	3.50
NPENTANE	0.388	2.00	1C3-DMCP	0.385	1.99
22-DMB	0.006	0.03	1T3-DMCP	0.346	1.79
CPENTANE	0.171	0.88	1T2-DMCP	0.594	3.07
23-DMB	0.169	0.87	3-EPENT	0.000	0.00
2-MP	0.971	5.01	224-TMP	0.000	0.00
3-MP	0.556	2.87	NHEPTANE	2.645	13.65
NHEXANE	1.975	10.19	1C2-DMCP	0.085	0.44
MCP	1.396	7.20	MCH	5.109	26.37
22-DMP	0.000	0.00	ECP	0.270	1.39
24-DMP	0.109	0.56	BENZENE	0.022	0.11
223-TMB	0.043	0.22	TOLUENE	0.749	3.87

TOTALS	
ALL COMP	19.382
GASOLINE	19.377

SIG COMP RATIOS	
C1/C2	2.65
A /D2	6.80
D1/D2	1.13
C1/D2	10.95
PENT/IPENT	5.66
CH/MCP	1.07

PARAFFIN INDEX 1	1.038
PARAFFIN INDEX 2	21.463

INTERPRETER - R.E. METTER
ANALYST - H.M. FRY

C4-C7 OIL — TABLE 11 — 01 NOV 83

77006C AUSTRALIA, LUDERICK-1, RFT 7/42, 2018 M.

	TOTAL PERCENT	NORM PERCENT
METHANE	0.000	
ETHANE	0.017	
PROPANE	0.940	
IBUTANE	1.372	3.58
NBUTANE	3.142	8.20
IPENTANE	3.211	8.38
NPENTANE	3.878	10.13
22-DMB	0.128	0.33
CPENTANE	0.249	0.65
23-DMB	0.400	1.04
2-MP	2.446	6.39
3-MP	1.251	3.27
NHEXANE	3.909	10.21
MCP	1.986	5.19
22-DMP	0.000	0.00
24-DMP	0.205	0.53
223-TMB	0.061	0.16

	TOTAL PERCENT	NORM PERCENT
CHEX	1.652	4.31
33-DMP	0.000	0.00
11-DMCP	0.183	0.48
2-MHEX	1.051	2.74
23-DMP	0.394	1.03
3-MHEX	1.006	2.63
1C3-DMCP	0.526	1.37
1T3-DMCP	0.468	1.22
1T2-DMCP	0.797	2.08
3-EPENT	0.000	0.00
224-TMP	0.000	0.00
NHEPTANE	3.756	9.81
1C2-DMCP	0.108	0.28
MCH	5.531	14.44
ECP	0.289	0.75
BENZENE	0.029	0.08
TOLUENE	0.274	0.72

TOTALS

ALL COMP	39.258
GASOLINE	38.301

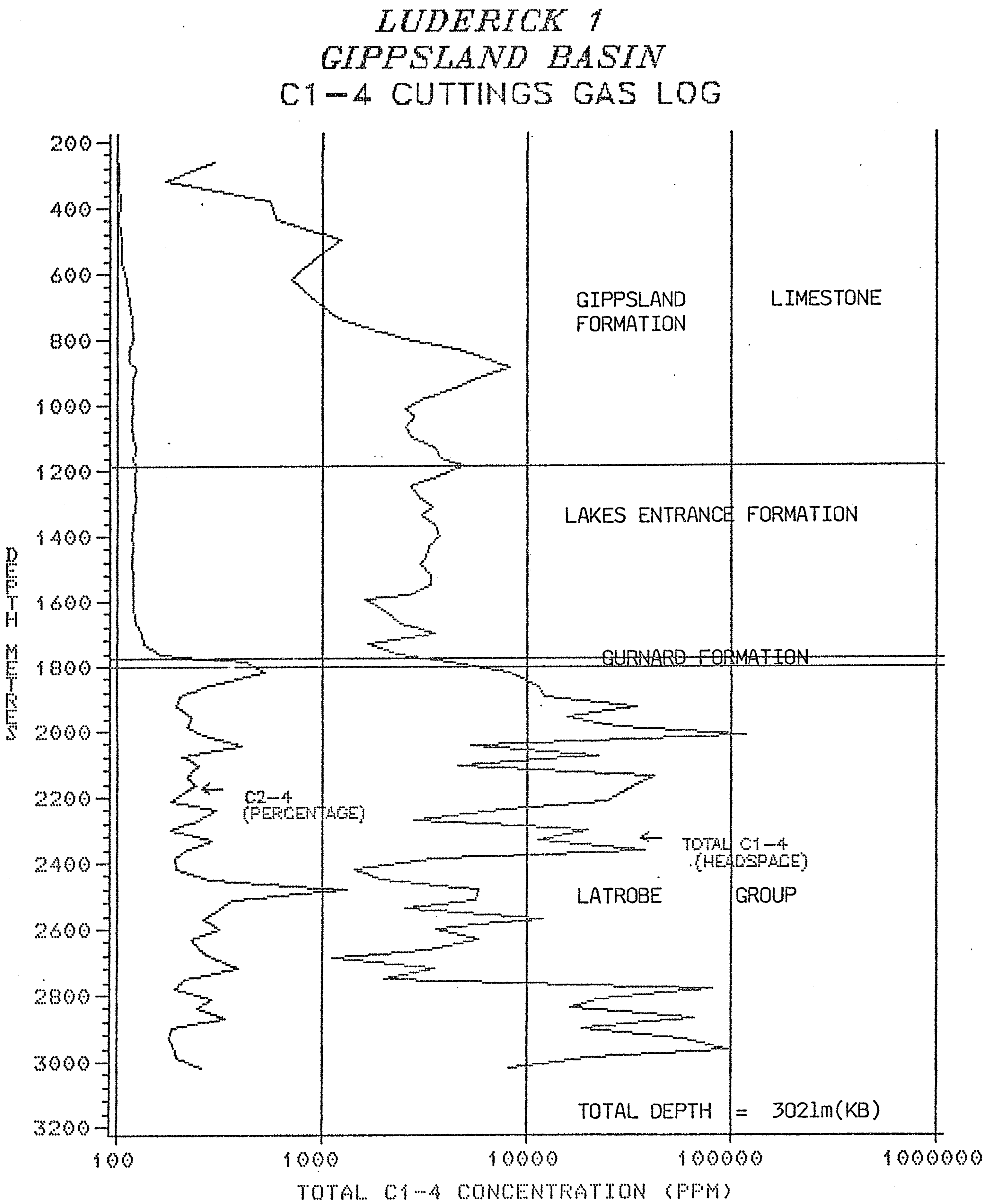
SIG COMP RATIOS

C1/C2	2.17
A /D2	7.62
D1/D2	0.30
C1/D2	8.37
PENT/IPENT	1.21
CH/MCP	0.83

PARAFFIN INDEX 1	1.149
PARAFFIN INDEX 2	24.449

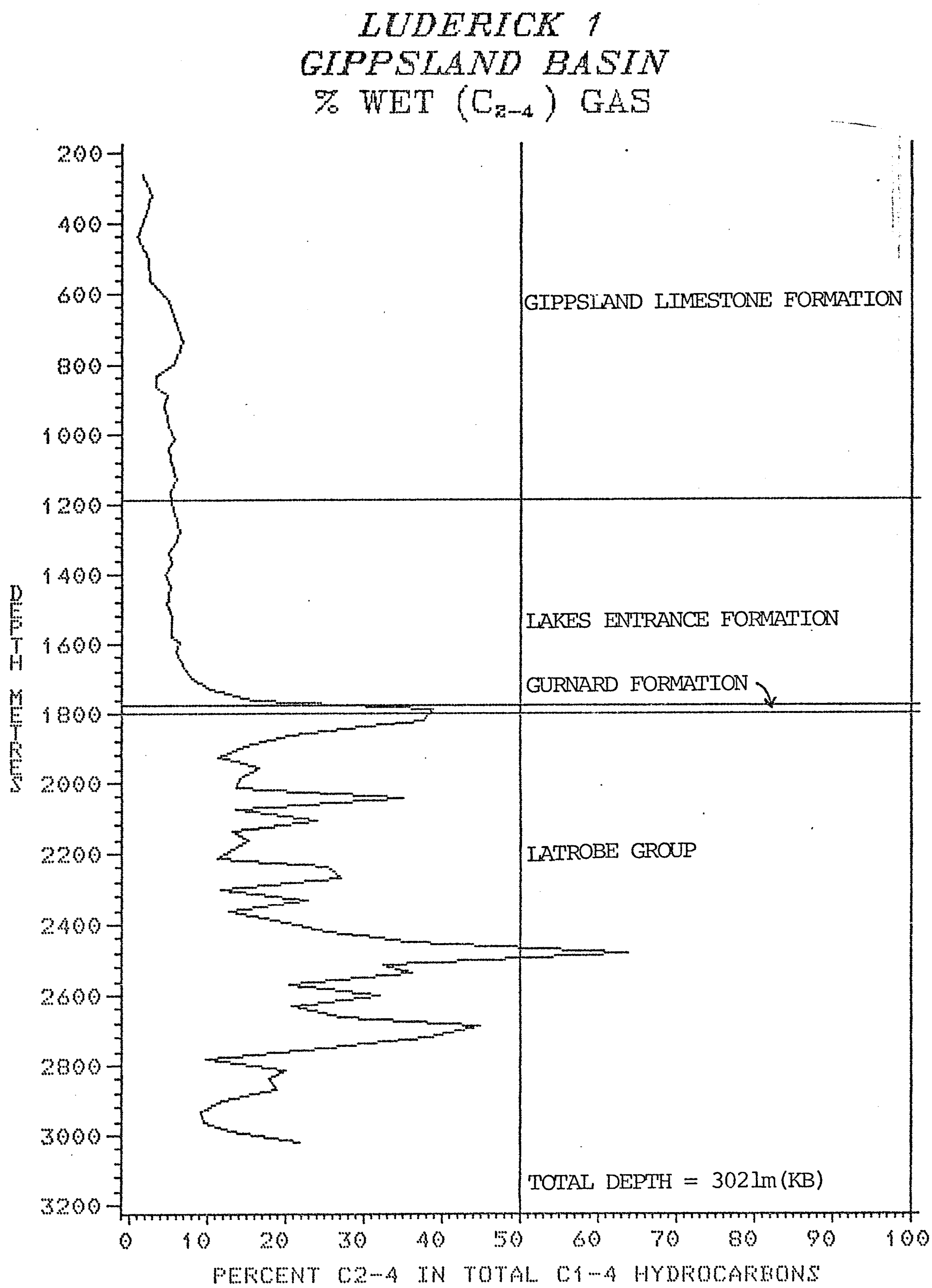
INTERPRETER - R.E. METTER
ANALYST - H.M. FRY

FIGURE 1(a)



LUDERICK 1
GIPPSLAND BASIN
C1-4 CUTTINGS GAS LOG
DEPTH METRES
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200
GIPPSLAND FORMATION
LIMESTONE
LAKES ENTRANCE FORMATION
GURNARD FORMATION
C2-4 (PERCENTAGE)
TOTAL C1-4 (HEADSPACE)
LATROBE GROUP
TOTAL DEPTH = 3021m(KB)
100
1000
10000
100000
1000000
TOTAL C1-4 CONCENTRATION (PPM)

FIGURE 1(b)


LUDERICK 1
GIPPSLAND BASIN
% WET (C2-4) GAS
DEPTH METRES
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200
GIPPSLAND LIMESTONE FORMATION
LAKES ENTRANCE FORMATION
GURNARD FORMATION
LATROBE GROUP
TOTAL DEPTH = 3021m (KB)
0
10
20
30
40
50
60
70
80
90
100
PERCENT C2-4 IN TOTAL C1-4 HYDROCARBONS

PE601267

This is an enclosure indicator page.
The enclosure PE601267 is enclosed within the container PE902540 at this location in this document.

The enclosure PE601267 has the following characteristics:

ITEM_BARCODE = PE601267
CONTAINER_BARCODE = PE902540
NAME = Gasoline range Geochemical Log
BASIN = GIPPSLAND
PERMIT =
TYPE = WELL
SUBTYPE = WELL_LOG
DESCRIPTION = Geochemical Log
REMARKS =
DATE_CREATED =
DATE_RECEIVED = 21/09/1984
W_NO = W819
WELL_NAME = Luderick-1
CONTRACTOR = ESSO
CLIENT_OP_CO = ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

LUDERICK 1
GIPPSLAND BASIN

VITRINITE REFLECTANCE VS. DEPTH

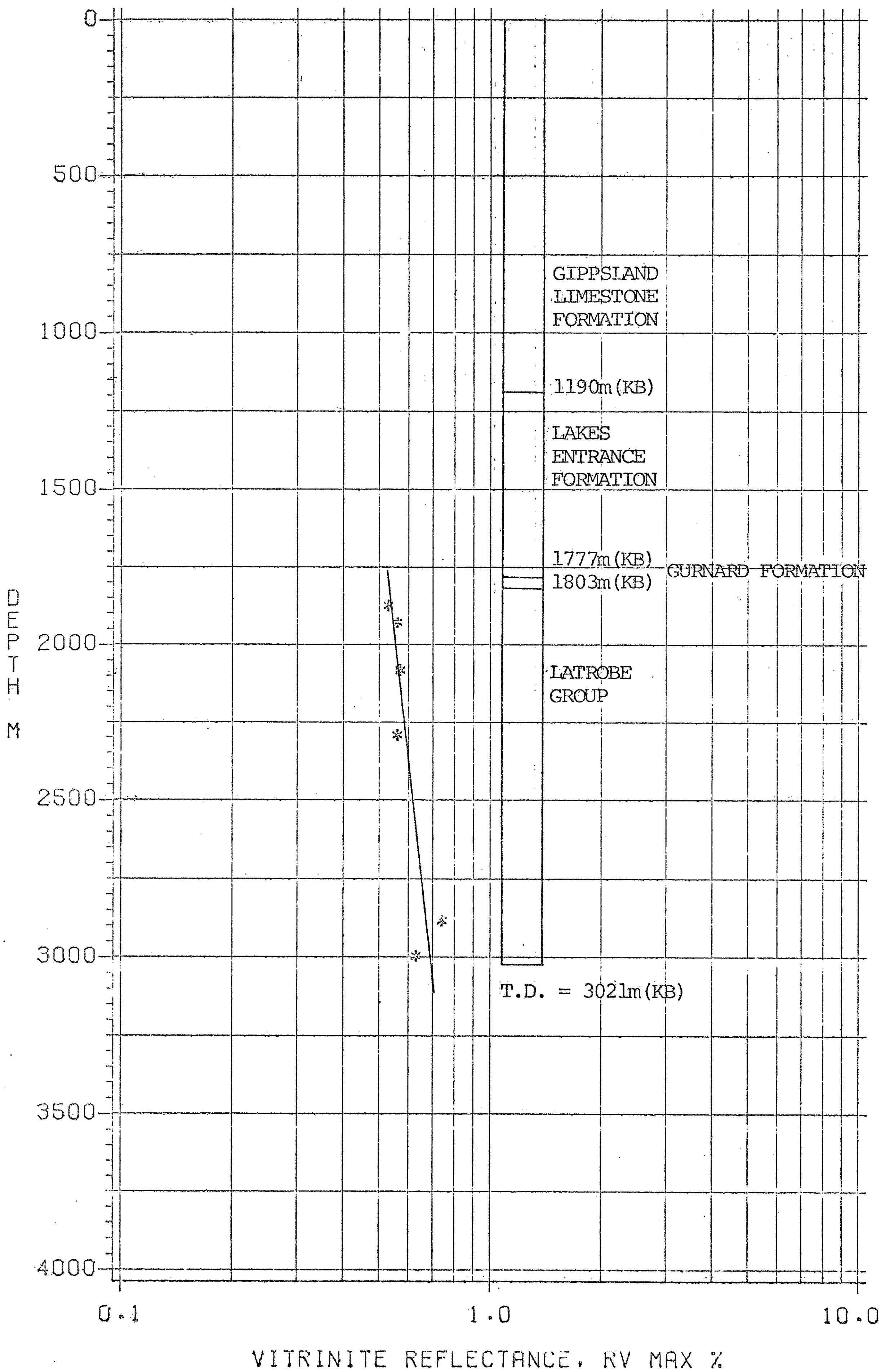
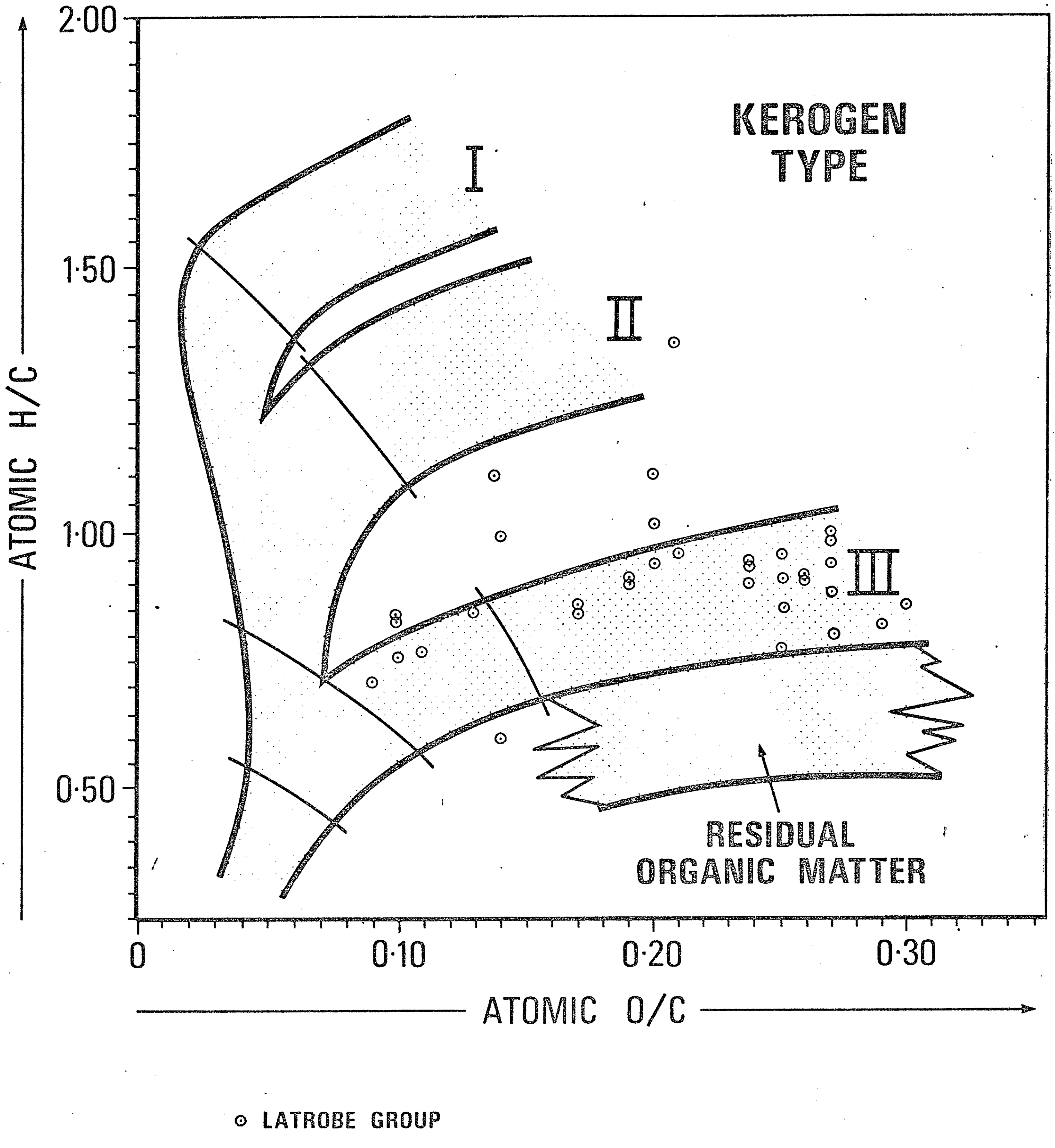
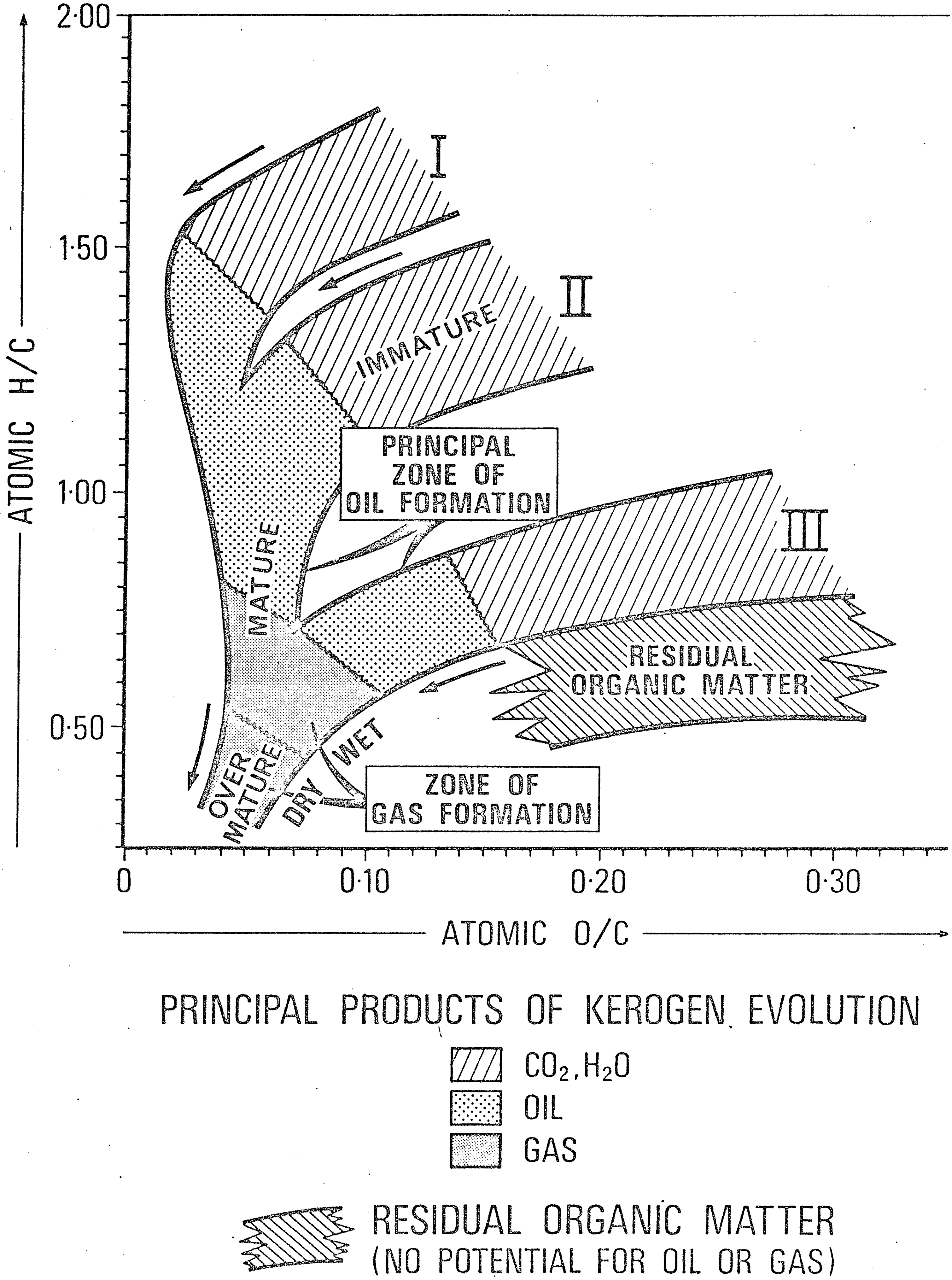


FIG. 4

LUDERICK-1

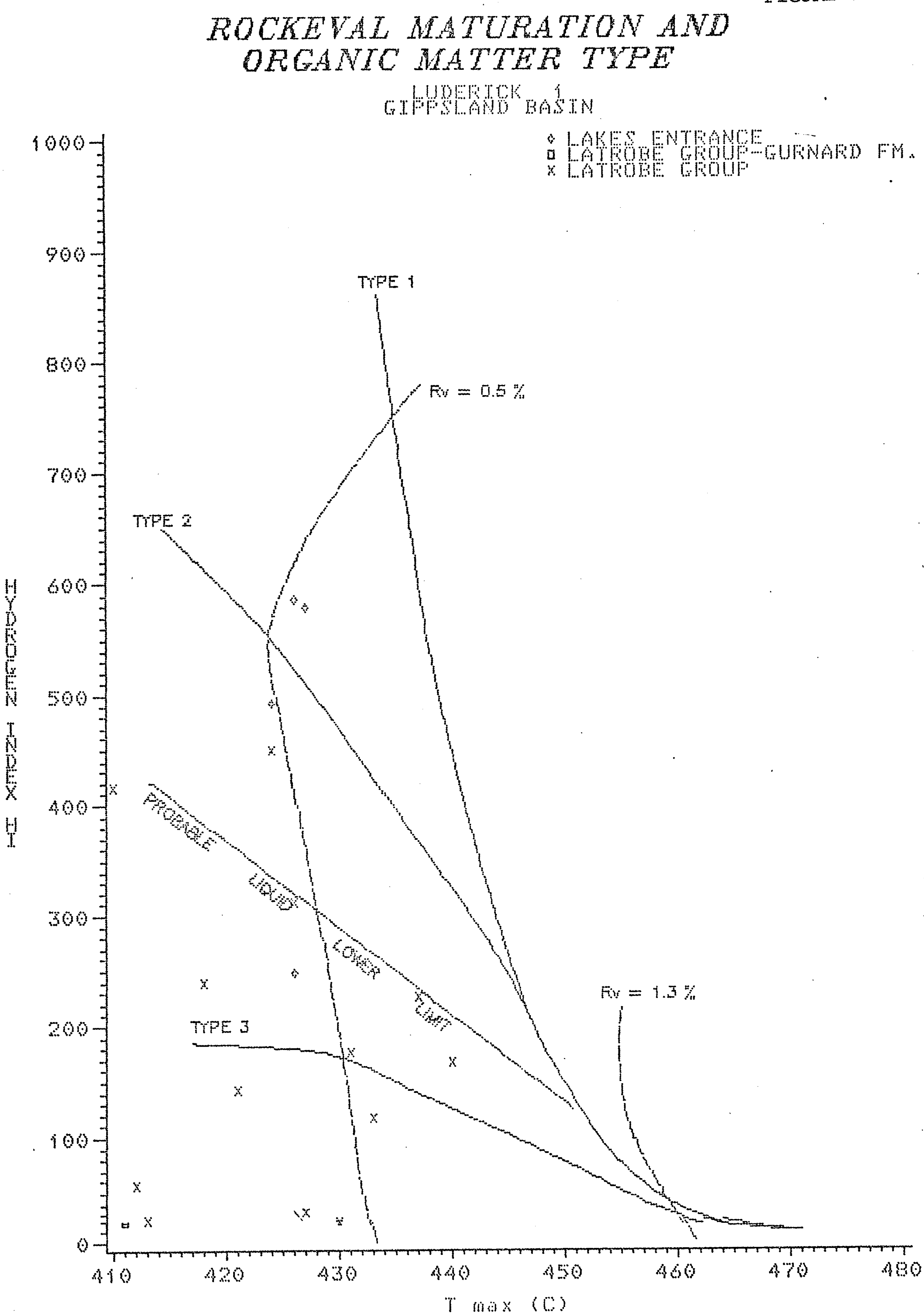


Dwg. 2188/OP/8


2·00
1·50
1·00
0·50
ATOMIC H/C
0
0·10
0·20
0·30
ATOMIC O/C
I
II
III
IMMATURE
PRINCIPAL ZONE OF OIL FORMATION
MATURE
RESIDUAL ORGANIC MATTER
OVER MATURE
DRY
WET
ZONE OF GAS FORMATION
PRINCIPAL PRODUCTS OF KEROGEN EVOLUTION
CO_2, H_2O
OIL
GAS
RESIDUAL ORGANIC MATTER
(NO POTENTIAL FOR OIL OR GAS)

1380/BS/75

FIGURE 6

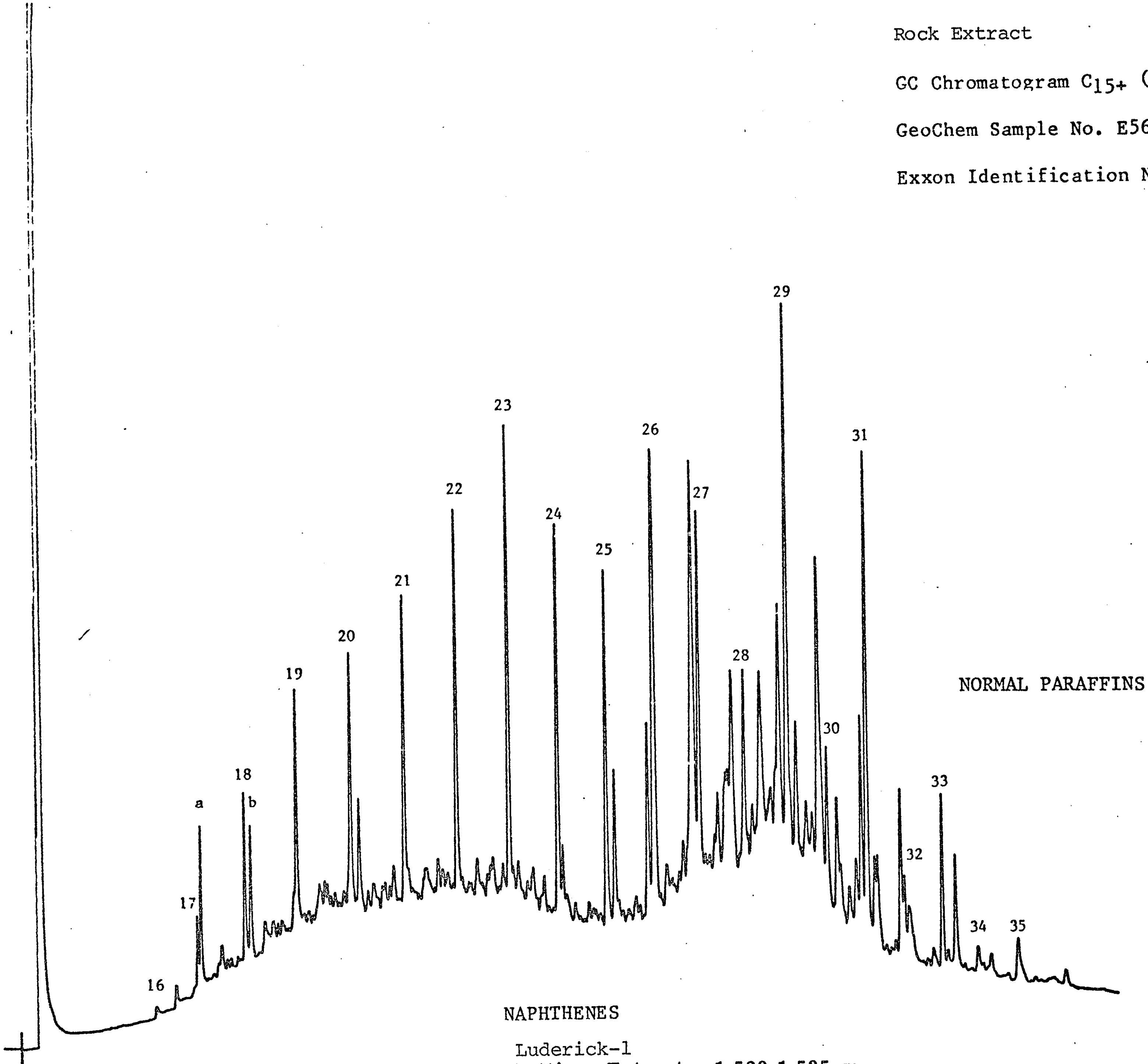

ROCKEVAL MATURATION AND
ORGANIC MATTER TYPE
LUDERICK 1
GIPPSLAND BASIN
LAKES ENTRANCE
LATROBE GROUP-GURNARD FM.
LATROBE GROUP
TYPE 1
TYPE 2
TYPE 3
Rv = 0.5 %
Rv = 1.3 %
PROBABLE LIQUID LOWER LIMIT
HYDROGEN INDEX HI
T max (C)
1000
900
800
700
600
500
400
300
200
100
0
410
420
430
440
450
460
470
480

Rock Extract

GC Chromatogram C_{15+} (P-N) Hydrocarbon

GeoChem Sample No. E569-001

Exxon Identification No. 72699-Q



Luderick-1

FIGURE 7 Cuttings Extract, 1,520-1,535 m.

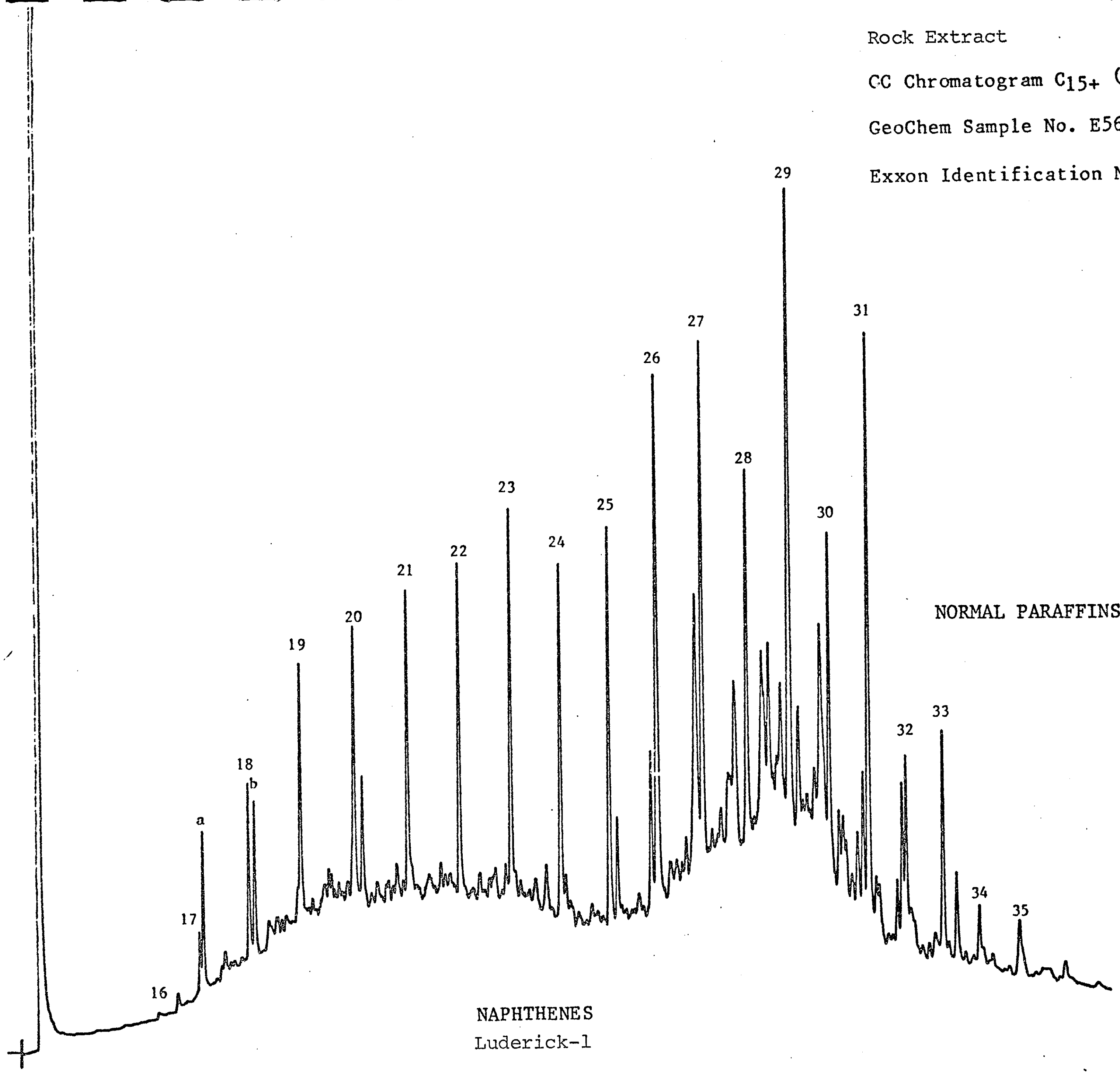
Lakes Entrace Formation

Rock Extract

CC Chromatogram C_{15+} (P-N) Hydrocarbon

GeoChem Sample No. E569-002

Exxon Identification No. 72700-M



Luderick-1

FIGURE 8 Cuttings Extract, 1,865-1,880 m.

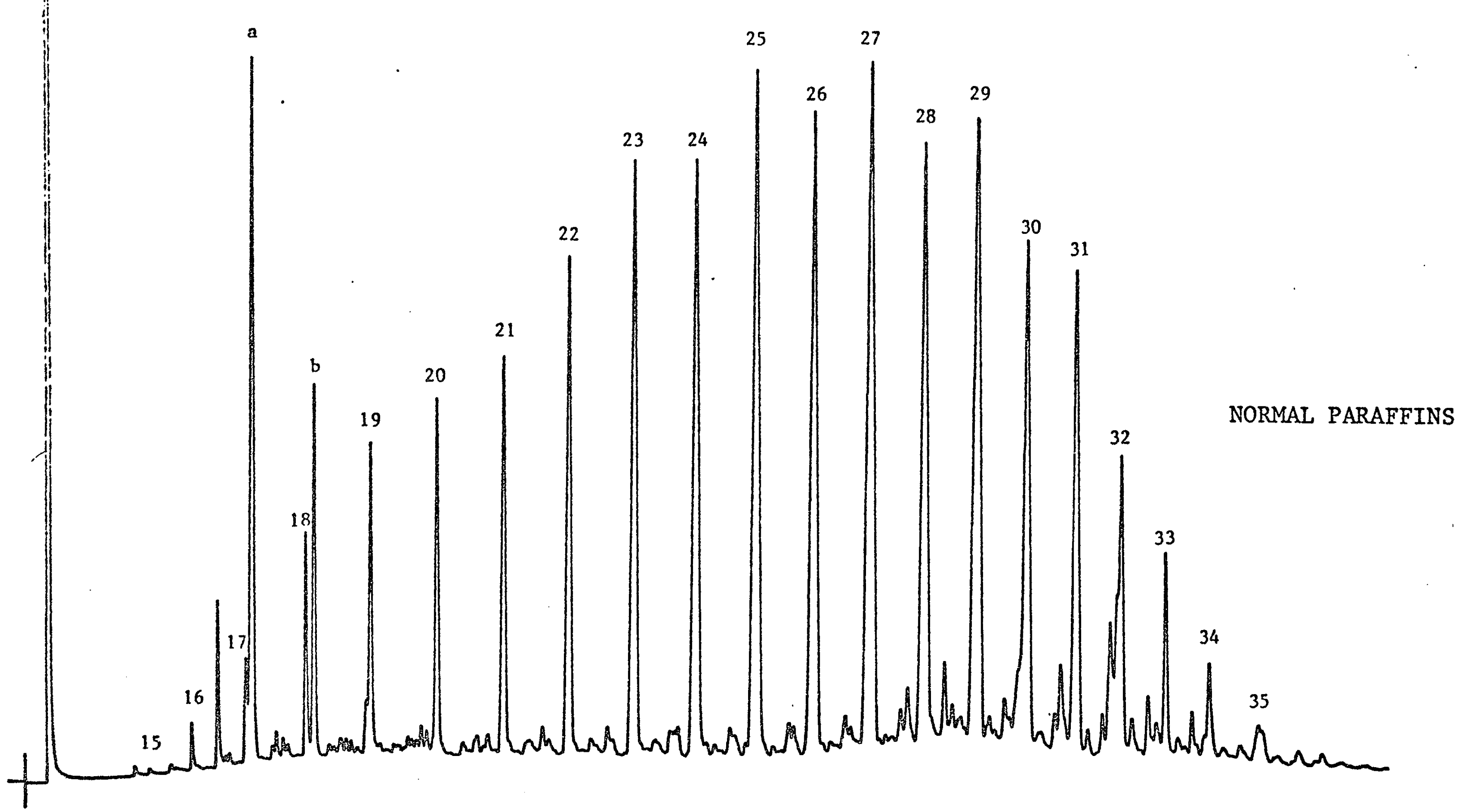
Latrobe Group

Rock Extract

GC Chromatogram C_{15+} (P-N) Hydrocarbon

GeoChem Sample No. E569-003

Exxon Identification No. 72701-R



NAPHTHENES

Luderick-1

FIGURE 9 Cuttings Extract, 2,330-2,345 m.

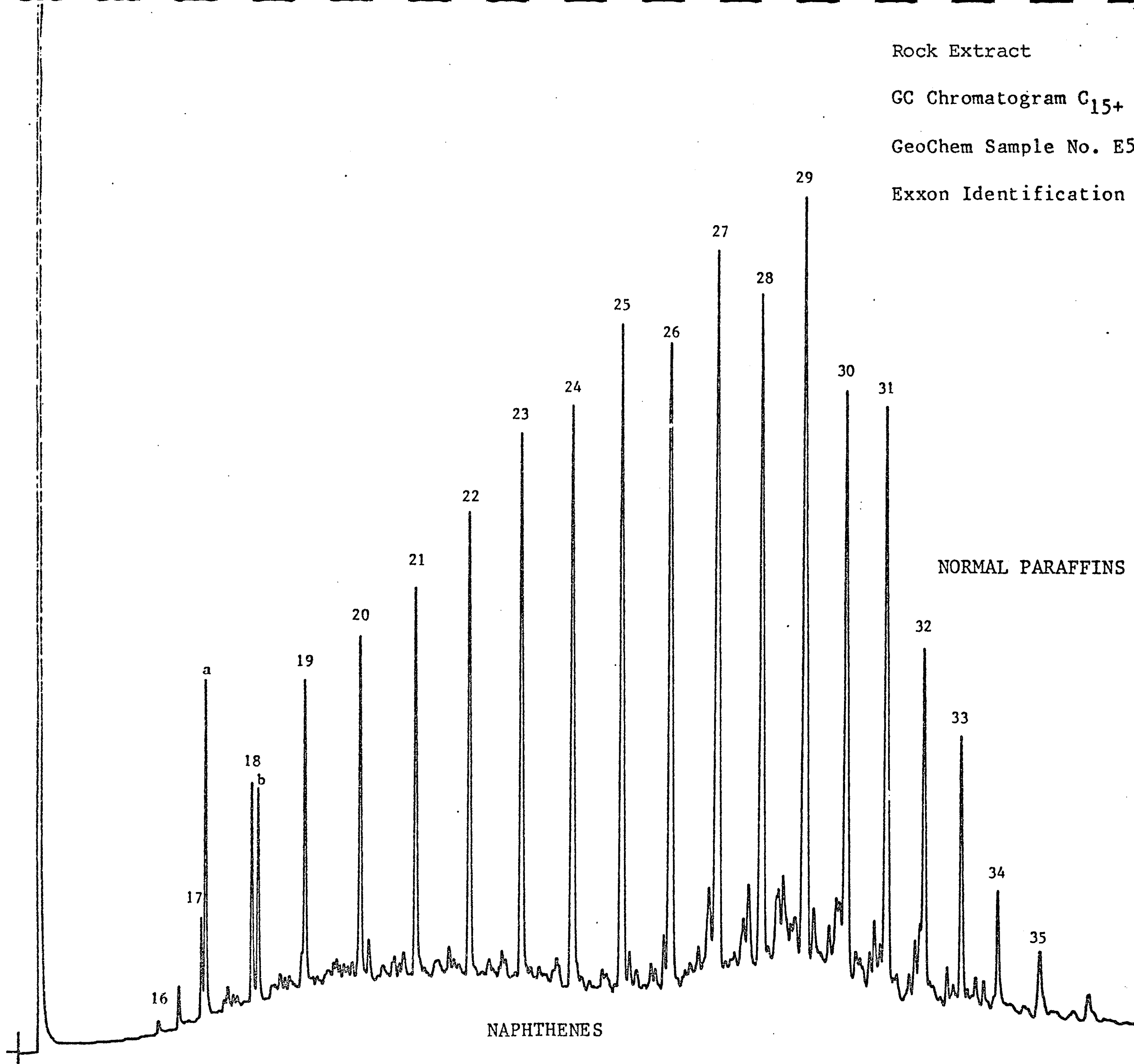
Latrobe Group

Rock Extract

GC Chromatogram C_{15+} (P-N) Hydrocarbon

GeoChem Sample No. E569-004

Exxon Identification No. 72702-L



Luderick-1

FIGURE 10 Cuttings Extract, 2,630-2,645 m.

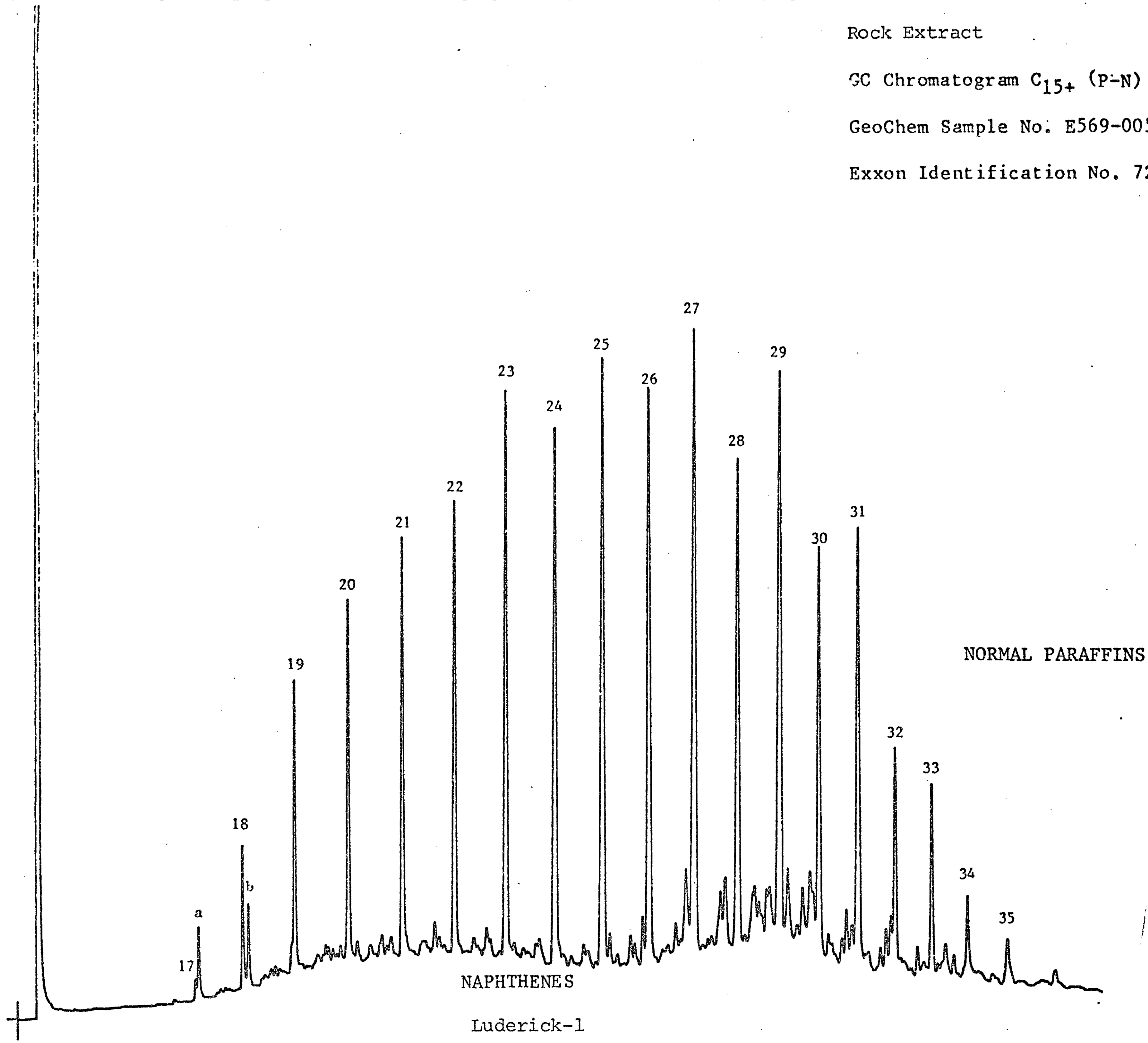
Latrobe Group

Rock Extract

GC Chromatogram C_{15+} (P-N) Hydrocarbon

GeoChem Sample No. E569-005

Exxon Identification No. 72703-D



Luderick-1

FIGURE 11 Cuttings Extract, 2,900-2,915 m.

Latrobe Group

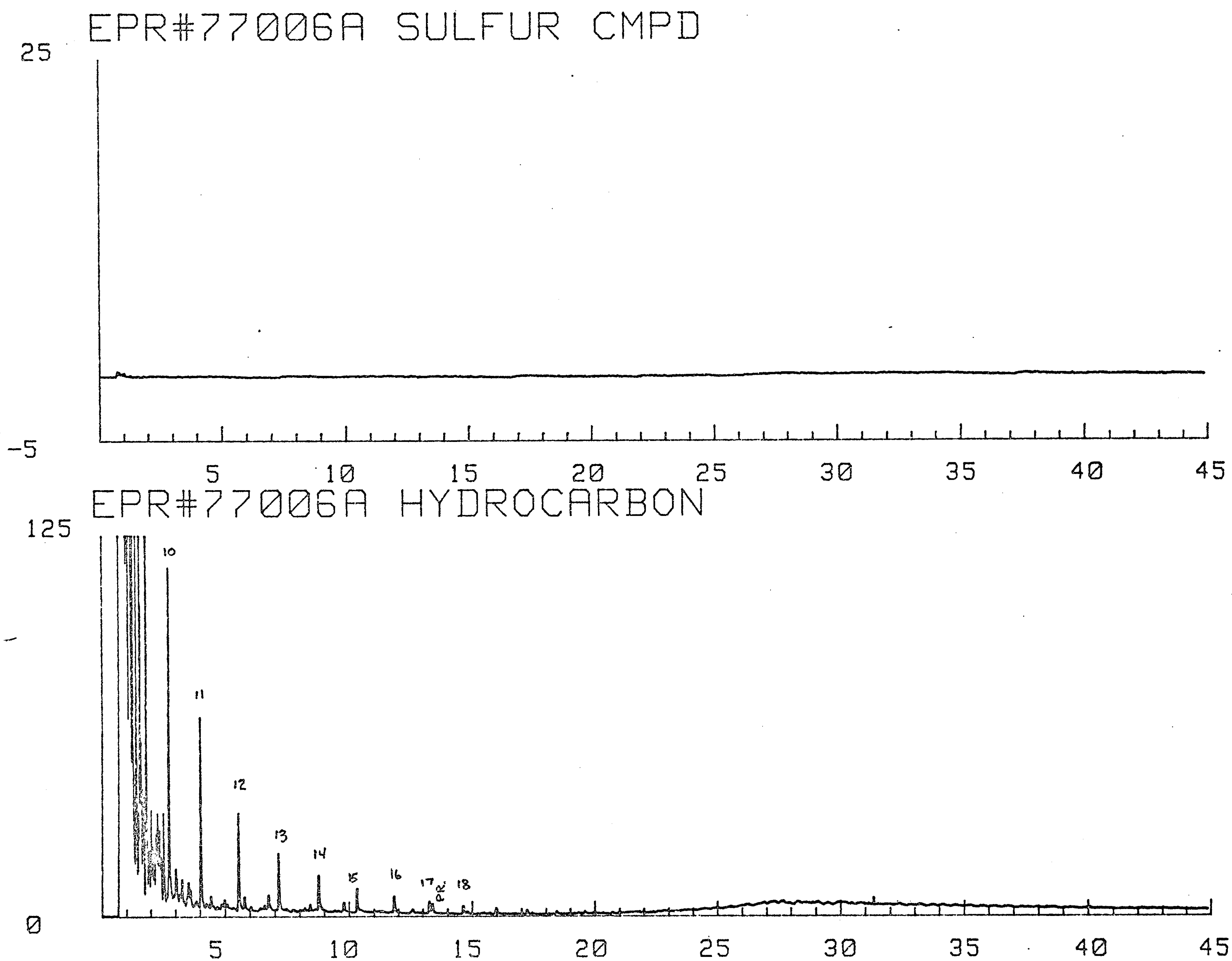


Figure 12. Luderick-1, RFT 2/36, 1838.5m, condensate, "whole oil" Chromatogram

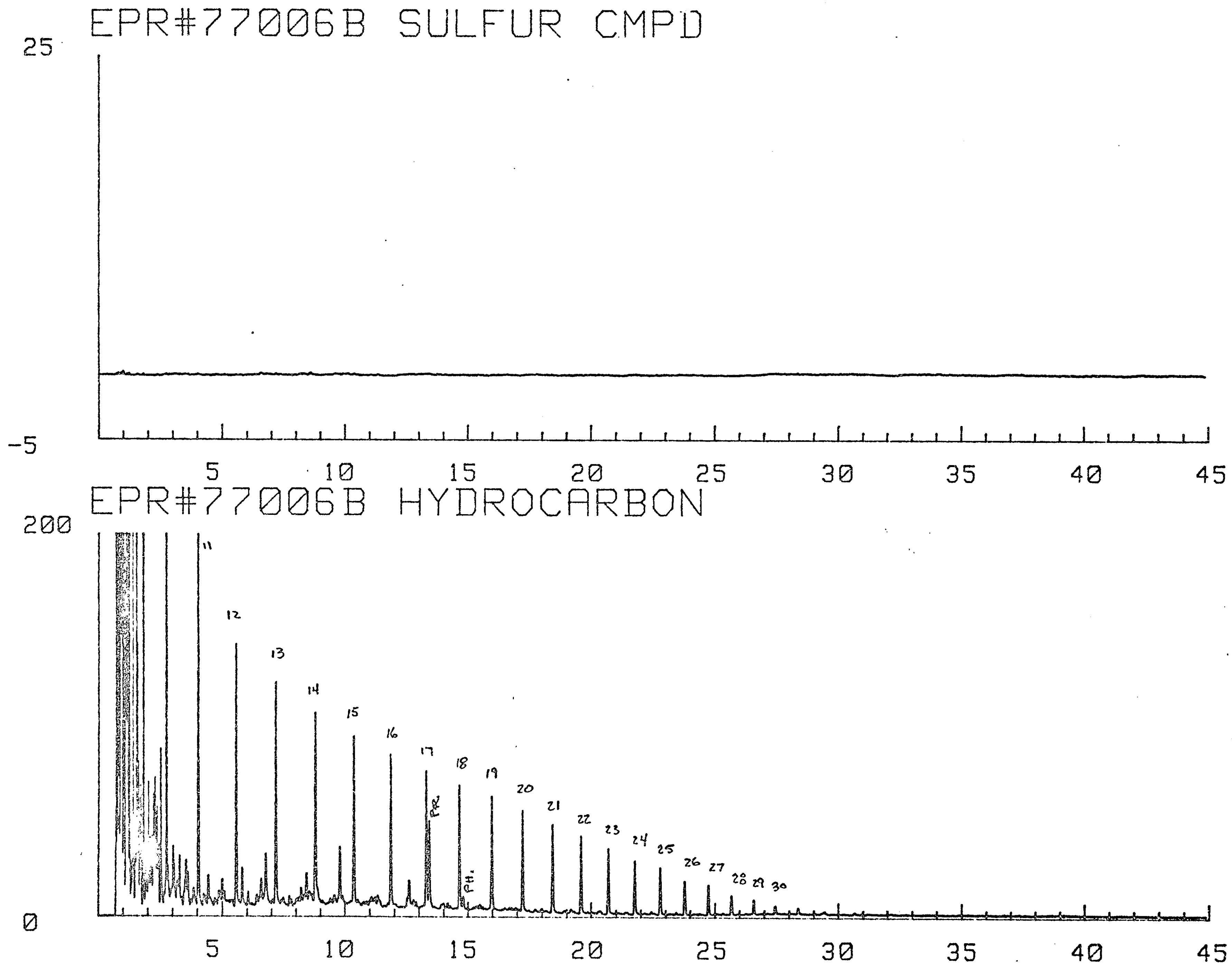
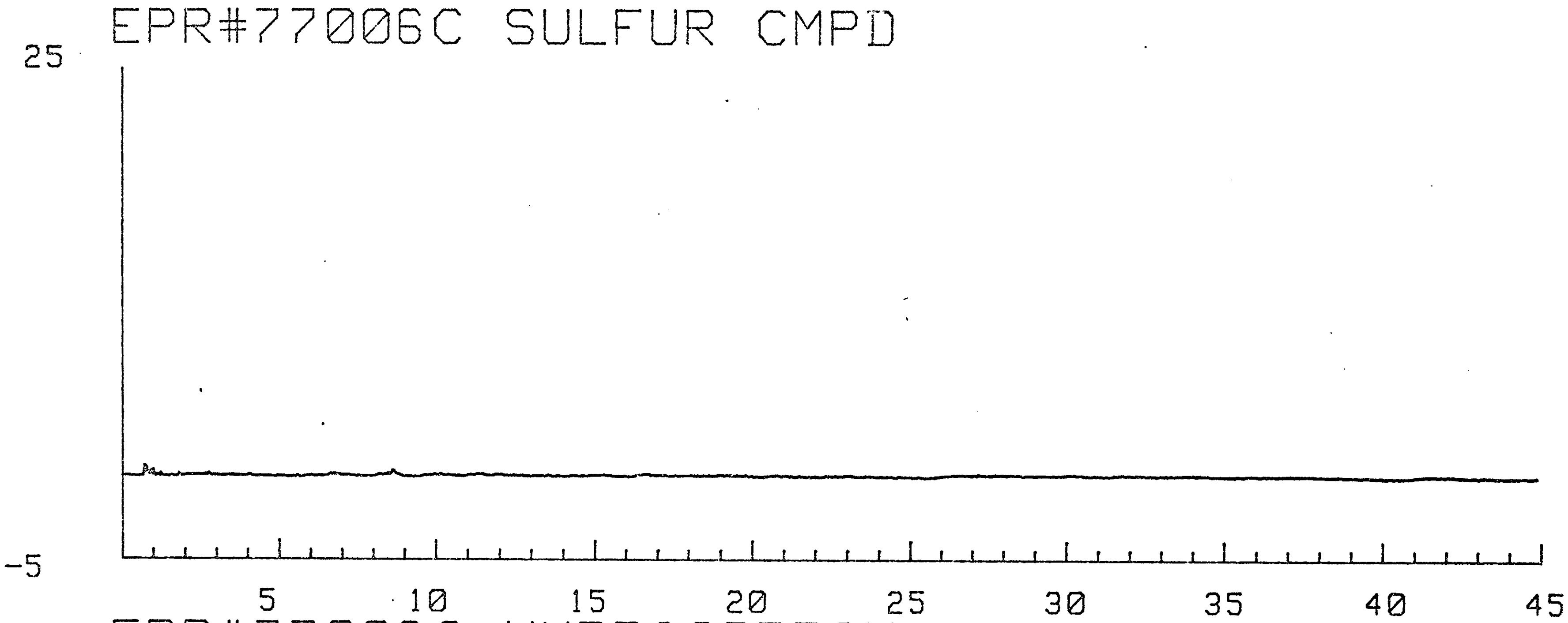


Figure 13 : Luderick-1, RFT 6/41, 1843m, "whole oil" gas chromatogram



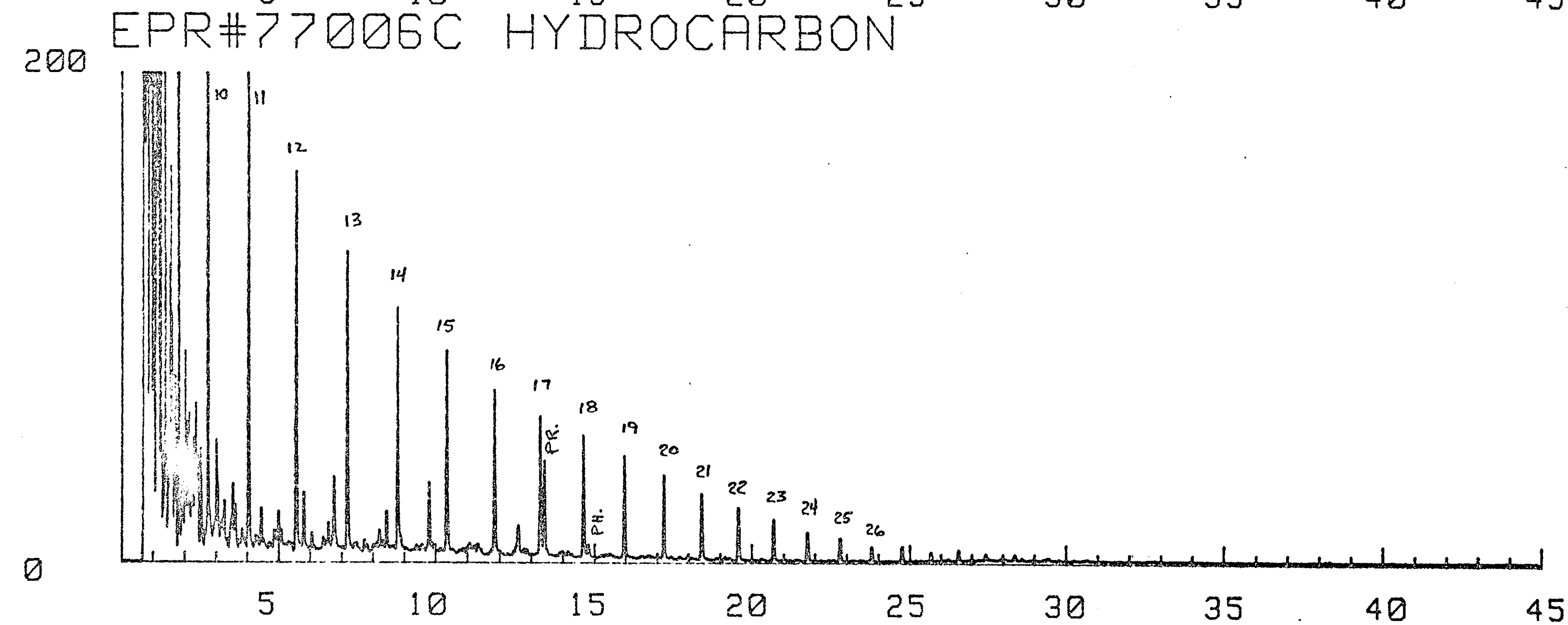


Figure 14 : Luderick-1, RFT 7/42, 2018m,"whole oil" gas chromatogram

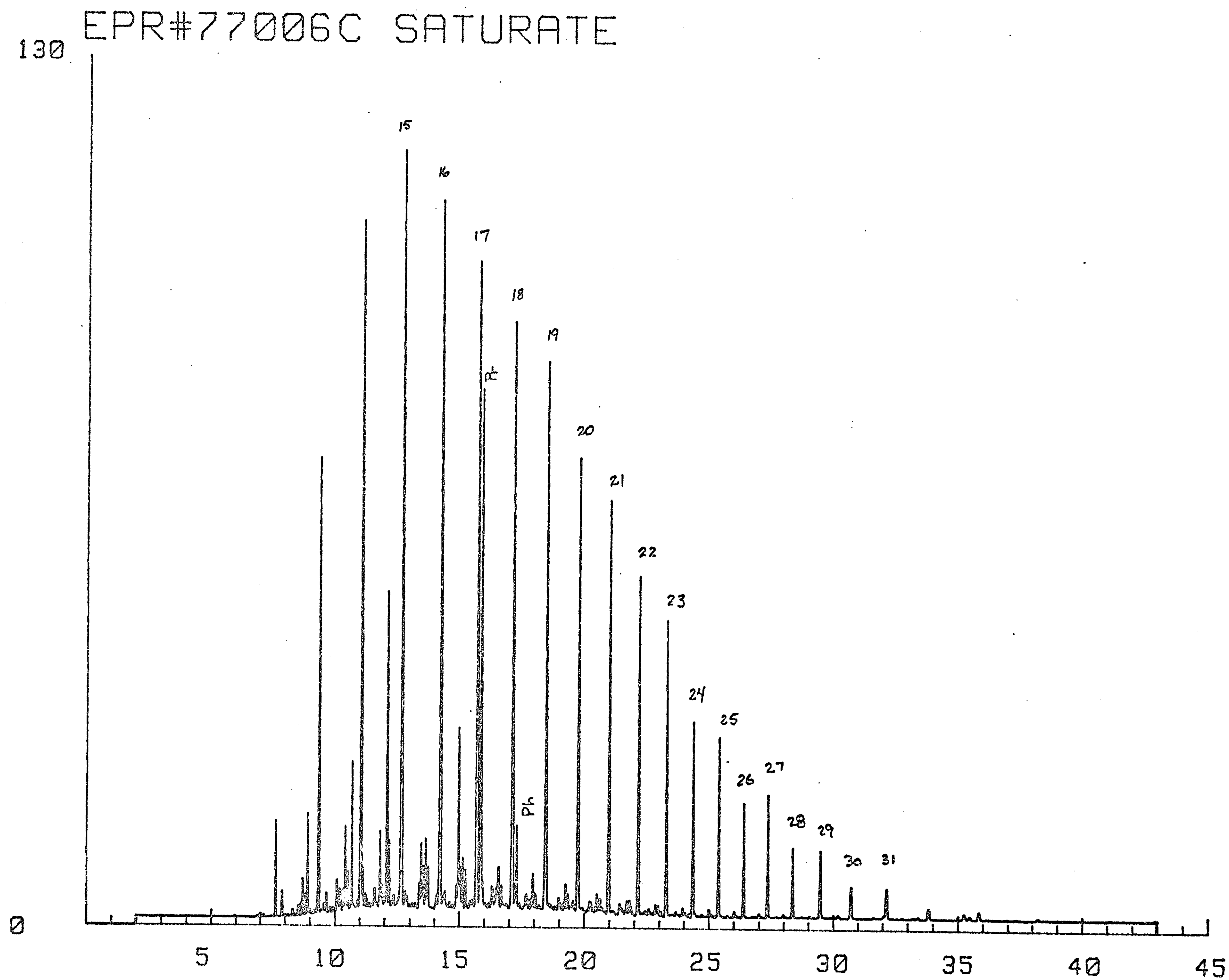


Figure 15 : Luderick-1 oil, RFT 7/42, 2018m (KB), C_{15+} saturate chromatogram.

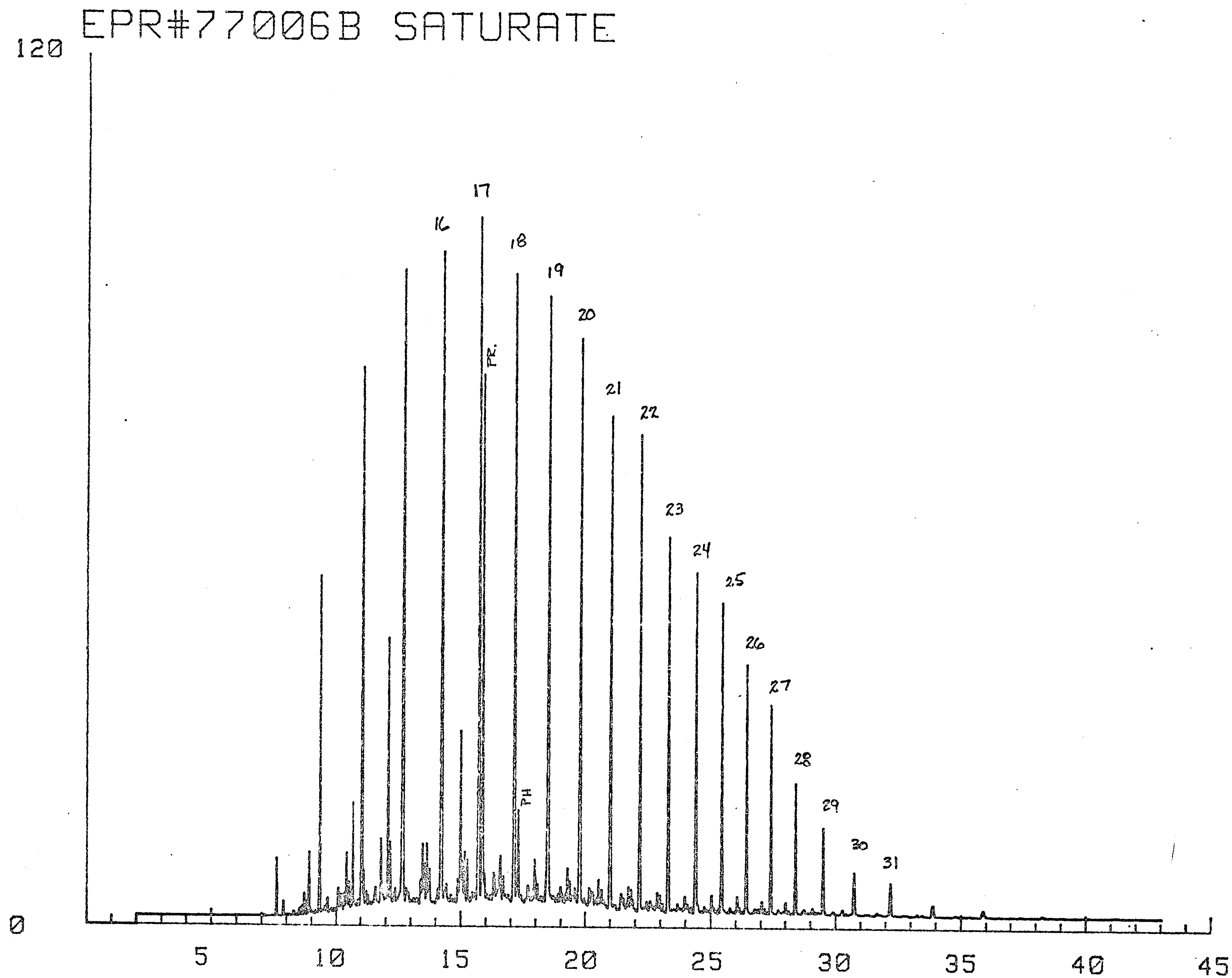


Figure 16 : Luderick-1, oil, RFT 6/41, 1843m(KB), C_{15+} saturate chromatogram.

APPENDIX-1

Detailed C_{4-7} gasoline-range

hydrocarbon data sheets

29 SEP 83

726990 AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 1505M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	0.0	0.00
NBUTANE	45.8	5.88
IPENTANE	142.9	18.33
NPENTANE	65.7	8.44
22-DMB	2.1	0.26
CPENTANE	4.0	0.51
23-DMB	8.1	1.03
2-MP	62.7	8.05
3-MP	26.9	3.45
NHEXANE	74.4	9.55
MCP	40.4	5.19
22-DMP	0.0	0.00
24-DMP	4.1	0.53
223-TMB	0.0	0.00
CHEXANE	15.2	1.95
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	29.6	3.80
23-DMP ,	11.4	1.46
3-MHEX ,	25.4	3.26
1C3-DMCP	12.2	1.56
1T3-DMCP	10.1	1.30
1T2-DMCP	11.7	1.50
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	0.0	0.00
1C2-DMCP	94.1	12.07
MCH	92.6	11.88

	TOTALS PPB	NORM PERCENT
ALL COMP	779.	
GASOLINE	779.	
NAPHTHENES	280.	35.96
C6-7	421.	54.05

SIG COMP RATIOS	
C1/C2	0.82
A /D2	2.93
C1/D2	5.41
CH/MCP	0.38
PENT/IPENT,	0.46

	PPB	NORM PERCENT
MCP	40.4	27.3
CH	15.2	10.3
MCH	92.6	62.5
TOTAL	148.2	100.0

PARAFFIN INDEX 1 1.620
PARAFFIN INDEX 2 0.000

29 SEP 83

726990 AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 1535M

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	8.1	1.42
ETHANE	0.0		1T2-DMCP	9.7	1.68
PROPANE	0.0		3-EPENT	0.0	0.00
IBUTANE	0.0	0.00	224-TMP	0.0	0.00
NBUTANE	0.0	0.00	NHEPTANE	0.0	0.00
IPENTANE	134.6	23.47	1C2-DMCP	58.0	10.11
NPENTANE	60.7	10.59	MCH	38.7	6.74
22-DMB	1.9	0.33			
CPENTANE	3.7	0.65			
23-DMB	7.5	1.31			
2-MP	60.5	10.55			
3-MP	23.0	4.01			
NHEXANE	68.6	11.97			
MCP	35.7	6.23			
22-DMP	0.0	0.00			
24-DMP	2.7	0.48			
223-TMB	0.0	0.00			
CHEXANE	6.7	1.17			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	17.8	3.10			
23-DMP ,	9.9	1.72			
3-MHEX ,	15.0	2.61			
1C3-DMCP	10.7	1.87			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	574.		C1/C2	0.52
GASOLINE	574.		A /D2	4.58
NAPHTHENES	171.	29.87	C1/D2	4.22
C6-7	282.	49.09	CH/MCP	0.19
			PENT/IPENT,	0.45

	PPB	NORM PERCENT
MCP	35.7	44.0
CH	6.7	8.2
MCH	38.7	47.7
TOTAL	81.1	100.0

PARAFFIN INDEX 1 1.149
PARAFFIN INDEX 2 0.000

29 SEP 83

726998 AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 1565M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	0.0	0.00
NBUTANE	0.0	0.00
IPENTANE	80.9	15.84
NPENTANE	51.2	10.03
22-DMB	0.0	0.00
CPENTANE	2.7	0.52
23-DMB	6.2	1.22
2-MP	44.7	8.75
3-MP	18.6	3.65
NHEXANE	60.8	11.91
MCP	29.3	5.73
22-DMP	0.0	0.00
24-DMP	3.0	0.60
223-TMB	0.0	0.00
CHEXANE	7.4	1.44
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	16.7	3.27
23-DMP ,	10.3	2.01
3-MHEX ,	16.4	3.22
1C3-DMCP	15.6	3.05

	TOTAL PPB	NORM PERCENT
1T3-DMCP	11.6	2.28
1T2-DMCP	8.5	1.67
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	58.1	11.39
1C2-DMCP	0.0	0.00
MCH	68.6	13.43

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	511.		C1/C2	1.43
GASOLINE	511.		A /D2	7.25
NAPHTHENES	144.	28.12	C1/D2	5.64
C6-7	306.	59.99	CH/MCP	0.25
			PENT/IPENT,	0.63

	PPB	NORM PERCENT
MCP	29.3	27.8
CH	7.4	7.0
MCH	68.6	65.2
TOTAL	105.3	100.0

PARAFFIN INDEX 1 0.928
PARAFFIN INDEX 2 27.263

29 SEP 83

72699U AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 1595M

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	9.0	2.00
ETHANE	0.0		1T2-DMCP	9.6	2.14
PROPANE	0.0		3-EPENT	0.0	0.00
IBUTANE	0.0	0.00	224-TMP	0.0	0.00
NBUTANE	0.0	0.00	NHEPTANE	73.5	16.41
IPENTANE	52.2	11.66	1C2-DMCP	0.0	0.00
NPENTANE	33.1	7.40	MCH	73.8	16.48
22-DMB	0.0	0.00			
CPENTANE	0.9	0.20			
23-DMB	4.2	0.93			
2-MP	35.8	7.99			
3-MP	17.3	3.87			
NHEXANE	48.9	10.91			
MCP	24.4	5.45			
22-DMP	0.0	0.00			
24-DMP	2.1	0.46			
223-TMB	0.0	0.00			
CHEXANE	6.7	1.49			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	16.9	3.78			
23-DMP ,	10.3	2.31			
3-MHEX ,	15.5	3.46			
1C3-DMCP	13.6	3.04			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	448.		C1/C2	1.72
GASOLINE	448.		A /D2	7.89
NAPHTHENES	138.	30.80	C1/D2	6.28
C6-7	304.	67.94	CH/MCP	0.27
			PENT/IPENT,	0.63

	PPB	NORM PERCENT
MCP	24.4	23.3
CH	6.7	6.4
MCH	73.8	70.4
TOTAL	104.9	100.0

PARAFFIN INDEX 1 1.009
PARAFFIN INDEX 2 32.103

29 SEP 83

72699W AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 1640M

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	6.1	1.16
ETHANE	0.0		1T2-DMCP	5.6	1.07
PROPANE	0.0		3-EPENT	0.0	0.00
IBUTANE	0.0	0.00	224-TMP	0.0	0.00
NBUTANE	29.2	5.57	NHEPTANE	30.2	5.77
IPENTANE	144.6	27.60	1C2-DMCP	0.0	0.00
NPENTANE	63.2	12.06	MCH	6.8	1.29
22-DMB	0.0	0.00			
CPENTANE	2.6	0.49			
23-DMB	8.7	1.67			
2-MP	64.4	12.28			
3-MP	25.2	4.80			
NHEXANE	67.2	12.82			
MCP	34.5	6.58			
22-DMP	0.0	0.00			
24-DMP	2.4	0.45			
223-TMB	0.0	0.00			
CHEXANE	0.0	0.00			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	11.4	2.18			
23-DMP ,	7.0	1.33			
3-MHEX ,	8.8	1.68			
1C3-DMCP	6.2	1.19			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	524.		C1/C2	0.35
GASOLINE	524.		A /D2	11.05
NAPHTHENES	62.	11.79	C1/D2	2.06
C6-7	186.	35.53	CH/MCP	0.00
			PENT/IPENT,	0.44

	PPB	NORM PERCENT
MCP	34.5	83.6
CH	0.0	0.0
MCH	6.8	16.4
TOTAL	41.3	100.0

PARAFFIN INDEX 1 1.127
PARAFFIN INDEX 2 36.802

29 SEP 83

72699Y AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 1655M

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	14.0	2.15
ETHANE	0.0		1T2-DMCP	15.2	2.33
PROPANE	0.0		3-EPENT	0.0	0.00
IBUTANE	0.0	0.00	224-TMP	0.0	0.00
NBUTANE	32.5	4.98	NHEPTANE	54.0	8.28
IPENTANE	137.6	21.10	1C2-DMCP	0.0	0.00
NPENTANE	59.8	9.18	MCH	72.3	11.09
22-DMB	0.0	0.00			
CPENTANE	4.3	0.65			
23-DMB	8.2	1.26			
2-MP	53.8	8.25			
3-MP	23.5	3.60			
NHEXANE	60.7	9.32			
MCP	46.6	7.15			
22-DMP	0.0	0.00			
24-DMP	3.2	0.49			
223-TMB	0.0	0.00			
CHEXANE	12.0	1.84			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	16.3	2.50			
23-DMP ,	9.9	1.52			
3-MHEX ,	12.6	1.94			
1C3-DMCP	15.6	2.39			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	652.		C1/C2	1.10
GASOLINE	652.		A /D2	9.09
NAPHTHENES	180.	27.60	C1/D2	7.97
C6-7	332.	50.97	CH/MCP	0.26
			PENT/IPENT,	0.43

	PPB	NORM PERCENT
MCP	46.6	35.6
CH	12.0	9.2
MCH	72.3	55.2
TOTAL	130.9	100.0

PARAFFIN INDEX 1 0.645
PARAFFIN INDEX 2 24.330

29 SEP 83

72700A AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 1685M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	0.0	0.00
NBUTANE	0.0	0.00
IPENTANE	138.5	18.23
NPENTANE	57.6	7.58
22-DMB	1.1	0.15
CPENTANE	3.3	0.43
23-DMB	11.2	1.47
2-MP	71.8	9.45
3-MP	25.7	3.38
NHEXANE	75.7	9.96
MCP	60.9	8.01
22-DMP	0.0	0.00
24-DMP	3.8	0.50
223-TMB	0.0	0.00
CHEXANE	11.9	1.56
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	19.2	2.53
23-DMP ,	18.2	2.40
3-MHEX ,	18.5	2.44
1C3-DMCP	19.7	2.59
1T3-DMCP	18.6	2.45
1T2-DMCP	29.6	3.89
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	90.7	11.93
1C2-DMCP	0.0	0.00
MCH	83.8	11.02

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	760.		C1/C2	0.89
GASOLINE	760.		A /D2	8.97
NAPHTHENES	228.	29.96	C1/D2	6.19
C6-7	451.	59.30	CH/MCP	0.19
			PENT/IPENT,	0.42

	PPB	NORM PERCENT
MCP	60.9	38.9
CH	11.9	7.6
MCH	83.8	53.5
TOTAL	156.6	100.0

PARAFFIN INDEX 1 0.557
PARAFFIN INDEX 2 29.224

29 SEP 83

72700C AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 1715M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	0.0	0.00
NBUTANE	0.0	0.00
IPENTANE	176.4	28.50
NPENTANE	77.1	12.46
22-DMB	2.5	0.41
CPENTANE	1.4	0.22
23-DMB	7.1	1.15
2-MP	68.1	11.00
3-MP	24.8	4.00
NHEXANE	73.6	11.90
MCP	53.9	8.70
22-DMP	0.0	0.00
24-DMP	3.7	0.60
223-TMB	0.0	0.00
CHEXANE	6.3	1.02
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	12.2	1.98
23-DMP ,	9.7	1.57
3-MHEX ,	12.1	1.95
1C3-DMCP	8.8	1.42

	TOTAL PPB	NORM PERCENT
1T3-DMCP	7.0	1.13
1T2-DMCP	7.8	1.26
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	43.2	6.97
1C2-DMCP	0.0	0.00
MCH	23.2	3.74

	TOTALS PPB	NORM PERCENT
ALL COMP	619.	
GASOLINE	619.	
NAPHTHENES	108.	17.51
C6-7	262.	42.26

SIG COMP RATIOS

C1/C2	0.54
A /D2	9.67
C1/D2	3.45
CH/MCP	0.12
PENT/IPENT,	0.44

	PPB	NORM PERCENT
MCP	53.9	64.6
CH	6.3	7.6
MCH	23.2	27.8
TOTAL	83.4	100.0

PARAFFIN INDEX 1 1.029
PARAFFIN INDEX 2 33.116

29 SEP 83

72700E AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 1745M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	43.9	3.29
NBUTANE	49.1	3.69
IPENTANE	269.0	20.19
NPENTANE	132.0	9.91
22-DMB	3.7	0.28
CPENTANE	9.9	0.74
23-DMB	20.9	1.57
2-MP	128.4	9.64
3-MP	40.3	3.02
NHEXANE	126.3	9.48
MCP	133.0	9.98
22-DMP	0.0	0.00
24-DMP	6.8	0.51
223-TMB	0.0	0.00
CHEXANE	21.7	1.63
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	26.5	1.99
23-DMP ,	21.5	1.61
3-MHEX ,	24.8	1.86
1C3-DMCP	22.6	1.69
1T3-DMCP	21.4	1.61
1T2-DMCP	26.9	2.02
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	129.4	9.72
1C2-DMCP	0.0	0.00
MCH	74.1	5.56

	TOTALS PPB	NORM PERCENT
ALL COMP	1332.	
GASOLINE	1332.	
NAPHTHENES	310.	23.24
C6-7	635.	47.67

SIG COMP RATIOS

C1/C2	0.60
A /D2	10.32
C1/D2	4.94
CH/MCP	0.16
PENT/IPENT,	0.49

	PPB	NORM PERCENT
MCP	133.0	58.1
CH	21.7	9.5
MCH	74.1	32.4
TOTAL	228.8	100.0

PARAFFIN INDEX 1 0.723
PARAFFIN INDEX 2 35.081

29 SEP 83

727006 AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 1775M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	51.3	5.78
NBUTANE	48.3	5.45
IPENTANE	152.4	17.18
NPENTANE	69.5	7.84
22-DMB	1.4	0.16
CPENTANE	7.5	0.85
23-DMB	11.9	1.35
2-MP	72.6	8.18
3-MP	26.1	2.95
NHEXANE	67.1	7.57
MCP	77.1	8.69
22-DMP	0.0	0.00
24-DMP	4.6	0.52
223-TMB	0.0	0.00
CHEXANE	15.0	1.69
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	21.4	2.41
23-DMP ,	17.2	1.94
3-MHEX ,	18.4	2.07
1C3-DMCP	18.4	2.07

	TOTAL PPB	NORM PERCENT
1T3-DMCP	16.9	1.90
1T2-DMCP	26.1	2.94
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	77.5	8.74
1C2-DMCP	0.0	0.00
MCH	86.1	9.71

	TOTALS PPB	NORM PERCENT
ALL COMP	887.	
GASOLINE	887.	
NAPHTHENES	247.	27.85
C6-7	446.	50.25

SIG COMP RATIOS

C1/C2	0.88
A /D2	7.86
C1/D2	6.66
CH/MCP	0.19
PENT/IPENT,	0.46

	PPB	NORM PERCENT
MCP	77.1	43.3
CH	15.0	8.4
MCH	86.1	48.3
TOTAL	178.2	100.0

PARAFFIN INDEX 1 0.648
PARAFFIN INDEX 2 26.112

29 SEP 83

727001 AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 1805M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	115.4	3.10
NBUTANE	410.6	11.03
IPENTANE	539.1	14.48
NPENTANE	551.2	14.80
22-DMB	11.6	0.31
CPENTANE	67.3	1.81
23-DMB	42.6	1.14
2-MP	230.5	6.19
3-MP	106.4	2.86
NHEXANE	294.3	7.91
MCP	303.2	8.14
22-DMP	0.0	0.00
24-DMP	5.5	0.15
223-TMB	0.0	0.00
CHEXANE	294.7	7.91
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	43.8	1.18
23-DMP ,	35.4	0.95
3-MHEX ,	34.7	0.93
1C3-DMCP	27.8	0.75

	TOTAL PPB	NORM PERCENT
1T3-DMCP	46.4	1.25
1T2-DMCP	40.3	1.08
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	129.9	3.49
1C2-DMCP	6.8	0.18
MCH	385.6	10.36

	TOTALS PPB	NORM PERCENT
ALL COMP	3723.	
GASOLINE	3723.	
NAPHTHENES	1172.	31.48
C6-7	1648.	44.28

SIG COMP RATIOS

C1/C2	1.71
A /D2	12.21
C1/D2	20.85
CH/MCP	0.97
PENT/IPENT,	1.02

	PPB	NORM PERCENT
MCP	303.2	30.8
CH	294.7	30.0
MCH	385.6	39.2
TOTAL	983.5	100.0

PARAFFIN INDEX 1 0.686
PARAFFIN INDEX 2 12.506

29 SEP 83

72700K AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 1835M

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	280.7	1.15
ETHANE	237.8		1T2-DMCP	518.0	2.13
PROPANE	583.5		3-EPENT	0.0	0.00
IBUTANE	501.8	2.06	224-TMP	0.0	0.00
NBUTANE	1819.6	7.47	NHEPTANE	1818.3	7.47
IPENTANE	1703.5	7.00	1C2-DMCP	61.5	0.25
NPENTANE	2605.3	10.70	MCH	4093.1	16.81
22-DMB	55.3	0.23			
CPENTANE	299.7	1.23			
23-DMB	226.6	0.93			
2-MP	1422.9	5.84			
3-MP	701.2	2.88			
NHEXANE	2478.4	10.18			
MCP	2043.9	8.39			
22-DMP	0.0	0.00			
24-DMP	42.6	0.17			
223-TMB	12.2	0.05			
CHEXANE	2123.1	8.72			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	472.3	1.94			
23-DMP ,	304.3	1.25			
3-MHEX ,	468.2	1.92			
1C3-DMCP	301.4	1.24			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	25175.		C1/C2	2.09
GASOLINE	24354.		A /D2	9.18
NAPHTHENES	9721.	39.92	C1/D2	14.29
C6-7	15018.	61.67	CH/MCP	1.04
			PENT/IPENT,	1.53

	PPB	NORM PERCENT
MCP	2043.9	24.7
CH	2123.1	25.7
MCH	4093.1	49.6
TOTAL	8260.1	100.0

PARAFFIN INDEX 1 0.855
PARAFFIN INDEX 2 17.518

29 SEP 83

72700M AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 1880M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	0.0	0.00
NBUTANE	0.0	0.00
IPENTANE	63.4	14.26
NPENTANE	40.3	9.06
22-DMB	0.8	0.19
CPENTANE	4.8	1.08
23-DMB	5.4	1.21
2-MP	42.9	9.66
3-MP	15.9	3.57
NHEXANE	52.4	11.78
MCP	34.7	7.80
22-DMP	0.0	0.00
24-DMP	1.4	0.31
223-TMB	0.0	0.00
CHEXANE	16.0	3.61
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	14.5	3.27
23-DMP ,	8.8	1.98
3-MHEX ,	10.7	2.41
1C3-DMCP	8.1	1.83

	TOTAL PPB	NORM PERCENT
1T3-DMCP	7.4	1.66
1T2-DMCP	7.7	1.73
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	53.7	12.07
1C2-DMCP	0.0	0.00
MCH	55.6	12.52

	TOTALS PPB	NORM PERCENT
ALL COMP	444.	
GASOLINE	444.	
NAPHTHENES	134.	30.22
C6-7	271.	60.96

SIG COMP RATIOS

C1/C2	1.49
A /D2	9.89
C1/D2	8.04
CH/MCP	0.46
PENT/IPENT,	0.64

	PPB	NORM PERCENT
MCP	34.7	32.6
CH	16.0	15.1
MCH	55.6	52.3
TOTAL	106.3	100.0

PARAFFIN INDEX 1 1.089
PARAFFIN INDEX 2 29.403

29 SEP 83

727000 AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 1910M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	32.0	3.57
NBUTANE	45.8	5.12
IPENTANE	128.2	14.32
NPENTANE	76.3	8.52
22-DMB	2.4	0.27
CPENTANE	8.2	0.92
23-DMB	8.7	0.98
2-MP	74.9	8.37
3-MP	29.6	3.31
NHEXANE	82.5	9.21
MCP	62.5	6.98
22-DMP	0.0	0.00
24-DMP	2.6	0.29
223-TMB	0.0	0.00
CHEXANE	24.2	2.70
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	25.2	2.82
23-DMP ,	16.1	1.80
3-MHEX ,	18.5	2.07
1C3-DMCP	16.0	1.79
1T3-DMCP	16.0	1.78
1T2-DMCP	15.0	1.67
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	106.7	11.92
1C2-DMCP	0.0	0.00
MCH	103.9	11.60

	TOTALS PPB	NORM PERCENT
ALL COMP	896.	
GASOLINE	896.	
NAPHTHENES	246.	27.45
C6-7	489.	54.63

SIG COMP RATIOS	
C1/C2	1.40
A /D2	10.20
C1/D2	8.27
CH/MCP	0.39
PENT/IPENT,	0.60

	PPB	NORM PERCENT
MCP	62.5	32.8
CH	24.2	12.7
MCH	103.9	54.5
TOTAL	190.6	100.0

PARAFFIN INDEX 1 0.932
PARAFFIN INDEX 2 31.231

29 SEP 83

727000 AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 1940M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	21838.6	
PROPANE	63493.4	
IBUTANE	27405.6	12.94
NBUTANE	42726.4	20.17
IPENTANE	30155.3	14.24
NPENTANE	19408.1	9.16
22-DMB	391.4	0.18
CPENTANE	3483.8	1.64
23-DMB	2718.5	1.28
2-MP	13696.7	6.47
3-MP	5361.0	2.53
NHEXANE	10133.8	4.78
MCP	15923.5	7.52
22-DMP	0.0	0.00
24-DMP	600.4	0.28
223-TMB	55.5	0.03
CHEXANE	7525.5	3.55
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	2300.5	1.09
23-DMP ,	2840.1	1.34
3-MHEX ,	2556.6	1.21
1C3-DMCP	2835.6	1.34

	TOTAL PPB	NORM PERCENT
1T3-DMCP	2400.8	1.13
1T2-DMCP	2488.2	1.17
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	9260.6	4.37
1C2-DMCP	187.0	0.09
MCH	7367.4	3.48

	TOTALS PPB	NORM PERCENT
ALL COMP	297154.	
GASOLINE	211822.	
NAPHTHENES	42212.	19.93
C6-7	66476.	31.38

SIG COMP RATIOS

C1/C2	0.72
A /D2	7.59
C1/D2	6.73
CH/MCP	0.47
PENT/IPENT,	0.64

	PPB	NORM PERCENT
MCP	15923.5	51.7
CH	7525.5	24.4
MCH	7367.4	23.9
TOTAL	30816.4	100.0

PARAFFIN INDEX 1 0.629
PARAFFIN INDEX 2 23.400

29 SEP 83

727008 AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 1970M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	0.0	0.00
NBUTANE	169.0	10.65
IPENTANE	169.7	10.69
NPENTANE	132.1	8.32
22-DMB	3.1	0.20
CPENTANE	17.8	1.12
23-DMB	19.8	1.24
2-MP	112.7	7.10
3-MP	46.9	2.95
NHEXANE	128.3	8.08
MCP	125.2	7.89
22-DMP	0.0	0.00
24-DMP	7.8	0.49
223-TMB	0.0	0.00
CHEXANE	62.6	3.94
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	58.7	3.70
23-DMP ,	28.0	1.76
3-MHEX ,	40.9	2.58
1C3-DMCP	28.6	1.80

	TOTAL PPB	NORM PERCENT
1T3-DMCP	37.6	2.37
1T2-DMCP	30.4	1.91
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	183.7	11.57
1C2-DMCP	4.3	0.27
MCH	180.5	11.37

	TOTALS PPB	NORM PERCENT
ALL COMP	1588.	
GASOLINE	1588.	
NAPHTHENES	487.	30.68
C6-7	916.	57.73

SIG COMP RATIOS

C1/C2	1.33
A /D2	7.63
C1/D2	7.38
CH/MCP	0.50
PENT/IPENT,	0.78

	PPB	NORM PERCENT
MCP	125.2	34.0
CH	62.6	17.0
MCH	180.5	49.0
TOTAL	368.3	100.0

PARAFFIN INDEX 1 1.031
PARAFFIN INDEX 2 28.221

29 SEP 83

72700U AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 2000M

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	378.4	1.07
ETHANE	0.0		1T2-DMCP	516.6	1.46
PROPANE	2632.3		3-EPENT	0.0	0.00
IBUTANE	3204.8	9.07	224-TMP	0.0	0.00
NBUTANE	5806.1	16.44	NHEPTANE	802.0	2.27
IPENTANE	5533.5	15.66	1C2-DMCP	62.2	0.18
NPENTANE	3959.8	11.21	MCH	1832.5	5.19
22-DMB	224.2	0.63			
CPENTANE	688.0	1.95			
23-DMB	715.8	2.03			
2-MP	2142.7	6.07			
3-MP	985.2	2.79			
NHEXANE	1477.4	4.18			
MCP	2740.9	7.76			
22-DMP	0.0	0.00			
24-DMP	110.4	0.31			
223-TMB	27.4	0.08			
CHEXANE	2389.8	6.77			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	381.1	1.08			
23-DMP ,	545.8	1.55			
3-MHEX ,	359.3	1.02			
1C3-DMCP	441.4	1.25			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	37957.		C1/C2	1.11
GASOLINE	35325.		A /D2	6.34
NAPHTHENES	9050.	25.62	C1/D2	12.81
C6-7	12065.	34.15	CH/MCP	0.87
			PENT/IPENT,	0.72

	PPB	NORM PERCENT
MCP	2740.9	39.4
CH	2389.8	34.3
MCH	1832.5	26.3
TOTAL	6963.2	100.0

PARAFFIN INDEX 1 0.554
PARAFFIN INDEX 2 10.487

29 SEP 83

72700W AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 2030M

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	12.8	0.83
ETHANE	0.0		1T2-DMCP	25.6	1.67
PROPANE	0.0		3-EPENT	0.0	0.00
IBUTANE	0.0	0.00	224-TMP	0.0	0.00
NBUTANE	77.4	5.06	NHEPTANE	144.8	9.45
IPENTANE	152.4	9.95	1C2-DMCP	0.0	0.00
NPENTANE	213.0	13.91	MCH	194.9	12.72
22-DMB	6.4	0.42			
CPENTANE	11.2	0.73			
23-DMB	18.5	1.21			
2-MP	125.8	8.21			
3-MP	64.7	4.22			
NHEXANE	171.4	11.19			
MCP	109.4	7.15			
22-DMP	0.0	0.00			
24-DMP	6.5	0.42			
223-TMB	0.0	0.00			
CHEXANE	87.1	5.69			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	36.9	2.41			
23-DMP ,	20.7	1.35			
3-MHEX ,	33.1	2.16			
1C3-DMCP	19.0	1.24			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	1532.		C1/C2	1.91
GASOLINE	1532.		A /D2	9.56
NAPHTHENES	460.	30.04	C1/D2	9.65
C6-7	862.	56.29	CH/MCP	0.80
			PENT/IPENT,	1.40

	PPB	NORM PERCENT
MCP	109.4	28.0
CH	87.1	22.3
MCH	194.9	49.8
TOTAL	391.4	100.0

PARAFFIN INDEX 1 1.220
PARAFFIN INDEX 2 25.183

29 SEP 83

72700Y AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 2060M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	39276.0	
PROPANE	135348.4	
IBUTANE	84595.6	8.35
NBUTANE	179288.5	17.69
IPENTANE	132715.7	13.09
NPENTANE	154417.5	15.23
22-DMB	1983.6	0.20
CPENTANE	13920.2	1.37
23-DMB	8703.5	0.86
2-MP	60806.1	6.00
3-MP	26912.4	2.65
NHEXANE	84635.9	8.35
MCP	71178.5	7.02
22-DMP	0.0	0.00
24-DMP	788.1	0.08
223-TMB	92.0	0.01
CHEXANE	52228.0	5.15
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	8486.2	0.84
23-DMP ,	5881.6	0.58
3-MHEX ,	8440.6	0.83
1C3-DMCP	7714.8	0.76

	TOTAL PPB	NORM PERCENT
1T3-DMCP	6687.2	0.66
1T2-DMCP	10037.3	0.99
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	34643.8	3.42
1C2-DMCP	911.2	0.09
MCH	58621.8	5.78

	TOTALS PPB	NORM PERCENT
ALL COMP	1188313.	
GASOLINE	1013689.	
NAPHTHENES	221299.	21.83
C6-7	350347.	34.56

SIG COMP RATIOS

C1/C2	1.24
A /D2	14.13
C1/D2	14.14
CH/MCP	0.73
PENT/IPENT,	1.16

	PPB	NORM PERCENT
MCP	71178.5	39.1
CH	52228.0	28.7
MCH	58621.8	32.2
TOTAL	182028.3	100.0

PARAFFIN INDEX 1 0.693

PARAFFIN INDEX 2 17.974

29 SEP 83

72701A AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 2090M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	124.9	
PROPANE	264.0	
IBUTANE	150.6	10.86
NBUTANE	187.9	13.56
IPENTANE	211.4	15.25
NPENTANE	132.4	9.55
22-DMB	2.4	0.17
CPENTANE	13.9	1.00
23-DMB	17.0	1.23
2-MP	105.3	7.60
3-MP	41.2	2.97
NHEXANE	94.3	6.80
MCP	73.3	5.29
22-DMP	0.0	0.00
24-DMP	5.6	0.41
223-TMB	0.0	0.00
CHEXANE	27.5	1.98
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	28.8	2.08
23-DMP ,	21.7	1.56
3-MHEX ,	26.4	1.91
1C3-DMCP	17.6	1.27
1T3-DMCP	14.7	1.06
1T2-DMCP	18.8	1.36
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	100.1	7.22
1C2-DMCP	0.0	0.00
MCH	95.2	6.87

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	1775.		C1/C2	1.22
GASOLINE	1386.		A /D2	7.35
NAPHTHENES	261.	18.83	C1/D2	5.73
C6-7	524.	37.81	CH/MCP	0.38
			PENT/IPENT,	0.63

	PPB	NORM PERCENT
MCP	73.3	37.4
CH	27.5	14.0
MCH	95.2	48.6
TOTAL	196.0	100.0

PARAFFIN INDEX 1 1.080
PARAFFIN INDEX 2 28.528

29 SEP 83

72701C AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 2120M

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	4.9	1.51
ETHANE	0.0		1T2-DMCP	8.3	2.58
PROPANE	0.0		3-EPENT	0.0	0.00
IBUTANE	0.0	0.00	224-TMP	0.0	0.00
NBUTANE	0.0	0.00	NHEPTANE	37.8	11.76
IPENTANE	35.3	11.00	1C2-DMCP	0.0	0.00
NPENTANE	42.8	13.32	MCH	33.1	10.29
22-DMB	0.0	0.00			
CPENTANE	1.9	0.59			
23-DMB	2.2	0.69			
2-MP	30.1	9.37			
3-MP	18.4	5.73			
NHEXANE	34.1	10.62			
MCP	20.4	6.34			
22-DMP	0.0	0.00			
24-DMP	1.4	0.45			
223-TMB	0.0	0.00			
CHEXANE	12.9	4.02			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	12.3	3.83			
23-DMP ,	7.1	2.20			
3-MHEX ,	11.5	3.57			
1C3-DMCP	6.8	2.13			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	321.		C1/C2	1.44
GASOLINE	321.		A /D2	6.26
NAPHTHENES	88.	27.47	C1/D2	5.08
C6--7	191.	59.31	CH/MCP	0.63
			PENT/IPENT,	1.21

	PPB	NORM PERCENT
MCP	20.4	30.7
CH	12.9	19.5
MCH	33.1	49.8
TOTAL	66.4	100.0

PARAFFIN INDEX 1 1.190
PARAFFIN INDEX 2 28.059

29 SEP 83

72701E AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 2150M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	113.9	
PROPANE	93.5	
IBUTANE	59.1	4.59
NBUTANE	168.3	13.06
IPENTANE	167.2	12.97
NPENTANE	152.2	11.81
22-DMB	4.3	0.34
CPENTANE	16.3	1.26
23-DMB	13.8	1.07
2-MP	94.7	7.35
3-MP	47.7	3.70
NHEXANE	86.6	6.72
MCP	120.5	9.35
22-DMP	0.0	0.00
24-DMP	3.1	0.24
223-TMB	0.0	0.00
CHEXANE	54.5	4.23
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	22.9	1.77
23-DMP ,	16.8	1.30
3-MHEX ,	23.5	1.82
1C3-DMCP	19.5	1.51

	TOTAL PPB	NORM PERCENT
1T3-DMCP	15.1	1.17
1T2-DMCP	26.0	2.02
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	72.4	5.62
1C2-DMCP	0.0	0.00
MCH	104.4	8.10

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	1496.		C1/C2	1.00
GASOLINE	1289.		A /D2	6.77
NAPHTHENES	356.	27.64	C1/D2	7.74
C6-7	565.	43.86	CH/MCP	0.45
			PENT/IPENT,	0.91

	PPB	NORM PERCENT
MCP	120.5	43.1
CH	54.5	19.5
MCH	104.4	37.4
TOTAL	279.4	100.0

PARAFFIN INDEX 1 0.765
PARAFFIN INDEX 2 20.399

29 SEP 83

727016 AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 2180M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	136.7	
PROPANE	50.5	
IBUTANE	48.8	3.74
NBUTANE	158.2	12.12
IPENTANE	184.5	14.13
NPENTANE	178.3	13.65
22-DMB	4.2	0.32
CPENTANE	20.4	1.57
23-DMB	16.2	1.24
2-MP	101.4	7.76
3-MP	48.9	3.74
NHEXANE	119.8	9.17
MCP	113.3	8.68
22-DMP	0.0	0.00
24-DMP	4.9	0.38
223-TMB	2.9	0.22
CHEXANE	63.5	4.86
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	22.4	1.72
23-DMP ,	15.6	1.19
3-MHEX ,	20.1	1.54
1C3-DMCP	16.8	1.29

	TOTAL PPB	NORM PERCENT
1T3-DMCP	15.8	1.21
1T2-DMCP	15.8	1.21
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	80.8	6.19
1C2-DMCP	0.0	0.00
MCH	53.3	4.08

	TOTALS PPB	NORM PERCENT
ALL COMP	1493.	
GASOLINE	1306.	
NAPHTHENES	299.	22.89
C6-7	545.	41.73

SIG COMP RATIOS	
C1/C2	0.86
A /D2	10.00
C1/D2	6.94
CH/MCP	0.56
PENT/IPENT,	0.97

	PPB	NORM PERCENT
MCP	113.3	49.3
CH	63.5	27.6
MCH	53.3	23.2
TOTAL	230.1	100.0

PARAFFIN INDEX 1	0.878
PARAFFIN INDEX 2	26.569

29 SEP 83

72701H AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 2195M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	26349.2	
PROPANE	240244.3	
IBUTANE	109490.9	12.58
NBUTANE	218186.8	25.07
IPENTANE	116767.9	13.42
NPENTANE	107820.4	12.39
22-DMB	1321.6	0.15
CPENTANE	16516.3	1.90
23-DMB	7866.0	0.90
2-MP	43957.6	5.05
3-MP	23967.4	2.75
NHEXANE	39915.2	4.59
MCP	49805.8	5.72
22-DMP	0.0	0.00
24-DMP	705.3	0.08
223-TMB	87.4	0.01
CHEXANE	33692.3	3.87
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	5920.4	0.68
23-DMP ,	7121.2	0.82
3-MHEX ,	7210.9	0.83
1C3-DMCP	5250.1	0.60

	TOTAL PPB	NORM PERCENT
1T3-DMCP	4902.8	0.56
1T2-DMCP	9018.2	1.04
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	23227.9	2.67
1C2-DMCP	2249.6	0.26
MCH	35368.9	4.06

	TOTALS PPB	NORM PERCENT
ALL COMP	1136963.	
GASOLINE	870370.	
NAPHTHENES	156804.	18.02
C6-7	224476.	25.79

SIG COMP RATIOS	
C1/C2	1.05
A /D2	8.76
C1/D2	10.40
CH/MCP	0.68
PENT/IPENT,	0.92

	PPB	NORM PERCENT
MCP	49805.8	41.9
CH	33692.3	28.3
MCH	35368.9	29.8
TOTAL	118867.0	100.0

PARAFFIN INDEX 1 0.685
PARAFFIN INDEX 2 17.635

29 SEP 83

72701J AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 2225M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	140.4	
PROPANE	103.6	
IBUTANE	71.2	5.66
NBUTANE	159.6	12.68
IPENTANE	140.4	11.16
NPENTANE	153.3	12.18
22-DMB	2.7	0.22
CPENTANE	18.0	1.43
23-DMB	11.9	0.94
2-MP	86.0	6.83
3-MP	51.8	4.11
NHEXANE	81.6	6.49
MCP	104.3	8.29
22-DMP	0.0	0.00
24-DMP	2.0	0.16
223-TMB	0.0	0.00
CHEXANE	51.9	4.13
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	24.5	1.95
23-DMP ,	17.9	1.43
3-MHEX ,	23.6	1.87
1C3-DMCP	18.6	1.48

	TOTAL PPB	NORM PERCENT
1T3-DMCP	15.0	1.19
1T2-DMCP	31.9	2.54
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	72.4	5.75
1C2-DMCP	0.0	0.00
MCH	119.7	9.51

	TOTALS PPB	NORM PERCENT
ALL COMP	1502.	
GASOLINE	1258.	
NAPHTHENES	359.	28.57
C6-7	563.	44.78

SIG COMP RATIOS	
C1/C2	1.15
A /D2	6.54
C1/D2	8.33
CH/MCP	0.50
PENT/IPENT,	1.09

	PPB	NORM PERCENT
MCP	104.3	37.8
CH	51.9	18.8
MCH	119.7	43.4
TOTAL	275.9	100.0

PARAFFIN INDEX 1 0.734
PARAFFIN INDEX 2 19.268

29 SEP 83

72701N AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 2285M

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	8.2	1.25
ETHANE	0.0		1T2-DMCP	20.3	3.09
PROPANE	0.0		3-EPENT	0.0	0.00
IBUTANE	33.3	5.07	224-TMP	0.0	0.00
NBUTANE	51.5	7.84	NHEPTANE	30.6	4.66
IPENTANE	81.0	12.35	1C2-DMCP	0.0	0.00
NPENTANE	60.7	9.26	MCH	73.7	11.24
22-DMB	0.2	0.03			
CPENTANE	10.7	1.63			
23-DMB	7.1	1.08			
2-MP	54.5	8.31			
3-MP	31.6	4.82			
NHEXANE	42.4	6.47			
MCP	75.4	11.49			
22-DMP	0.0	0.00			
24-DMP	0.0	0.00			
223-TMB	0.0	0.00			
CHEXANE	29.6	4.52			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	13.6	2.07			
23-DMP ,	7.7	1.17			
3-MHEX ,	12.8	1.96			
1C3-DMCP	11.0	1.68			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	656.		C1/C2	1.02
GASOLINE	656.		A /D2	5.68
NAPHTHENES	229.	34.91	C1/D2	9.11
C6-7	325.	49.60	CH/MCP	0.39
			PENT/IPENT,	0.75

	PPB	NORM PERCENT
MCP	75.4	42.2
CH	29.6	16.6
MCH	73.7	41.2
TOTAL	178.7	100.0

PARAFFIN INDEX 1 0.669
PARAFFIN INDEX 2 14.724

29 SEP 83

72701P AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 2315M

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	32.2	2.05
ETHANE	83.5		1T2-DMCP	66.3	4.22
PROPANE	94.0		3-EPENT	0.0	0.00
IBUTANE	52.5	3.35	224-TMP	0.0	0.00
NBUTANE	115.5	7.36	NHEPTANE	76.0	4.84
IPENTANE	157.2	10.01	1C2-DMCP	5.6	0.36
NPENTANE	136.7	8.71	MCH	162.8	10.37
22-DMB	1.3	0.08			
CPENTANE	20.7	1.32			
23-DMB	18.7	1.19			
2-MP	134.3	8.56			
3-MP	78.2	4.98			
NHEXANE	97.7	6.23			
MCP	201.2	12.82			
22-DMP	0.0	0.00			
24-DMP	4.8	0.31			
223-TMB	0.0	0.00			
CHEXANE	72.4	4.61			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	33.7	2.15			
23-DMP ,	25.6	1.63			
3-MHEX ,	43.0	2.74			
1C3-DMCP	33.1	2.11			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	1747.		C1/C2	0.79
GASOLINE	1570.		A /D2	4.04
NAPHTHENES	594.	37.86	C1/D2	6.25
C6-7	854.	54.44	CH/MCP	0.36
			PENT/IPENT,	0.87

	PPB	NORM PERCENT
MCP	201.2	46.1
CH	72.4	16.6
MCH	162.8	37.3
TOTAL	436.4	100.0

PARAFFIN INDEX 1 0.583
PARAFFIN INDEX 2 13.942

29 SEP 83

72701R AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 2345M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	165.8	
PROPANE	431.1	
IBUTANE	284.4	6.97
NBUTANE	607.0	14.87
IPENTANE	664.8	16.29
NPENTANE	550.5	13.49
22-DMB	10.3	0.25
CPENTANE	100.5	2.46
23-DMB	50.3	1.23
2-MP	333.2	8.16
3-MP	186.7	4.57
NHEXANE	260.2	6.38
MCP	463.1	11.35
22-DMP	0.0	0.00
24-DMP	5.4	0.13
223-TMB	0.0	0.00
CHEXANE	119.4	2.93
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	58.6	1.44
23-DMP ,	32.3	0.79
3-MHEX ,	51.5	1.26
1C3-DMCP	39.2	0.96
1T3-DMCP	35.8	0.88
1T2-DMCP	62.2	1.52
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	90.8	2.23
1C2-DMCP	0.0	0.00
MCH	75.5	1.85

	TOTALS PPB	NORM PERCENT
ALL COMP	4679.	
GASOLINE	4082.	
NAPHTHENES	896.	21.94
C6-7	1294.	31.70

SIG COMP RATIOS	
C1/C2	0.42
A /D2	6.82
C1/D2	4.93
CH/MCP	0.26
PENT/IPENT,	0.83

	PPB	NORM PERCENT
MCP	463.1	70.4
CH	119.4	18.1
MCH	75.5	11.5
TOTAL	658.0	100.0

PARAFFIN INDEX 1 0.802

PARAFFIN INDEX 2 16.067

29 SEP 83

72701T AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 2375M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	31597.0	
PROPANE	92137.8	
IBUTANE	57250.8	9.43
NBUTANE	81145.2	13.36
IPENTANE	87052.7	14.33
NPENTANE	59072.5	9.73
22-DMB	352.6	0.06
CPENTANE	10277.5	1.69
23-DMB	5451.5	0.90
2-MP	49434.2	8.14
3-MP	20622.6	3.40
NHEXANE	35128.7	5.78
MCP	55757.4	9.18
22-DMP	0.0	0.00
24-DMP	663.5	0.11
223-TMB	24.3	0.00
CHEXANE	20760.9	3.42
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	11245.0	1.85
23-DMP ,	6950.2	1.14
3-MHEX ,	10978.2	1.81
1C3-DMCP	7368.2	1.21

	TOTAL PPB	NORM PERCENT
1T3-DMCP	6844.6	1.13
1T2-DMCP	13507.5	2.22
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	25132.4	4.14
1C2-DMCP	3591.8	0.59
MCH	38785.1	6.39

	TOTALS PPB	NORM PERCENT
ALL COMP	731131.	
GASOLINE	607396.	
NAPHTHENES	156893.	25.83
C6-7	236738.	38.98

SIG COMP RATIOS

C1/C2	0.81
A /D2	5.49
C1/D2	6.45
CH/MCP	0.37
PENT/IPENT,	0.68

	PPB	NORM PERCENT
MCP	55757.4	48.4
CH	20760.9	18.0
MCH	38785.1	33.6
TOTAL	115303.4	100.0

PARAFFIN INDEX 1 0.802
PARAFFIN INDEX 2 17.752

29 SEP 83

72701V AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 2405M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	2481.0	
PROPANE	7866.8	
IBUTANE	9470.0	5.10
NBUTANE	13794.8	7.43
IPENTANE	24443.1	13.16
NPENTANE	15200.0	8.18
22-DMB	122.7	0.07
CPENTANE	3037.7	1.64
23-DMB	1795.9	0.97
2-MP	16861.4	9.08
3-MP	7024.3	3.78
NHEXANE	11547.1	6.22
MCP	20406.4	10.98
22-DMP	0.0	0.00
24-DMP	215.8	0.12
223-TMB	11.4	0.01
CHEXANE	7895.3	4.25
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	4310.7	2.32
23-DMP ,	2641.8	1.42
3-MHEX ,	4163.7	2.24
1C3-DMCP	2867.9	1.54

	TOTAL PPB	NORM PERCENT
1T3-DMCP	2706.7	1.46
1T2-DMCP	5780.9	3.11
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	10058.2	5.41
1C2-DMCP	1863.5	1.00
MCH	19548.3	10.52

	TOTALS PPB	NORM PERCENT
ALL COMP	196115.	
GASOLINE	185767.	
NAPHTHENES	64107.	34.51
C6-7	94018.	50.61

SIG COMP RATIOS	
C1/C2	0.94
A /D2	5.19
C1/D2	7.63
CH/MCP	0.39
PENT/IPENT,	0.62

	PPB	NORM PERCENT
MCP	20406.4	42.6
CH	7895.3	16.5
MCH	19548.3	40.9
TOTAL	47850.0	100.0

PARAFFIN INDEX 1 0.746
PARAFFIN INDEX 2 16.771

29 SEP 83

72701X AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 2435M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	328.6	
PROPANE	90.8	
IBUTANE	113.5	2.13
NBUTANE	288.7	5.41
IPENTANE	490.4	9.19
NPENTANE	480.6	9.01
22-DMB	10.5	0.20
CPENTANE	82.2	1.54
23-DMB	50.8	0.95
2-MP	387.1	7.26
3-MP	224.9	4.21
NHEXANE	324.9	6.09
MCP	674.8	12.65
22-DMP	0.0	0.00
24-DMP	10.6	0.20
223-TMB	0.0	0.00
CHEXANE	330.4	6.19
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	139.5	2.62
23-DMP ,	74.3	1.39
3-MHEX ,	169.3	3.17
1C3-DMCP	100.2	1.88
1T3-DMCP	152.8	2.86
1T2-DMCP	177.5	3.33
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	292.8	5.49
1C2-DMCP	20.6	0.39
MCH	739.2	13.85

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	5755.		C1/C2	1.07
GASOLINE	5336.		A /D2	3.65
NAPHTHENES	2278.	42.69	C1/D2	7.14
C6-7	3207.	60.10	CH/MCP	0.49
			PENT/IPENT,	0.98

	PPB	NORM PERCENT
MCP	674.8	38.7
CH	330.4	18.9
MCH	739.2	42.4
TOTAL	1744.4	100.0

PARAFFIN INDEX 1 0.718
PARAFFIN INDEX 2 13.457

29 SEP 83

72701Z AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 2465M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	111.3	
PROPANE	152.2	
IBUTANE	205.7	1.99
NBUTANE	486.2	4.71
IPENTANE	826.1	8.00
NPENTANE	770.1	7.46
22-DMB	15.4	0.15
CPENTANE	142.1	1.38
23-DMB	95.9	0.93
2-MP	753.3	7.29
3-MP	399.5	3.87
NHEXANE	656.3	6.35
MCP	1171.1	11.34
22-DMP	0.0	0.00
24-DMP	20.2	0.20
223-TMB	3.1	0.03
CHEXANE	685.1	6.63
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	248.2	2.40
23-DMP ,	200.5	1.94
3-MHEX ,	306.6	2.97
1C3-DMCP	186.1	1.80

	TOTAL PPB	NORM PERCENT
1T3-DMCP	190.0	1.84
1T2-DMCP	444.7	4.31
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	709.5	6.87
1C2-DMCP	47.0	0.46
MCH	1764.6	17.09

	TOTALS PPB	NORM PERCENT
ALL COMP	10591.	
GASOLINE	10328.	
NAPHTHENES	4631.	44.84
C6-7	6633.	64.23

SIG COMP RATIOS

C1/C2	1.32
A /D2	4.45
C1/D2	8.80
CH/MCP	0.59
PENT/IPENT,	0.93

	PPB	NORM PERCENT
MCP	1171.1	32.3
CH	685.1	18.9
MCH	1764.6	48.7
TOTAL	3620.8	100.0

PARAFFIN INDEX 1 0.676
PARAFFIN INDEX 2 14.984

29 SEP 83

72702B AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 2495M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	0.0	0.00
NBUTANE	0.0	0.00
IPENTANE	92.1	5.95
NPENTANE	84.0	5.42
22-DMB	1.2	0.08
CPENTANE	8.7	0.56
23-DMB	15.1	0.98
2-MP	131.7	8.50
3-MP	67.5	4.36
NHEXANE	125.5	8.10
MCP	162.3	10.48
22-DMP	0.0	0.00
24-DMP	5.1	0.33
223-TMB	0.0	0.00
CHEXANE	66.0	4.26
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	60.1	3.88
23-DMP ,	33.2	2.14
3-MHEX ,	61.3	3.96
1C3-DMCP	36.5	2.36

	TOTAL PPB	NORM PERCENT
1T3-DMCP	60.9	3.93
1T2-DMCP	60.2	3.89
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	184.8	11.93
1C2-DMCP	8.7	0.56
MCH	283.9	18.33

	TOTALS PPB	NORM PERCENT
ALL COMP	1549.	
GASOLINE	1549.	
NAPHTHENES	687.	44.36
C6-7	1148.	74.15

SIG COMP RATIOS

C1/C2	1.25
A /D2	5.06
C1/D2	6.68
CH/MCP	0.41
PENT/IPENT,	0.91

	PPB	NORM PERCENT
MCP	162.3	31.7
CH	66.0	12.9
MCH	283.9	55.4
TOTAL	512.2	100.0

PARAFFIN INDEX 1 0.771
PARAFFIN INDEX 2 21.824

29 SEP 83

72702D AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 2525M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	177.1	
PROPANE	70.8	
IBUTANE	65.1	0.30
NBUTANE	244.7	1.13
IPENTANE	761.0	3.52
NPENTANE	1029.9	4.76
22-DMB	35.3	0.16
CPENTANE	366.0	1.69
23-DMB	193.4	0.89
2-MP	1406.7	6.50
3-MP	779.6	3.60
NHEXANE	1542.1	7.13
MCP	2885.6	13.34
22-DMP	0.0	0.00
24-DMP	43.2	0.20
223-TMB	8.5	0.04
CHEXANE	2023.3	9.35
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	542.5	2.51
23-DMP ,	450.0	2.08
3-MHEX ,	816.8	3.78
1C3-DMCP	435.0	2.01
1T3-DMCP	421.6	1.95
1T2-DMCP	1007.8	4.66
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	1722.4	7.96
1C2-DMCP	107.8	0.50
MCH	4740.3	21.92

	TOTALS PPB	NORM PERCENT
ALL COMP	21876.	
GASOLINE	21628.	
NAPHTHENES	11987.	55.42
C6-7	16747.	77.43

SIG COMP RATIOS

C1/C2	1.50
A /D2	4.00
C1/D2	8.94
CH/MCP	0.70
PENT/IPENT,	1.35

	PPB	NORM PERCENT
MCP	2885.6	29.9
CH	2023.3	21.0
MCH	4740.3	49.1
TOTAL	9649.2	100.0

PARAFFIN INDEX 1 0.729

PARAFFIN INDEX 2 14.165

29 SEP 83

72702F AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 2555M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	47.3	
IBUTANE	119.9	1.80
NBUTANE	105.8	1.59
IPENTANE	769.2	11.54
NPENTANE	608.5	9.13
22-DMB	20.7	0.31
CPENTANE	86.7	1.30
23-DMB	91.3	1.37
2-MP	629.6	9.44
3-MP	372.1	5.58
NHEXANE	460.6	6.91
MCP	921 7	13.83
22-DMP	0.0	0.00
24-DMP	19.0	0.29
223-TMB	1.4	0.02
CHEXANE	394.8	5.92
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	183.2	2.75
23-DMP ,	109.7	1.65
3-MHEX ,	241.4	3.62
1C3-DMCP	128.1	1.92

	TOTAL PPB	NORM PERCENT
1T3-DMCP	120.8	1.81
1T2-DMCP	282.4	4.24
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	322.0	4.83
1C2-DMCP	18.6	0.28
MCH	658.5	9.88

	TOTALS PPB	NORM PERCENT
ALL COMP	6713.	
GASOLINE	6666.	
NAPHTHENES	2612.	39.18
C6-7	3862.	57.94

SIG COMP RATIOS	
C1/C2	0.84
A /D2	3.24
C1/D2	5.12
CH/MCP	0.43
PENT/IPENT,	0.79

	PPB	NORM PERCENT
MCP	921.7	46.7
CH	394.8	20.0
MCH	658.5	33.3
TOTAL	1975.0	100.0

PARAFFIN INDEX 1 0.799
PARAFFIN INDEX 2 13.191

29 SEP 83

72702H AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 2585M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	52.4	2.92
NBUTANE	100.5	5.59
IPENTANE	210.7	11.71
NPENTANE	251.9	14.00
22-DMB	3.3	0.19
CPENTANE	35.9	1.99
23-DMB	22.0	1.23
2-MP	178.6	9.93
3-MP	92.7	5.16
NHEXANE	169.6	9.43
MCP	228.8	12.72
22-DMP	0.0	0.00
24-DMP	3.7	0.21
223-TMB	0.0	0.00
CHEXANE	76.2	4.23
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	35.0	1.94
23-DMP ,	20.2	1.12
3-MHEX ,	40.3	2.24
1C3-DMCP	27.1	1.50
1T3-DMCP	17.7	0.98
1T2-DMCP	39.8	2.21
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	81.5	4.53
1C2-DMCP	0.0	0.00
MCH	110.7	6.16

	TOTALS PPB	NORM PERCENT
ALL COMP	1799.	
GASOLINE	1799.	
NAPHTHENES	536.	29.81
C6-7	851.	47.29

SIG COMP RATIOS

C1/C2	0.71
A /D2	6.23
C1/D2	5.51
CH/MCP	0.33
PENT/IPENT,	1.20

	PPB	NORM PERCENT
MCP	228.8	55.0
CH	76.2	18.3
MCH	110.7	26.6
TOTAL	415.7	100.0

PARAFFIN INDEX 1 0.889
PARAFFIN INDEX 2 18.169

29 SEP 83

72702J AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 2615M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	102.7	
PROPANE	58.4	
IBUTANE	70.6	2.07
NBUTANE	158.6	4.66
IPENTANE	285.2	8.38
NPENTANE	285.7	8.39
22-DMB	0.6	0.02
CPENTANE	52.8	1.55
23-DMB	37.7	1.11
2-MP	319.2	9.38
3-MP	151.8	4.46
NHEXANE	287.1	8.43
MCP	413.3	12.14
22-DMP	0.0	0.00
24-DMP	6.8	0.20
223-TMB	0.0	0.00
CHEXANE	162.6	4.78
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	116.4	3.42
23-DMP ,	54.1	1.59
3-MHEX ,	96.8	2.84
1C3-DMCP	57.9	1.70

	TOTAL PPB	NORM PERCENT
1T3-DMCP	87.5	2.57
1T2-DMCP	90.8	2.67
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	251.5	7.39
1C2-DMCP	12.7	0.37
MCH	404.9	11.89

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	3566.		C1/C2	1.03
GASOLINE	3405.		A /D2	5.56
NAPHTHENES	1283.	37.67	C1/D2	7.06
C6-7	2042.	59.99	CH/MCP	0.39
			PENT/IPENT,	1.00

	PPB	NORM PERCENT
MCP	413.3	42.1
CH	162.6	16.6
MCH	404.9	41.3
TOTAL	980.8	100.0

PARAFFIN INDEX 1 0.903

PARAFFIN INDEX 2 19.016

29 SEP 83

72702L AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 2645M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	0.0	0.00
NBUTANE	0.0	0.00
IPENTANE	20.6	8.77
NPENTANE	21.2	9.03
22-DMB	0.0	0.00
CPENTANE	1.8	0.78
23-DMB	2.9	1.23
2-MP	26.7	11.36
3-MP	13.9	5.92
NHEXANE	27.0	11.49
MCP	26.5	11.29
22-DMP	0.0	0.00
24-DMP	0.0	0.00
223-TMB	0.0	0.00
CHEXANE	10.9	4.63
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	7.5	3.20
23-DMP ,	4.3	1.84
3-MHEX ,	8.1	3.43
1C3-DMCP	4.6	1.94

	TOTAL PPB	NORM PERCENT
1T3-DMCP	4.9	2.07
1T2-DMCP	5.7	2.43
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	23.2	9.87
1C2-DMCP	0.0	0.00
MCH	25.2	10.71

	TOTALS PPB	NORM PERCENT
ALL COMP	235.	
GASOLINE	235.	
NAPHTHENES	80.	33.85
C6-7	148.	62.91

SIG COMP RATIOS

C1/C2	1.05
A /D2	6.23
C1/D2	5.41
CH/MCP	0.41
PENT/IPENT,	1.03

	PPB	NORM PERCENT
MCP	26.5	42.4
CH	10.9	17.4
MCH	25.2	40.2
TOTAL	62.6	100.0

PARAFFIN INDEX 1 1.030
PARAFFIN INDEX 2 24.577

29 SEP 83

72702N AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 2675M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	0.0	0.00
NBUTANE	167.3	9.16
IPENTANE	240.1	13.15
NPENTANE	232.1	12.71
22-DMB	1.5	0.08
CPENTANE	27.4	1.50
23-DMB	29.0	1.59
2-MP	262.4	14.38
3-MP	128.2	7.02
NHEXANE	224.8	12.31
MCP	207.6	11.37
22-DMP	0.0	0.00
24-DMP	7.8	0.43
223-TMB	0.0	0.00
CHEXANE	30.0	1.64
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	73.0	4.00
23-DMP ,	22.8	1.25
3-MHEX ,	45.0	2.46
1C3-DMCP	16.2	0.89

	TOTAL PPB	NORM PERCENT
1T3-DMCP	10.6	0.58
1T2-DMCP	24.3	1.33
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	63.3	3.47
1C2-DMCP	0.0	0.00
MCH	12.2	0.67

	TOTALS PPB	NORM PERCENT
ALL COMP	1826.	
GASOLINE	1826.	
NAPHTHENES	328.	17.98
C6-7	738.	40.40

SIG COMP RATIOS

C1/C2	0.45
A /D2	6.40
C1/D2	2.56
CH/MCP	0.14
PENT/IPENT,	0.97

	PPB	NORM PERCENT
MCP	207.6	83.1
CH	30.0	12.0
MCH	12.2	4.9
TOTAL	249.8	100.0

PARAFFIN INDEX 1 2.310
PARAFFIN INDEX 2 21.292

29 SEP 83

72702R AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 2735M

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	110.4	2.50
ETHANE	119.4		1T2-DMCP	97.0	2.20
PROPANE	102.1		3-EPENT	0.0	0.00
IBUTANE	116.5	2.64	224-TMP	0.0	0.00
NBUTANE	279.8	6.34	NHEPTANE	313.2	7.10
IPENTANE	375.0	8.50	1C2-DMCP	13.5	0.30
NPENTANE	488.6	11.07	MCH	572.4	12.97
22-DMB	5.0	0.11			
CPENTANE	55.4	1.26			
23-DMB	38.9	0.88			
2-MP	361.7	8.20			
3-MP	179.3	4.06			
NHEXANE	380.7	8.63			
MCP	425.5	9.64			
22-DMP	0.0	0.00			
24-DMP	9.7	0.22			
223-TMB	0.0	0.00			
CHEXANE	158.8	3.60			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	147.5	3.34			
23-DMP ,	54.2	1.23			
3-MHEX ,	158.4	3.59			
1C3-DMCP	71.6	1.62			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	4635.		C1/C2	1.22
GASOLINE	4413.		A /D2	4.38
NAPHTHENES	1505.	34.09	C1/D2	5.55
C6-7	2513.	56.94	CH/MCP	0.37
			PENT/IPENT,	1.30

	PPB	NORM PERCENT
MCP	425.5	36.8
CH	158.8	13.7
MCH	572.4	49.5
TOTAL	1156.7	100.0

PARAFFIN INDEX 1 1.096
PARAFFIN INDEX 2 18.604

29 SEP 83

72702T AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 2765M

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	3981.6	0.73
ETHANE	35016.2		1T2-DMCP	8205.7	1.50
PROPANE	121937.4		3-EPENT	0.0	0.00
IBUTANE	57209.0	10.44	224-TMP	0.0	0.00
NBUTANE	98204.9	17.92	NHEPTANE	24698.5	4.51
IPENTANE	77753.3	14.19	1C2-DMCP	890.0	0.16
NPENTANE	62622.5	11.43	MCH	33851.2	6.18
22-DMB	285.0	0.05			
CPENTANE	6289.8	1.15			
23-DMB	5085.9	0.93			
2-MP	42832.1	7.81			
3-MP	17624.4	3.22			
NHEXANE	34485.7	6.29			
MCP	26865.2	4.90			
22-DMP	0.0	0.00			
24-DMP	879.3	0.16			
223-TMB	67.6	0.01			
CHEXANE	16871.2	3.08			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	9782.7	1.78			
23-DMP ,	6976.8	1.27			
3-MHEX ,	9207.4	1.68			
1C3-DMCP	3436.7	0.63			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	705059.		C1/C2	1.39
GASOLINE	548106.		A /D2	6.43
NAPHTHENES	100391.	18.32	C1/D2	6.57
C6-7	180200.	32.88	CH/MCP	0.63
			PENT/IPENT,	0.81

	PPB	NORM PERCENT
MCP	26865.2	34.6
CH	16871.2	21.7
MCH	33851.2	43.6
TOTAL	77587.6	100.0

PARAFFIN INDEX 1 1.215
PARAFFIN INDEX 2 21.108

29 SEP 83

72702X AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 2825M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	118.9	
PROPANE	499.0	
IBUTANE	418.0	2.91
NBUTANE	1191.5	8.31
IPENTANE	1536.4	10.71
NPENTANE	1533.6	10.69
22-DMB	11.6	0.08
CPENTANE	187.7	1.31
23-DMB	142.4	0.99
2-MP	1274.4	8.88
3-MP	566.8	3.95
NHEXANE	1212.6	8.45
MCP	1121.9	7.82
22-DMP	0.0	0.00
24-DMP	127.3	0.89
223-TMB	3.1	0.02
CHEXANE	728.4	5.08
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	398.7	2.78
23-DMP ,	241.0	1.68
3-MHEX ,	423.7	2.95
1C3-DMCP	184.5	1.29

	TOTAL PPB	NORM PERCENT
1T3-DMCP	205.3	1.43
1T2-DMCP	378.9	2.64
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	926.7	6.46
1C2-DMCP	33.5	0.23
MCH	1497.5	10.44

	TOTALS PPB	NORM PERCENT
ALL COMP	14964.	
GASOLINE	14346.	
NAPHTHENES	4338.	30.24
C6-7	7483.	52.16

SIG COMP RATIOS

C1/C2	1.36
A /D2	5.05
C1/D2	6.19
CH/MCP	0.65
PENT/IPENT,	1.00

	PPB	NORM PERCENT
MCP	1121.9	33.5
CH	728.4	21.8
MCH	1497.5	44.7
TOTAL	3347.8	100.0

PARAFFIN INDEX 1 1.070
PARAFFIN INDEX 2 18.590

29 SEP 83

72702Z AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 2855M

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	25.5	0.95
ETHANE	94.7		1T2-DMCP	46.8	1.74
PROPANE	44.1		3-EPENT	0.0	0.00
IBUTANE	70.1	2.61	224-TMP	0.0	0.00
NBUTANE	180.1	6.71	NHEPTANE	163.3	6.08
IPENTANE	325.9	12.14	1C2-DMCP	5.3	0.20
NPENTANE	360.9	13.44	MCH	279.1	10.39
22-DMB	2.1	0.08			
CPENTANE	33.4	1.25			
23-DMB	27.7	1.03			
2-MP	234.2	8.72			
3-MP	114.5	4.26			
NHEXANE	260.9	9.72			
MCP	237.4	8.84			
22-DMP	0.0	0.00			
24-DMP	5.2	0.20			
223-TMB	0.0	0.00			
CHEXANE	96.4	3.59			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	84.1	3.13			
23-DMP ,	28.7	1.07			
3-MHEX ,	69.4	2.58			
1C3-DMCP	34.0	1.27			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	2824.		C1/C2	1.32
GASOLINE	2685.		A /D2	6.11
NAPHTHENES	758.	28.23	C1/D2	6.62
C6-7	1336.	49.76	CH/MCP	0.41
			PENT/IPENT,	1.11

	PPB	NORM PERCENT
MCP	237.4	38.7
CH	96.4	15.7
MCH	279.1	45.5
TOTAL	612.9	100.0

PARAFFIN INDEX 1 1.444
PARAFFIN INDEX 2 19.741

29 SEP 83

727038 AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 2885M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	104.0	
PROPANE	84.0	
IBUTANE	89.0	5.40
NBUTANE	142.5	8.64
IPENTANE	244.8	14.85
NPENTANE	187.7	11.38
22-DMB	2.0	0.12
CPENTANE	11.9	0.72
23-DMB	20.6	1.25
2-MP	163.2	9.90
3-MP	70.1	4.25
NHEXANE	131.3	7.96
MCP	121.2	7.35
22-DMP	0.0	0.00
24-DMP	4.9	0.30
223-TMB	0.0	0.00
CHEXANE	41.3	2.51
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	41.9	2.54
23-DMP ,	20.6	1.25
3-MHEX ,	37.8	2.30
1C3-DMCP	24.0	1.46

	TOTAL PPB	NORM PERCENT
1T3-DMCP	19.2	1.17
1T2-DMCP	29.3	1.78
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	89.8	5.44
1C2-DMCP	4.5	0.27
MCH	151.3	9.18

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	1837.		C1/C2	1.18
GASOLINE	1649.		A /D2	5.84
NAPHTHENES	403.	24.43	C1/D2	6.20
C6-7	717.	43.50	CH/MCP	0.34
			PENT/IPENT,	0.77

	PPB	NORM PERCENT
MCP	121.2	38.6
CH	41.3	13.2
MCH	151.3	48.2
TOTAL	313.8	100.0

PARAFFIN INDEX 1 1.098
PARAFFIN INDEX 2 19.715

29 SEP 83

72703D AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 2915M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	11.4	2.39
NBUTANE	17.9	3.75
IPENTANE	60.1	12.61
NPENTANE	41.0	8.59
22-DMB	0.0	0.00
CPENTANE	3.1	0.65
23-DMB	6.2	1.29
2-MP	46.6	9.77
3-MP	21.1	4.43
NHEXANE	45.6	9.57
MCP	34.8	7.30
22-DMP	0.0	0.00
24-DMP	2.4	0.49
223-TMB	0.0	0.00
CHEXANE	12.8	2.68
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	15.4	3.24
23-DMP ,	8.8	1.85
3-MHEX ,	12.9	2.71
1C3-DMCP	9.7	2.04
1T3-DMCP	8.1	1.71
1T2-DMCP	9.2	1.93
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	46.0	9.65
1C2-DMCP	0.0	0.00
MCH	63.6	13.35

	TOTALS PPB	NORM PERCENT
ALL COMP	477.	
GASOLINE	477.	
NAPHTHENES	141.	29.66
C6-7	269.	56.51

SIG COMP RATIOS

C1/C2	1.48
A /D2	7.09
C1/D2	7.11
CH/MCP	0.37
PENT/IPENT,	0.68

	PPB	NORM PERCENT
MCP	34.8	31.3
CH	12.8	11.5
MCH	63.6	57.2
TOTAL	111.2	100.0

PARAFFIN INDEX 1 1.048
PARAFFIN INDEX 2 24.641

29 SEP 83

72703F AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 2945M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	0.0	0.00
NBUTANE	0.0	0.00
IPENTANE	0.0	0.00
NPENTANE	511.5	19.53
22-DMB	3.0	0.12
CPENTANE	98.4	3.76
23-DMB	37.1	1.42
2-MP	342.9	13.09
3-MP	156.3	5.97
NHEXANE	338.7	12.93
MCP	229.5	8.76
22-DMP	0.0	0.00
24-DMP	11.0	0.42
223-TMB	0.0	0.00
CHEXANE	98.5	3.76
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	102.4	3.91
23-DMP ,	54.8	2.09
3-MHEX ,	69.7	2.66
1C3-DMCP	35.7	1.36
1T3-DMCP	34.5	1.32
1T2-DMCP	60.6	2.31
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	224.5	8.57
1C2-DMCP	6.4	0.24
MCH	204.0	7.79

	TOTALS PPB	NORM PERCENT
ALL COMP	2620.	
GASOLINE	2620.	
NAPHTHENES	768.	29.30
C6-7	1470.	56.13

SIG COMP RATIOS

C1/C2	1.10
A /D2	8.08
C1/D2	5.81
CH/MCP	0.43
PENT/IPENT,	999.99

	PPB	NORM PERCENT
MCP	229.5	43.1
CH	98.5	18.5
MCH	204.0	38.3
TOTAL	532.0	100.0

PARAFFIN INDEX 1 1.316
PARAFFIN INDEX 2 25.375

29 SEP 83

72703H AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 2975M

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	11.7	1.60
ETHANE	0.0		1T2-DMCP	17.2	2.34
PROPANE	0.0		3-EPENT	0.0	0.00
IBUTANE	0.0	0.00	224-TMP	0.0	0.00
NBUTANE	0.0	0.00	NHEPTANE	73.9	10.07
IPENTANE	76.5	10.44	1C2-DMCP	0.0	0.00
NPENTANE	79.0	10.78	MCH	91.1	12.42
22-DMB	1.2	0.17			
CPENTANE	4.2	0.57			
23-DMB	8.0	1.09			
2-MP	76.4	10.41			
3-MP	42.1	5.74			
NHEXANE	82.8	11.30			
MCP	55.3	7.53			
22-DMP	0.0	0.00			
24-DMP	2.5	0.34			
223-TMB	0.0	0.00			
CHEXANE	41.2	5.62			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	21.6	2.94			
23-DMP ,	12.6	1.72			
3-MHEX ,	21.9	2.98			
1C3-DMCP	14.2	1.94			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	733.		C1/C2	1.56
GASOLINE	733.		A /D2	7.16
NAPHTHENES	235.	32.02	C1/D2	7.03
C6-7	446.	60.81	CH/MCP	0.75
			PENT/IPENT,	1.03

	PPB	NORM PERCENT
MCP	55.3	29.5
CH	41.2	22.0
MCH	91.1	48.6
TOTAL	187.6	100.0

PARAFFIN INDEX 1 1.009
PARAFFIN INDEX 2 24.192

29 SEP 83

72703J AUSTRALIA, LUDERICK-1 ,GIPPSLAND BASIN 3005M

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	0.0	0.00
NBUTANE	0.0	0.00
IPENTANE	0.0	0.00
NPENTANE	148.0	7.77
22-DMB	21.1	1.11
CPENTANE	0.0	0.00
23-DMB	0.0	0.00
2-MP	186.2	9.78
3-MP	101.6	5.34
NHEXANE	303.6	15.94
MCP	142.0	7.46
22-DMP	0.0	0.00
24-DMP	13.3	0.70
223-TMB	0.0	0.00
CHEXANE	104.0	5.46
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	120.6	6.33
23-DMP ,	42.1	2.21
3-MHEX ,	85.3	4.48
1C3-DMCP	32.5	1.71

	TOTAL PPB	NORM PERCENT
1T3-DMCP	25.3	1.33
1T2-DMCP	43.9	2.31
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	275.7	14.47
1C2-DMCP	4.0	0.21
MCH	255.1	13.39

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	1904.		C1/C2	1.94
GASOLINE	1904.		A /D2	6.79
NAPHTHENES	607.	31.86	C1/D2	5.62
C6-7	1448.	76.00	CH/MCP	0.73
			PENT/IPENT,	999.99

	PPB	NORM PERCENT
MCP	142.0	28.3
CH	104.0	20.7
MCH	255.1	50.9
TOTAL	501.1	100.0

PARAFFIN INDEX 1 2.024
PARAFFIN INDEX 2 27.997

APPENDIX-2

Detailed Vitrinite Reflectance and

Exinite Fluorescence Data - by A.C. Cook

Luderick No. 1

KK No.	Esso No.	Depth m	$\bar{R}_v$ max %	Range R_v max %	N	Exinite fluorescence (Remarks)
						EOCENE - LATE CRETACEOUS
						Latrobe Group
18056	72670 -S	1873.0 SWC	0.53	0.45-0.60	32	Common sporinite, yellow to orange and dull yellow, common resinite, yellow to brown, sparse cutinite, yellow orange to dull orange, sparse fluorinite, green to yellow, sparse suberinite, brown and rare exsudatinite, dull orange. (Coal, V>E>I, clarite>duroclarite. Vitrinite shows dull brown fluorescence. Weak green oil cut from clarite. Micrinite abundant. Inertinite is largely of fungal origin.)
18057	72670 -F	1928.0 SWC	0.56	0.51-0.64	30	Abundant resinite, yellow to dull yellow brown, common suberinite brown, common liptodetrinite and sparse sporinite, yellow to orange, sparse, cutinite, yellow to dull orange and sparse fluorinite, green. (Coal, V>E>I, clarite and duroclarite. Exinite and inertinite both abundant. Thick layers of higher plant semifusinite present, sclerotinite common. Weak fluorescence from vitrinite. Green oil cut in clarite. Micrinite abundant. Common pyrite.)
18058	72669 -H	2081.7 SWC	0.57	0.50-0.64	32	Abundant sporinite, yellow, abundant resinite, greenish yellow to brown, common cutinite, dull orange to brown, common suberinite, brown, common liptodetrinite, yellow to dull orange and sparse fluorinite, green to yellow. (Coal, V>E>I, duroclarite. Weak vitrinite fluorescence. Micrinite abundant. Inertinite abundant, largely of fungal origin. Weak green oil cut. Rare pyrite.)
18059	72669 -R	2291.5 SWC	0.56	0.50-0.65	29	Abundant sporinite, liptodetrinite and common cutinite, yellow to orange, abundant, resinite and suberinite, brown. (Shaly coal>coal. Coal, V>E>>I. Clarite>duroclarite. Shaly coal, V>E>I. Weak green oil cut from shaly coal. Rare pyrite.)
18060	72668 -G	2881.3 SWC	0.74	0.54-0.87	28	Abundant resinite, yellow orange to dull orange, common sporinite, yellow orange to orange and sparse cutinite, orange to dull orange. (Claystone>coal. Coal, V>E, clarite. D.o.m. abundant, E>I>V. Exinite abundant, inertinite and vitrinite common. Vitrinite as d.o.m. typically <0.65%. Small grain of coal with vitrinite reflectance in the range 0.74 to 0.87%. Resinite rare as d.o.m. Green oil cut from resinite bearing clarite.)

Luderick No. 1

KK No.	Esso No.	Depth m	$\bar{R}_v max$ %	Range $R_v max$ %	N	Exinite fluorescence (Remarks)
18061	72668 -A	2995.0 SWC	0.63	0.55-0.76	29	Abundant sporinite, yellow orange to orange, common cutinite, yellow orange to brown, sparse resinite, yellow to dull orange. (Claystone and siltstone. D.o.m. abundant, I>E>V. All macerals abundant. Abundant pyrite.)

APPENDIX - 6

APPENDIX 6

SYNTHETIC SEISMIC TRACE

APPENDIX 6

Synthetic Seismic Trace

SYNTHETIC SEISMIC TRACE

SYNTHETIC SEISMIC TRACE PARAMETERS

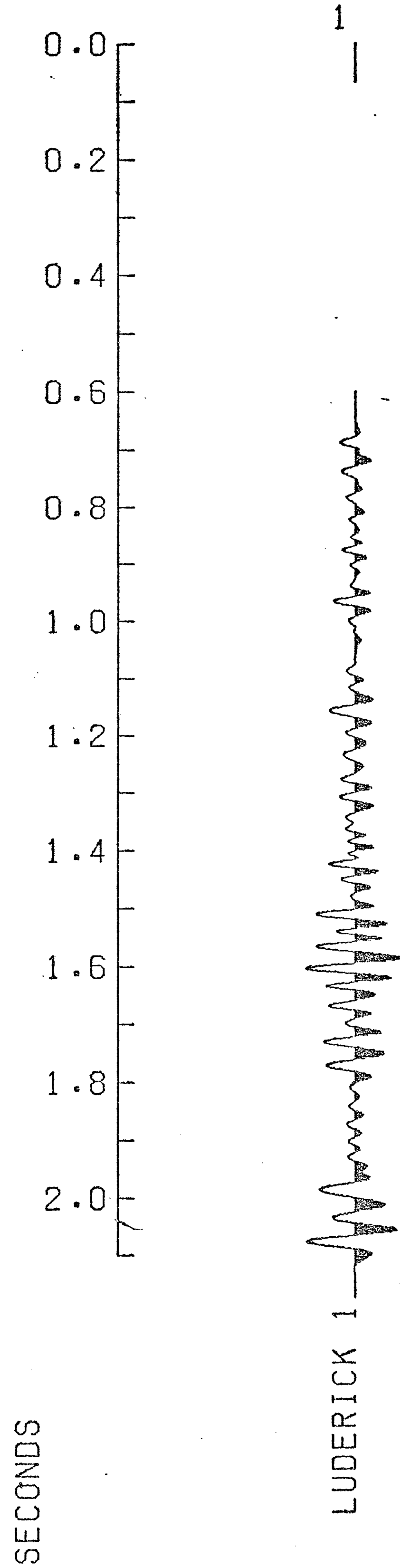
WELL:	Luderick#1
T.D.:	3021mKB
K.B.:	21m
WATER DEPTH:	52.0m
POLARITY:	Trough on section represents a positive acoustic reflection co-efficient.
PULSE TYPE:	Zero phase
PEAK FREQUENCY:	25 Hz 0 - 1803mKB, 15 Hz 1803 - 3100mKB
SAMPLE FREQUENCY:	3 metres
CHECK SHOT CORRECTIONS:	Linear interpolation used for check shot correction. Reflection coefficients are calculated using original (pre-corrected) sonic log data.

0745L

LUDERICK 1

PULSE NO 1   TYPE=2   FREQ=VAR

TIME OVERLAY



Dwg. 2188/OP/6

PE902543

This is an enclosure indicator page.
The enclosure PE902543 is enclosed within the container PE902540 at this location in this document.

The enclosure PE902543 has the following characteristics:

```
     ITEM_BARCODE = PE902543
CONTAINER_BARCODE = PE902540
             NAME = Synthetic Seismic Trace
            BASIN = GIPPSLAND
           PERMIT =
             TYPE = WELL
          SUBTYPE = SYNTH_SEISMOGRAM
      DESCRIPTION = Synthetic Seismic Trace
          REMARKS =
     DATE_CREATED = 08/02/1984
    DATE_RECEIVED = 21/09/1984
             W_NO = W819
        WELL_NAME = Luderick-1
       CONTRACTOR = ESSO
     CLIENT_OP_CO = ESSO
```

(Inserted by DNRE - Vic Govt Mines Dept)

ENCLOSURES

PE902544

This is an enclosure indicator page.
The enclosure PE902544 is enclosed within the container PE902540 at this location in this document.

The enclosure PE902544 has the following characteristics:

ITEM_BARCODE = PE902544
CONTAINER_BARCODE = PE902540
NAME = Structure Map - Top of Coarse Clastic Reservoir
BASIN = GIPPSLAND
PERMIT =
TYPE = SEISMIC
SUBTYPE = HRZN_CONTR_MAP
DESCRIPTION = Structure Map - Top of Coarse Clastic Reservoir
REMARKS =
DATE_CREATED = 31/11/1983
DATE_RECEIVED = 21/09/1984
W_NO = W819
WELL_NAME = Luderick-1
CONTRACTOR = ESSO
CLIENT_OP_CO = ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE902545

This is an enclosure indicator page.
The enclosure PE902545 is enclosed within the container PE902540 at this location in this document.

The enclosure PE902545 has the following characteristics:

ITEM_BARCODE =	PE902545
CONTAINER_BARCODE =	PE902540
NAME =	Structure Map -Upper M Diversus Seismic Marker
BASIN =	GIPPSLAND
PERMIT =	
TYPE =	SEISMIC
SUBTYPE =	HRZN_CONTR_MAP
DESCRIPTION =	Structure Map -Upper M Diversus Seismic Marker
REMARKS =	
DATE_CREATED =	31/11/1983
DATE_RECEIVED =	21/09/1984
W_NO =	W819
WELL_NAME =	Luderick-1
CONTRACTOR =	ESSO
CLIENT_OP_CO =	ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE902546

This is an enclosure indicator page.
The enclosure PE902546 is enclosed within the container PE902540 at this location in this document.

The enclosure PE902546 has the following characteristics:

ITEM_BARCODE =	PE902546
CONTAINER_BARCODE =	PE902540
NAME =	Geological Cross Section A-A'
BASIN =	GIPPSLAND
PERMIT =	
TYPE =	WELL
SUBTYPE =	CROSS_SECTION
DESCRIPTION =	Geological Cross Section
REMARKS =	
DATE_CREATED =	31/01/1984
DATE_RECEIVED =	21/09/1984
W_NO =	W819
WELL_NAME =	Luderick-1
CONTRACTOR =	ESSO
CLIENT_OP_CO =	ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE601269

This is an enclosure indicator page.
The enclosure PE601269 is enclosed within the container PE902540 at this location in this document.

The enclosure PE601269 has the following characteristics:

ITEM_BARCODE = PE601269
CONTAINER_BARCODE = PE902540
NAME = Well Completion Log
BASIN = GIPPSLAND
PERMIT =
TYPE = WELL
SUBTYPE = COMPLETION_LOG
DESCRIPTION = Well Completion Log
REMARKS =
DATE_CREATED = 31/08/1983
DATE_RECEIVED = 21/09/1984
W_NO = W819
WELL_NAME = Luderick-1
CONTRACTOR = ESSO
CLIENT_OP_CO = ESSO

(Inserted by DNRE - Vic Govt Mines Dept)