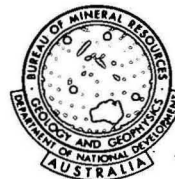


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COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF  
NATIONAL DEVELOPMENT  
BUREAU OF MINERAL  
RESOURCES, GEOLOGY  
AND GEOPHYSICS



Record 1972/11

~~RESTRICTED~~

GALILEE BASIN DETAILED  
GRAVITY SURVEY, QUEENSLAND,  
1971

- OPERATIONAL REPORT

by

W. Anfiloff

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**CANCELLED**

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PLATE 1 - Location Map

PLATE 2 - Preliminary gravity profiles

## SUMMARY

The gravity survey was carried out along a seismic traverse from Lake Galilee No. 1 well to Drummond Group outcrops in the east. In addition, work was done on several cross traverses, and on a line extending eastwards from the end of the seismic line. This has produced a strip of detailed gravity data across the boundary between the Galilee and Drummond Basins.

No large difference from the previous reconnaissance results has been observed, but the present survey has revealed several short wavelength anomalies which were not previously recorded. These may add significantly to the structural picture of the area.

## 1. INTRODUCTION

During the period 11 October to 26 November 1971, the Bureau of Mineral Resources (BMR) carried out a gravity survey in the Galilee Basin concurrently with a seismic survey (Harrison et al., 1971), over traverses totalling 185 km in length. The main objective of these surveys was to define the structural configuration of the eastern margin of the Galilee Basin, and its relationship to the western margin of the Drummond Basin.

The area covered is an east-west strip 95 km long, and 16 km wide extending eastwards from survey marker AB6, along the seismic traverse and beyond to "Beresford" homestead (Plate 1). The survey encompassed six sites previously occupied during the reconnaissance helicopter gravity survey in 1963 (Gibb, 1966), and was finally tied to Isogal station 6491.0250 at Clermont (Barlow, 1964).

This report provides information on the operational aspects of the gravity survey and includes preliminary gravity profiles for the main traverse, and six cross traverses (Plate 2).

## 2. TIE POINT, TRAVERSE, AND ROCK SAMPLE SPECIFICATIONS

### Ties to previous work

A comparison of existing and newly derived observed gravities is shown in Table 1, based on the value of the Clermont Isogal station.

TABLE 1

BASE	OBSERVED GRAVITY mgl. (1963)	OBSERVED GRAVITY mgl. (1971)	DIFFERENCE mgl.
6306.0805	978715.16	978715.11	-0.05
6306.0806	978715.16	978715.54	-0.07
6306.0807	978716.14	978716.05	-0.09
6306.1253	978764.18	978764.13	-0.05
6306.1254	978764.87	978764.88	0.01
6306.1255	978764.66	978764.52	-0.14
6491.0250	978775.64	978775.64	0.00

Tie station elevations

Elevations of previously established tie points and their newly assigned B.M.R. gravity station numbers are shown in Table 2.

TABLE 2

MARKER	BMR GRAVITY STN NO.	ELEVATION (metres)
AB5	6306.0805	302.36
AB6	6306.0806	299.00
AB7	6306.0807	301.44
AG53	6306.1253	230.43
AG54	6306.1254	237.44
AG55	6306.1255	241.09

Specifications for the main and cross traverses

Traverse specifications for gravity survey No. 7107 are given in Table 3.

TABLE 3

STATION NO.	SERIES	INTERVAL	LOCATION
7107.1068- 7107.1173	Seismic traverse	540 metres	Coincident with SP1068 to SP1173
7107.2001- 7107.2046	2000	Various between 0.05 to 0.8 km	Along road from "Langlan" to "Beresford", starting at 6306.1254 (AG54) and ending at permanent marker 7107.9001
7107.5001- 7107.5015	5000	0.8 km	Cross traverse along road from AB5 to AB7 via AB6
7107.5102- 7107.5229	5100	0.8 km	Cross traverse along dog-proof fence crossing seismic traverse at SP 1100 8/12

7107.5211- 7107.5229	5200	0.8 km	Cross traverse along road and fenceline, intersecting seismic traverse at SP 1155 and SP 1157
7107.5301- 7107.5319	5300	0.8 km	Cross traverse along road from AG53 to AG55 via AG54
7107.5401- 7107.5418	5400	0.8 km	Cross traverse along fencelines, intersecting main traverse at 7107.2023
7107.5501- 7107.5517	5500	0.8 km	Cross traverse along track, intersecting main traverse at 7107.2042 and 7107.2043

Rock sample specifications

Descriptions of rock samples collected for density determination are shown in Table 4.

TABLE 4

Number	Rock type	Description	Strat. Unit	Location	Density (g/cm <sup>3</sup> )
N1	Conglomerate	Buff-coloured, even-grained matrix with well rounded pebbles	Mt Hall Formation	Mt Bingeringo	2.50
N2	Quartzite	White, even-grained, arkosic	Mt Hall Formation	Mt Bingeringo	2.48
N3	Conglomerate	Red, with coarse uneven matrix and rounded to angular pebbles	Mt Hall Formation	Mt Bingeringo	2.59
N4	Conglomerate	Pink, coarse even-grained matrix with rounded pebbles	Mt Hall Formation	Mt Bingeringo	2.50

S1	Conglomerate	Dark red, with uneven matrix and angular to rounded pebbles; hematite and dark mineral inclusions	Mt Hall Formation	Mt Donnybrook	2.74
S2	Feldspathic quartz sandstone	White to pink, medium-grained	Mt Hall Formation	Mt Donnybrook	2.37
S3	Rhyolite	Dark-coloured pyroclastic	Silver Hill Volcanics	Piebald Creek east of Mistake Creek Syncline	2.57
S4	Rhyolite	Buff-coloured, porphyritic, flow-banded	Silver Hill Volcanics	12 km N.E. of "Pioneer"	2.41

### 3. DETAILS OF OPERATIONS

#### Personnel

The field operations were carried out by the following personnel, under the overall supervision of F.W. Brown.

W. Anfiloff	-	Geophysicist
C. Allen	-	Technical Assistant
T. Hoffman	-	Surveyor
T. Plant	-	Surveyor's assistant
D. Glasson	-	Surveyor's assistant (after completion of seismic traversing)

#### Survey statistics

The operations began on 11/10/71 and ended on 10/11/71. Within this period, the traverses were reconnoitred, and stations pegged, photo identified, and occupied for gravity observations. A total of 385 observations were made, which provided 265 new station values. Geological excursions were made in the vicinity of Mount Donnybrook, and further north at Mount Bingeringo, and rock samples were collected for density determination.



### Log of activities

Reconnaissance of traverses, photo identification of stations, and pegging of stations:	5 days
Geological reconnaissance:	3 days
Gravity observations:	12 days

### Levelling

Eight days were spent levelling traverses extra to the seismic line. Surveying control was available at six established survey markers (Table 2).

### Equipment

- 1 Gravity meter, MW548 (C.F. = 0.10937 mgl/div.)
- 1 L/R 4 x 4 for gravity work
- 1 L/R 4 x 4 for surveying work

After the completion of work on the seismic line, two Land Rovers and two rod men were used on the surveying operation.

## 4. REFERENCES

- BARLOW, B.C., 1964 - The Australian Isogal Survey, 1964. Bur. Miner. Resour. Aust. Rec. (in prep., unpubl.).
- GIBB, R.A., 1966 - North Eromanga and Drummond Basins reconnaissance gravity surveys, Queensland 1959-1963. Bur. Miner. Resour. Aust. Rec. 1966/210 (unpubl.).
- HARRISON, P., and BROWN, A.R., 1971 - Galilee Basin Seismic Survey Queensland, 1971 - Operational Report. Bur. Miner. Resour. Aust. Rec. 1971/138 (unpubl.).

