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PEL 16

MURRAY BASIN

1981 AND 1983 OVERLAND CORNER
(OC81 AND OC83) SEISMIC SURVEYS

OPERATIONS REPORTS, PROCESSED SECTIONS
AND GEOPHYSICAL INTERPRETATION REPORTS

Submitted by

International Mining Corporation NL
1983

MINES AND ENERGY
SOUTH AUSTRALIA

Enquiries: Information Services Branch
Mines and Energy South Australia
191 Greenhill Road, Parkside 5063
Telephone: (08) 274 7687
Facsimile: (08) 272 7597

ENVELOPE 4597

TENEMENT: PEL 16; Murray Basin

TENEMENT HOLDER: International Mining Corporation NL (operator) and Satima Pty Ltd

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MESA NO.

END OF CONTENTS

FIELD OPERATIONS REPORT

OVERLAND CORNER SEISMIC SURVEY 1981

PEL 16

FOR

SCOTT SUNLEA PTY. LIMITED

SYDNEY NSW

BY

WOWCO EXPLORATION SERVICES PTY. LTD

BRISBANE QUEENSLAND

FEBRUARY 28, 1982

INTRODUCTION

WOWCO Exploration Services Pty. Limited conducted the Overland Corner Seismic Survey for Scott Sunlea Pty. Limited during the period between December 10, 1981 and January 10, 1982 within the confines of PEL 16, South Australia. The field crew was on leave between December 21, 1981 and January 5, 1982.

LOCATION

The Overland Corner Seismic Survey was shot within the area of PEL 16 South Australia bounded by the co-ordinates 430000 E to 455000 E and 6 250000N to 6 220000N.

CLIMATIC CONDITIONS

Although high winds and intermittant precipitation forced the recording crew to suspend operations for relatively short periods of time on several occassions, unfavourable weather did not have a significant detrimental effect upon production.

TOPOGRAPHY

The relatively flat sandy terrain is covered with mallee. The strong root systems retarded the progress of the line clearing units. The primary land use in this portion of the Murray Basin is grazing.

ACCOMMODATION

The field crew was accommodated in tents adjacent to a shearing shed. Supplies were obtained from Renmark which is located approximately 50km from the prospect.

SURVEYING

The horizontal and vertical survey was conducted by chaining the distances between stations and taking elevations with a transit.

The South Australia Department of Lands topographic maps (scale 1:50,000) and aerial photographics were used to locate the programme. Horizontal control was obtained from an azimith survey which was plotted on a 1:50,000 base map.

The vertical and horizontal control from Trig station 6929/1386 and sun shots. Loop closures were within the required specifications.

LINE CLEARING

A D7G and a TD 15 were used to prepare the seismic traverses. The low relief topography did not seriously impede the progress of the bull-dozers.

DATA ACQUISITION

Geoflex, which was buried to a depth of one metre, was used as the energy source. A noise analysis and charge size comparisons were made prior to the commencement of production work to establish the shooting techniques.

The data acquisition parameters were as follows;

Charge depth:	1m
Charge length:	2 lengths of parallel cord 100m long
Ground interval;	40m
Shot point interval:	160m
CDP coverage:	600%
Record length;	4000ms
Geophones per trace:	12 (in line)

Geophone type:	GSC/20D - 14 Hz
Geophone interval:	3.6m
Spread dimensions:	960-80-0-80-960m
Instrumentation:	Sercel 338HR - 48 trace system
Filters on record:	12.5 - 250Hz
Sample rate:	1ms

A D7 bull-dozer was used to plough the trench for the geoflex. A grader filled in the ditch after the cord had been laid. The exceptionally high incidence of "hole blow" suggests that the heavy tracks of a dozer should have been used to "tamp" the loosely consolidated infill.

REFLECTION QUALITY

The quality of the reflected energy was generally satisfactory. The average 30Hz frequency of the deep energy bands was relatively low, because geoflex was used for this reconnaissance survey.

RESTORATION

Restoration of the environment was conducted by Wowco after data acquisition was completed on each traverse.

CONCLUSIONS

Geoflex proved to be a reasonable energy source for regional traverses in the Murray Basin of South Australia. Vibrations or deep hole dynamite warrant consideration, if detail coverage is programmed.

D. Taylor

DAVID TAYLOR

APPENDIX "A"

PEL 16 S.A.

EQUIPMENT LIST

RECORDING:

Sercel 338HR 48 Trace recording instruments

SIE ERC 10 52 trace camera

Imput/Output SSS 200 shooting system

5 "TAIT" model T198 transceivers

Rota-long switch and accessories

108 traces of CDP cable

108 sets of 12 GSC/20D 14 Hz geophones

A complete compliment of spare parts

6 Betsy Guns

1 four wheel drive quadravan recording vehicle

1 Toyota landcruiser shooting vehicle

3 " " cable and geophone vehicles

1 dynamite magazine and detonator magazine

SURVEYING

2 Toyota landcruiser survey vehicle

1 party managers vehicle

1 Wild T1-A Thedolite

2 Statia rods and chains

CAMP

One complete field camp to accommodate Wowco and sub contract personnel

Appendix "A" contd.

LINE CLEARING

1 D7G dozer

1 TD 15 "

1 D7G dozer with ripper to dig the cord trenches

1 grader

APPENDIX "B"

PEL 16 S.A.

PERSONNEL LIST

Supervisor	G. Speedy
Technical Supervision	A. James (Consultant)
Party Manager	G. Paton
Observer	R. Dunlop
Junior Observer	T. Brewer
9 man line crew	
Shooter	K. Howe
1 Preloader	M. Gayne
1 Assistant Preloader	
1 Surveyor	Graham Paton
2 Survey Assistants	
1 Mechanic	F. Liedel
1 permit man	B. Dickman

APPENDIX "C"

PEL 16 S.A.

STATISTICAL SUMMARY

Subsurface coverage	111.52km
No. of stations	2788
No. of Shot points	697
Recording hours	123.75
Travel Time	18.75
Experimental hours	11.50
Stand by time	3.00
Total hours	157.00
Km of subsurface coverage per 10 hr day	7.10
Line Clearing total hours	153.0
Km of subsurface coverage cleared per 10 hr day	7.29

00011

FINAL INTERPRETATION REPORT

OVERLAND CORNER SEISMIC
SURVEY (OC81)
PEL-16, MURRAY BASIN

BY

ALAN JAMES
CONSULTING PETROLEUM GEOPHYSICIST

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LIST OF FIGURES

1. Introduction

This report concerns itself with the acquisition and interpretation of the Overland Corner Seismic Survey (OC81) within PEL 16 in the Murray Basin, South Australia. The work has been commissioned by the operators of the permit International Mining Corporation N.L. of 447 Kent Street, Sydney 2000.

2. Seismic Data Quality and Coverage

The Overland Corner Seismic Data provided the basis for this interpretation, however older existing seismic was used to tie these data to the Renmark North #1 well, and to access any plays within the Renmark Trough.

The data used is as follows

i) Overland Corner Seismic Survey (OC81)

Lines, OC81 - 1 sp 100-304 10.08 Km
OC81 - 2 sp 100-400 13.92 Km
OC81 - 3 sp 104-424 14.72 Km
OC81 - 4 sp 100-512 18.400 Km
OC81 - 5 sp 100-336 11.36 km
OC81 - 6 sp 100-464 16.48 km
OC81 - 7 sp 100-552 20 Km
OC81 - 8 sp 100-348 11.84 km
OC81 - 9 sp 100-348 11.84 km 128.12 Km

ii) Renmark Seismic Survey ('RSS65')

Lines, L9 sp 100-210
L1 sp 1 - 77
L5 sp 1 - 42

The Overland Corner Seismic Survey was recorded by WOWCO Pty Ltd (party 1) during November, December and January 1981-82. A total of 120 kms of 600% geoflex data was recorded over the south eastern margin of the Canegrass Lobe extending across the Hamley Fault Zone (a major down to the east fault zone) into the Renmark Trough in a loose 3 x 4 kilometre grid.

The following field acquisition parameters were used:

40 m group interval
160 m shot interval
48 trace, 24-24 split spread
12 x 14 hz geophones/trace
80 m near trace offset
2 x 100 strips of 9 oz. geoflex detonated by one detenator per shot point.

The data was processed by S.D.P. in Sydney during January and February 1982. A standard processing routine was used, however because no field statics crew was employed and first breaks were of poor quality, a raw datum static was applied using a 0m datum and 2000 m/s replacement velocity. Surface consistant residual statics (and trim statics) were used to remove small lateral variations in datum statics. Although this is not an accurate method it appears to have worked well and be adequate for the reconaissance nature of this seismic survey.

The data quality of this survey is good allowing reliable mapping of the seismic events chosen.

The Renmark Seismic Survey - RSS65 (conducted for Tasman Oil Pty Ltd) was recorded in analogue form during 1965 by Geophysical Associates International. All these data were 100% dynamite using a 24 trace system (12-12 symmetric split spread), 110' group interval (using a weighted array of 12 geophones/trace), a shot point interval of 1320' and a near trace offset of 110'.

Data quality of these data is poor. The signal to noise ratio being very low. These data are not suitable for any reliable mapping of seismic events, particularly across the Hamley Fault Zone. It is considered that a simple redisplay using modern techniques would considerably improve these data. The seismic lines are arranged in a sparce irregular manner.

3. Well Tie - North Renmark No. 1

In order to date seismic events mapped a well tie was made to the North Renmark No. 1 well located within the Renmark Trough to the east of the Canegrass Lobe. Seismic lines RSS-1 (sp 1-77) and OC81-05 (sp 100-332) were used. (See Figure 1) The North Renmark #1 well was drilled in 1962. It was not located on a seismic line and as such a jump correlation of 1.0 kms to the south west to shot point 1 on Renmark Seismic Survey Line-1 was necessary. As previously mentioned the data quality of seismic line RSS-1 is poor, and as such the lithological correlations from the well to line OC81-05 are considered approximate only. The correlation of the Top Permian(?) and Top Pyap(?) (Mid Cretaceous) along line RSS65-1 is considered accurate within a few cycles. No velocity information was available from The North Renmark #1 well. As a result, well tops were translated to time using an average synthetic Time-Depth curve calculated from the normal moreout equation for seismic data from each of The Renmark Seismic Survey and The Overland Corner Seismic Survey (see Figure 2.) The two Time-Depth curves derived in this manner show good correlation and as such is considered fairly reliable.

The tops calculated and corresponding two way travel time for shot point 1 on RSS Line-1 (closest point to the well) are listed below.

	Unit	Depth* (feet)	TWTT (seconds)
EOCENE - PALEOCENE	Top Eocene Upper Renmark Beds	-626	0.22
	Top Lower Renmark Beds	-1055	0.36
CRETACEOUS	Top Lower Cretaceous Coombool Member	-1720	0.54
	Top Merti Member	-2392	0.70
	Top Pyap Member	-2820	0.80
PERMIAN	Top Permian	-3165	0.91
	Total Depth	-3938	1.11

* Source of Tops - Hydrocarbon Potential of the Western Murray Basin and Intra Basins - R.C.N. Thornton - Geological Survey of S.A. Report 41, 1974.

Seismic line RSS65 Line 1 (sp's 56 and 77) ties to both lines OC81-05 (sp 332) east of The Hamley Fault Zone and OC81-04 (sp 512) on the Canegrass Lobe.

The principal objective of the well tie to North Renmark #1 was to determine the aerial extent of the Permian (and Devonian?) section found within the Renmark Trough in a north westerly direction across the Hamley Fault Zone to the OC81 survey area on The Canegrass Lobe.

4. Stratigraphy of the Renmark Trough and Canegrass Lobe

The stratigraphy of The Renmark Trough is fairly well understood. There having been a number of wells drilled within its confines. Thornton (1974) has well described the structure and stratigraphy of The Renmark Trough, with particular emphasis on the hydrocarbon potential. Briefly, the main source and reservoir rocks identified within the Renmark Trough are considered to be Cretaceous sediments of the Pyap and Murrreti Members together with Lower Permian (non glacial) sediments. The Devonian section is not well understood and may provide a good source and reservoir for hydrocarbons. A general stratigraphic table is included below:

AGE	FORMATION	
RECENT TO QUATERNARY	UNNAMED	
PLIOCENE TO MIOCENE	LOXTON SANDS BOOKPURNONG BEDS	
MIOCENE TO OLIGOCENE	PATA LIMESTONE MORGAN LIMESTONE MANNUM FORMATION GAMBIER LIMESTONE ETTRICK FORMATION	
EOCENE TO PALEOCENE	U. RENMARK BEDS L. RENMARK BEDS	
LOWER CRETACEOUS	COOMBOOL MEMBER MERRETI MEMBER PYAP MEMBER	MONASH FORMATION
L. PERMIAN	UNNAMED	
? DEVONIAN	UNNAMED	
? CAMBRIAN	?KANMANTOO GROUP	

<u>The stratigraphy of the Canegrass Lobe</u> is not as well understood. Only four wells have been drilled on the feature: Canopus-1, Canopus-2, Bungunnia Bore, and the Waikerie Bores - 27W, 28W. None of these wells are within close proximity to the OC81 survey area. (See Figure 1).

Only the Waikerie Bores penetrated a Permian section. The Canopus 1 and 2 wells were drilled to 536' and 570' respectively and were T.D.'d in the Eocene U. Renmark Beds. The Bungunnia Bore penetrated a complete Recent to Paleocene section unconformably overlying rocks of Devonian age. The well was terminated at a depth of 1275' within a Cambrian section. No Lower Cretaceous or Permian section was intersected.

Previous published work by Thornton (1974, 1973) has discussed the geology, structure and hydrocarbon potential of the Canegrass Lobe. This work was based upon limited well data, gravity, magnetics and inadequate (in quality and quantity) seismic reflection and refraction traveses. Predictions of lithologies and ages of sediments which comprise the Canegrass Lobe were made principally on seismic refraction velocities, intergrated with the sparce well control available. He speculated that the stratigraphy of The Canegrass Lobe differed in the north (Canopus 1,2) to that in the south (Bungunnia Bore), in that a Cretaceous and Permian section absent in the north would be present in the south of the feature. This would also correspond with the decrease in throw of the Hamley Fault in a southerly direction. The general stratigraphy is included below:

NORTH

AGE	FORMATION
RECENT TO QUATERNARY	UNNAMED
PLIOCENE TO MIOCENE	LOXTON BEDS BOOKPURNONG BEDS
MIOCENE TO OLIGOCENE	PATA LIMESTONE MORGAN LIMESTONE MANNUM FORMATION GAMBIER LIMESTONE ETTRICK FORMATION
EOCENE TO PALEOCENE	U. RENMARK BEDS L. RENMARK BEDS
PALAEZOIC	BASEMENT

SOUTH

AGE	FORMATION	
RECENT TO QUATERNARY	UNNAMED	
PLIOCENE TO MIOCENE	LOXTON SANDS BOOKPURNONG BEDS	
MIOCENE TO OLIGOCENE	PATA LIMESTONE MORGAN LIMESTONE MANNUM FORMATION GAMBIER LIMESTONE ETTRICK FORMATION	
EOCENE TO PALEOCENE	U. RENMARK BEDS L. RENMARK BEDS	
LOWER CRETACEOUS	COOMBOOL MEMBER MERRETI MEMBER PYAP MEMBER	MONASH FORMATION
L. PERMIAN	UNNAMED	
? DEVONIAN	UNNAMED	
? CAMBRIAN	?KANMANTOO GROUP	

5. Interpretation of OC81 Seismic Data

Interpretation of the OC81 seismic data is considered reliable, the horizons chosen being easily mappable over the survey area. The horizons mapped were:

?Near Top Pata Limestone (Miocene) - Yellow
?Near Top Renmark Beds (Eocene) - Green
?Near Top Pyap Member (Mid Cretaceous) - Blue
?Near Top Permian - Brown
?Near Top Basement - Red

Two time structure maps were produced (Figures 3 and 4) and are discussed in section 6.

Seismic line OC81-05 (See Figure 8) which ties into RSS65-1, is an east-west line from the Renmark Trough to the Canegrass Lobe. This line best illustrates the truncation of predicted Permian sediments against the Hamley Fault Zone, suggesting the absence of these sediments and those older on The Canegrass Lobe. This suggests that the stratigraphy of The Canegrass Lobe in this area includes a Tertiary, Palaeocene-Eocene and Upper Cretaceous section as found within the Renmark Trough (The Pyap member may be compressed) sitting directly on economic basement.

The seismic character of this interpreted "basement" reflector on the Canegrass Lobe is significantly different to seismic events within the Renmark Trough. This event is a strong black event with an acoustically homogeneous section below it. The structural style of this "basement" reflector is different also, it being intensely disected by faults (extensional faults with minor compression or a right-lateral shear component).

A Thin (?) Permian (?) section is interpreted on line OC81-09, the southern most east-west line. This is based upon a change in basement character along this seismic line. This concept is supported by the presence of a Permian section in the Waikerie and Bungunnia Bores to the west. The time structure map - Top Brown Seismic event (?Near Top Permian) - Figure 4, indicates the aerial extent of the Permian section. Note also that the Hamley Fault loses throw in a southerly direction.

6. Discussion of Time Structure Maps

i) Blue Seismic Event - Near Top Pyap Member? (Mid Cretaceous) - Figure 3.

The predominant feature on this map is The Hamley Fault Zone, trending in a NE-SW direction. The average Throw of this fault being 50 milliseconds. Contours generally parallel the fault indicating a monoclinal form up onto the Canegrass Lobe.

Little additional faulting is seen on The Canegrass Lobe or in The Renmark Trough at this level.

Two closures are mapped opposite each other. One on the low side of the fault zone and one on the high side. The small high side closure is obviously more prospective and has a relief of 25 milliseconds (TWTT) over an area of 8 square kilometres.

The approximate crestal depth to the top of the Blue Seismic Event (Pyap Member?) and Red Seismic Event (Basement?) is 440 metres and 580 metres respectively. This feature occurs approximately at the intersection of lines OC81-02 and OC81-08 (Figures 6 and 7).

ii) Top Brown Seismic Event - (Near Top Permian?) - Figure 4.

This map shows the trend of the Hamley Fault Zone in the NE-SW direction. Considerably more faulting is evidenced at this level than at the Blue Seismic event level. The pinchout of The Permian Section against the Hamley Fault is evidenced north of line OC81-09. The interpreted re-entrant of the Permian Section across the fault zone to the west just north of line OC81-09 can also be seen. Broadly the structure contours parallel the fault trend.

One major closure is mapped on the low side of the fault against the fault zone. It has a relief of 0.5 seconds (TWTT) over an area of 8 square kilometres. This is considered of high risk as a fault seale is required.

iii) Top Red Seismic Event - ?Near Top Basement Reflector (Palaezoic?) - Figure 5.

This map shows what is interpreted to be a highly faulted 'basement' reflector. The basement appears seismically transparent, differing significantly in seismic character from all other seismic units. Normal faulting is dominant with onlap of the above Cretaceous Pyap Member (?) common. As this unit is interpreted to be economic basement the few small closed structures are not considered significant, and may just be a function of the OC81 survey line spacing.

The highly faulted and transparent nature of this horizon supports the assessment as a basement reflector and hence uneconomic.

7. Summary and Recommendations

The Overland Corner Seismic Survey has better defined the stratigraphy and structure of the south eastern flank of The Canegrass Lobe. Correlations from the North Renmark #1 well indicate that the prospective Permian and Devonian(?) section is unlikely to be present on The Canegrass Lobe to the north of line OC81-09. This down grades the attractiveness of this region of the Murray Basin.

However, migration of hydrocarbons up the Hamley Fault Zone into high side structures on The Canegrass Lobe adjacent to the fault zone is possible, given the likely prospect that hydrocarbons are generated from the deeper Renmark Trough section. To this extent the high-side structure mapped at the Blue Seismic Event level (Figure 3) is attractive. However it is very small. Low side fault closures mapped on the eastern flank of the Hamley Fault Zone at the Blue or Brown Seismic Event level are considered high risk as they rely on the fault zone for seal . Further, pinchout plays within the Permian or Cretaceous section on the western flank of The Renmark Trough are also considered high risk, and should only be attempted when the exploration of the area is more advanced.

It is recommended that future exploration should include a seismic survey over an area immediately to the south of line OC81-09 across the southern extension of The Hamley Fault Zone where a Permian section is more likely to be present. This is supported by Thornton's work (1974) which, based upon gravity data, predicts a small Permian re-entrant in this area (See Figure 1). This indicates the potential for both structural and pinchout plays within this re-entrant.

A small seismic survey of approximately 100 kilometres should be adequate to delineate whether any such Permian play exists (See Figure 1).

Indications are that previous drilling has not adequately tested the hydrocarbon potential of this area. Exploration wells are sparcely located and none appear to have tested valid closures at the Cretaceous or Permian levels. To this extent, further exploration within the area is warranted.

Alan James

Alan James.

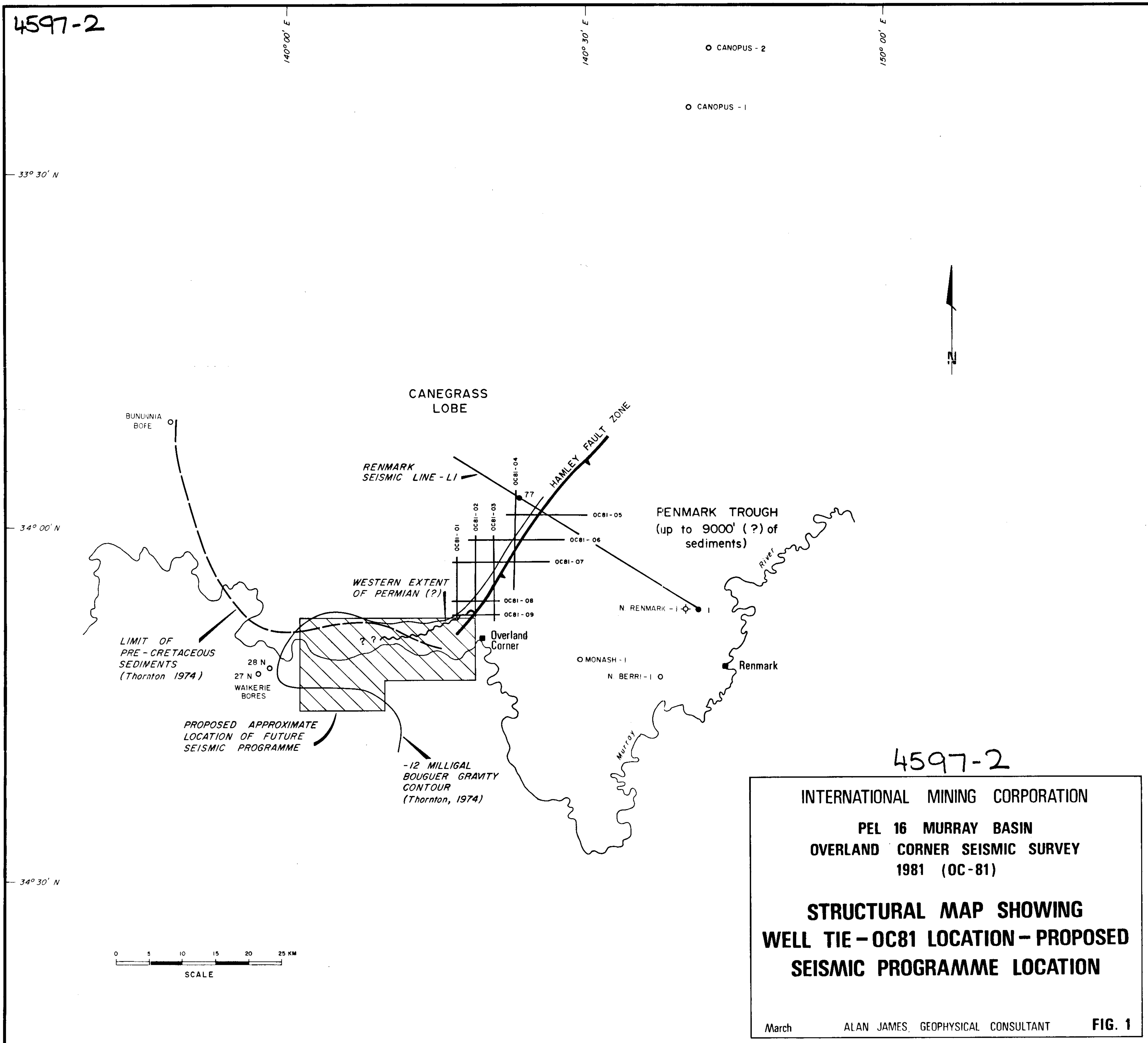
27/4/82.

References

1. Thornton R.C.N. (1974) "Hydrocarbon Potential of Western Murray Basin and Intrabasins". Report of Investigations 41. Geological Survey of South Australia.

2. Thornton R.C.N. (1973) "Murray Basin and Associated Intrabasins". in Aus. I.M.M. Economic Geology Part 3 Petroleum.

4597-2



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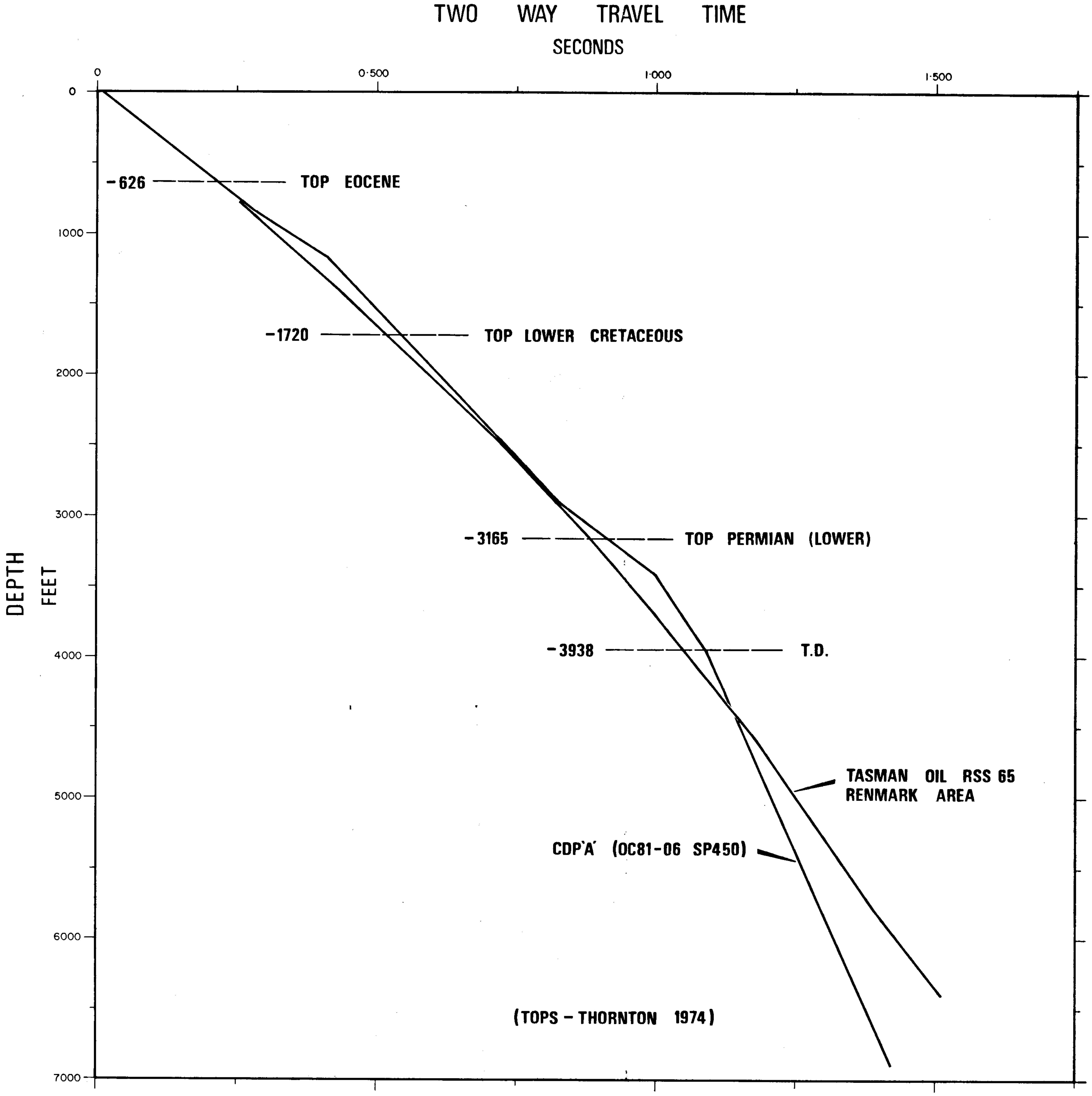
INTERNATIONAL MINING CORPORATION

PEL 16 MURRAY BASIN
OVERLAND CORNER SEISMIC SURVEY
1981 (OC-81)

STRUCTURAL MAP SHOWING WELL TIE – OC81 LOCATION – PROPOSED SEISMIC PROGRAMME LOCATION

March — ALAN JAMES, GEOPHYSICAL CONSULTANT — **FIG. 1**

4597-3



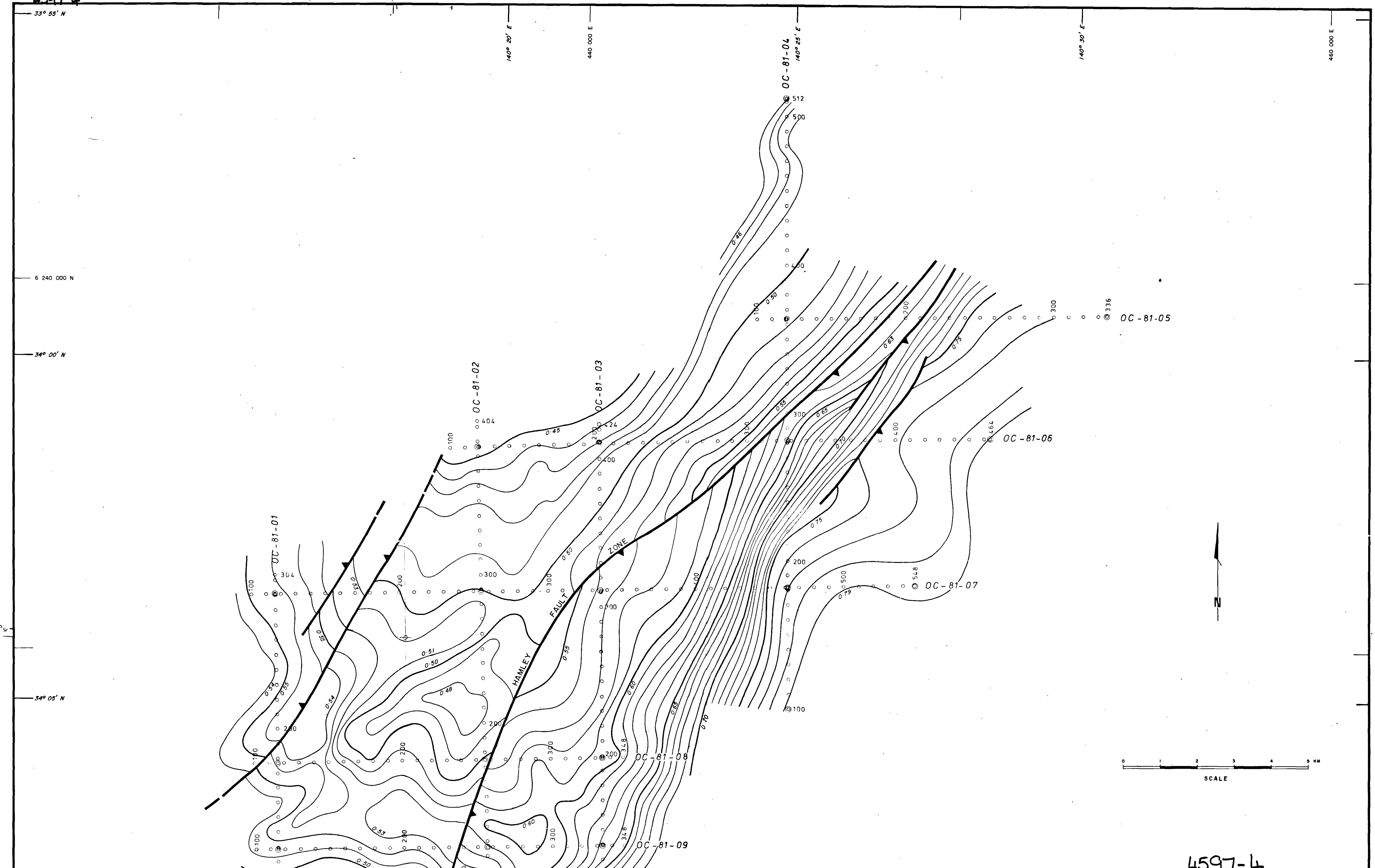
4597-3

INTERNATIONAL MINING CORPORATION

SYNTHETIC TIME - DEPTH CURVE
NORTH RENMARK - 1
(DERIVED FROM NMO CALCULATIONS)

March 1982 ALAN JAMES, GEOPHYSICAL CONSULTANT **FIG. 2**

4597-4



4597-4

INTERNATIONAL MINING CORPORATION

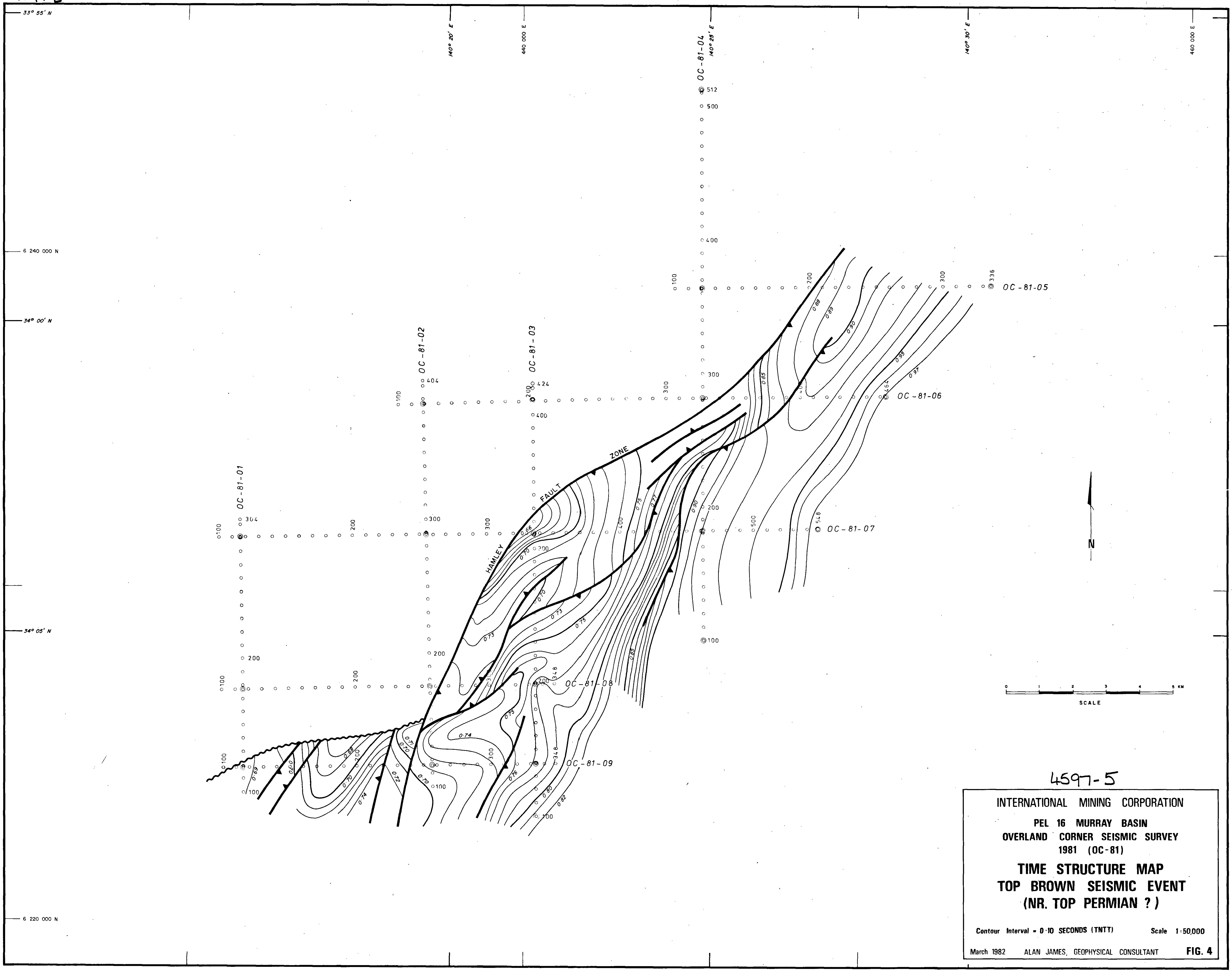
PEL 16 MURRAY BASIN
OVERLAND CORNER SEISMIC SURVEY
1981 (OC-81)

TIME STRUCTURE MAP
TOP BLUE SEISMIC EVENT
(NR. TOP PYAP? MID CRETACEOUS)

Contour Interval = 0·10 SECONDS (TNTT) Scale 1:50,000

March 1982 ALAN JAMES, GEOPHYSICAL CONSULTANT **FIG. 3**

4597-5



4597-5

INTERNATIONAL MINING CORPORATION

PEL 16 MURRAY BASIN
OVERLAND CORNER SEISMIC SURVEY
1981 (OC-81)

TIME STRUCTURE MAP
TOP BROWN SEISMIC EVENT
(NR. TOP PERMIAN ?)

Contour Interval = 0·10 SECONDS (TNTT) Scale 1:50,000

March 1982 ALAN JAMES, GEOPHYSICAL CONSULTANT **FIG. 4**

SEISMIC INTERPRETATION REPORT
OVERLAND CORNER SEISMIC SURVEY (OC83)
PEL - 16, MURRAY BASIN

BY

ALAN JAMES
CONSULTING PETROLEUM GEOPHYSICIST

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SEISMIC INTERPRETATION REPORT

OVERLAND CORNER SEISMIC SURVEY (OC83)

PEL - 16, MURRAY BASIN

BY

ALAN JAMES

CONSULTING PETROLEUM GEOPHYSICIST

A.W. JAMES & ASSOCIATES PTY. LTD.

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LIST OF FIGURES AND PLATES

1. PREAMBLE

This report presents the interpretation of seismic data from the Overland Corner Seismic Survey (OC83) located within PEL 16 in the Murray Basin, onshore South Australia. It has been commissioned by the operator of the PEL, International Mining Corporation N.L. of 447 Kent Street, Sydney, 2000.

2. INTRODUCTION

PEL 16 is located approximately 200 kilometres north east from the city of Adelaide, in the moderately populated (see Figure 1) 'Riverland' area of southern South Australia. The area is sparsely vegetated with mulga scrub except for the immediate vicinity of the Murray River, which is typically intensively farmed for citrus fruits.

The major tectonic features which lie within PEL 16 are the Renmark Trough and the Canegrass Lobe (see Figures 1 and 2).

The Renmark Trough is a NNE-SSW trending post Jurassic Trough containing up to 9,000' of Tertiary, Permian and Devonian sediments (Thornton, 1974). It is bordered to the west by the Canegrass Lobe, a large (approximately 10,000 sq. kms.) approximately circular high block recognised from gravity data. The boundary between these two features is the Hamley Fault Zone, an extensional fault exhibiting growth from probable pre-Permian to Tertiary time.

The primary objective of the OC83 Seismic Survey was to better define hydrocarbon plays along the western flank of the Renmark Trough. The survey was located over a small gravity low (5 milli-gals), to the immediate south-west of the previous OC81 Seismic Survey. This gravity low was predicted to indicate a small sedimentary re-entrant (post Permian?) within the Canegrass Lobe.

3. SEISMIC DATA QUALITY AND COVERAGE

The OC83 and OC81 seismic data provided the basis for this interpretation. Additional old (1965) analogue seismic data were used in an attempt to tie the isolated OC83 and OC81 seismic grid into North Renmark-1. These old analogue data are of poor final quality, principally due to the display method.

The OC83 and OC81 comprise approximately 250 kilometres of 600% CDP digitally recorded data, shot during 1981/82 and 1983. These two interconnecting seismic grids are located on the eastern flank of the Canegrass Lobe across the Hamley Fault Zone (see Figure 2) where a thinner sedimentary section was predicted (less than 1,500 sq. m) to that of the Renmark Trough.

The OC83 Seismic Survey was recorded by South Eastern Exploration Pty. Ltd. of Brisbane, during January 1983. A total of approximately 130 kms of 600% geoflex data was recorded as a southerly extension of the OC81 Seismic Survey recorded during 1981-82. The loose 3 x 4 kilometer grid covered a predicted Permian re-entrant across the Hamley Fault onto the Canegrass Lobe.

The following field acquisition parameters were used:

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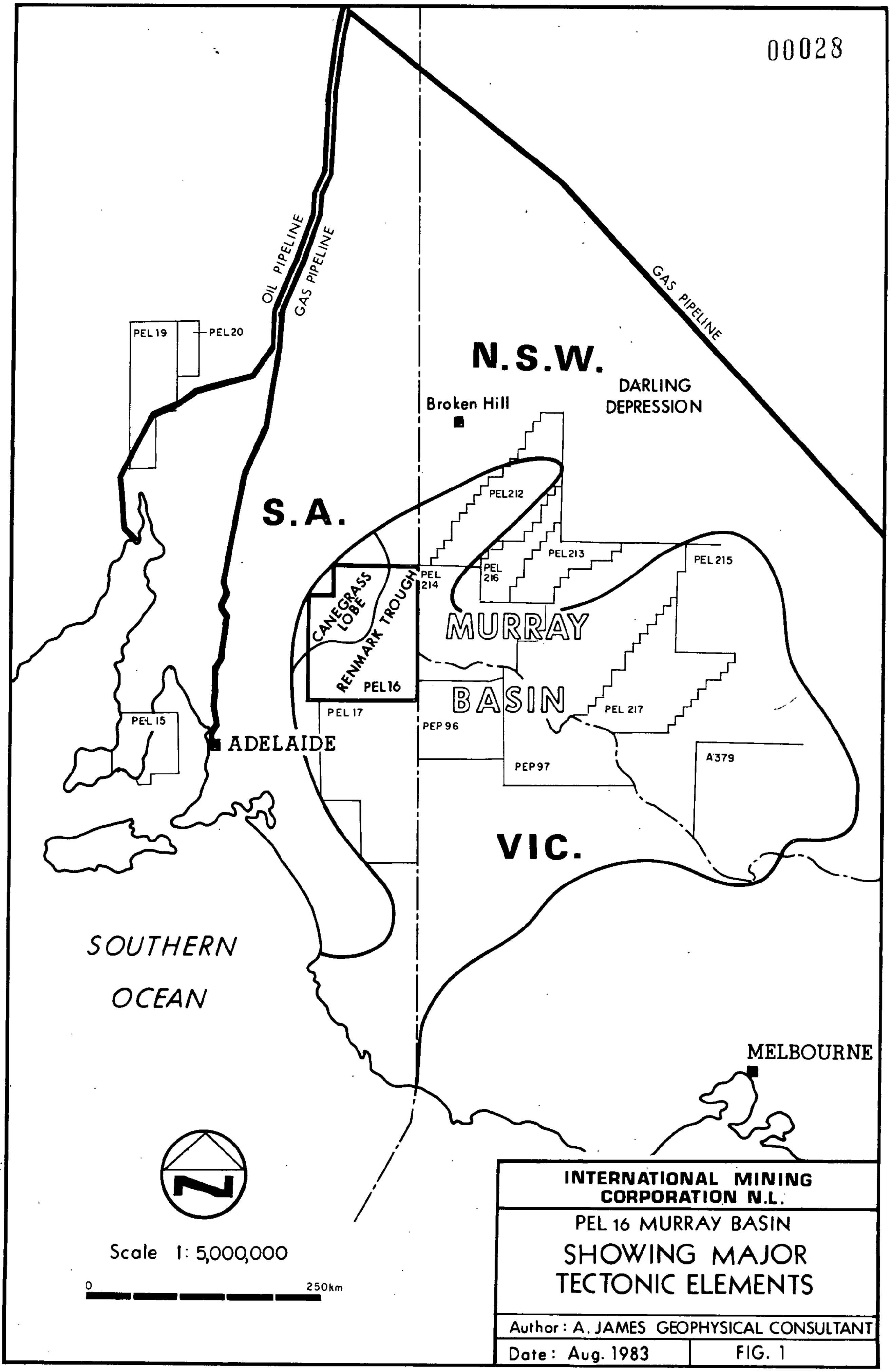


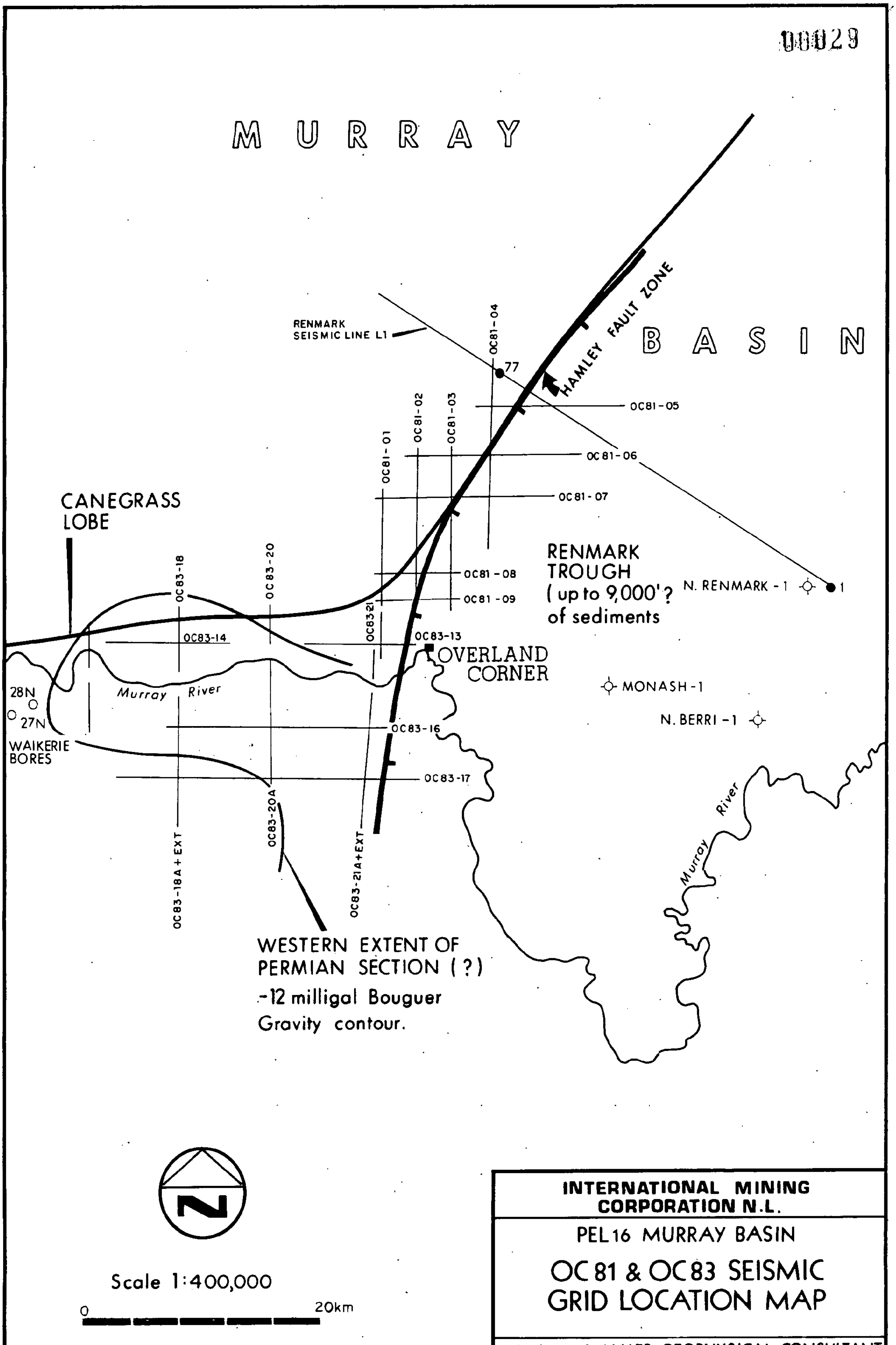
INTERNATIONAL MINING CORPORATION N.L.

PEL 16 MURRAY BASIN

SHOWING MAJOR TECTONIC ELEMENTS

Author: A. JAMES GEOPHYSICAL CONSULTANT

Date: Aug. 1983 | FIG. 1



INTERNATIONAL MINING CORPORATION N.L.

PEL16 MURRAY BASIN

OC81 & OC83 SEISMIC GRID LOCATION MAP

Author: A. JAMES GEOPHYSICAL CONSULTANT	
Date: Aug. 1983	FIG. 2

25m group interval
200m shot point interval
96 trace, 48-48 split spread
12 x 28 kz geophones / trace in line,
12 hz low cut (12db/oct), 124hz high
cut (48 db/oct)
2 x 40 metre strands of geoflex (parallel),
detonated in centre.

These data were processed by SDP in Sydney during February and March, 1983. A standard processing routine was used, however, because no field statics crew was employed and first breaks were of poor quality, a raw datum static was applied using a 0m datum and 2000 m/s replacement velocity. Surface consistant residual statics (and trim statics) were used to remove small lateral variations in field statics.

This approach was used as no highly variable weathered layer was detected, nor apparent from previous work. However, slight variations in weathering depth may effect the integrity of mapped closures.

A total of approximately 130 kilometres comprise the survey and are listed below:

OC83 - 11	sp's	92 - 500
OC83 - 12	"	52 - 292
OC83 - 13	"	100 - 468
OC83 - 14	"	100 - 460
OC83 - 16	"	100 - 908
OC83 - 17	"	100 -1164
OC83 - 18	"	100 - 300
OC83 - 18A+18A ext	"	28 - 244, 100 - 288
OC83 - 20	"	100 - 236
OC83 - 20A	"	100 - 412
OC83 - 21	"	120 - 345
OC83 - 21A+21A ext	"	92 - 288, 100 - 358

The OC81 Seismic Survey was recorded by WOWCO Pty. Ltd. (party 1) during November, December and January 1981-82. A total of 120 kms of 600% geoflex data was recorded over the south eastern margin of the Canegrass Lobe extending across the Hamley Fault Zone into the Renmark Trough in a losse 3 x 4 kilometre grid.

The following field acquisition parameters were used:

40m group interval
160m shot interval
48 trace, 24-24 split spread
12 x 14 hz geophones / trace
80m near trace offset
2 x 100 strips of 9 oz. geoflex detonated by one
detonator per shot point.

These data were also processed by SDP in Sydney during February/March 1982, using a similar processing routine to that used in the OC83 seismic survey.

The OC81 survey comprised approximately 130 kilometres. The line members and shot point ranges are listed below:

Overland Corner Seismic Survey ()C81) - approx. 130 kilometres

OC81 - 1	sp's	100 - 304
OC81 - 2	"	100 - 400
OC81 - 3	"	104 - 424
OC81 - 4	"	100 - 512
OC81 - 5	"	100 - 336
OC81 - 6	"	100 - 464
OC81 - 7	"	100 - 552
OC81 - 8	"	100 - 348
OC81 - 9	"	100 - 348

Renmark Seismic Survey ('RSS65') - approx. 120 kilometres

L9	sp's	100 - 210
L1	"	1 - 77
L5	"	1 - 42

The data quality of the OC83 and OC81 seismic surveys is good, allowing reliable mapping of the seismic events chosen. The final data quality of the OC83 survey is superior to the OC81 seismic data, particularly within the shallow section (less than 0.7 seconds TWT) where events have greater continuity and are stronger in amplitude.

The Renmark Seismic Survey - RSS65 (conducted for Tasman Oil Pty. Ltd.) was recorded in analogue format, during 1965, by Geophysical Associates International. All these data were 100% dynamite using a 24 trace system (12-12 symmetric split spread), 110' group interval (using a weighted array of 12 geophones/trace), a shot point interval of 1,320' and a near trace offset of 110'.

Data quality of these data is poor, the signal to noise ratio being very low. These data are not suitable for any reliable mapping of seismic events, particularly across the Hamley Fault Zone. It is considered that a simple redisplay using modern techniques would considerably improve these data. The seismic lines are arranged in a sparse irregular manner.

4. WELL TIE - NORTH RENMARK NO. 1

In order to date seismic events mapped, a well tie was made to the North Renmark No. 1 well located within the Renmark Trough to the east of the Canegrass Lobe. Seismic lines RSS-1 (sp 1-77) and OC81 -05 (sp 100-332) were used. (See Figure 1). The North Renmark No. 1 well was drilled in 1962. It was not located on a seismic line and as such a jump correlation of 1.0 kms to the south west to shot point 1 on Renmark Seismic Survey Line - 1 was necessary. As previously mentioned, the data quality of seismic line RSS-1 is poor, and as such the lithological correlations from the well to line OC81-05 are considered approximate only. The correlation of the Top Permian (?) and Top Pyap (?) (Mid Cretaceous) along line RSS65-1 is considered accurate within a few cycles. No velocity information was available from the North Renmark No. 1 well. As a result, well tops were translated to time using an average synthetic Time-Depth curve calculated from the moveout equation for seismic data from each of the Renmark Seismic Survey and the Overland Corner Seismic Survey (see OC81 Seismic Report). The two Time-Depth curves derived in this manner show good correlation and as such is considered fairly reliable.

The tops calculated and corresponding two way travel times for shot point 1 on RRS Line -1 (closest point to the well) are listed below:

	Unit	Depth* (feet)	TWTT (seconds)
EOCENE - PALEOCENE	Top Eocene Upper Renmark Beds	-626	0.22
	Top Lower Renmark Beds	-1055	0.36
CRETACEOUS	Top Lower Cretaceous Coombool Member	-1720	0.54
	Top Merti Member	-2392	0.70
	Top Pyap Member	-2820	0.80
PERMIAN	Top Permian	-3165	0.91
	Total Depth	-3938	1.11

* Source of Tops - Hydrocarbon Potential of the Western Murray Basin and Intra Basin - R.C.N. Thornton - Geological Survey of S.A. Report 41, 1974.

Seismic line RSS65 Line 1 (sp's 56 ans 77) ties to both lines OC81-05 (sp 332) east of the Hamley Fault Zone and OC81-04 (sp 512) on the Canegrass Lobe. (See Figure 2).

The principal objective of the well tie to North Renmark No. 1 was to determine the aerial extent of the Permian (and Devonian?) section found within the Renmark Trough in a north westerly direction across the Hamley Fault Zone to the OC83 survey area on the Canegrass Lobe.

5. STRATIGRAPHY OF THE RENMARK TROUGH AND CANEGRASS LOBE

The stratigraphy of the Renmark Trough is fairly well understood, there having been a number of wells drilled within its confines. Thornton (1974) has well described the structure and stratigraphy of the Renmark Trough, with a mention of the hydrocarbon potential. Briefly, the main source and reservoir rocks identified within the Renmark Trough are considered to be Cretaceous sediments of the Pyap and Murreti members, together with Lower Permian non glacial sediments. The Devonian section is not well understood and may provide a good source and reservoir for hydrocarbons. A general stratigraphic table is included below:

AGE	FORMATION	
RECENT TO QUATERNARY	UNNAMED	
PLIOCENE TO MIOCENE	LOXTON SANDS BOOKPURNONG BEDS	
MIOCENE TO OLIGOCENE	PATA LIMESTONE MORGAN LIMESTONE MANNUM FORMATION GAMBIER LIMESTONE ETTRICK FORMATION	
OECENE TO PALEOCENE	U. RENMARK BEDS L. RENMARK BEDS	
LOWER CRETACEOUS	COOMBOOL MEMBER MERRETI MEMBER PYAP MEMBER	MONASH FORMATION
L. PERMIAN	UNNAMED	
? DEVONIAN	UNNAMED	
? CAMBRIAN	?KANMANTOO GROUP	

The stratigraphy of the Canegrass Lobe is not as well understood. Only four wells have been drilled on the feature: Canopus-1, Canopus-2, Bungunnia Bore, and the Waikerie Bores - 27W, 28W. None of these wells are within close proximity to the OC83 survey area. (See Figure 2).

Only the Waikerie Bores penetrated a Permian section. The Canopus 1 and 2 wells were drilled to 536' and 570' respectively and were T.D.'d in the Eocene U. Renmark Beds. The Bungunnia Bore penetrated a complete Recent to Paleocene section unconformably overlying rocks of Devonian age. The well was terminated at a depth of 1,275' within a Cambrian section. No Lower Cretaceous or Permian section was intersected.

Previous published work by Thornton (1974, 1973) has discussed the geology, structure and hydrocarbon potential of the Canegrass Lobe. This work was based upon limited well data, gravity, magnetics and inadequate (in quality and quantity) seismic reflection and refraction traveses. Predictions of lithologies and ages of sediments which comprise the Canegrass Lobe were made principally on seismic refraction velocities, integrated with the sparse well control available. He speculated that the stratigraphy of the Canegrass Lobe differed in the north (Canopus 1, 2) to that in the south (Bungunnia Bore), in that a Cretaceous and Perminian section, absent in the north, would be present to the south of the feature. This would also correspond with the decrease in throw of the Hamley Fault in a southerly direction. The general stratigraphy is included below:

NORTH:

AGE	FORMATION
RECENT TO QUATERNARY	UNNAMED
PLIOCENE TO MIOCENE	LOXTON BEDS BOOKPURNONG BEDS
MIOCENE TO OBLIGOCENE	PATA LIMESTONE MORGAN LIMESTONE MANNUM FORMATION GAMBIER LIMESTONE ETTRICK FORMATION
EOCENE TO PALEOCENE	U. RENMARK BEDS L. RENMARK BEDS
PALAEZOIC	BASEMENT

SOUTH:

AGE	FORMATION	
RECENT TO QUATERNARY	UNNAMED	
PLIOCENE TO MIOCENE	LOXTON BEDS BOOKPURNONG BEDS	
MIOCENE TO OBLIGOCENE	PATA LIMESTONE MORGAN LIMESTONE MANNUM FORMATION GAMBIER LIMESTONE ETTRICK FORMATION	
OECENE TO PALEOCENE	U. RENMARK BEDS L. RENMARK BEDS	
LOWER CRETACEOUS	COOMBOOL MEMBER MERRETI MEMBER PYAP MEMBER	MONASH FORM-ATION
L. PERMIAN	UNNAMED	
? DEVONIAN	UNNAMED	
? CAMBRIAN	?KANMANTOO GROUP	

6. INTERPRETATION OF THE OC83 SEISMIC DATA

The OC83 seismic data was interpreted as an extension to the OC81 seismic interpretation previously presented. Where possible, the time structure maps contained within this report include both the OC83 and OC81 seismic data. However, as a result of the superior shallow data quality of the OC83 seismic data and increased resolution, some horizons were not mapped over the OC81 grid. Correlations of horizons throughout the OC83 seismic grid are considered reliable, the horizons chosen being easily correlated over the survey grid.

The horizons mapped were:

1) Yellow Seismic Event
(Near Top Pata Limestone ? Miocene)

2) Green Seismic Event
(Near Top Upper Renmark Beds ? Eocene)

3) Blue Seismic Event
(Near Top Pyap Member ? Mid Cretaceous)

4) Purple Seismic Event
(Intra Cretaceous reflector ?)

5) Ochre Seismic Event
(Near Base of Cretaceous ?)

6) Red Seismic Event
(Near Top Basement)

Time structure maps are presented in this report for all of these horizons(plates 1 - 5)with the exception of the Yellow Seismic Event. Together with these, an isochron map of the interval Blue to Yellow Seismic Events is also presented (plate 6). All mapping presented is at a scale of 1:50,000.

7. DISCUSSION OF TIME MAPPING

A. Time Structure Map - Green Seismic Event (Nr. Top Lower Renmark Beds?)

Three closed features are mapped. The northerly closure is located at approximately the intersection of OC83-11 and OC83-12 (15 milliseconds TWT relief over 8 sq. kilometres). A second elongated closure trending parallel to and on the upthrown side of the Hamley Fault is mapped to have two culminations (OC83-21A sp 280 and OC83-16 sp 840) on a broad high of 15 milliseconds relief over 9 sq. kilometres. The third closure (OC83-18 sp 100) may just be an easterly trending nose as it is poorly controlled by the seismic grid.

Broadly the form of the map shows a regional north easterly dip superimposed with a steeply dipping lineament parallel to the Hamley Fault Zone.

B. Time Structure Map - Blue Seismic Event (Nr. Top Purple Member?)

The form of this map shows a regional easterly dip across the Hamley Fault Zone with a northerly dip component predominant in the south (near OC83-20A). The Hamley Fault (down to the basin normal fault) cuts this seismic horizon and is continuous throughout the area mapped. Additional minor faulting is also evident on trend with the Hamley Fault Zone (NE-SW).

Superimposed on these regional trends are three closures; two high side fault dependant closures (OC83-16 sp 840, OC83-21 sp 200) of 10 milliseconds relief over 8 sq. kilometres and 10 milliseconds relief over 5 sq. kilometres respectively and a third closure located at the intersection of OC83-12 and OC83-11 is mapped to have 10 milliseconds closure over 12 sq. kilometres. Additional to these features is a poorly controlled low side fault (Hamley) dependant closure.

C. Time Structure Map : Top Ochre Seismic Event (Nr. Base Cretaceous ?)

D. Time Structure Map : Top Purple Seismic Event

The Purple and Ochre Time Structure Maps are seen to onlap old basement highs. No definite closed structures are mapped on either of these horizons, suggesting either no differential compaction of sediments over high blocks or extensive erosion at the 'Purple' and 'Ochre' times. However, potential exists (particularly on the Ochre horizon) for stratigraphic plays on the flanks of old highs (e.g. OC83-13 / 21). The distribution of the Ochre Seismic Event is seen to define the approximate limit of the Bouguer Gravity low.

E. Time Structure Map : Top Red Seismic Event (Near Top Basement (Palaeozoic))

The form of this horizon is highly disected by normal faults interpreted to trend NE-SW. The southerly area (OC83 seismic grid) is extensively faulted on both the high and low side of the Hamley Fault Zone. Together with this the throw on this fault is seen to diminish to the south suggesting the fault does not extend much further in this direction.

North of line OC81-09 on the low side of the Hamley Fault Zone basement is predicted to drop away quickly, and be covered by a thick section of Permian (?) sediments marking the beginning of the more typical Renmark Trough section.

The closures mapped tend to be small high relief features. As this map is interpreted to be on the top of economic basement, all structures mapped on this horizon are considered non prospective. However, if basement is granite, an 'unconformity' basal sand may directly overlie basement.

F. Time Isopach of the Interval Yellow to Blue Seismic Events (Miocene? to Mid Cretaceous ?)

This isochron map is presented to illustrate that a small but measurable amount of structural growth occurred over all three major closures mapped on the Blue Horizon during this time interval. It appears that the structural history of the northern most closure (located at approximately the intersection of OC83-12 and OC83-11) included growth from Basement time until the Tertiary. This feature exhibits the greatest amount of Yellow to Blue thinning.

8. SEISMIC INTERPRETATION DISCUSSION

As no exploration wells have been drilled in the vicinity of the OC83 and OC81 seismic grids the exact stratigraphy is highly interpretive. As a result, the distribution of the predicted Permian section is ambiguous as the correlation to the North Renmark-1 well is questionable. However, the results of the OC81 seismic survey together with the Bouguer gravity data suggested that a thin Permian section could be expected within the OC83 study area immediately to the south of the OC81 grid.

Based upon seismic character only a very thin veneer of Permian (?) section is interpreted to directly overlie Palaeozoic basement in this southern area. The small gravity anomoly over the OC83 survey area appears to indicate a thicker Cretaceous section coupled with the thinner Permian (?) section. This interpretation relies on the recognition of Basement as a highly faulted and often accoustically transparent seismic event.

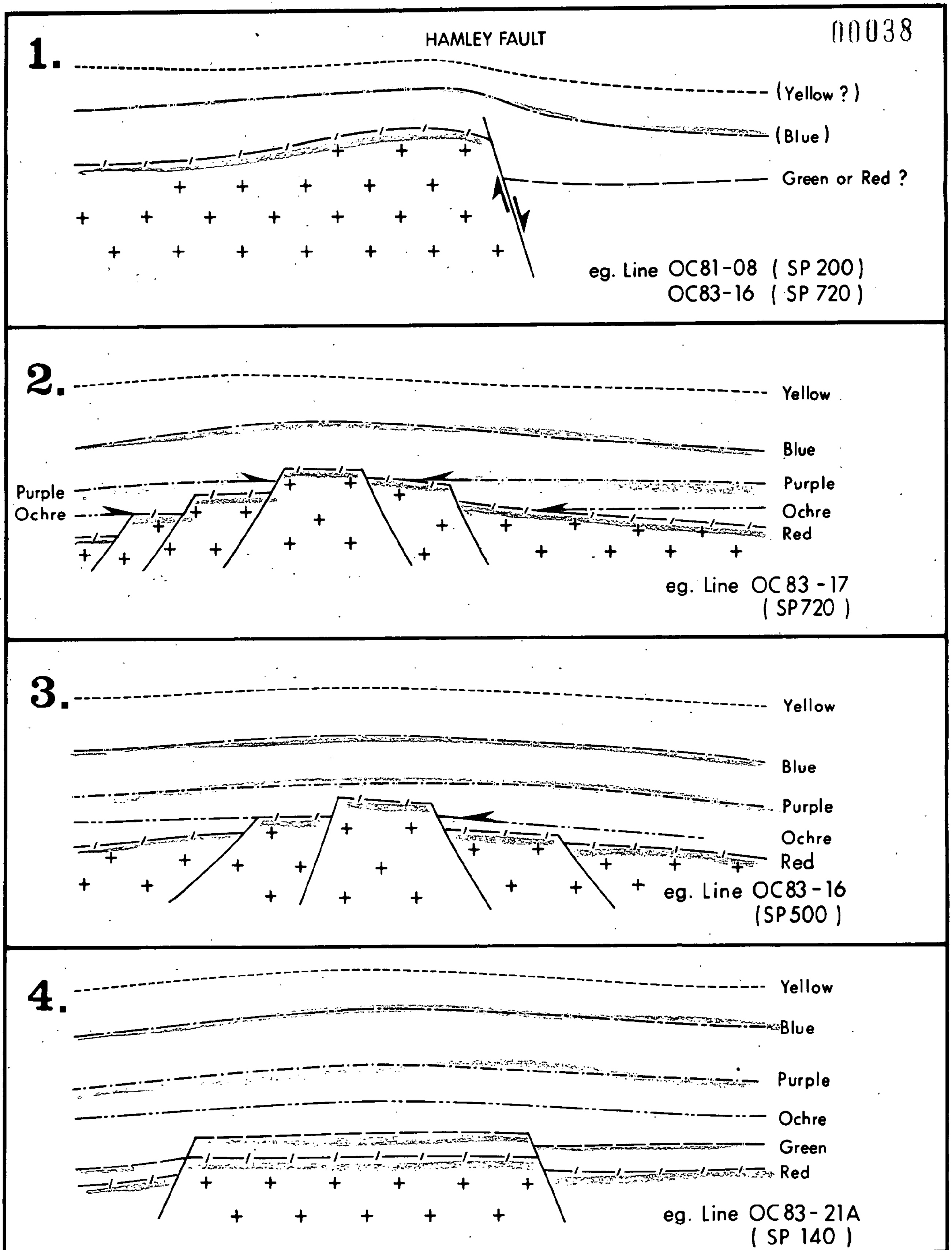
The Hamley Fault Zone (a normal, down to the east extensional fault) appears to limit the western distribution of Permian Sediments north of OC81-09. The throw on the fault zone decreases to the south where it eventually branches into a series of smaller normal faults. It is here that the OC83 survey was located and a small Permian (?) re-entrant (and larger Cretaceous re-entrant) is interpreted. This thin veneer of Permian onlaps Basement to the west, north and south (see Plate 5 for arial distribution). This is best seen on line OC83-21A SP at 292. The Permian is recognised by its high amplitude discontinuous seismic character. It is also possible that some of the basal section within depressions in the re-entrant may be of Permian age.

A number of different structural plays have been recognised from the OC83 and OC81 seismic data and are diagramatically represented in Figure 3.

Broadly, these can be divided into two categories:

i) This play type exhibits onlap of the basal section (Purple and Ochre seismic events) onto old Basement highs. A latter period of deformation (Cretaceous to Miocene ?) has further imprinted these structures close to the Hamley Fault Zone.

ii) The second play type are structures predominantly formed during the major period of movement of the Hamley Fault Zone, probably Tertiary. These features appear younger than the first group by evidence of their more significant Tertiary isopach thinning.



LEGEND

- - - - - - - -	Yellow Seismic Event Miocene ?
——·——	Blue Seismic Event Top Pyap Member (Mid Cretaceous) ?
—·—·—	Purple Seismic Event Intra Cretaceous ?
——··——	Ochre Seismic Event Basal Cretaceous ?
—— ——	Green Seismic Event Permian ?
——/——	Red Seismic Event Basement

INTERNATIONAL MINING CORPORATION N.L.

PEL 16 MURRAY BASIN

OC 81 & OC 83 SEISMIC SURVEYS
PLAY TYPES

Author: A. JAMES GEOPHYSICAL CONSULTANT

Date: Aug. 1983 | FIG. 3

In conclusion, all structures recognised are at least Tertiary to Cretaceous in age. The first group of structures are at least as old as the first basal onlap (Permian ? to Early Cretaceous ?) and to this extent may make better exploration targets, this being dependent upon the potential time of generation and migration of hydrocarbons. Potential also exists for stratigraphic plays on the flanks of old highs. However the maximum interpreted thickness of sediments in the study area is approximately 1,100 metres, with an average 800 metres of section suggesting that the section is more likely to be mature for early generated gas rather than oil, although source rock quality obviously affects the type of hydrocarbon generated.

Proposed Geological History

The Canegrass Lobe was probably located on the edge of a Devonian (?) and Permian (?) depocentre located further to the east of the OC83 and OC81 study areas. Little or no Permian and Devonian sediments were deposited on the Canegrass Lobe (a then basement high) except for a thin veneer of Permian (?) deposited in the east-west trending basement re-entrant in the OC83 study area. Further to the north, the Hamley Fault Zone defined the basin margin, not allowing the deposition of Permian and Devonian sediments onto the Canegrass Lobe.

Erosion of Palaeozoic (?) basement highs on the Canegrass Lobe occurred, potentially resulting in the development of a basal unconformity granitewash sand.

A small structural event occurred at the Lower Permian time faulting these Permian sediments.

A depositional hiatus occurred until the Lower Cretaceous, when the deposition of the Payap Member occurred. During this Lower Permian (?) to Lower Cretaceous depositional hiatus, widespread erosion of any high standing Permian probably occurred.

Following the deposition of the Cretaceous Pyap Member a further depositional hiatus occurred occupying much of the Upper Cretaceous.

Deposition continued throughout the Tertiary to Eocene with continued growth of the Hamley Fault Zone (basin loading effects?).

9. CONCLUSIONS AND RECOMMENDATIONS

The Overland Corner Seismic Survey (OC83) has better defined the structure of the southern Canegrass Lobe and the western truncation edge of what is interpreted to be Permian section. The survey has successfully delineated a basement re-entrant in the Canegrass Lobe with a maximum thickness of approximately 1,100 metres of what are interpreted to be Permian (?),Cretaceous and Tertiary sediments.

Three structural leads are recognised within this re-entrant. These vary in arial extent from 2 to 8 sq. kms and 10 to 20 milliseconds relief (50 to 100 ft.), and in age from Permian (?) to Cretaceous. Potential also exists for stratigraphic pinchout plays of the basal Permian (?) section onto old Basement high blocks.

The OC83 survey has also better defined the high side fault closure (OC83 - 11 and 12) previously recognised from the OC81 seismic data. This is the largest closure mapped and if the Hamley Fault acts as a conduit for hydrocarbon migration, it has a potentially large and deep drainage area (Renmark Trough).

It is recommended that a geochemical analysis of cores and cutting be undertaken from selected wells within the remainder of PEL 16. Such a study would be aimed at determining the quality of source rocks within the permit and their thermal maturation. These parameters could then be used to determine maturation models for areas of the Canegrass Lobe and the Renmark Trough. This lack of knowledge regarding the geochemical and maturation parameters appears to be the major stumbling block for exploration within the Renmark Trough and Canegrass Lobe.

Another option for future exploration in this area is to drill a shallow well aimed to test the high side fault closure located at the intersection of OC81-02 and OC81-08. Such a test, to a total depth of approximately 600 metres, could be drilled with a slim hole rig for approximately $100-150,000 in the present economic climate. This would allow the well to be fully cored giving vital detailed stratigraphic information.

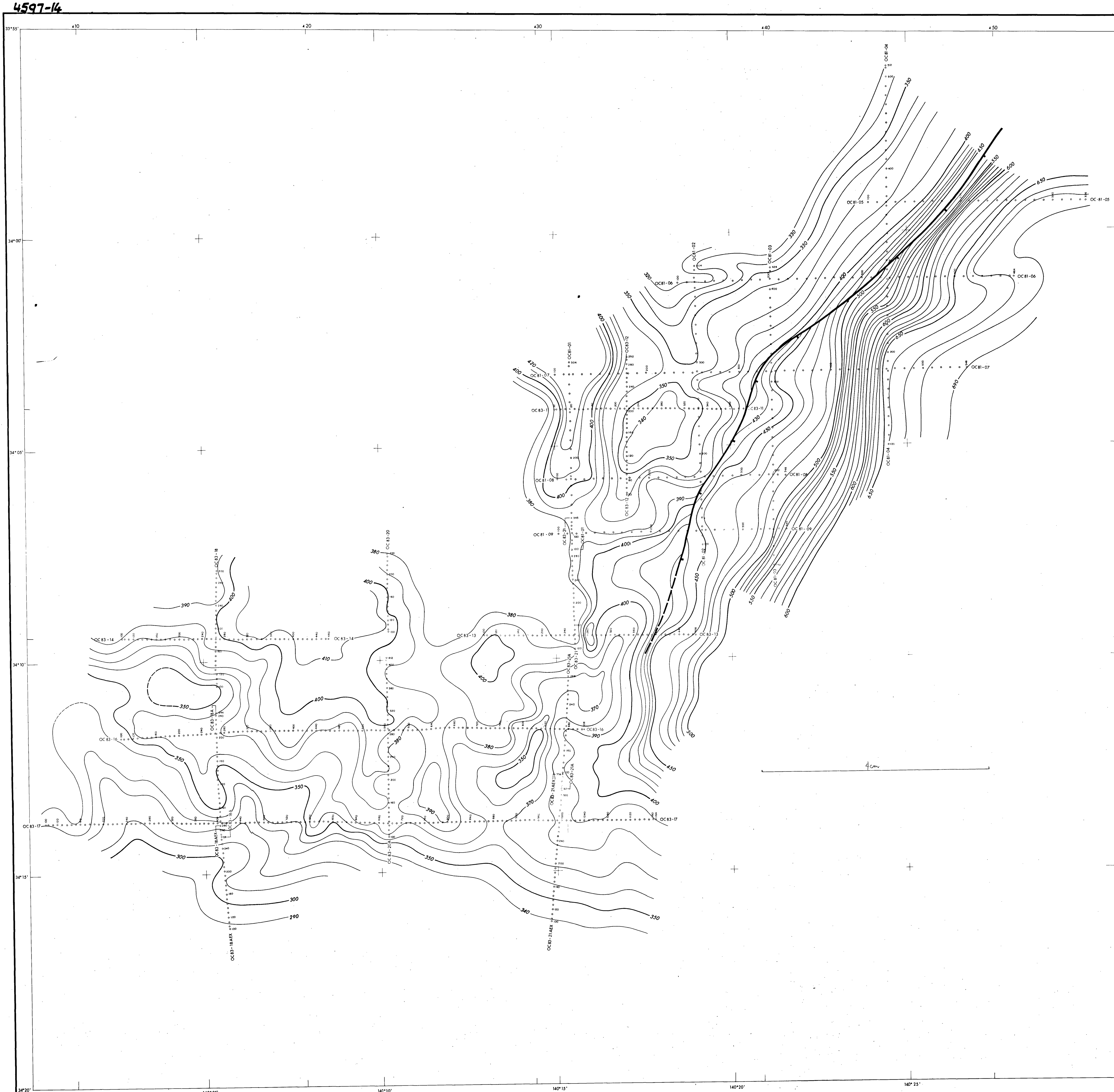
Indications are that previous drilling has not adequately tested the hydrocarbon potential of the PEL 16. Exploration wells are sparsely located and none appear to have tested valid closures at the Cretaceous or Permian levels. To this extent, further exploration within the Permit is warranted, particularly given its close proximity to potential markets in Adelaide.

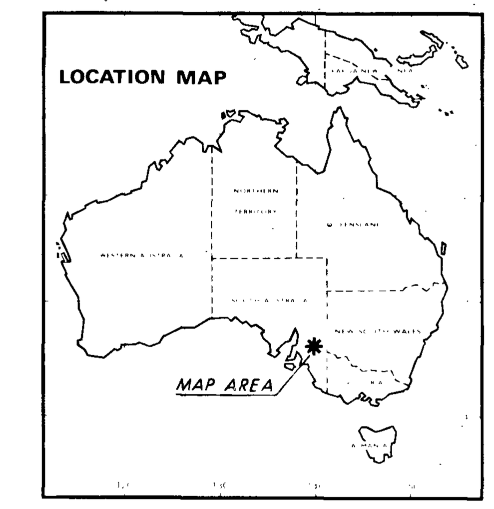
10. REFERENCES

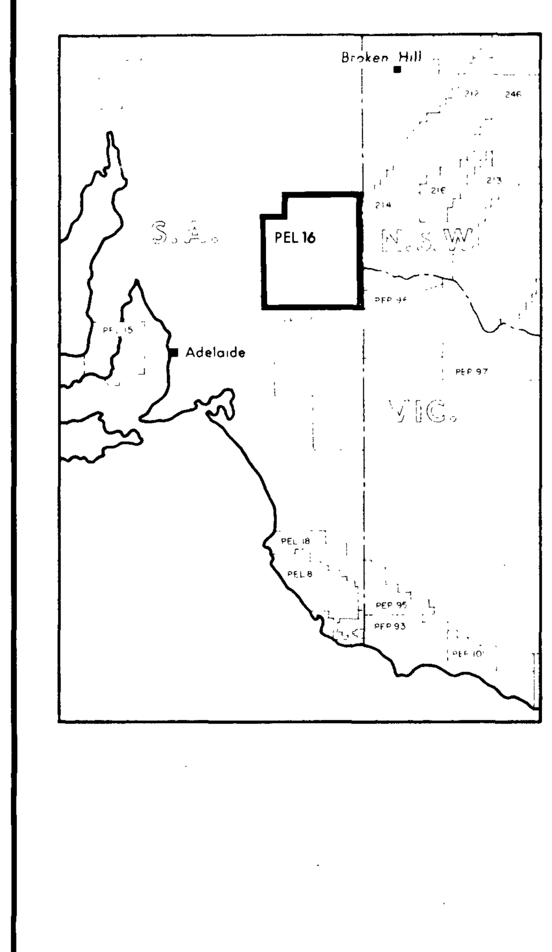
1) Thornton R.C.N. (1974) "Hydrocarbon Potential of Western Murray Basin and Intrabasins". Report of Investigations 41. Geological Survey of South Australia.

2) Thornton R.C.N. (1973) "Murray Basin and Associated Intrabasins" in Australia I.M.M. Economic Geology Part 3 Petroleum.

4597-14







PROJECTION :
A.M.G. ZONE 54

SCALE 1:50,000
0 5 km

4597-14

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PEL 16 MURRAY BASIN
1981 (OC-81) AND 1983 (OC-83)
OVERLAND CORNER SEISMIC SURVEYS

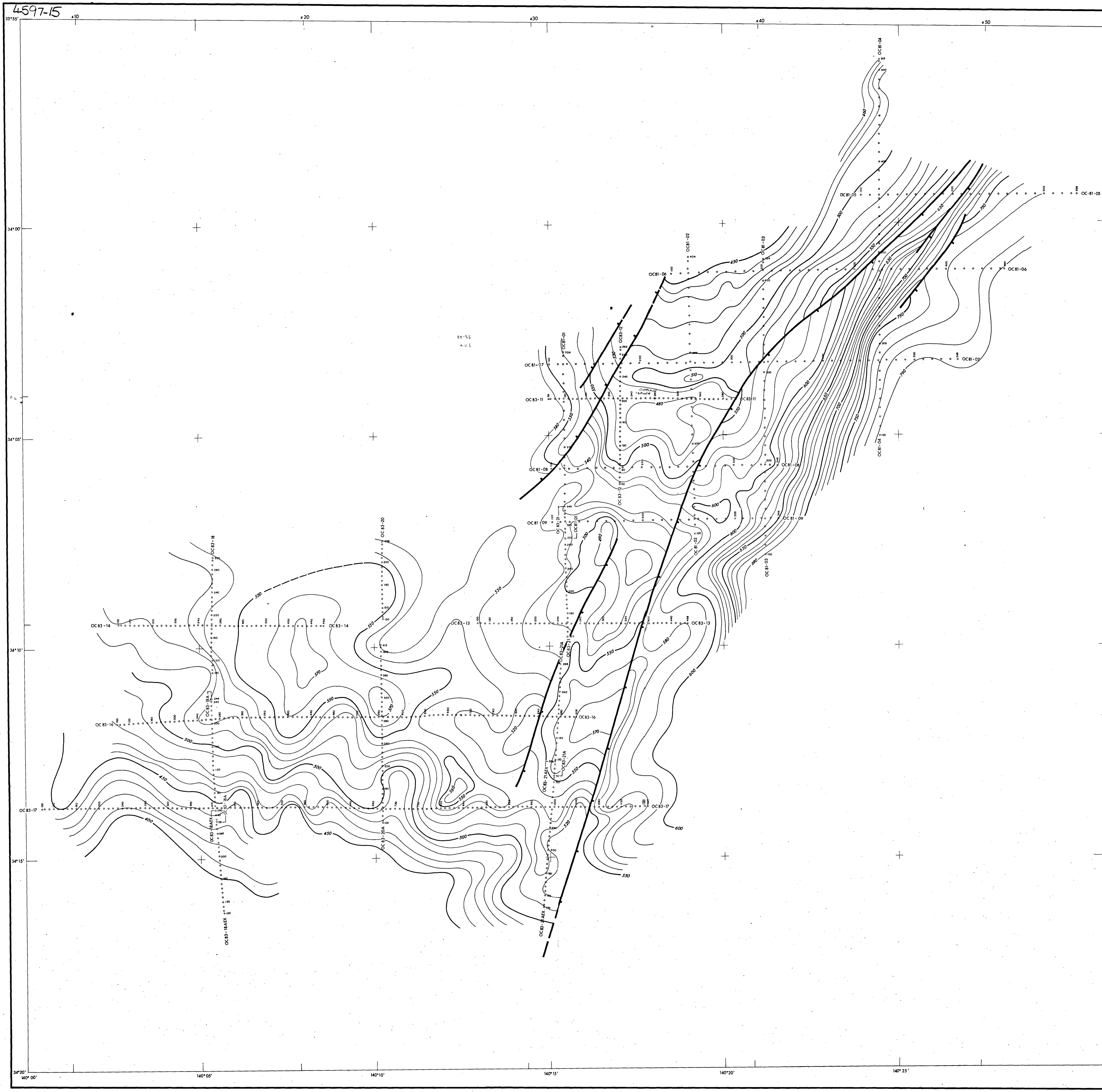
TIME STRUCTURE MAP
TOP GREEN SEISMIC EVENT
(TOP RENMARK BEDS ?)

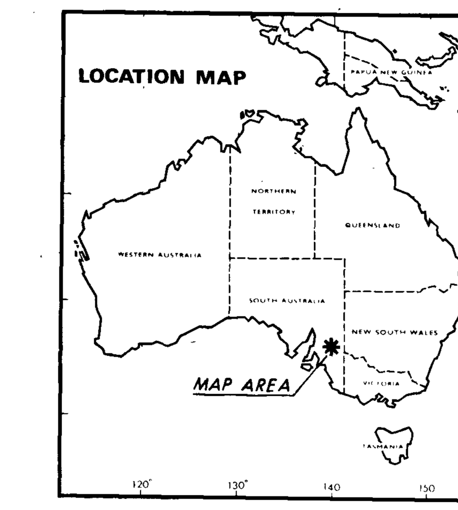
DATUM = 0m ASL

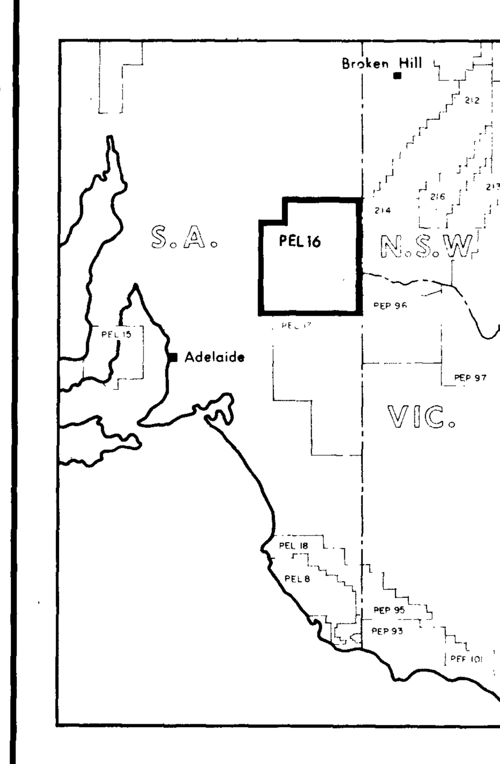
Author : ALAN JAMES, GEOPHYSICAL CONSULTANT

Date : Aug. 1983	Contour interval : 10 msec.	PLATE 1

4597-15







NORMAL FAULT

PROJECTION :
A.M.G. ZONE 54

SCALE 1:50,000

0 5 km

4597-15

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PEL16 MURRAY BASIN
1981 (OC-81) AND 1983 (OC-83)
OVERLAND CORNER SEISMIC SURVEYS

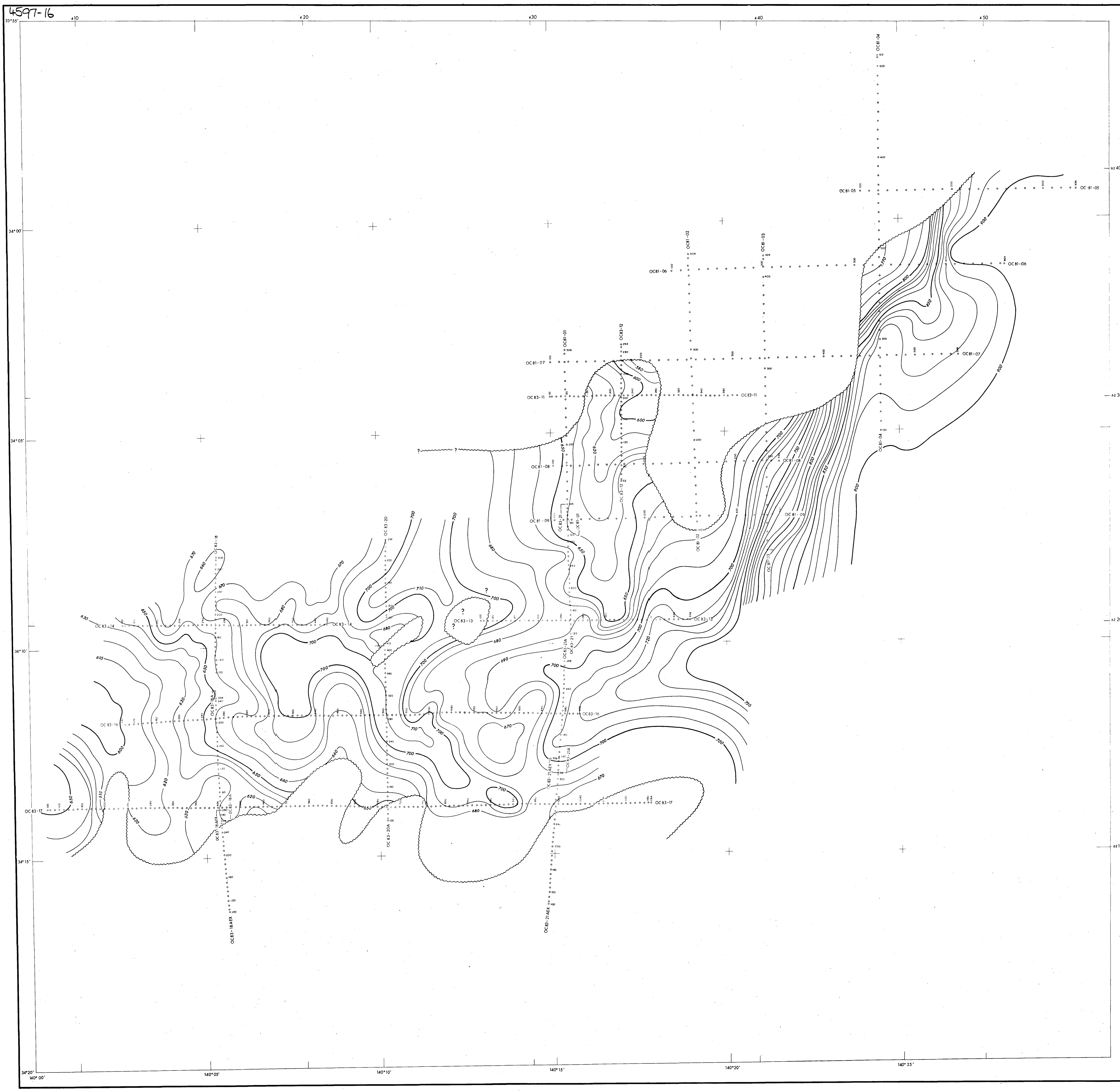
TIME STRUCTURE MAP
TOP BLUE SEISMIC EVENT
**(NEAR TOP PYAP MEMBER ?
LOWER CRETACEOUS)**

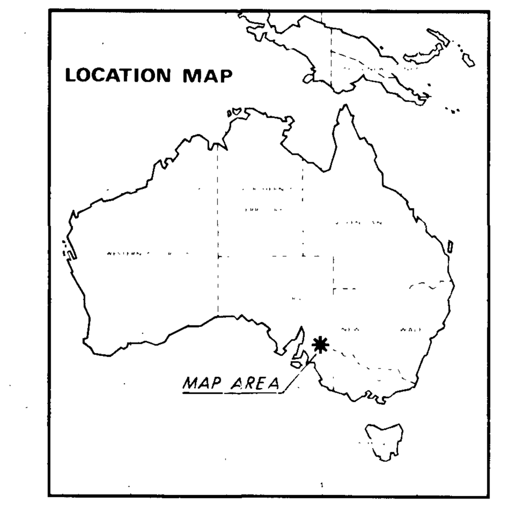
DATUM = 0m ASL

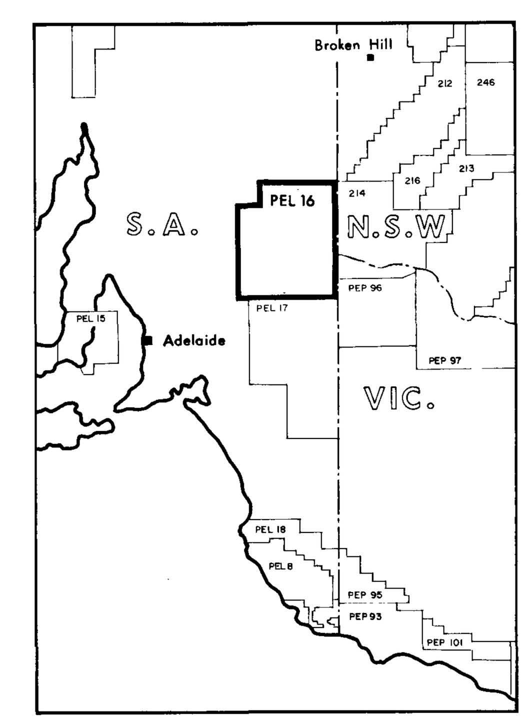
Author : ALAN JAMES, GEOPHYSICAL CONSULTANT

Date : Aug. 1983	Contour interval : 10 msec.	PLATE 2

4597-16







ONLAP EDGE OF PURPLE SEISMIC EVENT

PROJECTION : A.M.G. ZONE 54

SCALE 1:50,000

0 5 km

4597-16

INTERNATIONAL MINING CORPORATION N.L.

PEL 16 MURRAY BASIN
1981 (OC-81) AND 1983 (OC-83)
OVERLAND CORNER SEISMIC SURVEYS

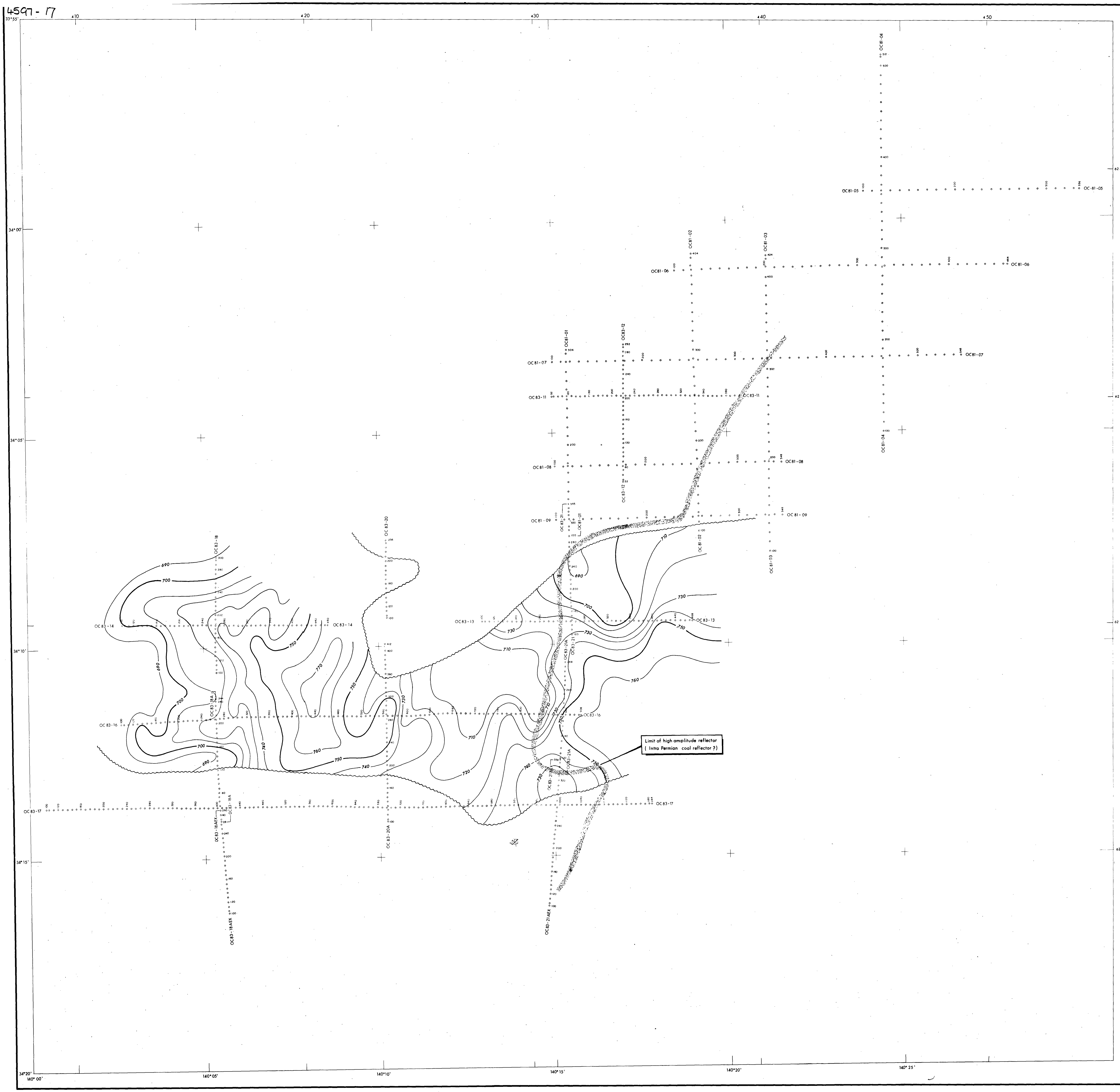
TIME STRUCTURE MAP
TOP PURPLE SEISMIC EVENT
(INTRA CRETACEOUS ?)

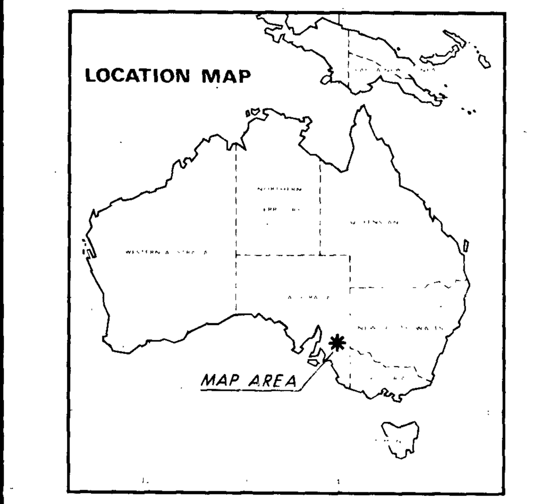
DATUM = 0m ASL

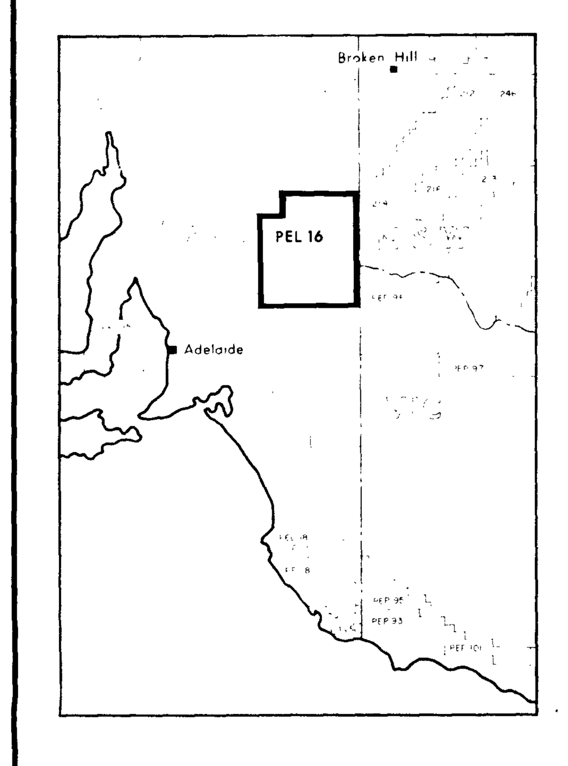
Author : ALAN JAMES, GEOPHYSICAL CONSULTANT

Date : Aug. 1983	Contour interval : 10msec.	PLATE 3

4597-17







ONLAP EDGE OF
OCHRE SEISMIC EVENT

PROJECTION :
A.M.G. ZONE 54

SCALE 1:50,000

0 — 5 km

4597-17

INTERNATIONAL MINING CORPORATION N.L.

PEL 16 MURRAY BASIN
1981 (OC-81) AND 1983 (OC-83)
OVERLAND CORNER SEISMIC SURVEYS

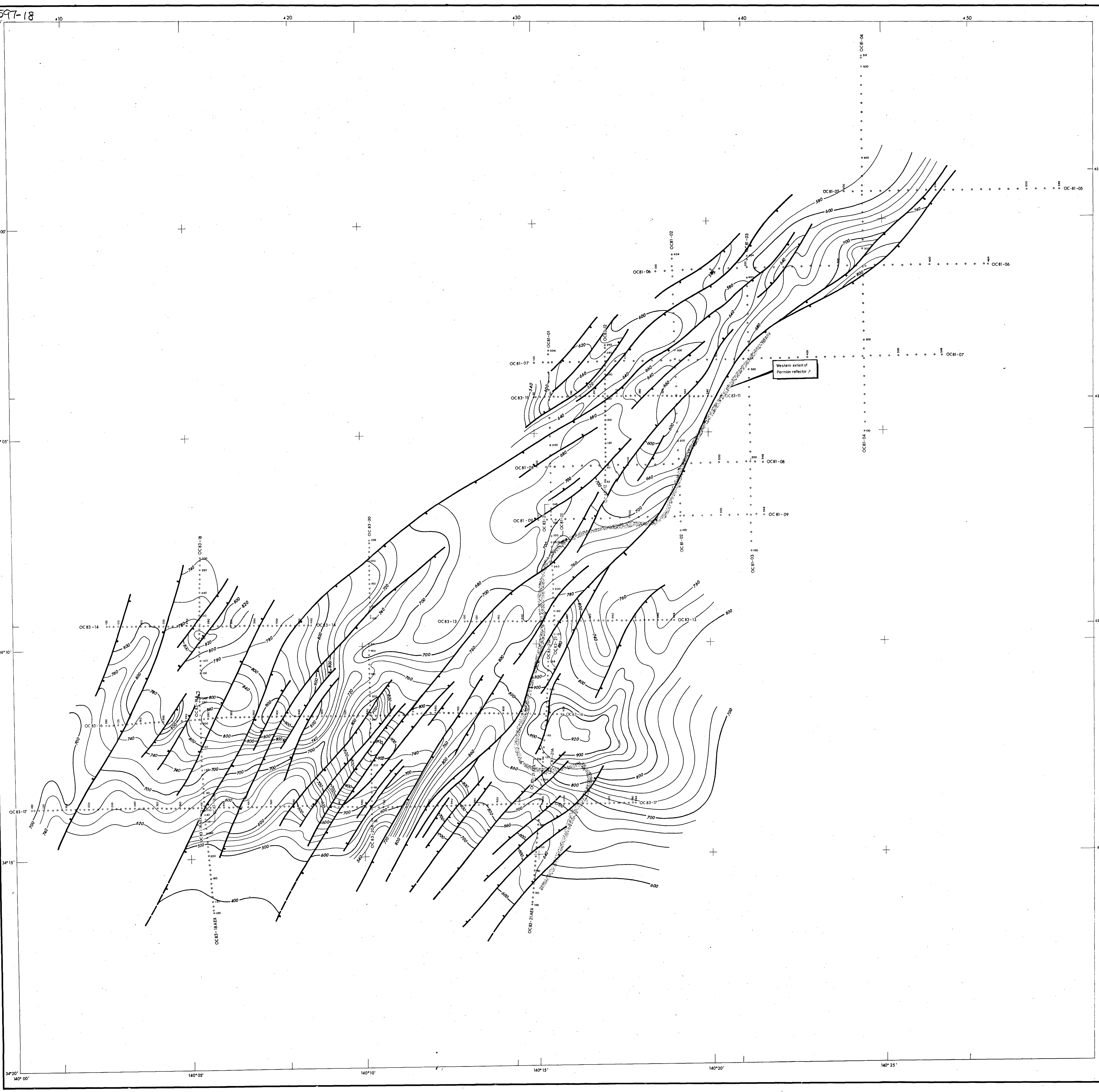
TIME STRUCTURE MAP
TOP OCHRE SEISMIC EVENT
(NEAR BASE CRETACEOUS ?)

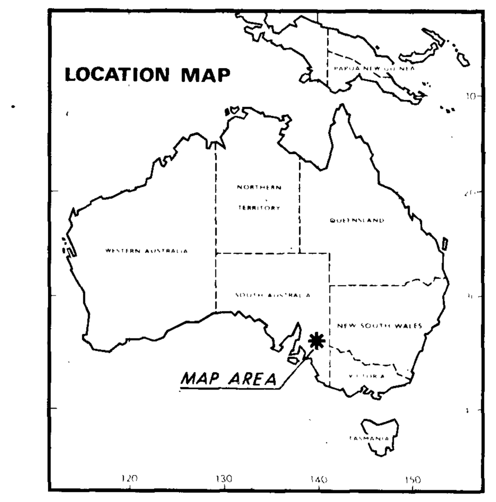
DATUM =0m ASL

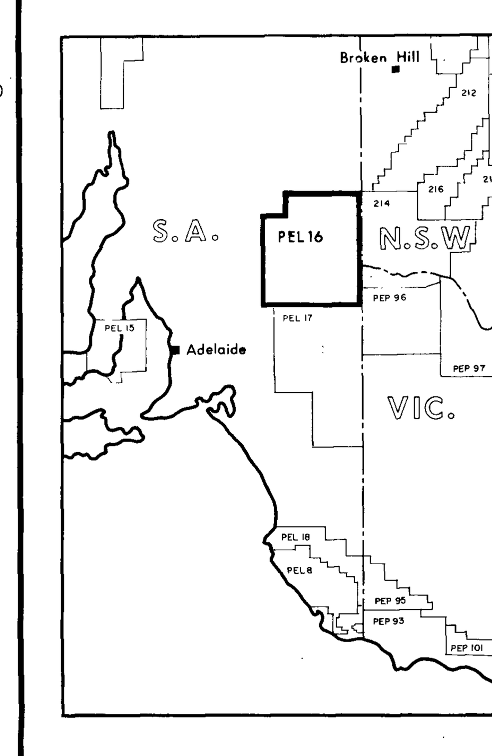
Author : ALAN JAMES, GEOPHYSICAL CONSULTANT

Date : Aug. 1983	Contour interval : 10msec.	PLATE 4

4597-18







NORMAL FAULT

PROJECTION :
A.M.G. ZONE 54

SCALE 1:50,000

0 5 km

4597-18

INTERNATIONAL MINING CORPORATION N.L.

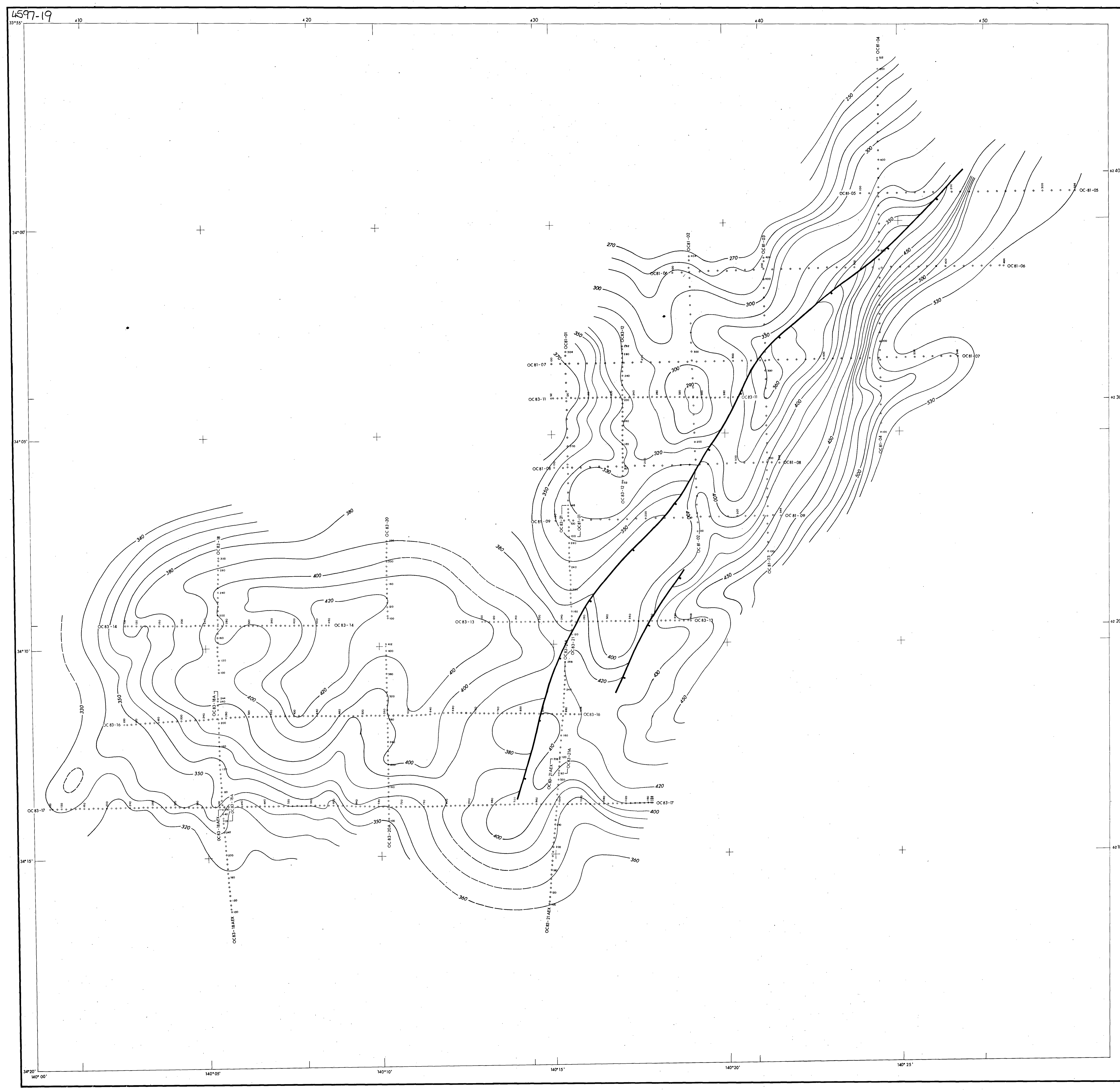
PEL 16 MURRAY BASIN
1981 (OC-81) AND 1983 (OC-83)
OVERLAND CORNER SEISMIC SURVEYS

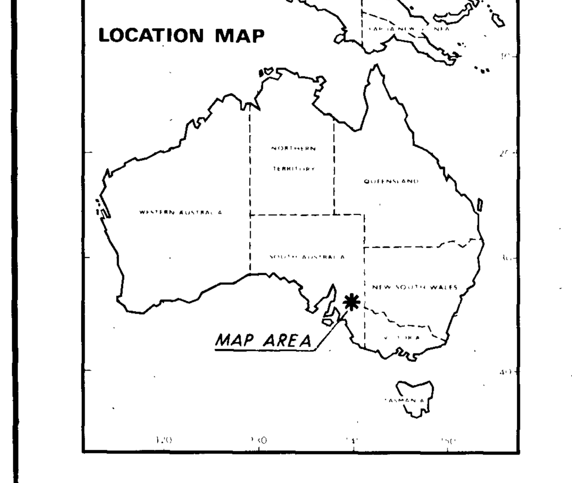
TIME STRUCTURE MAP
TOP RED SEISMIC EVENT
(NEAR TOP BASEMENT REFLECTOR)

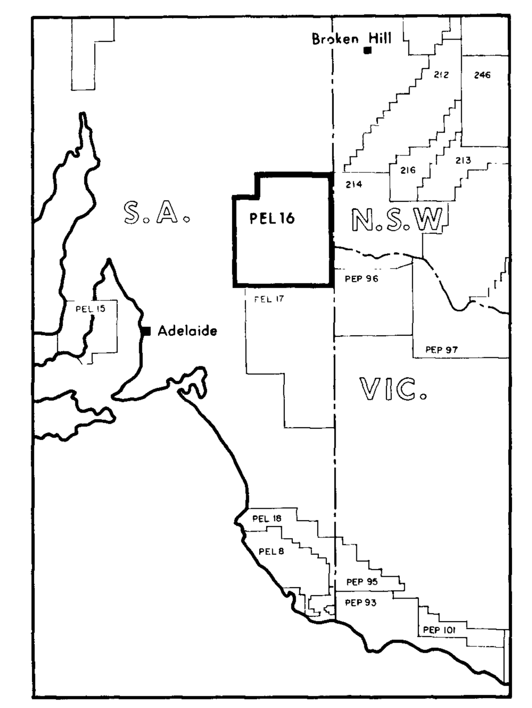
DATUM = 0m ASL

Author : ALAN JAMES, GEOPHYSICAL CONSULTANT

Date : Aug. 1983	Contour interval : 20msec.	PLATE 5







PROJECTION :
A.M.G. ZONE 54

SCALE 1:50,000

0 5 km

4597-19

INTERNATIONAL MINING CORPORATION N.L.

PEL16 MURRAY BASIN
1981 (OC-81) AND 1983 (OC-83)
OVERLAND CORNER SEISMIC SURVEYS

TIME ISOPACH MAP
YELLOW TO BLUE SEISMIC EVENTS
(MIOCENE ? TO MID CRETACEOUS ?)

Author : ALAN JAMES, GEOPHYSICAL CONSULTANT

Date : Aug. 1983 | Contour interval : 10 msec. | PLATE 6