GEOPHYSICAL REPORT

On

Induced Polarization and Ground Magnetic Surveys

On the

Met, San and Tan Groups

(Hump 1, 2, 3, 4, 5, 6, 7, 8, 21,
22, 29, 85, 86, 93, 94)

Liard Mining Division

Four Miles Northwest of Metsantan Lake

57°28'N, 127°25'W

For

Sullivan and Rodgers

by

Hidetaka Yoshida, M. Tech., Geophysicist

Kiyoshi Kawasaki, B. Tech., Geophysicist

July 20 to August 2, 1973

T. Rodgers
5.XI.73

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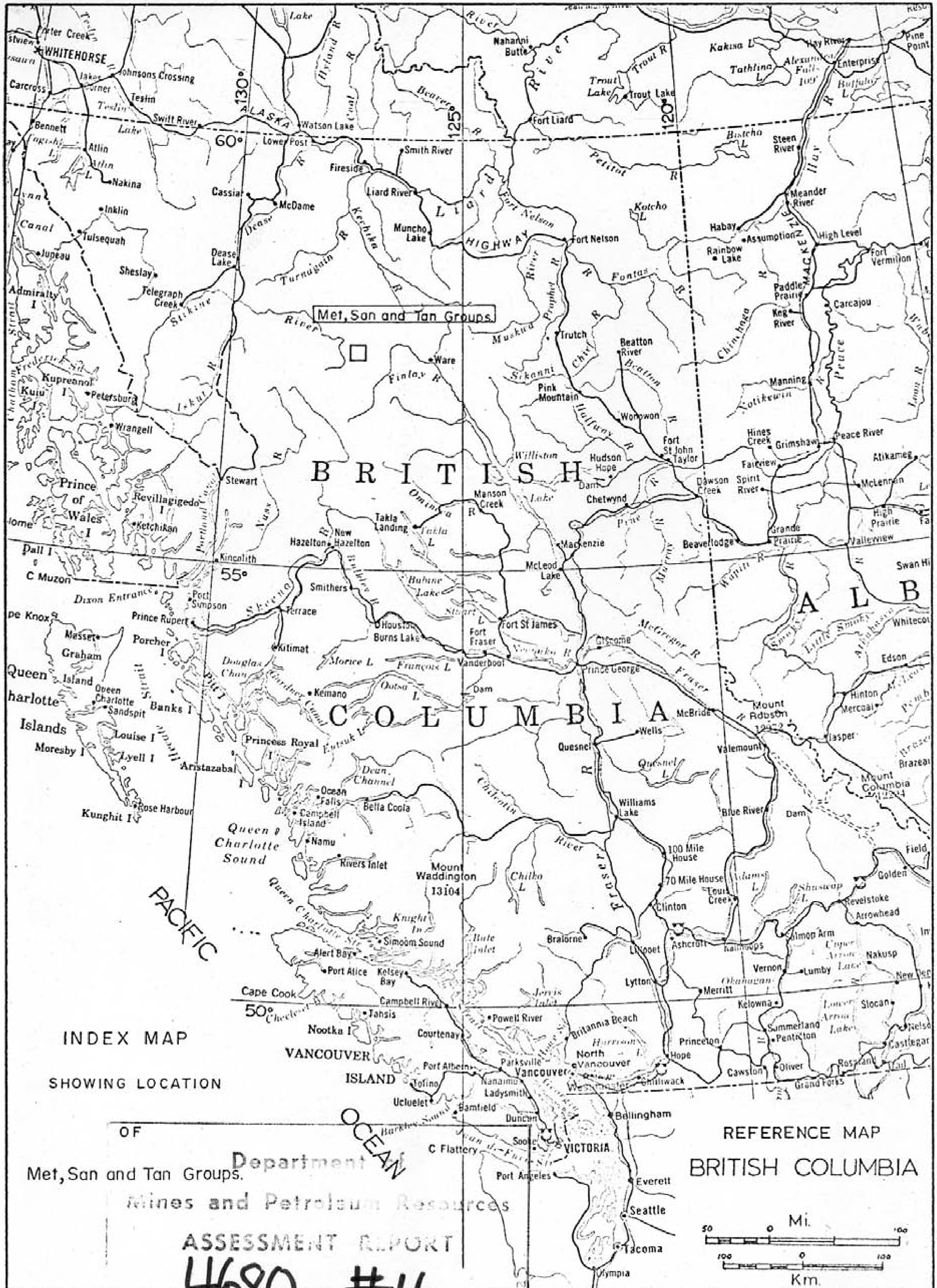
MAPS TO ACCOMPANY GEOPHYSICAL REPORT

BY H. YOSHIDA AND K. KAWASAKI



Department of Mines and Petroleum Resources
ASSESSMENT REPORT
4680 #4
NO. .... MAP ....

I. INTRODUCTION

On the basis of the results of geochemical surveys made in the Alberts Hump area by SUMAC MINES LTD. in 1971, about 100 claims were staked in early 1972.

Following the interpretation of the result of the geochemical surveys of 1972, an additional 36 claims were staked in 1973. An exploration programme including geological, detailed geochemical and geophysical surveys, was carried out in 1973. Six lines (a total of 5.5 line miles) were prepared for an I,P. survey. A magnetic survey was also carried out on July 24th and August 2nd.

II. I.P. AND RESISTIVITY SURVEY

1) SPECIFICATION

The induced polarization (I.P.) survey was carried out from July 22nd to 29th, 1973 by using a pulse-type system manufactured by Huntec Limited of Toronto, Ontario. Measurements with this system are made in the time domain.

The system consists basically of three units: a receiver, a transmitter and a motor generator. The transmitter, which provides a maximum of 2.5 Kw. D.C. to the ground, obtains its power from the 2.5 Kw. 400 cycle three phase generator which is driven by a goasoline engine. The cycling rate of the transmitter is 2.0 seconds "current on" and 2.0 seconds "current off", the pulse reversing continuously in polarity. The data recorded in the field consists of careful measurements of the current (I) in amperes flowing through electrode C_1 and C_2, the primary voltage (V_p) appearing between the potential electrodes, P_1 and P_2, during the "current on" part of the cycle and a secondary or overvoltage (V_s) appearing between

P_1 and P_2 during the "current off" part of the cycle. The apparent chargeability (MA) is calculated by dividing the secondary voltage by the primary voltage. The apparent resistivity is proportional to the ratio of the primary voltage and the measured current. The proportionality factor depends on the geometry of the array used. The chargeability and resistivity obtained are called apparent as they are values which that portion of the earth sampled would have, if it were homogeneous. As the earth sampled is usually inhomogeneous, the calculated apparent chargeability and resistivity are functions of actual chargeability and resistivity of the rocks.

The survey was carried out using the "gradient array" method of surveying. In this method of surveying the two current electrodes, C_1 and C_2, are placed a large distance "2Δ" (Δ = 4,000 feet) apart and are in a fixed position. The potential electrodes are held at a constant separation "a" (a=400 feet) and moved along lines parallel to the line joining C_1 and C_2. The line spacing was 800 feet. The separation "a" between P_1 and P_2 is not rigidly specified but should not be greater than $\Delta/10$.

The apparent resistivity is found from:

$$\rho a = \frac{\Delta^2}{a} \cdot K^1 \cdot \frac{\bar{V}_p}{I_g}$$ (See Figure 1)

where: apparent resistivity (ohm-ft./2)

$$K^1 = 0.61\pi / \left(\frac{1-D}{2^2+(1-D)^2} \quad 3/2 + \frac{1+D}{2^2+(1+D)^2} \right)$$

$Z = X/\Delta$

$D \doteq d/\Delta$

$\Delta = 4{,}000'$

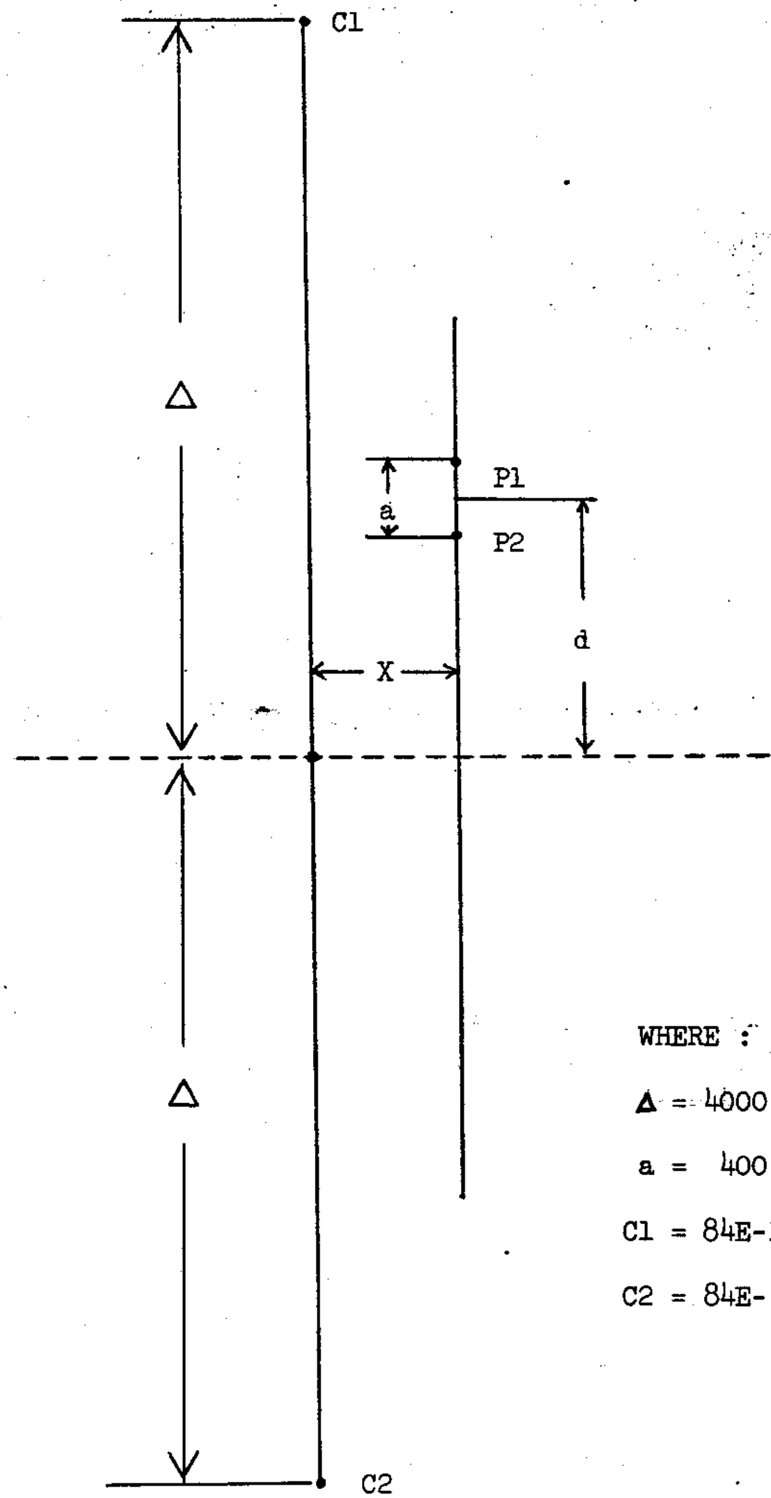
$a = 400'$

position of C_1 and C_2

C_1: 84E - 140N

C_2: 84E - 60N

THE GRADIENT ARRAY



WHERE :

Δ = 4000'

a = 400'

C1 = 84E-140N

C2 = 84E- 60N

Fig. 1

2) RESULTS AND DISCUSSION

The apparent resistivity is high in the north-eastern and south-western parts of the survey grid. The values of apparent resistivity are quite low in this property and the highest value recorded was 255 ohm-Ft/2π. The general topography of the apparent resistivity results can be described as flat and low.

The background value is about 2.0% in apparent chargeability. The highest apparent chargeability observed on this property was 4.49%. Values more than 4.0% could be called anomalous. One small anomalous zone was detected near the center of the property but it is neither large in area nor high in value. It does, however, coincide to the zone of the low apparent resistivity.

It was difficult to obtain the readings because the potential difference between two potential electrodes, was too low to facilitate the easy sincronization with the transmitter. However, the readings obtained were reliable and accurate. The higher I.P. chargeability would indicate a higher sulphide or metallic mineral content. Considering that the I.P. anomaly detected on this property is very small (max. 5%) it is not promising from the geophysical point of view.

SUMMARY OF I.P. SURVEY

ALBERTS HUMP PROPERTY

DATE	From July 22nd to July 28th
LINE INTERVAL	800 Feet
STATION INTERVAL	400 Feet
TOTAL LINE LENGTH	5.5 Line Miles
ELECTRODE ARRANGEMENT	Gradient Array
I.P. MEASUREMENT	Time Domain
	M_1; (240m to 290m seconds)
	M_2; (290m to 390m seconds)
	M_3; (390m to 590m seconds)
	M_4; (590m to 990m seconds)
I.P. INSTRUMENT	Huntec Mark III
	(2.5 Kw. Model)
RESULTS	
APPARENT RESISTIVITY MAP	Scale 1":400'
	Map No. 213-GP-1
APPARENT CHARGEABILITY MAP	Scale 1":400'
	Map No. 213-GP-2
	Integrated Time 390m - 990m seconds
	(M_3 + M_4)
GROUND MAGNETIC SURVEY MAP	Scale 1":400'
	Map No. 213-GP-3

III. MAGNETIC SURVEY (See Figure 213-GP-3)

A magnetic survey was carried out on July 11th and 19th, 1973.

The vertical component of the ground magnetic field was measured by using a "McPhar M-700" flux-gate type magnetometer. The accuracy of the instrument is 20 gammas. The reading was taken every 100 feet along the grid lines. Six lines (5.5 line miles) in total were covered by the magnetic survey.

The base station was set at the station 76E - 96N and had the value of 0 gamma. It was occupied at least twice a day in order to check the diurnal magnetic variation. As magnetic anomalies were high (more than 1000 gammas), in this property compared with the diurnal variation which was observed on July 18th, 1972 on the Moosehorn property, the correction for it was omitted. It would not have a significant effect on the interpretation.

The results of the magnetic survey are presented as a contoured plan at a scale of 1" = 400' in figure 213-GP-3.

The only noticeable magnetic anomaly was observed on the south-eastern zone of the property.

Geologically, altered and unaltered andesite lava is distributed throughout the whole area. From a geophysical point of view, the andesites are considered to be distinguishable as magnetic and non-magnetic andesites. The anomaly of the south-eastern part is considered to be caused by the unaltered andesite containing minor amounts of magnetite.

A relationship between the high apparent chargeability and the magnetic anomaly is not evident.

IV. CONCLUSION

On the I.P. survey, a small anomalous zone was detected in the center of this property. This zone, however, is not large in scale nor does it have a high value of apparent chargeability. The apparent resistivity distribution is very flat and smooth.

The magnetic survey, detected an anomalous zone on the south-eastern part of the property. It is considered that this anomaly indicates the state of distribution of magnetic and non-magnetic andesite. The magnetic anomaly has no relation with the high zone of apparent chargeability.

The data which was expected to disclose the existence of a mineralization zone was not obtained. In conclusion, this property does not have any interesting geophysical targets. Therefore, no drilling is recommended.

V. STATEMENT OF QUALIFICATIONS

1) I received a Bachelor of Science degree from Kyoto University in 1963 in Mining Engineering.

2) I received a Master of Technology degree from Kyoto University in 1965 in Applied Geophysics.

3) I continued my study on a Doctor's course at Kyoto University in Applied Geophysics from 1965 to 1967.

4) Since 1967, I have been employed as a geophysicist by Sumitomo Metal Mining Co. Ltd. and have worked in many countries (Japan, Canada, Malaysia, Phillipines, Taiwan and Australia). I have conducted most types of geophysical surveys over a wide variety of geologic environments.

5) Since 1970, I have been holding an additional post, in the computor section of Sumitomo Metal Mining Co. Ltd., as a senior systems engineer. This position involves working with data processing systems of geophysical survey, mining design, mining evaluation systems and many other kinds of systems.

Hidetaka Yoshida

Hidetaka Yoshida

October 1, 1973

I received a Bachelor of Technology degree from Kyushu University in 1971 in Applied Geophysics.

I have been employed on most types of geophysical work since graduation, for Sumitomo Metal Mining Co. Ltd,

Kiyoshi Kawasaki

Kiyoshi Kawasaki

October 1, 1973

DECLARATION OF COSTS

A) Personnel

T. Yoshida	11 days @	$40.37	$ 444.07
K. Kawasaki	11	33.08	363.88
S. Vulimiri	3	17.49	52.47
I. Jackisch	7	20.26	141.82
P. Gray	6	23.95	143.70
	38 man days		$1,145.94

B) Field Expenses

38 man days @ $70.73 per day — $2,687.74
(See Appended Schedule of Costs)

C) Office Expense

Drafting, reproduction, typing, etc. — 200.00

$4,033.68

Declared before me at the City of Vancouver, in the Province of British Columbia, this 6th day of November 1973, A.D.

A Commissioner for taking Affidavits within British Columbia or A Notary Public in and for the Province of British Columbia.

Sub - mining Recorder

T. Rodgers 5.XI.73

Schedule A

SUMAC 210/220 PROJECTS

Allocatable Costs - 1973

	$
Camp equipment & supplies	4,605
Equipment rental	4,000
Fuel	1,806
Catering	4,522
Communications	1,416
Transportation	11,407
Helicopter charter	20,804
Total	48,660

Man-days

Property	Period	Max. No. of Men	Man-days
Moosehorn	3 June - 10 July	12	355
Alberts Hump	11 July - 18 Aug.	10	206
Kutcho	19 Aug. - 9 Sept.	8	127
		Total	688

Cost per man-day

$$= \frac{48,660}{688} = \$70.73$$

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The following personnel were associates with the geophysical surveys:

HIDETAKA YOSHIDA	GEOPHYSICIST AS I.P.
KIYOSHI KAWASAKI	GEOPHYSICIST AS I.P.
INGO JACKISCH	I.P. HELPER AND MAGNETOMETER OPERATOR
PETER GRAY	I.P. HELPER
SUDHAKAR VULIMIRI	I.P. HELPER

OCTOBER 1, 1973

VANCOUVER, B. C.

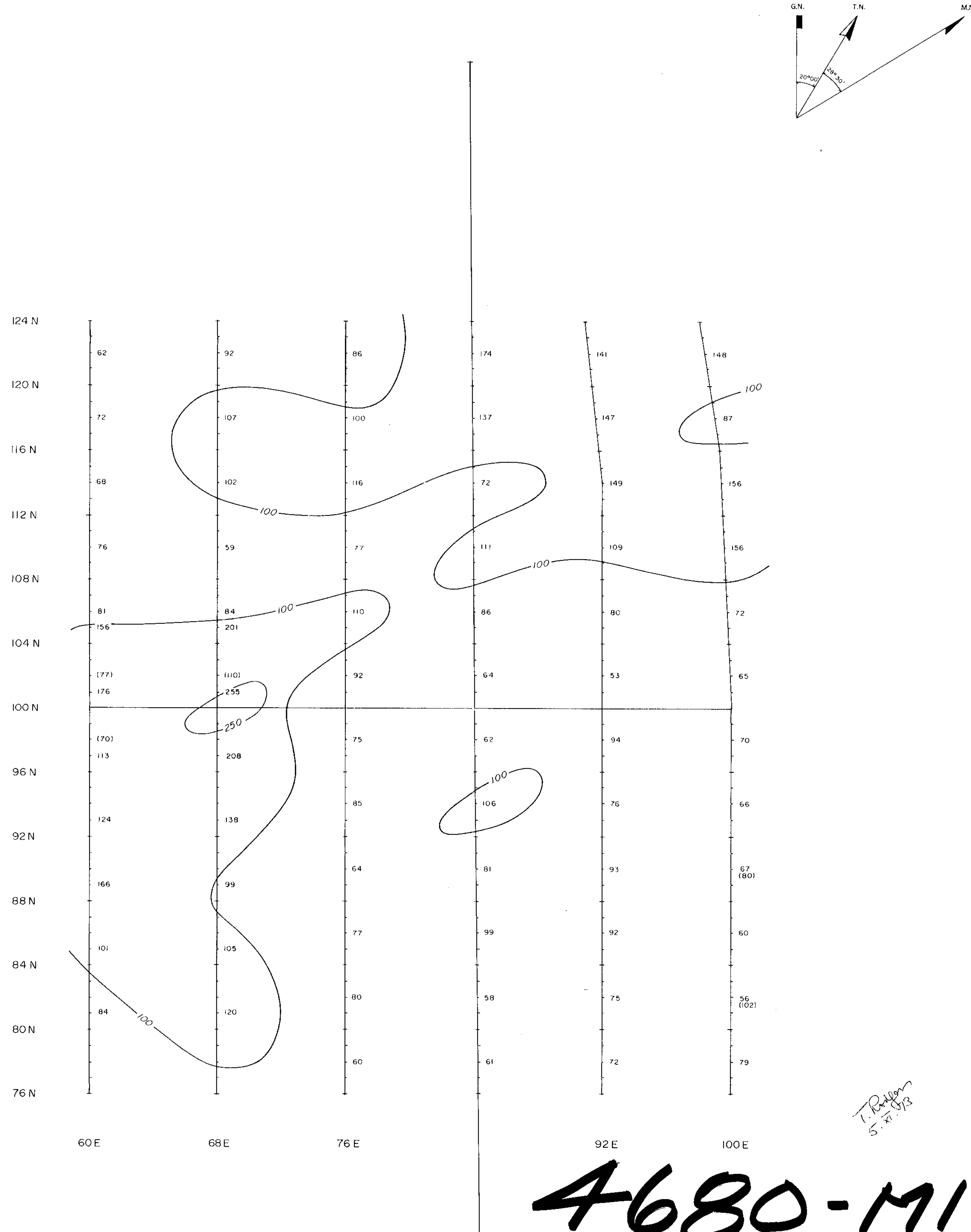
RESPECTFULLY SUBMITTED

Hidetaka Yoshida

Hidetaka Yoshida, M. Tech.
Geophysicist

Kiyoshi Kawasaki

Kiyoshi Kawasaki, B. Tech.
Geophysicist



4680-M1

SULLIVAN RODGERS

SUMAC - 213

MET-SAN-TAN GROUPS

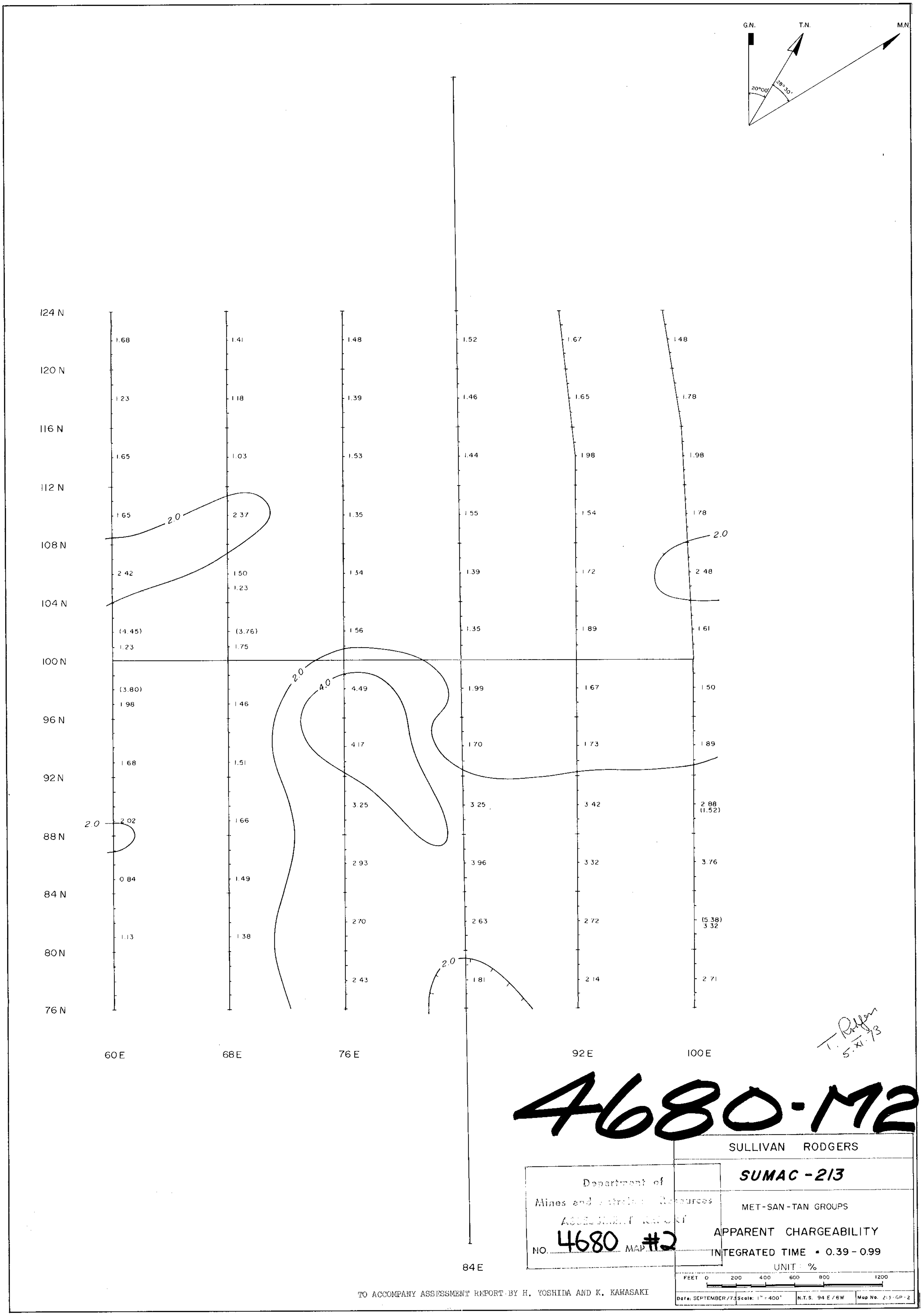
APPARENT RESISTIVITY

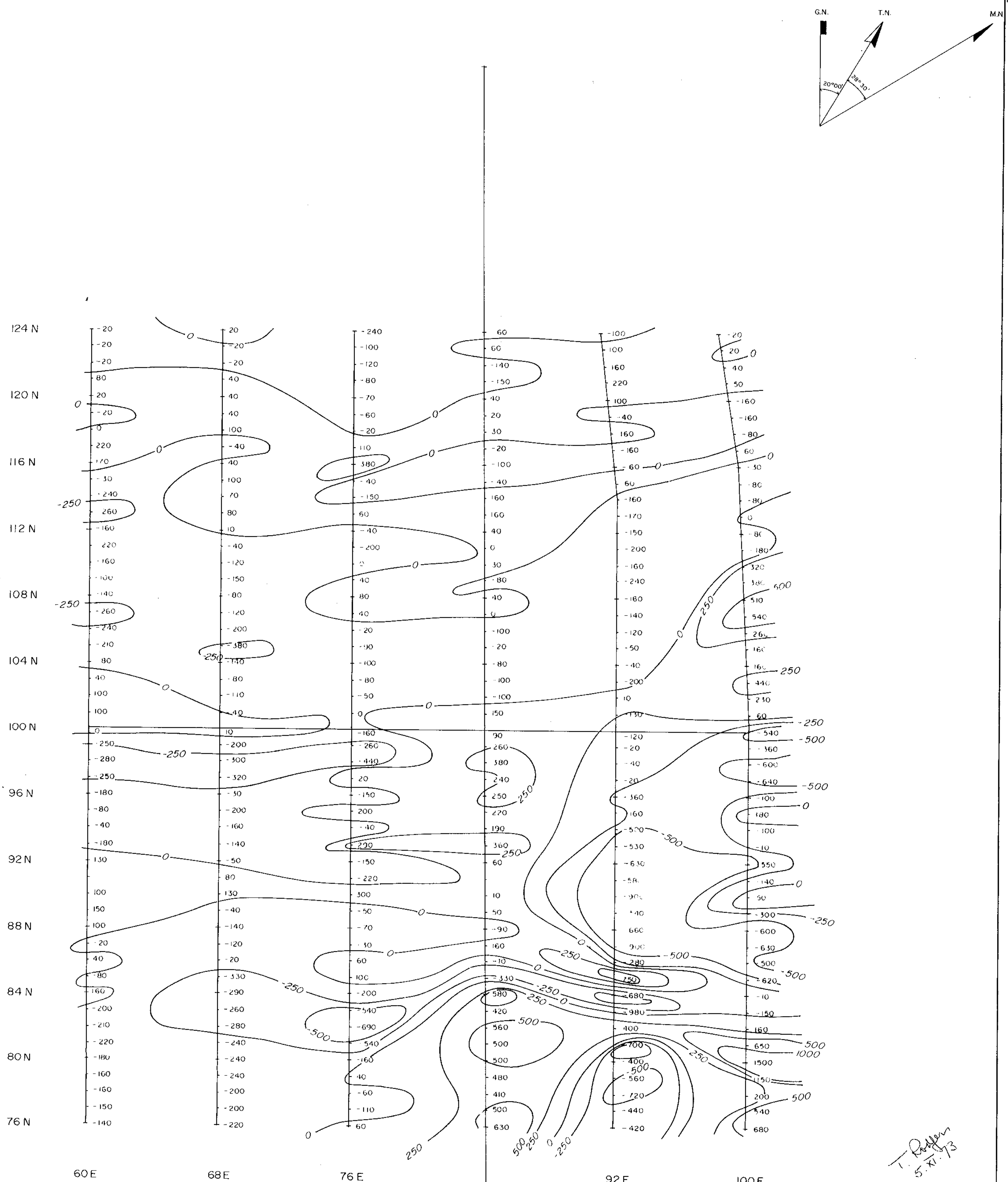
UNIT : OHM (Ω) - FT/2π

FEET 0 200 400 600 800 1200

Date: SEPTEMBER/73	Scale: 1" : 400'	N.T.S. 94 E/6W	Map No. 213-GP-1

TO ACCOMPANY ASSESSMENT REPORT BY H. YOSHIDA AND K. KAWASAKI


G.N.
T.N.
M.N.
20°00'
28°30'
124 N
120 N
116 N
112 N
108 N
104 N
100 N
96 N
92 N
88 N
84 N
80 N
76 N
60 E
68 E
76 E
84 E
92 E
100 E
2.0
4.0
1.68
1.23
1.65
1.65
2.42
(4.45)
1.23
(3.80)
1.98
1.68
2.02
0.84
1.13
1.41
1.18
1.03
2.37
1.50
1.23
(3.76)
1.75
1.46
1.51
1.66
1.49
1.38
1.48
1.39
1.53
1.35
1.34
1.56
4.49
4.17
3.25
2.93
2.70
2.43
1.52
1.46
1.44
1.55
1.39
1.35
1.99
1.70
3.25
3.96
2.63
1.81
1.67
1.65
1.98
1.54
1.72
1.89
1.67
1.73
3.42
3.32
2.72
2.14
1.48
1.78
1.98
1.78
2.48
1.61
1.50
1.89
2.88
(1.52)
3.76
(5.38)
3.32
2.71
T. Rolfe
5-XI-73
4680-M2
Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4680 MAP #2
SULLIVAN RODGERS
SUMAC -213
MET-SAN-TAN GROUPS
APPARENT CHARGEABILITY
INTEGRATED TIME • 0.39 - 0.99
UNIT : %
FEET 0 200 400 600 800 1200
Date: SEPTEMBER/73
Scale: 1" = 400'
N.T.S. 94 E/6W
Map No. 213-GP-2
TO ACCOMPANY ASSESSMENT REPORT BY H. YOSHIDA AND K. KAWASAKI



4680-M3

Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4680 MAP #3

SULLIVAN RODGERS

SUMAC - 213

MET-SAN-TAN GROUPS

MAGNETIC MAP
VERTICAL COMPONENT

UNIT: GAMMA

FEET 0 200 400 600 800 1200

Date: SEPTEMBER/73	Scale: 1" : 400'	N.T.S. 94 E/6W	Map No. 213-GP-3

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