

Q79 No 18.

269001

GEOLOGY OF AIRBORNE
GEOPHYSICAL ANOMALY
24/1
Hudson River

59-273

Anomalies 24/1N + 24/1S
LEE. 4/5/59.
(+ ATTACHED FIGURES)

MICROFILMED

369E

000

682

LYELL - E.Z. - EXPLORATIONS

079

369002

4th May, 1959

To: Mr. G.F. Hudspeth

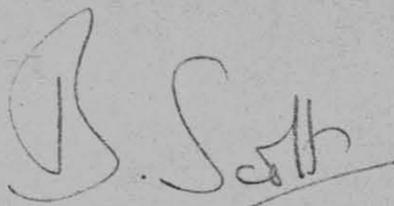
Anomaly 24/1N

The accompanying reports describe the geological and geophysical setting of airborne anomaly 24/1N. The anomaly occurs in the Precambrian approximately 500 feet to the east of the contact with the Elliott Granite.

The airborne response has been confirmed and it is considered to be due to the development of graphite along a major strike fault. Some pyrrhotite is assumed to occur within this fault on the basis of the weak magnetic high on line 22N. However, the lack of a response on the gravimeter coverage and soil sampling programme indicates that this mineralisation is insignificant.

Conclusion

No further work is warranted on this anomaly.



Chief Geologist, L.E.E.

AMG REFERENCE POINTS ADDED

001

LYELL - E.Z. - EXPLORATIONS

369003

4th May, 1959

To: Mr. G.F. Hudspeth.

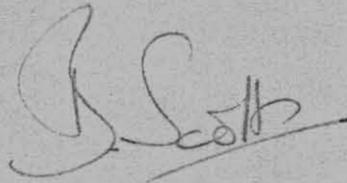
Anomaly 24/1S

The accompanying reports describe the geological and geophysical setting of airborne anomaly 24/1S.

On its plotted position the response would have been entirely within granite and some 300 feet west of the same Precambrian/granite contact as in anomaly 24/1N. However, the ground check did not relocate the response and, as is indicated in the geophysical section, there is some evidence for assuming that this anomaly is a misplaced section of the southern end of response 24/1N.

Conclusion

No further work is warranted on this anomaly.



Chief Geologist, L.E.E.

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369004

AMG
41346ME
5331463MN

AMG
408287ME
5300644MN

Cape Sorell

STRAHAN

GORMANSTON
QUEENSTOWN

MT JUKES

MT. SORELL
MT. DARWIN

FRENCHMAN
CAP

Macquarie Harbour

BIRCH
(OLD CAMP)

Pt. Hibbs

THIRKELL
HILL

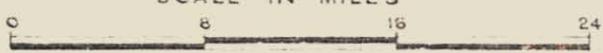
Low Rocky Pt.

ELLIOTT
HILL

L Pedder

SOUTH-WEST TASMANIA

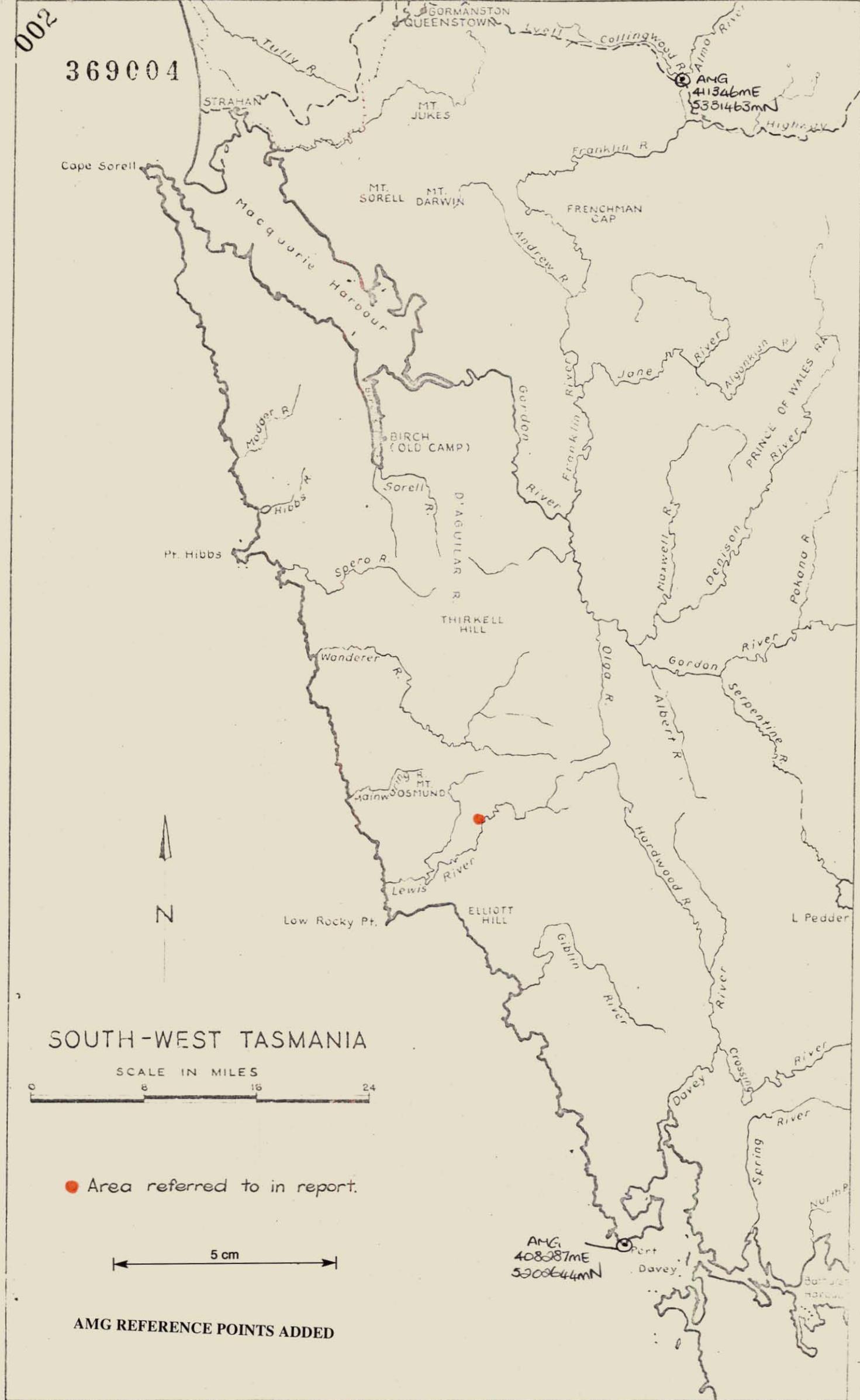
SCALE IN MILES



● Area referred to in report.



AMG REFERENCE POINTS ADDED



003

LYELL - E.Z. - EXPLORATIONS

369005

I. GEOLOGY OF AIRBORNE GEOPHYSICAL ANOMALY 24/1, HUDSON RIVER

1. Dates of Investigation: 4.2.59 to 24.2.59

2. Man Days in the Field: 60

<u>Personnel:</u>	Geologist:	I.M. Paltridge
	Students:	K. Fletcher
		R. Hewitt
	Bushmen:	D.H. Watson
		J. Mands

3. Introduction

This anomaly is situated about 5 miles east of Mount Osmund on the granite/Precambrian contact as shown on Plate 25R, and about 24 miles south of Birch. The trend of the A.E.M. axis is approximately north/south and parallel to the regional strike of the Precambrian schists. For investigation, the anomaly was divided into two sections 24/1N and 24/1S. Unfortunately, no geology was done on 24/1S as the grid location was changed and a return to the area was not possible. The anomaly is covered by air-photo 24/923/51.

4. GEOLOGY

(a) Precambrian rocks here consist of quartz-mica-schists and meta-quartzites and outcrop over most of the area (Plate P84).

Schistosity strikes about north and dips west at 50° to 70°. Bedding is approximately parallel to schistosity, but has a slightly different dip. Mapping on a scale of 10 chains to 1 inch showed that there is a swing in the regional strike which is parallel to the swing in the strike of the A.E.M. axis.

Carbonaceous beds in the original sequence have given rise to graphitic schists such as are found in a creek bed east of 24/1N and in a pit sunk on indications obtained with ground E.M. equipment. The latter exposure consisted of about 3 feet of graphitic schist with very minor (<0.1%) sulphide (LE1268)(see plate Q20/1).

(b) Granite was exposed in two prospect pits on the western part of 24/1N. LE1269 from 16E/10N is a porphyritic biotite granite with felspar up to $\frac{1}{4}$ ". However, weathering has proceeded to considerable depth and the rock is very friable.

Structure

No geological structures were mapped in the field, but photo-geological evidence suggests that there are two intersecting faults near 24/1N. This confirms the geophysical interpretation. //

Mineralisation

A little insignificant pyrite was found in the schists and associated with graphite.

Conclusions

The airborne electromagnetic anomaly is due to graphite and no further work is warranted.

J. Michael Partridge

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LYELL - E.Z. - EXPLORATIONS

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II. GEOCHEMICAL INVESTIGATION 24/1

Soil samples 1274 to 1309 were collected from 24/1N and 1310 to 1338 from 24/1S. These form lot 17.

No significant concentration of base metals was found.

J. Michael Partridge

369008

To: Mr. G.F. Hudspeth.

11th March,

9

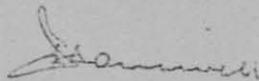
A.E.M. Anomaly 24/1N

The airborne anomaly 24/1 occurs in rocks of Precambrian age very near the contact of a Devonian granite. The anomalous expression is characterised by an apparent strike length in excess of 5000', and a peak low frequency response of 0.9 degrees of phase shift above background in a ratio of 0.82 with the high.

Ground investigations confirmed the presence of a steeply dipping (about 60 degrees west) conducting sheet under a thin cover, less than 20' to the south, but increasing to the north. A discontinuity in strike was implied between lines 14N and 18N.

Gravimetric coverage allowed the interpretation of a cross-structure compatible with a displacement of 400' E to the electrical horizon. A further N-S fault axis can be inferred, and is apparently similarly displaced. However, the only evidence of mineralisation in this setting is the 70 gamma magnetic high on line 22N. The character and order of this latter anomaly suggests the minor incidence of pyrrhotite throughout the dip extent of the conductor horizon.

Graphite has been recognised at the conductor intersection of line 20N. If it be assumed that the N-S structure is a strike fault, then the geophysical investigation presumes a graphitic horizon with insignificant mineralisation along planes of schistosity. Thus, no economic potential is implicit in this zone.



J.B. BONIWELL

3rd April,

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A.E.M. Anomaly 24/1S

Immediately south of the A.E.M. anomaly 24/1 grid, there occurs (apparently as a single independent event) a high order airborne response - line 536: 1.5 degrees low frequency phase shift in a ratio with the high of probably greater than 1.5.

A specific ground check of the plotted position failed to confirm a conductor real or strong enough to be detected in the air. The dip profiles do, however, indicate trends in dip consistent with a conductor off the grid to the east.

The major part of the grid might be presumed in Devonian granite, the contact, on the geophysical evidence, being at about 13E-14E on all lines. The gravimetric expressions to the west, forming a similar strike pattern, might be related to contact zoning within the granite. The magnetics are featureless.

Footnote:

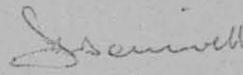
The A.E.M. anomaly 24/1 appears as an electrical linear extending at least from line 538 in the north to line 535 in the south. Yet, on flight line 536, it does not appear unless it be the anomalous expression under investigation; and the already strong evidence in favour of such a relation is overwhelmingly strengthened by the striking similarity of the air-expressions recorded on the adjacent lines 536 and 537, themselves only 550' apart at this point.

In this event, the chart fiducial of 24/1S must contain a lag

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equivalent to approximately 500' W on the ground, that is, as the aircraft flew from the east, the anomaly plot should be at least 300' E of its present position, allowing for the correction inherent to the plotting. The reason for this abnormal lag must be related to aircraft height above the ground, the only extenuating circumstances. The spot height recorded for the anomaly is 360' (displacing it east would make it even less) so that the "bird" was only 150' above ground level. Whilst it is possible to theorise a lag on electromagnetic field considerations, conclusive proof needs to be derived from flight testing a given conductor, e.g. a steel bridge, at various altitudes. As far as known, such tests have not been made with the Canso equipment in Australia.



J.B. BONIWELL.

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369011

24/923/51

24/1 N

Granite

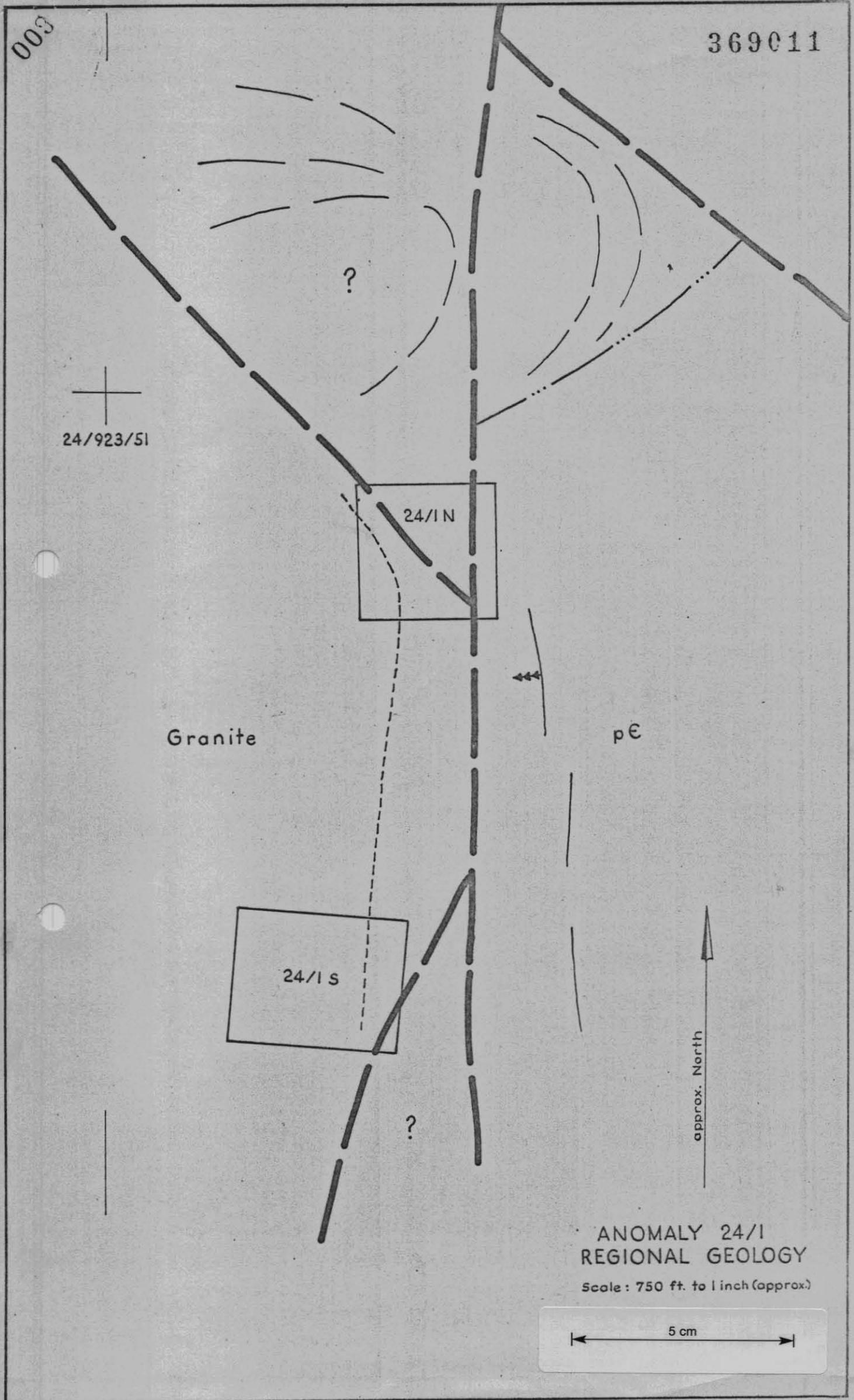
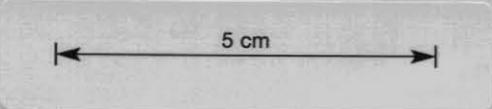
pE

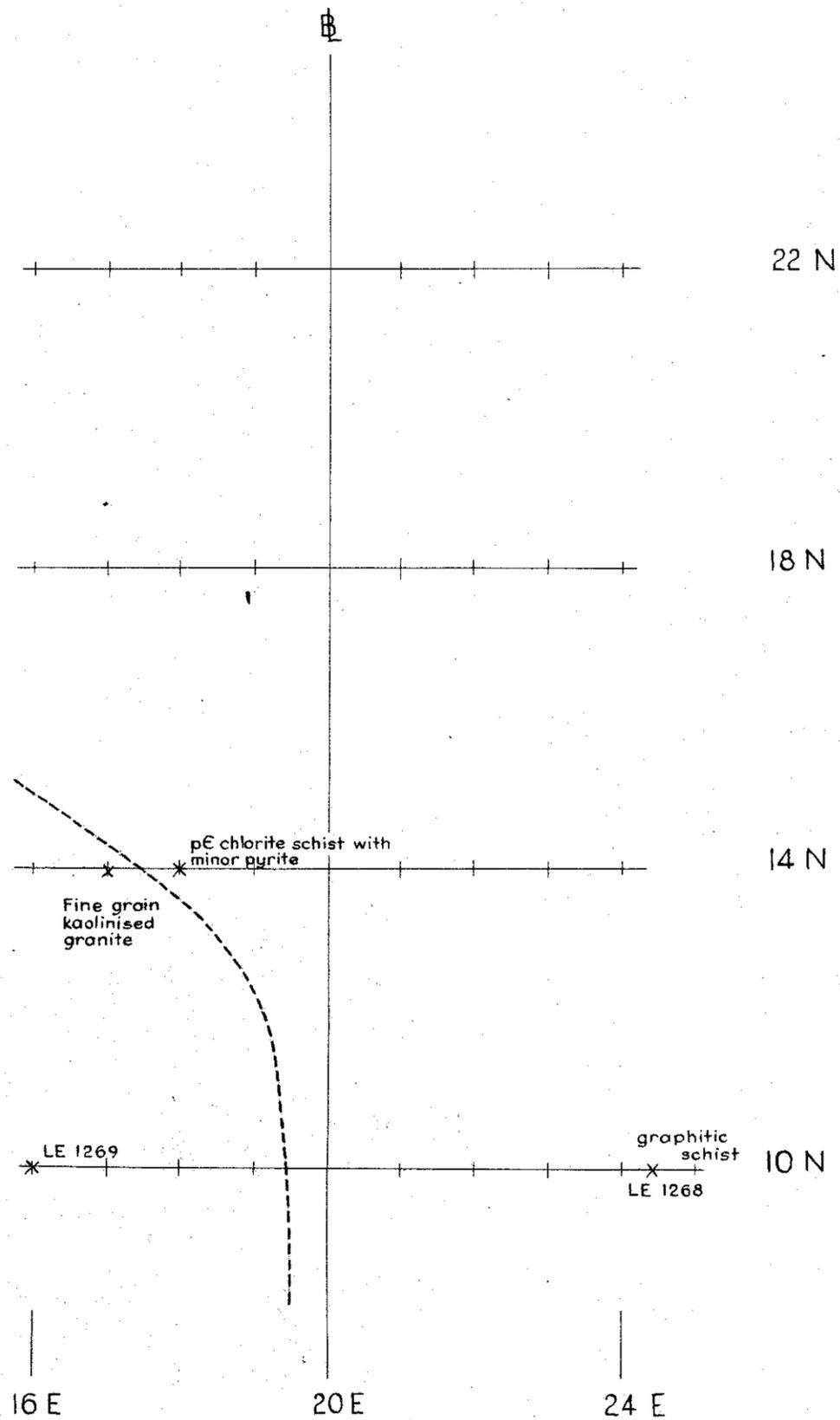
24/1 S

approx. North

ANOMALY 24/1 REGIONAL GEOLOGY

Scale: 750 ft. to 1 inch (approx.)

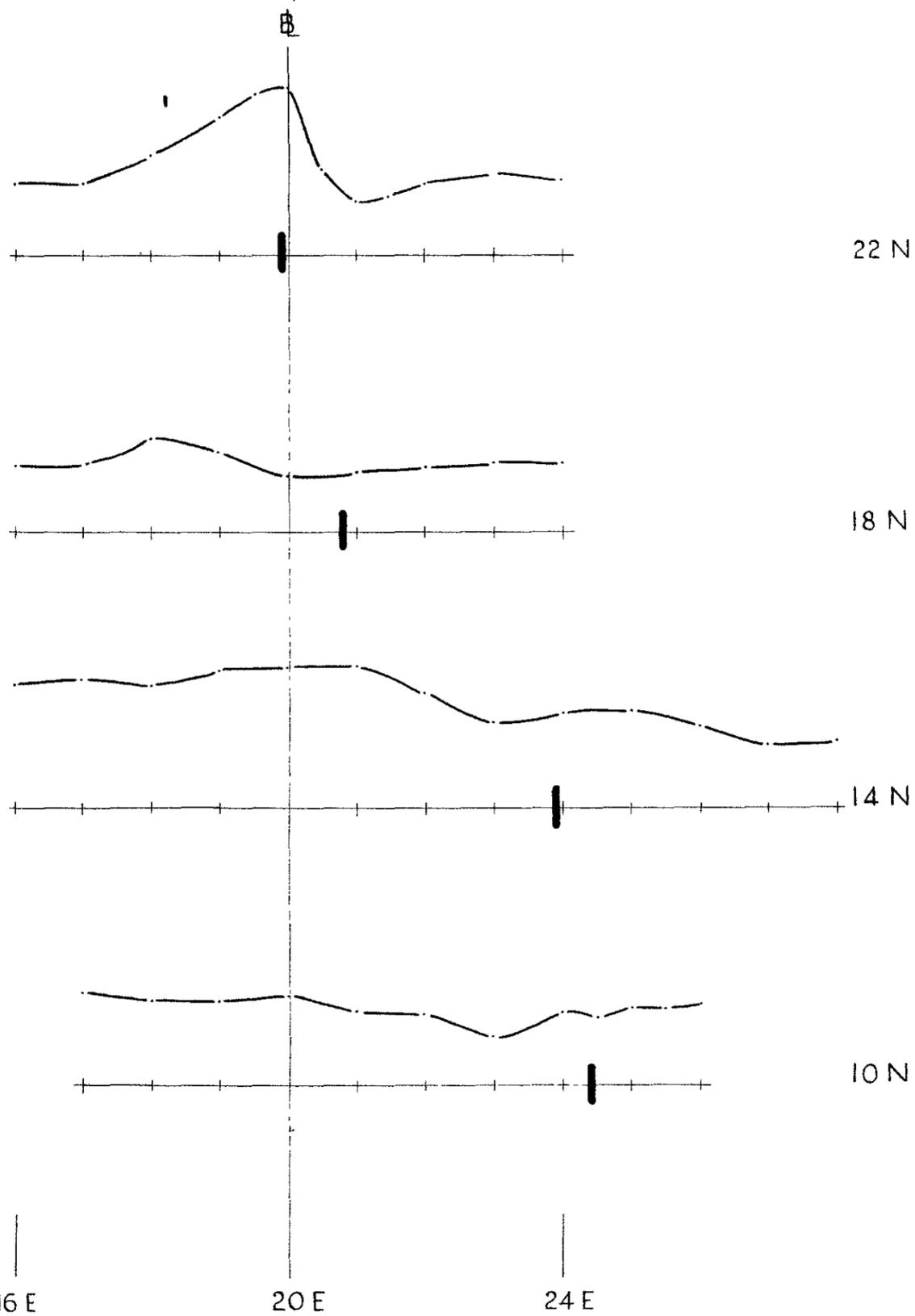




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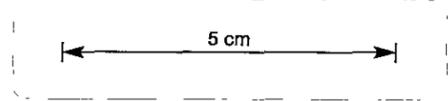
59-273

References	LYELL E 7 EXPLORATIONS				QUEENSTOWN	
	ANOMALY 24/1 N					
Survey	D.H.W.	Apr.'59	Scale 200 ft. to 1 inch	2175		
Geology	I.M.P.	Apr.'59				
Geophysics						
Geochemistry						
Drawn	I.M.P.	Apr.'59	Checked by: 	Sheet No.	1	
Traced	D.S.	Apr.'59				Date: 13.7.59
GEOLOGY						



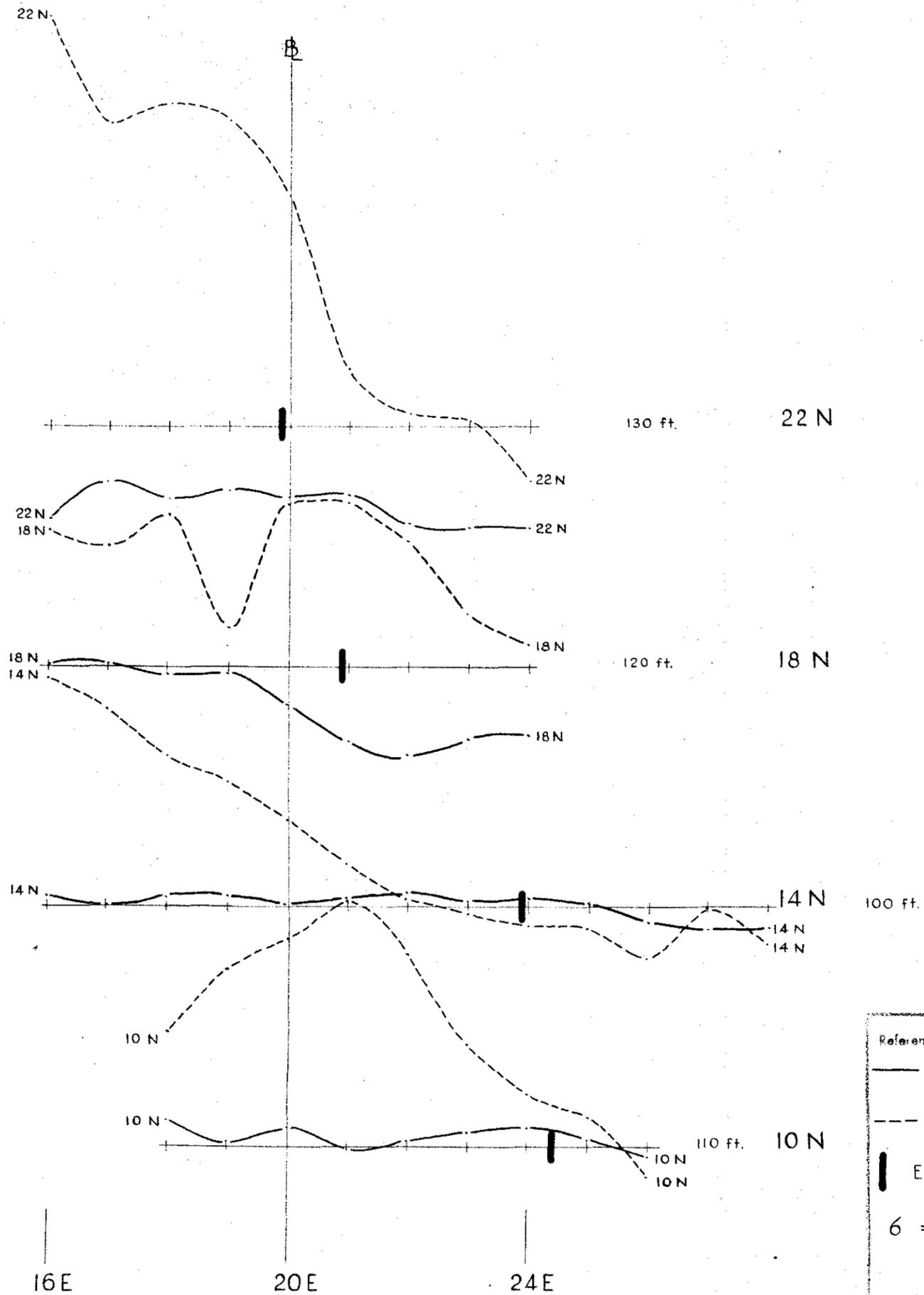
North (true)

369013

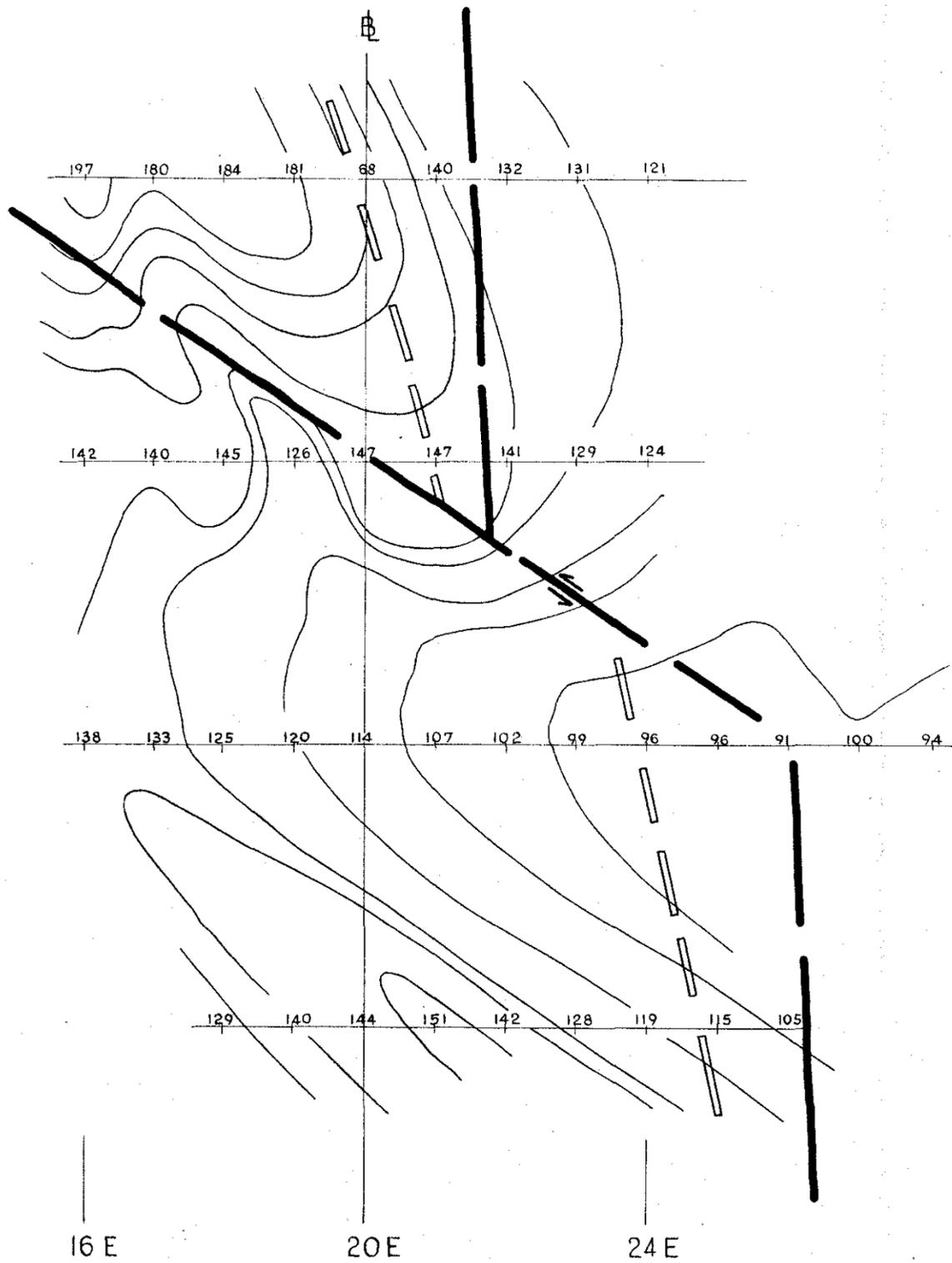


59-273

References		LYELL E.Z. EXPLORATIONS		QUEENSTOWN	
E.M. Cross-over Point		ANOMALY 24/1 N			
Survey		Scale	2176		
Geology		Hor	100 ft to 1 inch		
Geophysics	I.M. Sefton	Feb '59	Vert.	Q20	Sheet No. 3
Geochronology					
Method	I.M.S.	Mar. '59	100 ft to 1 inch	Date 13 7 '59	
	D.S.	Mar '59			
MAGNETIC					



References		LYELL E.Z. EXPLORATIONS		QUEENSTOWN	
— Bouguer Gravity		ANOMALY 24/1 N			
- - - Topography					
E.M. Cross-over Point		2177		Sheet	4
6 = 2.67 gms./cc.		Scale		No.	
Survey		Hor.	200' to 1"	Q20	
Geology		Vert.	20' to 1"		
Geophysics	I. Sefton	Mar. 59	Δg	1" = 1.0 mgal	
Geochemistry					
Drawn	I.M.S.	Mar. 59	Checked by: <i>[Signature]</i>		
Traced	D.S.	Mar. 59	Date: 13 7 59		
BOUGUER GRAVITY					



22 N

18 N

14 N

10 N

16 E

20 E

24 E

North (true)

369015

5 cm

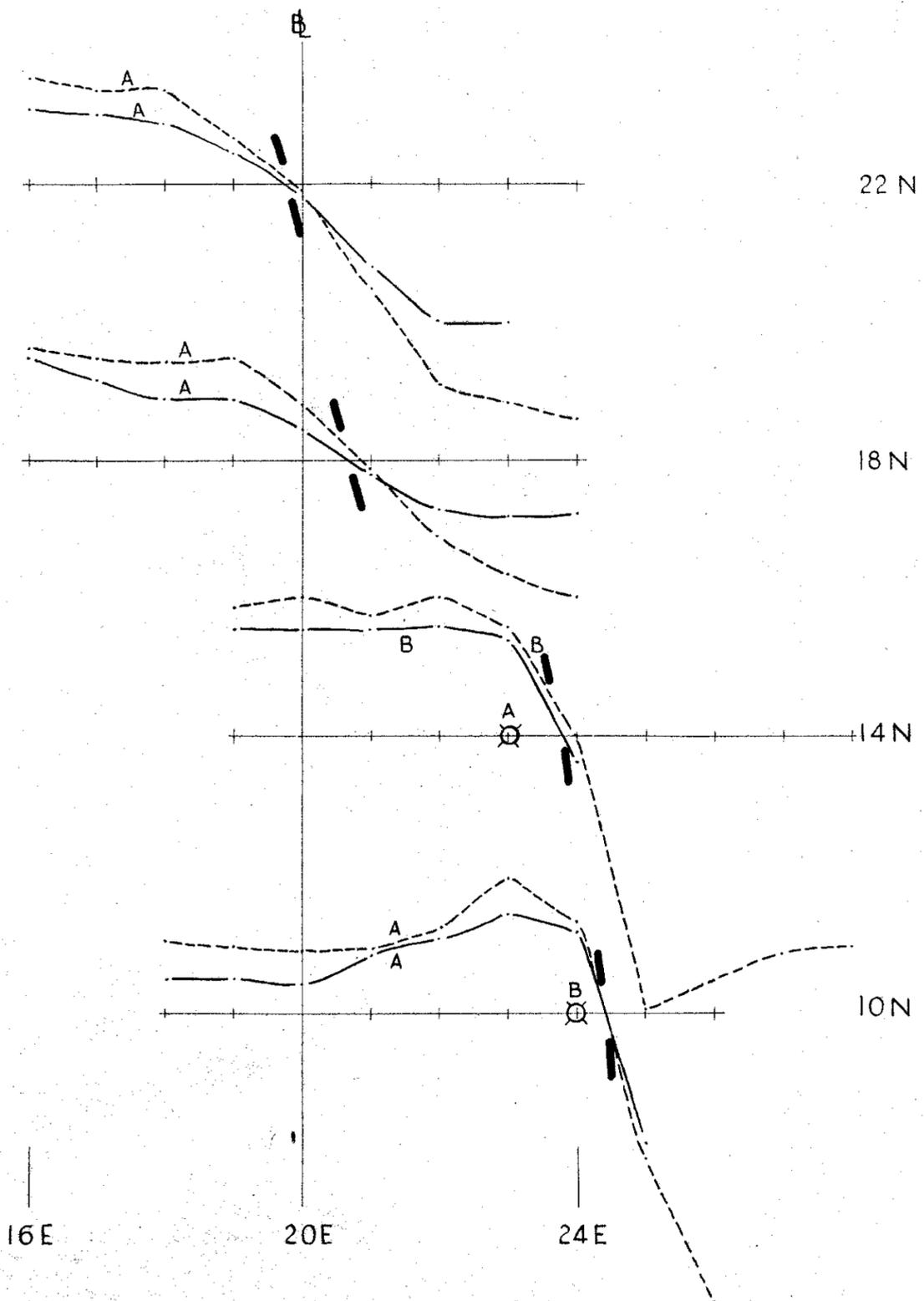
59-273

References Topographic contours C.I. 10 ft. — Faults — E.M. Axes GRAVITY	LYELL E.Z. EXPLORATIONS QUEENSTOWN			
	ANOMALY 24/1 N			
	STRUCTURAL INTERPRETATION			
	Survey	J.M. Paltridge	Feb. '59	Scale 200 ft to 1 inch
	Geology	J.M. Paltridge	Feb. '59	
	Geophysics	J.B. Boniwell	Feb. '59	Sheet No. 40
Geochemistry				
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Traced	D.S.	Mar. 59		

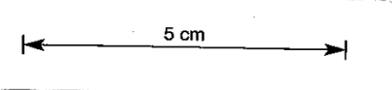
2178

Q20

Sheet
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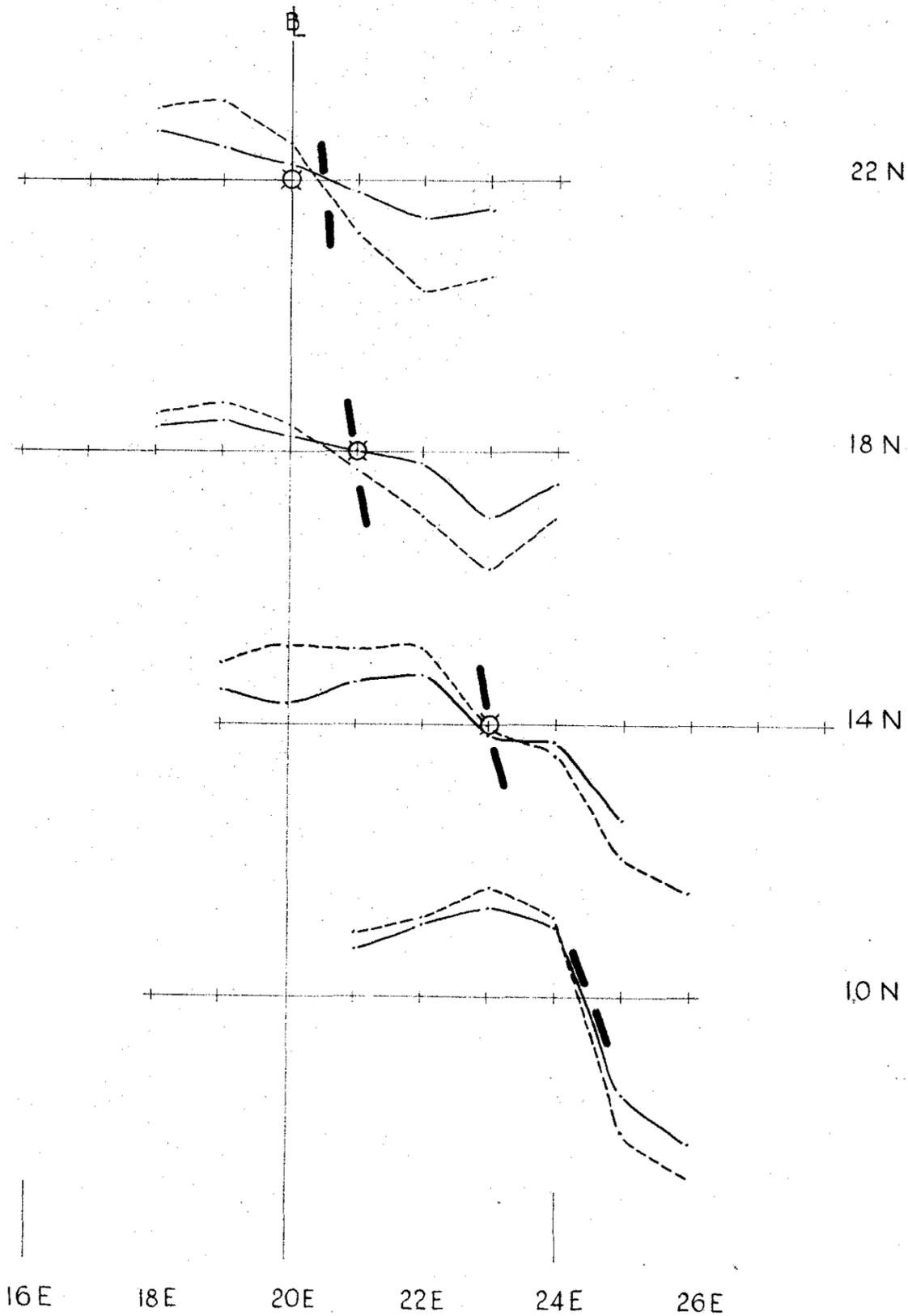


369016



59-273

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- - -	5000 cps				
VERTICAL COIL		Survey		Scale	2179
		Geology		Hor. 200 ft. to 1 inch Vert. 20° to 1 inch	Sheet Q 20 No. 10
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		Geochemistry			
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		Traced	D.S.	Mar. '59	



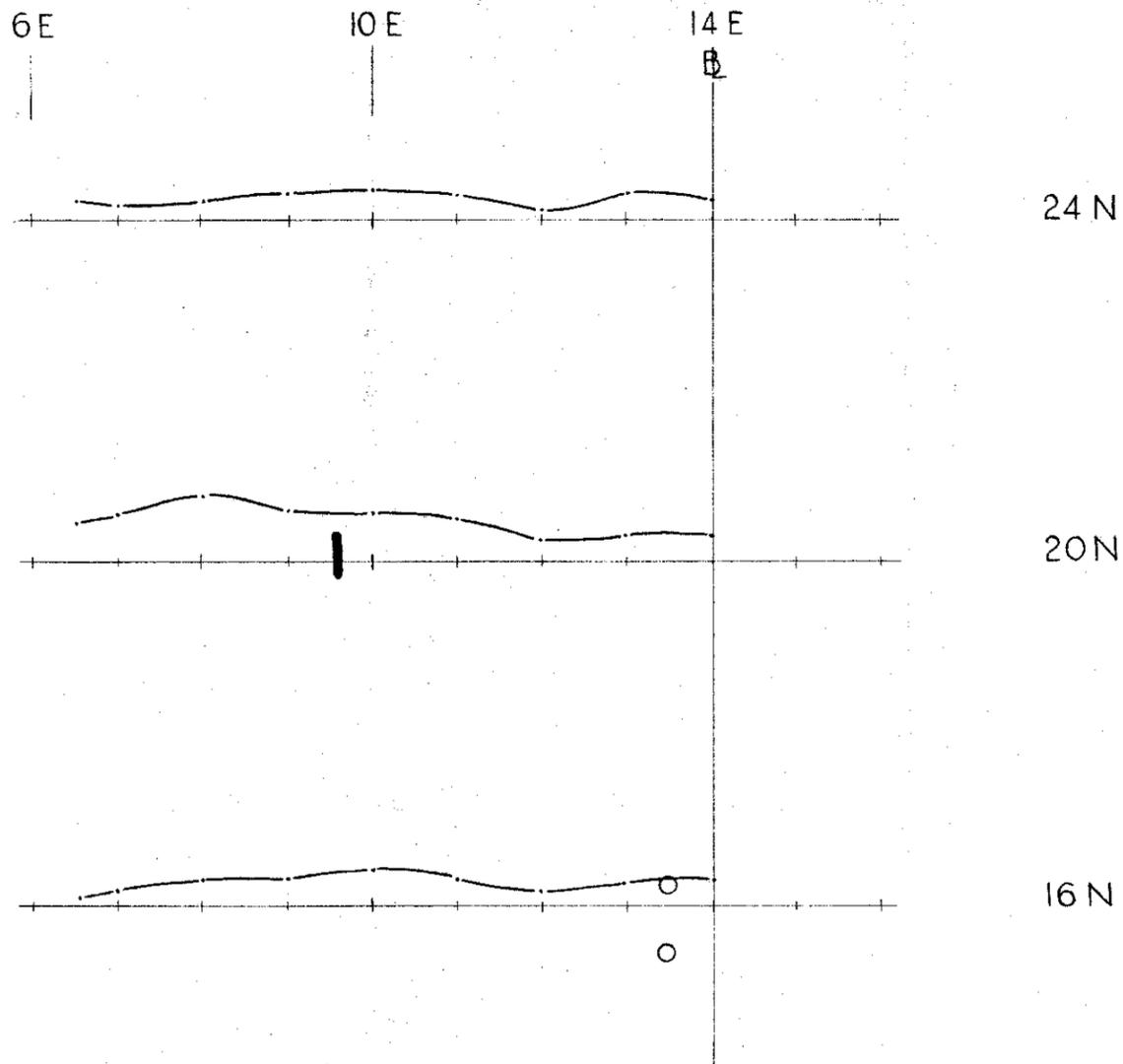
North (true)

369017

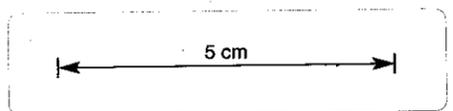
5 cm

59-273

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Geochemistry		Vert. 20° to 1 inch	Checked By: <i>[Signature]</i>	Date: 13.7.59	
Drawn	I.M. Paltridge Feb. '59				
Traced	D.S. Mar. '59				
R.E.M.					

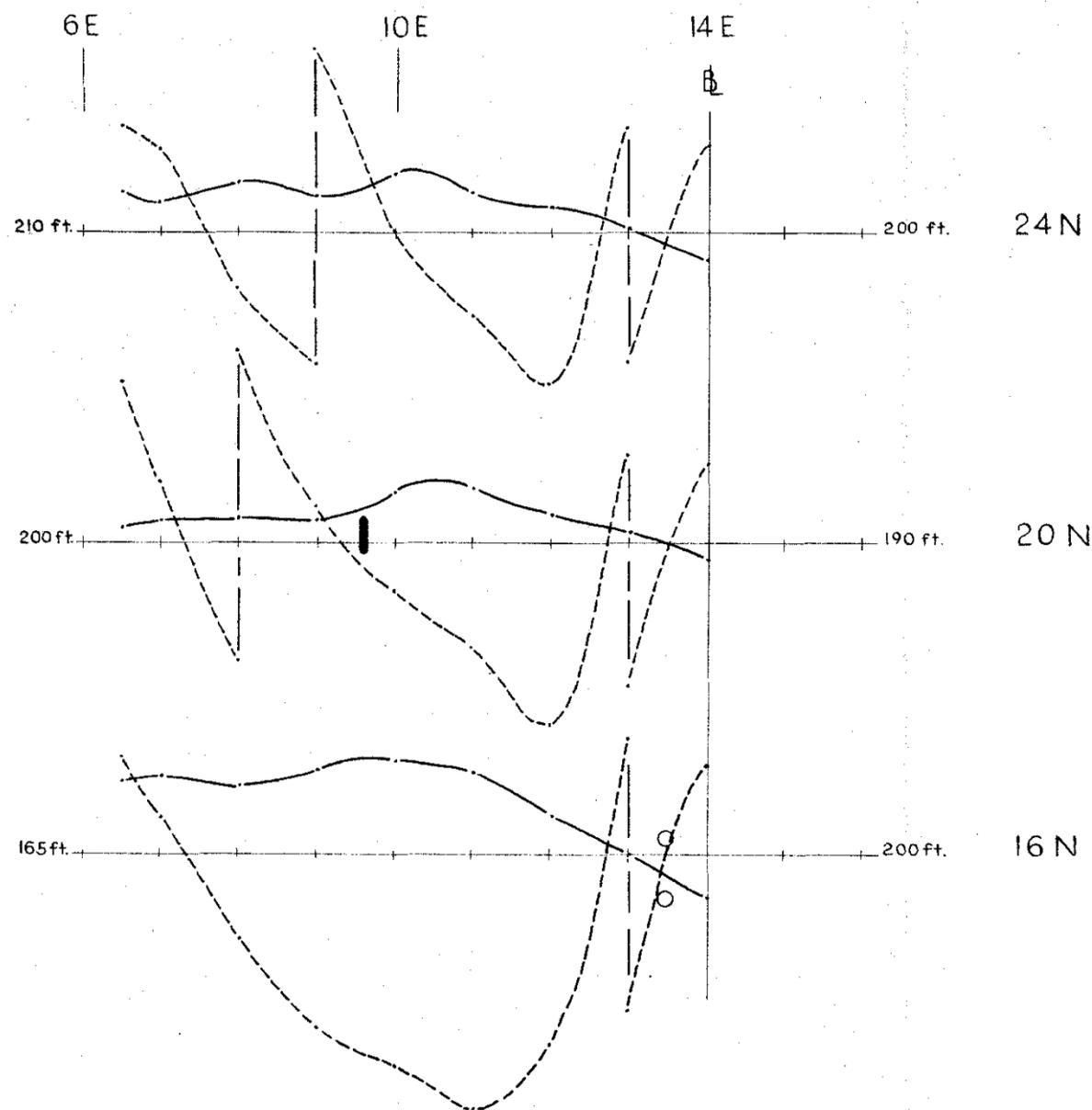


369018

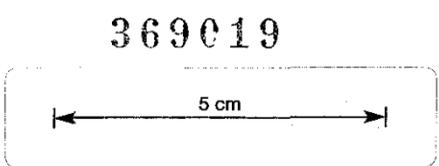


59-273

References	LYELL E.Z. EXPLORATIONS			
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	Geochemistry			Vert. 100 y to 1 inch
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	Traced	J.R.G.	Apr. 59	
MAGNETIC			2191	Sheet No. 3
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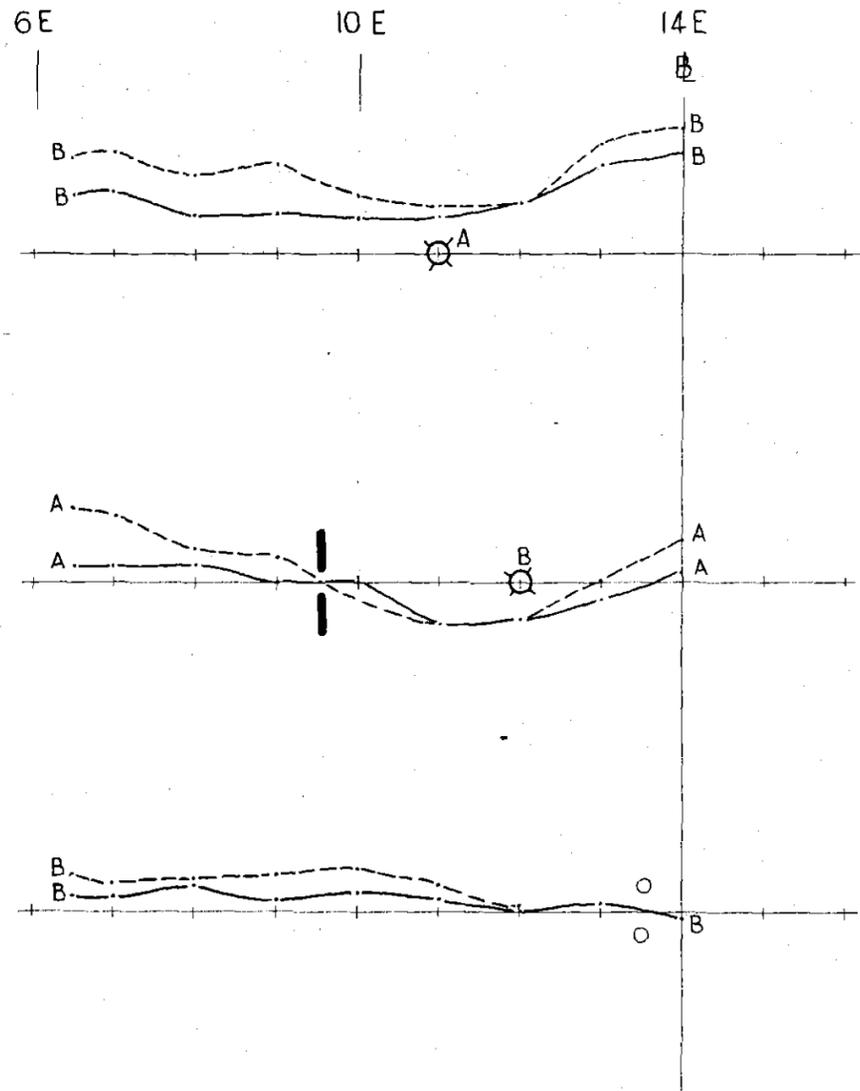


North (true)



59-273

References — Bouguer Gravity - - - Topography E.M. Axis δ = 2.67 gms/cc. Grid not related to 24/1 N	LYELL E.Z. EXPLORATIONS QUEENSTOWN			
	ANOMALY 24/1 S 2182			
Survey			Scale	
Geology			Hor.	
Geophysics	I.M.S.	Apr. '59	200' to 1"	Q26 Sheet No. 4
Geochemistry			Vert.	
Drawn	I.M.S.	Apr. '59	20' to 1"	
Traced	J.R.G.	Apr. '59	Δg 1" = 1.0 mgal	Checked by: <i>J.P.</i> Date: 13.7.59
BOUGUER GRAVITY				



24 N

20 N

16 N



369020

5 cm

59-273

References		LYELL E.Z. EXPLORATIONS QUEENSTOWN			
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- - - 5000 cps		Survey		Scale	
Grid not related to 24/1 N		Geology		2183	
		Geophysics		Hor.	
		Geochemistry		200 ft. to 1 inch	
		Drawn		Vert.	
		Traced		20° to 1 inch	
VERTICAL COIL		T.N.B.		Apr. '59	
		I.M.P.		Apr. 59	
		J.R.G.		Apr. 59	
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		Date: 13.7.69			