

GEOPHYSICAL SURVEY  
INDUCED POLARIZATION SURVEY  
MALONEY CREEK COPPER PROSPECT  
POT GROUP

CASINO AREA, YUKON



10 miles @ 200/mil. from  
claim 6833

This report has been examined by the Geological Evaluation Unit and is recommended to the Commissioner to be considered as representation work in the amount of

\$6,833

*D.B. Craig*

~~Resident Geologist or  
Resident Mining Engineer~~

Considered as representation work under  
Section 53 (4) Yukon Quartz Mining Act.

*[Signature]*

Commissioner of Yukon Territory



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### APPENDIX I - Assessment Work Charges

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### ILLUSTRATIONS

- Base Line 1 - Line No. 48E, 40E, 32E, 20E, 16E, 12E,  
4E, 0, 8W, 16W, 24W, 32W  
and 40W
- I.P. Anomaly

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GEOPHYSICAL SURVEY  
INDUCED POLARIZATION SURVEY  
MALONEY CREEK COPPER PROSPECT  
POT GROUP  
CASINO AREA, YUKON

SUMMARY

Induced Polarization Surveys of the Pot Group were carried out in order to locate 'porphyry-type' copper mineralization associated with acid intrusives. Three anomalous I.P. zones were located. The zone south of the baseline was the best defined. The other two zones appeared to be located at depth and were not completely outlined.

It is recommended that the south zone be drilled. The other two zones should be weighted in terms of geochemical and geologic evidence before work on them is considered.

GEOPHYSICAL SURVEY  
INDUCED POLARIZATION SURVEY  
MALONEY CREEK COPPER PROSPECT  
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CASINO AREA, YUKON

I. INTRODUCTION

Induced polarization surveys were carried out over area between Peace and Chimo Creeks. This area of Carmacks Volcanics is intruded by quartz porphyry and quartz diorite. The area is generally unglaciated, outcrops are few and the geology is inferred from float.

II. PROPERTY, LOCATION AND ACCESS

The Pot Group is located in the Dawson Range north-west of Whitehorse, Yukon. Access was by fixed wing aircraft to the Casino airstrip and by helicopter to the property. The N.T.S. references are 115 I/4 and 115 H/13.

III. GENERAL GEOLOGY

An area of older metamorphic sediments and volcanics of the Yukon Group, together with Cenozoic volcanics of the Carmacks Group, has been intruded by quartz porphyries and quartz diorite. The relationships of the induced polarization anomalies to these intrusives are not well established because of the limited bedrock information.

#### IV. INDUCED POLARIZATION SURVEY

The dipole-dipole survey was run along north-south grid lines spaced at 800 foot intervals. The extent of the coverage is shown on the plan map by the accented lines. Three intermediate lines were run over the anomalous area. The electrode separation was 400 feet and five dipole receiver readings were taken from each transmitter dipole.

The psuedo profiles are fold-outs in the back of the report and the anomalous zones are marked as three grades: definite, probable, and possible. These are also shown on a plan map (scale 1" = 500') in envelope. The frequencies employed were 0.3 and 5.0 c.p.s. A brief explanation of the operation and understanding of I.P. is included in the appendix. The equipment used was a McPhar model 654 multi-frequency I.P. unit.

Caution should be used in interpreting the I.P. effect because the mineralization in 'porphyry-type' deposits is usually zoned in pyrite, copper minerals and possibly magnetite. It is often useful if there is at least a partial section drilled across the intrusive. Variation in the depth of weathering for overburden where gulleys cut the topography often requires special interpretation.

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LINES 48E, 40E and 30 E

These anomalies are only twice the background values of the Metal Factor and tend to be amplified by resistivity lows. Geochemical evidence would encourage drilling the anomaly at 5N line 48E.

LINES 20E, 16E, 12E, 8E, 4E, 0 and 8W

The anomalous zone lying south of the baseline is best defined on lines 8E and 4E. It should be drilled in this area.

The anomaly at 8N line 12E appears deep and has not been explored on adjacent lines. The anomaly at 20N line 0 could be related to the one on line 12E. It too appears at depth.

On line 8W a weaker anomaly occurs at 25N.

LINES 8W, 16W and 24W

A weak zone was traced from 0 line 8W to 10N line 24W. This could be an extension of the zone that lies south of the baseline.

No anomalies occur on lines 32W and 40W.

## V. CONCLUSIONS AND RECOMMENDATIONS

Three definite I.P. zones were located on the survey.

The zone between lines 20E and 0 south of the baseline should be drilled.

Further work on the other two I.P. zones should have supporting geochemical or geologic evidence before drilling is considered.

It should be remembered that depth of burial could have suppressed the results.

Respectfully submitted

August 11, 1970



Tom Gledhill, B.A., P.Eng.

SURVEY DATA

Mining Area: Work Period: July 20th to July 28th, 1970  
Territory: Yukon  
Location: Casino Area Operating days: 9-1/2  
Sponsor: Amax Exploration Inc. Consulting days: 4  
Survey: Induced Polarization Drafting days: 6  
Miles of line surveyed: 10 miles Number of stations: 121  
Number of readings: 475

Personnel:

Geophysicist - Tom Gledhill, 21 Sandalwood Place, Don Mills, Ont.

Field Technicians:

George Beier ) c/o Tom Gledhill, 21 Sandalwood Place  
Eldo Hildebrand ) Don Mills, Ontario  
Andrew Gledhill )

2 helpers supplied by the client

Draughtsman:

R. Marcoft ..... c/o Tom Gledhill, 21 Sandalwood Place  
Don Mills, Ontario

August 11, 1970



*Tom Gledhill*  
Tom Gledhill, B.A., P.Eng.

APPENDIX I

Assessment Work Charges

Induced Polarization Survey

POT #1-48 inclusive (Maloney Creek Property)

July 20 - July 28, 1970

1. Tom Gledhill - Induced Polarization Contractor (see attached bill)		\$4,518.00
2. Additional AMAX helpers		
J.L. LeBel, R.R. #4, Belleville, Ontario 10 days @ \$25.00/day		250.00
L.A. Procyshyn, Box 272, Winnipegosis, Manitoba 1/3 month @ \$525.00/month		175.00
3. Camp Costs (per Schedule B)		435.00
4. Helicopter		
T.N.T.A. Flight Report 3611	5.4 hours	
3632	4.3 hours	
	<u>9.7 hours</u>	
9.7 hours @ \$130.00/hour	1,261.00	
Fuel, oil @ 20.00/hour	<u>194.00</u>	<u>1,455.00</u>
		\$ <u>6,833.00</u>

## APPENDIX II

### Induced Polarization

#### Theory and Method of Survey

Induced Polarization (I.P.) surveys refer to a measurement of the blocking or back voltage - polarization of metallic conductors in a medium of ionic solution conduction.

This electro-chemical relationship occurs whenever metallic-type minerals such as base metal sulphides have an electrical current pass through them. In ordinary resistivity surveys, the current travels by conduction through the ions present in the water content of the ground. This is possible because almost all of the minerals have a much higher resistivity than the aqueous portion of the ground. A group of "metallic" type minerals have specific resistivities much lower than the ground water.

The I.P. effect occurs at the interfaces, where the mode of conduction from ionic in solutions to electronic in the metallic minerals is present in the rock.

This blocking action or induced polarization which depends on the energies necessary to allow ions to give up or receive electrons from the metallic surface, increases with the time that a direct current is allowed to pass through the rock. Thus as ions accumulate against the

metallic interface the resistance to current flow increases. In time these excess ions reduce the amount of current flow through the metallic particle. This phenomena is repeated at each of the infinite number of solution-metal interfaces present in the metallic rich rock.

When the direct current voltage that is used to cause a direct current is cut off, then the charged ions forming the polarization return to their normal position. This movement of charge creates a small, but measurable current flow on the surface of the ground.

Using an alternating current source, the effective resistivity of the system will change with the frequency of the switching.

The recorded values of the per cent frequency effect or F.E. are a measurement of the polarization in the rock mass. An often more useful quantity is the metal factor (M.F.) which is obtained by normalizing the F.E. for varying resistivities.

I.P. is used in the search for disseminated metallic sulphides of less than 20% by volume.

Field procedure in most I.P. surveys is as follows:

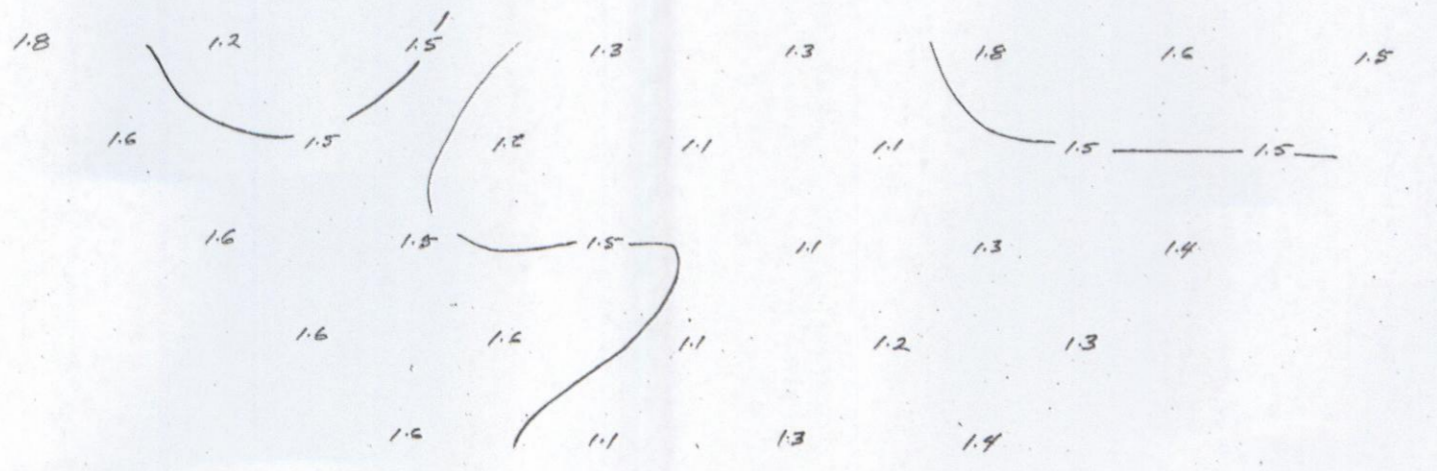
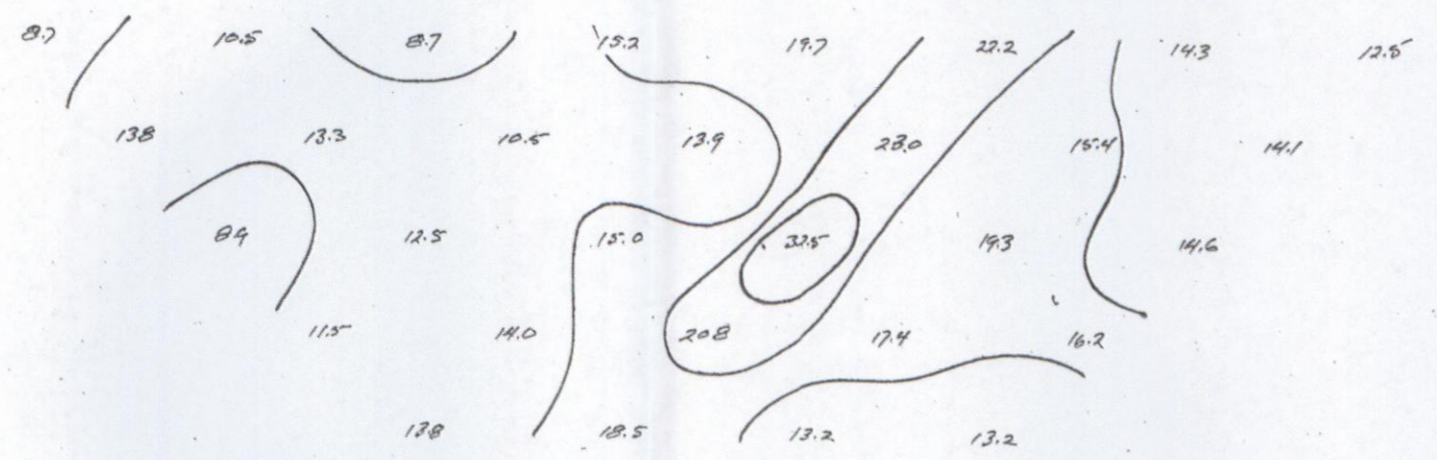
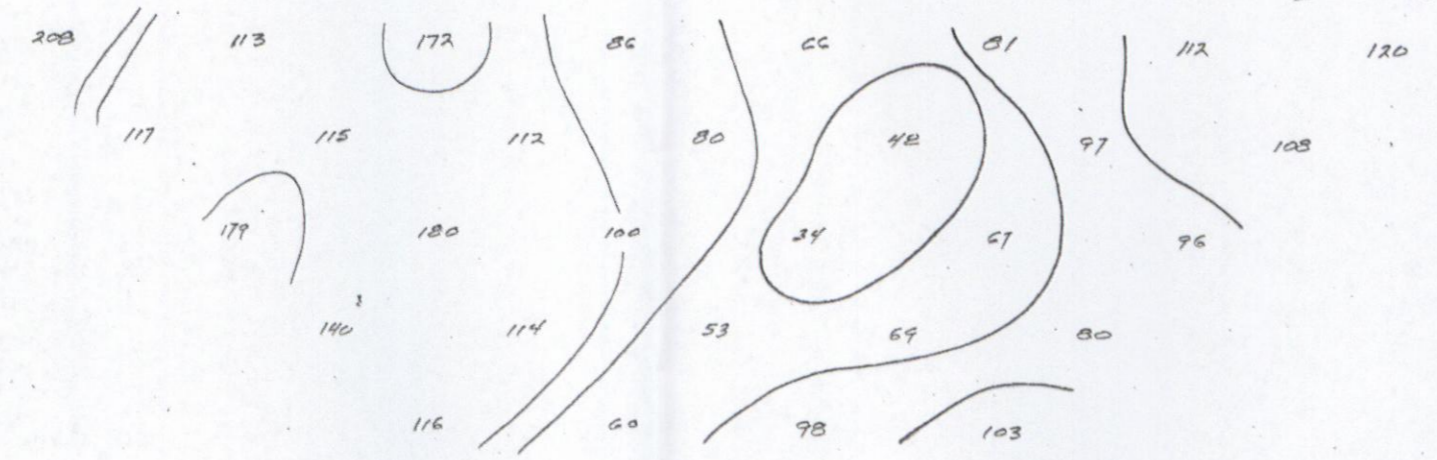
Current is applied to the ground at two points x feet apart. The potentials are measured at two other

points  $x$  feet apart in line with the current electrodes and the separation of the near current and potential electrodes is  $nx$  where  $n=1,2,3,$ etc.

The measurements are made along a picket line with constant distance  $nx$  feet employed between the nearest current and potential electrodes and several values of  $n$  may be employed ( $n=1,2,3,$ etc.)

In plotting the results, the values of the apparent resistivity, metal factor, the percentage frequency effect measured for each set of electrodes are plotted at the intersection of two imaginary lines drawn from the centre of the current and potential electrodes at  $45^\circ$  to the surface to meet at a mid point below the electrode array. Each of the three quantities are plotted in upright psuedo-sections.

150 85 0 8N 16N



← n = 1  
 ← n = 2  
 ← n = 3  
 ← n = 4  
 ← n = 5

Apparent Resistivity  
(ohm feet)

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 ← n = 5

Metal Factor

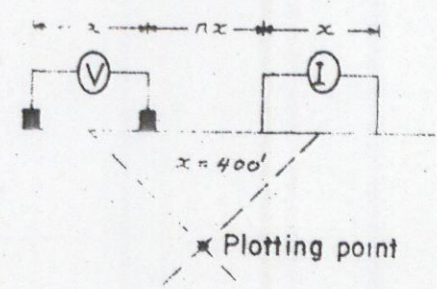
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Frequency Effect  
(%)

**INDUCED POLARIZATION  
 AND  
 RESISTIVITY SURVEY  
 for  
 AMAX EXPLORATION INC.  
 MALONEY CREEK  
 COPPER PROSPECT  
 POT GROUP  
 CASINO AREA, YUKON**

BASE LINE I      LINE NO. 48E

Electrode Configuration

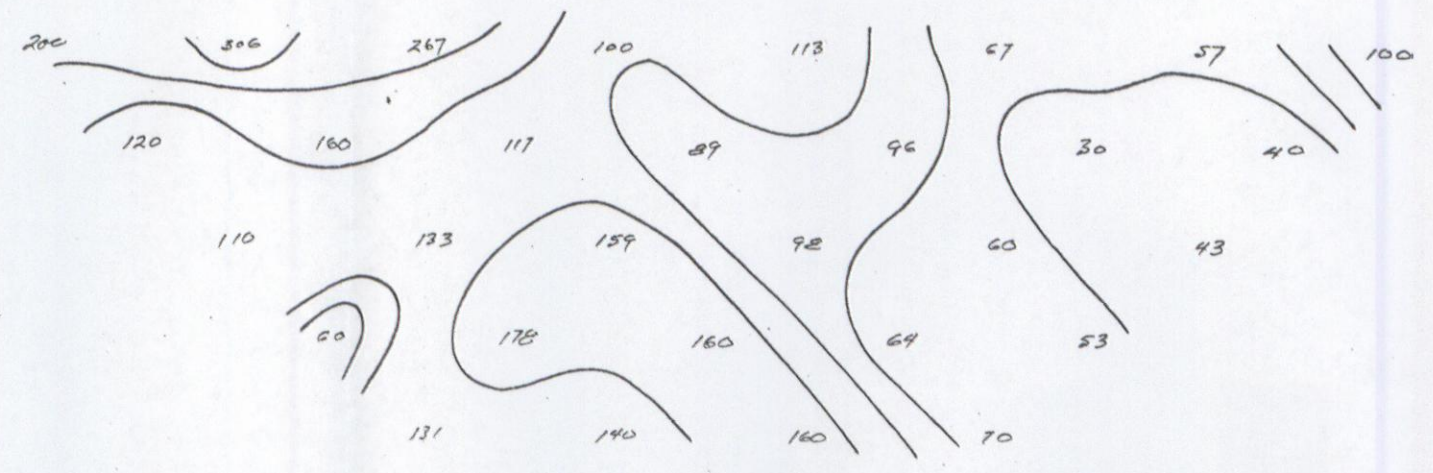


SCALE - 1" = 400'    DATE - Aug. 1970  
 Contours at logarithmic multiples of -  
 - 10, 15, 20, 30, 50, 75 & 100

INDUCED POLARIZATION  
AND  
RESISTIVITY SURVEY  
for  
AMAX EXPLORATION INC.  
MALONEY CREEK  
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CASINO AREA, YUKON

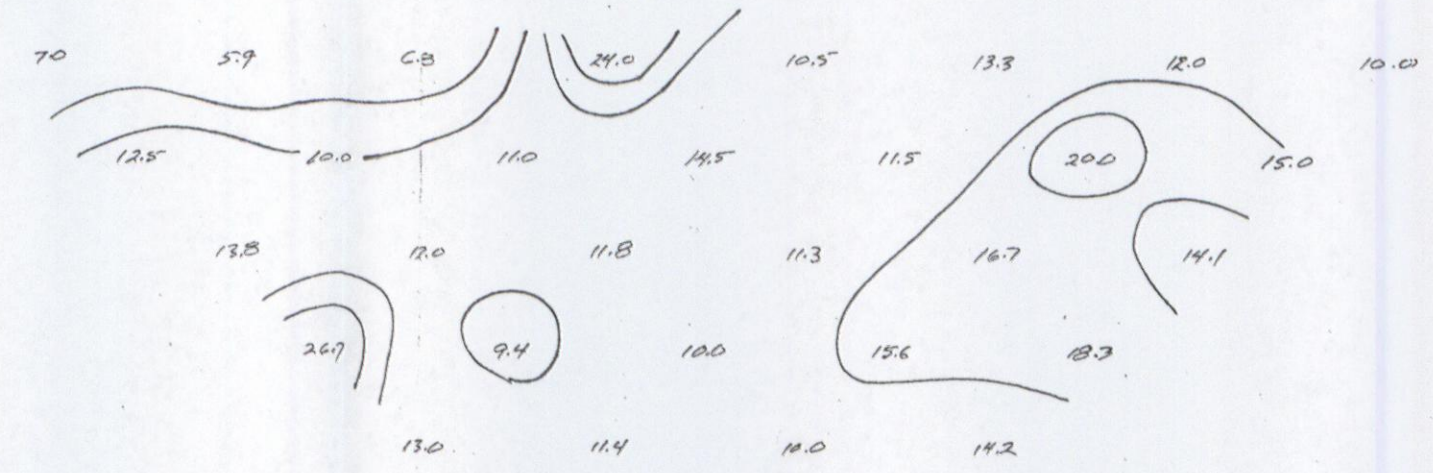
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165      85      0      8N      14N



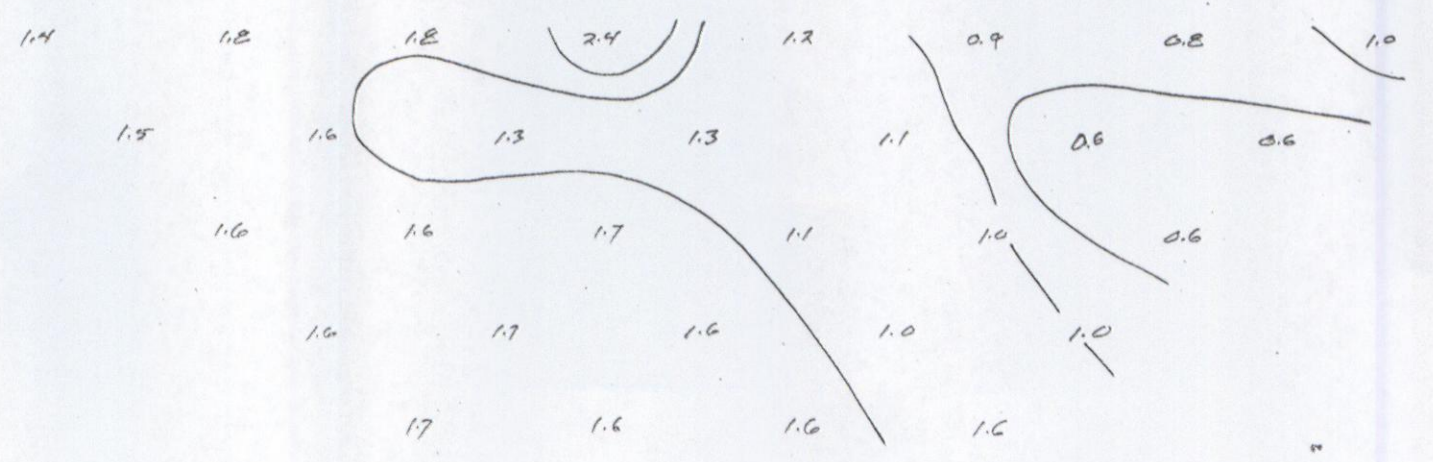
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Apparent Resistivity  
(ohm feet)



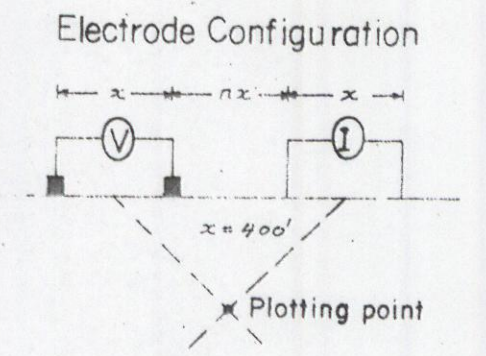
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Metal Factor



← n = 1  
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← n = 5

Frequency Effect  
(%)

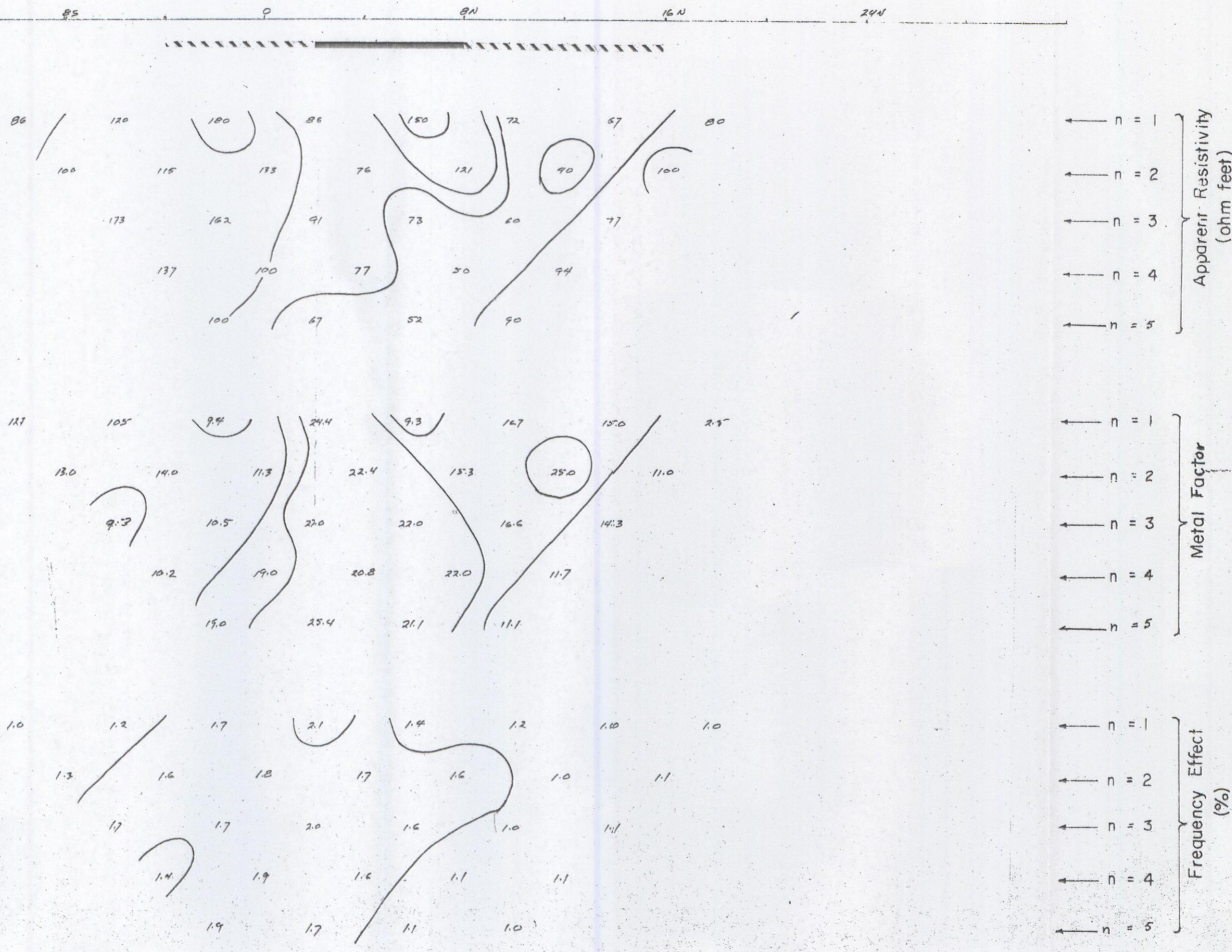
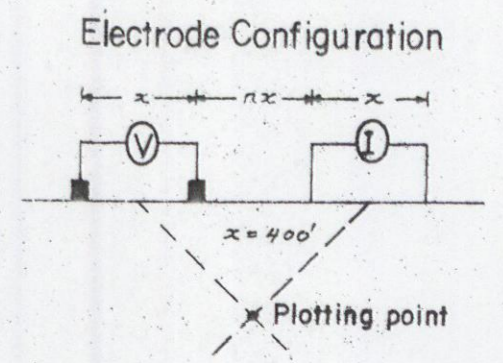


SCALE - 1" = 400'    DATE - Aug. 1970  
Contours at logarithmic multiples of -  
- 10, 15, 20, 30, 50, 75 & 100

BASE LINE I    LINE No.40E

INDUCED POLARIZATION  
AND  
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AMAX EXPLORATION INC.  
MALONEY CREEK  
COPPER PROSPECT  
POT GROUP  
CASINO AREA, YUKON

BASE LINE I      LINE NO. 32E



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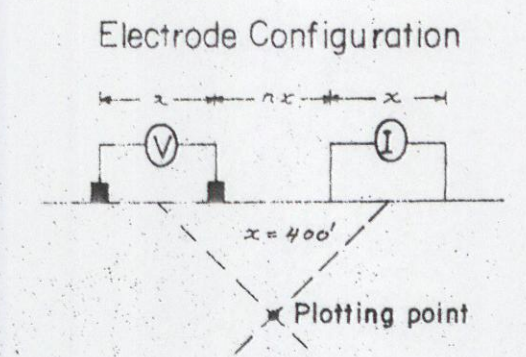
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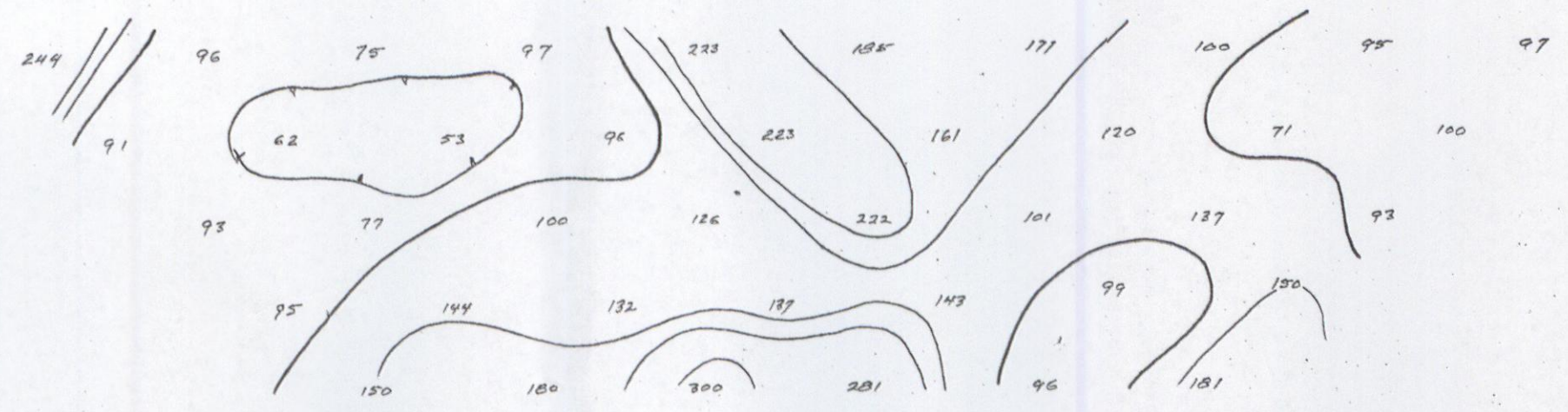
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INDUCED POLARIZATION AND RESISTIVITY SURVEY for AMAX EXPLORATION INC. MALONEY CREEK COPPER PROSPECT POT GROUP CASINO AREA, YUKON

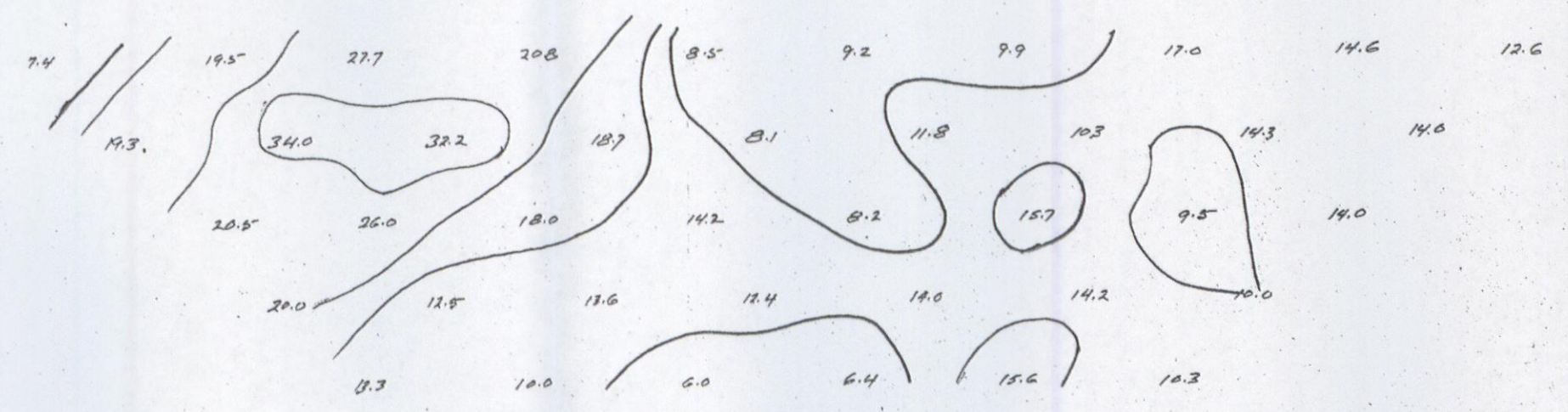
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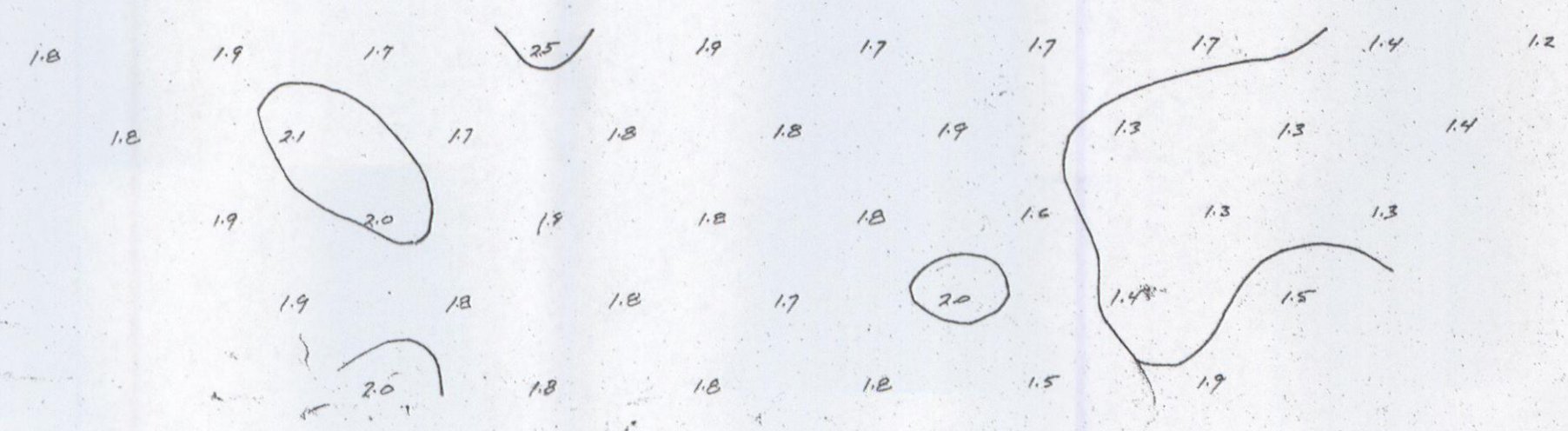
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- ← n = 5



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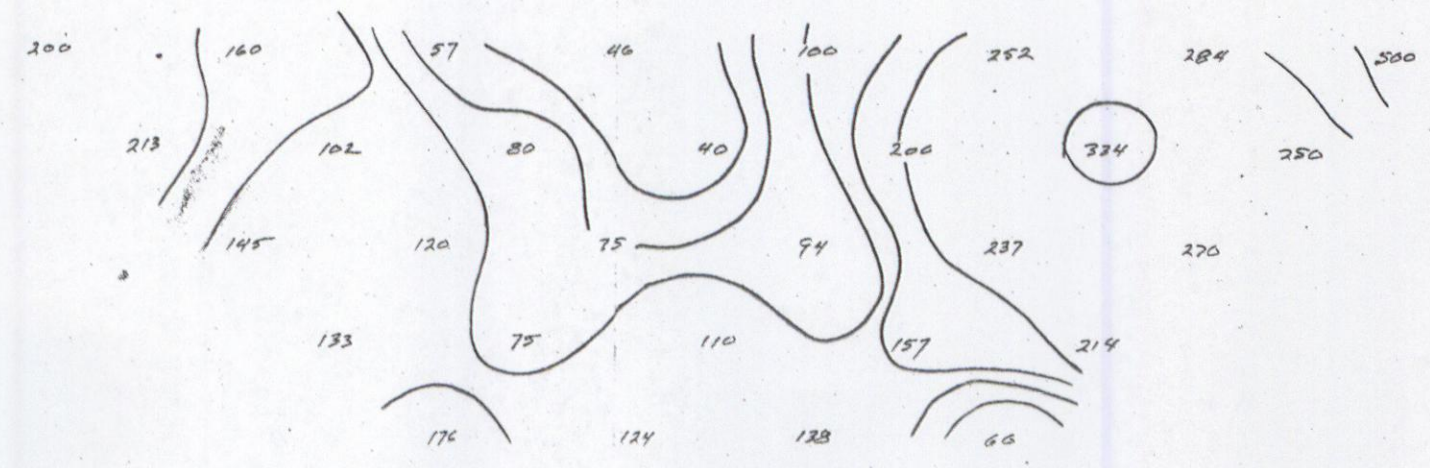


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 Contours at logarithmic multiples of -  
 - 10, 15, 20, 30, 50, 75 & 100

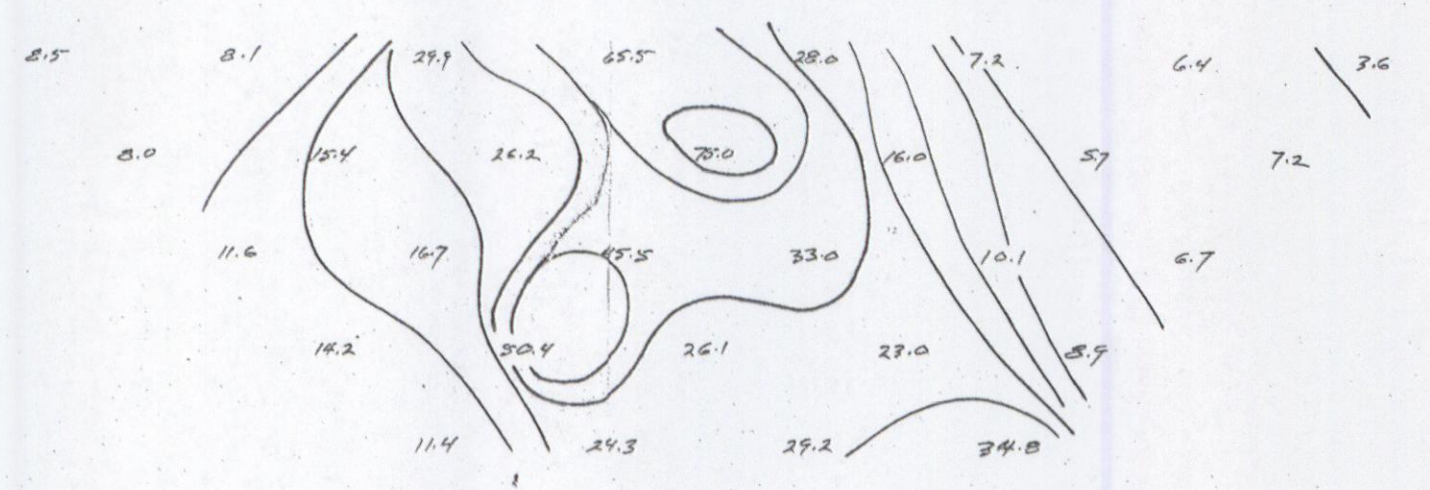
BASE LINE I LINE NO. 20E

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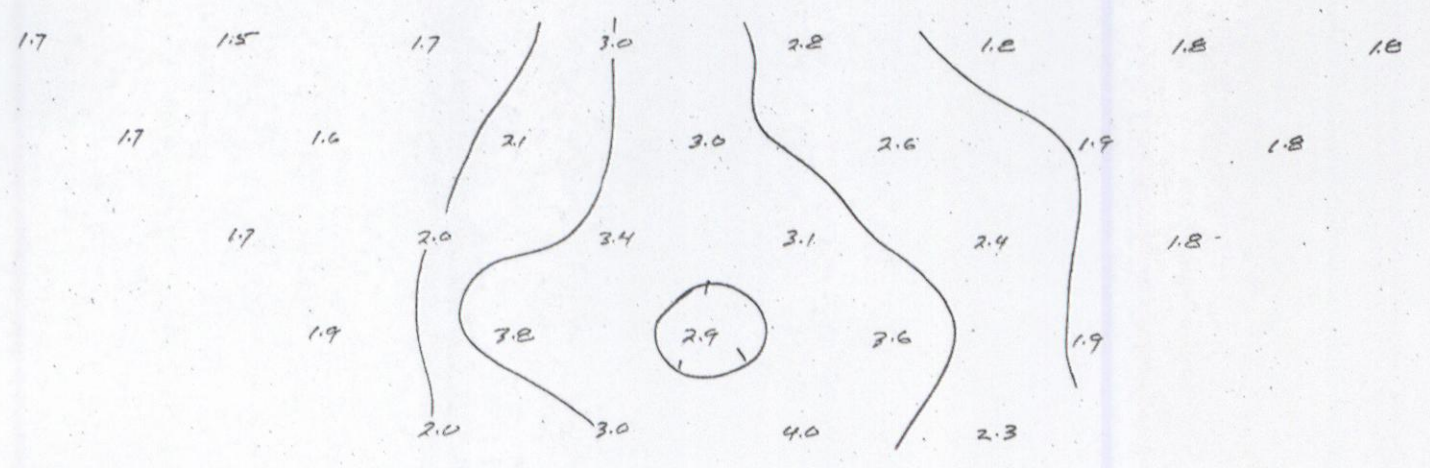
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Apparent Resistivity  
(ohm feet)



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 ← n = 5

Metal Factor

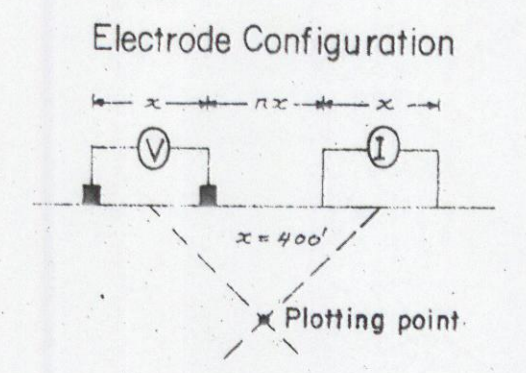


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Frequency Effect  
(%)

**INDUCED POLARIZATION  
 AND  
 RESISTIVITY SURVEY  
 for  
 AMAX EXPLORATION INC.  
 MALONEY CREEK  
 COPPER PROSPECT  
 POT GROUP  
 CASINO AREA, YUKON**

BASE LINE I      LINE No.16E

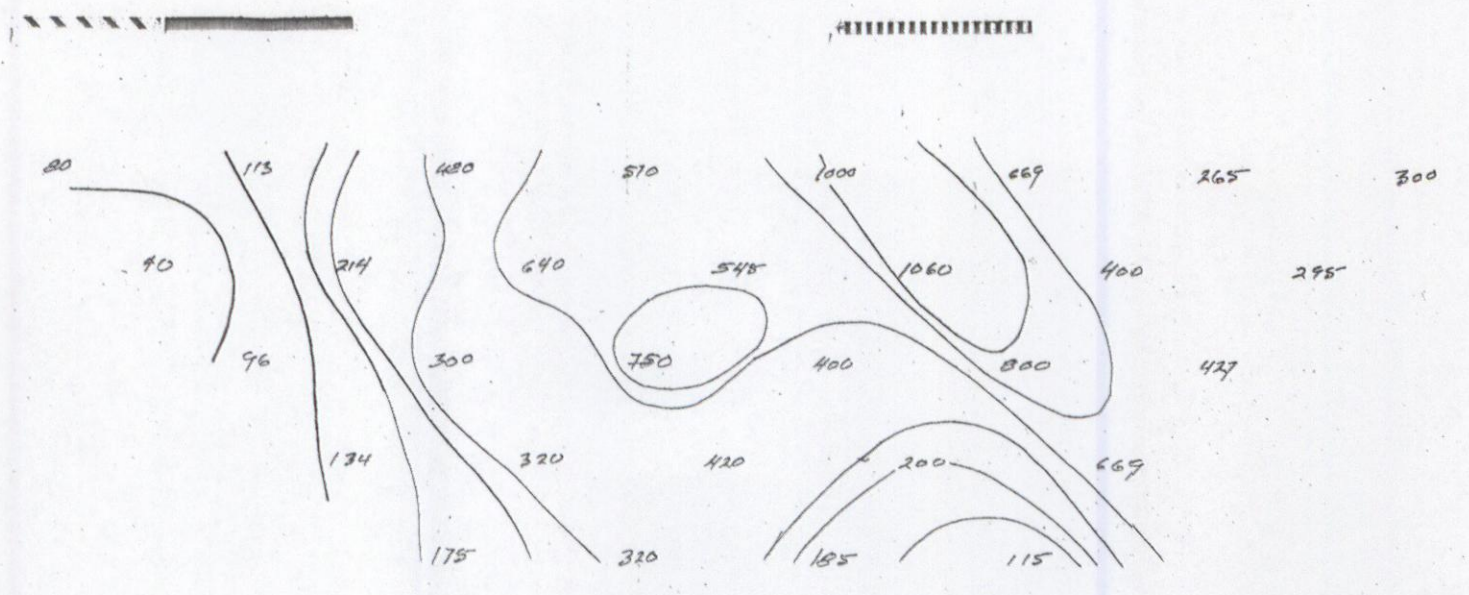
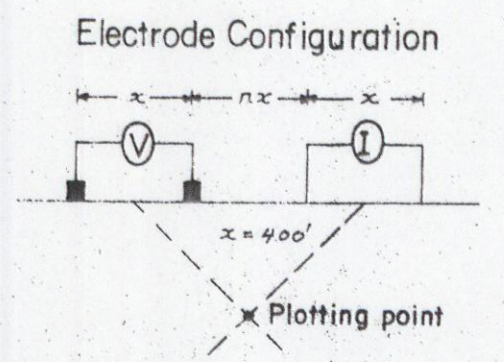


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 Contours at logarithmic multiples of -  
 - 10, 15, 20, 30, 50, 75 & 100

BASE LINE I    LINE No.16E

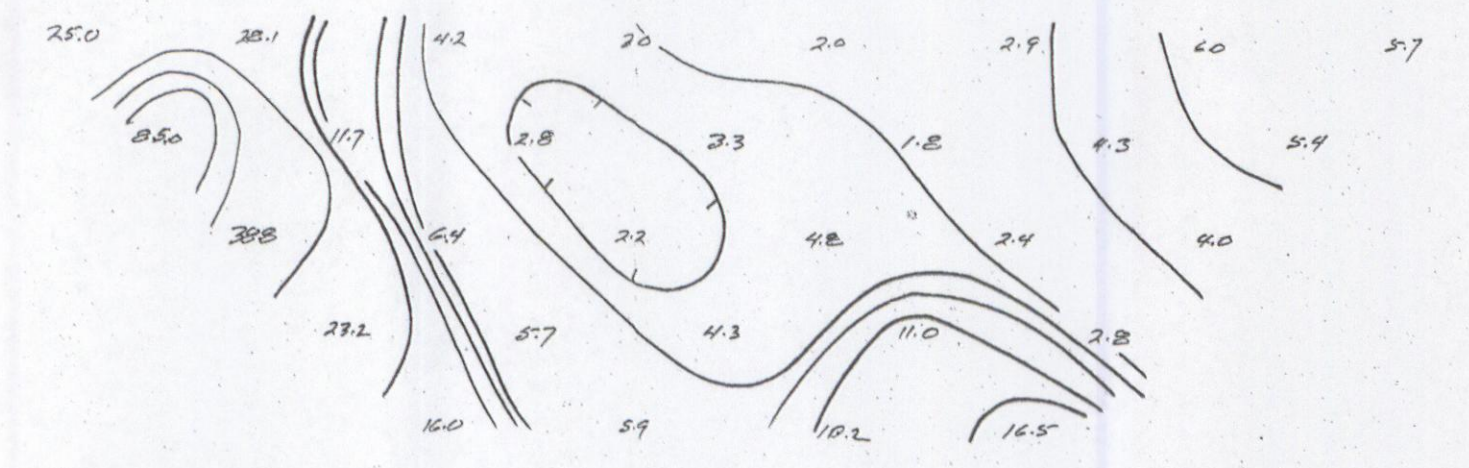
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BASE LINE 1      LINE NO. 12E



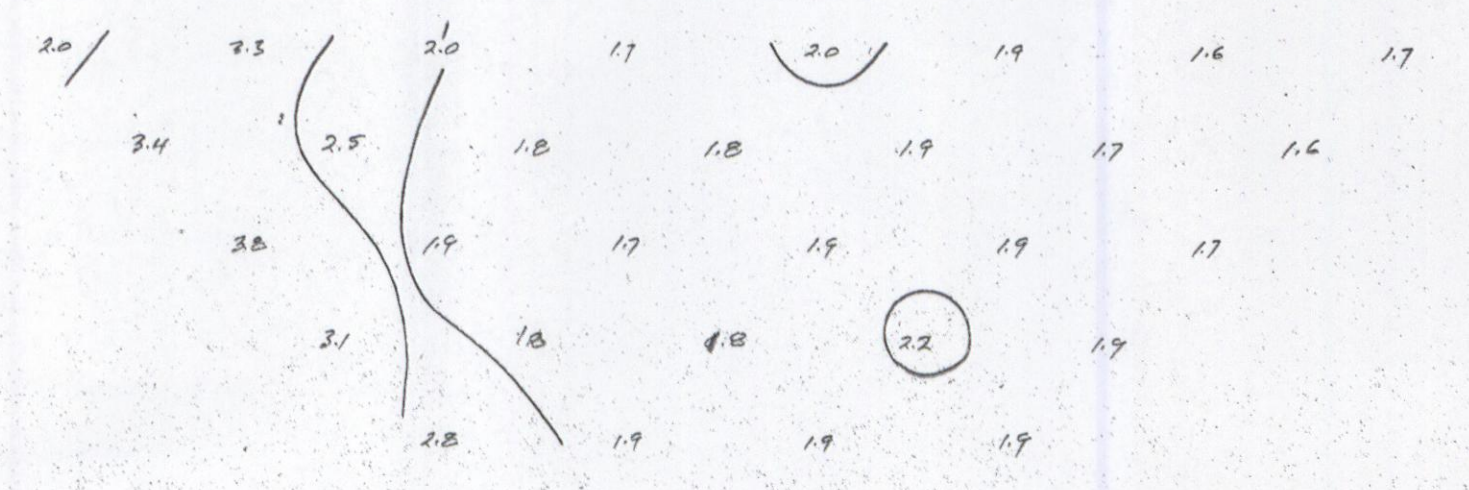
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Apparent Resistivity  
(ohm feet)



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← n = 3  
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← n = 5

Metal Factor



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← n = 5

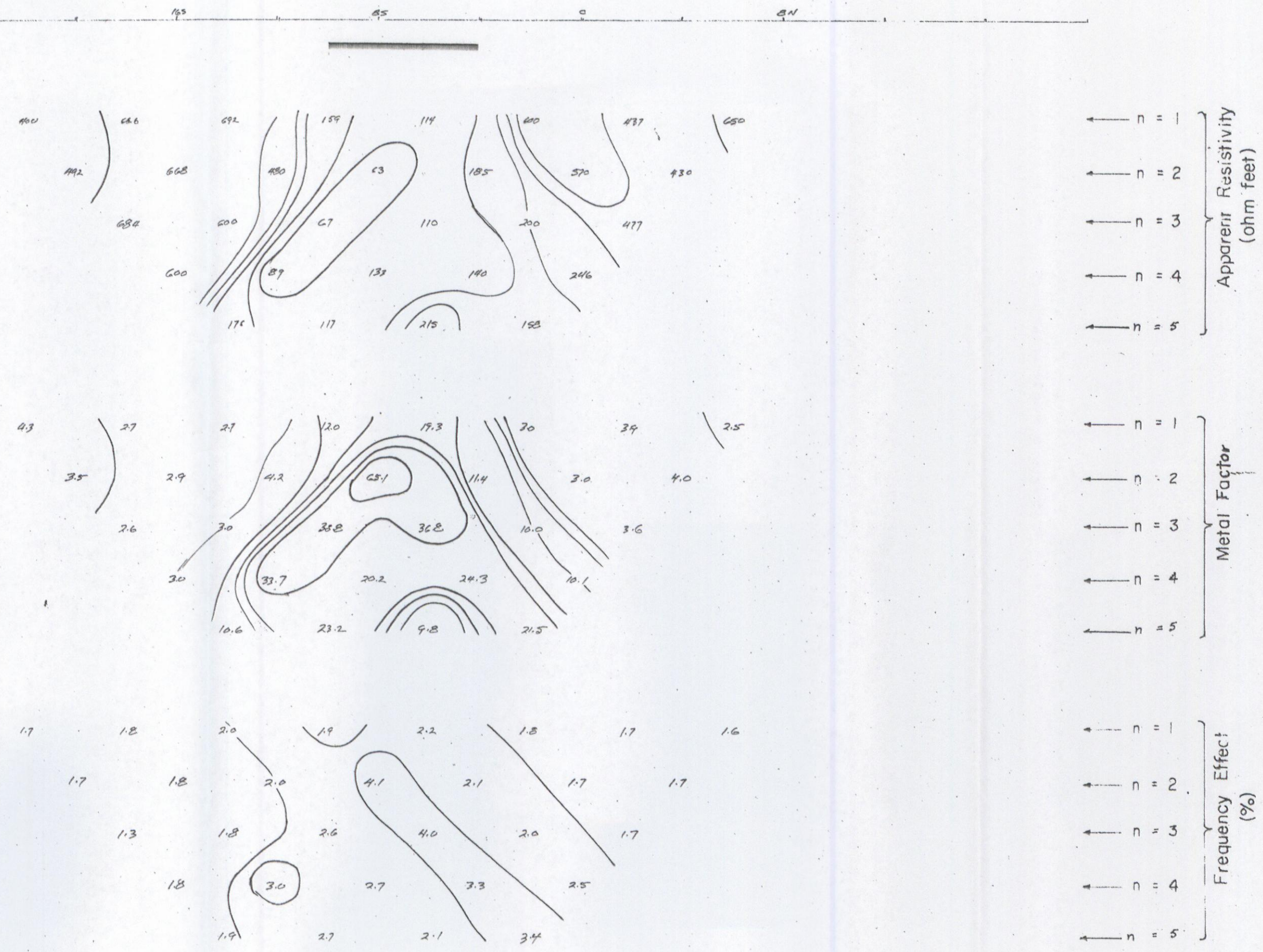
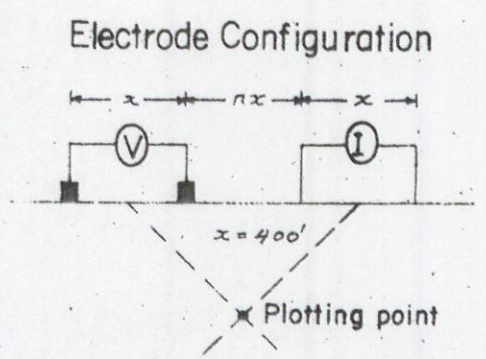
Frequency Effect  
(%)

SCALE - 1" = 400'    DATE - Aug. 1970  
Contours at logarithmic multiples of -  
- 10, 15, 20, 30, 50, 75 & 100

BASE LINE 1      LINE NO. 12E

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BASE LINE I      LINE NO. 4E



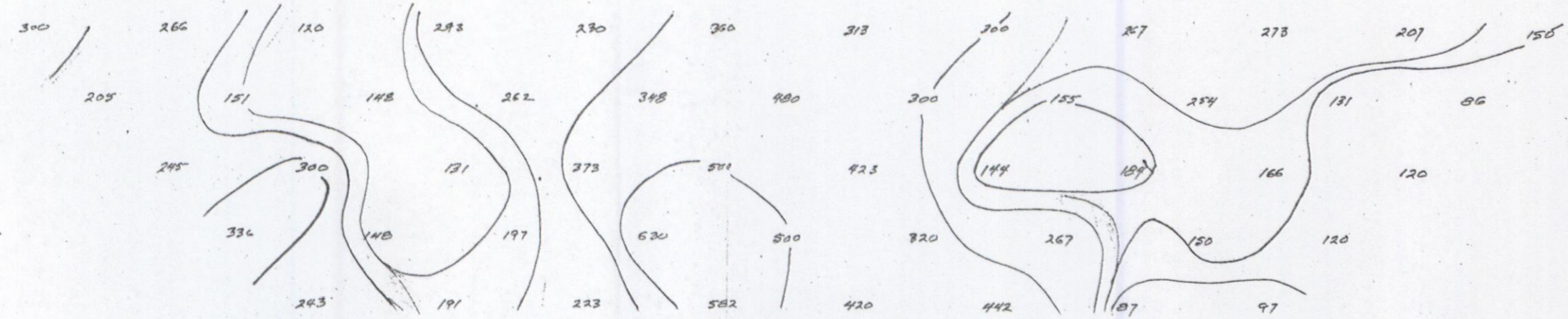
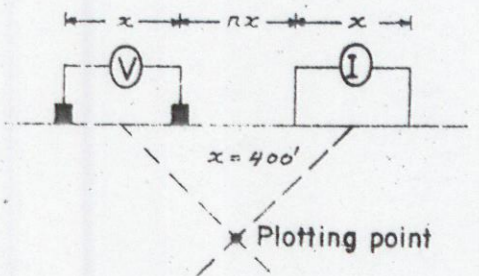
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BASE LINE I    LINE NO. 4E

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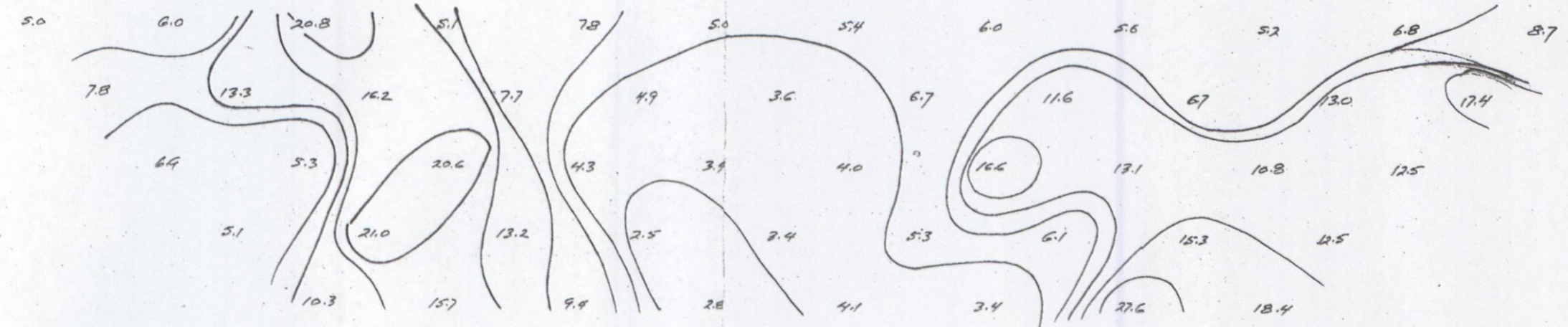
BASE LINE I      LINE No. 0

Electrode Configuration



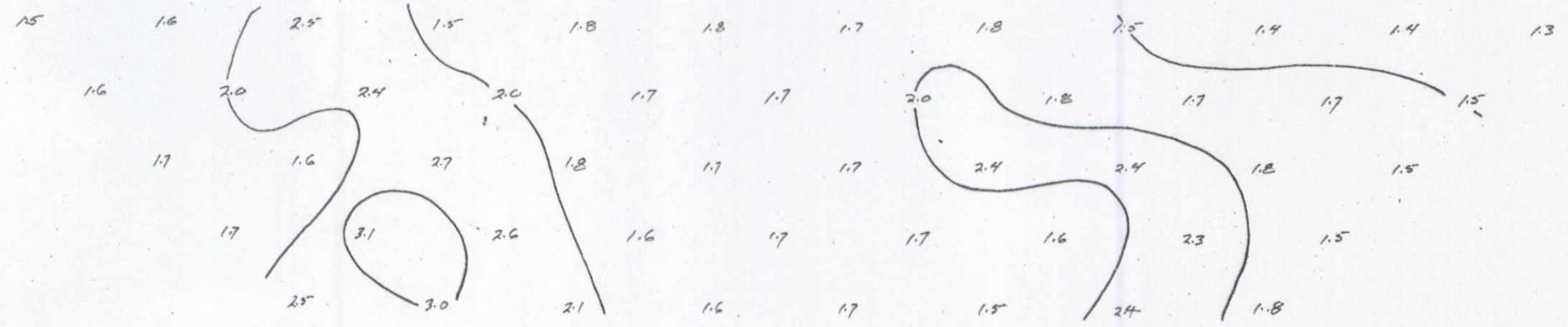
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← n = 5

Apparent Resistivity  
(ohm feet)



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← n = 3  
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Metal Factor



← n = 1  
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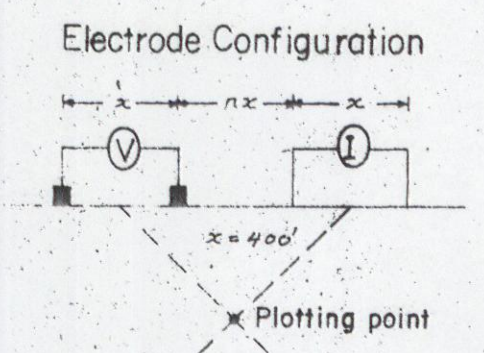
Frequency Effect  
(%)

SCALE - 1" = 400'    DATE - Aug. 1970  
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- 10, 15, 20, 30, 50, 75 & 100

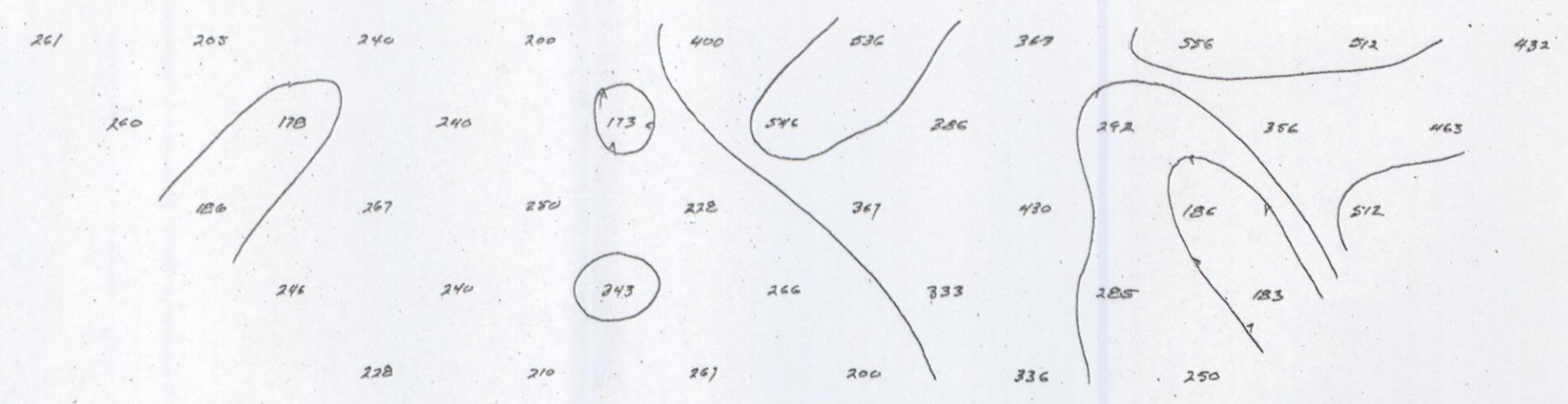
BASE LINE I    LINE No. 0

INDUCED POLARIZATION AND RESISTIVITY SURVEY for AMAX EXPLORATION INC. MALONEY CREEK COPPER PROSPECT POT GROUP CASINO AREA, YUKON

BASE LINE I LINE NO.8W

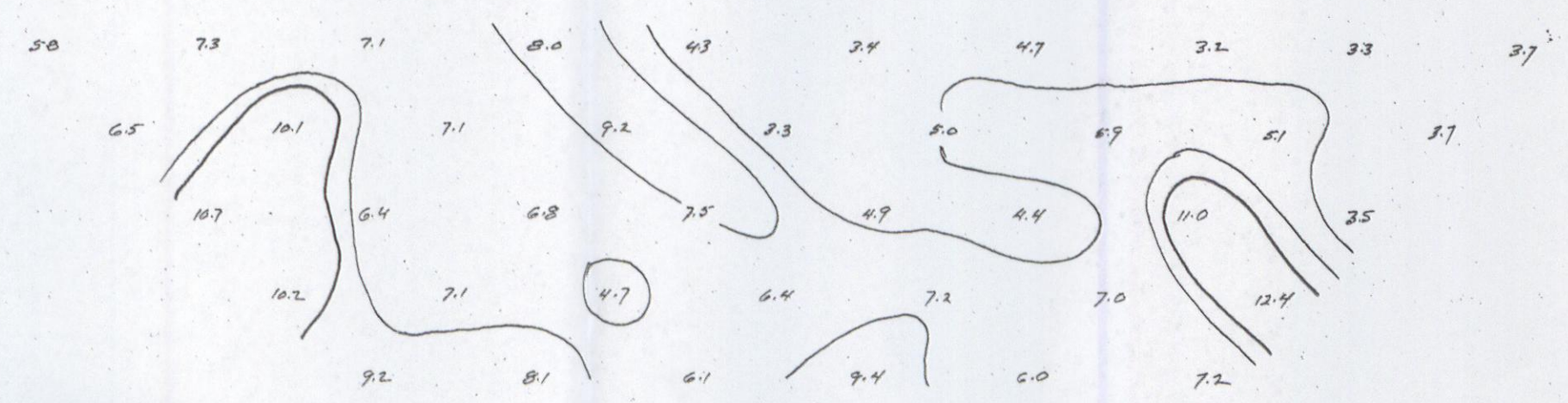


85 0 8N 16N 24N 32N



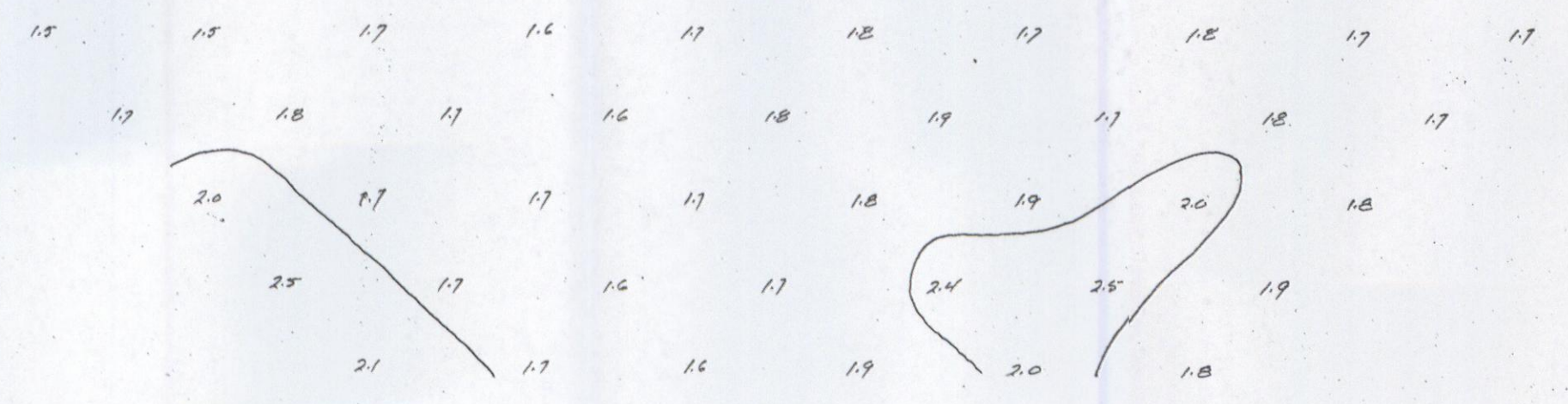
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← n = 4  
← n = 5

Apparent Resistivity (ohm feet)



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← n = 2  
← n = 3  
← n = 4  
← n = 5

Metal Factor



← n = 1  
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← n = 3  
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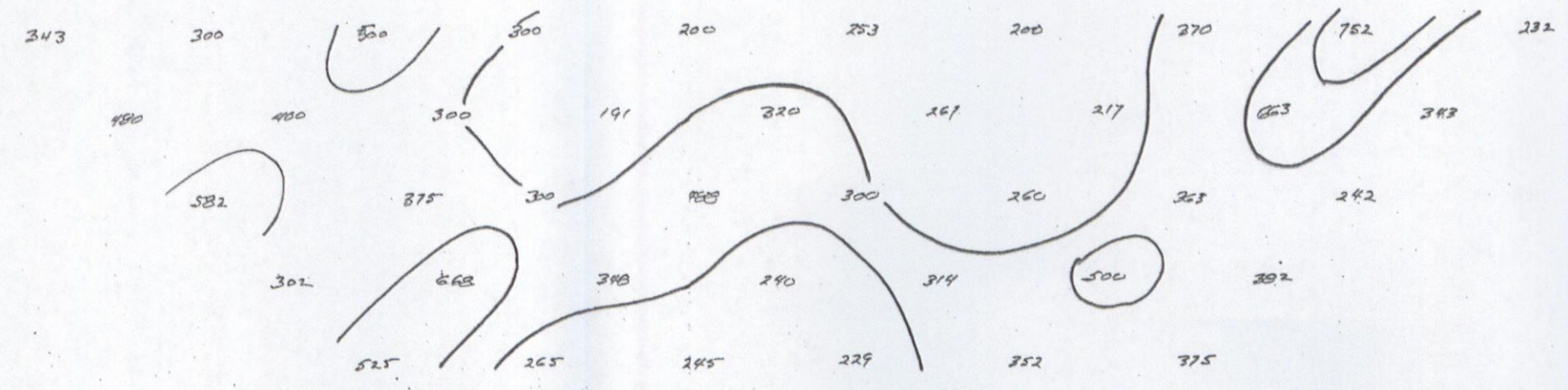
Frequency Effect (%)

SCALE - 1" = 400' DATE - Aug. 1970  
Contours at logarithmic multiples of -  
- 10, 15, 20, 30, 50, 75 & 100

BASE LINE I LINE NO.8W

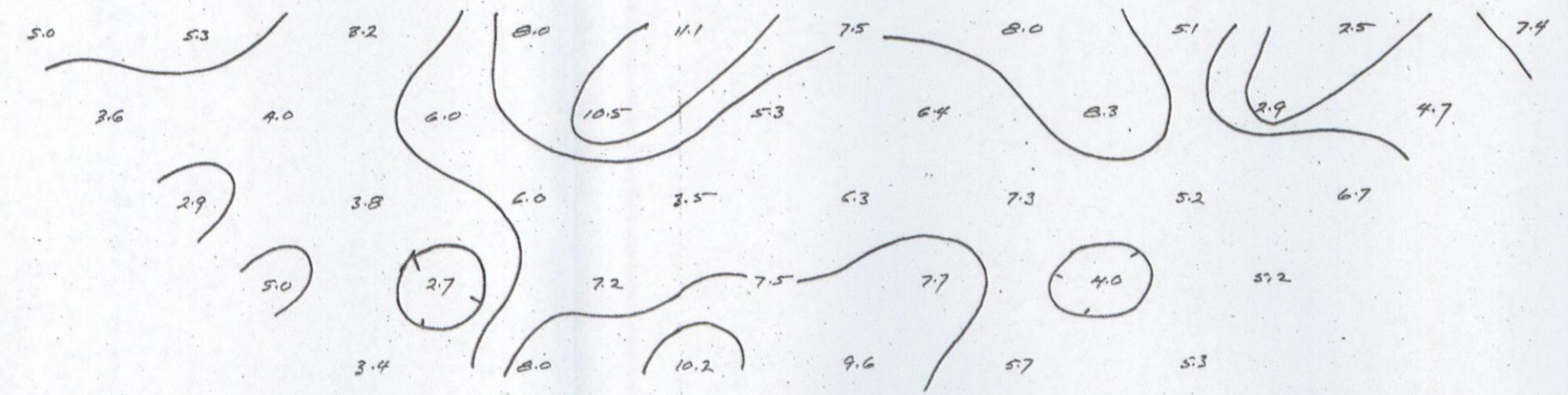
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165      85      0      8N      16N      24N      32N



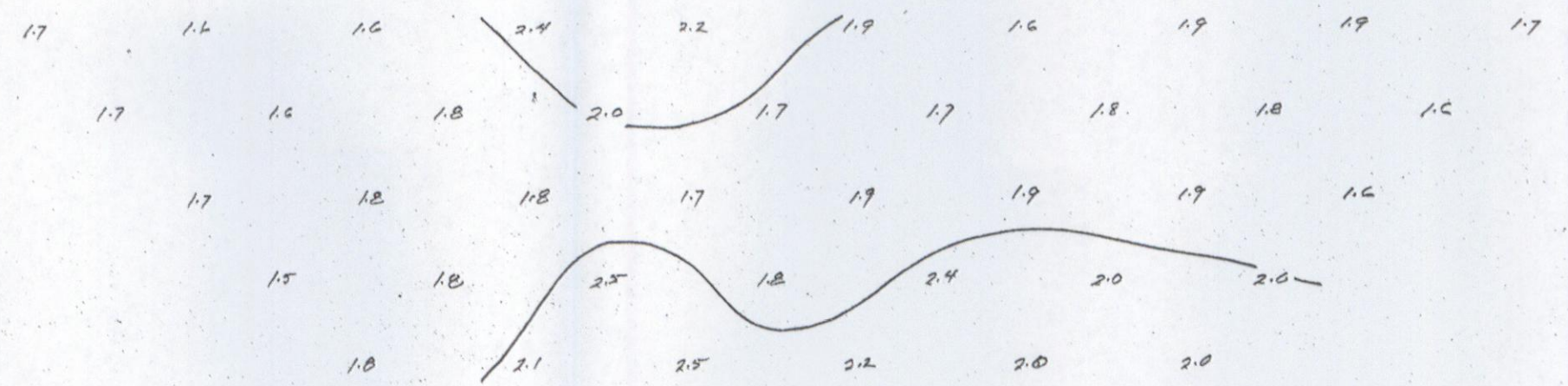
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← n = 5

Apparent Resistivity (ohm feet)



← n = 1  
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← n = 3  
← n = 4  
← n = 5

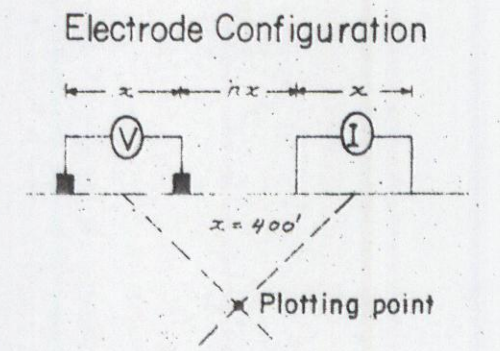
Metal Factor



← n = 1  
← n = 2  
← n = 3  
← n = 4  
← n = 5

Frequency Effect (%)

BASE LINE I      LINE NO. 16W

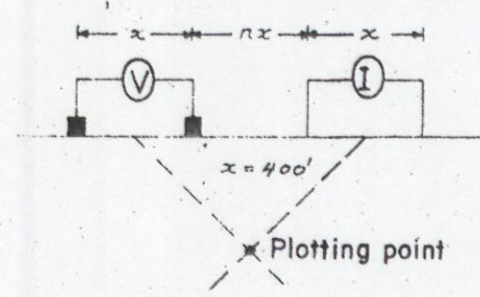


SCALE - 1" = 400'    DATE - Aug. 1970  
Contours at logarithmic multiples of -  
- 10, 15, 20, 30, 50, 75 & 100

**INDUCED POLARIZATION  
AND  
RESISTIVITY SURVEY  
for  
AMAX EXPLORATION INC.  
MALONEY CREEK  
COPPER PROSPECT  
POT GROUP  
CASINO AREA, YUKON**

BASE LINE I      LINE NO. 24W

Electrode Configuration



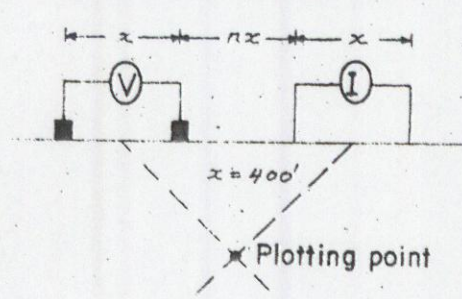
SCALE - 1" = 400'    DATE - Aug. 1970  
Contours at logarithmic multiples of -  
- 10, 15, 20, 30, 50, 75 & 100

BASE LINE I    LINE NO. 24W

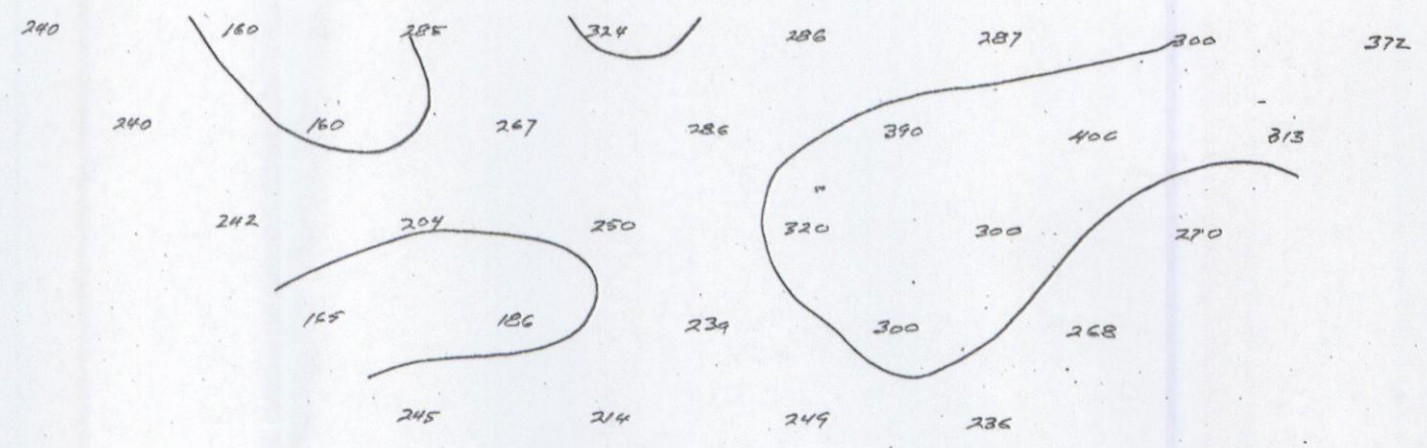
**INDUCED POLARIZATION  
AND  
RESISTIVITY SURVEY  
for  
AMAX EXPLORATION INC.  
MALONEY CREEK  
COPPER PROSPECT  
POT GROUP  
CASINO AREA, YUKON**

BASE LINE I      LINE NO. 32W

Electrode Configuration

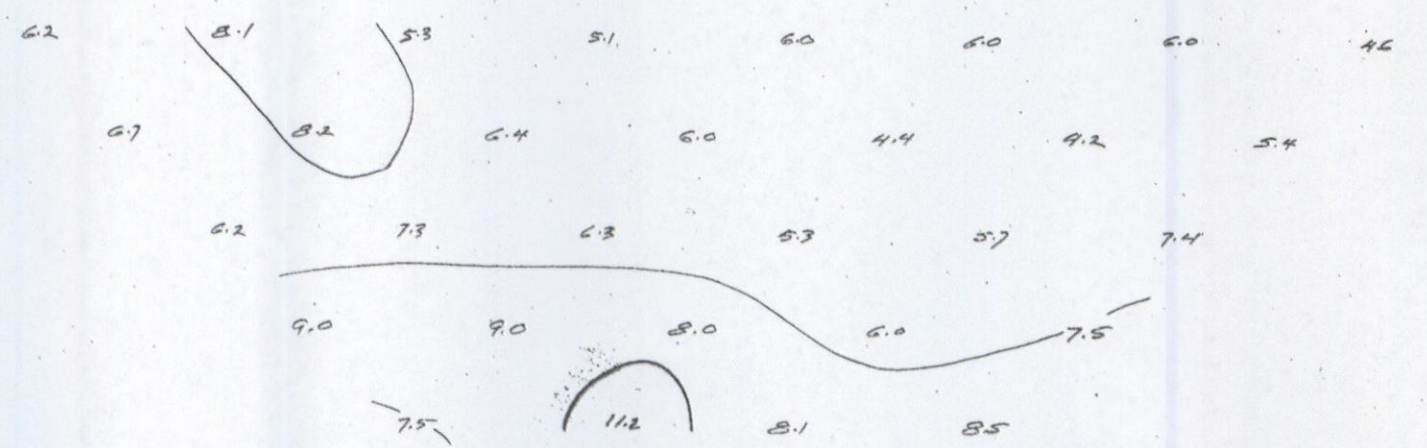


16S      8S      0      8N      16N



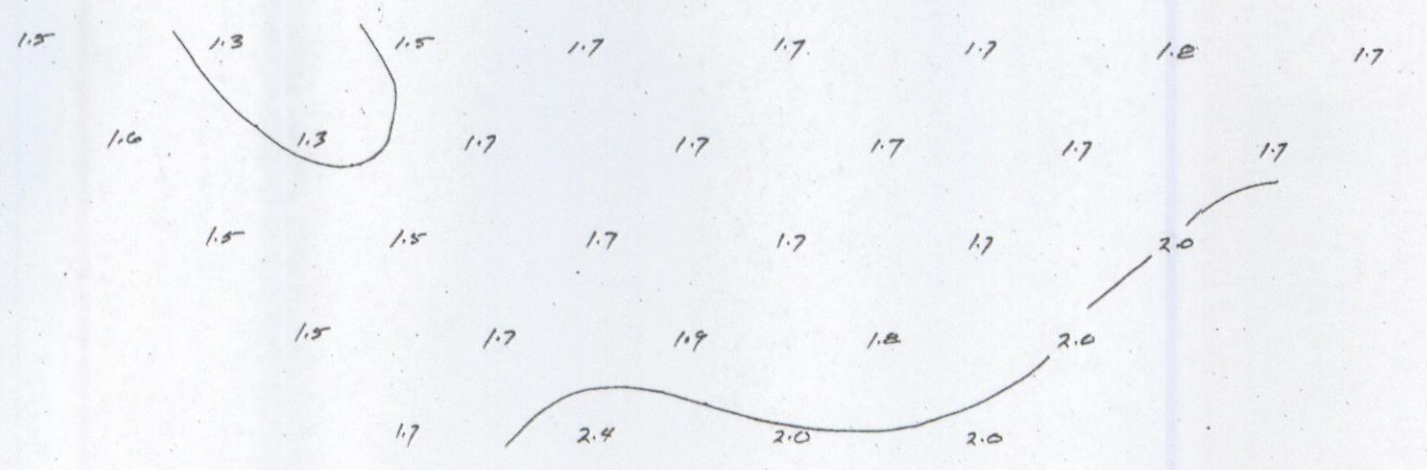
← n = 1  
← n = 2  
← n = 3  
← n = 4  
← n = 5

Apparent Resistivity  
(ohm feet)



← n = 1  
← n = 2  
← n = 3  
← n = 4  
← n = 5

Metal Factor



← n = 1  
← n = 2  
← n = 3  
← n = 4  
← n = 5

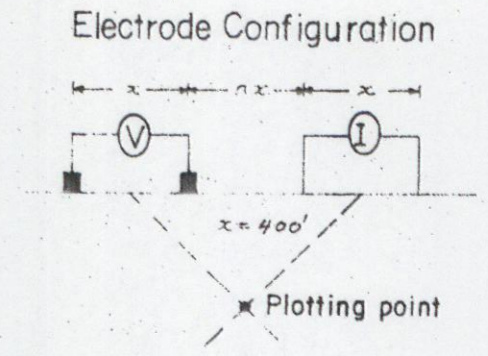
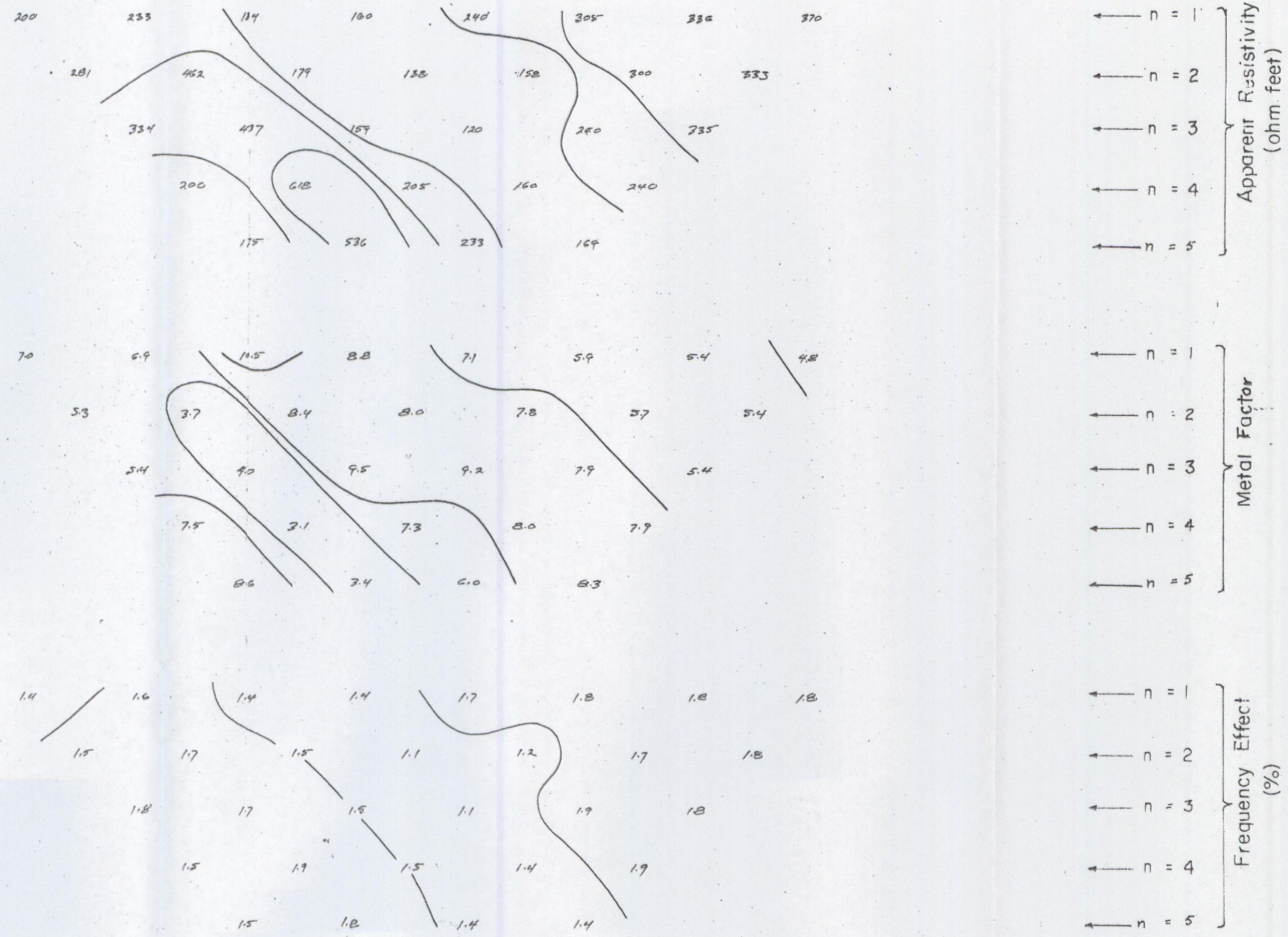
Frequency Effect  
(%)

SCALE - 1" = 400'    DATE - Aug. 1970  
Contours at logarithmic multiples of -  
- 10, 15, 20, 30, 50, 75 & 100

BASE LINE I    LINE NO 32W

INDUCED POLARIZATION  
AND  
RESISTIVITY SURVEY  
for  
AMAX EXPLORATION INC.  
MALONEY CREEK  
COPPER PROSPECT  
POT GROUP  
CASINO AREA, YUKON

BASE LINE I      LINE NO. 40W



SCALE - 1" = 400'      DATE - Aug. 1970  
Contours at logarithmic multiples of -  
- 10, 15, 20, 30, 50, 75 & 100

BASE LINE I      LINE NO. 40W



INDUCED POLARIZATION  
ANOMALY

■ DEFINITE

▨ PROBABLE

- - - POSSIBLE



AMAX EXPLORATION INC.  
MALONEY CREEK  
POT GROUP  
CASINO AREA, YUKON  
SCALE 1" = 800'