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REPORT: 701/14

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Answered				
DEPT. OF MINES				
REF. No. 1089/82				

QUARTERLY REPORT

FOR THE PERIOD

10TH OCTOBER, 1981 TO 9TH JANUARY, 1982

ON

EXPLORATION PERMIT
FOR PETROLEUM
T/14P
BASS BASIN, TASMANIA

FOR

CUE MINERALS N.L.

CONSORTIUM

General Geological Services
Work Order: CUE 701

February, 1982

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Broad Sedimentation Patterns of the Paleocene-Eocene. Eastern View Group Bass Basin, Tasmania	
by J. K. Davidson of Petrecon Australia Pty. Ltd. (December, 1981)	

1. INTRODUCTION

This quarterly report by General Geological Services, prepared on behalf of Cue Minerals N.L., outlines work performed and planned in relation to offshore petroleum exploration in T/14P during the period 10th October 1981 to 9th January 1982. This period represents the fourth quarter of the second permit year and thus the report constitutes the Second Annual Report.

Cue Minerals N.L. is the operator for the consortium holding title to the exploration permit. The permit covers 42 blocks in the Bass Basin and was granted on 9th January 1980 for a six-year tenure.

In the second permit year, the shooting and processing of the BCS-81 seismic survey, which totalled 550 km at a cost of \$340,000, met the permit commitment of 400 km of seismic traversing at a cost of \$160,000. Total expenditure for the year amounted to \$412,478.

During the fourth quarter, interpretation of the results of the BCS-81 survey and earlier surveys was commenced by Petrocon Australia Pty. Ltd.. These consultants were briefed by Cue Minerals to undertake regional geological and geophysical studies which will lead to a further seismic survey in the first half of the third permit year, probably in April-May, 1982.

Petrocon Australia has prepared a report on their initial study of regional sedimentation patterns in the Eastern View Group based on sand percentages in three selected biostratigraphic intervals. This report was prepared as the initial stage in establishment of a depositional model for the Bass Basin and it is presented as an appendix.

2. OPERATIONS PERFORMED

2.1 Interpretation of BCS-81 Seismic Survey

Geophysical Services International completed the BCS-81 marine seismic survey as detailed in the Operations Report (February, 1981), the Navigation Report (February, 1981) and the Data Processing Report (December, 1981) and submitted respectively with Cue Minerals' first (701/10), second (701/12) and third (701/13) quarterly reports. A shotpoint location map was also included in the second quarterly report

Petrecon Australia Pty. Ltd. was briefed to undertake geophysical interpretation of the recent and past seismic surveys across T/14P. This work was commenced during the last quarter of the second permit year with the objectives of delineating prospective anomalies or leads for further seismic surveys and selecting future drilling targets.

2.2 Study of Burial and Thermal Geohistory

Paltech Pty. Ltd. carried out an assessment of hydrocarbon maturation in the Bass Basin jointly for Cue Minerals N.L. and Bass Strait Oil & Gas N.L., and their report was included with the second quarterly report (701/12). This geochemical study will be integrated with both the seismic interpretation and the depositional modelling projects.

2.3 Development of a Depositional Model

Included as an appendix to this report is a copy of the report by Petrecon Australia Pty. Ltd. entitled "Broad Sedimentation Patterns of the Paleocene-Eocene, Eastern View Group Bass Basin, Tasmania". Cue Minerals N.L. and Bass Strait Oil & Gas N.L. jointly commissioned the study. The results suggest that the direction and quantity of sand deposited in the basin during the Early Tertiary varied markedly. As parts of this section are mature geochemically, such a knowledge of sand distribution is essential in locating the areas of higher reservoir potential. It appears that there may be a relationship between the amount of sand in a unit and its seismic response. The data quality of the BCS-81 survey is sufficiently improved to warrant a seismic/depositional facies comparison. The above sedimentation study also concludes that the targets nearer the basin margins in the east and west and towards the south could, if buried deep enough to be geochemically mature, be the most prospective.

3. OPERATIONS PLANNED

3.1 Interpretation of BCS-81 Seismic Survey

Petrecon Australia Pty. Ltd. are now undertaking detailed seismic interpretation in T/14P for Cue Minerals N.L.. The regional nature of the BCS-81 seismic survey has added significant new data to several leads, some of which were poorly defined previously. Efforts to tie these new data with earlier surveys will be made before selecting two or three of these leads for the more detailed shooting anticipated in April-May. This will be conducted in conjunction with further geological studies in order to meet the commitment to drill a well in the third permit year.

3.2 Integration of Seismic and Facies Data

A seismic/depositional facies comparison will be commenced in the early part of the third permit year.

4. EXPENDITURE

Cue Minerals N.L.

Permit T/14P

Quarterly Report - Expenditure Details

Period: 10th October 1981 to 9th January 1982

Lease Fees (Rental)	Office Overhead	Office Studies	FIELD WORK		
			Geological	Geophysical	Drilling
	\$9,000	\$12,000			

Second Annual Report - Expenditure Summary

Period: 10th January 1981 to 9th January 1982

Quarterly Period	Lease Fees (Rental)	Office Overhead	Office Studies	FIELD WORK		
				Geological	Geophysical	Drilling
1st		5,800	6,300		257,000	
2nd		12,500	20,000		82,178	
3rd	1,000 (4/5/81)	5,000	2,700			
4th		9,000	12,000			
Year 2	\$1,000	\$32,300	\$41,000	-	\$339,178	-

Signed:

David Klein

5. APPENDIX

BROAD SEDIMENTATION PATTERNS OF THE
PALEOCENE-EOCENE, EASTERN VIEW GROUP
BASS BASIN, TASMANIA.

by

J.K. DAVIDSON

of

PETRECON AUSTRALIA PTY LTD

DECEMBER 1981.

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FIG 1. CORRELATIONS OF GIPPSLAND BASIN ZONATIONS
WITH THE GEOLOGICAL TIME SCALE.

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PLATE III UPPER EASTERN VIEW (UPPER M. DIVERSUS TO
UPPER N. ASPERUS) ISOPACH AND NET SAND/
GROSS SECTION.

Introduction

At the request of Cue Minerals N.L. and Bass Strait Oil & Gas N.L., the Operators of T 14 P and T 18 P respectively, a study was performed of available well data in Bass Basin in order to gain a perspective of the broad sedimentation patterns prevailing in the basin during the Paleocene-Eocene. Isopachs and net sand/gross section maps were prepared (Plates I to III) for three periods of time during the Paleocene-Eocene. Each of the periods coincides with a palynological zone or zones defined by Partridge (1976; see Fig. 1).

L. balmei Isopach and Net Sand/Gross Section (Plate I)

Partridge (1976) defined two spore pollen assemblage zones which almost entirely span the Paleocene. These zones were the Upper and Lower Lygistepollenites balmei zones. The zones were combined in this study in order to establish a net sand/gross section map (Plate I). Net sand was considered to be any sandy interval with sonic log or conductivity response indicating porosity greater than about 10%.

The isopach is a little lacking in control in that the L. balmei section was not reached in Bass-1, Cormorant-1 and Toolka-1 and although over 480 metres was penetrated in Pelican-3 to the southwest, there is sufficient evidence to postulate a major depositional trough in the southern part of the basin. Preliminary interpretation of the BCS81 seismic survey suggests there could be 3000 to 4000 metres of L. balmei age sediments near Dondu-1, suggesting the major depocentre may have formed to the east.

Net sand/gross section data are also sparse but sufficient to indicate a large sand source from the southeast near Durroon-1 with less prominent basin flank sources from the east and west. Essentially no sand reached the present basin axial position, nor does there appear to be any evidence of a sand source from the north. Indeed, the shaling of the unit to the north seems well established and one would anticipate that the unit would be

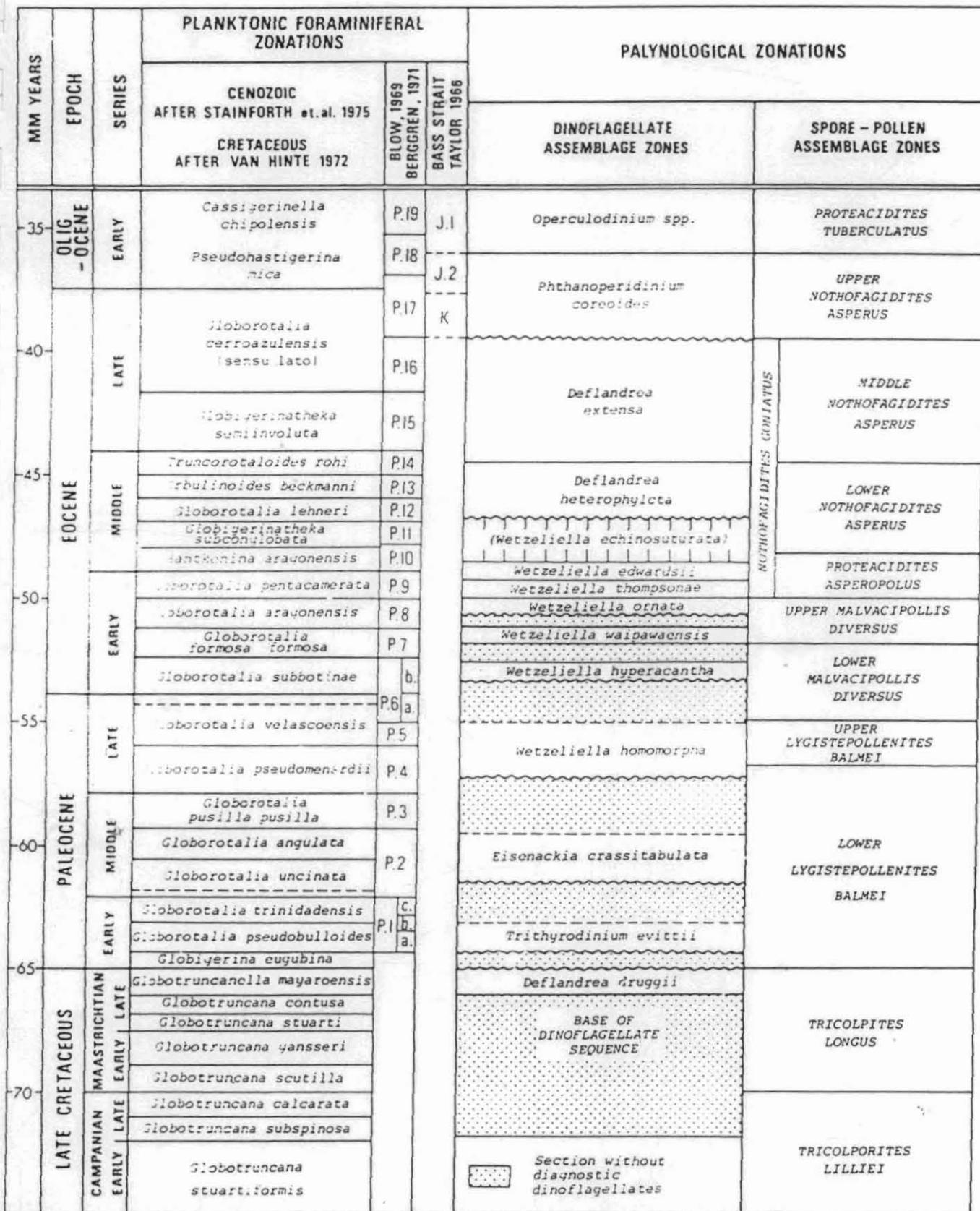
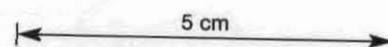


Fig. 2 Correlations of Gippsland Basin zonations with the Geological Time Scale. Partridge (1976) The APEA Journal, 1976

FIGURE 1.



almost entirely shale, albeit geochemically mature (as with the overlying unit at Cormorant-1) over the large northern portion of the basin. The 10% value at Nankero-1 located between two lower values at Dondu-1 and Poonboon-1 suggest the relatively simple depositional pattern described above may have been influenced by uplift providing local sources of sand. However, this appears to be a minor influence with Nankero-1 type sands not providing particularly good reservoir potential.

Lower *M. diversus* Isopach and Net Sand/Gross Section (Plate II)

Partridge (1976) indicated the Lower *Malvacipollis diversus* spore-pollen zone to be of Late Paleocene-Early Eocene age and the Upper *Malvacipollis diversus* zone to be of Early Eocene age. Several of the wells in Bass Basin have a zone identified as Middle *M. diversus*. For convenience the latter zone was combined with the Lower *M. diversus* zone to form Plate II. It must be recognised that the isopach of the Lower plus Middle *M. diversus* will be a little misleading as one of the major unconformities within the Eastern View Group occurred during Middle *M. diversus* time.

The isopach of Plate II is considered accurate enough to indicate that the depositional axis changed from that of *L. balmei* time to one located in a more central north-south position. In fact, the absence of the unit at Pelican-3 and Bass-3 suggests there was quite a rift valley in the Pelican-1 and 2 and Narimba-1 area. Aroo-1 may have constituted a major horst within the rift which turned north between Bass-3 and Tarook-1 to the Cormorant-1/Toolka-1 region.

Despite the absence of sand at Durroon-1 due to erosion, the sand source distribution is rather similar to the previous *L. balmei* unit. However, relatively greater proportions of sand were entering the basin suggesting increased uplift of the margins and particularly of northern Tasmania.

Upper Eastern View (Upper M. diversus to Upper N. asperus) Isopach
and Net Sand/Gross Section (Plate III)

Partridge (1976) assigned the Upper M. diversus to Upper N. asperus zones to the Early Eocene through Early Oligocene. The BBS and BCS81 seismic data exhibit onlap of the base of the unit onto the often truncated Middle M. diversus unit.

The isopach of Plate III indicates a return to the general form of that of the Paleocene L. balmei. However, there is no seismic expression of a deep trough to the east near Dondu; rather the depocentre may have been in the Pelican-Narimba region.

Even greater proportions of sand entered the basin at this time and were derived from essentially the total basin perimeter. Despite the uplift of the northern part of the basin, the lower sand percentages were still located in the north-central area.

Conclusions

This rapid initial study has shown the variable nature of sand percentages in Bass Basin in the Paleocene-Eocene. Examination of the well logs indicates that where net sand percentages fall below 25% there is rapid deterioration in the thickness of individual sands and in sand quality. Thus the maps also indicate that if the pre Upper M. diversus sediments are geochemically mature and form an exploration objective (Nicholas et, al, 1981) then this unit needs to be explored near the basin margin to the east and west and in the south. This appears to be at variance with the exploration philosophy which located many of the wells in the basin axis.

References

Nicholas, E., Lockwood, K.L.,
Martin, A.R. and Jackson, K.S..
1981.

Petroleum Potential of Bass Basin
in BMR Jour. of Aust. Geol. &
Geophys., 6 pp. 199-212.

Partridge, A.D., 1976

The geological expression of eustacy
in the Early Tertiary of the Gippsland
Basin, APEA Jour. Vol 16, part 1,
pp. 73-80.

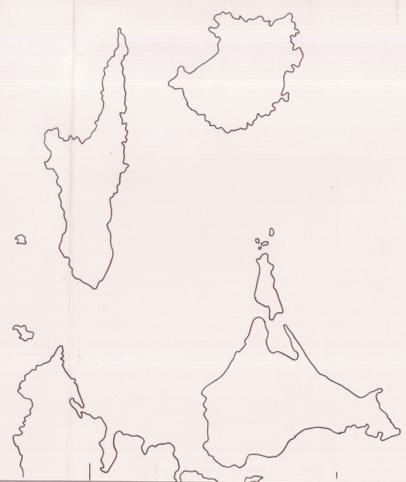
39° 15' 145° 00' 0% KONGON-1 107 146° 00' 147° 00'

39° 30'

40° 00'

40° 15'

40° 30'



TOOLKA-1
NOT REACHED

COMORANT-1
NOT REACHED

BASS-1
NOT REACHED

AROO-1
16% 411

BASS-3
27% 251

TAROOK-1
NOT REACHED

NANGKERO
10% 350

POONBOON
0% 566

NARIMBA-1
NOT REACHED

PELICAN-3
480

PELICAN-2
NOT REACHED

PELICAN-1
NOT REACHED

BASS-2
33% 131

YURONGI-1
20% 420

DONDU-1
4% 561

DISCONFORMITY (OR NO BREAK)
OR
UNCONFORMITY AT TOP OF UNIT
566m THICKNESS OF UNIT (MAX.)
UNCONFORMITY
OR
DISCONFORMITY
OR
BASE NOT REACHED
10% NET SAND / GROSS SECTION



PETRECON AUSTRALIA PTY LTD

BASS BASIN

L balmei

ISOPACH & NET SAND / GROSS SECTION

COMPILED: J.K.D. SCALE: 1:250,000 FIGURE:
DATE: DEC 1981 DRAWN: V.V. PLAN No.:

PLATE I

137017



DURROON-1
366
> 90%

TPR OK-138

0% KONKON-1
145°00' 17

146°00'

147°00'

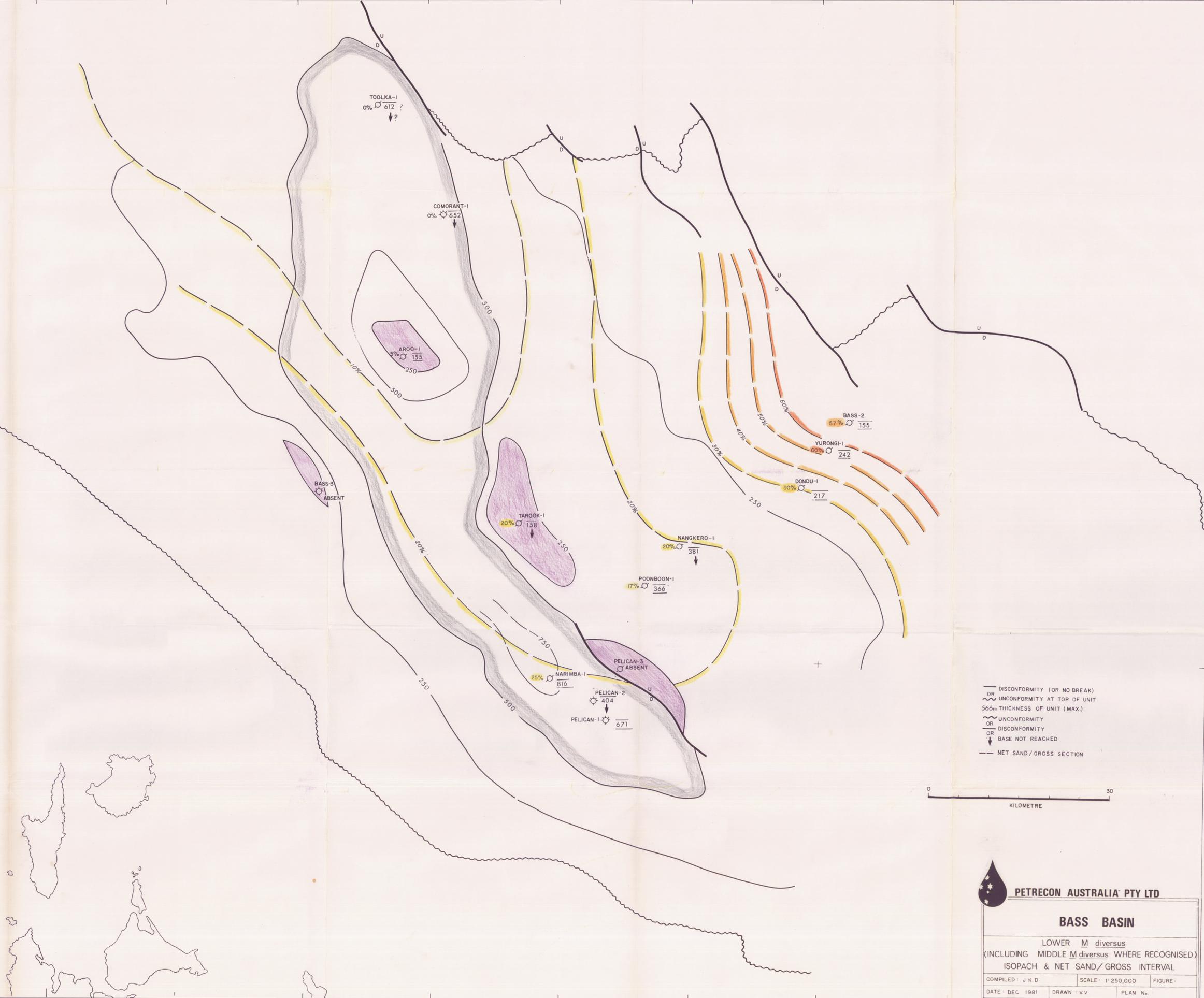
39°15'

39°30'

40°00'

40°15'

40°30'



- DISCONFORMITY (OR NO BREAK)
OR DISCONFORMITY AT TOP OF UNIT
- 506m THICKNESS OF UNIT (MAX.)
- ~ UNCONFORMITY
- OR DISCONFORMITY
- ↓ BASE NOT REACHED
- NET SAND / GROSS SECTION



DURROON-1
ABSENT



PETRECON AUSTRALIA PTY LTD

BASS BASIN

LOWER *M diversus*
(INCLUDING MIDDLE *M diversus* WHERE RECOGNISED)
ISOPACH & NET SAND/GROSS INTERVAL

COMPILED: J. K. D.	SCALE: 1:250,000	FIGURE:
DATE: DEC 1981	DRAWN: V.V.	PLAN No.

PLATE II

137018



TPR OR-138



— DISCONFORMITY (OR NO BREAK)
 OR
 UNCONFORMITY AT TOP OF UNIT
 566m THICKNESS OF UNIT (MAX.)
 ~~~~~ UNCONFORMITY  
 OR  
 DISCONFORMITY  
 ↓ BASE NOT REACHED  
 10% NET SAND / GROSS SECTION



DURROON-1

**PETRECON AUSTRALIA PTY LTD**

**BASS BASIN**

UPPER EASTERN VIEW  
 (UPPER *M. diversus*, *P. asperopolus*, LOWER *N. asperus* &  
 lower Upper *N. asperus*) ISOPACH & NET SAND/  
 GROSS SECTION

|                    |                   |           |
|--------------------|-------------------|-----------|
| COMPILED: J. K. D. | SCALE: 1: 250,000 | FIGURE:   |
| DATE: DEC 1981     | DRAWN: V. V.      | PLAN No.: |

PLATE III

137019



TPR1 DR-138