

1087

GEOPHYSICAL REPORT

ON

INDUCED POLARIZATION SURVEY

OF EASTERN PART OF THE PROPERTY OF

SHEBA COPPER MINES LTD. (N.P.L.)

HIGHLAND VALLEY, KAMLOOPS M. D.

BY

TAKEO YOKOYAMA

September 20, 1967

CLAIMS SURVEYED

CU # 1-6 (incl.)
CU #17-20 (incl.)
DO # 1-6 (incl.)

DO # 2 Fr.-8 Fr. (incl.)
ANN #5, 6, 16 & 17 Frs.
JJ # 1 Fr.

and

ANN # 2 Fr.
JJ # 2 Fr.
DO # 1 Fr.

J # 3, 5, 21 & 32
J # 33 Fr. - 38 Fr. (incl.)
JAY # 11-2- (incl.)

LOCATION

HIGHLAND VALLEY - 4MILES SSE OF BETHLEHEM MINE
50° 120° S W

SUPERVISING ENGINEER

Gordon R. Hilchey, P. Eng.

FIELD WORK

MAY 15th - JULY 10th

AUGUST 23-26th. (inclusive)
1967

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#8 1-8	CLAIM MAY (East Half), Overlay

INTRODUCTION

An induced polarization survey was carried out from May 14th to July 11, 1967 and on additional lines from August 23rd. to August 27th, on the property of Sheba Copper Mines Ltd., Highland Valley, B. C.

On area of approximately 3 square miles consisting of about 42 line miles was covered.

I.P. measurements were made by means of the variable frequency method using the McPhar Induced Polarization System, Model 654. Frequencies of 5 c/s and 0.3 c/s were used on the survey. Intervals of 200' & 400' were adopted using the pole-dipole array with electrode separation of 200' & 400'. The data are presented as contoured plans and profiles of apparent resistivity, frequency effect, and metal factor for 200' and 400' separation using a scale of 1" = 400'.

For reference, the I.P. survey was made on the Lornex, Highmont, and Gaza ore bodies. The profiles and plans of these are also shown.

The I.P. survey was done by the following crew:

T. Yokoyama	Geophysicist & Operator
J. Byberg	Operator & Draftman
J. Puddicombe	Helper
V. Hogan	Helper
C. Huckvale	Helper

INTERPERTATION

The data obtained from the I.P. survey on Sheba property are expressed as frequency effect (F.E.), apparent resistivity and metal factor (M.F.). The latter being dependant of the other two.

The frequency effect had very little variation. No. F.E. anomaly (3-5 percent) could be detected. More than 2% values were contoured as anomalous areas. However, a two percent F.E. does not necessarily indicate an ore body.

For example:(1) on the Lornex ore body (see fig. 1-17-19) the maximum value was 5.6 percent and the area bounded by the 3-4 percent contour coincides with the ore deposit.

(2) on the Highmont and Gaza ore body (see fig. 1-7-20 & 1-7-21) the frequency effect is from 2-3%. Taking these results into consideration, it is possible that a 2% F.E. anomaly could indicate disseminated sulphide deposits of very low grade.

Most values of apparent resistivity ($\rho/2\pi$ Ω -feet) are between 100 and 1000. As only granitic rocks exist on the property, apparent resistivity should be fairly uniform. The variation in resistivity value is considered to depend mainly upon thickness of overburden. On this property, the overburden varies a great deal. Mineralization and alteration also make resistivity lower. But resistivity of disseminated low grade ore may be almost the same as that of deep overburden. Therefore, it is very difficult to distinguish a promising area from the resistivity results. An area of low resistivity where there is little overburden, is considered to be a promising one, especially if an area of low resistivity coincides with an area of high frequency effect. A vertical resistivity survey is necessary to decide the precise depth of overburden. The metal factor (frequency effect divided by the apparent resistivity) is usually an

important parameter as the frequency effect increases as resistivity increases. On this property however, the variation of frequency effect is so small that the metal factor changes mainly with apparent resistivity and is less than 20. Accordingly, the metal factor is not worthy of notice on this property.

CONCLUSION & RECOMMENDATION

This property is not very promising as far as the results of I.P. and resistivity surveys are concerned.

Taking the large number of mineralized exposure on the property into account, it is supposed that many small low grade mineralization could exist in the property, but from the geophysical point of view, it could not be expected to find a workable ore body. On the other hand, it is probable that a high frequency effect would not be observed owing to a small quantity of total sulphide.

Furthermore it is the writer's opinion that all places with any possibilities should be investigated in the early stage of exploration. Therefore, the following drilling is recommended on four F.E. anomalies.

A LIST OF DRILL HOLES RECOMMENDED

	Station	Direction	Dip	Length	Ranking
A	24N 8E	East	$+45^{\circ}$	500'	5
	32N 21E	West	-45°	500'	4
B	16N 44E	West	-45°	300'	8
	12N 44E	West	-45°	300'	3
C	32S 15E	North	-60°	500'	6
	44S 15E		-90°	400'	7
D	72S 16W	West	-45°	500'	1
	72S 4W	West	-45°	500'	2
Total				3500'	

October 12, 1967

Vancouver, B. C.

Takeo Yokoyama
T. Yokoyama

Geophysicist

G. R. Hilchey
Gordon R. Hilchey, P. Eng.
Supervising Engineer

STATEMENT OF QUALIFICATIONS

I received a Bachelor of Science degree from Kyoto University in 1960 in geology.

I received a Master of Science degree from Kyoto University in 1962 in geophysical geology.

I have been continuously employed on most types of geophysical surveys (and related work) since graduation, for Besshi Mine and Sumitomo Metal Mining Co. Ltd.

I have had three years experience as geophysicist on Induced Polarization surveys.

Takeo Yokoyama
Takeo Yokoyama

FIG. 7

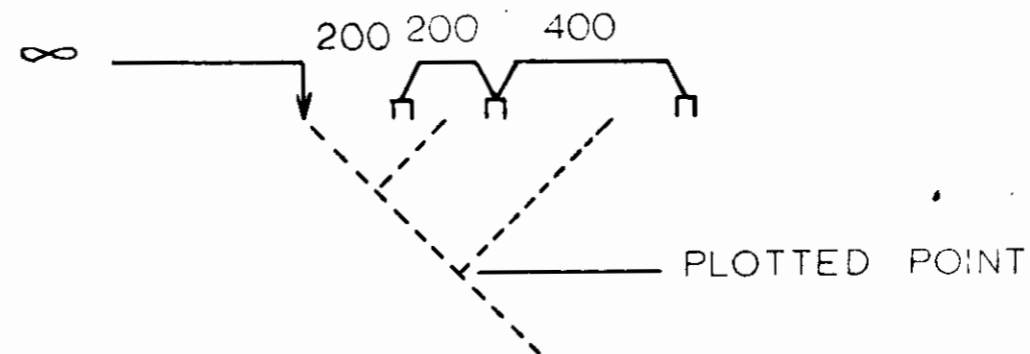
INDUCED POLARIZATION SURVEY

SHEBA PROPERTY

SECTION PROFILES

POLE - DIPOLE CONFIGURATION

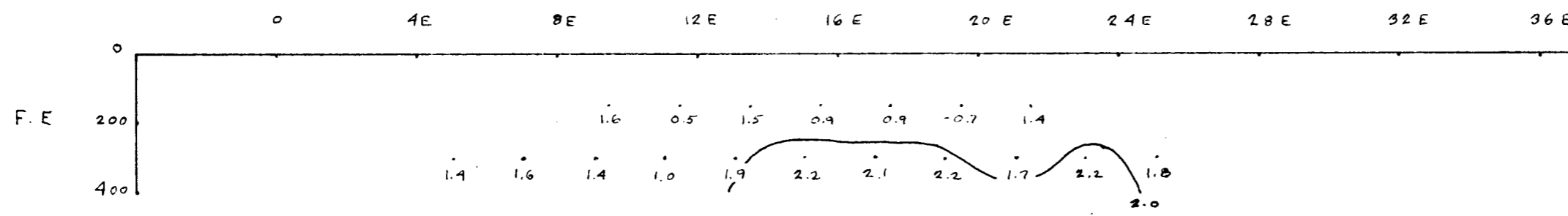
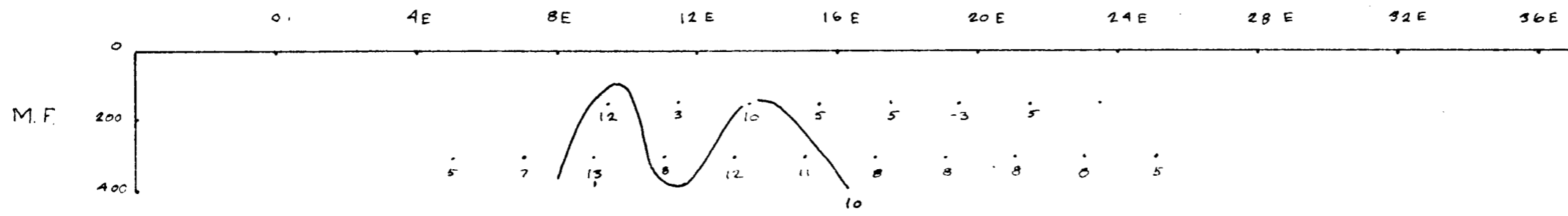
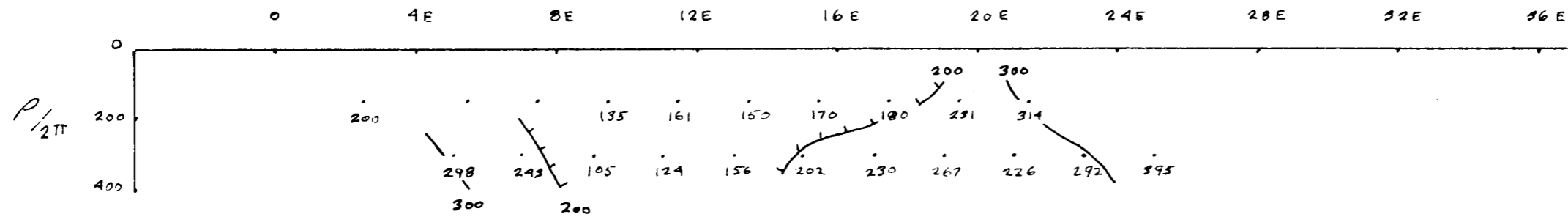
SCALE : 1in = 400ft



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1087 MAP 7

1087

3200 N



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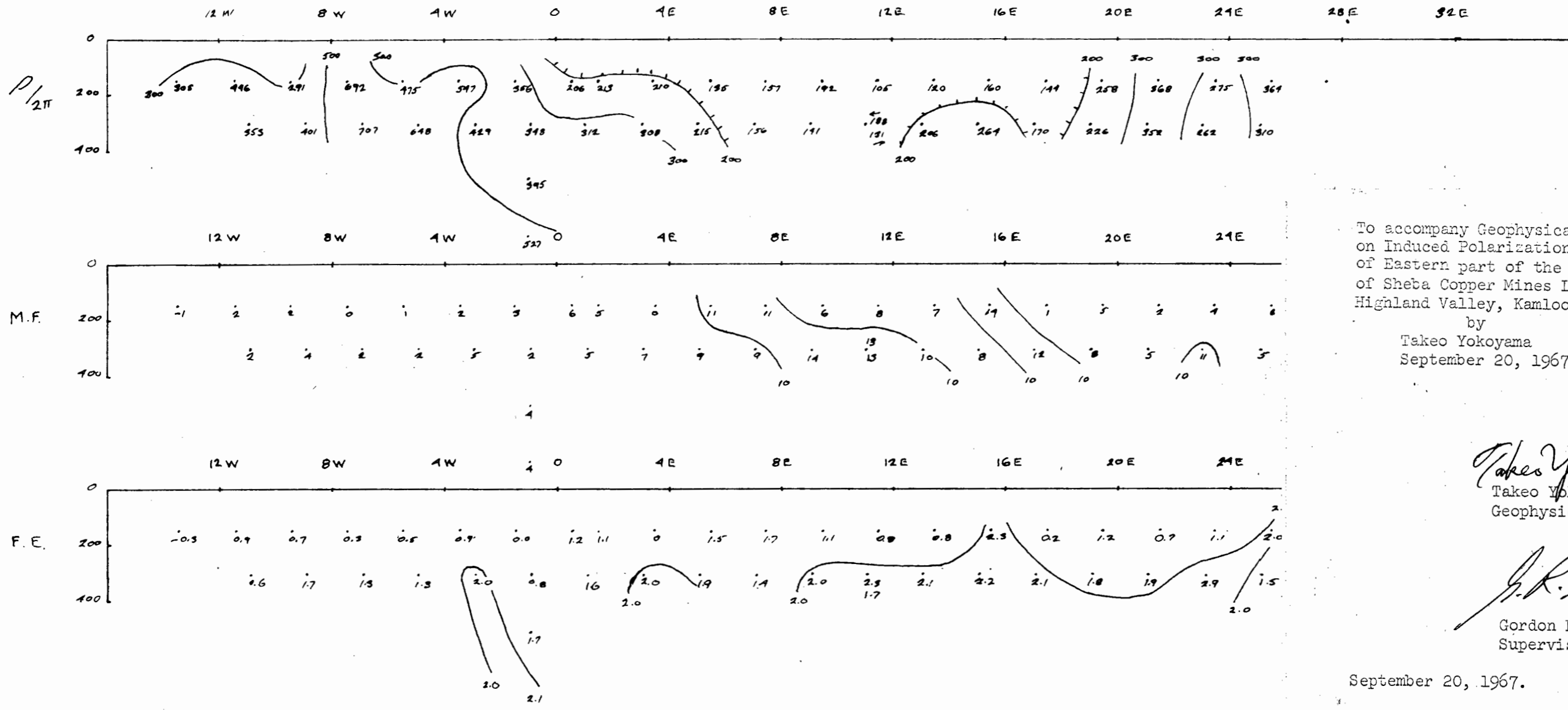
Takeo Yokoyama
 Takeo Yokoyama
 Geophysicist

G. R. Hilchey
 Gordon R. Hilchey
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September 20, 1967.

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2800 N



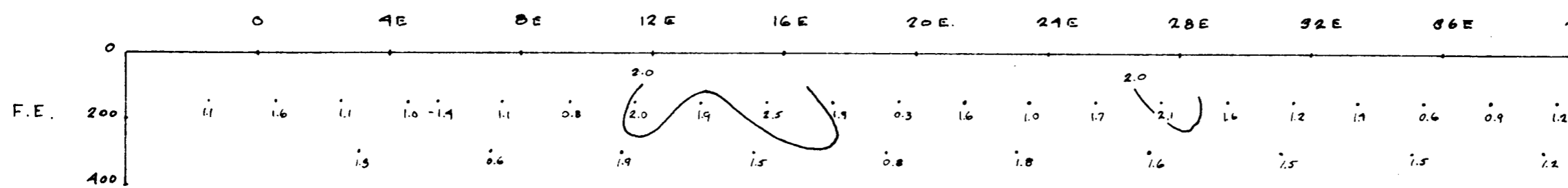
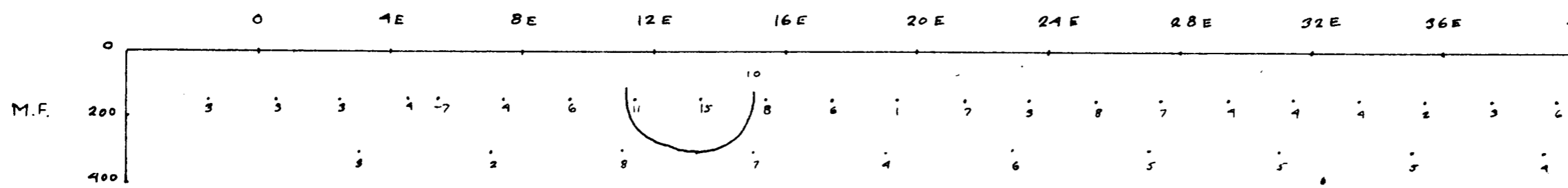
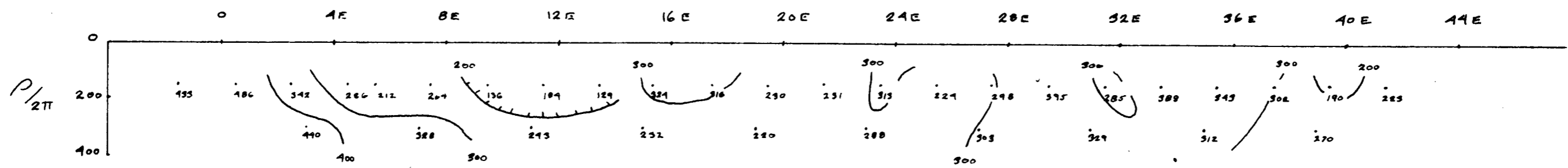
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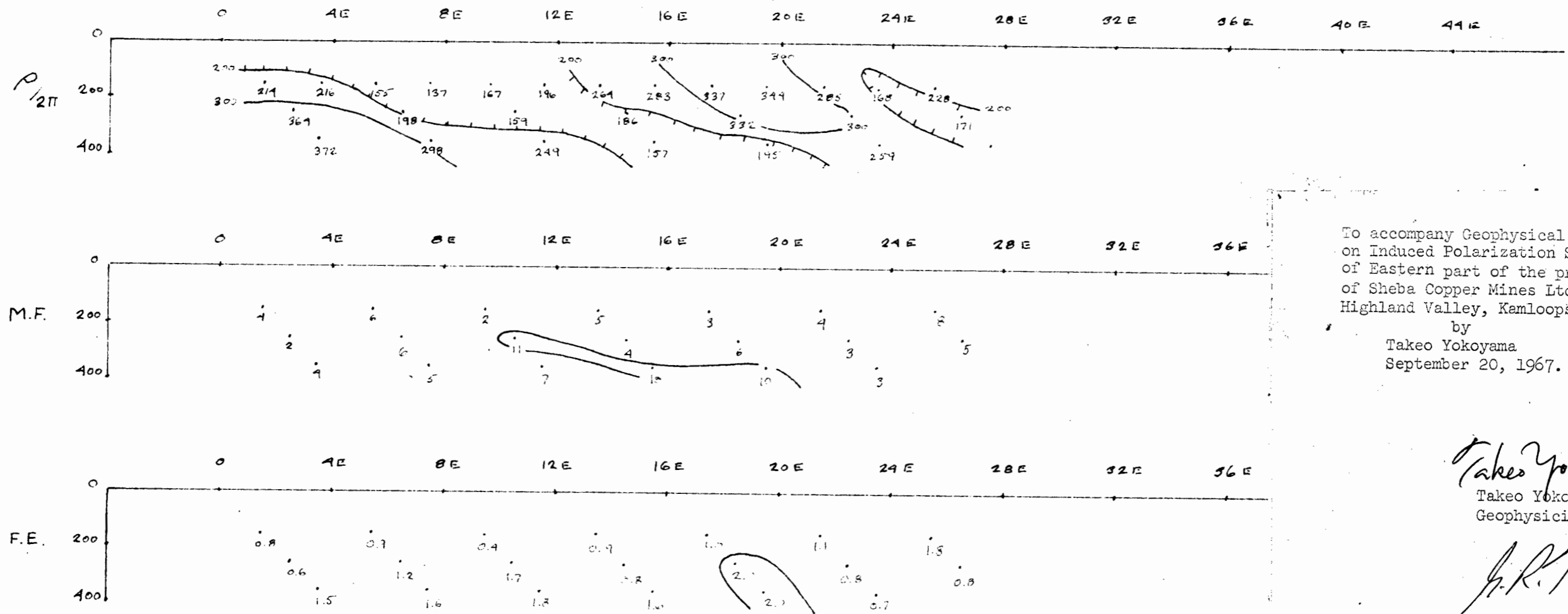
G. R. Hilchey
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800 N

POLE - DIPOLE



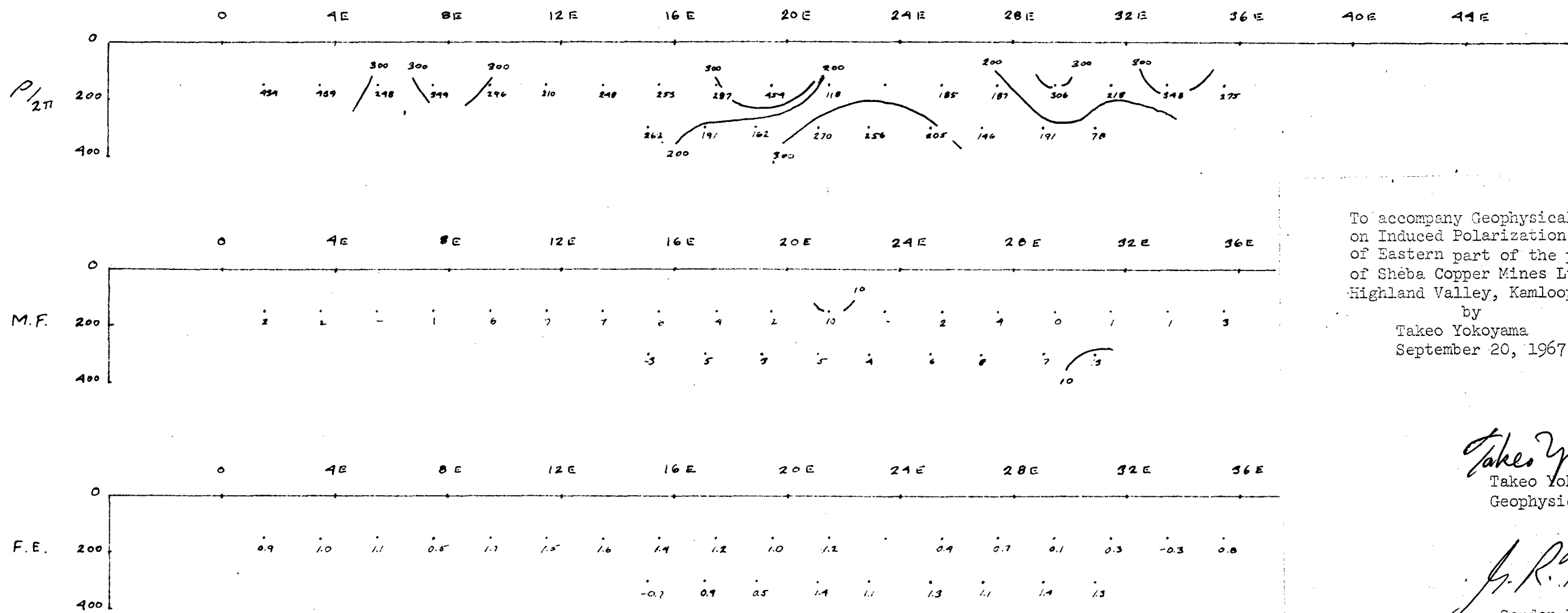
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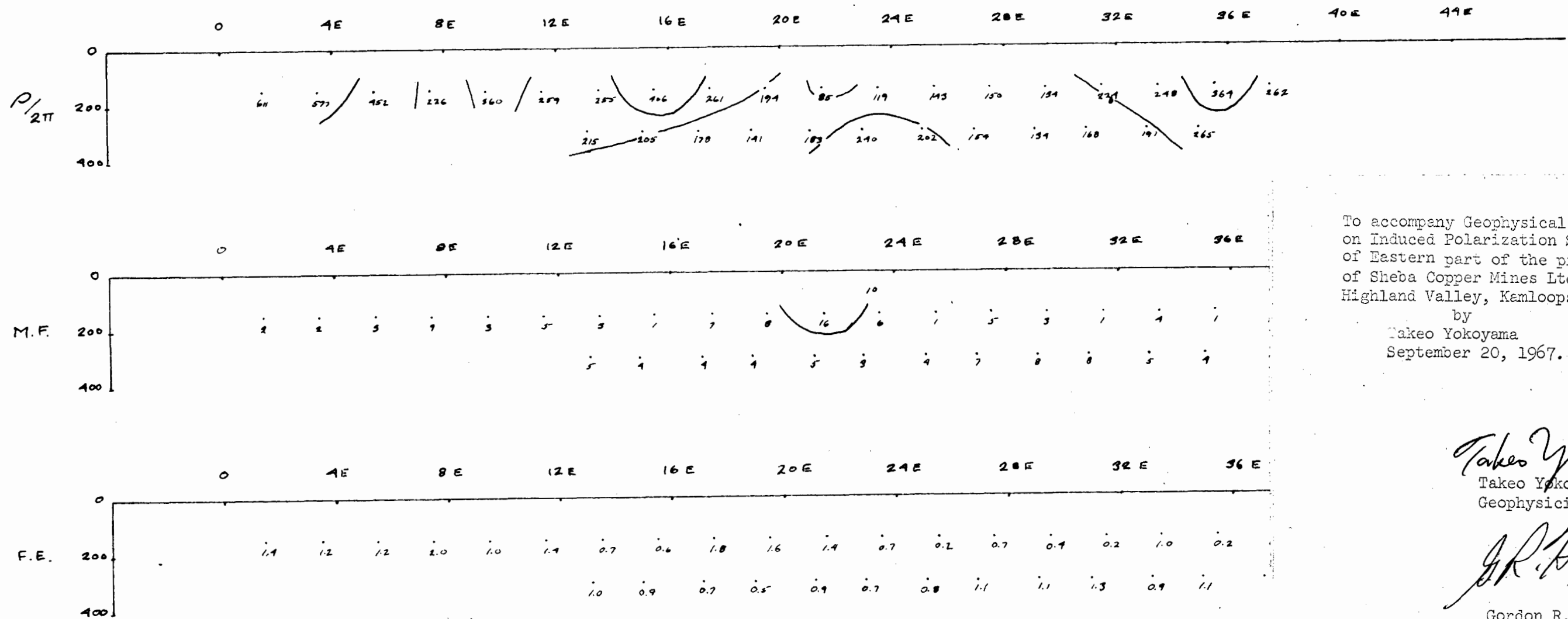
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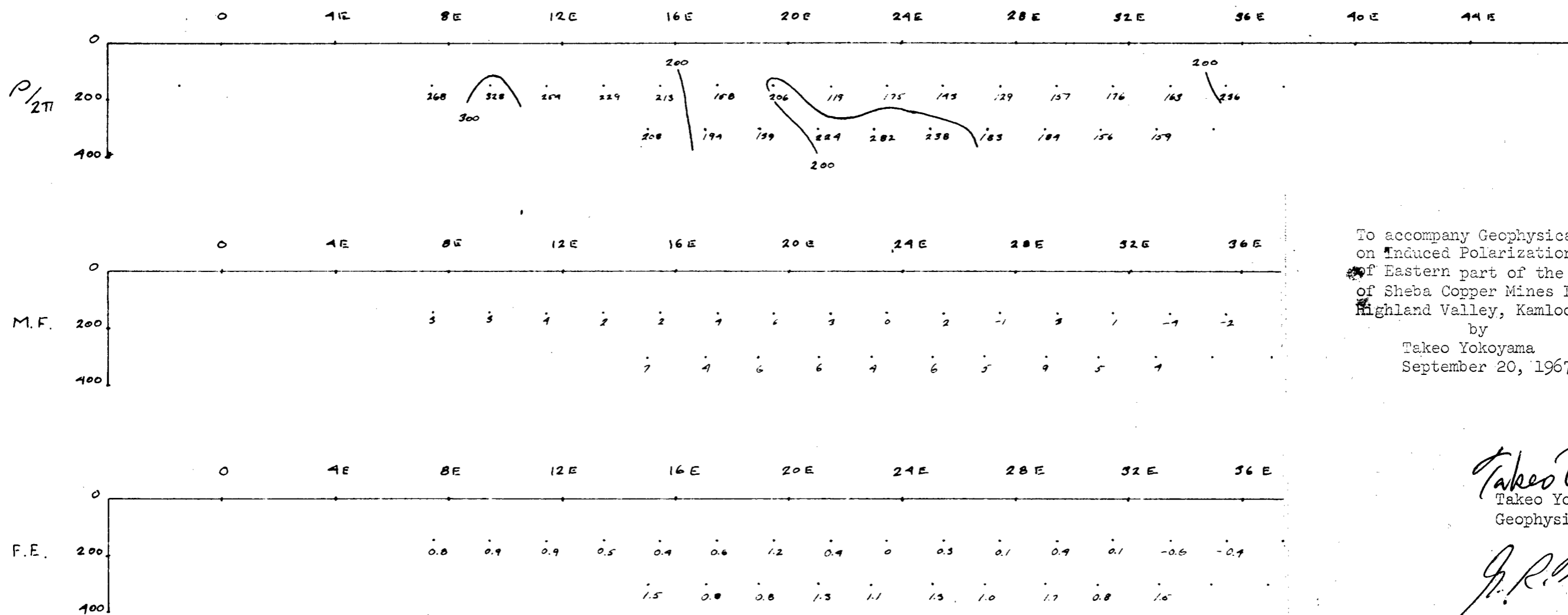
Takeo Yokoyama
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2000 S



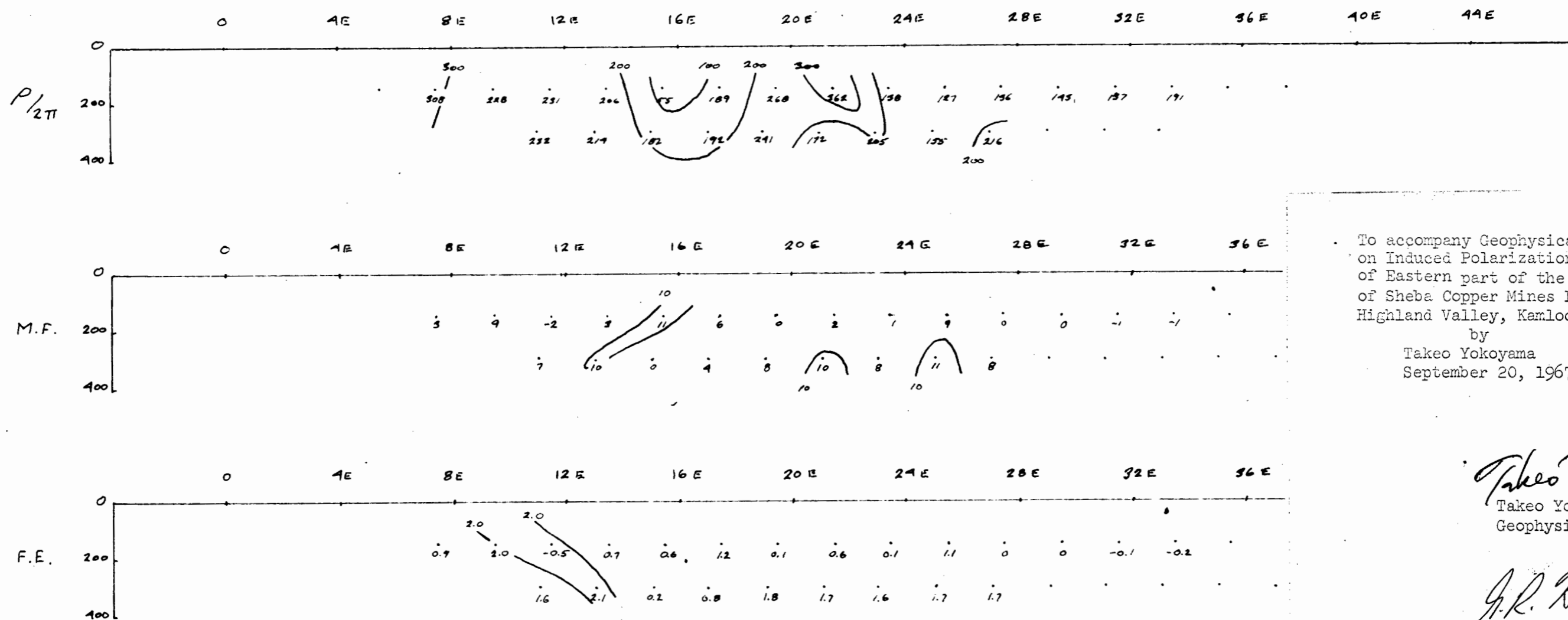
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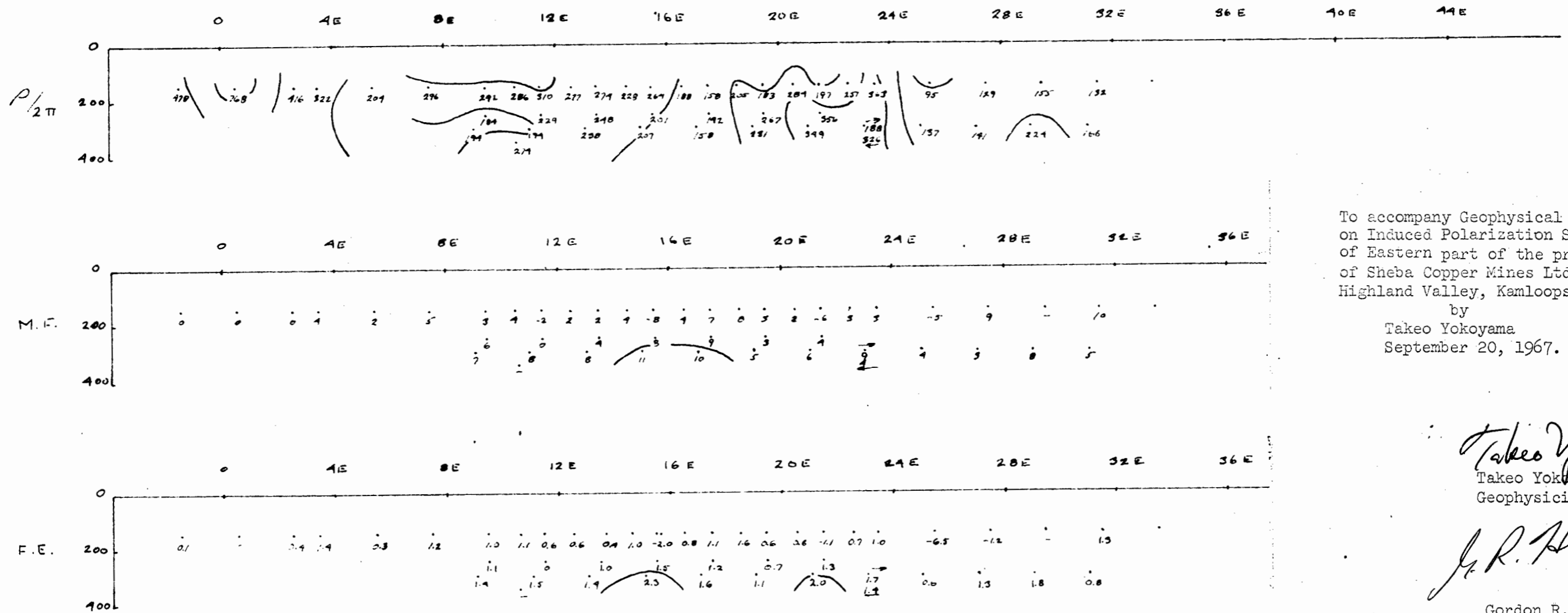
Takeo Yokoyama
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Gordon R. Hickey
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2800 S



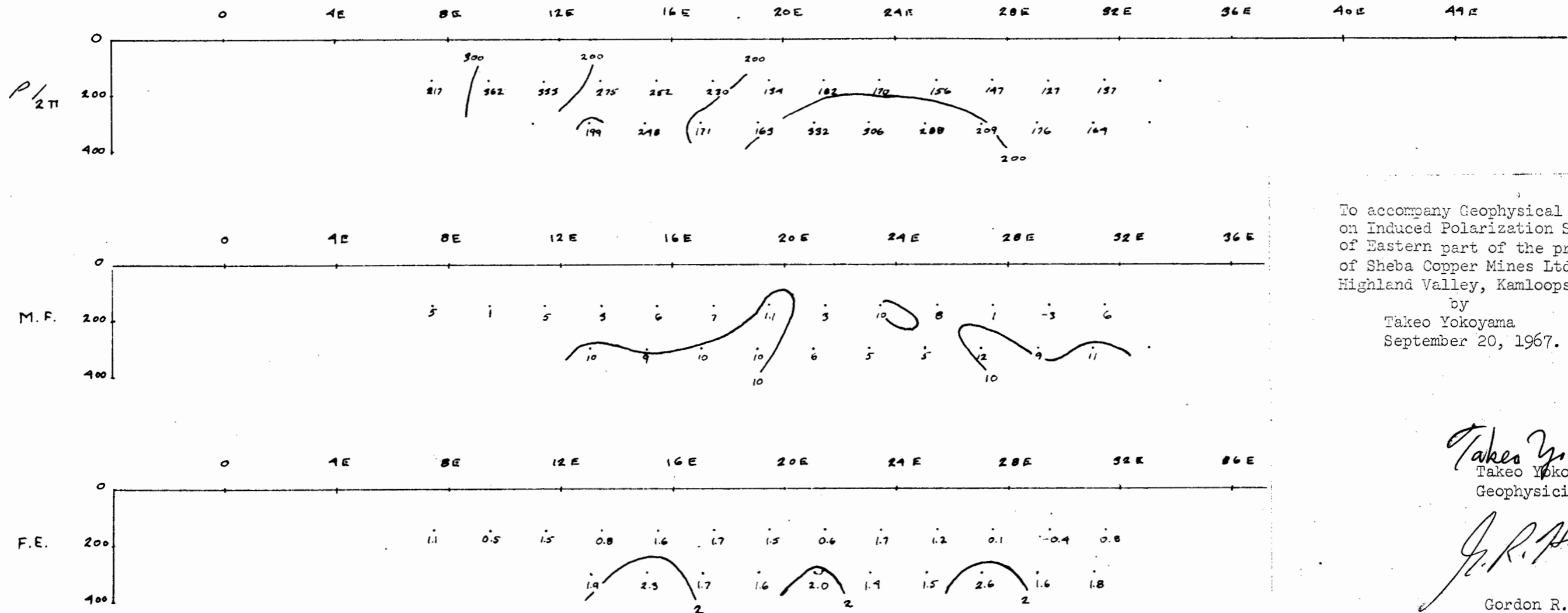
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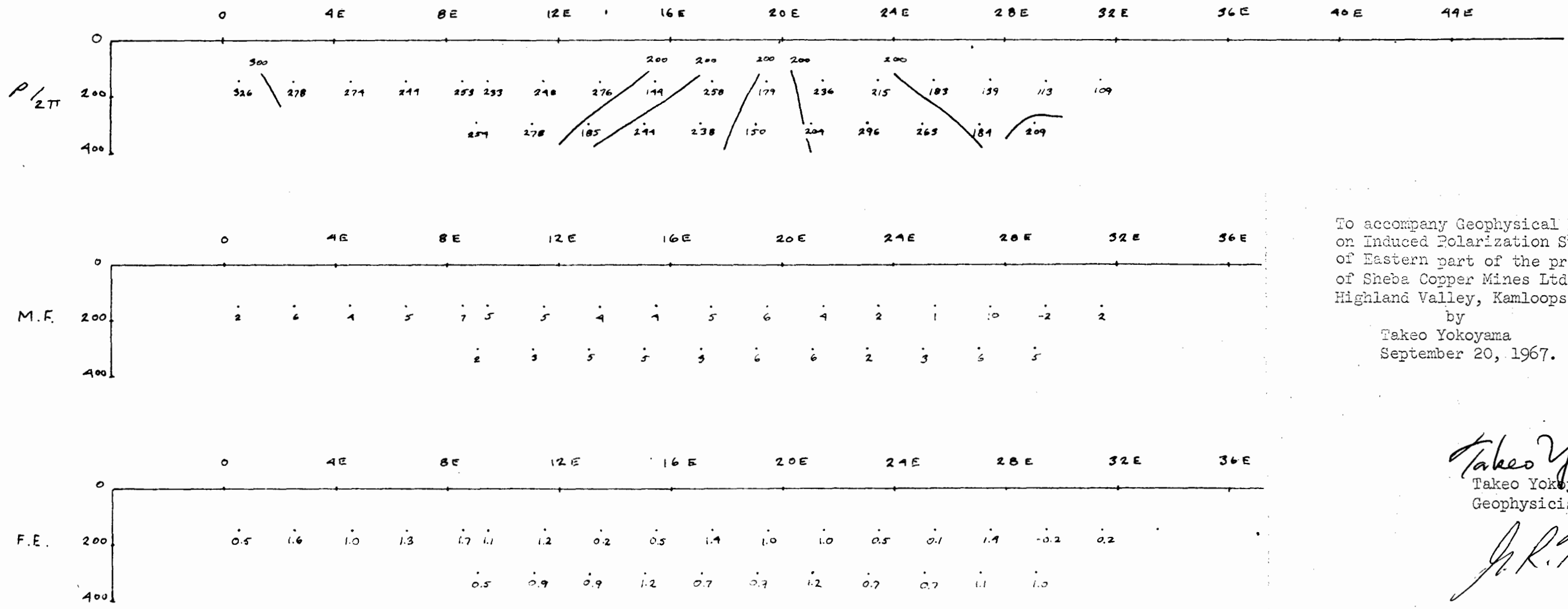
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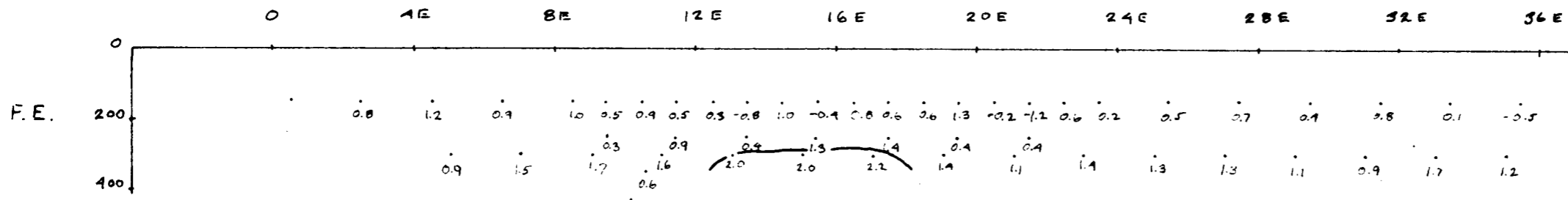
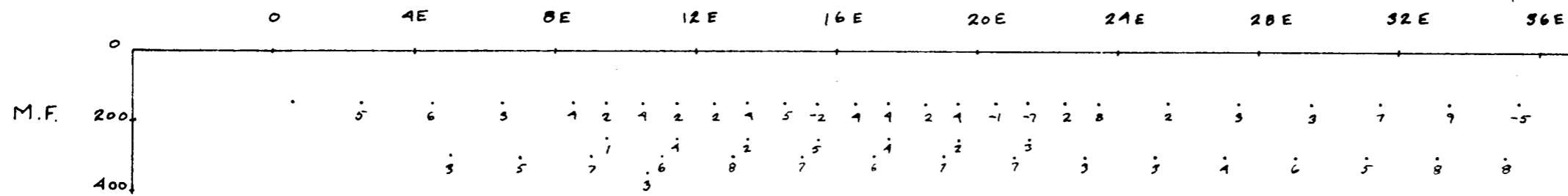
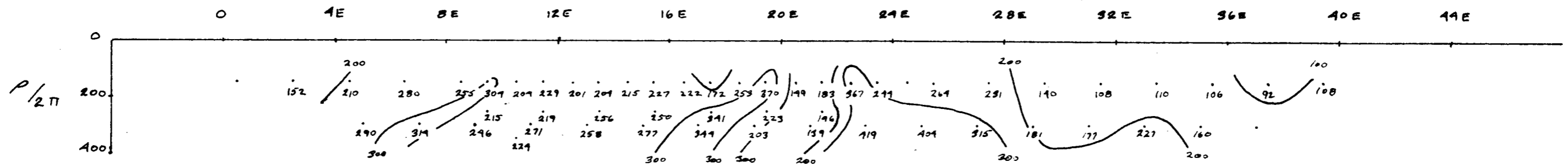
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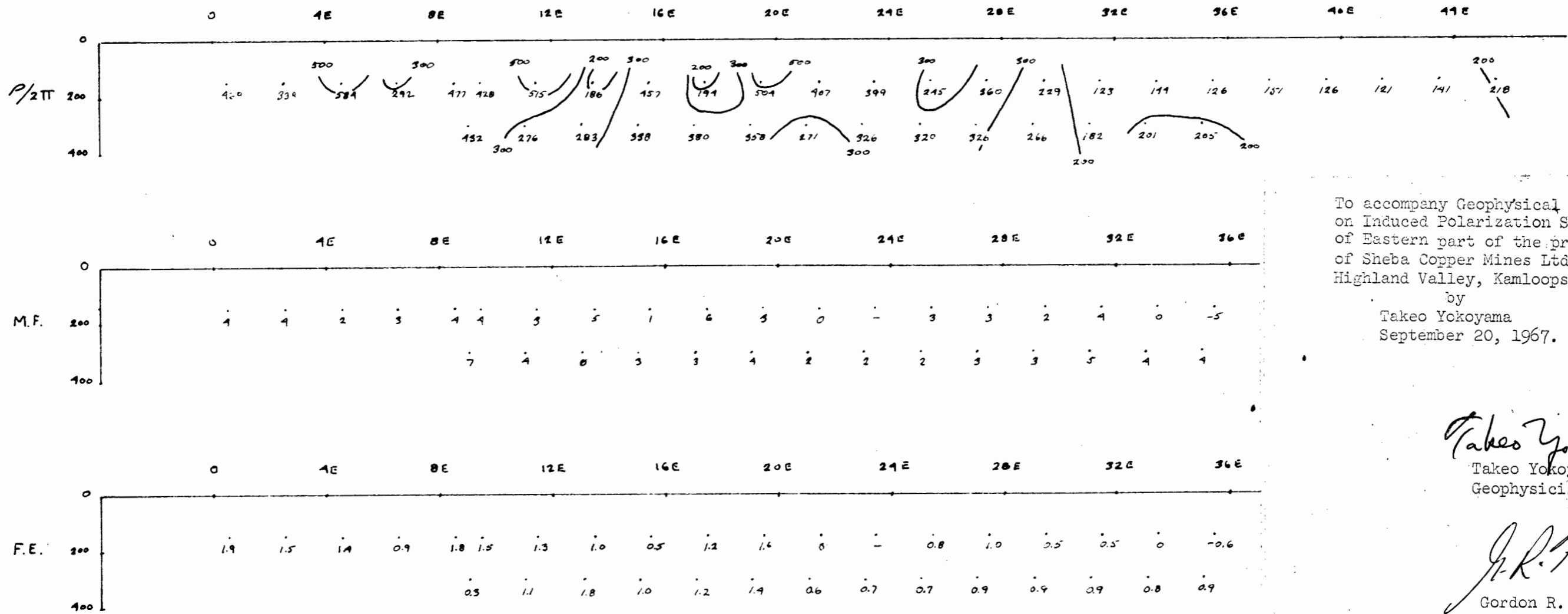
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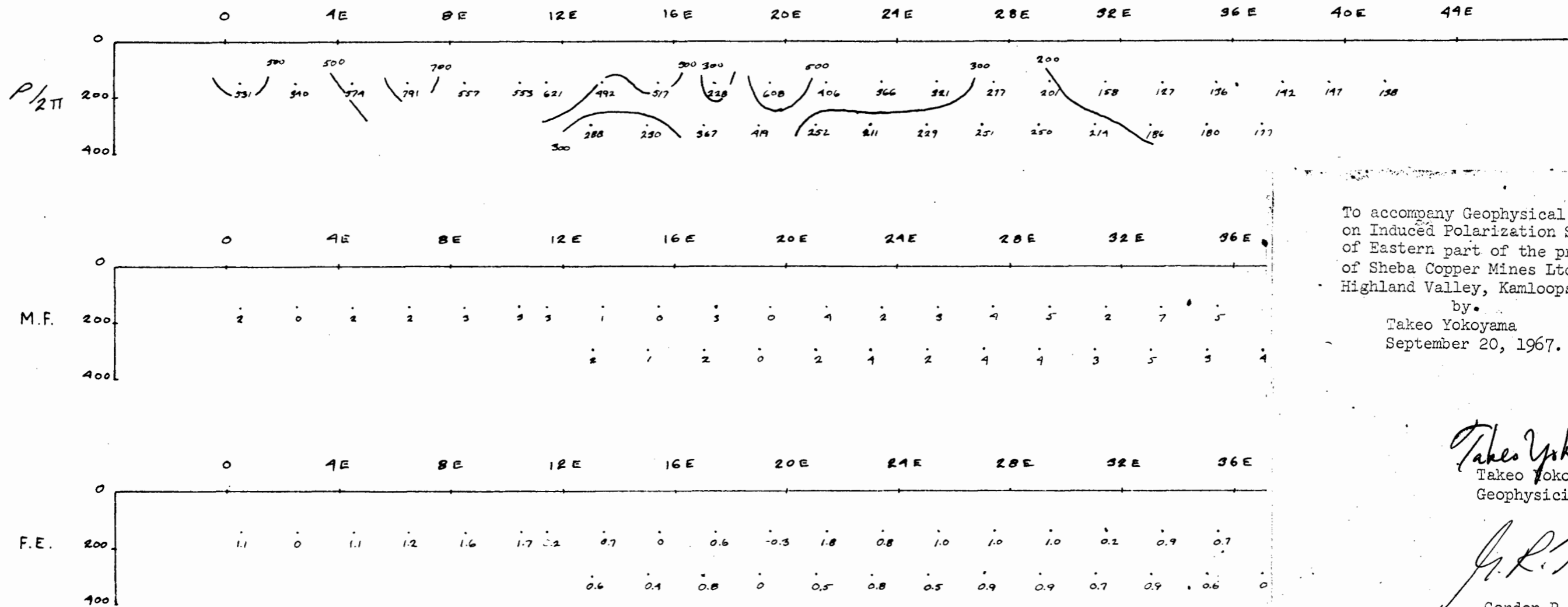
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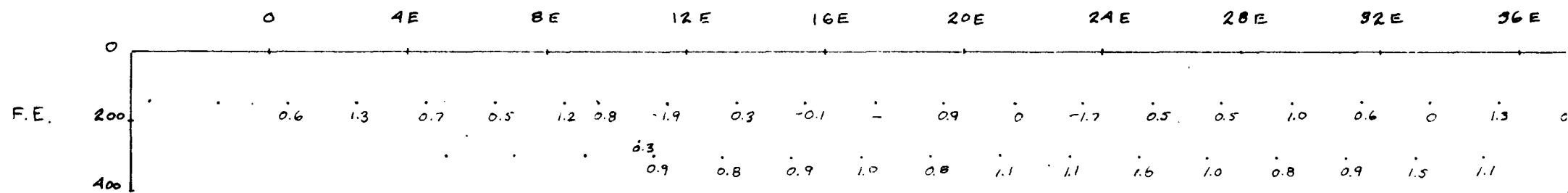
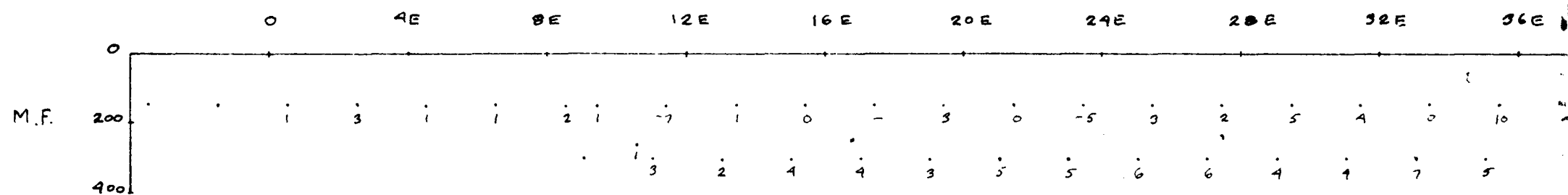
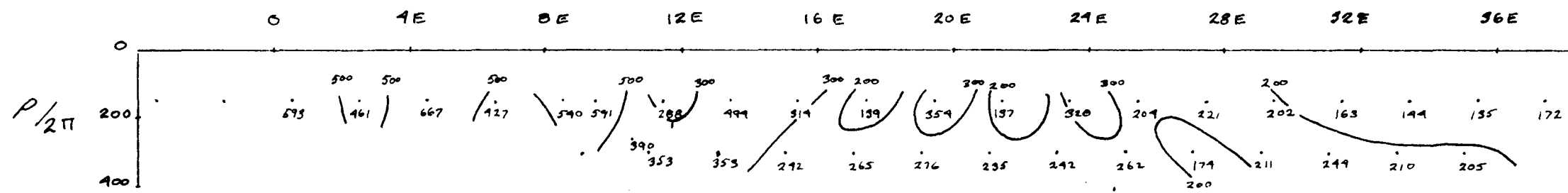
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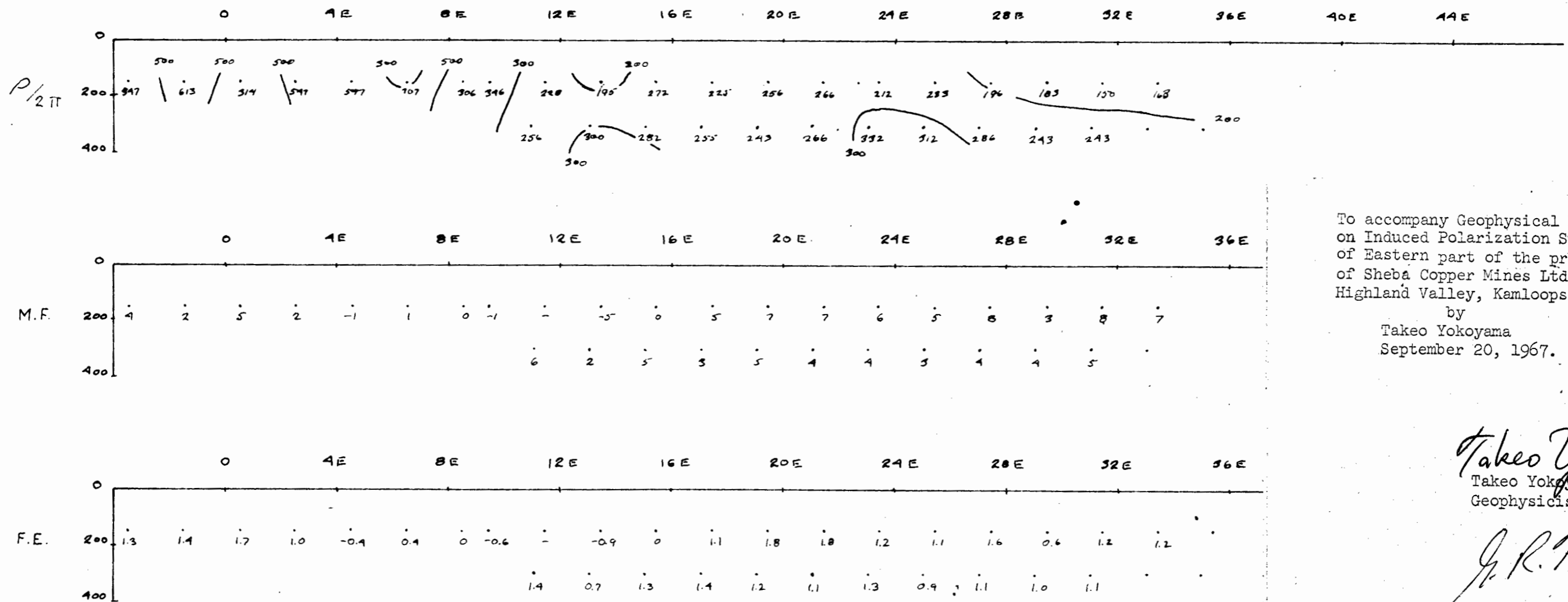
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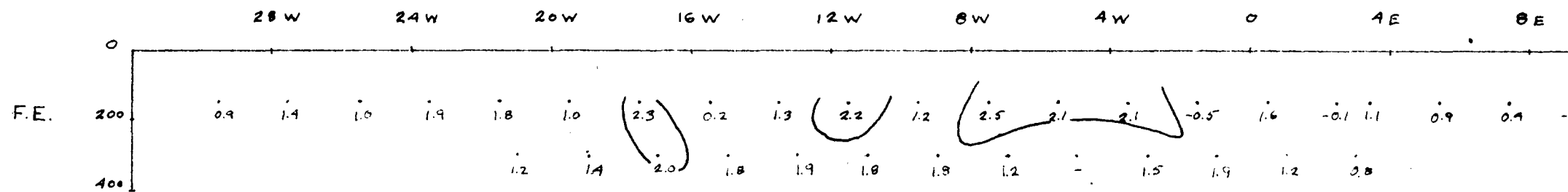
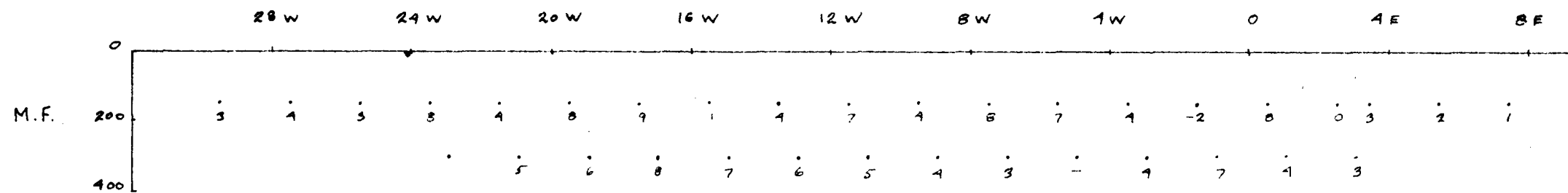
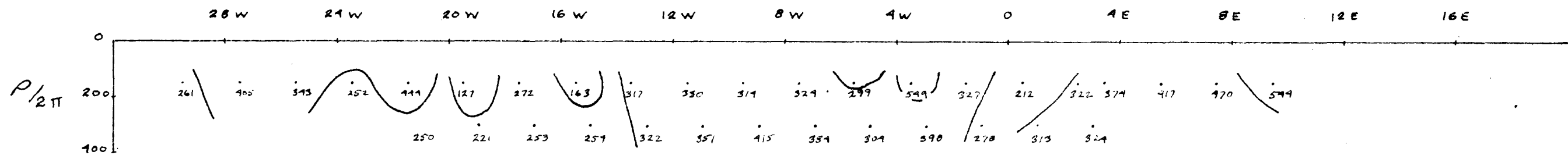
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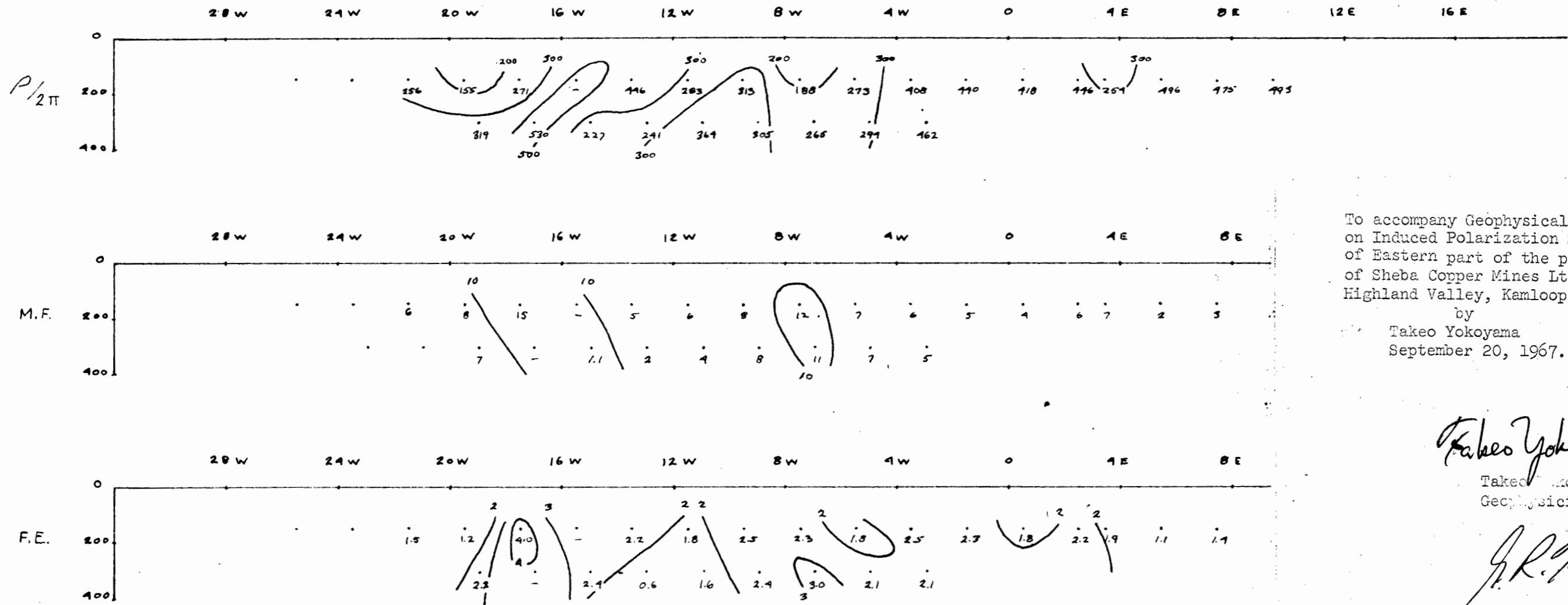
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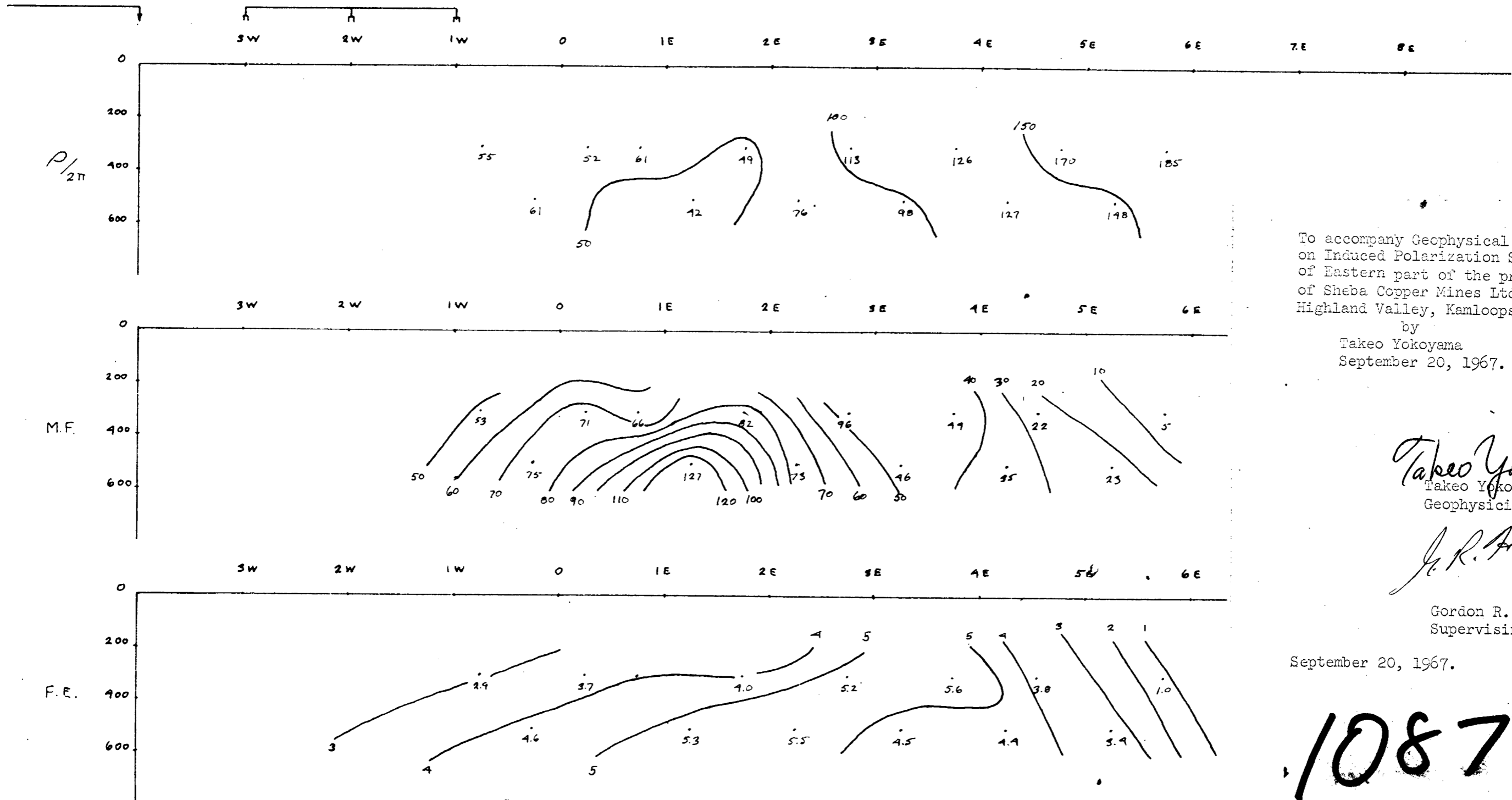
DETAIL SURVEY LORNEX ORE BODY

section profile on 15n drill line

POLE - DIPOLE METHOD

n = 1, 2
400ft separation

SCALE : 1in = 400ft



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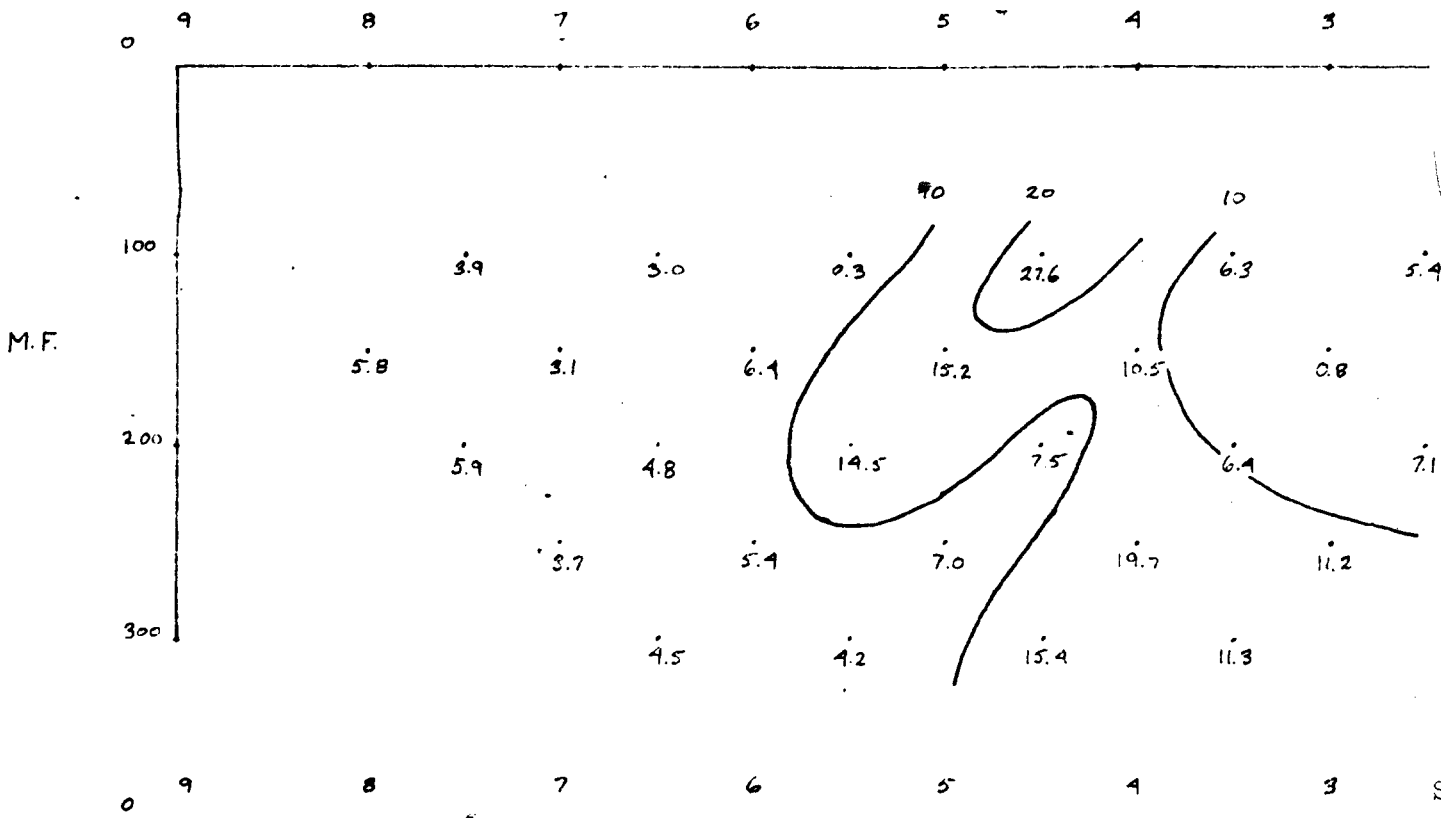
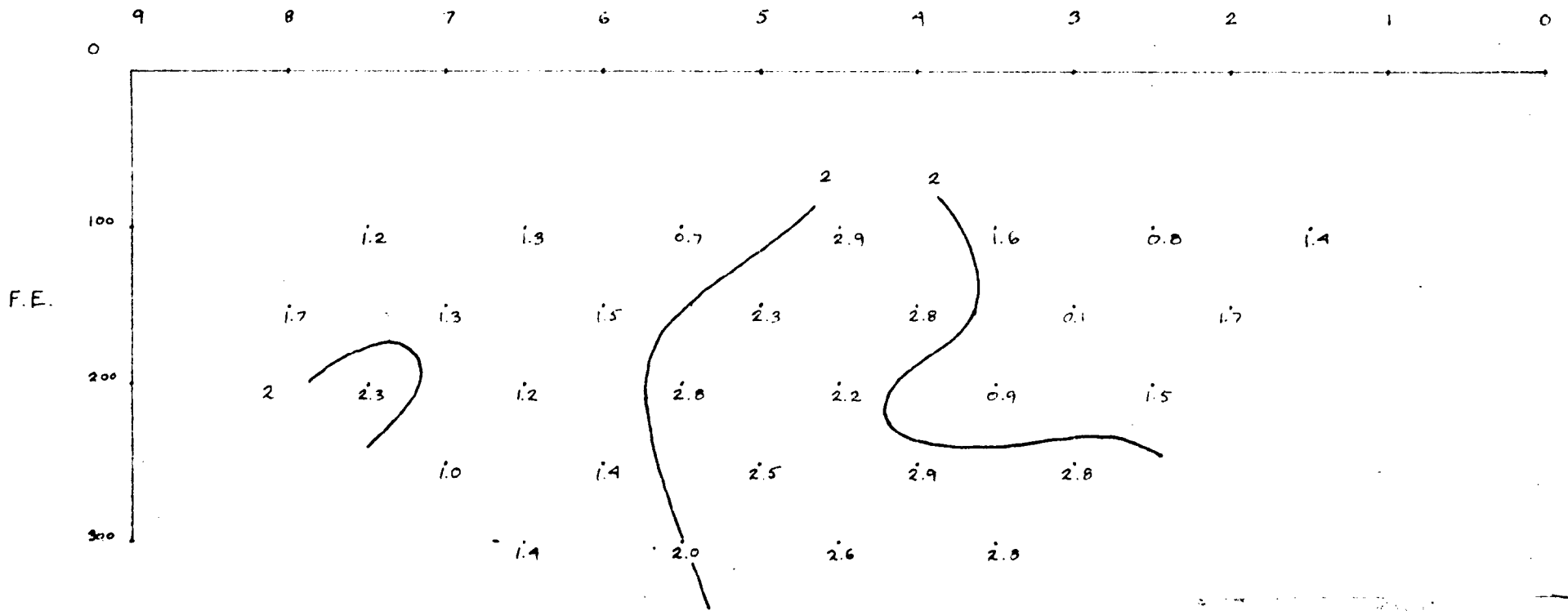
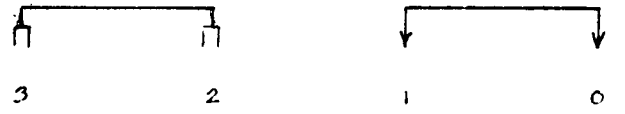
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DETAIL SURVEY ON GAZA SHOWING

SCALE : 1 in = 100 ft

DIPOLE - DIPOLE ARRAY
n=1,2,3,4,5
100 ft separation



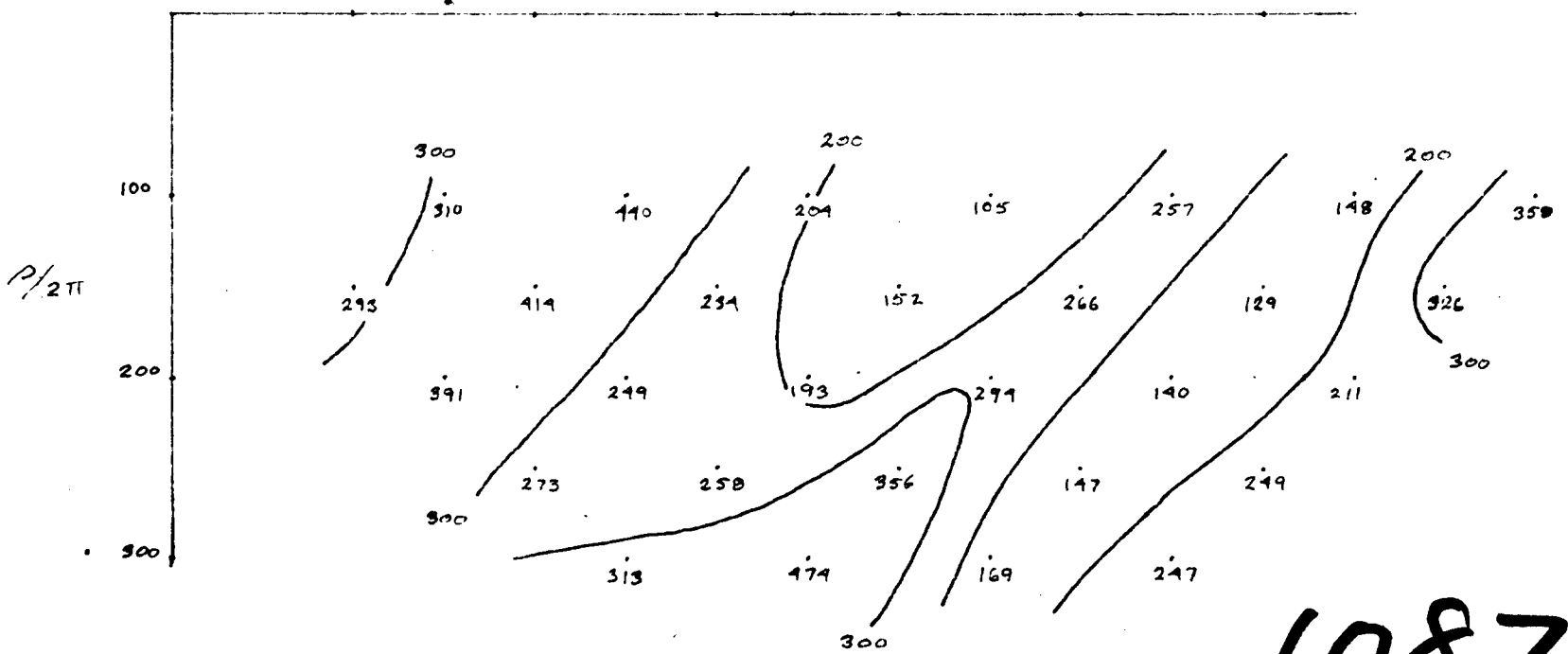
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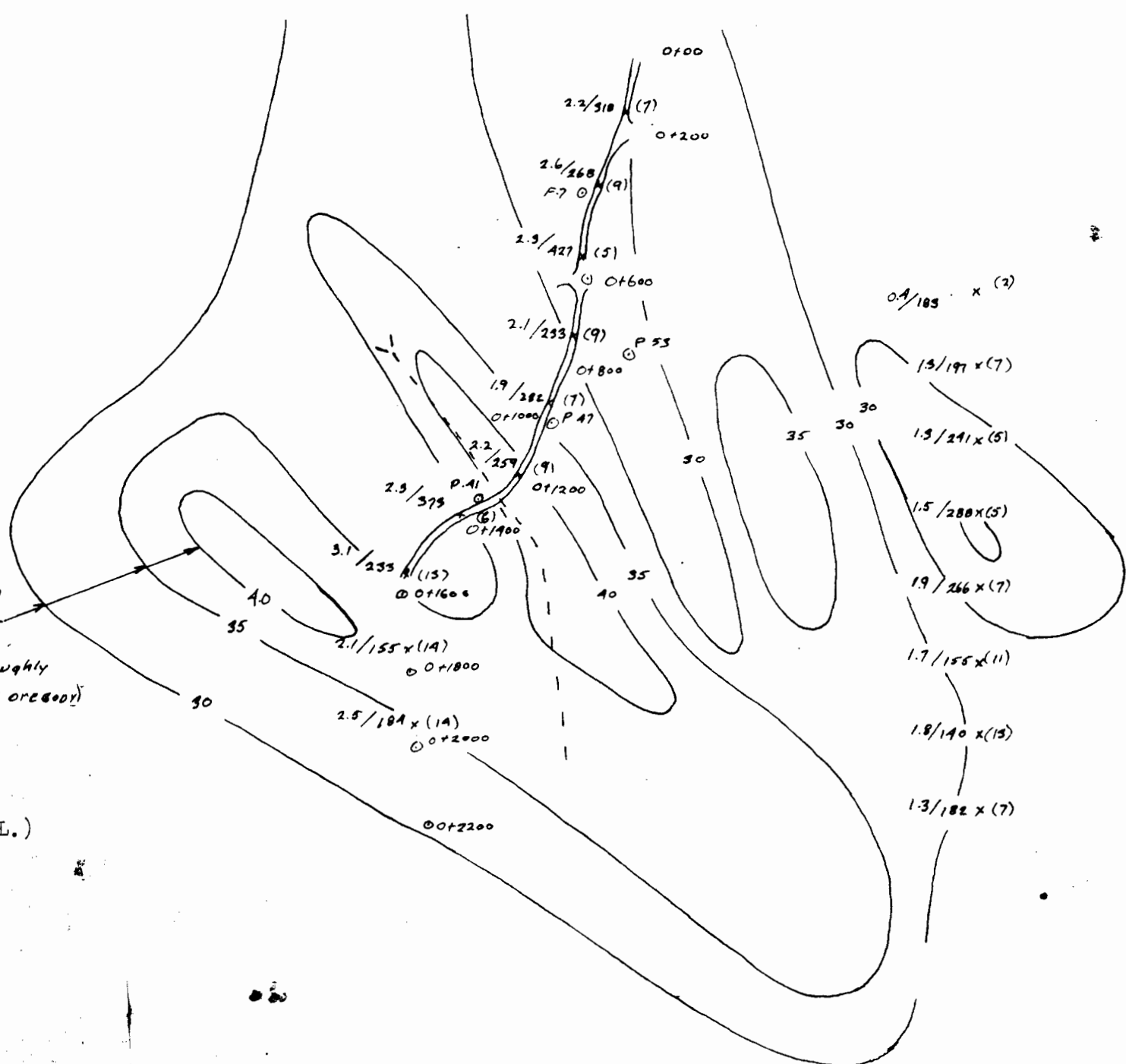
Takeo Yokoyama
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Contours on ANACONDA
IP Survey, 1964
(ANACONDA IP ANOMALY roughly
coincides with HIGHMONT OREBODY)

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I.P. - HIGHMONT PROPERTY
SCALE : 1in=400ft

○ P.41 HIGHMONT PERCUSSION
drill hole

--- Approximate location of
HIGHMONT bulk sample adit

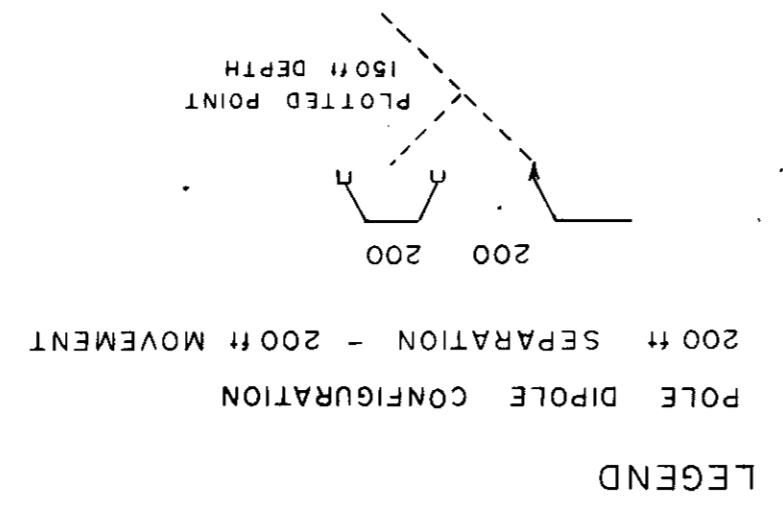
2.5/184 FREQUENCY EFFECT (%) APPARENT RESISTIVITY ($\rho/2\pi$ Ω FEET)

(14) METAL FACTOR

Pole-Dipole Configuration
200' electrode separation

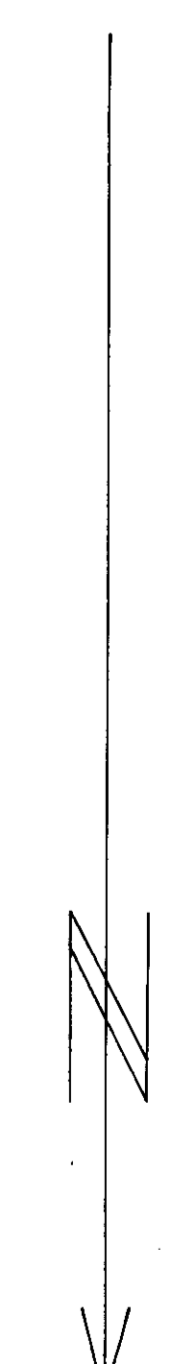
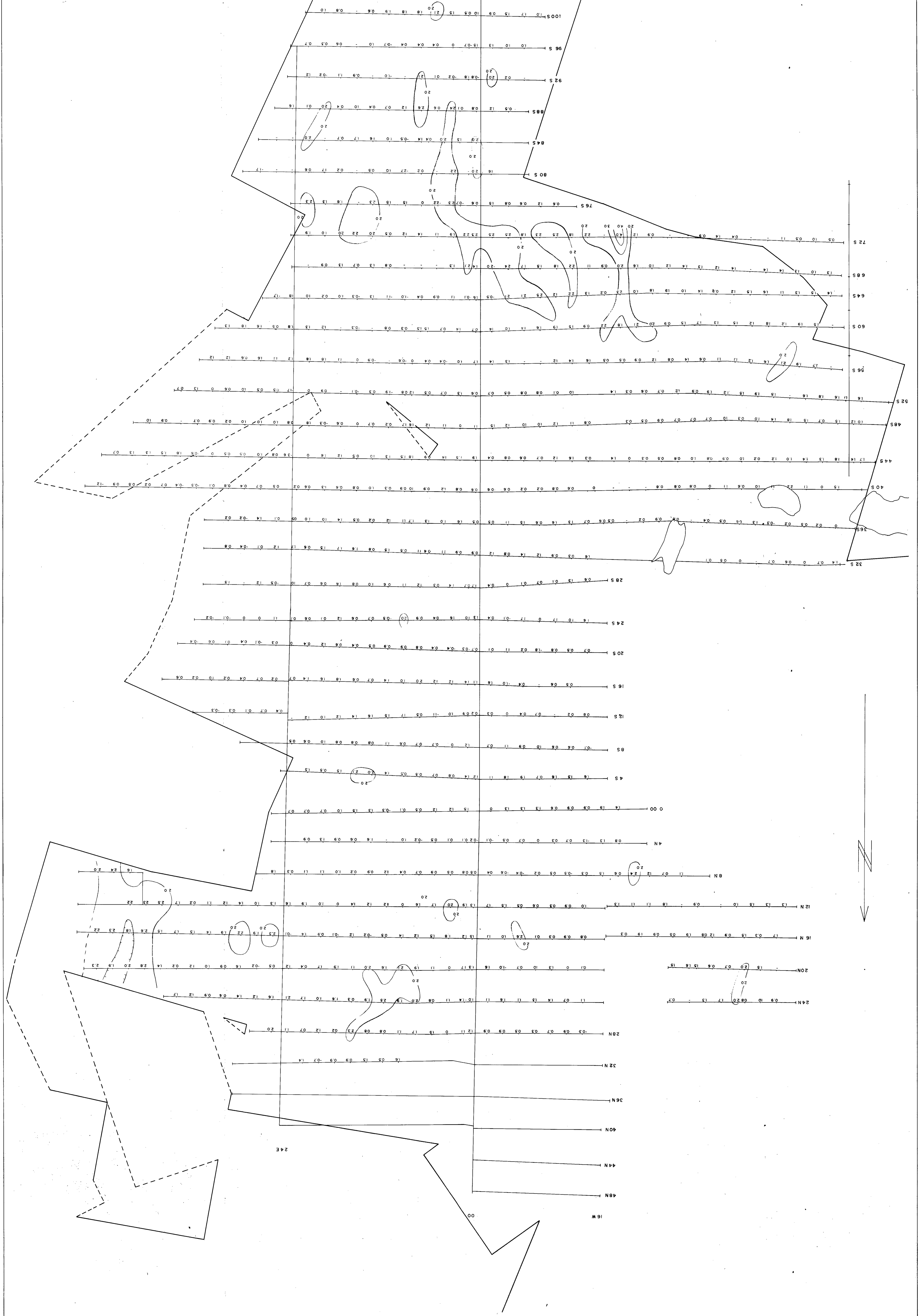
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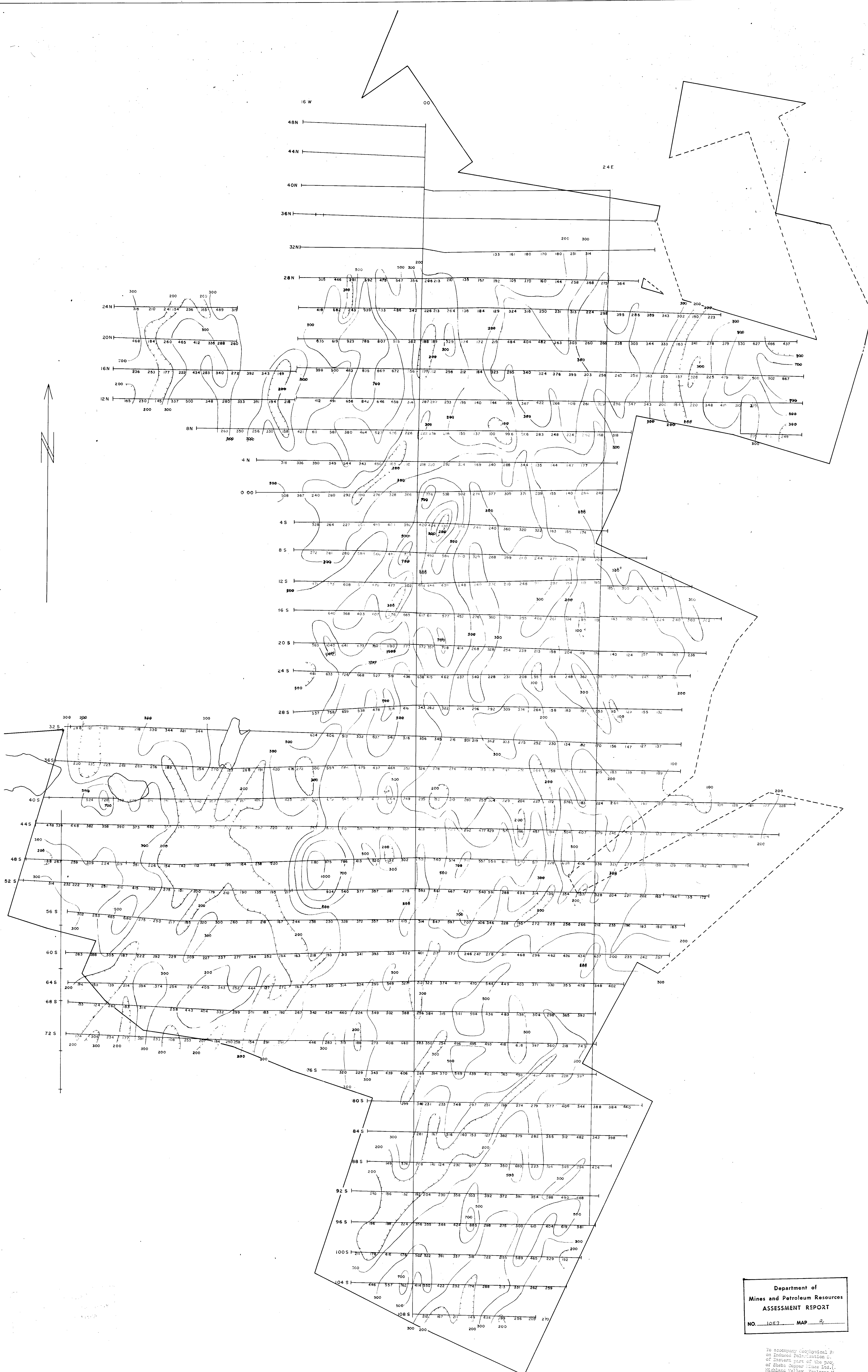
1087



September 20, 1967.
 Gordon R. Allender
 Geophysicist
 Department of Energy and Mines
 Ottawa, Ontario
 License No. 1000
 September 20, 1967.

Department of Energy and Mines
 Mineral Resources
 Assessment Report
 NO. 1087 MAP





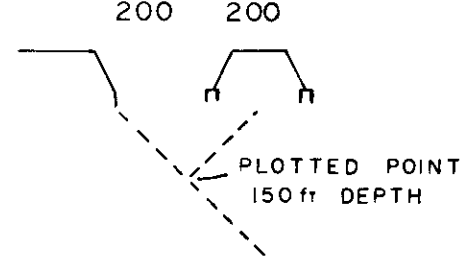
Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1087 MAP 2

To accompany Geophysical Report on Sheba Copper Mines, Eastern part of the map of Sheba Copper Mines Ltd., (Gibson Valley, Manitoba N.) by Taisa Yokoyama, September 20, 1967.

J. R. H. H. H.

September 20, 1967

LEGEND
POLE DIPOLE CONFIGURATION
200 ft SEPARATION 200ft MOVEMENT



SUMITOMO METAL MINING Co.
Of CANADA Ltd.

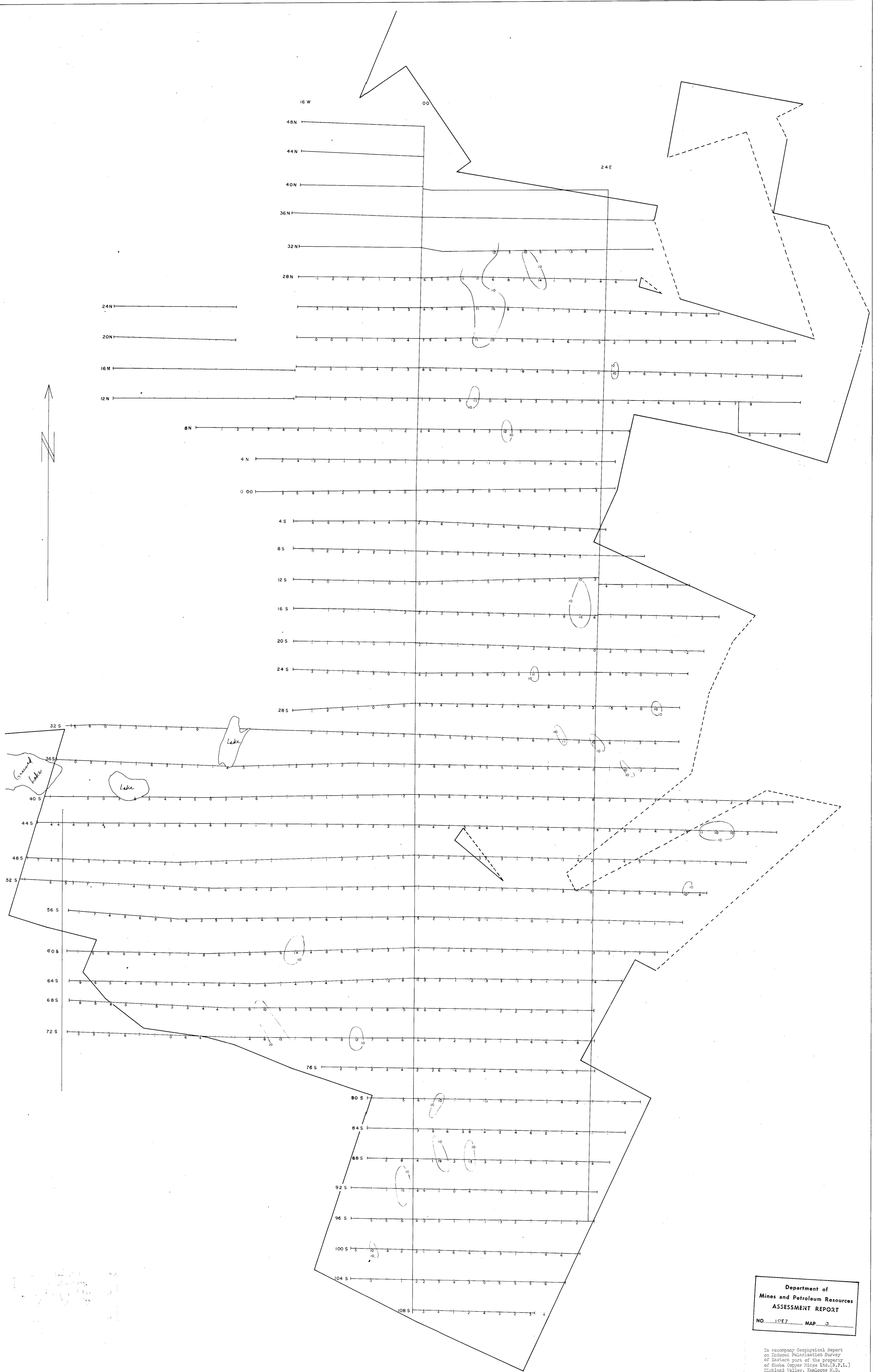
PROJECT SHEBA COPPER MINES

I.P. SURVEY
Variable Frequency Method
RESISTIVITY

SCALE: 1 inch = 400 ft
DRAWN BY: J. BYBERG
DATE: SEPT. 1967

DRAWING NO. 1-2

1087

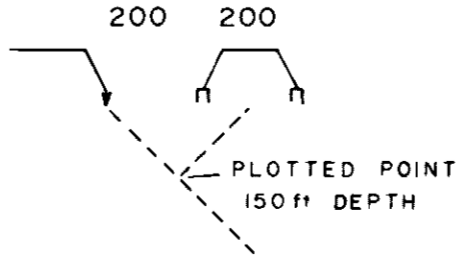


Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1087 MAP 3

To accompany Geophysical Report
on Induced Polarization Survey
of Eastern part of the property
of Sheba Copper Mines Ltd. (N.P.L.)
Highland Valley, Kamloops B.C.
by
Takao Yokoyama
September 20, 1967.

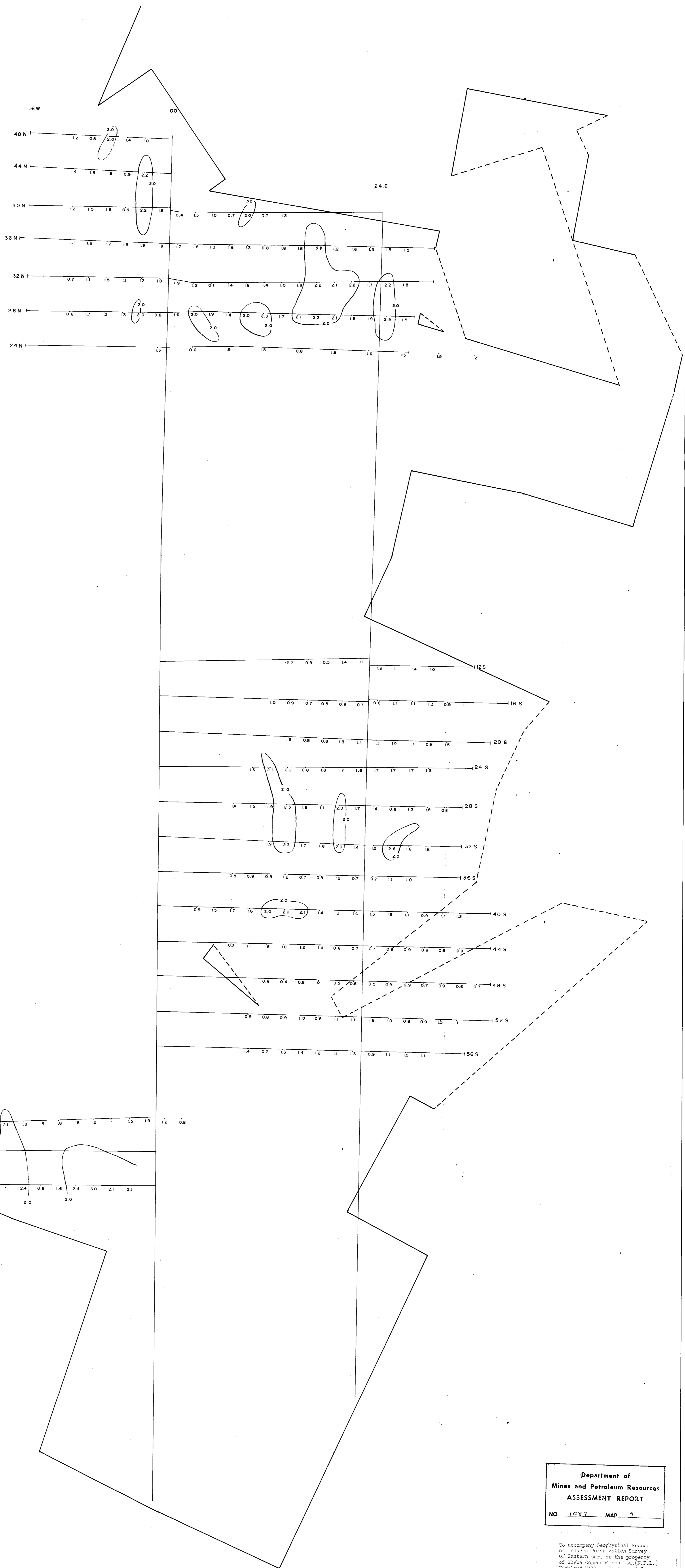
Takao Yokoyama
Geophysicist
G.R. Hickey
Supervising Engineer
September 20, 1967.

LEGEND
POLE DIPOLE CONFIGURATION
200 FT SEPARATION - 200 FT MOVEMENT



SUMITOMO METAL MINING CO.
Of CANADA Ltd.
PROJECT SHEBA COPPER MINES
I.P. SURVEY
Variable Frequency Method
METAL FACTOR
SCALE: 1" = 400 FT.
DRAWN BY: J.BYBERG
DATE: SEPT., 1967. DRAWING NO. 1-3

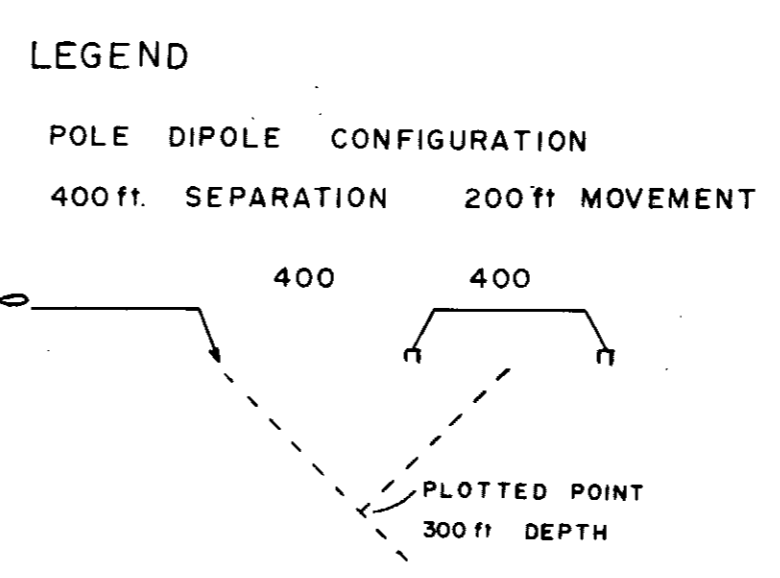
1087



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1087 MAP 4

To accompany Geophysical Report
on Induced Polarization Survey
of Eastern part of the property
of Sheba Copper Mines Ltd. (S.P.L.)
Highland Valley, Manitoba N.D.
by
Takeo Yokoyama
September 20, 1967.

Takeo Yokoyama
Takeo Yokoyama
Geophysicist
Gordon R. Hilday
Gordon R. Hilday
Supervising Engineer
September 20, 1967.



SUMITOMO METAL MINING CO.
Of CANADA Ltd.

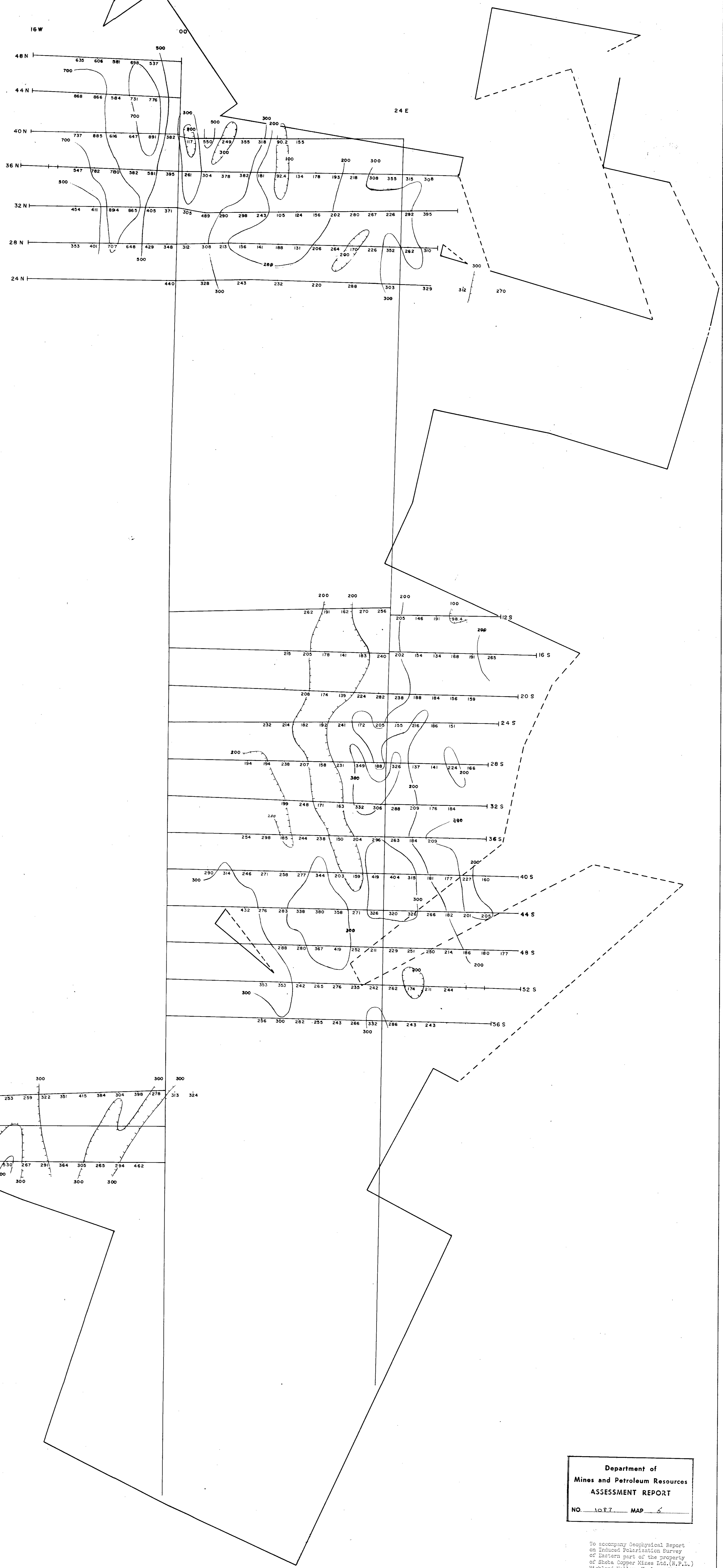
PROJECT SHEBA COPPER MINES

I.P. SURVEY
Variable Frequency Method
FREQUENCY EFFECT

SCALE 1" = 400 ft.
DRAWN BY: J.BYBEG
DATE: SEPT. 1967

DRAWING NO: 1-4

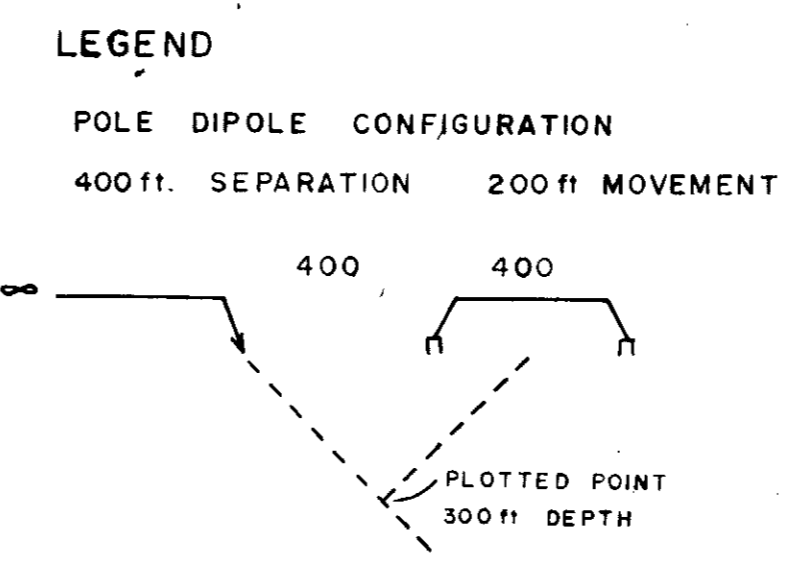
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Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1087 MAP 5

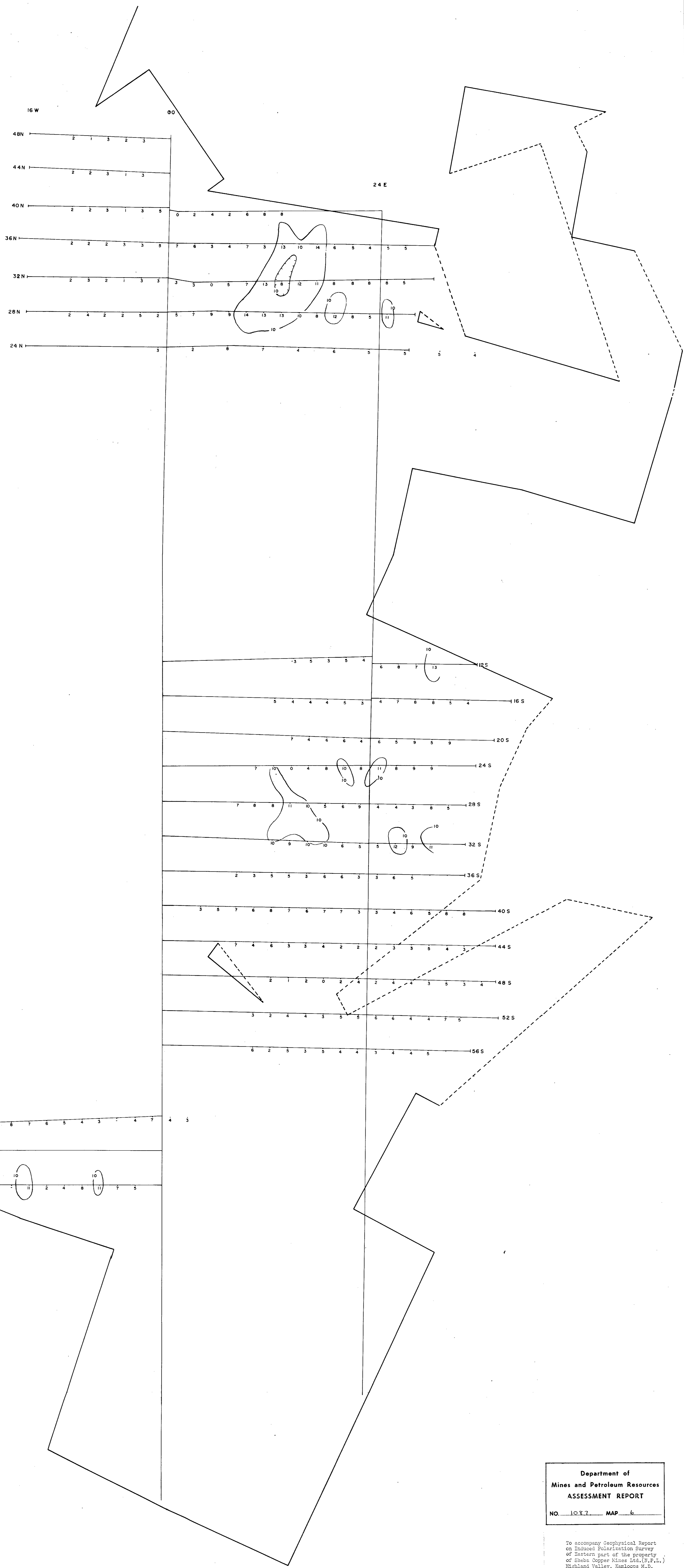
To accompany Geophysical Report on Induced Polarization Survey of Eastern part of the property of Sheba Copper Mines Ltd. (S.M.T.) Highland Valley, Kamloops B.C.
by
Takao Yokoyama
September 20, 1967.

Takao Yokoyama
Geophysicist
G.R. Hilsberg
Gordon R. Hilsberg
Supervising Engineer
September 20, 1967.



SUMITOMO METAL MINING Co.
Of CANADA Ltd.
PROJECT SHEBA COPPER MINES
I.P. SURVEY
Variable Frequency Method
RESISTIVITY
SCALE 1" = 400 ft
DRAWN BY J.BYBERG
DATE SEPT., 1967
DRAWING NO. 1-5

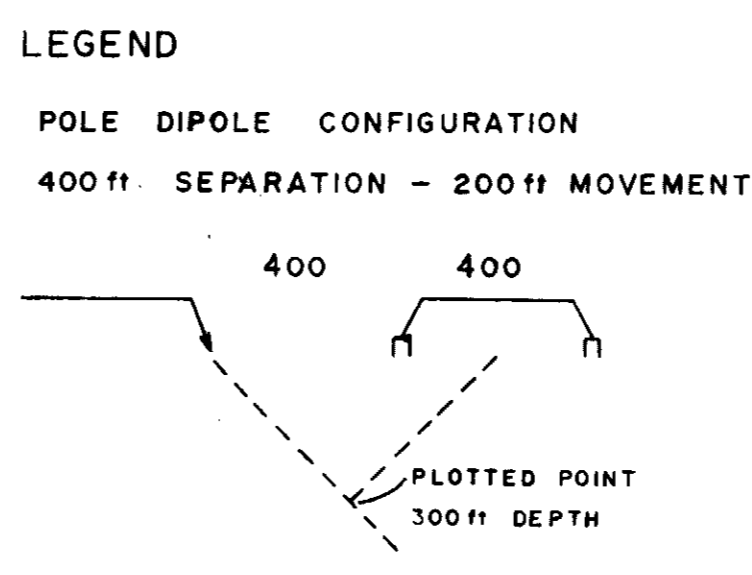
1087



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1087 MAP 6

To accompany Geophysical Report
on Induced Polarization Survey
of Eastern part of the property
of Sheba Copper Mines Ltd. (N.F.L.)
Highland Valley, Kamloops N.B.
by
Takeo Yokoyama
September 20, 1967.

Takeo Yokoyama
Geophysicist
G.R. Hickey
Geoson P. Hickey
Supervising Engineer
September 20, 1967.



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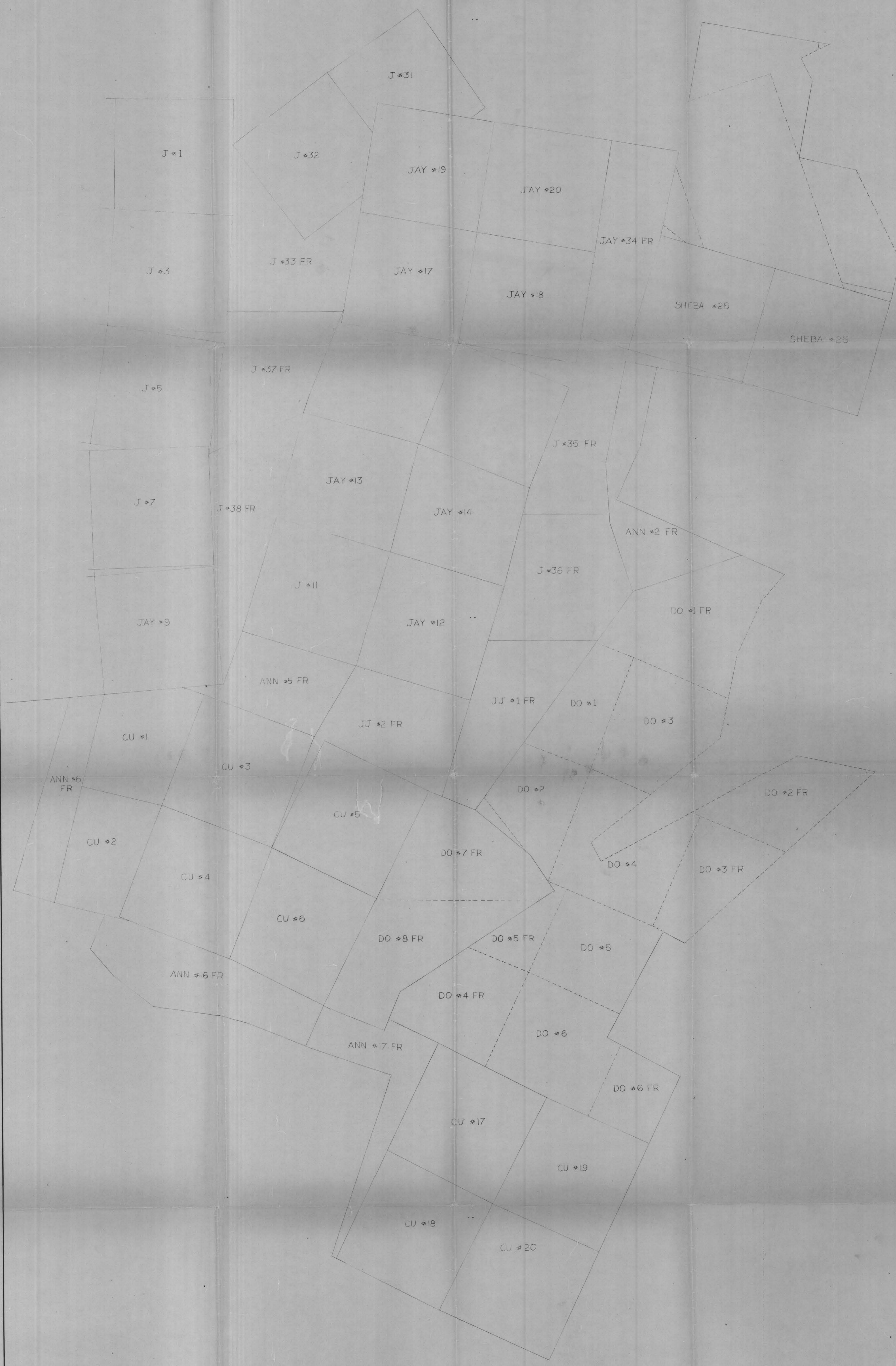
SUMITOMO METAL MINING Co.
Of CANADA Ltd.

PROJECT SHEBA COPPER MINES

I.P. SURVEY
Variable Frequency Method
METAL FACTOR

SCALE 1 in = 400 ft
DRAWN BY J.BYBERG
DATE SEPT, 1967

DRAWING NO. 1-6



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1087 MAP 8

To accompany: GEOPHYSICAL REPORT ON
INDUCED POLARIZATION SURVEY OF EASTERN
PART OF THE PROPERTY OF SHEBA COPPER
MINES LTD. (N.P.L.), HIGHTLAND VALLEY,
KAMLOOPS M.D. by: Takeo Yokoyama
Sept 20, 1967

1087

Gordon R. Hickey, P.Eng.
Supervising Engineer

SUMITOMO METAL MINING Co.
of CANADA Ltd.
PROJECT: SHEBA COPPER MINES
CLAIM MAP
(EAST HALF)
OVER-LAY
SCALE: 1" = 400'
DRAWN BY: L.G.A.
DATE: SEPT., 1967
DRAWING NO: 1-B