LYELL E.Z. EXPLORATIONS
Queenstown

INDUCED POLARIZATION SURVEY

NORTHERN MOORE'S VALLEY

& D'AGUILAR RANGE

1959 - 1960

327002

23rd May, x60

To: Mr. G.F. Hudspeth

Induced Polarisation Survey - Northern Moore's Valley and D'Aguilar Range 1959-1960

Attached is a report by McPhar Geophysics Ltd. describing the results of the induced polarisation survey north of line 44N in Moore's Valley and the two lines which were completed near the D'Aguilar Range. The area south of line 44N in the former locality and covering anomalies A, B and C has already been described in GP 30.

As this report indicates, although a considerable amount of structural information can be inferred from the resistivity values, little of economic interest has been discovered. Three weak I.P. anomalies have been located, two in Moore's Valley and one at the D'Aguilar Range. The anomaly on line 76N Extended is associated with the northerly continuation of the two fault zones which appear to have localised anomalies A and B: the anomaly on line 156N is placed near the northern boundary fault but nothing further is known of its structural position. The D'Aguilar Range anomaly is at the ~~eastern~~ western edge of a resistivity low which is associated with the Great Lyell Fault in this area; this particular section of the Fault was examined with I.P. as a result of the AFMAG anomaly located here during February (GP31).

The structural information is summarised on sheet R10a which shows the continuation of a fault beneath the Cainozoic cover from south to north across Moore's Valley. This fault apparently displaces the two shear zones associated with anomalies A and B and is itself displaced by a major fault which continues to the west to reach the Coast near the mouth of the Wanderer River. The two boundary faults have been defined at the north and south edges of the Valley and their position is marked on this plan. The northerly continuation of the shear zones associated with the I.P. anomalies at the south end of the Valley can be traced to line 76N Extended and possibly to line 148N Extended.

The McPhar Geophysics ~~Pty.~~ Ltd. recommend further work on the D'Aguilar Range area and line 156N but not line 76N Extended.

B. Scott.

Chief Geologist, L.E.E.

327003

GP32

2nd May, 1960.

McPHAR GEOPHYSICS LIMITED

REPORT ON THE INDUCED POLARIZATION AND RESISTIVITY SURVEY IN NORTHERN MOORE'S VALLEY AND D'AGUILAR RANGE

FOR

LYELL - E.Z. EXPLORATIONS

1959 - 1960.

1. INTRODUCTION

A study of the induced polarization and resistivity results in the southern part of Moore's Valley shows that a considerable amount of geologic structure can be implied from the resistivity results. Therefore, a reconnaissance program was undertaken north of the grid on which the anomaly was found, to detect the possible presence of other induced polarization anomalies, and to see if any structural information could be gained from the resistivity results in that area.

2. PRESENTATION OF RESULTS

The results of the induced polarization and resistivity survey in Northern Moore's Valley are shown on the following maps included in this report.

BASELINE	400' SPREADS	Drwg.	Q52/13
LINE 44N	400' SPREADS	Drwg.	Q52/13a
LINE 76N	100' SPREADS	Drwg.	Q52/13b
LINE 76N	400' SPREADS	Drwg.	Q52/13c
LINE 108N	400' SPREADS	Drwg.	Q52/13d
LINE 128N	400' SPREADS	Drwg.	Q52/13e
LINE 148N Extended	400' SPREADS	Drwg.	Q52/13f
LINE 156N	400' SPREADS	Drwg.	Q52/13g
LINE 19E	400' SPREADS	Drwg.	Q52/13h
LINE 40E	400' SPREADS	Drwg.	Q52/13i
LINE 0+00	D'AGUILAR RANGE	Drwg.	Q54/13a
LINE 8+00N	D'AGUILAR RANGE	Drwg.	Q54/13b

3. DISCUSSION OF RESULTS

BASELINE

Last year's work on the baseline was extended to 180N in this year's survey. The apparent resistivities measured along the baseline are very uniform, and show no pattern. All of the values measured are between 60 and 160. The induced polarization results are also very uniform, and there is no pattern that could be called anomalous.

LINE 44N

The results on the eastern portion of Line 44N are similar to those on the baseline, except that the surface resistivities are somewhat higher. The only variations in the resistivity data occur at two places where definite lows can be seen. These resistivity lows are not of large magnitude, and there is little or no induced polarization contrast associated with them.

LINE 76N

The induced polarization and resistivity results along this line are very uniform, and the only changes are the slightly low resistivity values associated with stations 28E to 32E. There is no IP anomaly associated with this resistivity low, and it is of interest mostly because it seems to correlate with the similar feature on Line 44N.

There is a change in resistivity level west of station 62W. The near-surface values and the values at depth decrease by a factor of two or three.

LINE 108N

The induced polarization and resistivity values measured along this line are very uniform, and similar to those on the other lines. The resistivity values do not show any increase or decrease, which indicates that the sediments are either very thin or very thick. A third possibility would be that there is little or no resistivity contrast between the sediments and the underlying bedrock.

LINE 128N

The results along this line are similar to those measured farther south.

LINE 148 (Extended)

The resistivity values along this line are very different from the others. The area surveyed is two miles west of the baseline, and the only other information in the area is from Line 76N (Extended). On that line, low resistivity values (less than 30) were also measured at depth. However, there we did not measure the very high resistivities at the surface.

Since there is no large induced polarization effect associated with the low resistivities at depth, they must be due to electrolytic conductivity. The most obvious explanation of the resistivity pattern would be a relatively thick section of sediments with increasing water and/or salt content with depth. Additional measurements would be necessary to completely explain the geologic picture.

LINE 156N

The results on this line are similar to those east of the baseline farther south. However, there is a deep, weak anomaly centered at 58E that is of some interest. More work with longer spreads and wider frequency range is required. If the anomaly can be shown to be of further interest, additional lines should be surveyed.

LINE 19E and LINE 40E

These north-south lines were surveyed at the extreme northern end of Moore's Valley. The resistivity patterns are a little more variable, but the magnitudes are no greater than elsewhere.

D'AGUILAR RANGE LINE 0+00 and LINE 8+00N

These lines are surveyed north of Moore's Valley in the vicinity of a conductor indicated by the reconnaissance AFMAG survey. On both lines, there is a resistivity low at about 16W to 20W. One Line 8+00N, there is a definite induced polarization anomaly associated with this low. The anomaly is not of large magnitude, and its location is somewhat uncertain; however, it is important enough to be investigated further.

4. CONCLUSIONS AND RECOMMENDATIONS

A large area in Moore's Valley has been covered in this induced polarization and resistivity survey. No anomalies comparable to those previously located along the southern edge of the valley were found. The electrical properties of the rocks underlying the valley are uniform over wide areas.

In most of the area covered, there is no apparent change with resistivity with depth, which would help to indicate the depth of the sediments. On the extreme western end of Line 148N, the resistivity decreases dramatically with depth.

Two small induced polarization surveys located in this survey are worthy of further interest. One is at 52E to 64E on Line 156N.

The other is associated with the AFMAG conductor at 16W on the two lines surveyed north of Moore's Valley near the D'Aguilar Range. Both of these anomalies should be considered for further investigation.

McPhar Geophysics Limited

Philip G. Hallof,
Geophysicist.

Photomosaic Ic

THIRKELL EXPLORATIONS
QUEENSTOWN

MOORES VALLEY
GENERAL GEOLOGY

Survey			Scale
Geology	B.S., R.G.E., P.R.	1957/1960	2200 ft to 1 inch
Geophysics	Mc Phar	1959/1960	
Geochemistry			
Drawn	P.R., B.S.	March 1960	
Traced	R.E., D.S.	March 1960	

R 10 — Sheet No. a

5 cm

AMG REFERENCE POINTS ADDED

SCALE
0 FT 2200 FT 4400 FT 6600 FT 8800 FT

approx North

LEGEND

Bedding
Boundary
I.P Lines completed
I.P. Anomaly
Fault
Anticline
Syncline
Afmag Crossover
Resistivity Trend / Probable Fault

8 N
00

Jeep Road

Cainozoic

Position partly by aeromagnetic survey

Position by aeromagnetic survey

148 N Ext

Colin Rvt

Conder River

Moores Fault

Baseline

Innes Fault

Jones Fault

Moores Fault

Conder Fault

76 N Ext
22W

Cainozoic

Dundas Group

Owen Conglomerate

Cainozoic

Owen Conglomerate

Dundas Group

Cainozoic

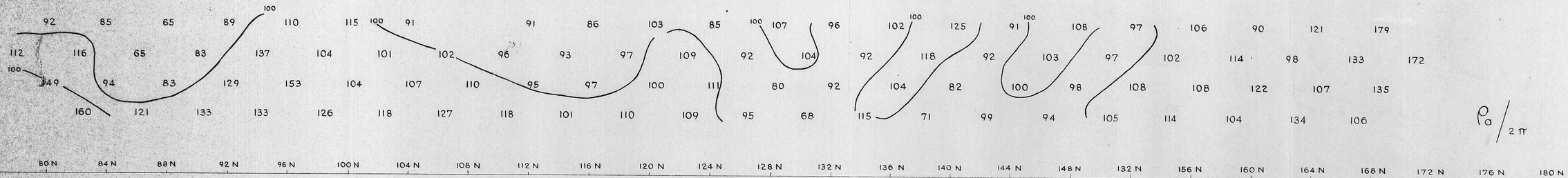
Dundas Group

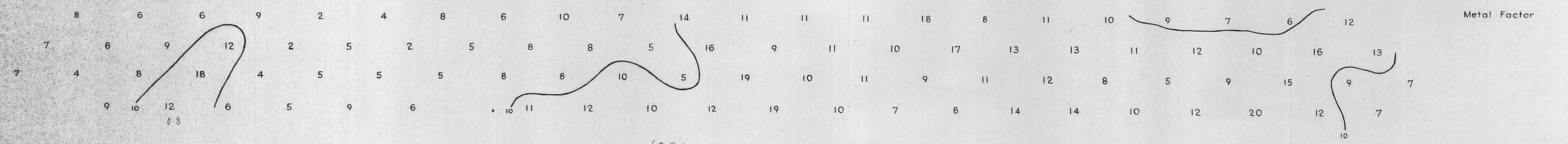
Oo

Δ THIRKELL HILL
AMG 38961mE, 5271970mN

19 E
Exposed positn
40 E
Position by I.P.
58E
156 N
128 N
108 N
76 N
44 N
12 N
20S
40E
60E
40S
10W
10E
A
B
C

327007





pfc 21.

327008

5 cm

Reference

LYELL EZ EXPLORATIONS
QUEENSTOWN

MOORES VALLEY

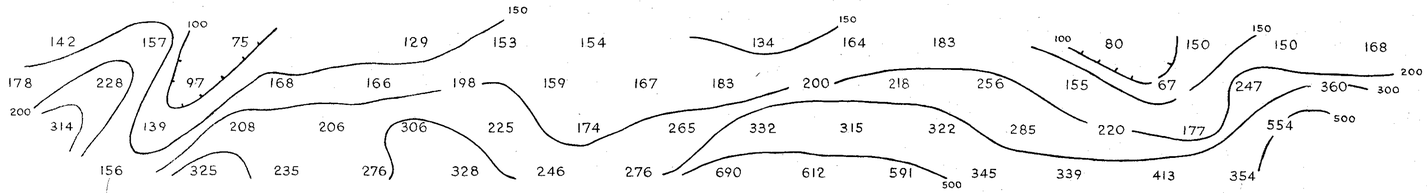
LINE - BASE LINE — 400 FT SPREADS

			Scale
Geology			
Geophysics	E.W.	Jan.'60	400 ft. to 1 inch
Geochemistry			
Drawn	E.W.	Jan '60	
Traced	D.S.	May '60	

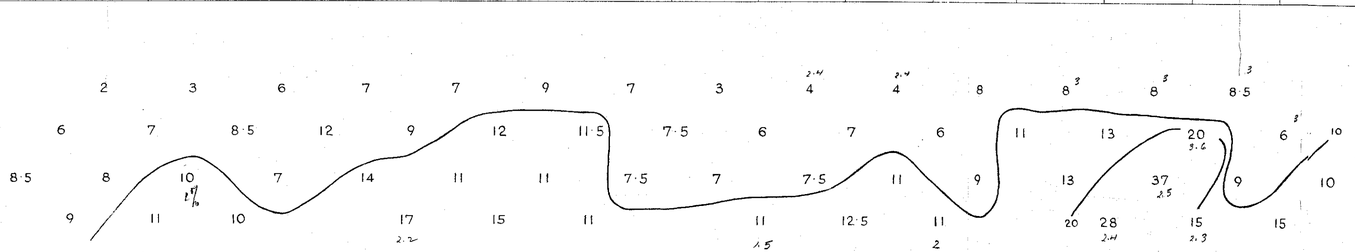
INDUCED POLARIZATION

Q52 — Sheet No. 13

June 3. 60



$\rho_a / 2\pi$



Apparent
Metal Factor

327009

5 cm

PROJECT

LYELL E.Z. EXPLORATIONS
QUEENSTOWN

MOORES VALLEY

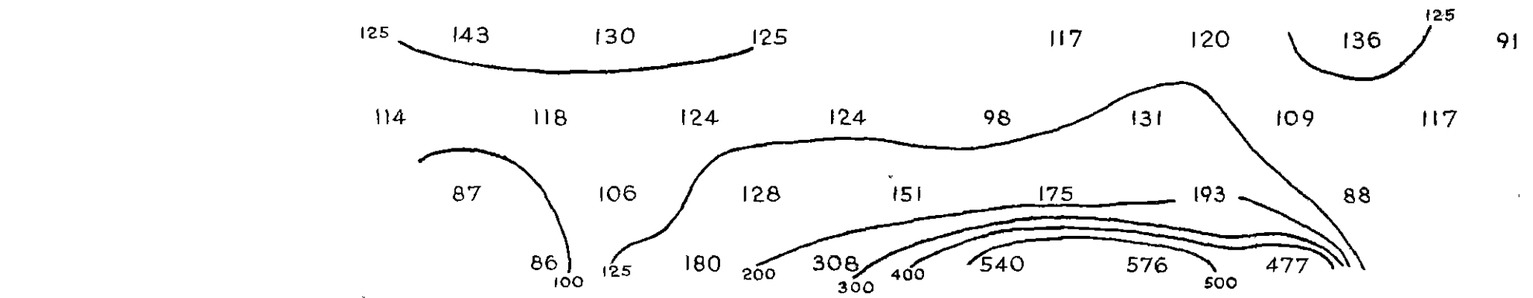
LINE 44 N — 400 FT. SPREADS

Survey				
Grading				
Compilation	E.W.	Dec.'59	400 ft. to 1 inch	Q52
Chemistry				
Drawn	E.W.	Dec.'59		
Check	D.S.	May'60		

Sheet No. 13a

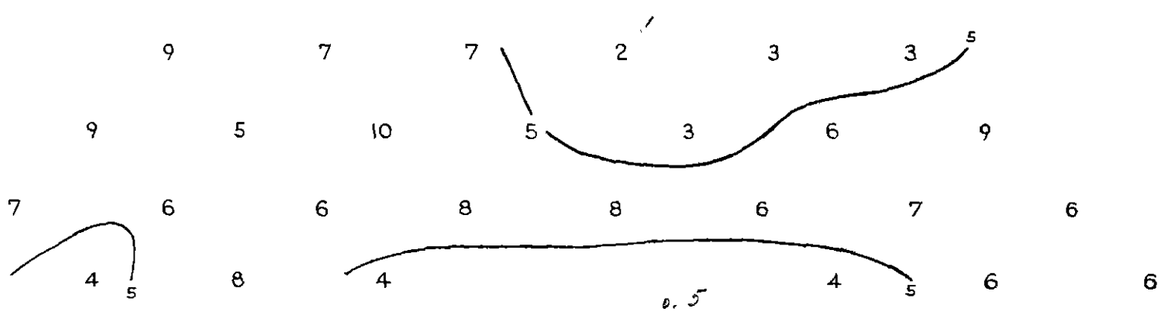
INDUCED POLARIZATION

Date June 6/60



$\rho_a / 2\pi$

0 1E 2E 3E 4E 5E 6E 7E 8E 9E 10E 11E 12E



Apparent

Metal Factor

5 cm

Referer ..e

INDUCED POLARIZATION

LYELL E.Z. EXPLORATIONS
QUEENSTOWN

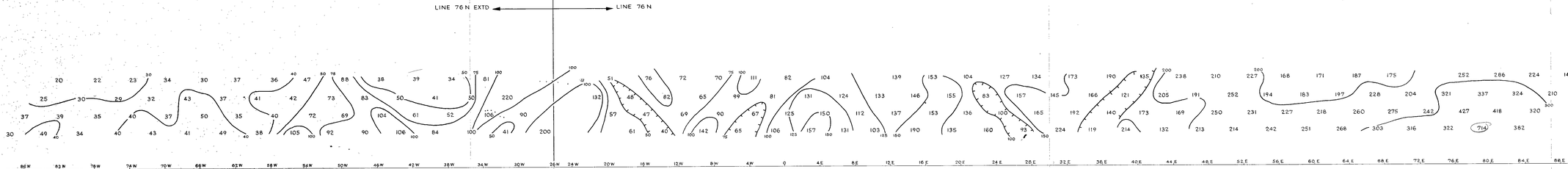
MOORES VALLEY

LINE 76 N — 100 FT. SPREADS

Survey			Scale
Geology			100 ft. to 1 inch
Geophysics	E W.	Mar '60	
Geochemistry			
Drawn	E W	Mar '60	
Traced	D S.	June '60	

Q 52 Sheet No. 13b

0.2701

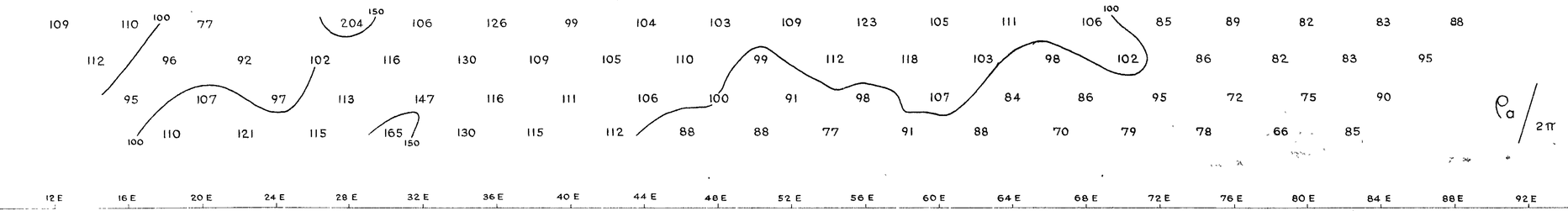


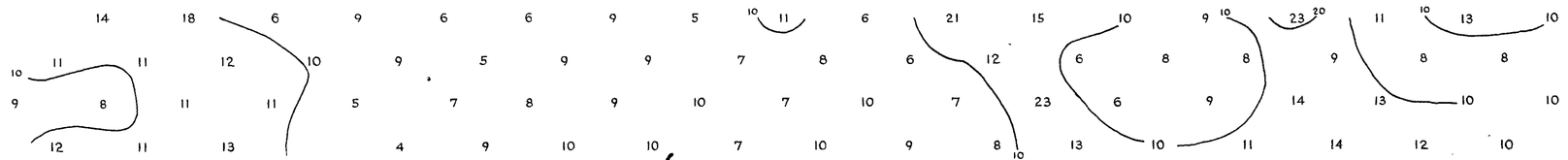
Apparent Metal Factor

327011

5 cm

References	LYELL E.Z. EXPLORATIONS QUEENSTOWN				
	MOORES VALLEY LINE 76N EXT & 76N 400 FT SPREADS				
	Survey			Scale	
	Geology			400 ft to 1 inch	Q 52 Sheet No. 13
	Geophysics	E.W	Jan '60		
	Geochemistry				
INDUCED POLARIZATION	Draw	E.W	Jan '60		Contour Int. 1 mv
	Trace	T.S.	May '60		





Apparent
Metal Factor

327012

5 cm

LYELL E.Z. EXPLORATIONS
QUEENSTOWN

MOORES VALLEY

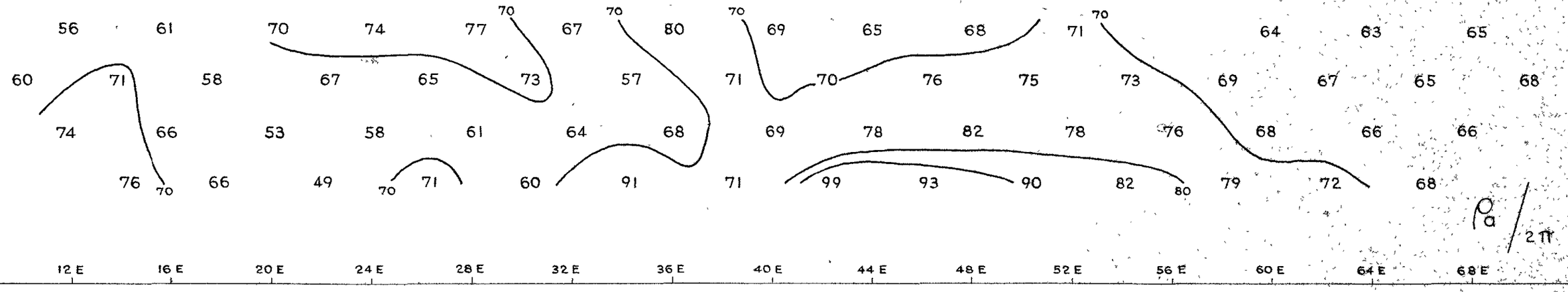
LINE 108N — 400 FT. SPREADS

Geology		
Geophysics	E.W.	Jan.'60
Geochemistry		
Drawn	E.W.	Jan '60
Traced	D.S.	June '60

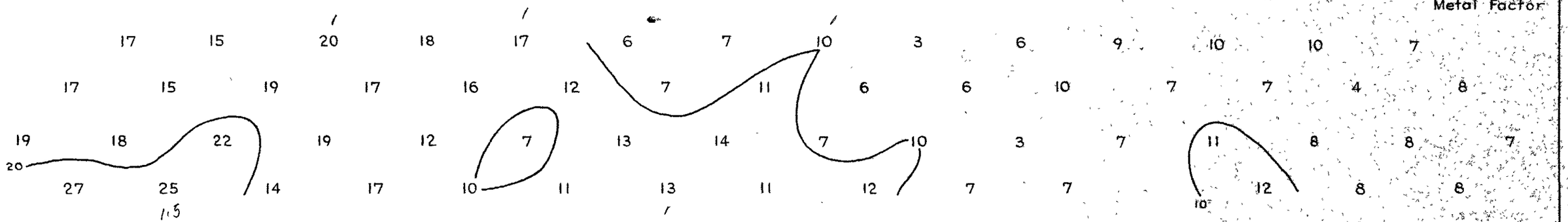
400 ft. to 1 inch

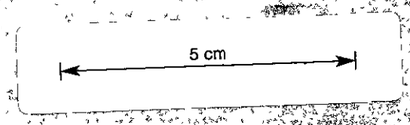
Sheet Q52 13d

INDUCED POLARIZATION



Apparent Metal Factor





References

INDUCED POLARIZATION

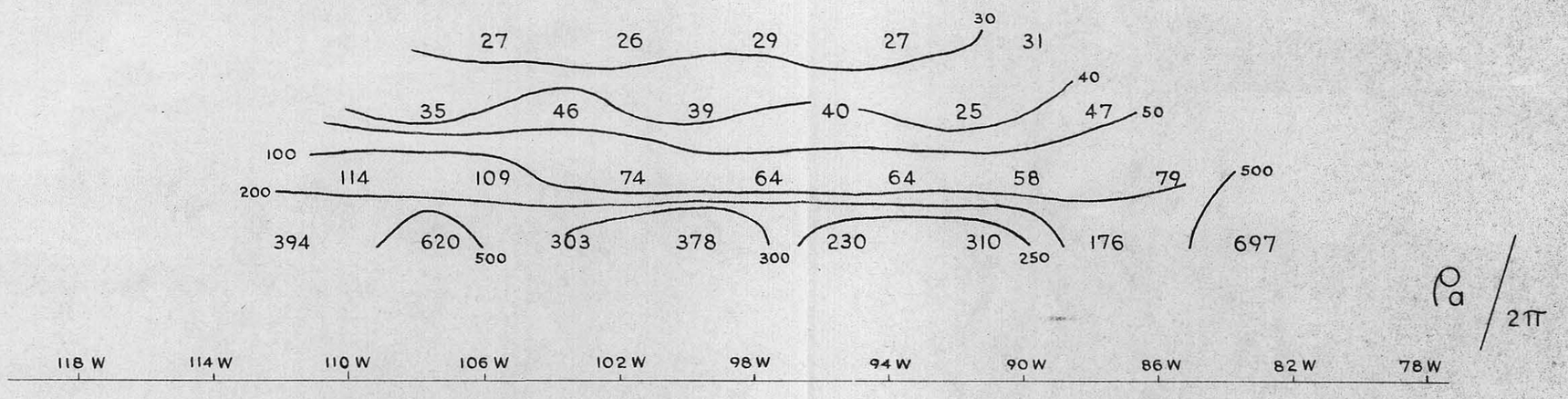
LYELL E.Z. EXPLORATIONS
QUEENSTOWN

MOORES VALLEY

LINE 128 N — 400 FT. SPREADS

Survey			400 ft. to 1 inch	Q52 Sheet No. 13e
Geology				
Geophysics	E W	Jan. '60		
Geochemistry				
Drawn	E.W.	Jan. '60		Checked C. Riddle
Traced	D.S.	June '60		Date June 60

32 50 13



5 cm

References

INDUCED POLARIZATION

LYELL E.Z. EXPLORATIONS
QUEENSTOWN

MOORES VALLEY

LINE 148 N EXT. 400 FT. SPREADS

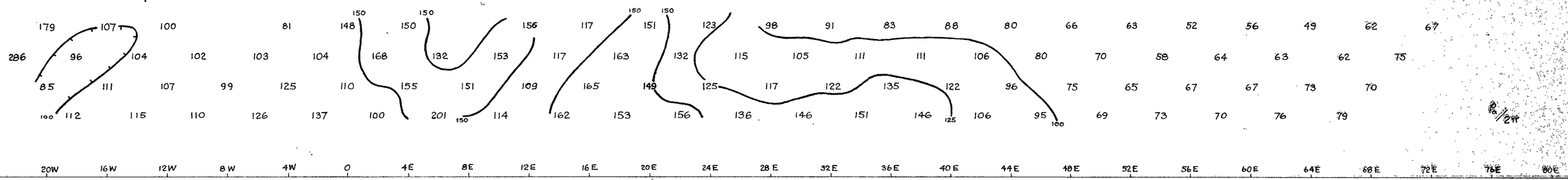
Survey		
Geology		
Geophysics	E.W.	Mar.'60
Geochemistry		
Drawn	E.W.	Mar.'60
Traced	D.S.	June '60

400 ft. to 1 inch

Q52 Sheet No. 13f

P. Redda June 8, '60

92 C/4



Apparent Metal Factor

5 cm

327015

LYELL E.Z. EXPLORATIONS
QUEENSTOWN

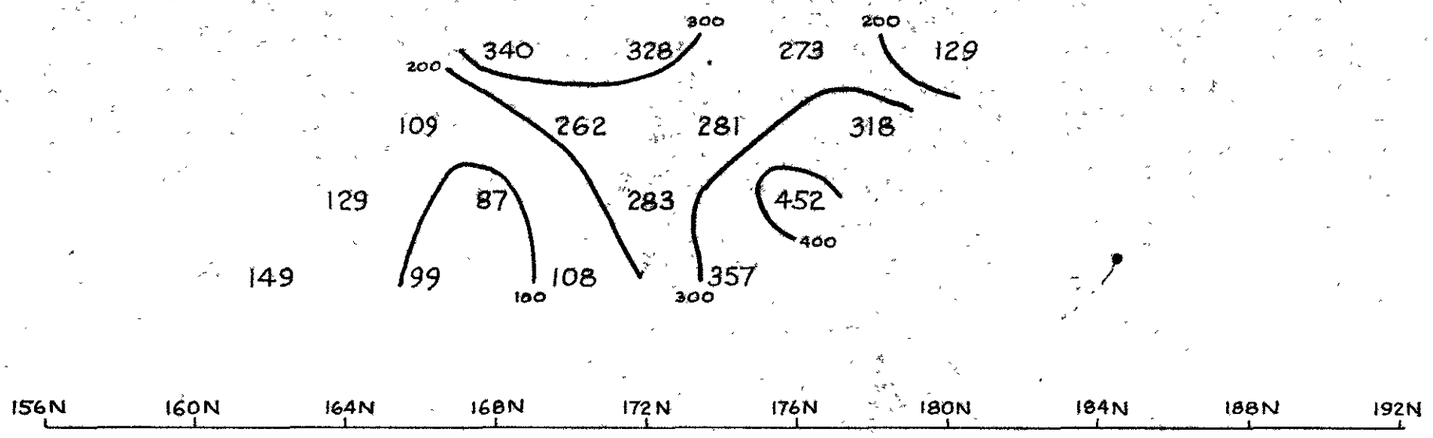
MOORES VALLEY
LINE 156N — 400FT. SPREADS

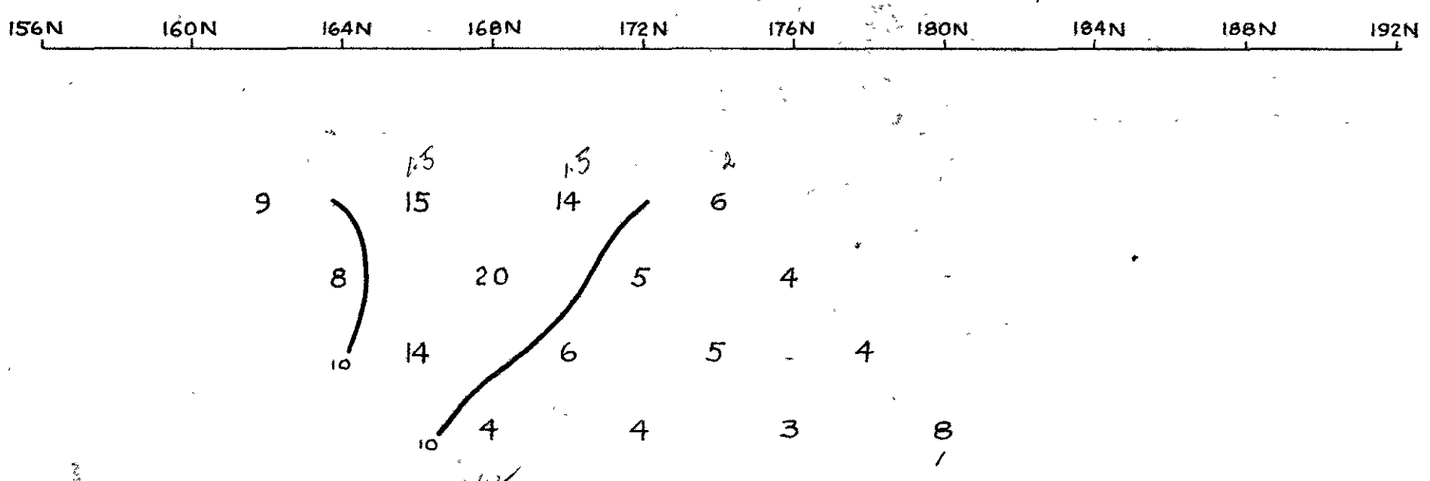
Geology		
Geophysics	E.L.W.	Feb. '60
Grid	E.L.W.	Feb. '60
Plan	T.H.P.	June '60

References

400 ft. to 1 inch

Q 52 — Sheet No. 13g





$\rho_a / 2\pi$

Apparent
Metal Factor

5 cm

References

LYELL E.Z. EXPLORATIONS
QUEENSTOWN

MOORES VALLEY

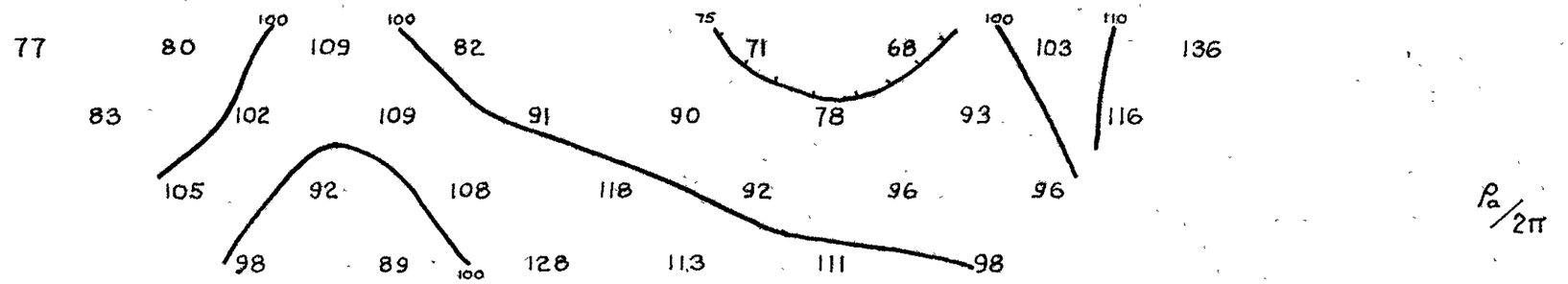
LINE 19E 400FT. SPREADS

			Scale
Survey			400 ft. to 1 inch
Geology			
Geophysics	E.L.W.	Feb. '60	
Geochemistry			
Drawn	E.L.W.	Feb. '60	
Traced	T.H.P.	June '60	

Q52 Sheet No 13h

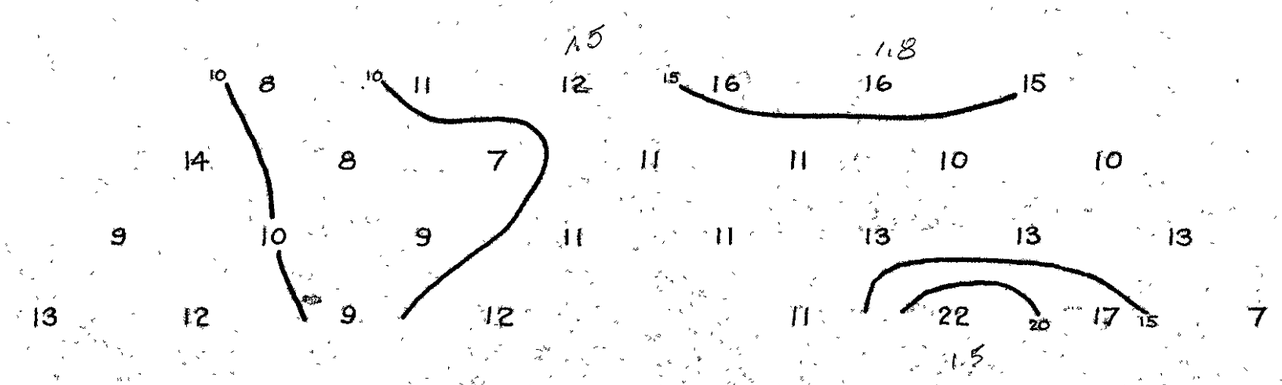
P. Rodda
June 10, '60

32704G



$\rho_a/2\pi$

128N 132N 136N 140N 144N 148N 152N 156N 160N 164N 168N 172N 176N 180N 184N



Apparent Metal Factor

5 cm

References

LYELL E.Z. EXPLORATIONS
QUEENSTOWN

MOORES VALLEY

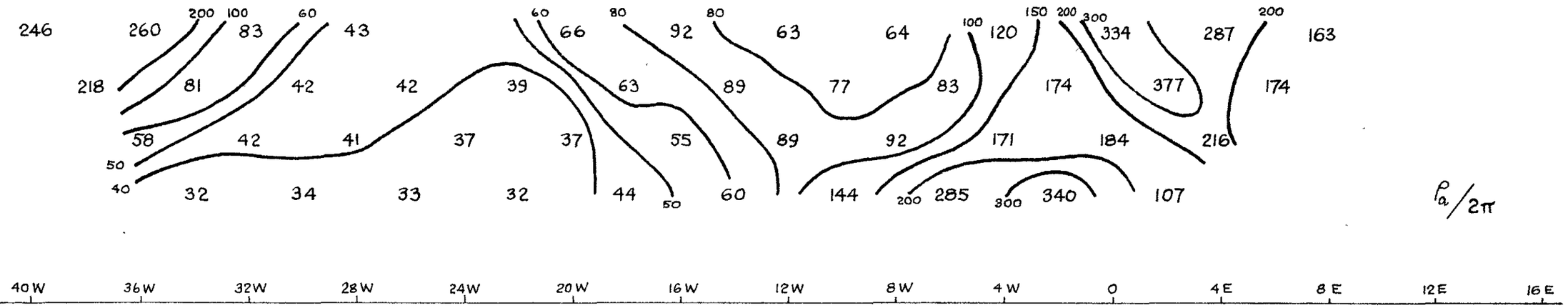
LINE 40E 400 FT. SPREADS

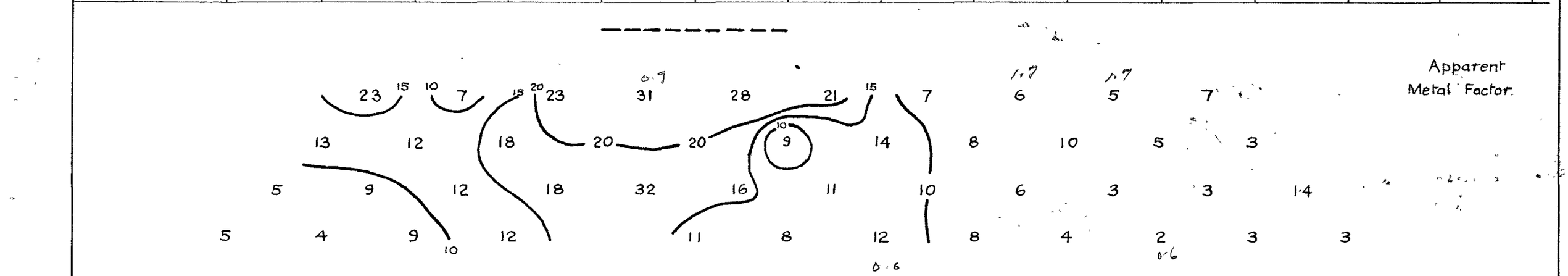
			Scale
Survey			
Geology			
Geophysics	E.L.W.	Feb. '60	400 Ft. to 1 inch
Geochemistry			
Drawn	E.L.W.	Feb. '60	
Traced	T.H.P.	June '60	

Q52 Sheet No. 13i

P. Rhodes
June 10, '60

327014





Apparent Metal Factor

5 cm

CYPRUS EXPLORATIONS
QUEENSTOWN

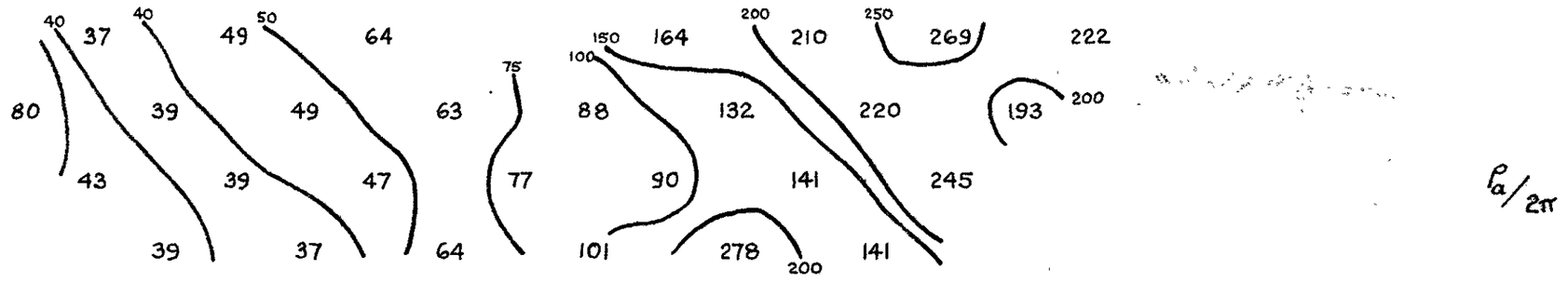
D'AGUILAR RANGE

LINE BASELINE 400 FT. SPREADS.

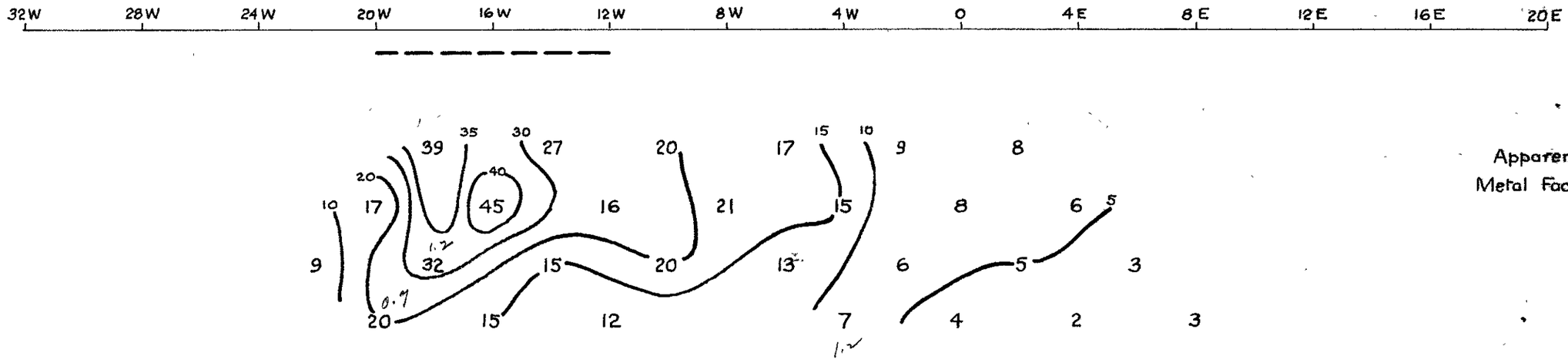
Geology			400 ft. to 1 inch
Grid Surveyed	E.L.W.	Mar. '60	
Geophysics			
Drawn	E.L.W.	Mar. '60	
Traced	T.H.P.	June '60	

Q54 Sheet No 13a

3270/18



$\rho_a/2\pi$



Apparent
Metal Factor

5 cm

References

LYELL E.Z. EXPLORATIONS
QUEENSTOWN

D'AGUILAR RANGE

LINE 8N — 400 FT. SPREADS

			Scale	
Survey				
Geology				
Geophysics	E.L.W.	Mar. '60	400 ft. to 1 inch	Q54 Sheet No. 13b
Geochemistry				
Drawn	E.L.W.	Mar. '60		
Traced	T.H.P.	June '60		

22709