

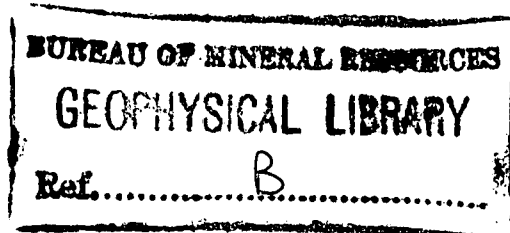
1964/16
B

COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

RECORD No. 1964/16



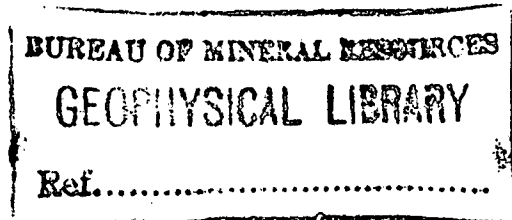
KIEWA HYDRO-ELECTRIC
POWER SCHEME
GRAVITY MEASUREMENTS,
VICTORIA 1956



by

W.J. LANGRON

The information contained in this report has been obtained by the Department of National Development as part of the policy of the Commonwealth Government to assist in the exploration and development of mineral resources. It may not be published in any form or used in a company prospectus or statement without the permission in writing of the Director, Bureau of Mineral Resources, Geology and Geophysics.



RECORD No. 1964/16

KIEWA HYDRO-ELECTRIC
POWER SCHEME
GRAVITY MEASUREMENTS,
VICTORIA 1956

by

W.J. LANGRON

The information contained in this report has been obtained by the Department of National Development as part of the policy of the Commonwealth Government to assist in the exploration and development of mineral resources. It may not be published in any form or used in a company prospectus or statement without the permission in writing of the Director, Bureau of Mineral Resources, Geology and Geophysics.

CONTENTS

	Page
SUMMARY	
1. INTRODUCTION	1
2. DISCUSSION OF RESULTS	1
3. REFERENCE	2

Appendix. Party and survey operational details

ILLUSTRATION

Plate 1. Locality and gravity-station plans (Drawing No. J55/B2-33)

SUMMARY

In 1956 gravity measurements were made at the West Kiewa power station in north-eastern Victoria.

In 1961 the State Electricity Commission requested a value of the acceleration due to gravity in the underground power station at McKay Creek. The estimated figure supplied to the Commission was based on the Bouguer-anomaly values of gravity stations located in the immediate alpine region.

1. INTRODUCTION

In March 1956, during the course of a regional gravity survey in north-eastern Victoria, gravity measurements were made by the Bureau of Mineral Resources, Geology and Geophysics at two sites at the No. 4 Power Station of the Kiewa hydro-electric scheme. This station has since been renamed West Kiewa Power Station. In February 1961, a request was received from the State Electricity Commission of Victoria (SEC) for an estimated value of the acceleration due to gravity in the Commission's underground power station at McKay Creek. These two topics are considered together in this Record.

The locations of both power stations and of the two gravity sites within the West Kiewa Power Station are shown on Plate 1.

2. DISCUSSION OF RESULTS

West Kiewa Power Station

The principal details relating to the gravity stations in this power station (latitude $36^{\circ}45.7'S$, longitude $147^{\circ}11.5'E$) are :

<u>Gravity station</u>	<u>Elevation</u> (ft A.S.L.)	<u>Obs. grav.</u> (mgal)	<u>Free-air anomaly</u> (mgal)	<u>Terr. corr.</u> (mgal)	<u>Bouguer anomaly</u> (mgal)
Control room	1596	979,749.8	+3.5(5)	14.8	-36.0(3)
Turbine floor	1130	979,758.8	-32.3(3)	27.7	-43.1(3)

The observed gravity values are referred to the National Gravity Base Melbourne ($g = 979,979.0$ mgal). They have been adjusted in accordance with the latest revision of the calibration factors for gravity meters (Dooley, 1962).

The Bouguer corrections have been calculated for a rock density of 2.67 g/cm^3 .

Terrain corrections have been calculated from a topographic map (of scale $1'' = 2000$ ft and with 100-ft contour intervals) recently supplied by the SEC. The calculations were carried out using a mechanical integrator designed and built by the Bureau of Mineral Resources.

McKay Creek Power Station

Gravity had not been measured at McKay Creek, but an estimated figure was based on the Bouguer-anomaly values of gravity stations located in the immediate alpine region, and in particular on the values of stations within the $148^{\circ}/149^{\circ}E$, $36^{\circ}/37^{\circ}S$ degree square.

<u>Gravity station</u>	<u>Lat.</u>	<u>Long</u>	<u>Elev.</u> (ft A.S.L.)	<u>Estimated actual grav.</u> (mgal)	<u>Free-air anomaly</u> (mgal)	<u>Terr. corr.</u> (mgal)	<u>Bouguer anomaly</u> (mgal)
Turbine	36°51'	147°14'	3520	979,633	+60	10	-50
Level							
(under-ground)							

In the above tabulation, a Bouguer anomaly of -50 mgal was adopted for the station. A terrain correction of 10 mgal was estimated using the contours on the Tallangatta sheet of the military 4-mile series. The actual gravity value shown was then obtained by working back using the known height and latitude of the station.

The value of 979.63 (± 0.05) gal was communicated to the SEC on 7th February 1961; this figure was considered to be within the accuracy of one part in 10,000 requested by the SEC.

Using the detailed topographical contour map supplied by the SEC at a later date, terrain corrections were recalculated for the above and neighbouring stations. This indicates that an adopted Bouguer anomaly of -40 mgal (with a terrain correction of 15 mgal) may be more appropriate. However, this revision does not make a significant difference to the figure given to the SEC.

3. REFERENCE

DOOLEY, J.C.	1962	Australian gravity network adjustment 1962. <u>Bur. Min. Resour. Aust. Rec.</u> 1962/141 (unpubl.)
--------------	------	--

APPENDIX

Party and survey operational details

Party personnel L.W. Williams

Geophysical equipment

1 Worden gravity meter (No. 260). Calibration factor =
0.11030 mgal/div. (revised figure = 0.11048 mgal/div.).

Period of survey

20th-21st March 1956

Gravity data files

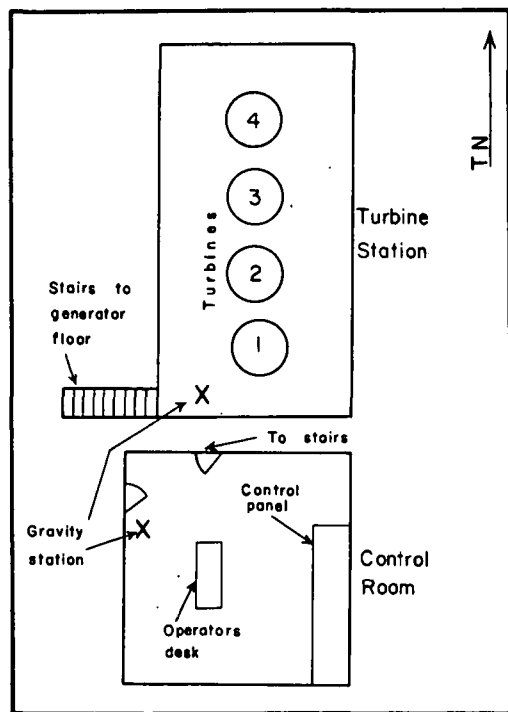
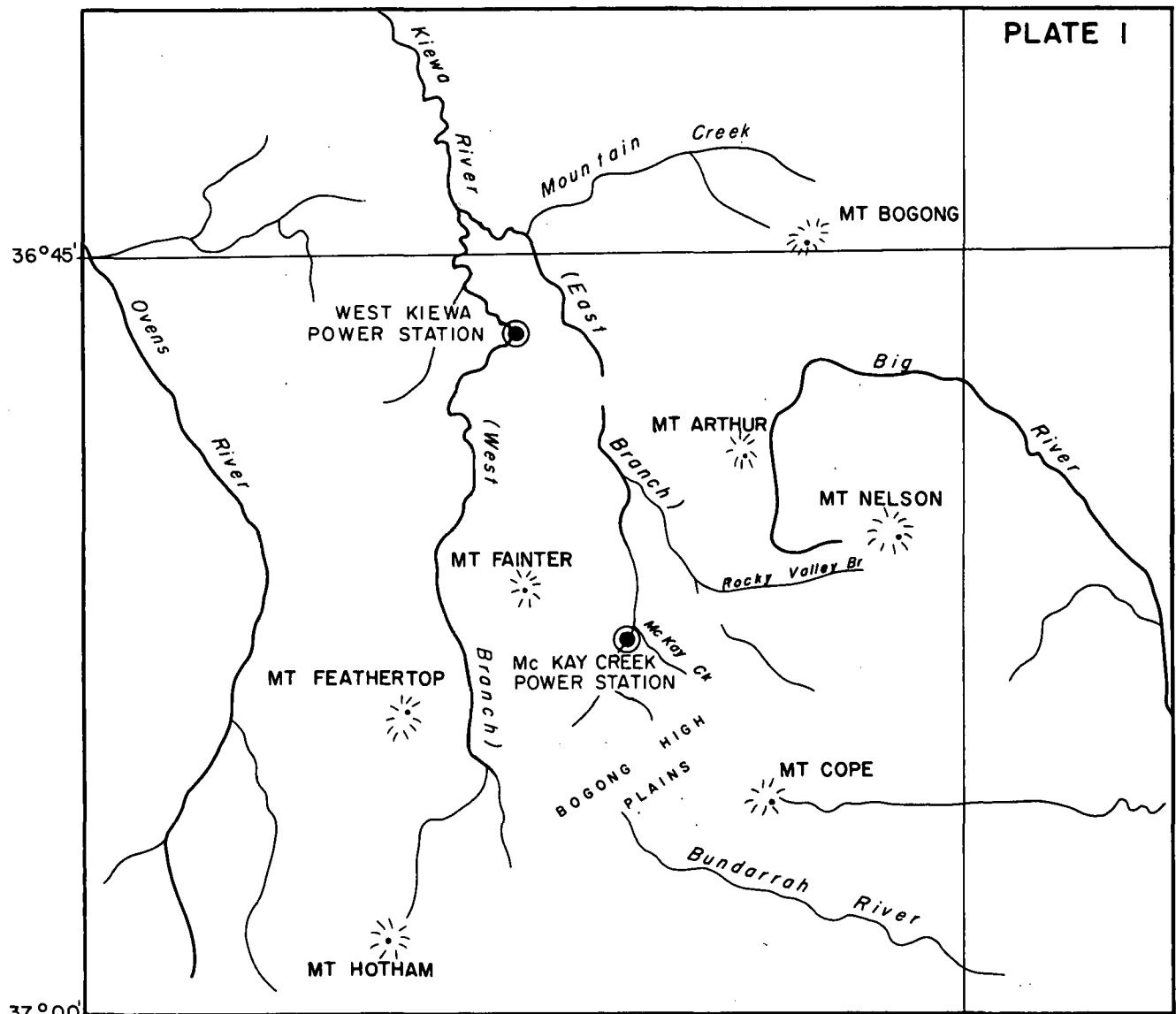
56-501 Field sheets and drift curves

56-502 Station description sheets

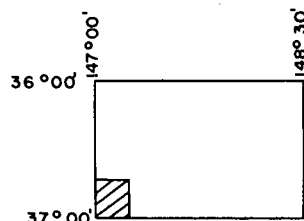
56-503 Calculation sheets

Project file

35V/1



WES KIEWA POWER STATION



Reference to Australia Standard Map
Series: Tallangatta

GRAVITY TIE TO KIEWA STATIONS VICTORIA

