

Bass Basin part IV

BASS BASIN SEISMIC SURVEY

by

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OR-004

ABSTRACT

This report of the Bass Basin Seismic Survey presents the interpretation of 219 miles of new semi-detailed seismic control integrated with previous reconnaissance seismic control and existing regional data. No subsurface geologic data was available in the Bass Basin during the interpretation.

The seismic reflections are divided into five zones or units, and an interpretation of the stratigraphy is postulated from seismic analysis. The highly conjectural sequence of lithology and age is:

- (a) Unit I. A mainly marine Quaternary-Plio-Pleistocene section of marl, shallow water limestone, sandstone and shale.
- (b) Unit II. A marine Pliocene-Upper Miocene section, predominantly marl, equivalent to the Gippsland-Tambo River formations of the Gippsland Basin.
- (c) Unit III. A reef complex facies of the Miocene, equivalent to the Gippsland formation of the Gippsland Basin.
- (d) Unit IV. A marine limestone, marl, and/or sand and shale Oligo-Miocene facies at the top of the unit, equivalent to the Gippsland formation or alternately the Lakes Entrance formation of the Gippsland Basin. The lower part of the unit is a marine sand, shale, and marl Oligocene equivalent to the Gippsland Basin Lakes Entrance.
- (e) Unit V. A non-marine sand with possible coal measures equivalent to the Latrobe Valley formation of the Gippsland Basin. Alternately this unit might represent older sediments of Paleocene or Mesozoic age.
- (f) Basement crystalline rocks, probably Paleozoic.

Maps on four horizons and one thickness map are presented. Six structural leads of varying degrees of merit are indicated and many build-up anomalies interpreted to be reefs are outlined.

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INTRODUCTION

The objectives of this survey were to find the highest structural point on reef-like build-ups in two separate areas, to determine the lateral relationship of the build-ups to each other in these areas, to determine by detailed shooting if closure exists on the structural nose in the vicinity of Lat. 145°30'E Long. 39°35'S. as delineated from reconnaissance seismic control, and to better define seismic stratigraphic characteristics. We believe these objectives have been met. These objectives were aimed towards the selection of a wellsite to test an anomaly and gain the best possible subsurface stratigraphic information in this untested basin.

Western Geophysical was the contractor for this survey. A six fold CDP technique was used for most of the program. However, four of the twenty-three lines shot were recorded as single fold coverage to facilitate the completion of the survey pending severe weather. The quality of the CDP data is generally very good with little multiple interference in the units being mapped. The Esso Bass Seismic Survey contains 1540 reflection profiles for a total of 182 miles of CDP and 37 miles of single fold coverage. Three expanding spread velocity profiles and one reversed refraction profile were shot to help define the reflecting horizons (see Plate I). Field work began on the Bass Basin Seismic Survey on 11th April, 1965 and was completed on 10th May, 1965.

Appendix I is a listing of the recording and playback procedures used during this survey.

REGIONAL GEOLOGY

Geographically, the Bass Basin occupies an area of approximately 20,000 sq. miles located offshore in Bass Strait between the States of Tasmania and Victoria.

Bass Basin lies at the southern end of the Paleozoic Tasman Geosyncline whose rocks are reported to probably exceed 25,000 feet thickness in the Mornington Peninsula area, north of the basin. The strata range from Cambrian through Carboniferous in a complexity of folded, faulted, and intruded marine to non-marine sedimentary, metamorphic, and extrusive and intrusive igneous rocks. In Tasmania tens of thousands of feet of similar complex rocks occur along with more than 25,000 feet of pre-Cambrian sedimentary and metamorphic rocks. Any of the rocks can be expected to underlie the Bass Basin, at shallow depths at the basin edge and downward to approximately 12,000 feet in its deepest part.

The stratigraphy and geologic history of the hidden Bass Basin must be extrapolated from the regional geology of the Tasmania and southern Victoria areas. Bass is essentially a Tertiary basin, although it may contain Permian, Triassic, Jurassic and Cretaceous rocks between the undisturbed Tertiary above and the complexly folded and intruded pre-Permian rocks below. Permian "tillites" are known along the northern Tasmanian coastline. These may extend northward for some distance into the Bass Basin. Triassic sandstone and shale with

minor conglomerate and coal occurs in Tasmania and minor glacial beds in Victoria. Regional outcrop pattern precludes the likelihood of these being in Bass. The Jurassic-Lower Cretaceous Otway group (non-marine greywacke, sub-greywacke, sandstones, silts, mudstones, arkoses and minor coals) occurs in the Gippsland and Otway basins. Upper Cretaceous marine mudstones, silts, and sands occur in the Otway Basin. These also may be present in the Bass Basin. Considerable pre-Tertiary uplift and deformation, accompanied by long erosion, occurred over a widespread region including both the Otway and Gippsland Basins and probably in Bass.

During Paleocene and Eocene time gentle regional downwarping occurred in the Gippsland and Otway basins. It is assumed similar downwarp occurred in the Bass Basin. Tasmania remained a positive area. Volcanism and lava flows were abundant from the western part of Gippsland to the eastern part of Otway and a few small flows occurred in Tasmania. There were widespread swamp conditions under which peat, clay, sand, silt, and gravel were deposited. Uplift, slight deformation and erosion followed the Eocene coal measure deposition in the Gippsland Basin. Deposition apparently was continuous during this time in the Otway Basin.

During Oligocene and Miocene time, a transgressive marine phase occurred in both Gippsland and Otway basins where fossiliferous limestone, calcareous shale, marl, sandstone, and minor siltstone beds were deposited. At and near the present edge of the Bass Basin in Tasmania and Victoria are similar outcrops of mainly Miocene skeletal limestones and some marine, fossiliferous siltstones.

During Pliocene time, the marine transgression reached the end of its full cycle in the Gippsland and Otway basins. During middle Pliocene time, those areas, and also the entire Bass Strait region, were subjected to uplift, probably accompanied by some gentle deformation and faulting. Volcanism and outpouring of lava was widespread in Tasmania and west central Victoria.

The sea in general regressed to its present limits during late Pliocene and Pleistocene time.

VELOCITY CONTROL

The three expanding spread velocity profiles, a reversed refraction profile, and a T- Δ T analysis of selected refraction shots, affords all the velocity control available in the basin.

The velocity profiles were shot in the proximity of and parallel to lines EB-14, EB-18, and EB-23 and their center points are noted on the shot-point index map (Plate I). Profiles V-18 and V-23 are over build-up anomalies and V-14 is located in an area of regional geology. Included in the appendices are graphical presentations of the results of profiles V-14 and V-23 (appendices II, III, and IV). Lack of usable reflections below the top of the reef-like anomaly restricted the effectiveness of profile V-18. The time depth curve, calculated from V-14 and V-23, is compared in Appendix IV to that computed using T- Δ T data from lines EB-6 and EB-8. Appendix V is a tabulation of time-depth from these velocity profiles and was used to construct the depth maps in this report. The possible significance of the interval velocities will be discussed under stratigraphic interpretation of the reflecting units.

A refraction profile was shot to help identify and delineate the anomalous diapiric-like feature appearing on reflection lines EB-5 and EB-8. The profile is 7150 meters in length, is reversed, and is parallel to line EB-8 crossing the east flank of the feature. A V_1 of 5240 feet/sec., a V_2 of 7500 feet/sec., and a V_3 of 16,300 feet/sec. were computed. At the intersection of line EB-8 and EB-5, the V_2 interface is at -500 feet and the V_3 interface is at -4000 feet. The 16,300 feet/sec. interface occurs at the top of the blank-out area as shown on the seismic section. The velocity of 16,300 feet/sec. suggests that this anomaly could be salt. However, the feature could represent a horst block which due to the lack of internal reflections would probably be basement, although the velocity does not seem high enough. Appendix VI shows the results of this profile graphically.

INTERPRETATION

Reflecting Units and Postulated Stratigraphy

General - The reflecting section has been divided into six intervals, referred to as Unit I through V and basement. Each unit is postulated to represent a specific stratigraphic section. Seismic stratigraphic correlations to known sections in the adjacent Otway and Gippsland basins have been based only on geophysical character and relative subsurface positioning and thus must be qualified as conjectural. No subsurface data from well control is present. Average velocities to the base of the postulated marine Tertiary is slower in the Bass Basin compared to the Gippsland Basin. We believe a thicker Plio-Pleistocene section causes the slower average velocity in the Bass Basin.

Unit I - This unit comprises what can be roughly tied by projecting seismic dips shoreward to the Pliocene and younger outcrops. The interval is identified as Plio-Pleistocene and probably contains shales, sandstones and shallow-water limestone. Reflections from within this interval are limited to the deeper portions of the basin and have not been mapped. The average velocity to the base of this unit is approximately 6850 feet/sec. A maximum thickness of 2150 feet is indicated in the area mapped.

Unit II - The upper part of this interval is a band of average amplitude and frequency reflections interpreted to be Upper Miocene. The lithology is expected to be marine and basically soft marl with some sands. The interval velocity is approximately 6300 feet/sec. (see Appendices II and III).

The lower part of Unit II is generally a low amplitude reflection interval with continuous reflections developing only locally. The average interval velocity is 7900 feet/sec. It is interpreted to be marine sediments of Miocene age, laterally equivalent to the upper Gippsland Limestone of the Gippsland Basin. The lithology is postulated to be fairly homogeneous, probably shales and/or marls with some sands locally. This interval surrounds and caps the build-up anomalies characteristic of Unit III and is expected to be an effective seal and possible source rock should the build-ups prove to be reefs.

049008

Plate II presents the structure at the top of Unit II. The reflection mapped is by far the most reliable reflection on the original Haem- atite data and provides good control for tying the three areas of detailed shooting.

Unit III - The upper limit of this unit is the top of the build-up anomalies and the unit is interpreted as a possible reef complex. Characteristically this unit is a high amplitude reflection interval containing many erratic and variable dips. The base of Unit III is picked as the character changes to that of the normal low amplitude reflecting unit (Unit IV). The apparent regional interval velocity of Unit III indicated in Appendices II and III is 8500 feet/sec. locally increasing to 9600 feet/sec. in build-up areas. Unit III is postulated to be a limestone facies containing local reef build-ups of Miocene age, and laterally equivalent to the Gippsland Limestone formation of the Gippsland Basin. The map at the top of this unit, see Plate III, is considered to be a rock-structure map transgressing time. Plate V is the thickness map of Unit III.

Unit IV - The upper part of Unit IV is for the most part a low amplitude interval with some continuous reflections. It is interpreted to be a predominantly homogeneous marine stratigraphic unit containing marl, shale, and some sand. This is correlated to the Gippsland Limestone formation of the Gippsland Basin but the possibility of the correlation being Upper Lakes Entrance is recognized. The age is suggested as Oligo-Miocene.

The lower part of Unit IV has characteristic high amplitude, relatively low frequency, reflections which are typical of those recognised as the Oligocene Lakes Entrance formation in the Gippsland Basin. The unconformity at the base of Unit VI also is characteristic of the Lakes Entrance formation in the Gippsland Basin. Thus the lithology would be marly sand and shale. The interval velocity computed from profile V-14 is 9600 feet/sec. (see Appendix II). The correlation of this interval should be qualified by the alternate, suggested above, that the top of the Lakes Entrance equivalent could be the top of Unit IV. This alternate correlation would then require this lower interval to represent a stratigraphic change within the Lakes Entrance formation and to be dated as Lower Oligocene. Plate IV presents the structure at the top of Unit IV.

Units I through IV thin regionally towards the margins of the basins by non-deposition and demonstrate marked onlapping of the younger onto and over the older beds. This thin section projects to the Oligo-Miocene limestone outcrops on King Island, interpreted to contain a facies characteristic of clean water conditions capable of contemporaneous reef growth in the more seaward portion of the basin. This correlation of Units I through IV to the Oligo-Miocene outcrops, while recognised as weak, lends support to the stratigraphy and lithology postulated for these units.

Unit V - The top of this unit is an unconformity interpreted to be the base of the marine Tertiary. The correlation of Unit V to the Gippsland Basin suggests that it is probably Latrobe Valley formation equivalent, but without the continuous, extremely high amplitude reflections recognised as originating from coal in the Gippsland Basin. A velocity inversion occurring at the top of Unit V supports this correlation. The postulated lithology of the unit is sands, shales and local coals. Lack of continuous coal type reflections suggests the possibility of this unit being older than Latrobe Valley (Cretaceous or Otway equivalent sediments). If this alternate

correlation is actually the case, it would suggest that this interval could be sands, siltstones and/or greywacke. Plate VI presents the structural map of the unconformity at the top of Unit V and indicates that the overlying marine Tertiary and Quaternary reach a thickness of approximately 6775 feet. The base of Unit V is considered to be economic basement.

Structural

General - Four structural maps and one thickness map have been constructed. These maps are presented as Plates II through VI. The quality of the new control is regarded as very good with the exception of the part of the top of Unit IV (Plate IV) which coincides with the blank-out zones indicated on Plate VI. Recognised velocity anomalies not compensated for at this date slightly distort all horizons below the top of the build-up anomalies (Unit III).

Uplift Anomalies - Pre-unconformity (see Plate VI) structural closures and more recent deformation have been mapped. Many small closures due to draping over the build-ups are present at the top of Unit II. The recognition of faulting which develops in an echelon pattern on the north flank of the basin sheds new light on the geologic history. These faults are younger towards the basin edge and provide depositional barriers to much of the section. The faults are illustrated by the map at the top of Unit V. The younger faulting is also seen on the map at the top of Unit III and traces of the faults are reflected in the contouring of the top of Unit II. Detailed structures and structural leads are indicated on all maps alphabetically with an S prefix, however no anomaly quality grading is intended.

Structural closure SA is on a basinward plunging nose previously detected with the regional Haematite control. Closure exists on all maps contoured. This anomaly has 100+ feet of vertical and 50 sq. miles of areal closure present at the top of Unit II, 200+ feet of vertical and 34 sq. miles of areal closure present at the top of Unit III, and 200+ feet of vertical and 26 sq. miles of areal closure present at the top of Unit V. This feature was uplifted at the end of the deposition of Unit III. Subsequent movement of a more gentle nature and compaction provides the closure on the younger horizons. The greater areal closure of the younger beds is explained as in part due to the later period of movement causing a more gentle dip extending further to the north than that found on the deeper horizons.

Structural anomaly "SB", best illustrated in cross-section form by seismic lines EB-5 and EB-8, is interpreted to be a salt dome feature with the salt intruding up to an elevation of approximately -3500 feet, almost to the top of Unit IV. The 16,300 ft/sec. velocities obtained from the refraction profile previously discussed leads to this conclusion. If the feature is a salt dome, the salt is explained as originating from undefined Paleozoic or pre-Cambrian sediments. The north flank of this complex feature is uncontrolled. There are somewhat similar blank-outs on lines EB-15, 17 and 20 (see Plate VI). These are controlled by the single fold data and are not as clearly defined. The strikes of two en echelon faults project into the blank-out areas.

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Structure "SC" is an old structure reflected in the map at the top of Unit V. Approximately 300 feet of vertical relief is present. The structure grew during the pre-unconformity and possibly Oligocene time. There is no closure on the top of Unit II.

Anomalies "SD", "SE", and "SF" are structural noses which possibly contain closure. All three features appear as noses on the top of Unit II. Anomaly "SE" is a horst block as seen on the tops of Units III through V.

Build-up Anomalies - Numerous build-up type anomalies, interpreted to be reefs, were evident on the original Haematite data and several additional ones were found by the new shooting. The reef-like anomalies detailed by the Esso survey have been lettered alphabetically with a B prefix for identification, again no anomaly quality grading is intended.

The anomalies can be classified into three different types of build-ups. All of the anomalies appear to grow from a common base. The thickness map of Unit III, Plate III, illustrates the combined picture of the build-ups and the more regional basal unit. Anomalies "BA", "BB", "BC", "BL", "BP", and "BD" appear to be local highs on general build-up areas. Anomalies "BE", "BF", "BO" and "BH" are isolated build-up analogous to patch reefs. The third type anomaly are those associated with the positive areas created by the postulated salt intrusions. Build-up "BN" best typifies this latter type anomaly, anomalies "BI", "BJ", "BM" and "BK" are other examples. Anomaly "BP" has the greatest area of any build-up mapped but is not sufficiently detailed to determine the highest point of relief.

The greatest concentration of build-ups outlined to date is in the area of lines EB10-23. The regional lines have indicated build-up evidence scattered throughout the western Bass Basin. A definite pattern of build-up occurrence is not certain. The thickness map of Unit III (Plate V) indicates that the basin deep during the deposition of the build-ups is slightly to the west of the present day basin. The anomalies concentrated around lines EB10-23 are on a thick nose plunging to the south-west.

CONCLUSIONS

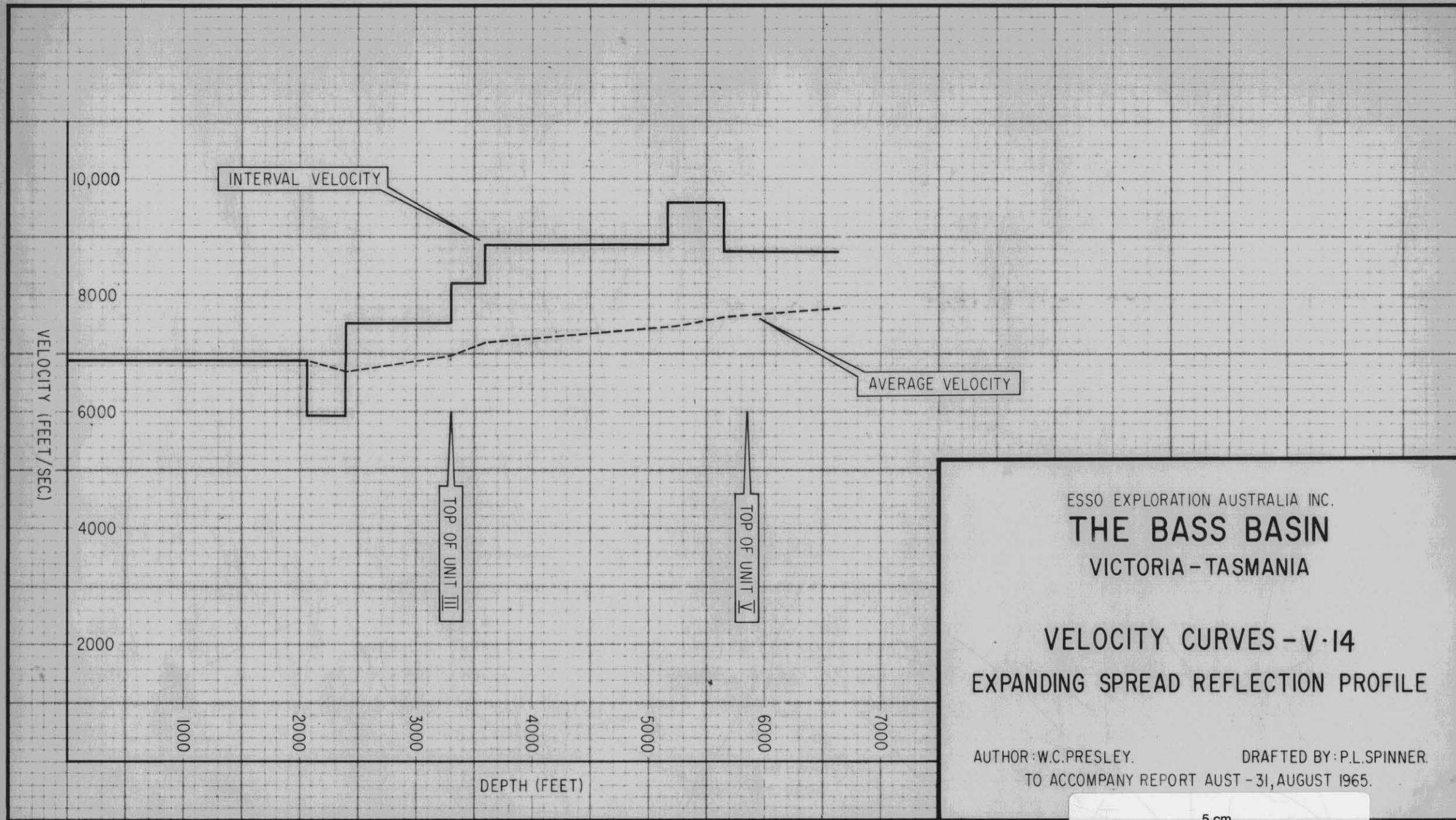
The CDP technique has produced excellent data. The reflecting section is divisible into discrete reflecting units with independent reflection character. Conjectured correlations of the reflecting units to known formations in the adjacent Gippsland and Otway basins are considered reasonable. The build-up anomalies are interpreted to be reefs and it is likely that the first Esso Bass well will test the validity of this interpretation.

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APPENDIX I

RECORDING AND PLAYBACK PROCEDURES

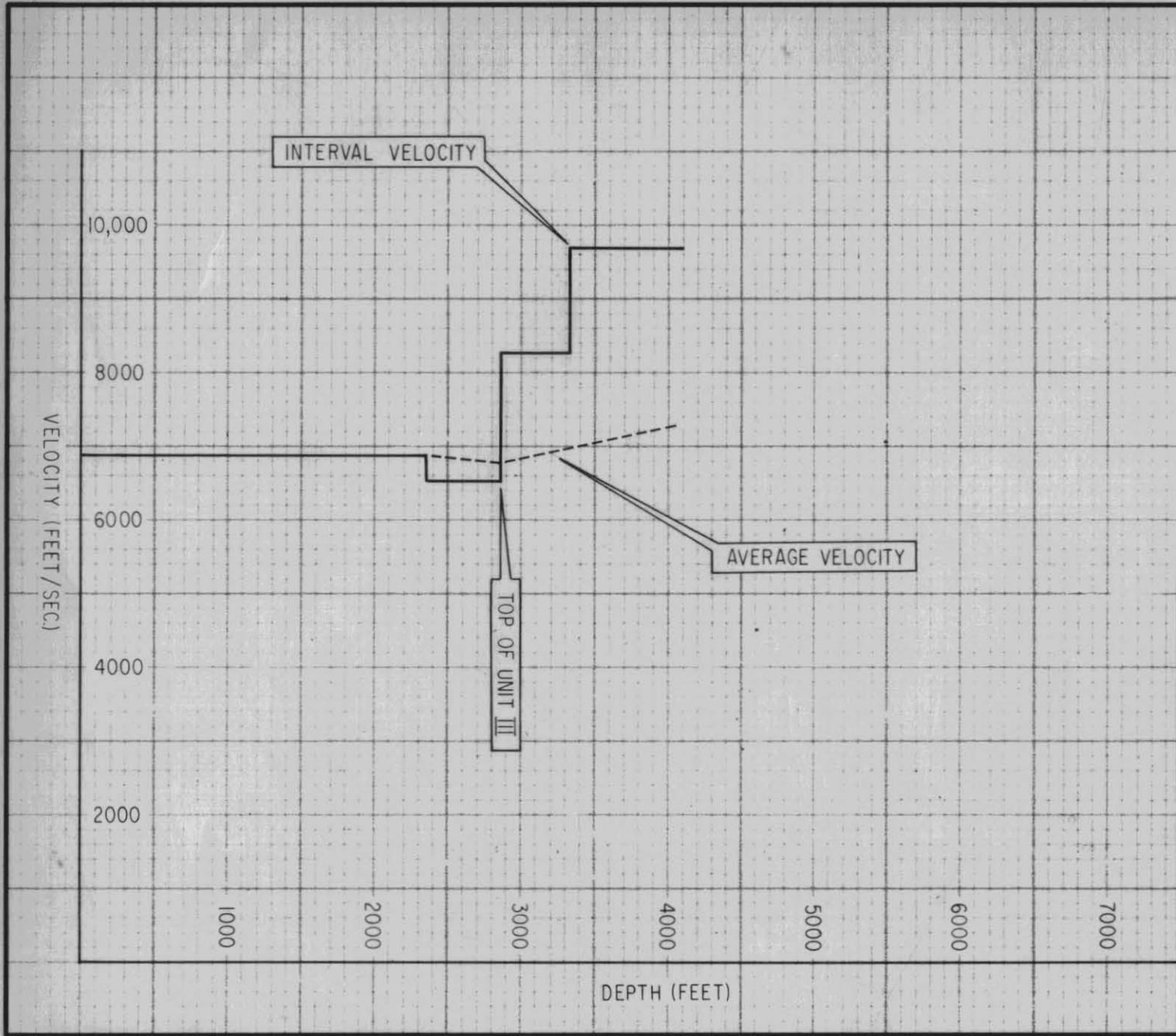
1. Western Geophysical was the contractor, and the Western dual, 600 meter and 1200 meter, cable was used.
2. The Western cable contained four geophones/trace.
3. A 6 fold CDP shooting technique was used over most of the area, although 4 of the 23 lines were shot conventionally to facilitate completion of the survey pending bad weather.
4. Two sets of Western FA40A amplifiers were used to record both long and short spreads.
5. One hundred pound charges were used throughout the survey.
6. Slow (tape) A.G.C. was used in record.
7. Both long and short spreads were recorded using the 8.5-55 filter.
8. Playback of the data was made with filter setting 17-93 and tape A.G.C.
9. Both field and playback procedures were closely supervised by Esso personnel.
10. Offshore Navigation Inc. using the Shoran radiopositioning system controlled the navigation. The three base stations used were Station 704 (Mount Oberon, Victoria, Latitude 39°02' 31".72, Longitude 146°20'43".17 and elevation 1845 feet), Station 706 (Mount Barrow, Tasmania, Latitude 41°22'44".496, Longitude 147°25'17".150, and elevation 4,550 feet) and Station 709 (Bass Hill, Victoria, Latitude 38°29'04".14, Longitude 145°32'44".10 and elevation 939 feet).



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VELOCITY CURVES - V-14
 EXPANDING SPREAD REFLECTION PROFILE

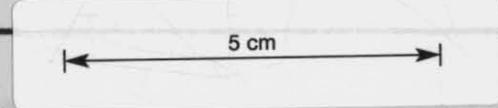
AUTHOR: W.C. PRESLEY. DRAFTED BY: P.L. SPINNER.
 TO ACCOMPANY REPORT AUST - 31, AUGUST 1965.

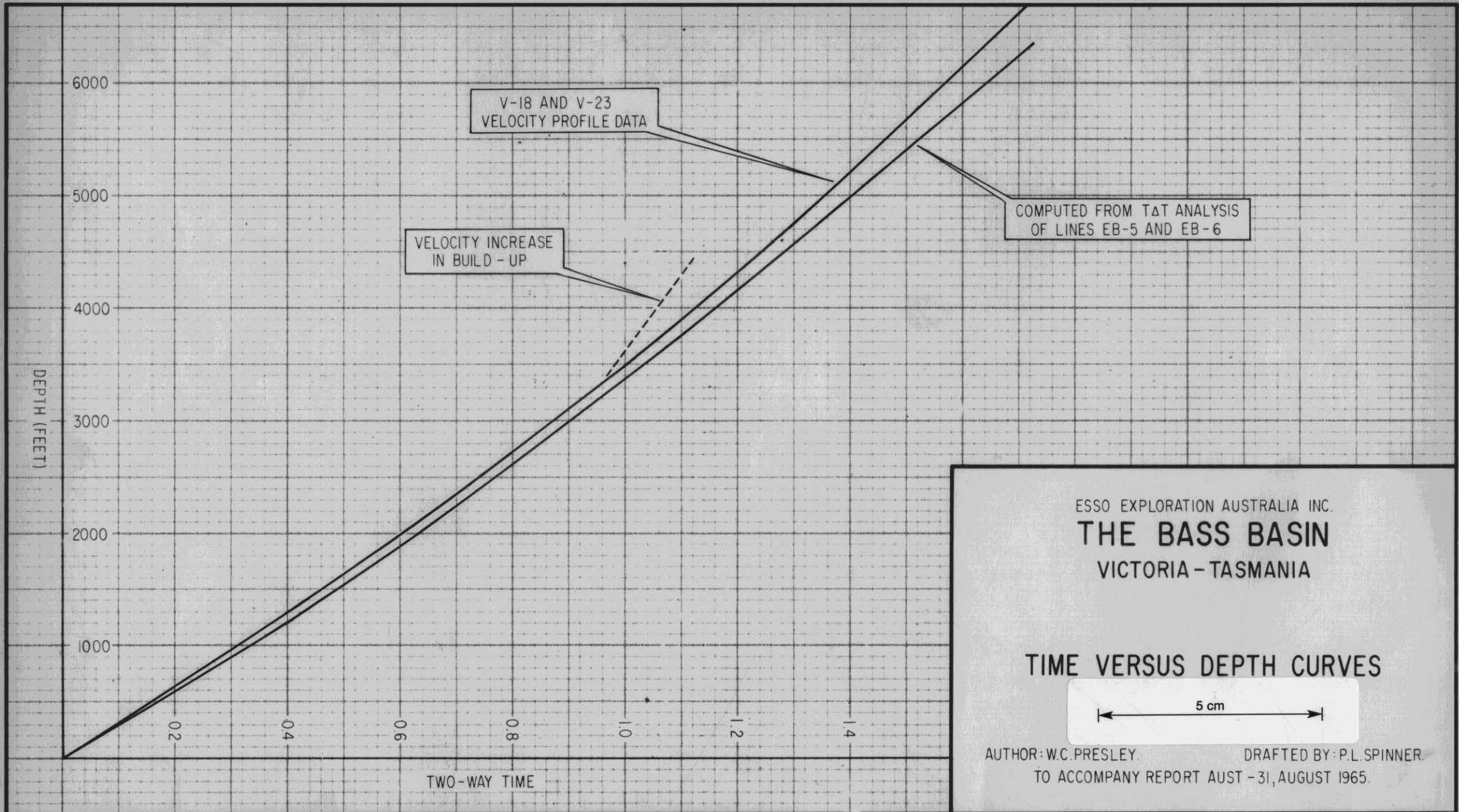


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VELOCITY CURVES - V-23
 EXPANDING SPREAD REFLECTION PROFILE

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TIME VERSUS DEPTH CURVES

5 cm

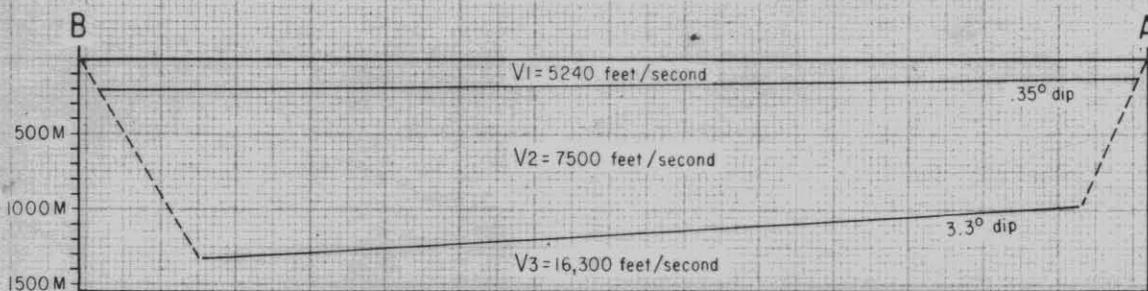
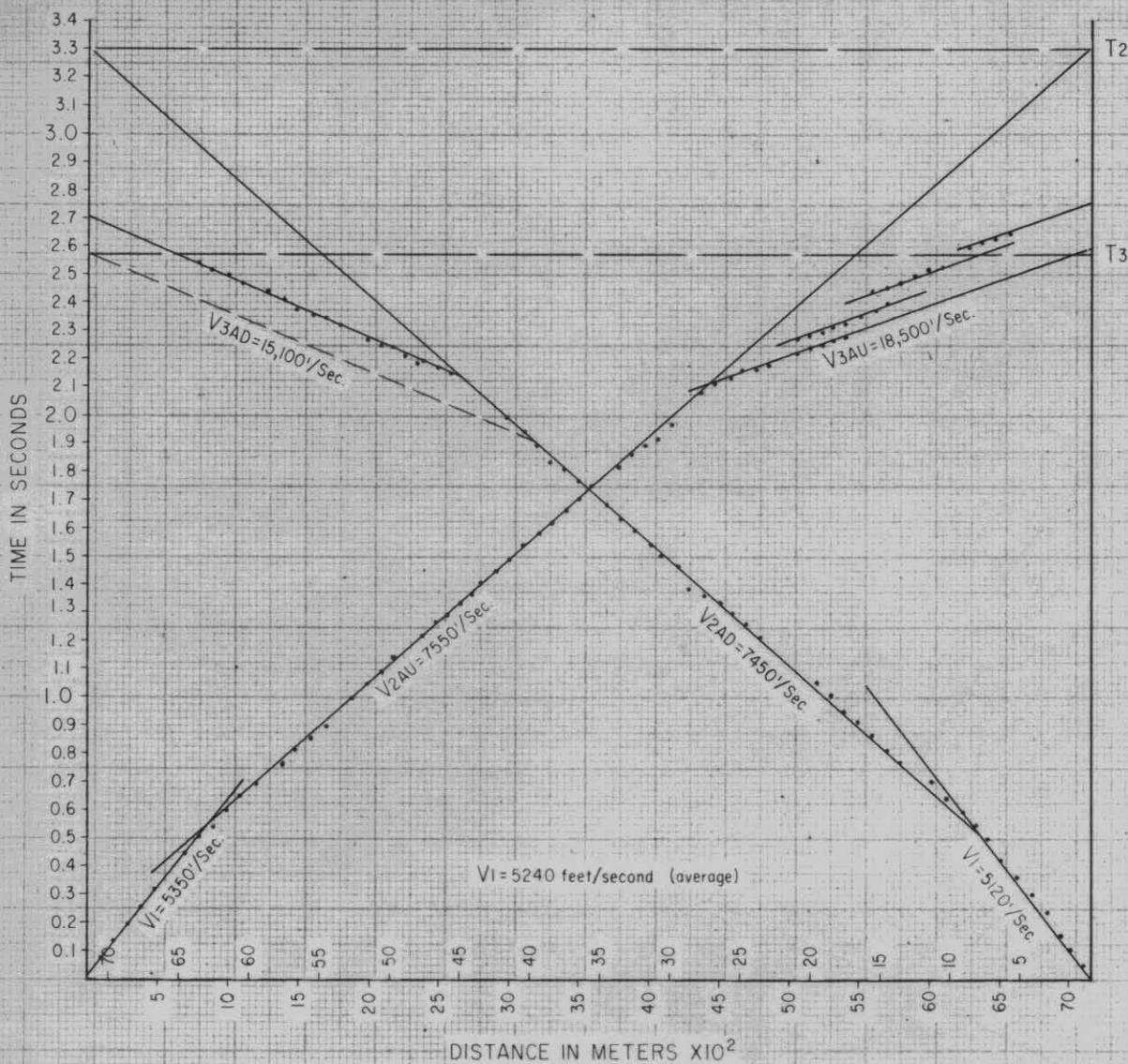
AUTHOR: W.C. PRESLEY. DRAFTED BY: P.L. SPINNER.
TO ACCOMPANY REPORT AUST - 31, AUGUST 1965.

APPENDIX V

BASS BASIN TIME vs. DEPTH CHART

X² -T² DATA

<u>Depth</u>	<u>Two-Way Time</u>	<u>Depth</u>	<u>Two-Way Time</u>
100		3900	1.095
200		4000	1.120
300		4100	1.140
400		4200	1.165
500		4300	1.190
600		4400	1.210
700		4500	1.235
800		4600	1.255
900	.280	4700	1.280
1000	.310	4800	1.300
1100	.345	4900	1.325
1200	.375	5000	1.345
1300	.405	5100	1.370
1400	.430	5200	1.390
1500	.460	5300	1.410
1600	.490	5400	1.435
1700	.520	5500	1.455
1800	.550	5600	1.480
1900	.575	5700	1.500
2000	.605	5800	1.520
2100	.630	5900	1.540
2200	.660	6000	1.560
2300	.690	6100	1.585
2400	.720	6200	1.605
2500	.745	6300	1.630
2600	.775	6400	1.650
2700	.800	6500	1.670
2800	.830	6600	1.690
2900	.855	6700	1.710
3000	.885	6800	1.735
3100	.910	6900	1.750
3200	.930	7000	1.775
3300	.955	7100	1.800
3400	.975	7200	1.820
3500	1.000	7300	1.840
3600	1.025	7400	1.860
3700	1.050	7500	1.880
3800	1.070		



NOTE: This profile was shot in rough seas resulting in very noisy records. It is likely that secondary refractions were picked for the deep refractor. Thus the results must be qualified as approximate with a probable limit of accuracy of 10%.

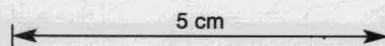
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EB-8 REFRACTION PROFILE

AUTHORS: W.C. PRESLEY,
 E.B. STANFORD.

DRAFTED BY: P.L. SPINNER.

TO ACCOMPANY REPORT AUST. - 31, AUGUST 1965.



APPENDIX VII
SUMMARY OF STATISTICS

A. Lines and Profiles

1. 200 meter spacing - 600% subsurface coverage

Line EB-1	S.P.	1-93	Profiles	93
" EB-2	"	1-93	"	93
" EB-3	"	1-88	"	88
" EB-4	"	1-87	"	87
" EB-5	"	1-23, 20A-85	"	89
" EB-6	"	1-3, 1A-37	"	40
" EB-7	"	1-42	"	42
" EB-8	"	1-70	"	70
" EB-9	"	1-6, 1A-63	"	69
" EB-10	"	1-3, 1A-103	"	110
" EB-11	"	1-9, 6A-84	"	88
" EB-12	"	1-84	"	84
" EB-13	"	1-107	"	107
" EB-14	"	1-113	"	113
" EB-15	"	1-18	"	18
" EB-16	"	1-28, 25A-113	"	117
" EB-18	"	1-35	"	35
" EB-21	"	1-22	"	22
" EB-22	"	1-51	"	51
" EB-23	"	1-40	"	40

Total: 1,456

2. 600 meter shot spacing - 200% subsurface coverage

Line EB-15	S.P.	19-48	Profiles	30
" EB-17	"	1-26	"	26
" EB-19	"	1-24	"	24
" EB-20	"	1-19	"	19

Total: 99

3. Velocity Profiles (600 meter shot interval)

VP (EB-14)	7
VP (EB-18)	5
VP (EB-23)	5

Total: 17

4. Refraction Profiles (2400 meter spread)

Line RA northeast	Profile	3
Line RA southwest	"	3

Total: 6

5. Total Profiles

Reflection: 200 meter shot spacing	Profiles	1456
600 meter shot spacing	"	99
Refraction:	"	6
Velocity Profiles	"	17
	<hr/>	
Total:		1578

B. MILEAGE

1. 600 meter shot spacing:	37.2
2. 200 meter shot spacing:	182.00
3. Velocity Profiles:	6.3
4. Refraction Profiles	9.0
	<hr/>
Total:	234.5

C. EXPLOSIVES USED

Reflection	155,600 pounds
Velocity Profile	1,800 pounds
Refraction	1,700 pounds
	<hr/>
Total:	159,100 pounds

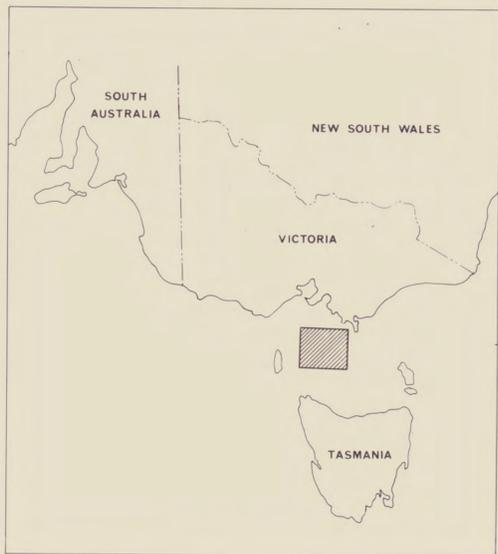
D. KEY WESTERN GEOPHYSICAL PERSONNEL

<u>Office:</u>		
Brenda	A	Operations Manager
<u>Recording Boat:</u>		
David	V.B.	Operations Co-Ordinator
Humerickhouse	J.	Observer
Russ	R.	Observer
Dunwoody	K.	Assistant Observer
Affolter	J.	Assistant Observer
Fitzclarence	B.	Recording Helper
McLean	R.	Recording Helper
<u>Shooting Boat:</u>		
Clingan	J.	Shooter
Sutcliffe	D.	Shooter
Marshall	J.	Shooter's Helper
Hickey	S.	Shooter's Helper

Operations were supervised by Mr. V.C. Boyd Jr. of Western Geophysical Company of America.



INDEX MAP



LEGEND

- ESO seismic shot-point location
- Haematite seismic shot-point location
- x Centre points of velocity profiles

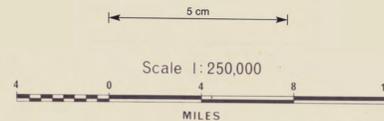
NOTE: Lines EB-17, EB-19, EB-20 and most of EB-15 are single fold conventional coverage. Line EB-1 through EB-23, exclusive of those listed above, are six fold C.D.P. coverage.

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THE BASS BASIN
VICTORIA - TASMANIA

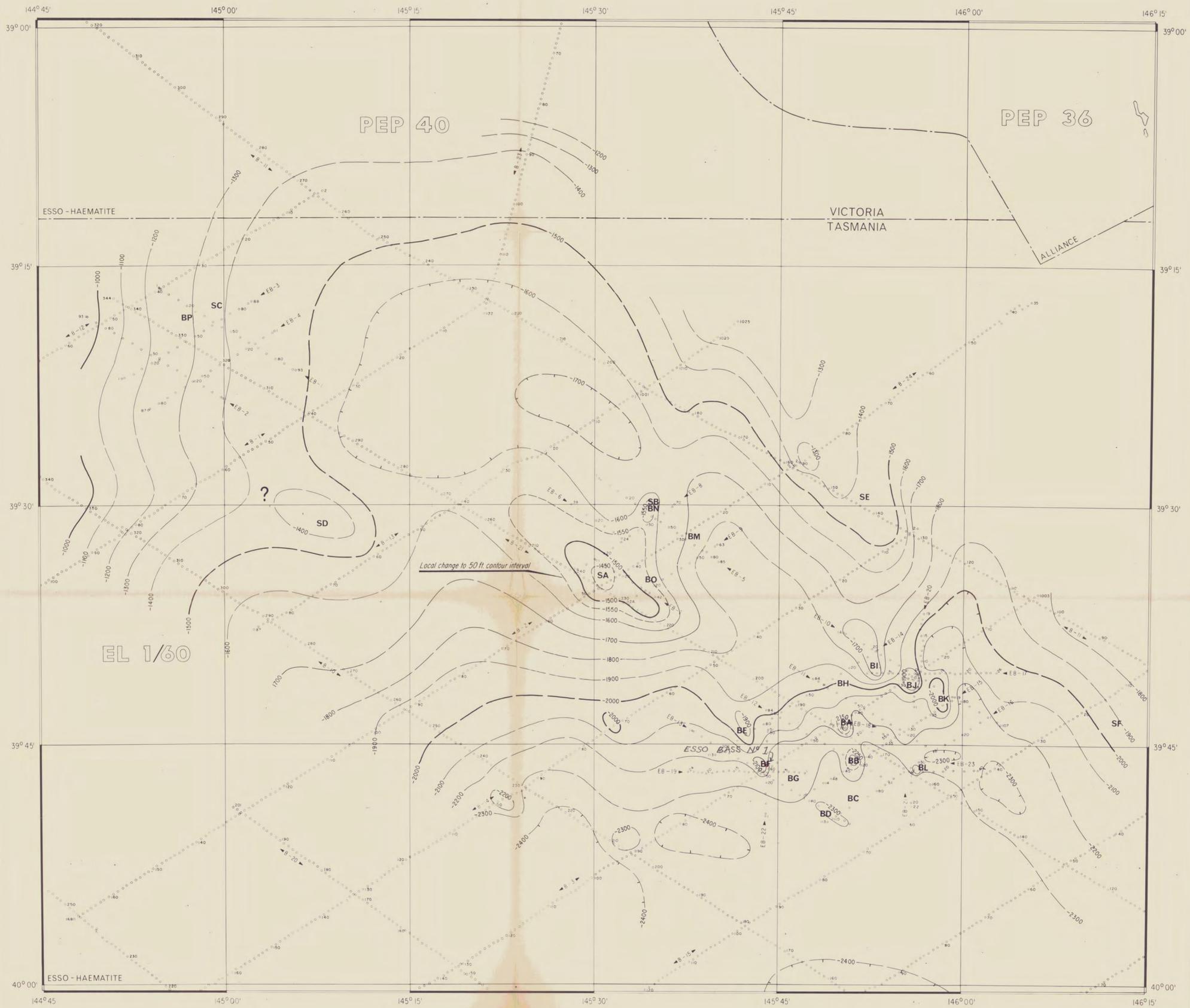
SEISMIC SHOT-POINT INDEX MAP

049619

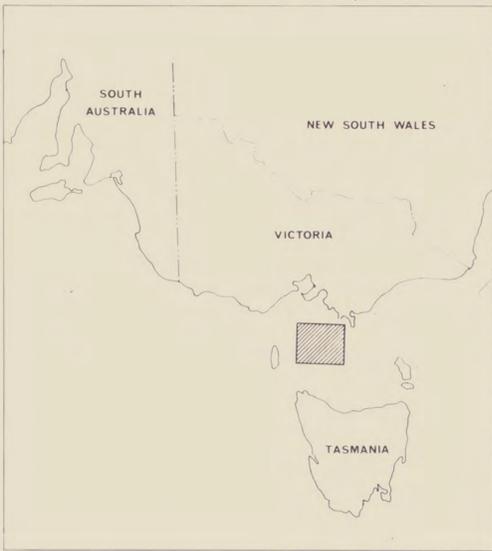


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DRAFTED BY: A. F. STRAHAN
REVISED: P. L. SPINNER

PLATE I



INDEX MAP



LEGEND

- Petroleum tenement boundary
- EB-7 — ESSO seismic line
- B-2 — Haematite seismic line
- SC Structural anomaly notation
- BF Build-up anomaly notation
- 1800- Structure contour

ESSO EXPLORATION AUSTRALIA INC., SYDNEY, NEW SOUTH WALES

THE BASS BASIN
VICTORIA - TASMANIA

STRUCTURE CONTOUR MAP
REFLECTION AT TOP OF UNIT II 049020

5 cm

CONTOUR INTERVAL: 100 FEET

DATUM: SEA LEVEL



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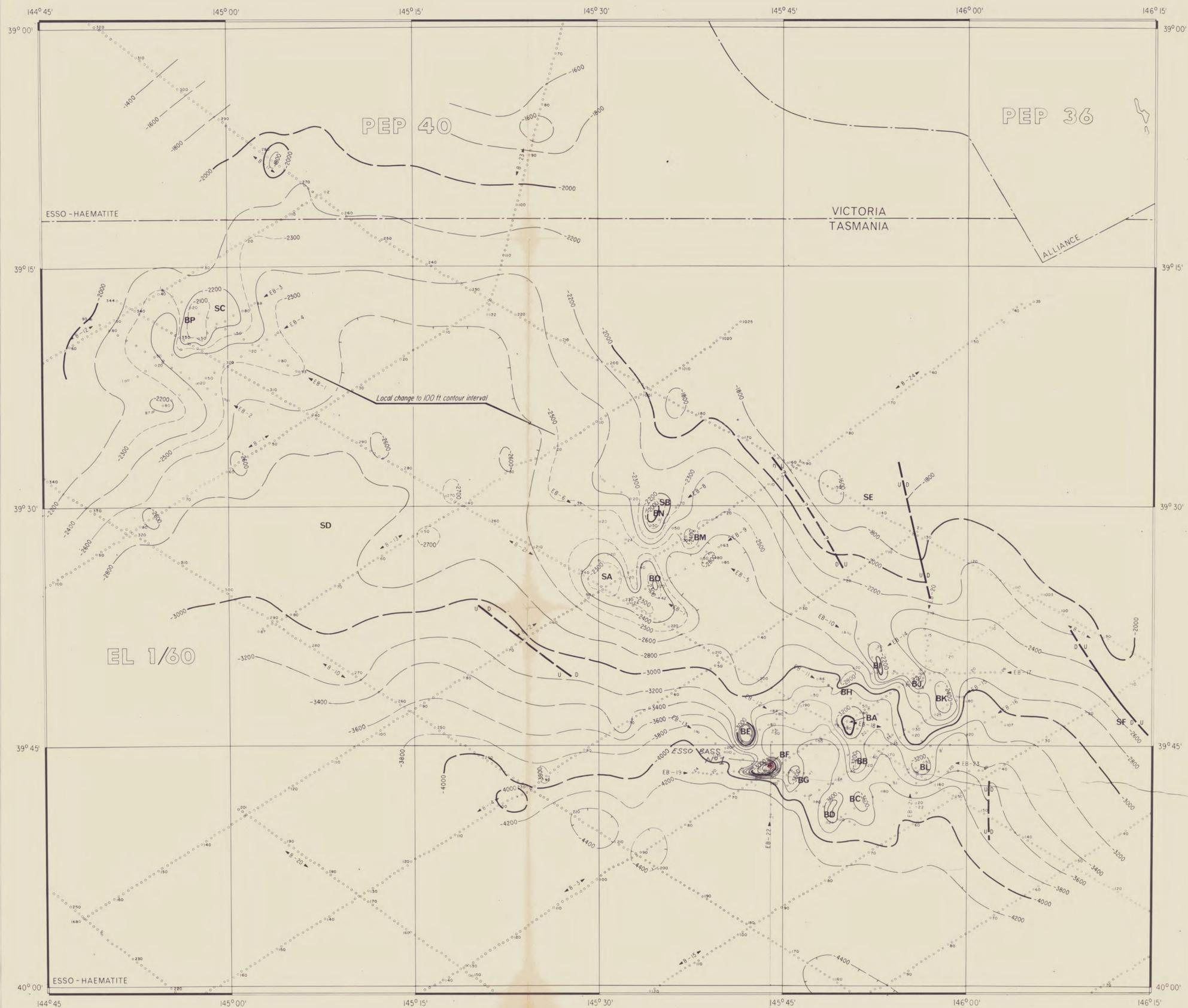
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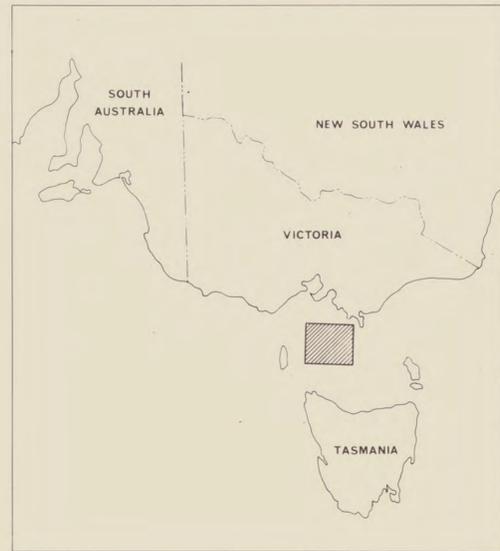
PLATE II

NOTE: See shot-point index map (Plate I) for the refraction and velocity profile location

CR-004



INDEX MAP



LEGEND

- Petroleum tenement boundary
- ◄ EB-7 ► ESSO seismic line
- ◄ B-2 ► Haematite seismic line
- SC Structural anomaly notation
- BF Build-up anomaly notation
- 2800 Structure contour
- U Fault "U" upthrown side
- D Fault "D" downthrown side

ESSO EXPLORATION AUSTRALIA INC., SYDNEY, NEW SOUTH WALES

THE BASS BASIN
VICTORIA - TASMANIA

STRUCTURE CONTOUR MAP
REFLECTION AT TOP OF UNIT III

5 cm

CONTOUR INTERVAL: 200 FEET

C 49021
DATUM: SEA LEVEL



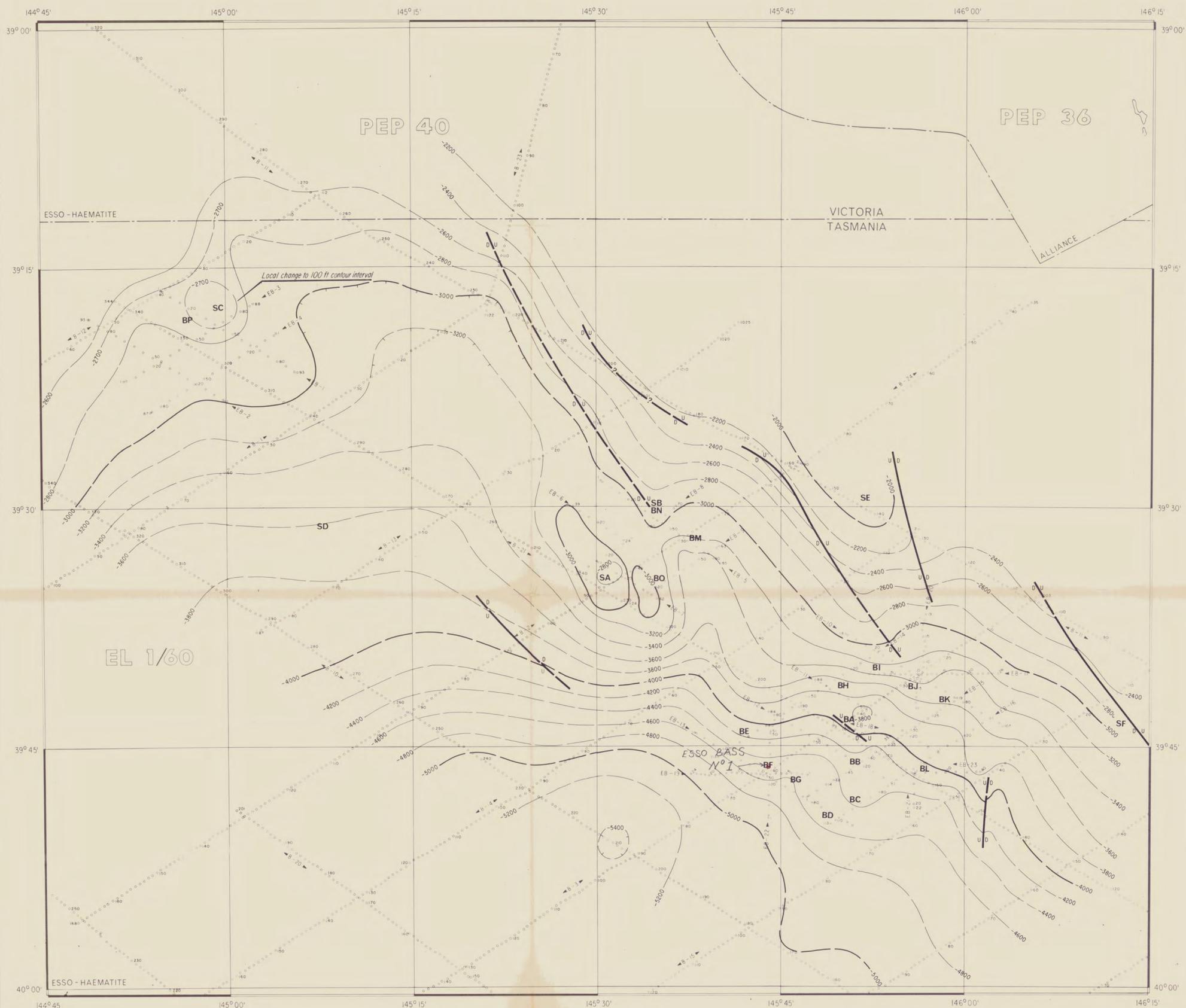
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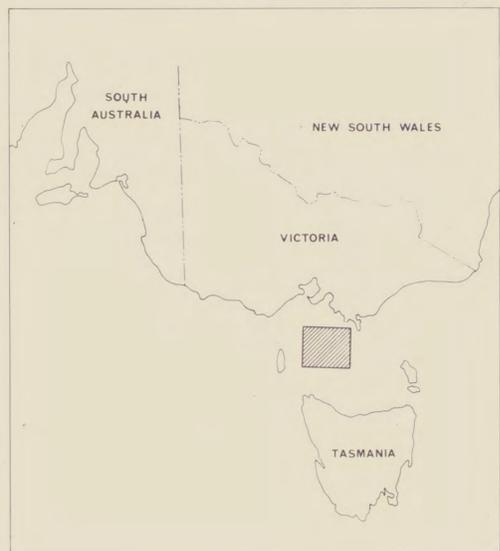
PLATE III

NOTE: See shot-point index map (Plate I) for the refraction and velocity profile locations.

CR-CC4



INDEX MAP



LEGEND

- Petroleum tenement boundary
- ← EB-7 → ESSO seismic line
- ← B-2 → Haematite seismic line
- SC Structural anomaly notation
- BF Build-up anomaly notation
- 2800 Structure contour
- U D Fault "U" upthrown side
"D" downthrown side

NOTE: See shot-point index map (Plate I) for the refraction and velocity profile locations.

ESSO EXPLORATION AUSTRALIA INC., SYDNEY, NEW SOUTH WALES

THE BASS BASIN
VICTORIA - TASMANIA

STRUCTURE CONTOUR MAP
REFLECTION AT TOP OF UNIT IV



049022

CONTOUR INTERVAL: 200 FEET

DATUM: SEA LEVEL

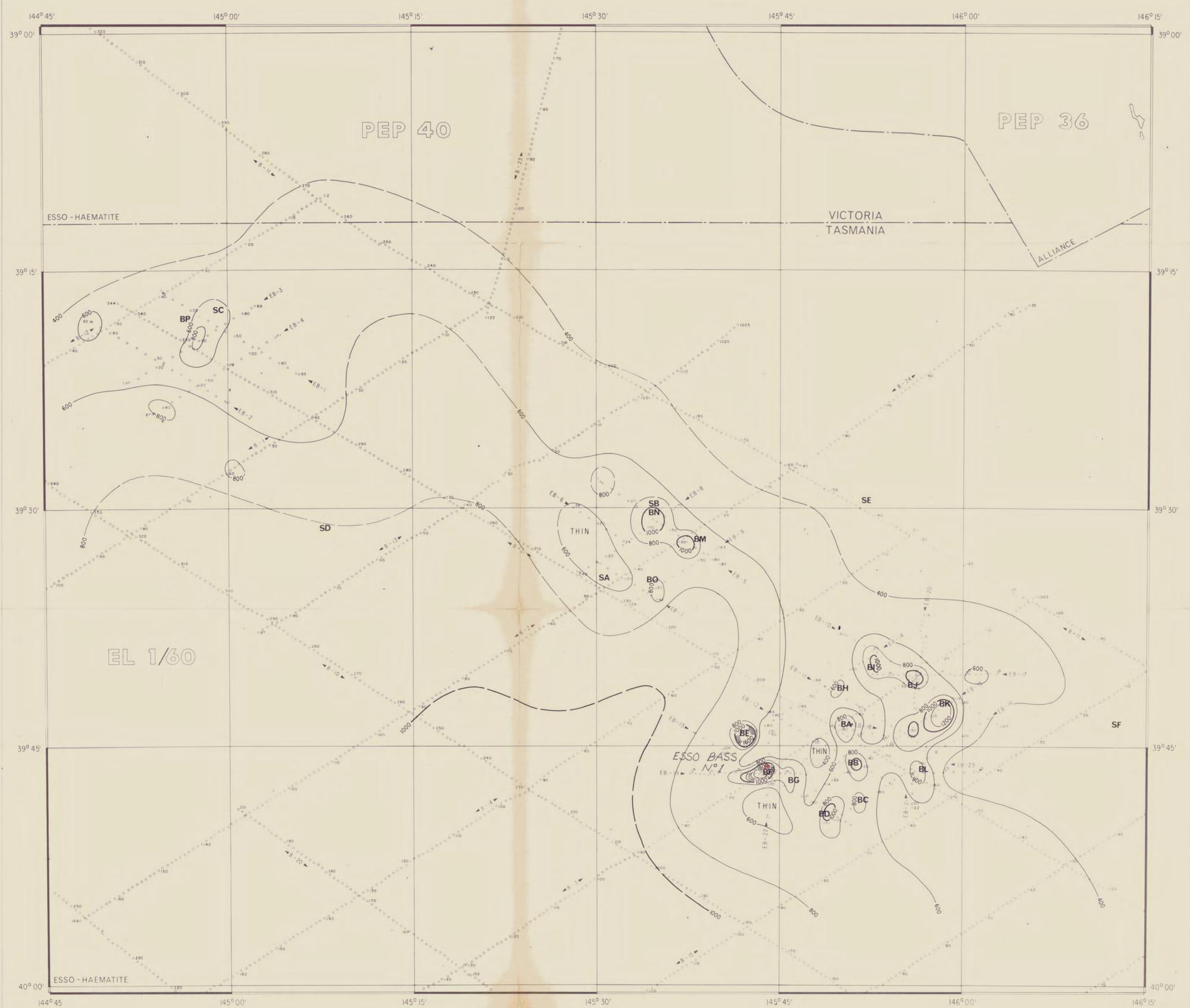


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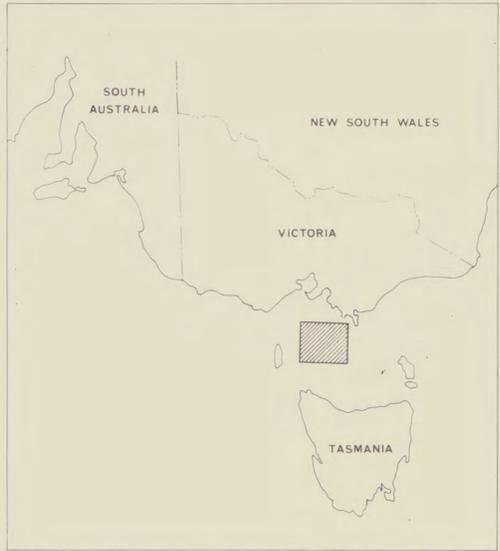
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REVISED

PLATE IV

OK-CC4



INDEX MAP



LEGEND

- Petroleum tenement boundary
- EB-7 — ESO seismic line
- B-2 — Haematite seismic line
- SC Structural anomaly notation
- BF Build-up anomaly notation
- 800 — Thickness contour

NOTE - See shot-point index map [Plate I] for the refraction and velocity profile locations

ESSO EXPLORATION AUSTRALIA INC., SYDNEY, NEW SOUTH WALES

THE BASS BASIN
VICTORIA - TASMANIA

THICKNESS MAP OF UNIT III

049023

CONTOUR INTERVAL - 200 FEET



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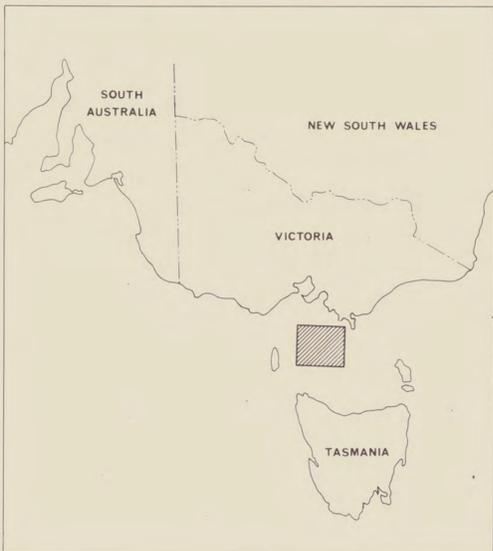
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P. L. SPINNER
REVISED

PLATE V

CR-001



INDEX MAP



LEGEND

- Petroleum tenement boundary
- ◄ EB-7 ► ESSO seismic line
- ◄ B-2 ► Haematite seismic line
- SC Structural anomaly notation
- BF Build-up anomaly notation
- 6000 Structure contour
- U Fault 'U' upthrown side
- D Fault 'D' downthrown side
- Blankout zone

NOTE: See shot-point index map (Plate I) for the refraction and velocity profile locations.

ESSO EXPLORATION AUSTRALIA INC., SYDNEY, NEW SOUTH WALES

THE BASS BASIN
VICTORIA - TASMANIA

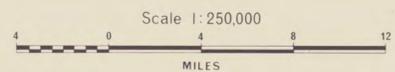
STRUCTURE CONTOUR MAP
REFLECTION AT TOP OF UNIT V

049024

5 cm

CONTOUR INTERVAL: 100 FEET and 500 FEET

DATUM: SEA LEVEL



AUTHOR: E. B. STANFORD

DRAFTED BY: A. F. STRAHAN

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REVISED P. L. SPINNER

PLATE VI

NORTHEAST

CR-004

1' A₁

2' B₁

3' C₁

3" C₂

2" B₂

1" A₂

5 cm

BASS BASIN

LINE EB-8

049025

REVERSED REFRACTION PROFILE

TOTAL PROFILE LENGTH = 7150 METERS

ESSO EXPLORATION AUSTRALIA INC.

Bass Basin part IV

0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1.1
1.2
1.3
1.4
1.5
1.6
1.7
1.8
1.9
2.0
2.1
2.2
2.3
2.4
2.5
2.6
2.7
2.8
2.9
3.0
3.1
3.2
3.3
3.4
3.5
3.6

TWO WAY TIME (IN SECONDS)

