DEPARTMENT OF
MINERALS AND ENERGY

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

RECORD 1976/27

GALILEE BASIN SEISMIC SURVEY, QUEENSLAND, 1975 - OPERATIONAL REPORT

by

P.L. Harrison and J.A. Bauer

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SUMMARY

The Bureau of Mineral Resources made a seismic survey in the western part of the Galilee Basin in central Queensland during July to November 1975. The aim of the survey was to obtain basic information on the extent and thickness of the western part of the basin, which is entirely concealed beneath the Eromanga Basin.

The western part of the Galilee Basin consists of the Lovelle Depression, a northeast-trending trough of Permian and Triassic sediments up to 700 m thick, west of the Cork Fault. The margins of the Lovelle Depression were poorly known from scattered petroleum exploration wells, water-bores and limited seismic traverses.

The seismic survey recorded 320 km of continuous single-coverage reflection recording and 18 km of six-fold CDP recording during 87 operating days.

The area was generally a good one in which to record seismic reflections and small geophone and shot-hole patterns were found sufficient to attenuate coherent shot-noise.

Preliminary interpretation indicates that Galilee Basin sediments in the Lovelle Depression are more extensive than previously realized. The first complete seismic cross-section over the Lovelle Depression was obtained; this cross-section shows that the sediments thin gradually towards the western margin, and that the eastern margin probably lies east of the Holberton Structure, the previously inferred margin.

The southern margin of the Depression was previously defined by the absence of Permian sediments in Ooroonoo No. 1 and Mayneside No. 1 wells. Results of this survey, together with review of a company line south of Ooroonoo No. 1 well indicate Permian sediments are about 200 m thick 70 km south of the well and that the well may have been drilled on a local basement high.

The southern margin of the Lovelle Depression is therefore not yet defined. However a direct link with the Cooper Basin is unlikely because a company seismic line in the north-western part of the Cooper Basin indicates that the Permian and Triassic sediments of the Cooper Basin thin out completely about 100 km south of the presently known extent of the Galilee Basin.

Two major faults were mapped. The Holberton Structure, previously known from geological mapping, corresponds to a major fault in the subsurface with up to 300 m of downthrownto the west. Another major fault appears to be a southerly continuation of the Cork Fault.

The survey also discovered a basement high having an amplitude of 300 m at the basement level; depth to the top of the high is 1400 m. The structure has apparent axial lengths of 7 km and 3 km, and is inferred to trend approximately northwest.

The presence of a sedimentary (or possibly metamorphic) sequence up to 7500 m thick beneath the Permian sediments near Mount Windsor was confirmed. The sequence is known only from seismic work and could be one of several older sequences which exploration wells and water-bores have intersected in the area (Proterozoic sediments to the west, metasediments to the east and possible Palaeozoic carbonates to the northwest).

INTRODUCTION

From July to November 1975 BMR conducted a seismic survey in the Lovelle Depression in the western part of the Galilee Basin, central Queensland. The locations of the BMR seismic traverses, private company seismic lines, petroleum exploration wells and water bores in relation to the principal structural features and presently defined margins of the Galilee, Cooper and Georgina Basins are shown in Plate 1. The survey area lay mainly in petroleum exploration titles ATP 166P, held by US Natural Resources Australia Ltd, and ATP 211P, held by Black Giant Oil Company. A detailed gravity survey was conducted concurrently with the seismic survey; gravity observations were made at each shotpoint along the seismic traverses (Appendix 3).

The Galilee Basin, the western part of which is entirely concealed beneath the Jurassic-Cretaceous sediments of the Eromanga Basin, has been covered by gravity, aeromagnetic and numerous seismic surveys. Harrison & Bauer (1975) have reviewed the results of these surveys in the western and north eastern parts of the basin in formulating a program for the 1975 BMR survey. In the Mackunda and Winton 1:250 000 Sheet areas, both the gravity and magnetic data indicated the presence of a major northeast-trending fault - the Cork Fault - but the interpreted directions of downthrow conflicted. Seismic work during 1964-71 confirmed the presence of the Cork Fault; it indicated a downthrow to the west of about 300 m and suggested that a trough of sediments 2000 m thick, including at least 600 m of pre-Jurassic sediments, existed on the downthrown side of the fault. Lovelle Downs No. 1 well, which was subsequently drilled on the downthrown side of the fault, confirmed the seismic interpretation and intersected 630 m of Permo-Triassic rocks. It was postulated, by following the seismic lines southwards, that a substantial, though thinner, Permo-Triassic section existed 100 km southwest of the well.

About 50 km southwest of the southern limit of the seismic lines, Permian and Triassic sediments appeared to be absent in the Ooroonoo No. 1 well, and it was considered at the time of drilling that the well had passed directly through Eromanga Basin sediments into granite basement. Thus, based on seismic results and the results from Ooroonoo No. 1 well, a minimum extent for the Lovelle Depression was proposed such that the western and southwestern boundaries lay at the ends of seismic lines which indicated the presence of Galilee Basin sediments, and the southeastern boundary coincided with the Holberton Structure.

After reviewing all available information in this area, it seemed reasonable to expect that the Galilee Basin sediments could extend farther to the south, west and east. Reflection seismic work was proposed to help define the western, southern, and eastern margins of the Lovelle Depression, the reflection method being chosen because of the need to obtain precise information about the thickness of the Permian and Triassic sediments. In addition, on a company seismic line south from

Ooroonoo No. 1 well, deep reflections indicated a sedimentary sequence about 5000 m thick beneath about 1200 m of Eromanga Basin sediments. The sequence was known only from a single seismic line and a cross-traverse was considered necessary to verify its presence and to further define its extent.

Economic interest in the Galilee Basin sediments results from the possible presence of oil, gas or coal. Hydrocarbon shows have been recorded from the Permian sediments of the Galilee Basin. The two most significant shows were from Lake Galilee No. 1 well and Koburra No. 1 well, both of which lie within the Koburra Trough to the east, but minor shows have been recorded from numerous other wells, including Lovelle Downs No. 1 in the Lovelle Depression, where oil fluorescence was noted in the cuttings. Possible source and reservoir rocks are known to exist within the Galilee Basin sediments. Structural traps may exist where sediments are draped over basement highs and stratigraphic traps may be present. By analogy with the Permian sequences of the Cooper and Bowen Basins, the Galilee Basin could contain commercial quantities of hydrocarbons.

The survey area straddles the Diamantina River; access to it is by a graded Shire road from Winton, following the eastern margin of the river. There are numerous station tracks, but all roads are unsurfaced and impassable after rain. The average annual rainfall for the area is 300 mm, almost all of which falls in summer, but the deviations from the average can be large, resulting in extremes of wet or drought. The land surface varies from floodplains and rolling downs, to mesas and buttes. Braided channel country with thick vegetation is associated with the Diamantina River and its tributaries.

Extensive data processing and analysis are required before a detailed interpretation of the seismic data will be possible. This report describes the work done during the field survey and presents a preliminary interpretation.

OBJECTIVES

The original aim of the seismic survey was to obtain information about the thickness and structure of the Permo-Triassic sediments in two areas, near the western and north-eastern margins of the Galilee Basin as proposed by Harrison and Bauer (1975). However, after some work had been done near the western margin it was decided that the results warranted spending the entire field season in that area and the proposal for seismic work near the northeastern margin was deferred.

The specific objectives near the western margin were:

1. to investigate the extent of the Lovelle Depression, a trough of Permo-Triassic sediments known to exist on the western, downthrown side of the Cork Fault, and

2. to further define a thick pre-Mesozoic sedimentary (or metamorphic) section of undefined age that had been indicated by Marathon Seismic Line 5B (Marathon, 1964).

PROGRAM AS PROPOSED

Operations were to commence near the western margin. It was planned to record a reflection seismic traverse oriented southwest to join Line 16 (Phillips-Sunray, 1968) in the north to Line 5B south of Ooroonoo No. 1 well, and to record a second traverse oriented perpendicular to the first and designed to cross the Holberton Structure. If time allowed, an additional east-west traverse south of Ooroonoo No. 1 well, to intersect Line 5B, was also proposed.

It was proposed to carry out initial experimental work as follows:-

1. Uphole shoot to establish best shooting depth and to obtain near-surface velocity information.

2. Noise test to study the characteristics of longitudinal and transverse noise in order to choose recording frequency filters and to design suitable shot-hole and geophone arrays.

Previous reflection seismic surveys in the Lovelle Depression have obtained fair-quality results using single-coverage recording. Hence it was proposed that the coverage should consist of about two-thirds single-fold and one-third six-fold CDP.

PROGRAM AS CARRIED OUT

The locations of the BMR seismic traverses and those of earlier company seismic lines are shown in Plate 2.

Experimentation

The uphole shoot was cancelled because a very hard formation, reached at a depth of 20 metres, prevented the drilling of a sufficiently deep hole. Weathering shots recorded by 540-0-540 m spreads, were used to determine the thickness of the weathering and the initial hole depth was selected accordingly.

A noise test was recorded at Traverse A, SP 997. Seven in-line spreads, with maximum offset 1680 m, and two transverse spreads at SP 999 with a combined length of 480 m were recorded. The results indicated troublesome longitudinal noise events with a frequency range of 6-38 Hz and a wave-number range of 6-27 cycles/1000 m. Transverse noise was negligible. The initial recording parameters, considered to satisfactorily attenuate the coherent noise, were a geophone pattern of 16 per trace, in two rows of eight spaced 6 m apart in line, together with a recording filter having a low-frequency cut-off of 16 Hz with a slope of 12 dB/octave, and a high-frequency cut-off of 100 Hz.

The thickness and velocity of the weathered layer were normally found from the first breaks and uphole times on the reflection records. Some short weathering spreads with 73-m offset were recorded in an attempt to obtain information on the low-velocity layers, but in many areas the offset was found to be too short to enable the depth to the sub-weathering layer to be determined, and these shots were discontinued.

Production recording

Traverse A was shot, connecting Line 16 in the north-east to Line 5B in the southwest. A split-spread configuration was used with a geophone - station interval of 45 m, the geophone pattern described earlier, and two or three-hole shot patterns. Traverse A overlapped the southern 2 km of Line 16, which was recorded using 24 geophones per trace and three-hole shot patterns, and had comparable quality records to those of Line 16. From SP 949 southwards, the geophone pattern was reduced from 16 geophones per trace to eight per trace when comparison shots indicated no discernible difference in record quality.

Traverse B was shot in a southeasterly direction perpendicular to Traverse A and crossed the Holberton Structure approximately at right angles. The traverse linked Line F1 (Aquitaine, 1963), which connects to Fermoy No. 1 well in the southeast, to the Phillips-Sunray (1962) seismic line in the northwest. The record quality deteriorated badly on the south-eastern part of Traverse B due to an increase in the noise level. This probably resulted in part from shooting in the weathered layer which averaged 100 m thick in this area. It was not practicable to drill all shot holes to the subweathering layer, firstly because of the excessive drilling time required, and secondly because the holes were prone to collapsing. The party experimented with different hole patterns and shot depths here. This indicated that the best results were obtained by shooting beneath the weathered layer; when shots were fired within the weathering, better results were obtained by shooting in single deep holes rather than in single shallow holes or shallow patterns.

The short Traverses C and I were shot perpendicular to Traverse B to check regional dip, and Traverse D was recorded to investigate the north-east-southwest extent of a possible anticlinal structure found on Traverse B.

Traverse E was shot in an easterly direction, intersecting Line 5B about 50 km south of Ooroonoo No. 1 well and passing through water bore RN10644. Traverse G was recorded west-southwest from bore RN10644 for dip control.

Three six-fold CDP probes were recorded to improve definition of primary reflections by cancelling multiples, and to obtain vertical velocity information. Off-end spreads of 0-90-2160 m and a geophone station interval of 90 m were used.

Velocity Investigations

Two expanded spreads were recorded to determine the vertical velocity distribution and to differentiate between primary and multiple reflections. The first, centred on SP 2007, Traverse B consisted of nine spreads giving a maximum offset of 4860 m. A T^2-X^2 analysis was done on the main reflection events on this expanded spread, and the velocities thus determined were found to be close to those from the Lovelle Downs No. 1 well velocity survey. The second expanded spread, with a maximum offset of 2700 m, was centred on SP 1905, Traverse B. Both expanded spreads indicated that surface multiples were not a serious problem.

Deep crustal reflection recording

Two deep crustal reflection shots, each using a 0-180-4320 m spread and a 500-kg charge were recorded, one along Traverse I and the other along Traverse B at its intersection with Traverse I. The spread along Traverse B was also used to record a reversed refraction profile.

FIELD OPERATIONS

Operational details are presentednin Appendices 1 and 2 and in Plate 5. Supplies were obtained through Winton which had twice-weekly airsservices and weekly rail services. Camp and drilling water supplies were obtained from waterholes in the Diamantina River and from the Mayne Pub Bore and the Mackunda Bore. Although the weather was mainly fine, operations were halted by rain in early August for one day, in late September for three days and in late October for four days; the whole area became boggy after only a centimetre or so of rain and all roads became impassable.

Access

The survey area is mainly undulating grassland, except near the Diamantina River and its tributaries where the ground is often heavily-timbered and cut by numerous steep channels which are difficult to cross. Near Mount Windsor homestead the country consists largely of duricrust-capped mesas and buttes. Numerous station tracks provided access and traverses were placed along these tracks wherever possible. The traverses were frequently bent in order to avoid thick scrub, deep river channels, and mesas.

About 20 km of bulldozing was carried out on Traverse A to clear scrub and to smooth creek corssings. However, most of the country away from the river channels did not require bulldozing.

Surveying

To ensure that drilling and recording crews were not delayed it was generally necessary to operate two separate surveying teams, one pegging and the other levelling. All distances were chained. Horizontal and vertical control was made by tying to Department of Services and Property benchmarks. Permanent marks consisting of steel star pickets with aluminium tags were placed approximately every thirty shot-points and at the ends of traverses. The survey rate was restricted by the requirement for Third-Order Levelling.

Drilling

Air injection was mainly used, and water injection only occasionally. The drilling rate was generally moderate to fast except in the area around Old Cork where hard shallow limestones were encountered. Holes generally stood without caving and did not require pre-loading. Two rigs were usually sufficient to maintain progress, the third rig being required for pattern drilling, multiple coverage and for standby in case of breakdowns.

PRELIMINARY RESULTS

Preliminary single-coverage record sections from Shot points 1966 to 1985 and from 2061 to 2088 on Traverse B are shown in Plate 3 to illustrate general record quality. Preliminary interpretative depth cross-sections are shown in Plate 4.

The record quality over the area surveyed was generally fair to good, but poorer in areas of higher elevation with duricrust surface. The following problems reduced the quality of the reflection data: Coherent noise, random noise, variable energy coupling, and large variations in weathering thickness. Coherent noise was not a serious problem in most areas except on the southeastern part of Traverse B where the weathered layer is so thick (up to 120 m) that shots had to be fired within it. Energy coupling in the shot-holes and at the geophones was variable, giving records of variable quality. Automatic gain control was used. Large variations in the weathering thickness over short distances reduced the continuity of the reflections.

Four reflections were identified on company sections at the Lovelle Downs No. 1 well, as follows:

A- Near top of Toolebuc Formation (Cretaceous)

B- Near top of Hooray Sandstone (Lower Cretaceous/Upper Jurassic)

C- Near top of Permian

D- Basement

The top of the Triassic section did not correspond to a strong reflection at the well, and therefore could not be identified on the seismic sections.

These reflections were followed on company lines south of the well and along the BMR traverses. The identification of the reflections south of the well is tentative because of variable reflection quality on the company and BMR sections. The upper two reflections were strong and generally easy to follow, whereas the other two were variable in character and were sometimes difficult to pick or to distinguish, particularly when the interval reflection time between them became less than 100 milliseconds. Additional reflections, less persistent though frequently strong, were recorded but were not included in the preliminary interpretation.

Further processing of the records is required before the final interpretation can be made. Analogue processing will comprise revised normal move-out and static corrections. It is proposed to digitally process all the multiple-coverage records and about half of the single-coverage records, with the following main techniques and objectives:

- Digital band-pass filtering and deconvolution to improve the resolution of reflections, especially near the Permian level.
- Automatic residual statics to improve reflection continuity, particularly over areas of low record quality.
- Velocity analyses using the multiple-coverage and expanded-spread records to obtain improved vertical velocity information for normal moveout corrections and time to depth conversion.

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- To permit more accurate stacking of multiple coverage data. Good stacked sections have not been obtained from the analogue playback system because of problems in applying large values of moveout.

Traverse A

On Traverse A the total sedimentary section thins gradually southwards from about 1800 m to 1300 m, and the Permian section thins from 300 m to 150 m at the intersection with Line 5B. Following this, Line 5B was reviewed, and Permian sediments were interpreted to be present along the entire line except for the 12 km south of Ooroonoo No. 1 well (where the Permian is missing). The Permian sediments may be 200 m thick at the southern end of Line 5B.

Traverse B

On Traverse B (Plate 3) the sediments as a whole are about 2600 m thick in the southeast and thin uniformly to 600 m in the northwest. The permian part of the section thins from 500 m in the southeast and wedges out in the northwest. Two major faults were found in the southeast, near SP 2082 and SP 2068; downthrow is to the west, and both faults displace the four main reflection horizons by up to 300 m. The fault at SP 2082 corresponds to the Holberton Structure previously known from geological mapping and the fault at SP 2068 appears to be a southerly extension of the Cork Fault. A basement high was recorded between SPs 1984 and 1972, and on the short cross-Traverse D; the high has an apparent extent of 7 and 3 km, respectively, on the two traverses. The 'Top of Permian' and 'Basement' reflectors are displaced by 300 m over the structure but the shallower reflectors are displaced much less. The Permian thins, from 300 m, to 100 m on the crest of the structure. The inferred trend of the structure is approximately northwest, which is close to the regional basement trend indicated by the gravity and magnetic anomalies in the area.

Traverse E

On Traverse E the sedimentary section thins gradually towards the west from 1700 m to 1100 m showing the same trend as on traverse B. The Permian sediments are about 200 m thick over most of the line, but gradually thin eastward to 100 m.

Some deep events were recorded over 10 km of traverse near the intersection with Line 5B; dip is to the east at 20°; and the possible maximum depth is 9200 m. They indicate a possible 7500-m thick sequence, below the base of the Permian; this sequence could be related to one of the following sequences in the area:

- Proterozoic sediments as found in Canary No. 1 and Elizabeth Springs No. 1 wells to the northwest.

- Metasediments as found in Mayneside No. 1, Fermoy No. 1 and Newlands No. 1 wells to the east.

- Lower Palaeozoic sediments possibly related to the Georgina Basin.

CONCLUSIONS

Preliminary interpretation of the seismic results suggests a substantial revision of the extent of Galilee Basin sediments in the Lovelle Depression, defined previously by widely scattered wells and water-bores and some limited seismic traverses. The possible limits of the Lovelle Depression are now revised, as outlined below.

The eastern limit probably lies between the Holberton Structure and the western end of company line F1. The southeast limit lies between the eastern end of Traverse E and Mayneside No. 1 well.

The western limit of the Depression is defined by the pinchout of the Permian sediments on Traverse B. The southwest limit lies west of Traverse E.

The southern limit of the Lovelle Depression was previously defined only by the apparent absence of Galilee Basin sediments in Ooroonoo No. 1 and Mayneside No. 1 wells. Results of Traverse A and the review of Line 5B indicate that about 200 m of Permian sediments may be present at the southern end of line 5B, and therefore that the southern limit of the Depression has not yet been defined. A direct link with the Cooper Basin is unlikely because a seismic line in the northwestern part of the Cooper Basin indicates that the Permian and Triassic sediments of the Cooper Basin thin out completely. However a large unexplored area remains between the presently defined extents of the basins where the Permian thickness is unknown.

The Holberton Structure, previously recognized from geological mapping, corresponds to a major subsurface fault which has a downthrow to the west of up to 300 m. Another major fault exists 8 km west of the Holberton Structure; this fault has a downthrow to the west of similar magnitude, and is probably a southerly continuation of the Cork Fault.

A basement high was discovered having apparent axial lengths 7 km and 3 km and amplitude 300 m at the basement level. The Permian section appears to thin from 300 m to 100 m at the crest of the structure.

An east-west seismic line through Mount Windsor confirmed the presence of a sedimentary or metamorphic sequence up to 7500 m thick beneath the Permian sediments. The sequence could be one of several sequences in the area as exploration wells and water-bores have indicated the subsurface existence of Proterozoic sediments to the west, metasediments to the east and possible Palaeozoic carbonates to the northeast.

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APPENDIX 1

STAFF AND EQUIPMENT

Staff

Party Leader	P.L. Harrison
Geophysicists	J.A. Bauer (30.6.75 - 10.8.75) D. Schmidt (3.8.75 - 12.12.75) F. Brassil (10.9.75 - 24.10.75)
Observer	L.E. Hemphill (30.6.75 - 10.9.75) R. Enders (11.9.75 - 19.11.75)
Assistant Observer	R. Enders (26.7.75 - 10.9.75)
Shooters	R.D.E. Cherry L. Rickardsson

Survey Personnel: Surveyors - G. Nichols (30.6.75 - 13.9.75)
(from Dept Services - R. James (10.9.75 - 17.11.75)
and Property) : Technical Officers - J. Alp (3.8.75 - 8.10.75)
- R. Leetham (19.9.75 - 17.11.75)
- I. Preston-Stanley (9.10.75 - 7.11.75)

2 Chainmen (10.9.75 - 17.11.75)

Toolpusher	A. Zoska
Drillers	L.A.C. Keast T.P. Shanahan J. Kearney
Mechanics: staff	D.K. McIntyre
wages	A. Crawford B. Dickinson
Clerk	P. Swan
Field Hands	Cook, cook's offsider, and 12 others

Equipment

Recorder	Seismic Amplifiers SIE PT-700 Oscillograph SIE TRO-6 Magnetic Recorder (FM) SIE PMR-20
Geophones	GSC 20D, 8Hz
Drilling Rigs	Mayhew 1000 (3)

Other vehicles, camping and miscellaneous equipment.

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APPENDIX 2

OPERATIONAL STATISTICS

Detailed statistical information is given in the Seismic Operations Chart (Plate 5).

Sedimentary Basin	Galilee
Camp Sites	Old Cork (30.6.75 - 15.9.75, 28.10.75 - 2.11.75) Mayne Pub bore (16.9.75 - 27.10.75) Lilleyvale (3.11.75 - 21.11.75)
Survey commenced	30 June 1975
Survey completed	21 November 1975
Kilometres of reflection coverage	single-fold - 320 Six-fold - CDP -18
Number of reflection shots recorded	single-fold - 587 Six-fold - CDP - 97
Number of recording days	single-fold - 79 Six-fold - CDP - 8
Number of recording days lost	Bad weather - 8 Camp shifts etc. - 4
Production rates (one month defined as twenty recording days)	Single-fold - 80 km/month Six-fold CDP - 40 km/month
Topographic survey control	Department of Services and Property benchmarks
Total number of holes drilled	1060
Total depth drilled (metres)	36,300
Explosives used	19,500 kg TOVEX
Detonators used	2000
Shot-point interval	540 metres
Geophone station interval	45 m (single-fold) 90 m (6-fold CDP)
Normal geophone group	8 in line; spacing in line - 6 metres
Normal hole patterns	Single Three in one line parallel to traverse, spacing 20 metres
Hole depths	14 to 100 metres; average 34 metres
Charge sizes	2 to 75 kg/shot, average 26 kg/shot 500 kg/shot for deep crustal shots
Normal tamping	Solid

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Normal recording mode	Automatic gain control
Normal recording filters	1/16 to 2/100
Datum for corrections	150 metres A.S.L.
Weathering velocity	500-1300 metres per second
Sub-weathering velocity used	2000 metres per second

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APPENDIX 3

OPERATIONAL DETAILS - GRAVITY SURVEY

1. The survey commenced on 8 October and was completed on the 16 November 1975.

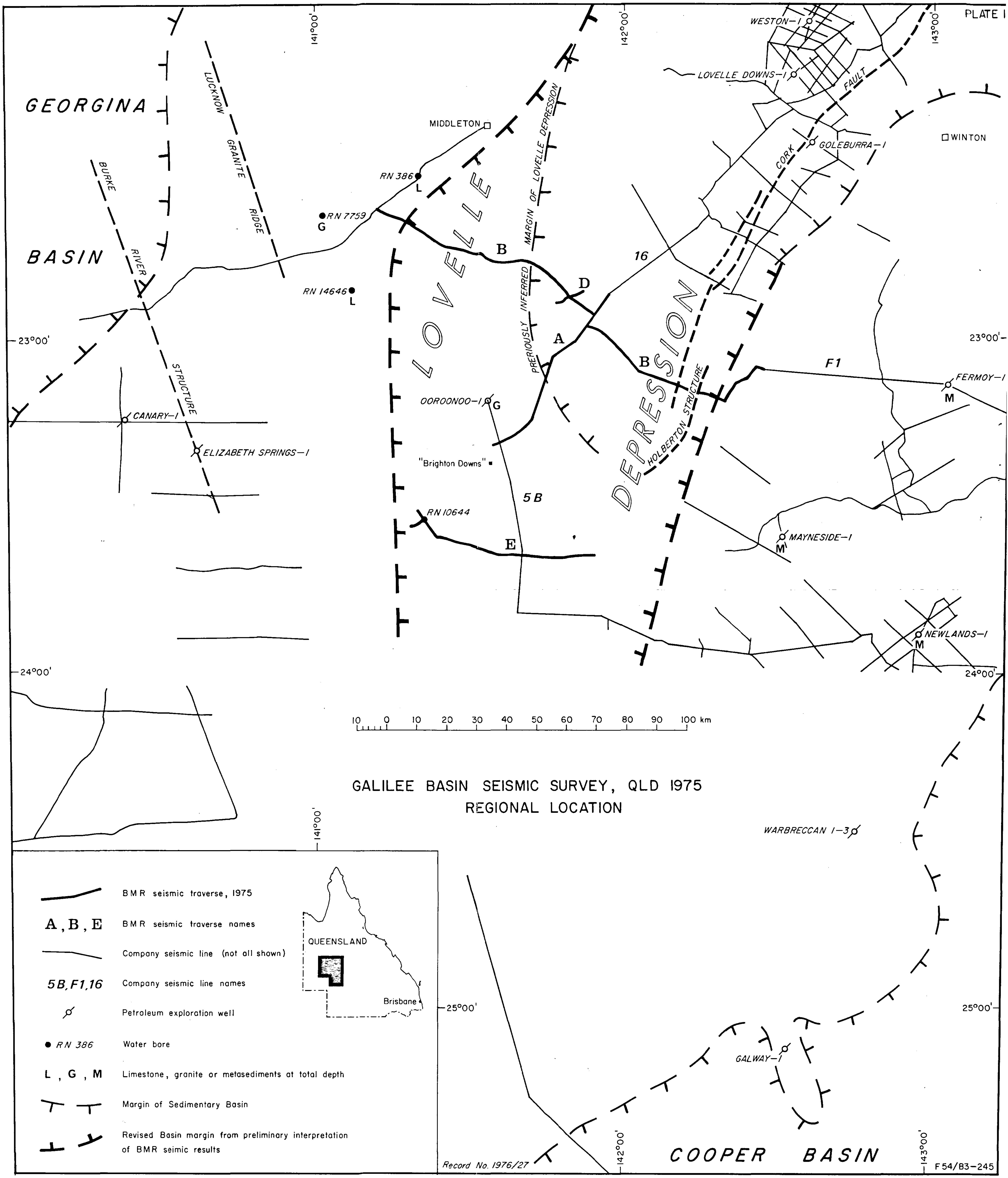
2. 587 new stations were read.

3. Worden 140 was used (C.F. 0.10194 mgals/division).

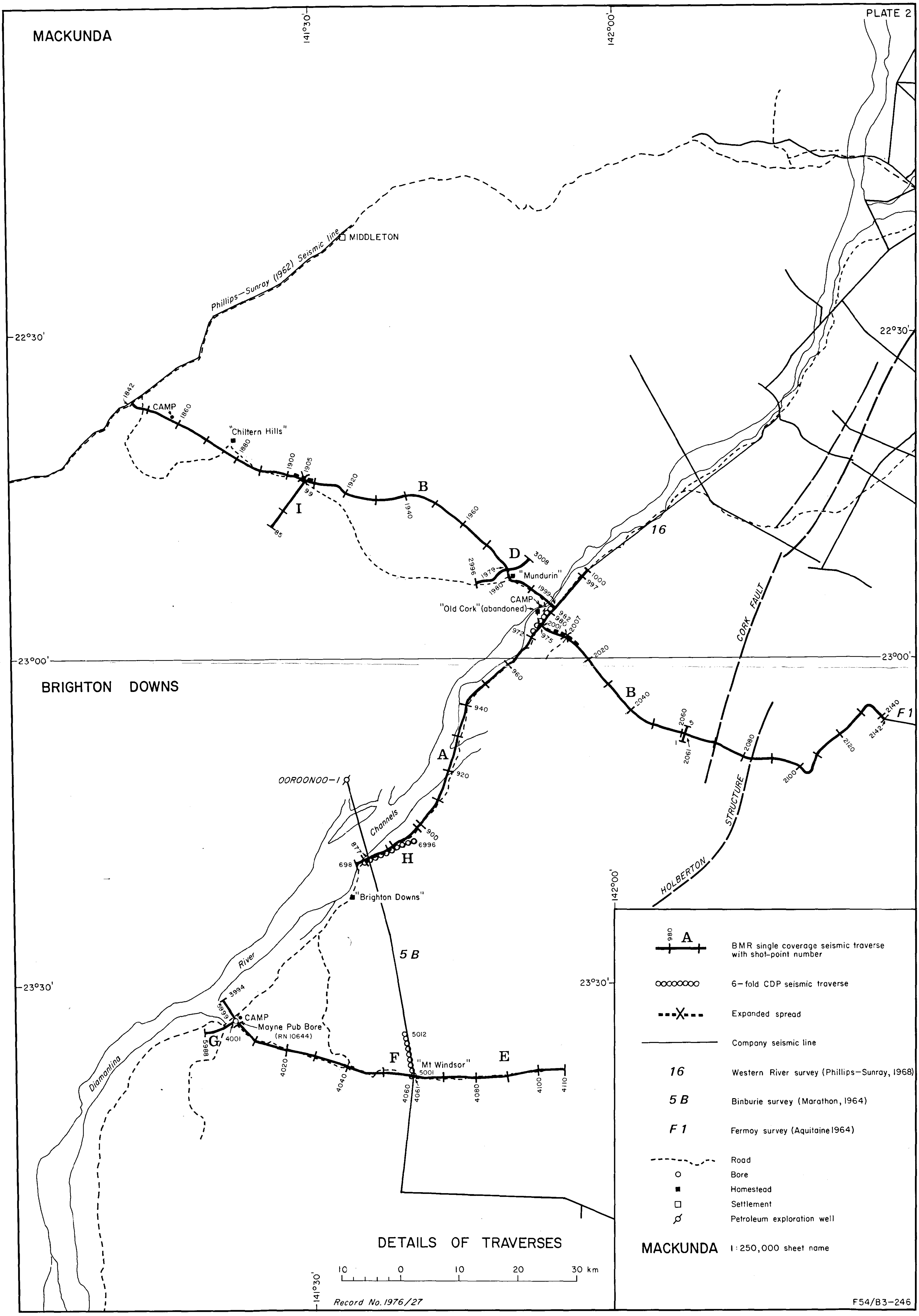
4. The survey was tied to the Middleton Isogal stations (6491.9033 and 6491.1033), and also to previous stations 5805.2039, 5908.5815, 5908.5818, 5908.5822 and 5908.5826.

5. All stations were seismic shot-point locations and levels were optically obtained to Third-Order standard.

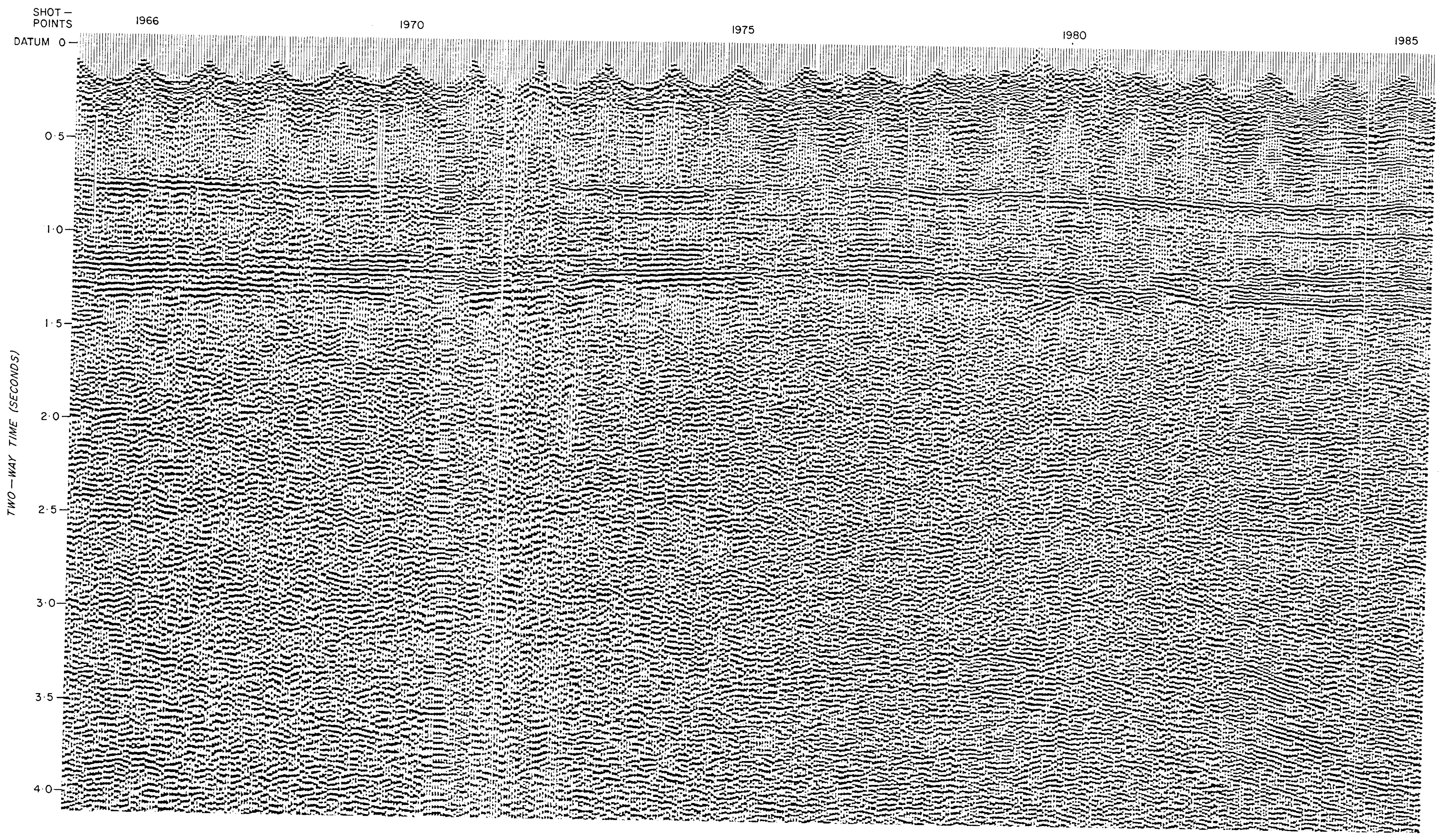
6. The Survey Number in the BMR's Regional Gravity filing system is 7511.

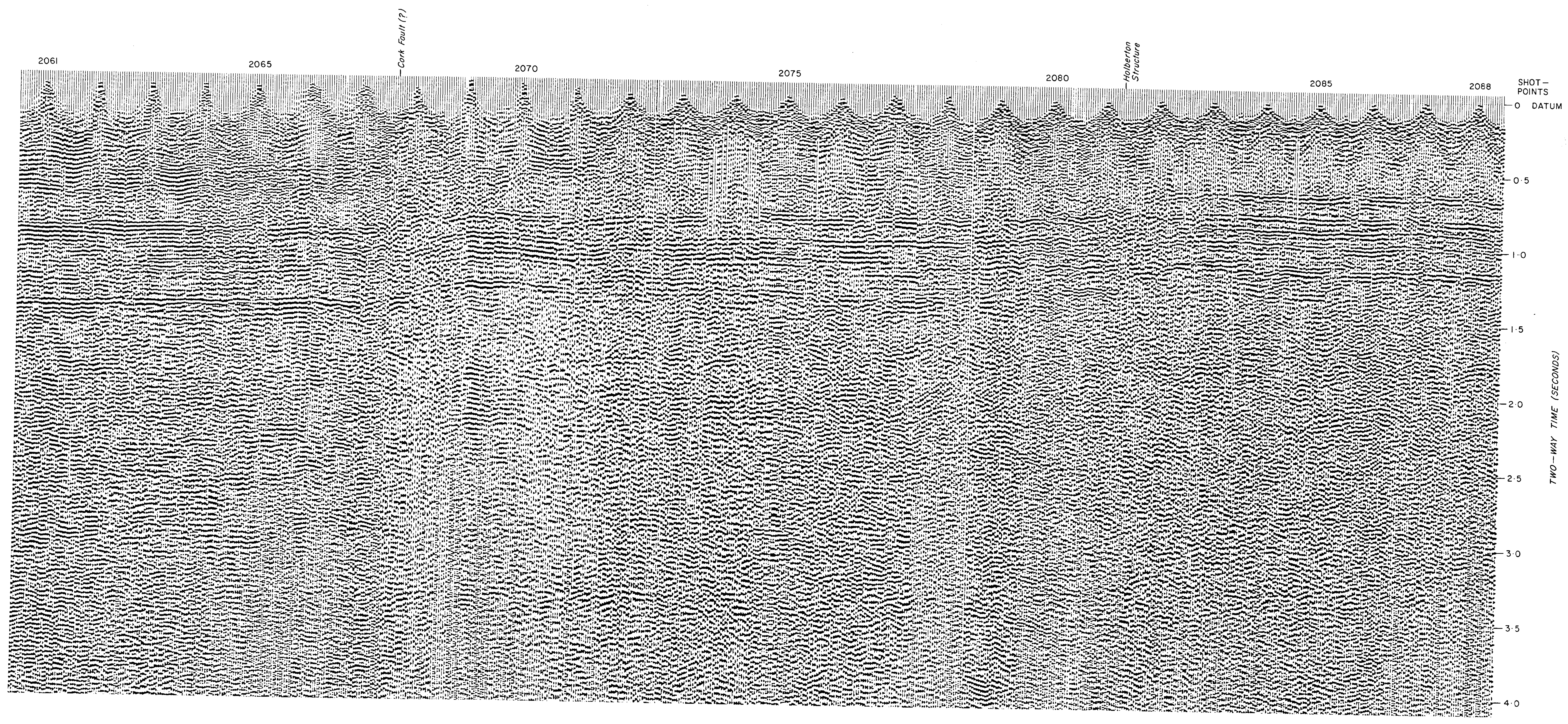


GALILEE BASIN SEISMIC SURVEY, QLD 1975
REGIONAL LOCATION


MACKUNDA
141°30'
142°00'
Phillips—Sunray (1962) Seismic line
MIDDLETON
22°30'
CAMP
"Chiltern Hills"
B
I
D
"Mundurin"
CAMP
"Old Cork" (abandoned)
16
CORK FAULT
23°00'
BRIGHTON DOWNS
B
F 1
A
OOROONOO-1
Channels
H
HOLBERTON STRUCTURE
"Brighton Downs"
5 B
23°30'
River
CAMP
Mayne Pub Bore
(RN 10644)
G
F
"Mt Windsor"
E
Diamantina
A
BMR single coverage seismic traverse with shot-point number
6-fold CDP seismic traverse
Expanded spread
Company seismic line
16
Western River survey (Phillips-Sunray, 1968)
5 B
Binburie survey (Marathon, 1964)
F 1
Fermoy survey (Aquitaine 1964)
Road
Bore
Homestead
Settlement
Petroleum exploration well
MACKUNDA
1:250,000 sheet name
DETAILS OF TRAVERSES
10 0 10 20 30 km

F54/B3-246





PRELIMINARY REFLECTION RECORDED SECTION
TRAVERSE B SP 2088–2061 and SP 1985–1966

NOTE: NMO and static corrections have been applied to the section

Record No. 1976/27

F54/B3–247


PRELIMINARY INTERPRETATIVE CROSS-SECTIONS
LEGEND
A Toolebuc Member
B Near top of Longsight Sandstone
C Near top of Permian
D Basement or base of Permian
Identification of horizons is tentative
5 0 5 10 15 km
V/H = 5 approx.
LINE 5B
TRAVERSE A
OOROONOO-1
Junction Trav A (SP 877) and Line 5B (SP 37)
Trav B (SP 2001)
Trav B (SP 1999)
Depth (m)
TRAVERSE G
Trav E (SP 4001)
TRAVERSE B
Trav I (SP 99)
Trav D (SP 3001)
Trav A (SP 982)
Trav A (SP 975)
Trav C (SP 3)
CORK FAULT
HOLBERTON STRUCTURE
TRAVERSE E
Trav G (SP 5999)
Line 5B (SP 127)
CHANGE IN DEPTH SCALE
TRAVERSE I
Trav B (SP 1905)
TRAVERSE D
Trav B (SP 1979)
TRAVERSE C
Trav B (SP 2061)

PLATE 5

YEAR : 1975

SEISMIC PARTY : GALILEE BASIN

SEISMIC OPERATIONS CHART