DEPARTMENT OF MINES
SOUTH AUSTRALIA

RB 49/3

GRAVIMETRIC INVESTIGATIONS OF THE EDEN FAULT ZONE IN THE GLEN OSMOND, BEAULIEU AND ROSSLYN PARK AREAS

by

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59-234

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SUMMARY

Gravity investigations were carried out at Glen Osmond, Beaumont and Rosslyn Park in an attempt to delineate accurately the fault zones in these areas.

The reduced results of each traverse showed a pronounced gravity anomaly which proved to be due to the Eden fault zone.

INTRODUCTION

Gravimetric investigations were carried out at Glen Osmond, Beaumont and Rosslyn Park to map fault zones occurring in these areas. The purpose of this survey was to aid the Senior Geologist (Soils Geology Section) in locating the sites of large concrete tanks to be erected in these areas.

It is desirable that these tanks are not erected on fault zones or other zones of weakness.

PREVIOUS GEOPHYSICAL METHODS

The Eden fault zone has been broadly delineated by previous gravity surveys by W. Fenner, C. Kerr Grant and other officers of the geophysical section of the Department of Mines.

These surveys show that large gravity anomalies are associated with the Eden fault zone due to the sharp contrast in density of the Tertiary rocks and the Proterozoic rock formations occurring across the fault zone.

SURVEY DETAILS

Glen Osmond:

In the Glen Osmond area, a traverse was run along the Glen Osmond road and some distance up the Mt. Barker road. Gravimeter readings were taken at intervals of 100 to 600 feet. The reduced levels of the stations were measured with a staff and level, and tied to a bench-mark (BM 565) located on the Mt. Barker road opposite the Big Gum Tree.

The length of the traverse was approximately 5600 feet and 28 gravity stations were read along it. See plan No.(1) showing the layout of the traverse and the gravity stations.

Beaumont:

A gravity traverse was run across the vineyards at Penfold's Winery, up Government road and along Vista Road in the Skye area.

The length of the traverse is 5600 feet and 47 gravity stations were established. See plan (No. 2) for layout of the gravity traverse.

Rosalyn Park:

In the Rosalyn Park area, a traverse was completed from the Tower Hotel on Magill Road, up the Old Norton Summit Road to BM 144 (near turnoff to Horsnell's Gully Road).

The length of the traverse was approximately 8600 feet, and 23 gravity stations were located. See plan (No. 3) for layout of gravity traverse.

REDUCTION OF RESULTS

The gravity results in these three areas were reduced by applying corrections for drift, elevation and latitude.

The gravity anomaly pattern was computed as Bouguer Anomalies, obtained by subtracting the theoretical gravity values at the stations from the reduced values.

An elevation correction of 0.060 milligals per foot was accepted. This corresponds to a density of 2.67 grammes per cc.

The profiles of the Bouguer Anomalies for the three traverses are presented on plans (No. 4, 5 and 6) for these areas, namely Glen Osmond, Beaumont and Rosalyn Park.

INTERPRETATION OF RESULTS

Glen Osmond Area

The location of the Eden fault zone is marked on Plan (No. 1) and on the Gravity Profile Plan (No. 4). This anomaly is a pronounced one due to the low density Tertiary rocks of the Adelaide plains being faulted up against the Proterozoic rock formations of the Adelaide hills.

A total Bouguer Anomaly of approximately 5 milligals is observed along the whole length of the traverse.

Beaumont

The location of the Eden fault zone is marked as "EDEN [redacted]ide fault Zone" in Plan (No. 2) and on the Gravity Profile Plan (No. 5)

The anomaly due to the Eden fault zone is very definite here.

Rosalyn Park

The Eden fault zone is marked on Plan(No. 3) and the gravity profile plan (No. 6) as "Eden fault Zone".

This anomaly is pronounced and due to the lower density Tertiary rocks occurring up against the denser Adelaide system rocks.

RECOMMENDATIONS AND CONCLUSIONS

The Eden fault zone was accurately located in t[redacted] three areas - namely Glen Osmond, Beaumont and Rosalyn Park. The anomaly due to this fault zone is pronounced in these areas due to the large contrast in density across the fault.

A minor and indefinite anomaly occurs east of the fault zone along each of the three gravity traverses and is assumed to be due to another fault zone.

Further work appears desirable in the area between these three areas to map these fault zones as there appears to be some confusion on the 1 mile per inch geological map of the Adelaide area between these fault zones.

IAM:AGK
6/7/59

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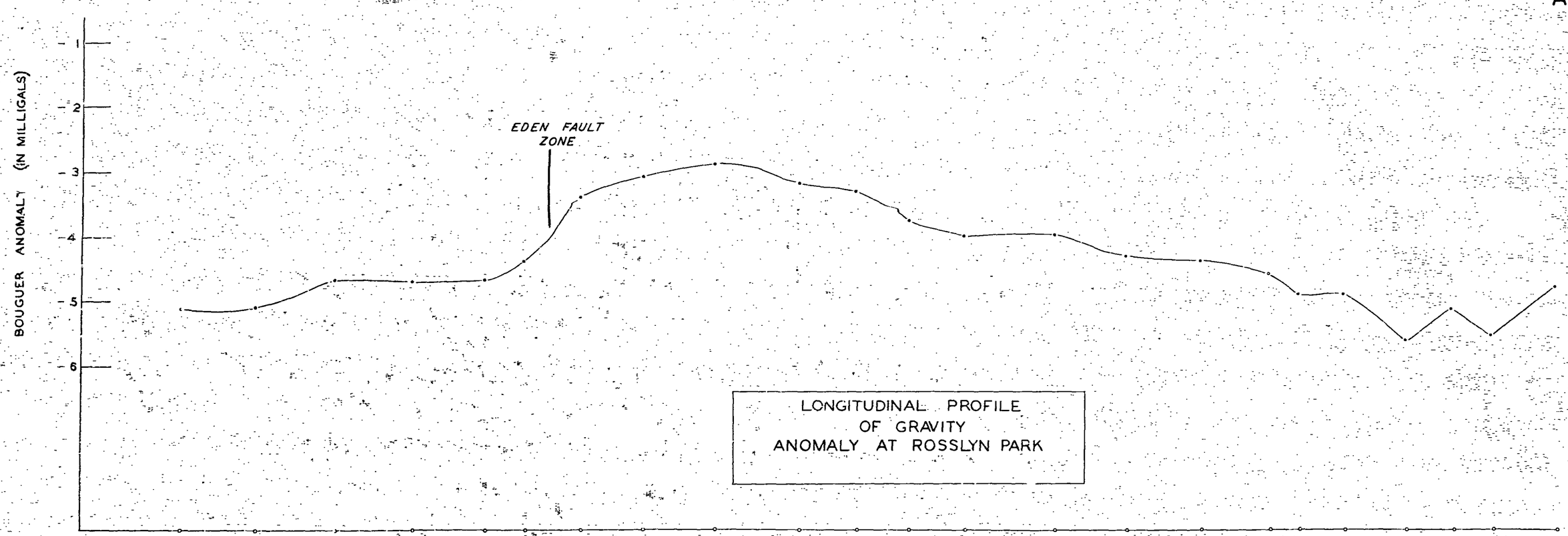
Geophysical Section.

REFERENCE

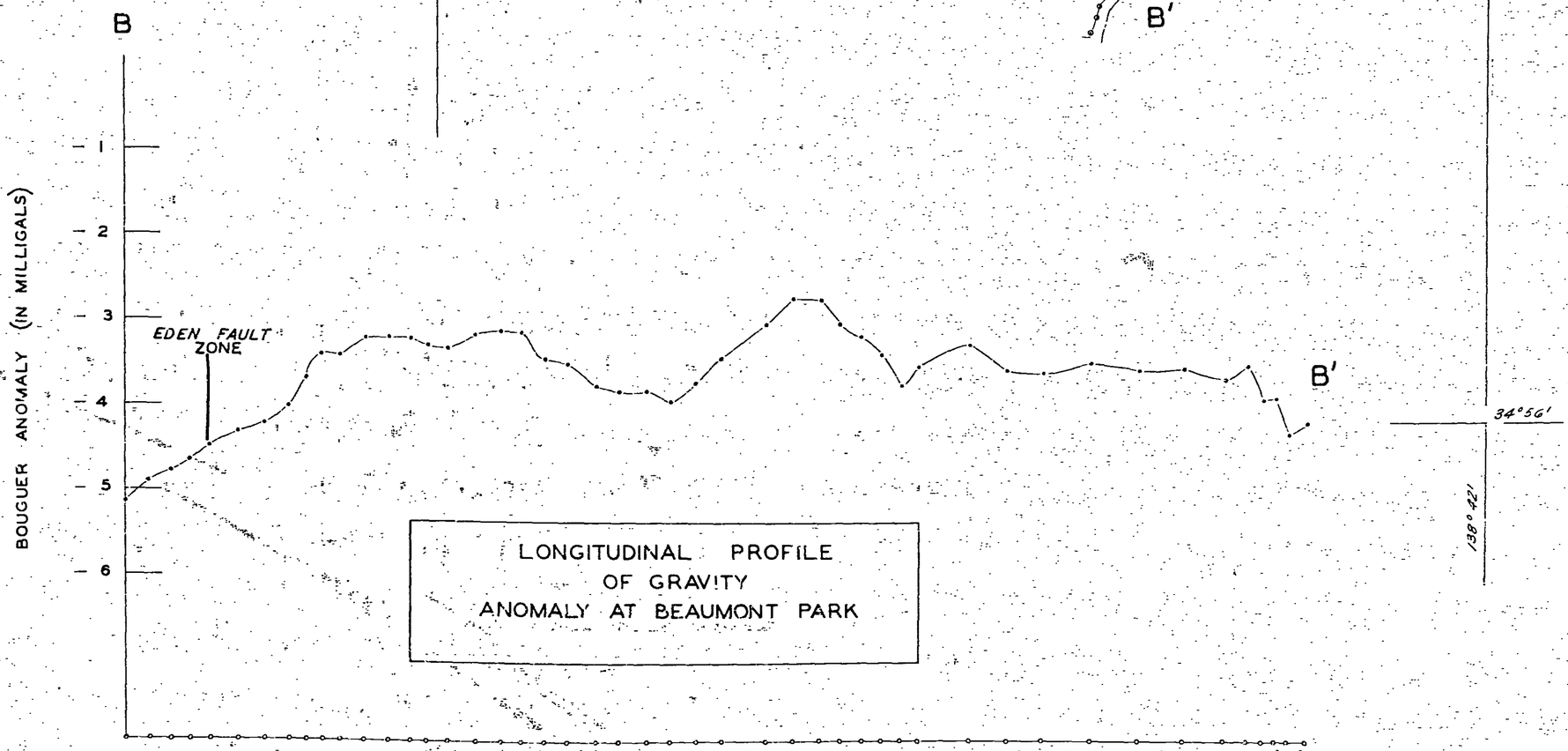
C. Kerr Grant.

Gravity Observations on the Adelaide plains.

Geology and Underground Water Resources of the Adelaide Plains Area by Dr. K.R. Miles Bulletin No. 27.



LONGITUDINAL PROFILE
OF GRAVITY
ANOMALY AT ROSSLYN PARK



LONGITUDINAL PROFILE
OF GRAVITY
ANOMALY AT BEAUMONT PARK

HORIZONTAL SCALE
PLAN & PROFILE

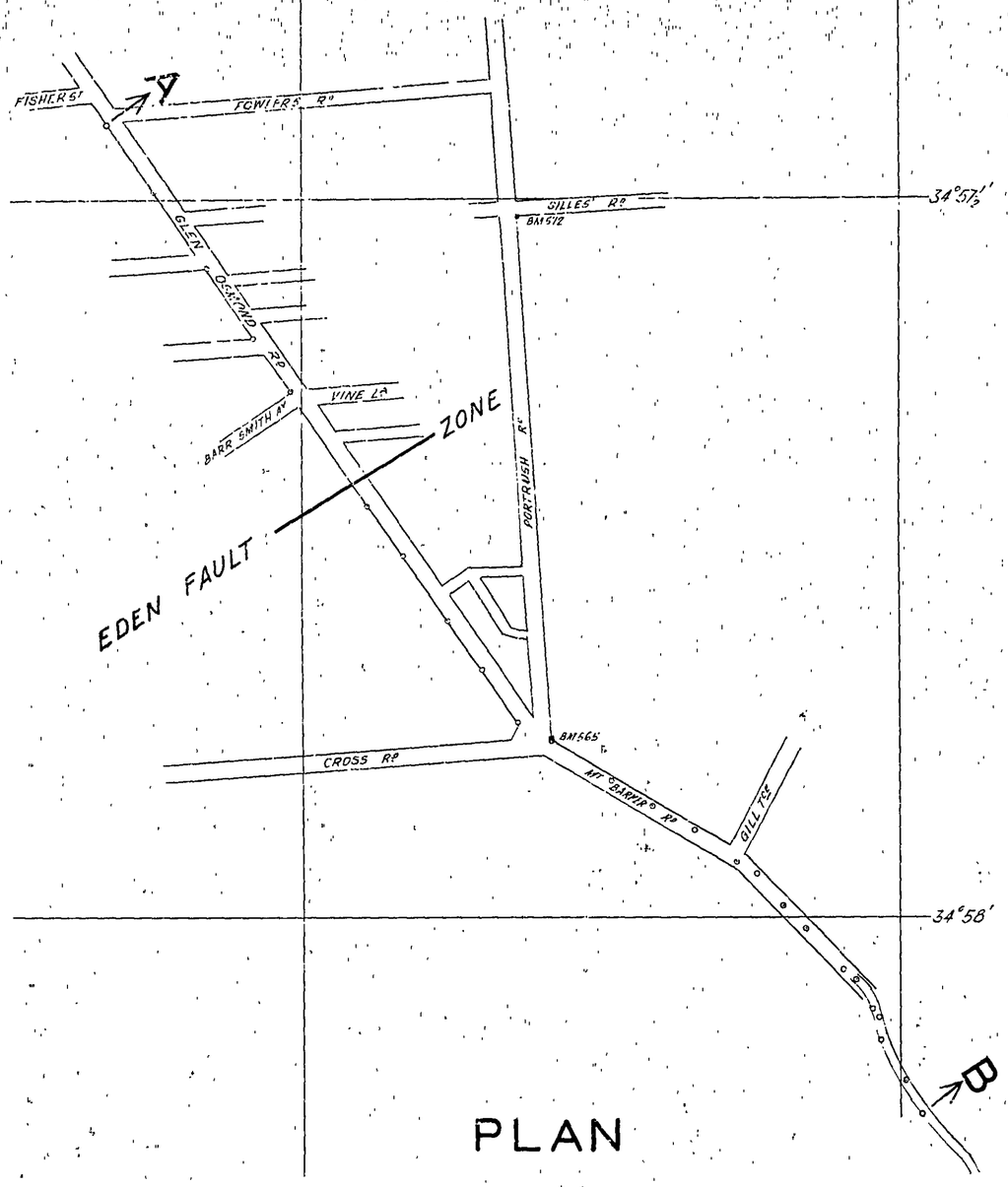
FEET 400 200 0 400 800 1200 1600 2000 FEET

Gravity Stations shown Thus ..... ⊙

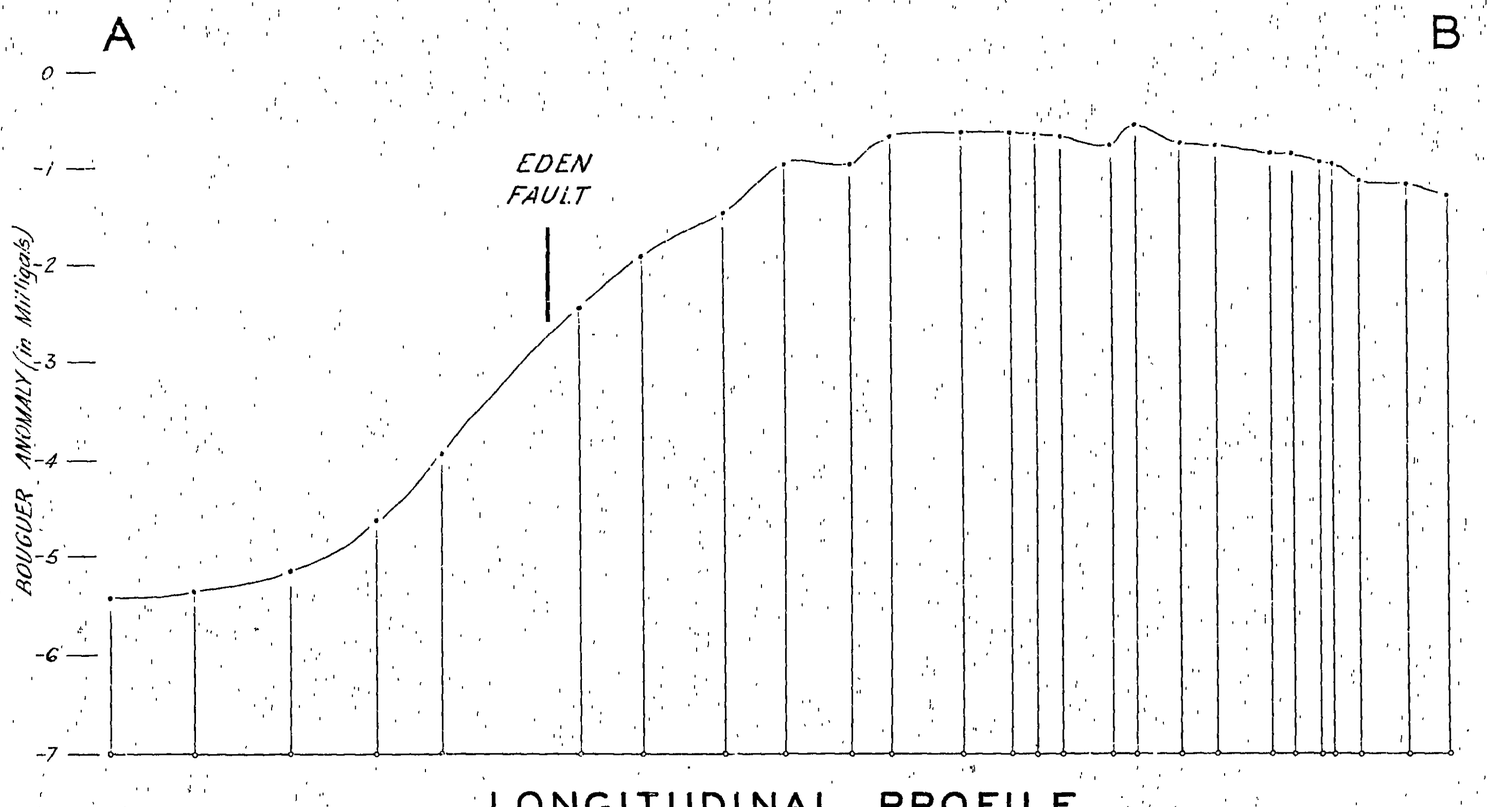
S.A. DEPARTMENT OF MINES
EDEN FAULT LOCATION
MAGILL EAST
GRAVITY SURVEY
PLAN & PROFILES

59-234
H06

Survey by M. Orian. To accompany report by I.A. Mumme. 13-7-59



PLAN



LONGITUDINAL PROFILE

HORIZONTAL SCALE
(PLAN & PROFILE)

FEET 400 200 0 400 800 1200 1600 2000 FEET

Gravity stations shown thus . . . .

To accompany report by I. A. Mumme. Survey by M Orian.

S.A. DEPT. OF MINES

EDEN FAULT LOCATION
GLEN OSMOND ROAD
GRAVITY SURVEY
PLAN & PROFILE

Associated Drawing	No.

No.	Amendment	Exd.	Date

Req. No.
D.M.
Compiled from

Approved	Passed
Director of Mines	

Drn.
Tcd. M.B.L.
Ckd. R.A.
Exd.

Scale: 400 ft. to 1 in.

59-226

Date 6-7-59 | No 6