DEPARTMENT OF MINES
SOUTH AUSTRALIA

SECOND APPENDIX TO REPORT ON GEOPHYSICAL INVESTIGATIONS OF YUDNAMUTANA COPPER DEPOSITS

Umberatana - 1 mile sheet

by

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Rep. Bk. No. 64/104
G.S. No. 3716
D.M. No. 1486/66

17th May, 1968

DEPARTMENT OF MINES
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ABSTRACT

Additional Induced Polarization and magnetic surveys in the vicinity of Yudnamutana have resulted in anomalies being detected by both methods. Drilling is recommended to test an area where strong magnetic, Induced Polarization and geochemical anomalies are coincident.

INTRODUCTION

Geochemical work (Plan 67-783) by W.A. Fairburn east of the previously reported area revealed copper anomalies extending along strike within the actimolite marble beds.

Surveyed lines were established by extending the previous grid to cover the area along the Geralina Creek between the Beach Queen East and the Cockscomb prospect. The 300N line was extended through the area and used as a main base line for both geochemical and geophysical surveys. North-south lines were spaced at 400 feet intervals along the base line with stations 100 feet appart along the lines.

Induced polarization and magnetic readings were taken along these lines from line 2400E to line 5600E inclusive.

RESULTS

Induced polarization results in the form of contours of apparent resistivity, frequency effect and metal

factor are included with this appendix.

A contour map showing lines of equal vertical magnetic intensity is also shown. (Plan 68-385).

INTERPRETATION

A narrow bed within the actinolite marble series is traceable by its strong magnetic anomaly over most of the strike length. Between lines 3600E and 4000E this bed is either severely folded or faulted.

It is believed that the copper anomalies are associated with the bed containing the magnetic iron minerals since the geochemical copper results follow a similar pattern.

Structural features such as are indicated between lines 3600E and 4000E could be a course of the higher copper content of the soil and increased magnetic effect in this area.

A low resistivity with associated high frequency effect and metal factor was indicated on most of the lines during the induced polarization survey. These effects are most apparent near the area of maximum magnetic anomaly. The most intense anomalies are on line 4400 east. These would correspond to material dipping to the north with a probable outcrop 100 to 200 feet north of the point of the greatest measured vertical magnetic intensity.

The coincidence of magnetic and induced polarization anomalies suggests that the cause of the anomalies is similar to the anomalies found near the Black Queen, which were due to sulphide material associated with magnetite.

The magnetic anomalies north of the actinolite marble beds are associated with metamorphosed volcanic material.

RECOMMENDATIONS

The strong induced polarization magnetic and geochemics anomalies between 100N and 200N on lines 4000E and 4400E should be investigated by drilling.

The down the hole hammer technique could be used to investigate the anomalies as the feature causing the anomalies would appear to approach the surface.

The actinolite marble beds continue beyond the area over which the surveys have been conducted. It should be possible to trace the bed causing the magnetic anomaly further with particular emphasis on locating structural features, which may be related to higher than average copper concentrations.

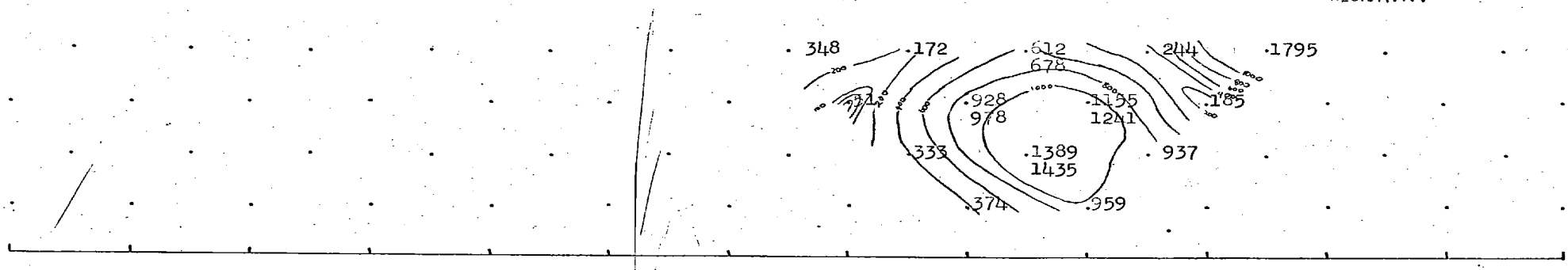
D. McPHARLIN
ASSISTANT SENIOR GEOPHYSICIST

DMcP:CFL
17.5.1968

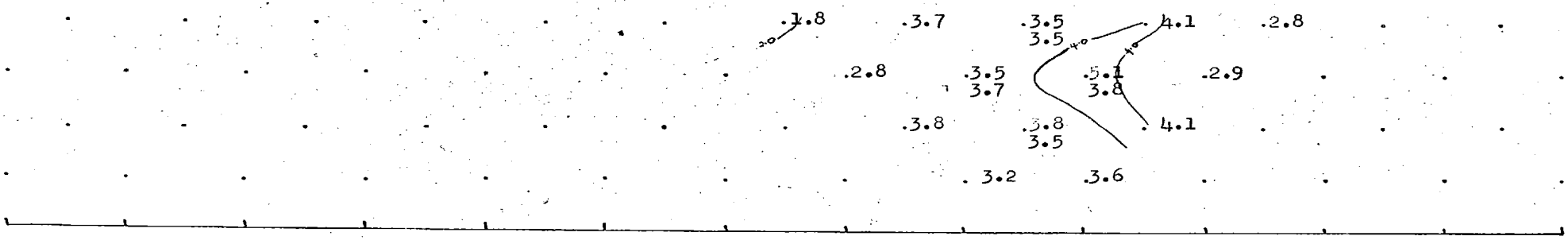
LINE YUDNAMUTANA 2400E

1200S 1000S 800S 600S 400S 200S 0 200N 400N 600N 800N 1000N 1200

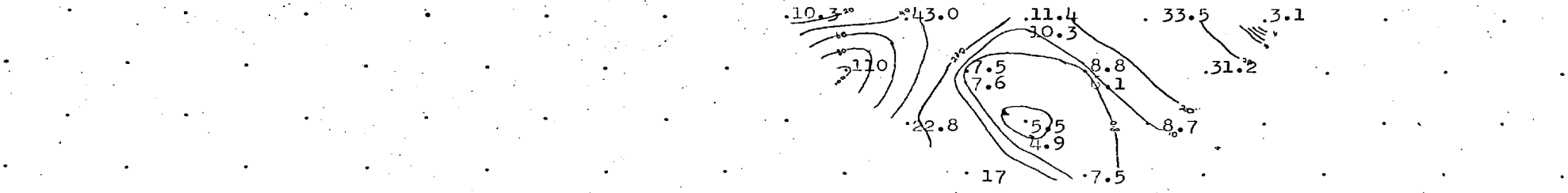
APPARENT RESISTIVITY



FREQUENCY EFFECT



METAL FACTOR

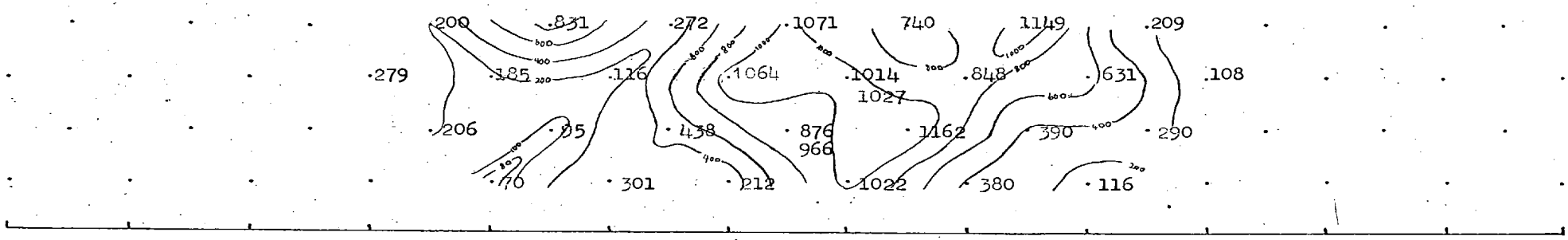


SCALE: 1" rep. 200 ft
S 6630

LINE YUDNAMUTANA 2800E

1000S 800S 600S 400S 200S 0 200N 400N 600N 800N 1000N 1200N

APPARENT RESISTIVITY



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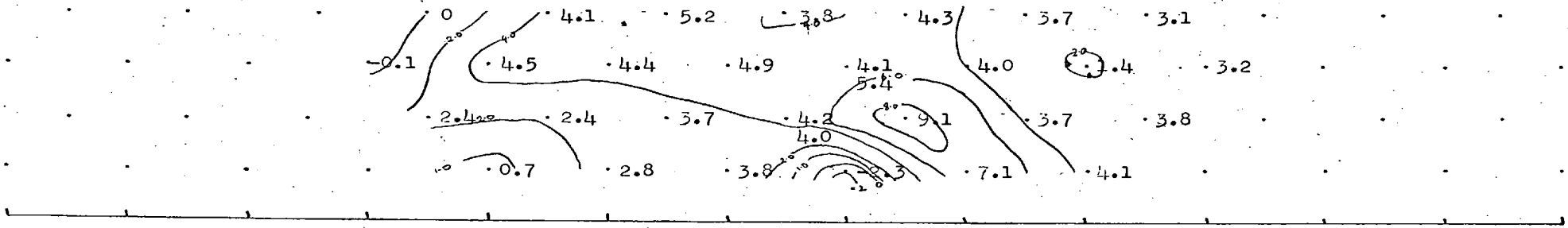
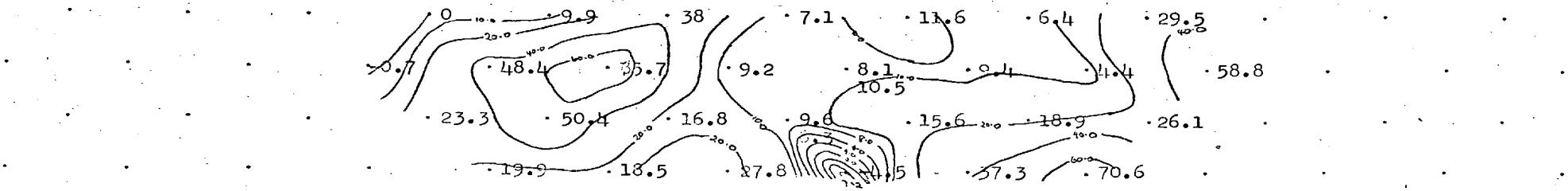


METAL FACTOR



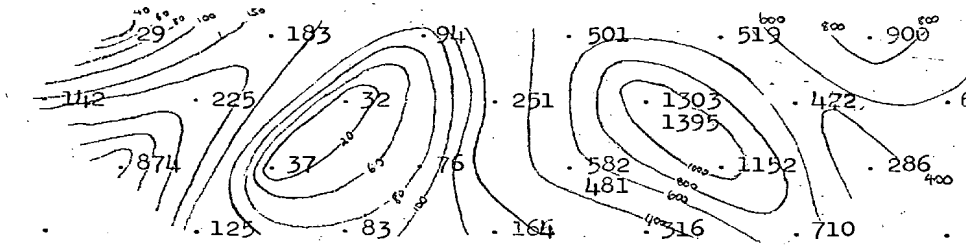
SCALE: 1" rep 200 ft

S 6631

LINE YUDNAMU PANA 3200E

900S 700S 500S 300S 100S 100N 300N 500N 700N 900N 1100N

APPARENT RESISTIVITY



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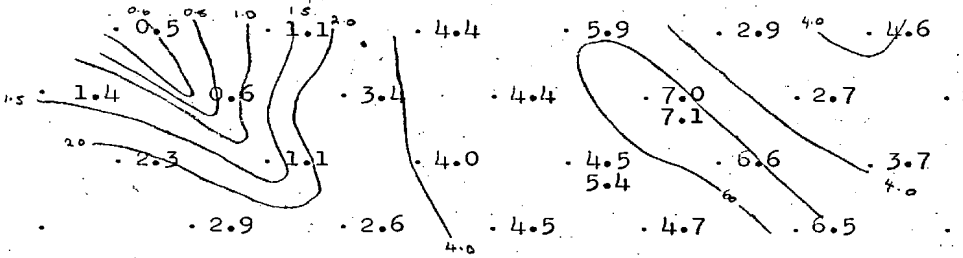
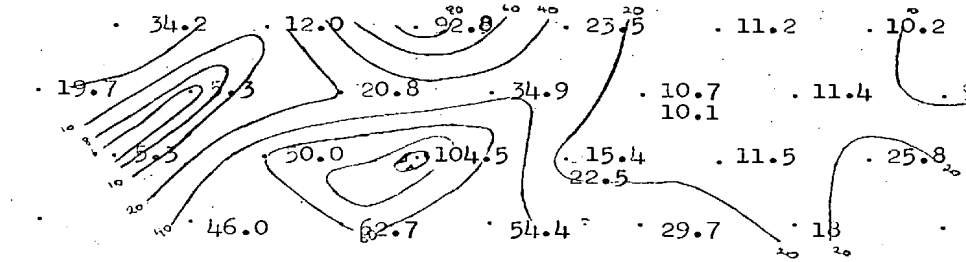


METAL FACTOR

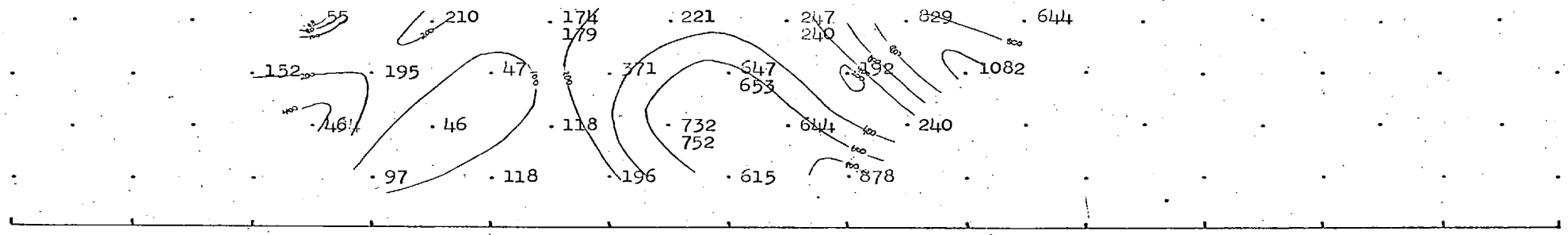


SCALE: 1" rep. 200ft
S6632

LINE YUDNAMUTANA 3600E

900S 700S 500S 300S 100S 100N 300N 500N 700N 900N 1100N

APPARENT RESISTIVITY



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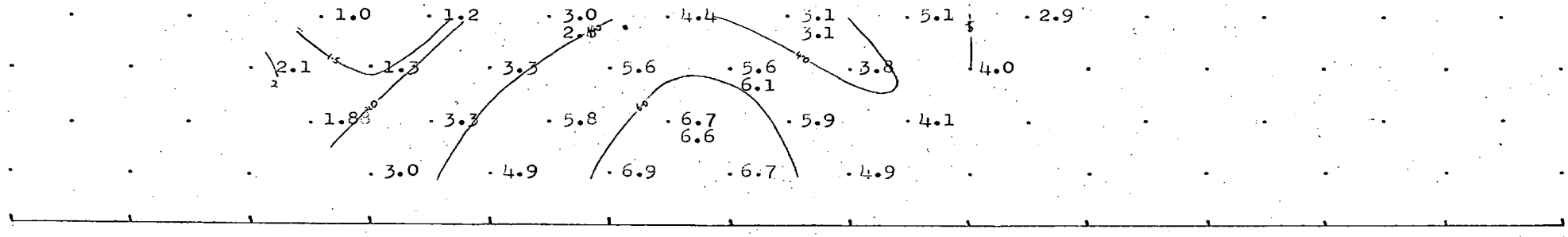
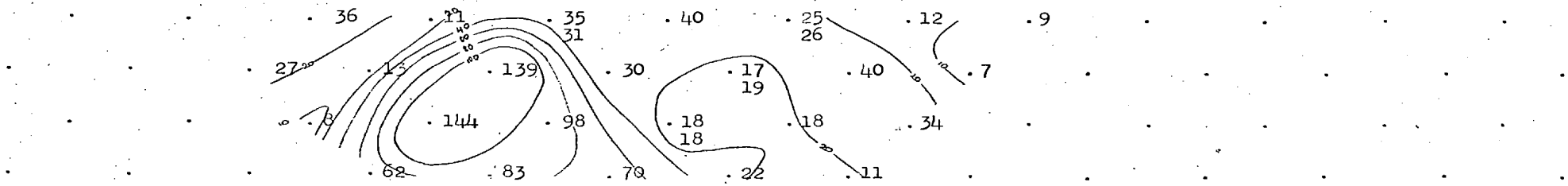


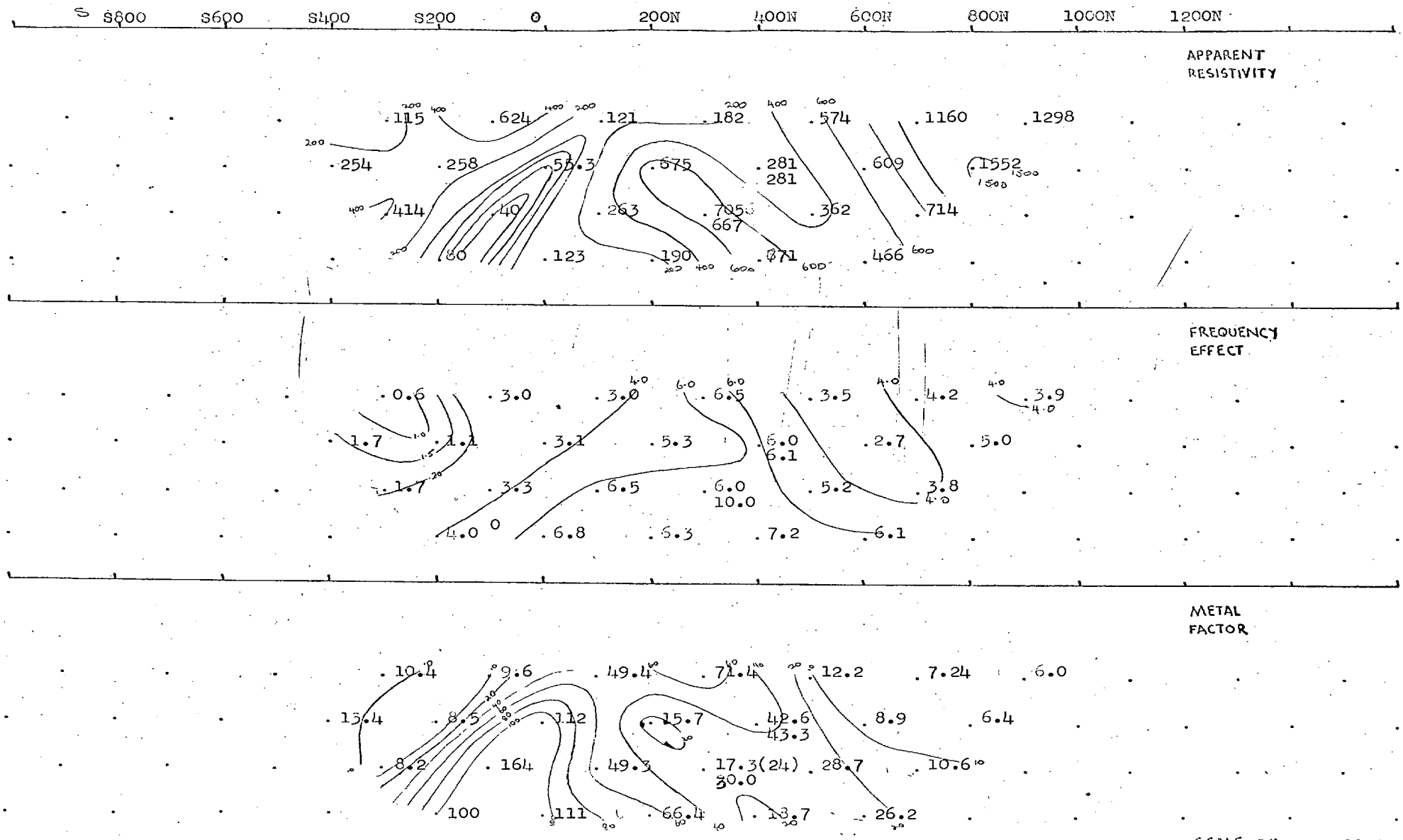
METAL FACTOR



SCALE: 1" rep. 200 ft

S 6633

LINE YUDNAMUTANA 4000E

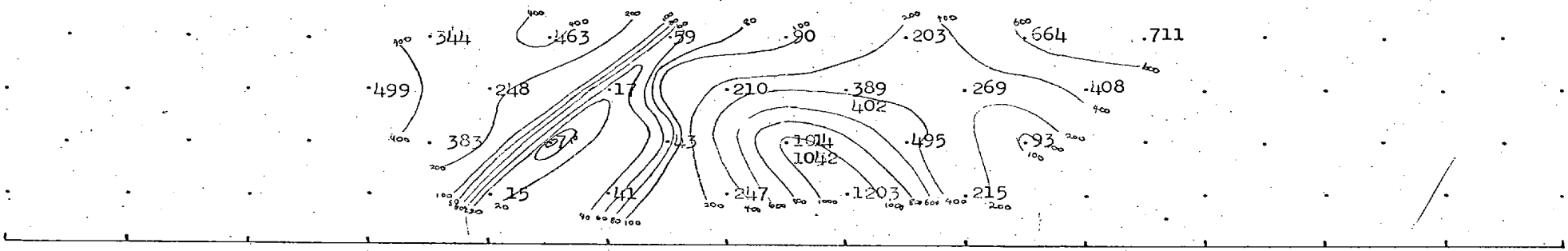


SCALE: 1" rep 200 ft
S 6634

LINE YUDNAMUTANA 4400E

800S 600S 400S 200S 0 200N 400N 600N 800N 1000N 1200N

APPARENT RESISTIVITY



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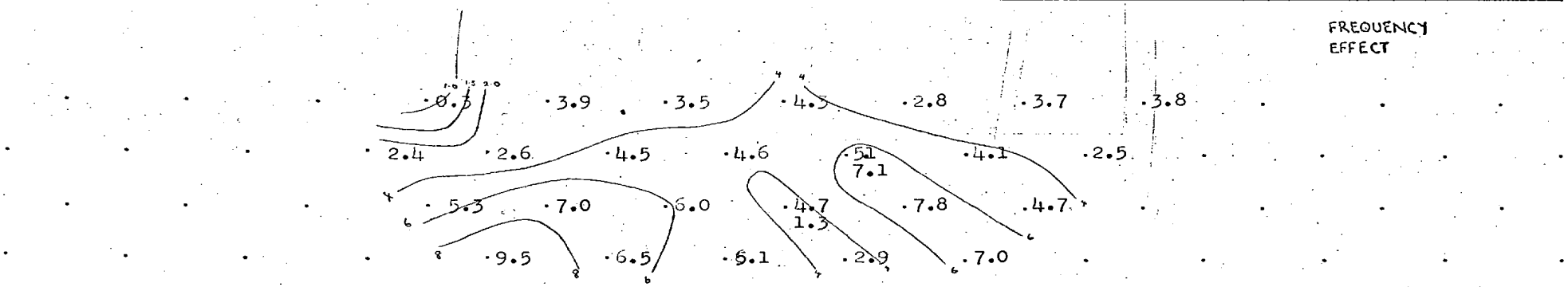
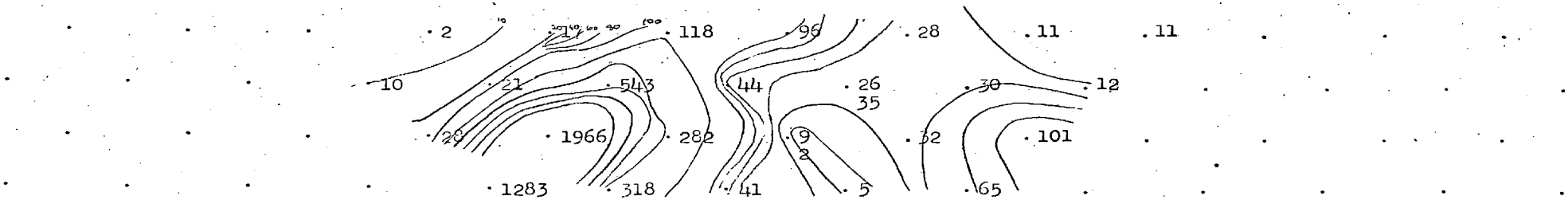
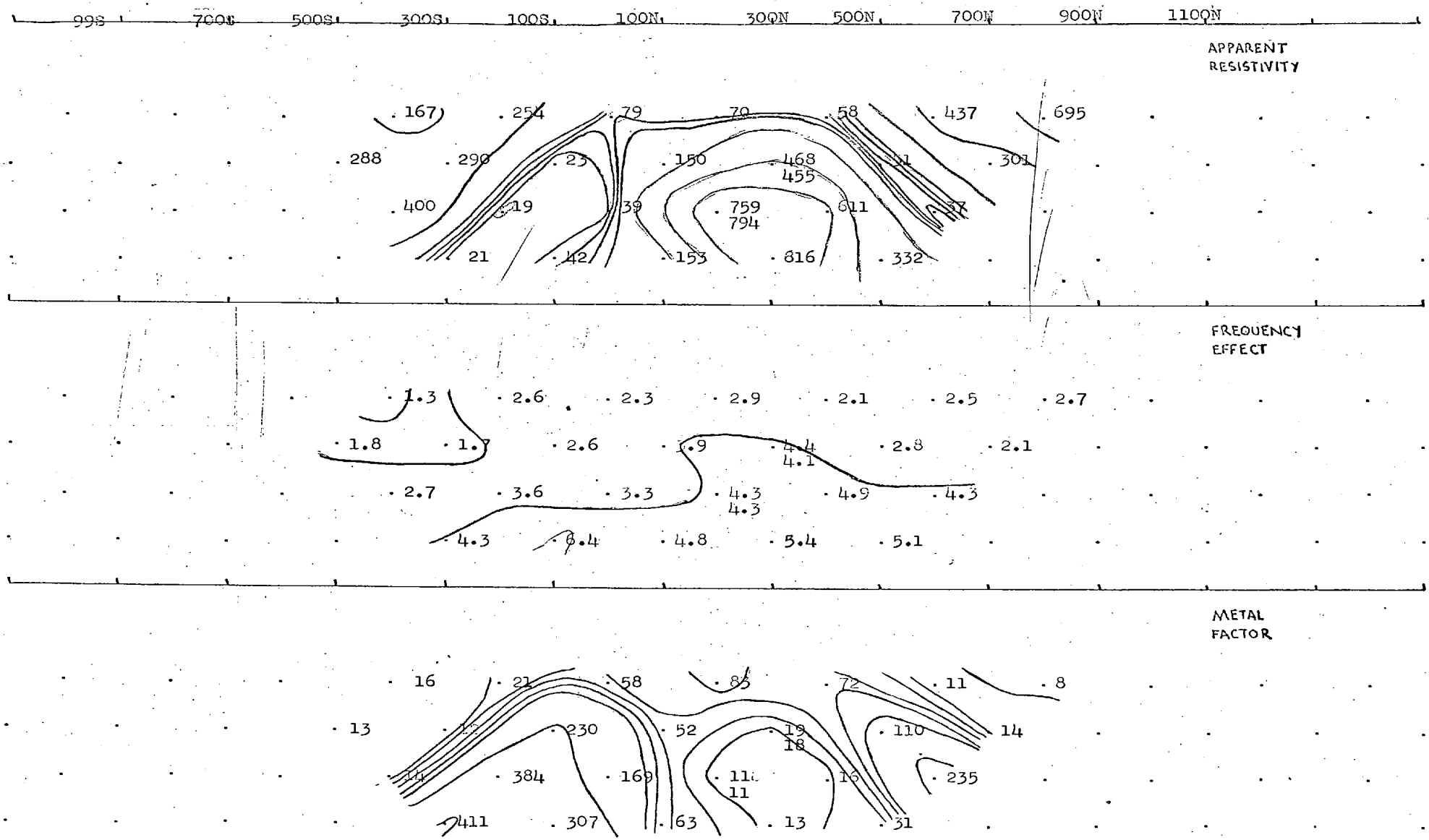


METAL FACTOR



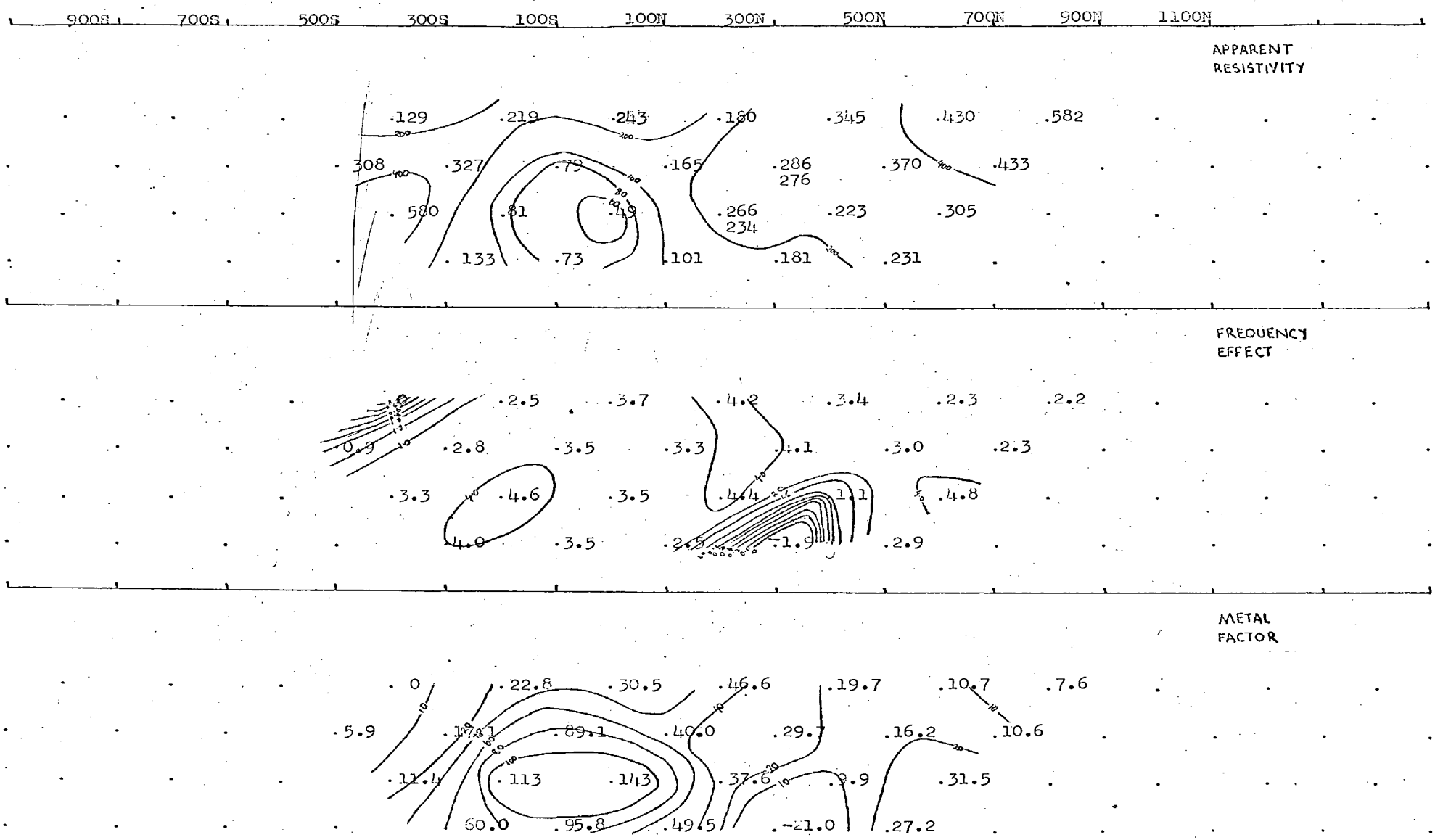
SCALE: 1" rep 200 ft
S 6635

LINE YUDNAMUTANA 4800S



SCALE: 1" rep. 200 ft
S6636

LINE YUDNAMUTANA 5200E

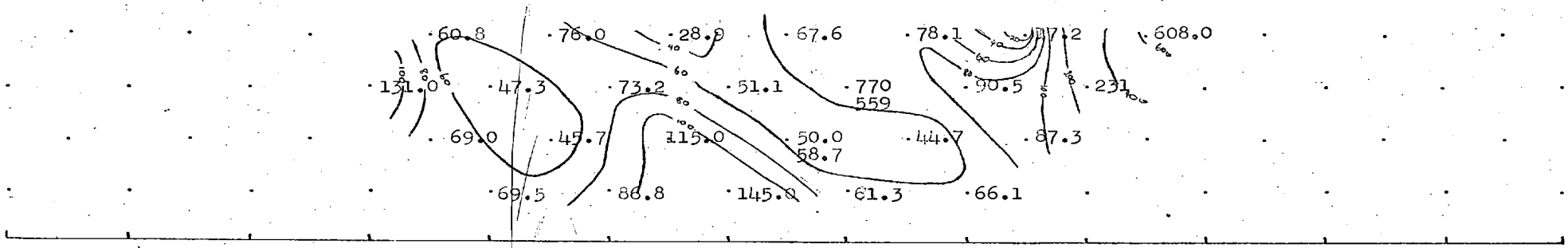


SCALE: 1" rep. 200 ft
S 6637

LINE YUDNAMUTANA 5600E

900S 700S 500S 300S 100S 100N 300N 500N 700N 900N 1100N

APPARENT RESISTIVITY



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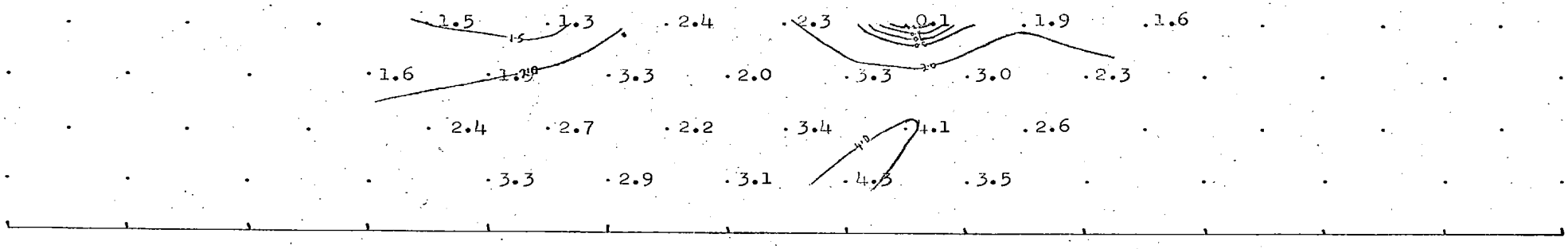

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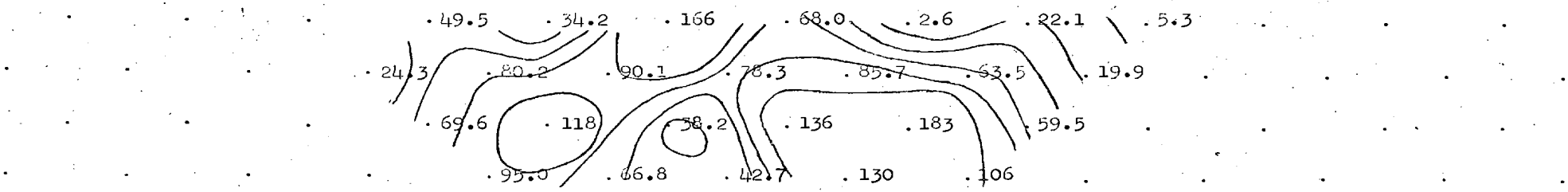


SCALE: 1" = [illegible] ft

S6638

00 400E 800E 1200E 1600E 2000E 2400E 2800E 3200E 3600E 4000E 4400E 4800E 5200E 5600E

1200N 800N 400N 00 400S 800S 1200S

N

YERELINA CREEK

BLACK QUEEN (WEST)

BLACK QUEEN (EAST)

SCALE

FEET 0 400 800 1200 1600 2000 FEET

LEGEND

Copper content in soils in p.p.m.
(Creek samples not included)

> 1000

500—1000

250—500

100—250

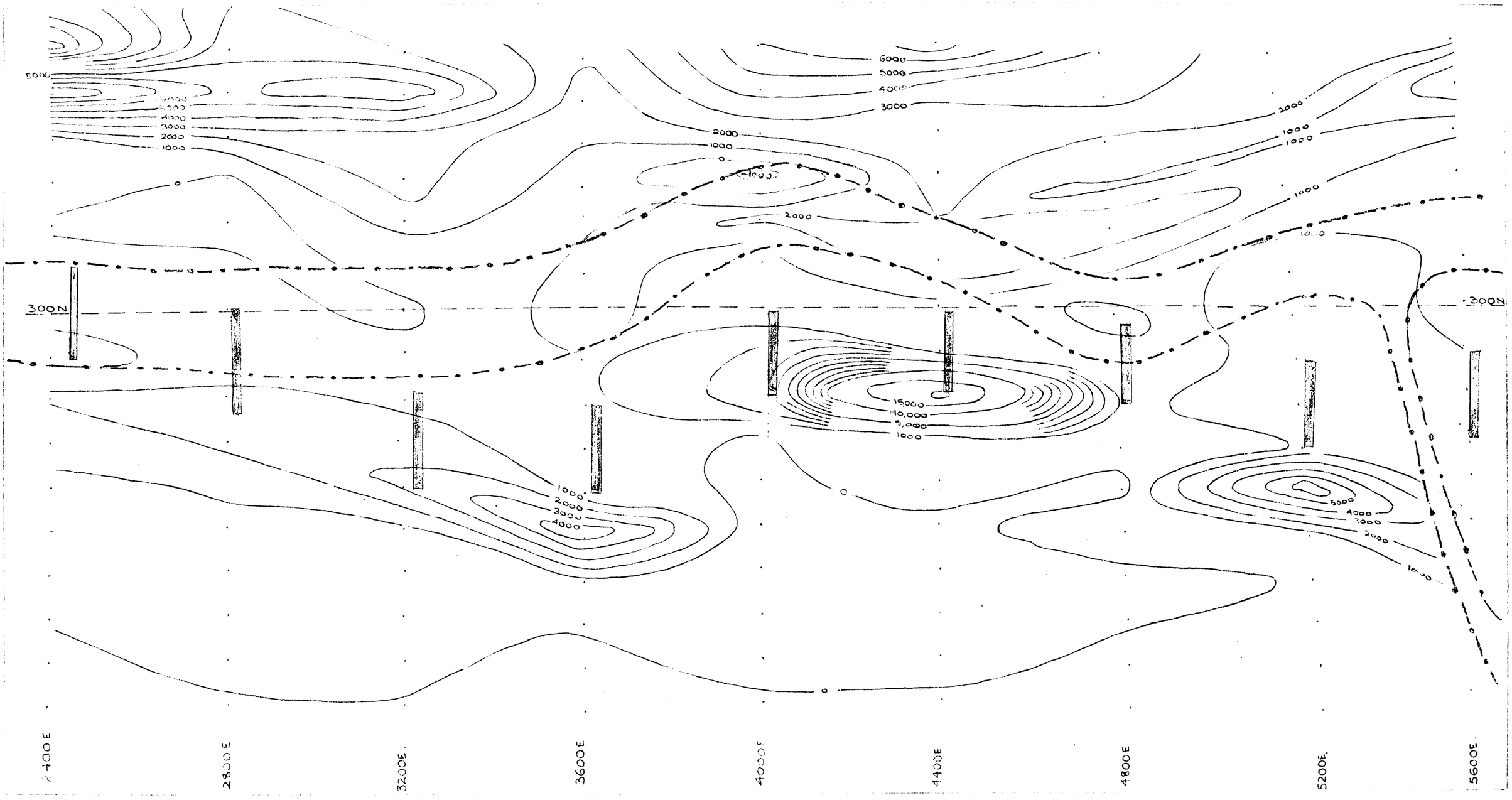
Edge of exposed area of Actinolite Marble (Wywyana Formation

Northern edge of exposed Quartzite (Basal Callanna Quartzite)

67—783

W.A. Fairburn Assistant Senior Geologist

S.A. Dept. of Mines



Contour Interval 1000 gammas

Yeralina Creek Boundary ——

Induced Polarization Anomalies

DEPARTMENT OF MINES — SOUTH AUSTRALIA

YUDNAMUTANA AREA

Contours of equal vertical magnetic intensity

		Drn.	SCALE: 1 inch = 2000 ft
		Tcd.	
		Ckd.	C_d 68—385
Director of Mines		Exd.	DATE: 7 – 5 – 68