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REPORT ON THE INDUCED POLARIZATION AND RESISTIVITY SURVEY ON THE BURN CLAIM GROUP, OMINECA MINING DIVISION, BRITISH COLUMBIA FOR LUC SYNDICATE

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McPHAR GEOPHYSICS LIMITED

REPORT ON THE INDUCED POLARIZATION AND RESISTIVITY SURVEY ON THE BURN CLAIM GROUP, OMINECA MINING DIVISION, BRITISH COLUMBIA FOR LUC SYNDICATE

BY

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AND

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NAME AND LOCATION OF PROPERTY

BURN CLAIM GROUP,

OMINECA MINING DIVISION, B.C. 55°30'N, 125°20'W

DATE STARTED: JULY 3, 1972

DATE FINISHED: JULY 22, 1972

CAM:- I LIKED LAST YEAR'S ORDER AS SHOWN IN TABLE OF CONTENTS.

N.B.C. SYNDICATE

EXPLORATION REPORT 1969

by

J.C. STEPHEN

Vancouver, B.C.

December 18th, 1969.

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NOTES ON THE THEORY, METHOD OF FIELD OPERATION, AND PRESENTATION OF DATA FOR THE INDUCED POLARIZATION METHOD

Induced Polarization as a geophysical measurement refers to the blocking action or polarization of metallic or electronic conductors in a medium of ionic solution conduction.

This electro-chemical phenomenon occurs wherever electrical current is passed through an area which contains metallic minerals such as base metal sulphides. Normally, when current is passed through the ground, as in resistivity measurements, all of the conduction takes place through ions present in the water content of the rock, or soil, i.e. by ionic conduction. This is because almost all minerals have a much higher specific resistivity than ground water. The group of minerals commonly described as "metallic", however, have specific resistivities much lower than ground waters. The induced polarization effect takes place at those interfaces where the mode of conduction changes from ionic in the solutions filling the interstices of the rock to electronic in the metallic minerals present

in the rock.

The blocking action or induced polarization mentioned above, which depends upon the chemical energies necessary to allow the ions to give up or receive electrons from the metallic surface, increases with the time that a d. c. current is allowed to flow through the rock; i. e. as ions pile up against the metallic interface the resistance to current flow increases. Eventually, there is enough polarization in the form of excess ions at the interfaces, to appreciably reduce the amount of current flow through the metallic particle. This polarization takes place at each of the infinite number of solution-metal interfaces in a mineralized rock.

When the d. c. voltage used to create this d. c. current flow is cut off, the Coulomb forces between the charged ions forming the polarization cause them to return to their normal position. This movement of charge creates a small current flow which can be measured on the surface of the ground as a decaying potential difference.

From an alternate viewpoint it can be seen that if the direction of the current through the system is reversed repeatedly before the polarization occurs, the effective resistivity of the system as a whole will change as the frequency of the switching is changed. This is a consequence of the fact that the amount of current flowing through each metallic interface depends upon the length of time that current has been passing through it in one direction.

The values of the per cent frequency effect or F. E. are a measurement of the polarization in the rock mass. However, since the measurement of the degree of polarization is related to the apparent resistivity of the rock mass it is found that the metal factor values or M. F. are the most useful values in determining the amount of polarization present in the rock mass. The MF values are obtained by normalizing the F. E. values for varying resistivities.

The induced polarization measurement is perhaps the most powerful geophysical method for the direct detection of metallic sulphide mineralization, even when this mineralization is of very low concentration. The lower limit of volume per cent sulphide necessary to produce a recognizable IP anomaly will vary with the geometry and geologic environment of the source, and the method of executing the survey. However, sulphide mineralization of less than one per cent by volume has been detected by the IP method under proper geological conditions.

The greatest application of the IP method has been in the search for disseminated metallic sulphides of less than 20% by volume. However, it has also been used successfully in the search for massive sulphides in situations where, due to source geometry, depth of source, or low resistivity of surface layer, the EM method can not be successfully applied. The ability to differentiate ionic conductors, such as water filled shear zones, makes the IP method a useful tool in checking EM

anomalies which are suspected of being due to these causes.

In normal field applications the IP method does not differentiate between the economically important metallic minerals such as chalcopyrite, chalcocite, molybdenite, galena, etc., and the other metallic minerals such as pyrite. The induced polarization effect is due to the total of all electronic conducting minerals in the rock mass. Other electronic conducting materials which can produce an IP response are magnetite, pyrolusite, graphite, and some forms of hematite.

In the field procedure, measurements on the surface are made in a way that allows the effects of lateral changes in the properties of the ground to be separated from the effects of vertical changes in the properties. Current is applied to the ground at two points in distance (X) apart. The potentials are measured at two other points (X) feet apart, in line with the current electrodes is an integer number (n) times the basic distance (X).

The measurements are made along a surveyed line, with a constant distance (nX) between the nearest current and potential electrodes. In most surveys, several traverses are made with various values of (n); i. e. (n) = 1, 2, 3, 4, etc. The kind of survey required (detailed or reconnaissance) decides the number of values of (n) used.

In plotting the results, the values of the apparent resistivity, apparent per cent frequency effect, and the apparent metal factor

measured for each set of electrode positions are plotted at the intersection of grid lines, one from the center point of the current electrodes and the other from the center point of the potential electrodes. (See Figure A.) The resistivity values are plotted above the line as a mirror image of the metal factor values below. On a second line, below the metal factor values, are plotted the values of the per cent frequency effect. In some cases the values of per cent frequency effect are plotted as superscripts of the metal factor value. In this second case the frequency effect values are not contoured. The lateral displacement of a given value is determined by the location along the survey line of the center point between the current and potential electrodes. The distance of the value from the line is determined by the distance (nX) between the current and potential electrodes when the measurement was made.

The separation between sender and receiver electrodes is only one factor which determines the depth to which the ground is being sampled in any particular measurement. The plots then, when contoured, are not section maps of the electrical properties of the ground under the survey line. The interpretation of the results from any given survey must be carried out using the combined experience gained from field results, model study results and theoretical investigations. The position of the electrodes when anomalous values are measured is important in the interpretation.

In the field procedure, the interval over which the potential differences are measured is the same as the interval over which the electrodes are moved after a series of potential readings has been made. One of the advantages of the induced polarization method is that the same equipment can be used for both detailed and reconnaissance surveys merely by changing the distance (X) over which the electrodes are moved each time. In the past, intervals have been used ranging from 25 feet to 2000 feet for (X). In each case, the decision as to the distance (X) and the values of (n) to be used is largely determined by the expected size of the mineral deposit being sought, the size of the expected anomaly and the speed with which it is desired to progress.

The diagram in Figure A demonstrates the method used in plotting the results. Each value of the apparent resistivity, apparent metal factor, and apparent per cent frequency effect is plotted and identified by the position of the four electrodes when the measurement was made. It can be seen that the values measured for the larger values of (n) are plotted farther from the line indicating that the thickness of the layer of the earth that is being tested is greater than for the smaller values of (n); i. e. the depth of the measurement is increased. When the F. E. values are plotted as superscripts to the MF values the third section of data values is not presented and the F. E. values are not contoured.

The actual data plots included with the report are prepared utilizing an IBM 360/75 Computer and a Calcomp 770/763 Incremental Plotting System. The data values are calculated, plotted, and contoured according to a programme developed by McPhar Geophysics. Certain symbols have been incorporated into the programme to explain various situations in recording the data in the field.

The IP measurement is basically obtained by measuring the difference in potential or voltage (ΔV) obtained at two operating frequencies. The voltage is the product of the current through the ground and the apparent resistivity of the ground. Therefore in field situations where the current is very low due to poor electrode contact, or the apparent resistivity is very low, or a combination of the two effects; the value of (ΔV) the change in potential will be too small to be measurable. The symbol "TL" on the data plots indicates this situation.

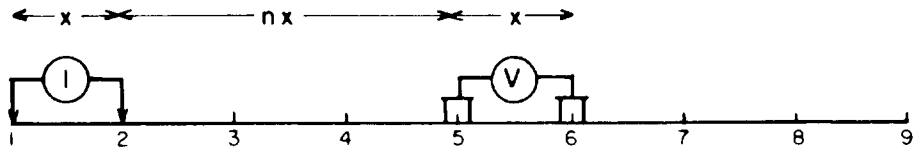
In some situations spurious noise, either man made or natural, will render it impossible to obtain a reading. The symbol "N" on the data plots indicates a station at which it is too noisey to record a reading. If a reading can be obtained, but for reasons of noise there is some doubt as to its accuracy, the reading is bracketed in the data plot ( ).

In certain situations negative values of Apparent Frequency Effect are recorded. This may be due to the geologic environment or spurious electrical effects. The actual negative frequency effect value recorded is indicated on the data plot, however the symbol "NEG" is

indicated for the corresponding value of Apparent Metal Factor. In contouring negative values the contour lines are indicated to the nearest positive value in the immediate vicinity of the negative value.

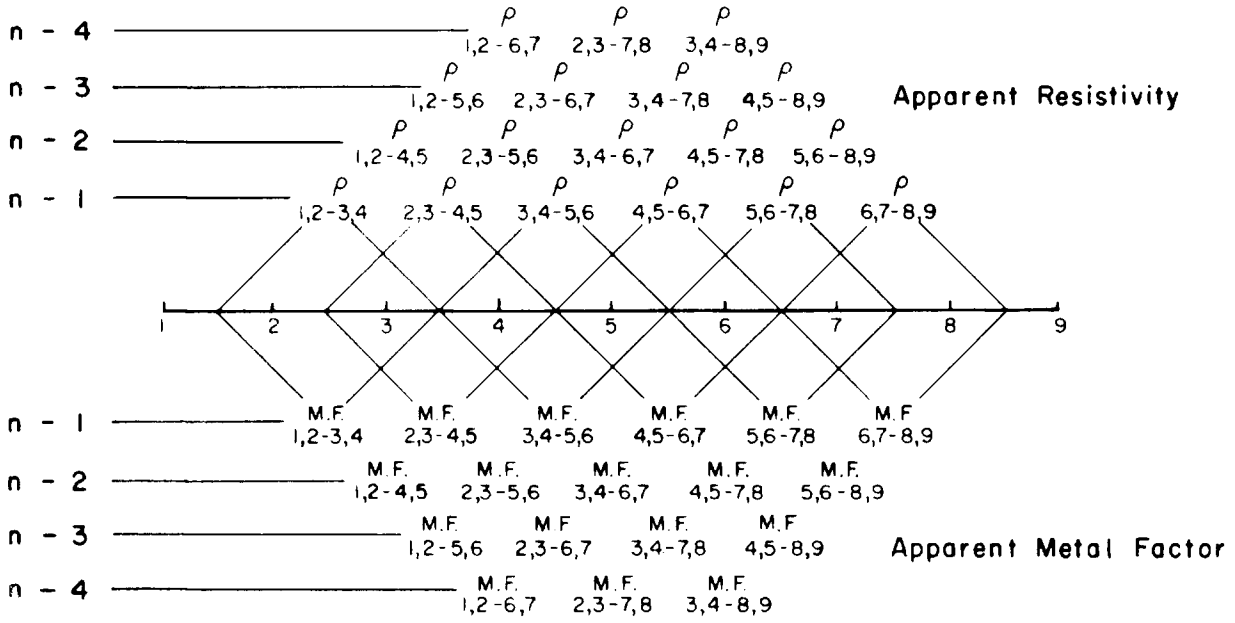
The symbol "NR" indicates that for some reason the operator did not attempt to record a reading although normal survey procedures would suggest that one was required. This may be due to inaccessible topography or other similar reasons. Any symbol other than those discussed above is unique to a particular situation and is described within the body of the report.

METHOD USED IN PLOTTING DIPOLE-DIPOLE INDUCED POLARIZATION AND RESISTIVITY RESULTS



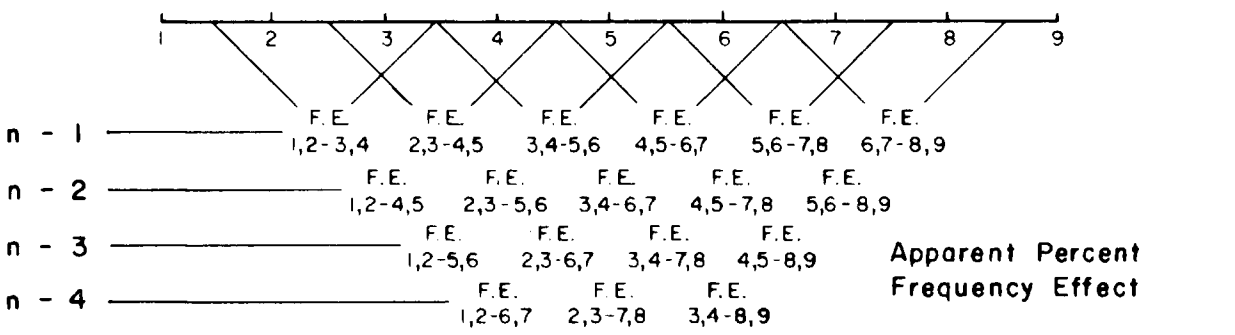
Stations on line

x = Electrode spread length
n = Electrode separation



Apparent Resistivity

Apparent Metal Factor



Apparent Percent Frequency Effect

Fig. A

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1. INTRODUCTION

At the request of Mr. W.R. Bacon, Manager of the company, an Induced Polarization and Resistivity survey has been completed on the Burn Claim Group, 28 miles southwest of Germanson Landing in the Omineca Mining Division of British Columbia for Luc Syndicate. The claim group is situated at 55°30' north latitude and 125°20' west longitude. Access is by tractor road or helicopter.

The Burn claims are located within the Hogem batholith, an Omineca intrusion of Upper Jurassic or Lower Cretaceous age. The batholith consists of a core of granodiorite-granite with a border zone of syenodiorite or more basic rock. In the grid area a relatively massive alaskite dyke intrudes monzonite and quartz monzonite. Outcrops in the creek area (see Dwg. I.P.P. 3539) indicate a zone of pyrite mineralization to the north. Limited trenching indicates intense fracturing with disseminated mineralization in relatively massive monzonite and fracture filling and veins containing quartz,

molybdenite, pyrite and chalcopyrite. A geochemical survey indicated the presence of molybdenite and copper.

The IP survey was carried out to outline a possible pyritic halo north and west of an apparent area of predominantly molybdenite mineralization and to possibly outline zones of relative copper enrichment within the area of molybdenite mineralization as indicated by the geochemical survey.

The work was completed in July, 1972, using a McPhar P660 high power variable frequency IP unit operating at 0.3 and 5.0 cps over the following claims:

Burn - 1, 2, 3, 4, 5, 9, 10, 11, 12, 13, 14, 15, 16, 18, 20, 21, 22, 23, 24, 25, 26, 31, 43, 73.

These claims are assumed to be owned by Luc Syndicate.

2. PRESENTATION OF RESULTS

The Induced Polarization and Resistivity results are shown on the following data plots in the manner described in the notes preceding this report.

Line	Electrode Intervals	Dwg. No.
10000N	300 feet	IP 5972-1
9600N	300 feet	IP 5972-2
9200N	300 feet	IP 5972-3
8800N	300 feet	IP 5972-4
8400N	300 feet	IP 5972-5
8000N	300 feet	IP 5972-6
7600N	300 feet	IP 5972-7

Line	Electrode Intervals	Dwg. No.
7200N	300 feet	IP 5972-8
6800N	300 feet	IP 5972-9
6400N	300 feet	IP 5972-10
6000N	300 feet	IP 5972-11
5600N	300 feet	IP 5972-12
5200N	300 feet	IP 5972-13
4800N	300 feet	IP 5972-14
4400N	300 feet	IP 5972-15
4000N	300 feet	IP 5972-16

Also enclosed with this report is Dwg. I.P.P. 3539, a plan map of the Burn Claim Grid at a scale of 1" = 400'. The definite, probable and possible Induced Polarization anomalies are indicated by bars, in the manner shown on the legend, on this plan map as well as on the data plots. These bars represent the surface projection of the anomalous zones as interpreted from the location of the transmitter and receiver electrodes when the anomalous values were measured.

Since the Induced Polarization measurement is essentially an averaging process, as are all potential methods, it is frequently difficult to exactly pinpoint the source of an anomaly. Certainly, no anomaly can be located with more accuracy than the electrode interval length; i.e. when using 300' electrode intervals the position of a narrow sulphide body can only be determined to lie between two stations 300' apart. In order to definitely locate, and fully evaluate, a narrow, shallow source it is necessary to use shorter electrode intervals. In order to locate sources at some

depth, larger electrode intervals must be used, with a corresponding increase in the uncertainties of location. Therefore, while the centre of the indicated anomaly probably corresponds fairly well with source, the length of the indicated anomaly along the line should not be taken to represent the exact edges of the anomalous material.

The drill hole information shown on Dwg. I.P.P. 3539 has been taken from maps made available by the staff of Luc Syndicate.

3. DISCUSSION OF RESULTS

The IP survey located anomalies on every line. These anomalies are, for the most part, very weak, but on the assumption that molybdenum is the prime mineralization, the source could be of economic importance. The stronger or probable anomalies are only probable relative to the weak or possible anomalies. The probable anomalies likely represent either an increase in mineralization or a change in the source mineral. That very weak anomalies can be of major importance is shown on Page 3 of Appendix A.

An area of the grid which is almost certainly barren of mineralization has been outlined on the south-southeastern portion of the grid. In this area, the frequency effects are all less than 1%.

Three zones have been suggested on Dwg. I.P.P. 3539.

Zone A

Zone A runs the entire length of the grid; it seems to be disappearing to the south, but it is open to the north. The anomalies suggest weak, disseminated mineralization. The probable portion of the anomalies does not have significant strike length.

Zone B

This zone is similar to Zone A but the anomalies are less extensive.

Zone C

This zone is suggested by probable anomalies on Line 8400N and Line 8000N. The source of these anomalies could be narrow, tabular massive metallic mineralization or a shallow zone of concentrated mineralization (see Appendix B). These anomalies should be detailed with shorter electrode intervals to better locate the source and provide better drill targets. If this is not possible, the source should be tested by angled drill holes. These anomalies provide the best indication of possible copper enrichment on the grid.

4. CONCLUSIONS AND RECOMMENDATIONS

The IP survey has outlined three anomalous zones. Zone A and Zone B appear to represent very weak disseminated metallic mineralization. Although the anomalies of these two zones are very weak, the source could be important, since the mineralization in the survey grid area is stated to be molybdenum.

Zone C appears only on two lines, but the source could be more concentrated mineralization with more than one mineral present. The anomalies on this zone should be detailed with shorter electrode intervals to better locate and define the source.

A zone of apparently barren rock, characterized by very low frequency effects, has been outlined on the south-southeastern portion of the grid.

Fifteen drill sites have been shown on the base map provided by the

client and are shown on Dwg. I.P.P. 3539. Seven, or perhaps eight, of these sites would test the weak anomalies of Zone 1. If these holes have been drilled, the source of the weak mineralisation is probably known. If not, at least seven holes would test the source of the weak anomalies, as can be seen on Dwg. I.P.P. 3539.

It is recommended that Zone C be detailed to obtain better drilling targets, but if this is not possible, angled holes should be drilled to test the source as follows:

Line 8000N - (1) a hole drilled to test the source below 58+50E at a vertical depth of 150'.

- (2) a hole drilled to test the source below 64+50E at a vertical depth of 150'.

The IP survey does not appear to have located concentrated sulphide mineralisation in the northwest portion of the grid.

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Marion A. Goudie,
Geologist.

Philip G. Hallof,
Geophysicist.

Dated: August 22,1972

APPENDIX A

EXPECTED IP ANOMALIES FROM "PORPHYRY COPPER" TYPE ZONES OF DISSEMINATED SULPHIDE MINERALIZATION

Our experience in other areas has shown that the induced polarization method can be successfully used to locate, and outline, zones of disseminated sulphide mineralization of the "porphyry copper" type. In most cases the interpretation of the IP results is simple and straightforward. The results shown in Figure 1 and Figure 2 are typical.

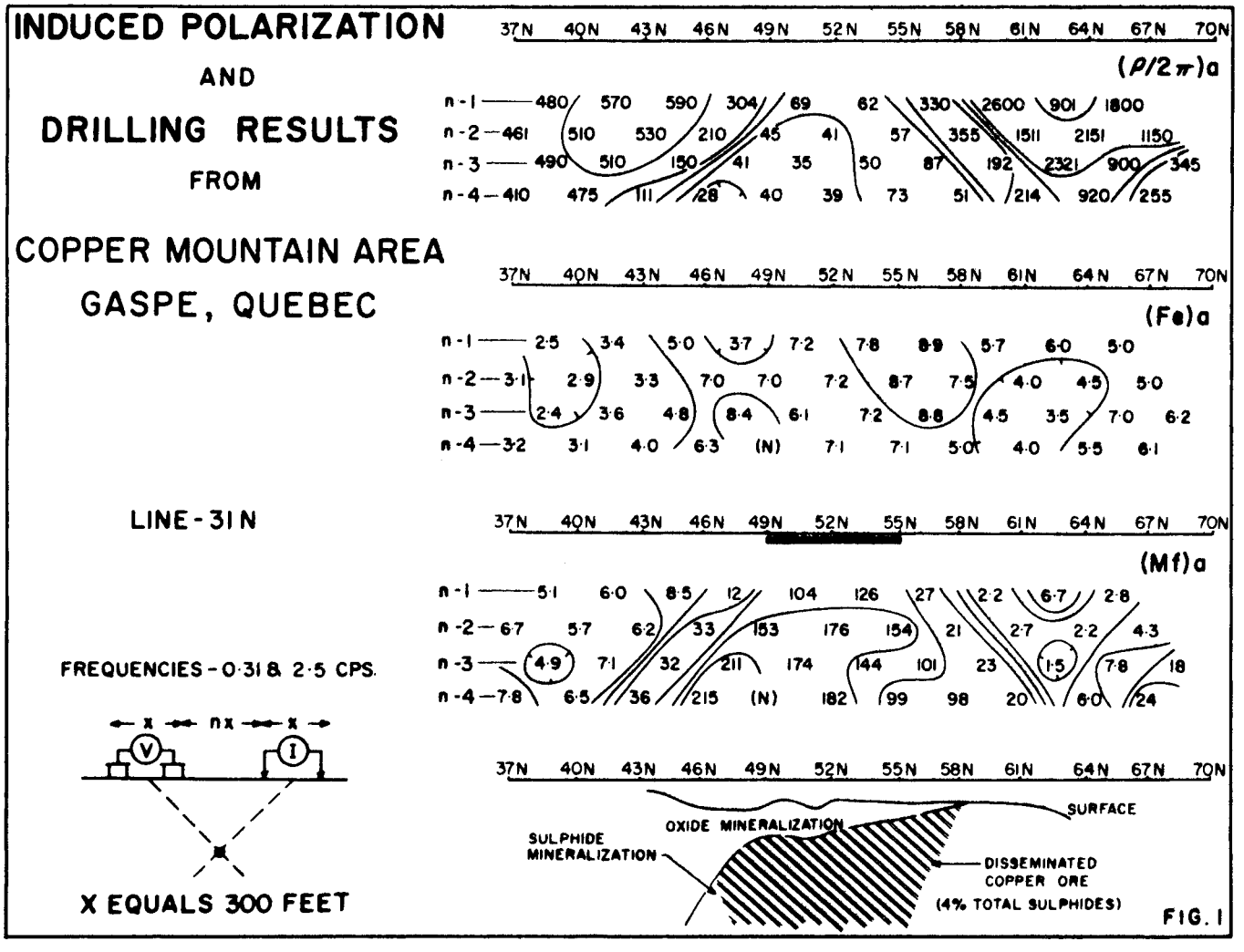
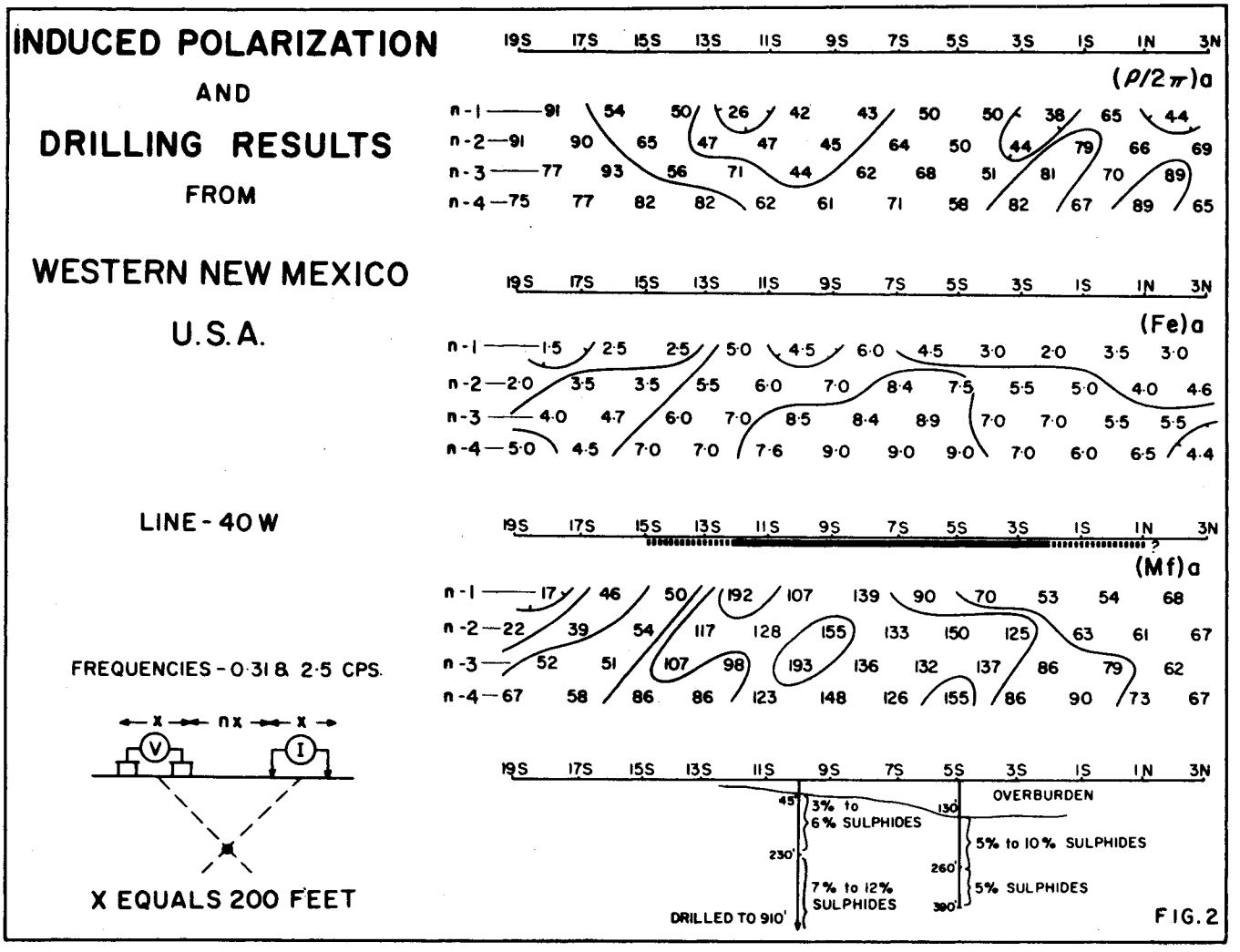


FIG. 1

The source of the moderate magnitude IP anomaly shown in Figure 1 contains approximately 4% metallic mineralization. The zone is of limited lateral extent and enough copper is present to make the mineralization "ore grade". The presence of the surface oxidation can be seen in the fact that the apparent IP effects increase for n = 2.



The IP anomaly shown in Figure 2 has about the same magnitude as that described above. It should be noted that appreciably greater concentrations of metallic mineralization are present; further, there is little or no copper present. These results illustrate the fact that IP results can not be used to determine the exact amount of metallic mineralization present or to determine the economic importance of a mineralized zone. In some geologic situations zoning is present; the zones of mineralization of greatest economic value may contain less total metallic mineralization than other zones in the same general area.

In the proper geologic environment, the method will detect even very low concentrations of metallic mineralization. The IP results shown in Figure 3 located the ore zone at the Brenda Property near Peachland, B. C. The zone contains 1.0 to 1.5 per cent metallic mineralization; however, the mineralization is "ore grade" because only molybdenite and chalcopyrite are present.

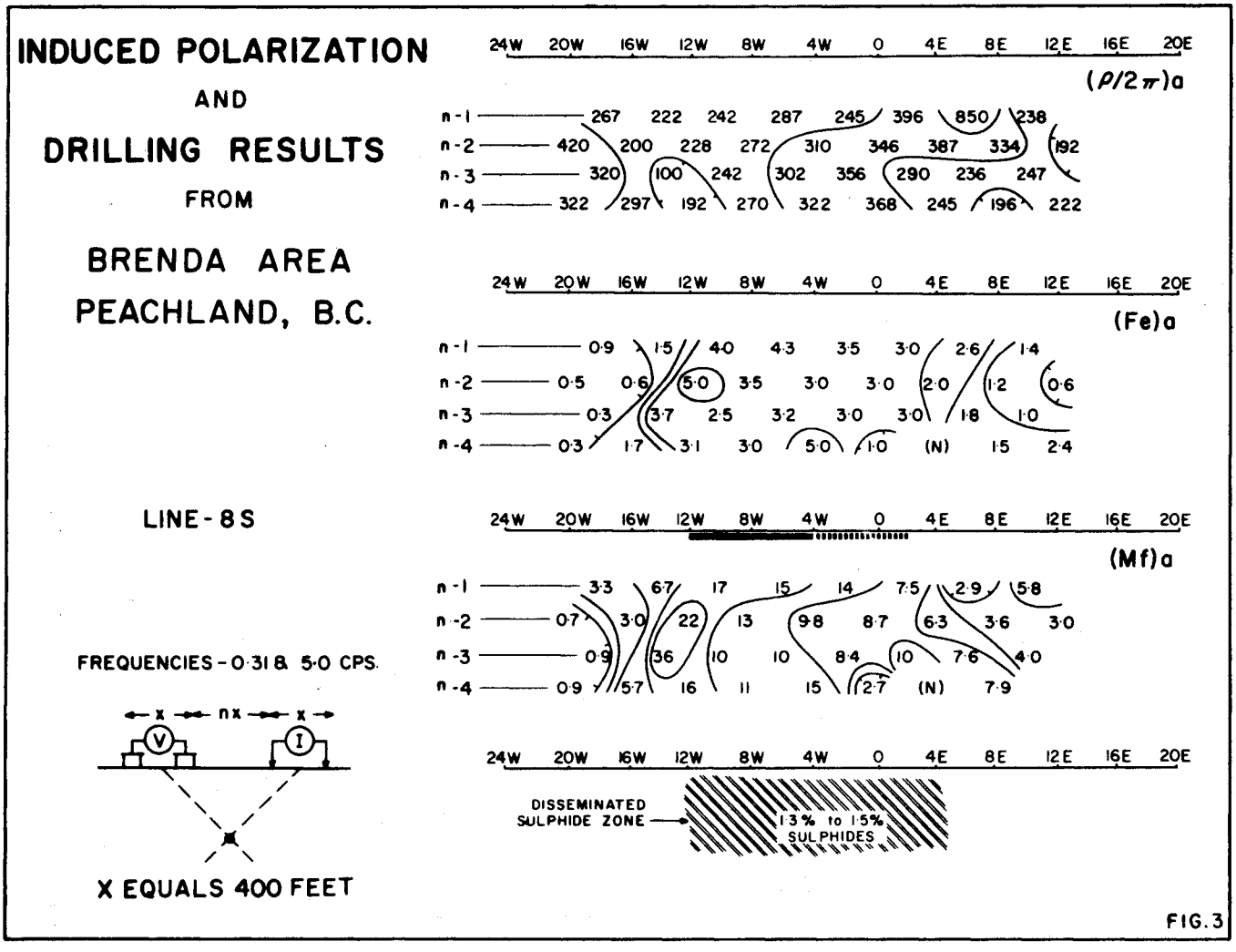


FIG. 3

APPENDIX B

THE INTERPRETATION OF INDUCED POLARIZATION ANOMALIES FROM RELATIVELY SMALL SOURCES

The induced polarization method was originally developed to detect disseminated sulphides and has proven to be very successful in the search for "porphyry copper" deposits. In recent years we have found that the IP method can also be very useful in exploring for more concentrated deposits of limited size. This type of source gives sharp IP anomalies that are often difficult to interpret.

The anomalous patterns that develop on the contoured data plots will depend on the size, depth and position of the source and the relative size of the electrode interval. The data plots are not sections showing the electrical parameters of the ground. When the electrode interval (X) is appreciably greater than the width of the source, a large volume of unmineralized rock is averaged into each measurement. This is particularly true for the large values of the electrode separation (n).

The theoretical scale model results shown in Figure 1 and Figure 2 indicate the effect of depth. If the depth to the top of the source is small compared to the electrode interval (i.e. d X) the measurement for n = 1 will be anomalous. In Figure 1 the depth is 0.5 units (X = 1.0 units) and the n = 1 value is definitely anomalous; the pattern on the contoured data plot is typical for a relatively shallow, narrow, near-vertical tabular source. The results in Figure 2 are for the same source with the depth increased to 1.5 units. Here the n = 1 value is not anomalous; the larger values of (n) are anomalous but the magnitudes are much lower than for the source at less depth.

When the electrode interval is greater than the width of the source, it is not possible to determine its width or exact position between the electrodes. The true IP effect within the source is also indeterminate; the anomaly from a very narrow source with a very large true IP effect will be much the same as that from a zone with twice the width and 1/2 the true IP effect. The theoretical scale model data shown in Figure 3 and Figure 4 demonstrate this problem. The depth and position of the source are unchanged but the width and true IP effect are varied. The anomalous patterns and magnitudes are essentially the same, hence the data are insufficient to evaluate the source completely.

The normal practise is to indicate the IP anomalies by solid, broken, or dashed bars, depending upon their degree of distinctiveness. These bars represent the surface projection of the anomalous zones as interpreted from the location of the transmitter and receiver electrodes

when the anomalous values were measured. As illustrated in Figure 1, Figure 2, Figure 3 and Figure 4, no anomaly can be located with more accuracy than the spread length. While the centre of the solid bar indicating the anomaly corresponds fairly well with the source, the length of the bar should not be taken to represent the exact edges of the anomalous material.

If the source is shallow, the anomaly can be better evaluated using a shorter electrode interval. When the electrode interval used approaches the width of the source, the apparent effects measured will be nearly equal to the true effects within the source. When there is some depth to the top of the source, it is not possible to use electrode intervals that are much less than the depth to the source. In this situation, one must realize that a definite ambiguity exists regarding the width of the source and the IP effect within the source.

Our experience has confirmed the desirability of doing detail. When a reconnaissance IP survey using a relatively large electrode interval indicates the presence of a narrow, shallow source, detail with shorter electrode intervals is necessary in order to better locate, and evaluate, the source. The data of most usefulness is obtained when the maximum apparent IP effect is measured for n = 2 or n = 3. For instance, an anomaly originally located using X = 300' may be checked with X = 200' and then X = 100'. The data with X = 100' will be quite different from the original reconnaissance results with X = 300'.

The data shown in Figure 5 and Figure 6 are field results from a greenstone area in Quebec. The expected sources were narrow (less than 30' in width) zones of massive, high-grade, zinc-silver ore. An electrode interval of 200' was used for the reconnaissance survey in order to keep the rate of progress at an acceptable level. The anomalies located were low in magnitude.

The very weak, shallow anomaly shown in Figure 5 is typical of those located by the X = 200' reconnaissance survey. Several anomalies of this type were detailed using shorter electrode intervals. In most cases the detail measurements suggested broad zones of very weak mineralization. However, in the case of the source at 20N to 22N, the measurements with shorter electrode intervals confirmed the presence of a strong, narrow source. The X = 50' results are shown in Figure 6. Subsequent drilling has shown the source to be 12.5' of massive sulphide mineralization containing significant zinc and silver values.

The change in the anomaly that results when the electrode interval is reduced is not unusual. The X = 50' data more accurately locates the narrow source, and permits the geophysicist to make a better evaluation of its importance. The completion of this type of detail is very important, in order to get the maximum usefulness from a reconnaissance IP survey.

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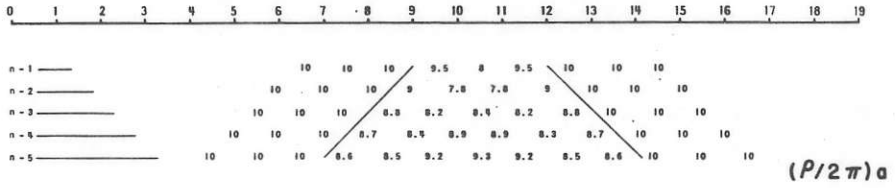
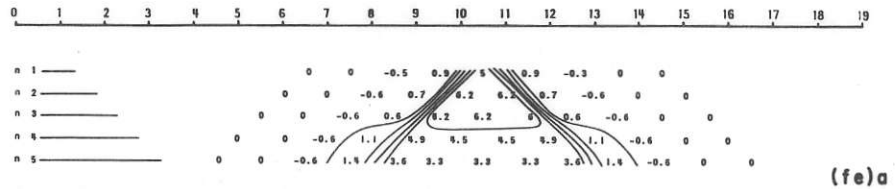
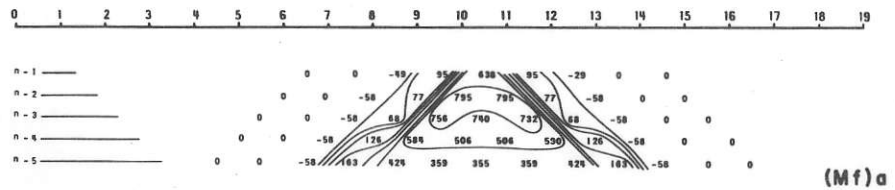
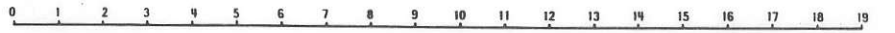
Theoretical Induced Polarization and Resistivity Studies

Scale Model Cases









$(P/2\pi)_1 = 10$

$(Mf)_1 = 0$

$(P/2\pi)_2 = 2.51$

$(Mf)_2 = 10000$

$(fe)_2 = 25\%$

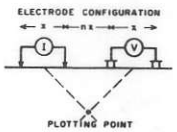
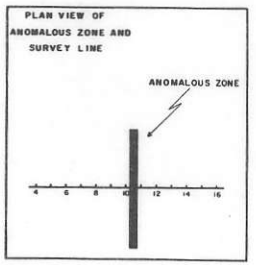


FIG 1



CASE II-0.5-BU-10-a

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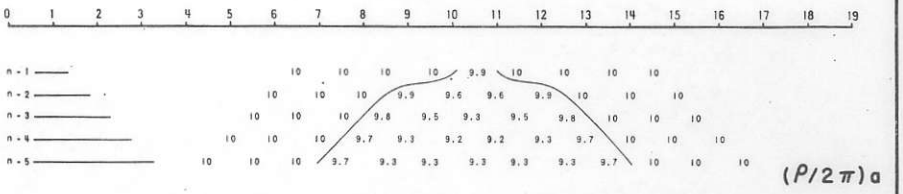
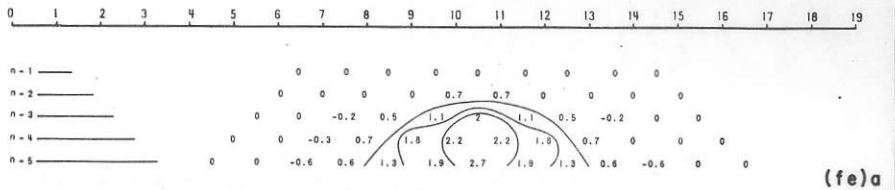
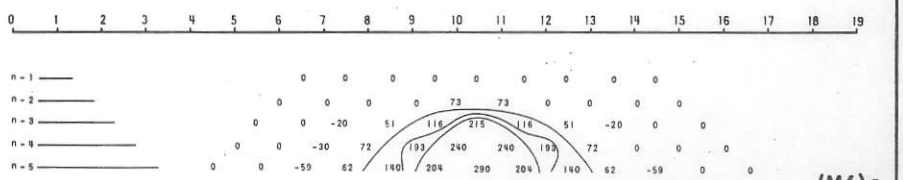
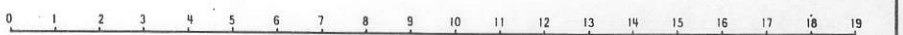
Theoretical Induced Polarization and Resistivity Studies

Scale Model Cases









$(P/2\pi)_1 = 10$

$(Mf)_1 = 0$

$(P/2\pi)_2 = 2.6$

$(Mf)_2 = 9250$

$(fe)_2 = 24\%$

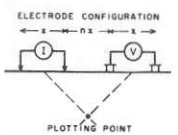
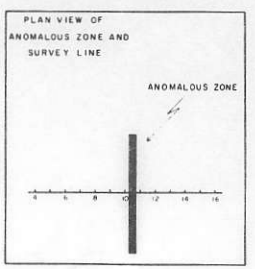


FIG 2

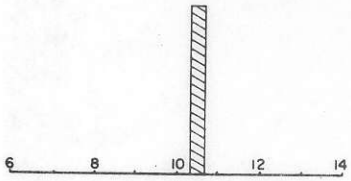


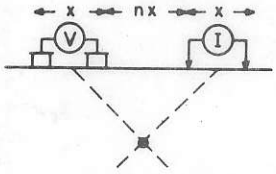
CASE II-1.5-BU-10-a

THEORETICAL INDUCED POLARIZATION AND RESISTIVITY STUDIES

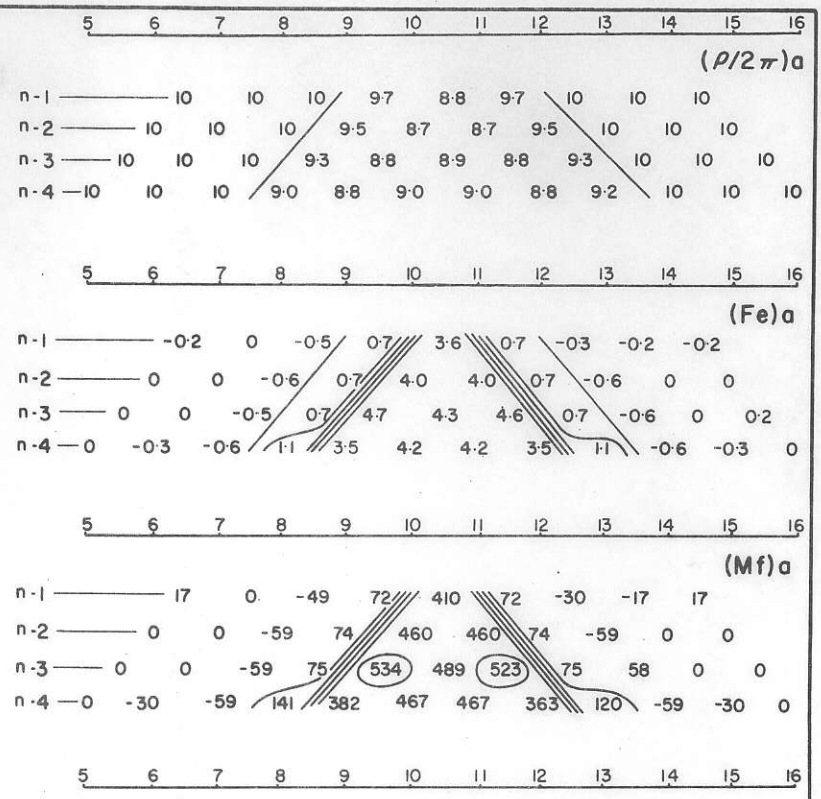
SCALE MODEL CASE

PLAN VIEW





X EQUALS 1 UNIT



$(\rho 2\pi)_1 = 10$
$(Mf)_1 = 0$

$(\rho 2\pi)_2 = 2.57$
$(Mf)_2 = 11700$
$(Fe)_2 = 30\%$

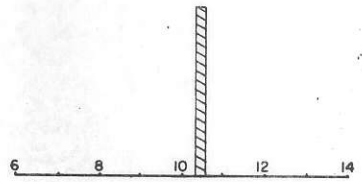
DEPTH EXTENT OF SOURCE 4 UNITS

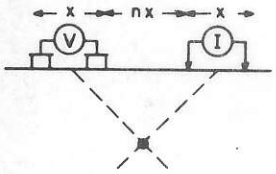
FIG. 3

THEORETICAL INDUCED POLARIZATION AND RESISTIVITY STUDIES

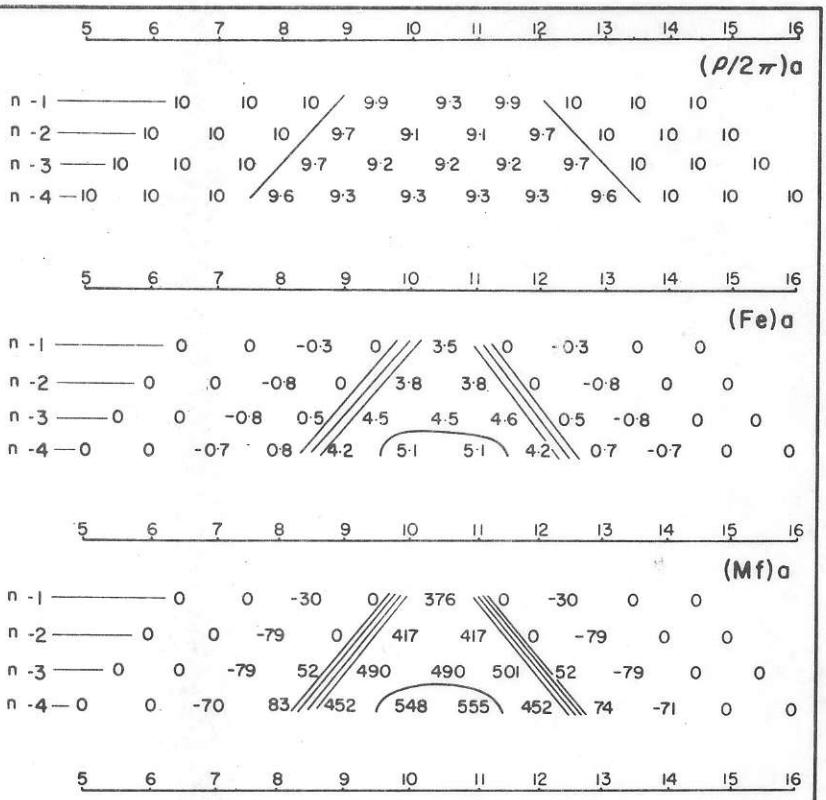
SCALE MODEL CASE

PLAN VIEW





X EQUALS 1 UNIT



$(\rho 2\pi)_1 = 10$
$(Mf)_1 = 0$

$(\rho 2\pi)_2 = 2.41$
$(Mf)_2 = 22800$
$(Fe)_2 = 55\%$

DEPTH EXTENT OF SOURCE 4 UNITS

FIG. 4

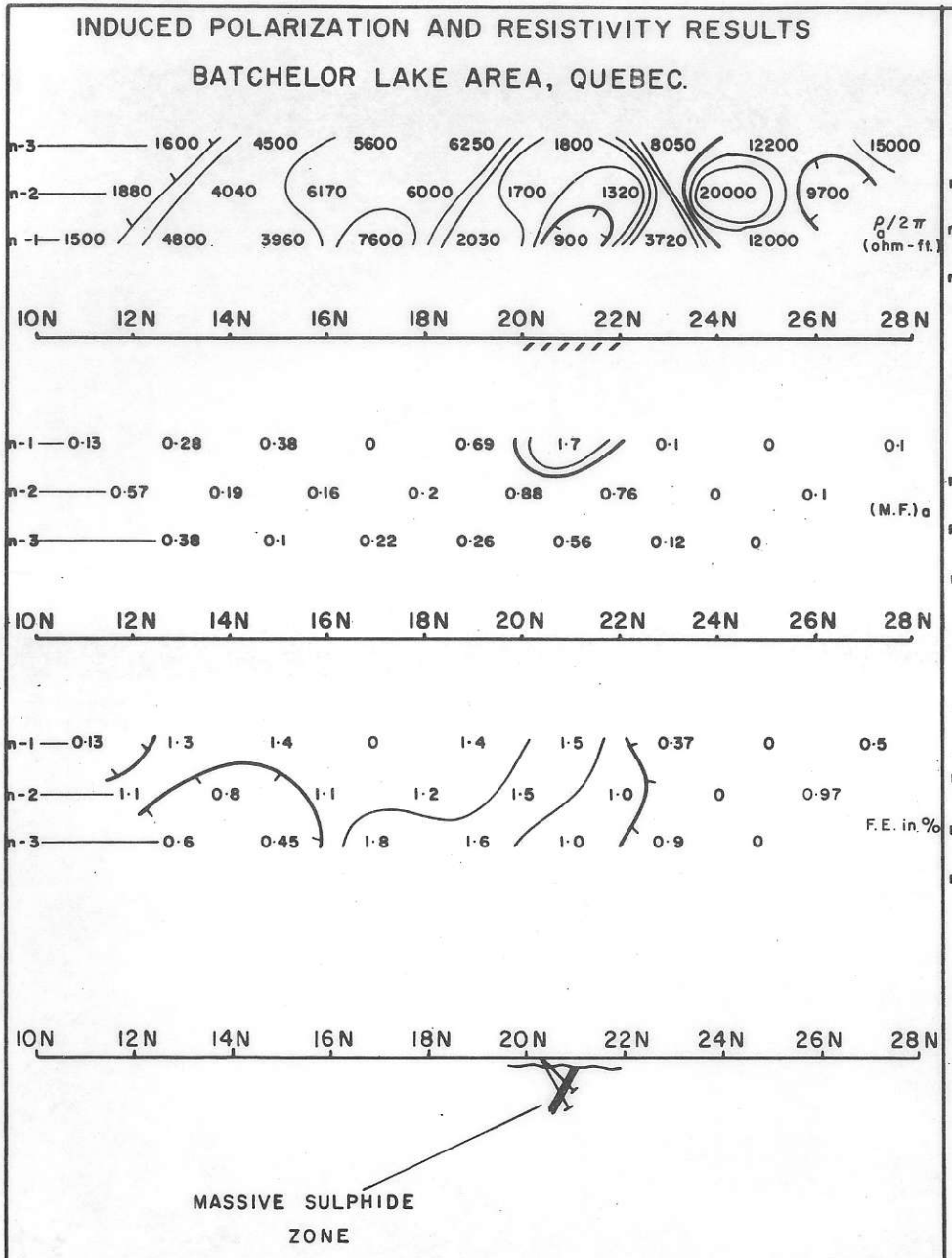

INDUCED POLARIZATION AND RESISTIVITY RESULTS
BATCHELOR LAKE AREA, QUEBEC.
n-3 1600 4500 5600 6250 1800 8050 12200 15000
n-2 1880 4040 6170 6000 1700 1320 20000 9700
n-1 1500 4800 3960 7600 2030 900 3720 12000
ρa/2π (ohm-ft.)
10N 12N 14N 16N 18N 20N 22N 24N 26N 28N
n-1 0·13 0·28 0·38 0 0·69 1·7 0·1 0 0·1
n-2 0·57 0·19 0·16 0·2 0·88 0·76 0 0·1
n-3 0·38 0·1 0·22 0·26 0·56 0·12 0
(M.F.)a
10N 12N 14N 16N 18N 20N 22N 24N 26N 28N
n-1 0·13 1·3 1·4 0 1·4 1·5 0·37 0 0·5
n-2 1·1 0·8 1·1 1·2 1·5 1·0 0 0·97
n-3 0·6 0·45 1·8 1·6 1·0 0·9 0
F.E. in %
10N 12N 14N 16N 18N 20N 22N 24N 26N 28N
MASSIVE SULPHIDE ZONE

FIG. 5

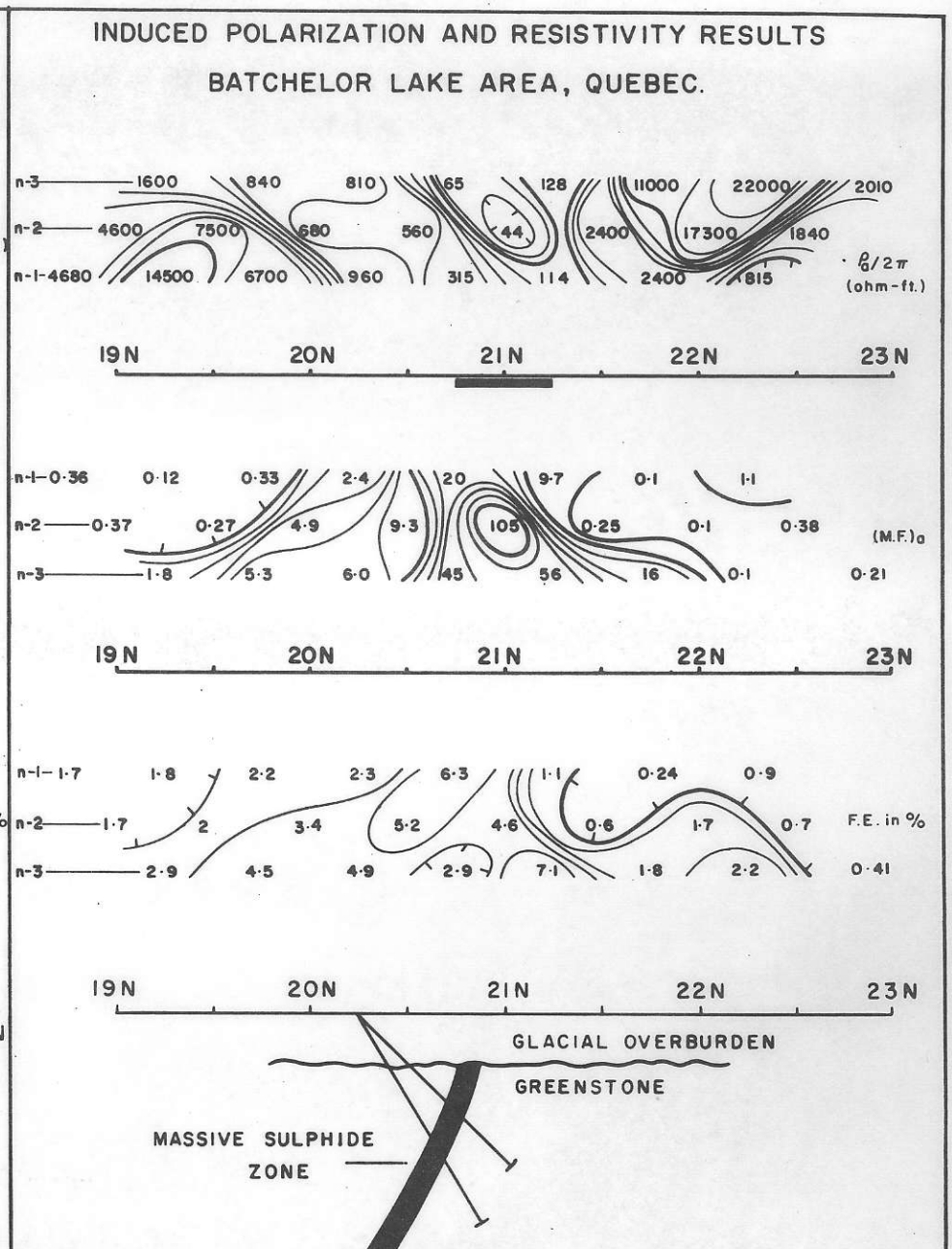

INDUCED POLARIZATION AND RESISTIVITY RESULTS
BATCHELOR LAKE AREA, QUEBEC.
n-3 1600 840 810 65 128 11000 22000 2010
n-2 4600 7500 680 560 44 2400 17300 1840
n-1 4680 14500 6700 960 315 114 2400 815
ρa/2π (ohm-ft.)
19N 20N 21N 22N 23N
n-1 0·36 0·12 0·33 2·4 20 9·7 0·1 1·1
n-2 0·37 0·27 4·9 9·3 105 0·25 0·1 0·38
n-3 1·8 5·3 6·0 45 56 16 0·1 0·21
(M.F.)a
19N 20N 21N 22N 23N
n-1 1·7 1·8 2·2 2·3 6·3 1·1 0·24 0·9
n-2 1·7 2 3·4 5·2 4·6 0·6 1·7 0·7
n-3 2·9 4·5 4·9 2·9 7·1 1·8 2·2 0·41
F.E. in %
19N 20N 21N 22N 23N
GLACIAL OVERBURDEN
GREENSTONE
MASSIVE SULPHIDE ZONE

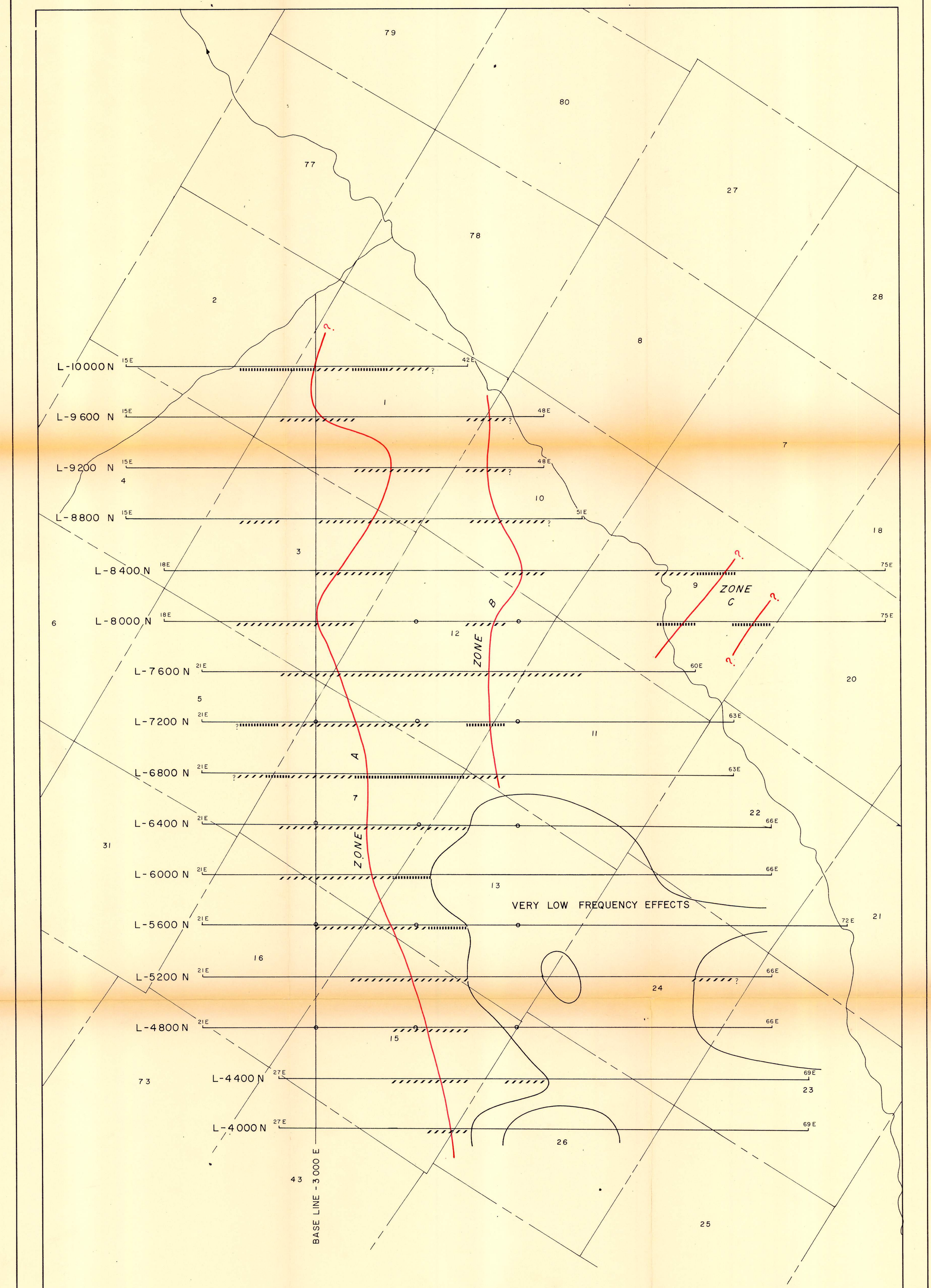
FIG. 6

DWG. IPP-3539

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

PLAN MAP



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

Numbers at the end of the anomalies indicate electrode interval

inches 0 1 2 / 0 1 2 3 4 5 centimetres

BRITISH COLUMBIA GEOLOGICAL SURVEY

This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

LUC SYNDICATE

BURN CLAIM GROUP, OMINECA M.D.
BRITISH COLUMBIA

SCALE

ONE INCH EQUALS FOUR HUNDRED FEET

DRILL SITE

AXES OF ANOMALOUS IP ZONES

DRAWN: V T Y
DATE: AUGUST 1972
APPROVED:
DATE:

McPHAR GEOPHYSICS LIMITED

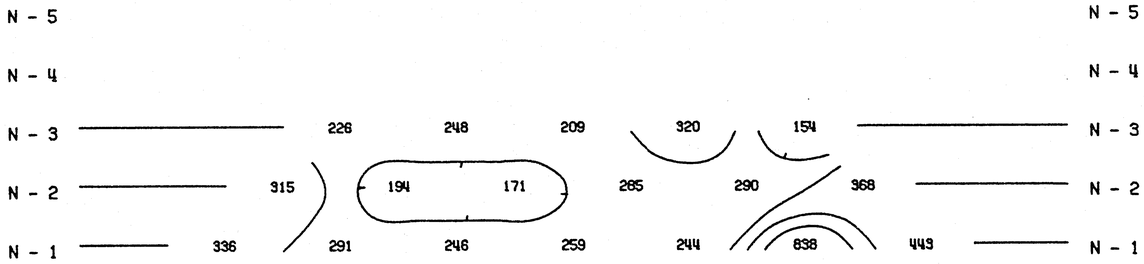
DWG. IPP-3539

DWG. NO.- I.P.-5972- I

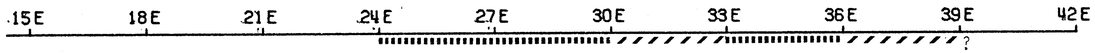
LUC SYNDICATE

BURN CLAIM GROUP, KWANIKA CREEK AREA
OMINECA M.D., B.C.

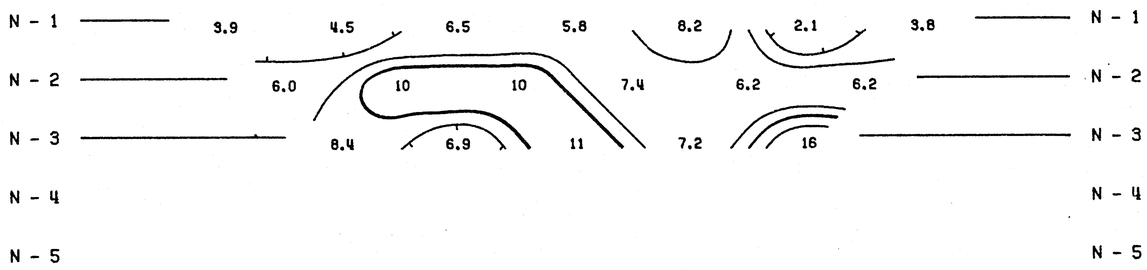
LINE NO.- 10000N



RESISTIVITY (APP.) IN OHM FEET / 2π



RESISTIVITY (APP.) IN OHM FEET / 2π

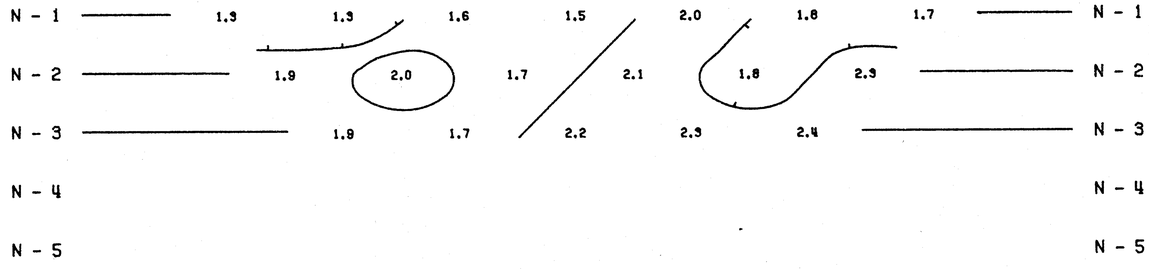


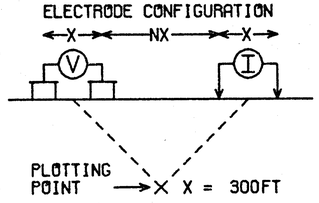
METAL FACTOR (APP.)

METAL FACTOR (APP.)

FREQUENCY EFFECT (APP.) IN %

FREQUENCY EFFECT (APP.) IN %



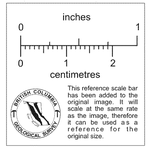


SURFACE PROJECTION
OF ANOMALOUS ZONES

DEFINITE ━━━━

PROBABLE ┅┅┅┅

POSSIBLE ╱╱╱╱╱



FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: JUL 1972

APPROVED:

DATE: 24 Aug 72

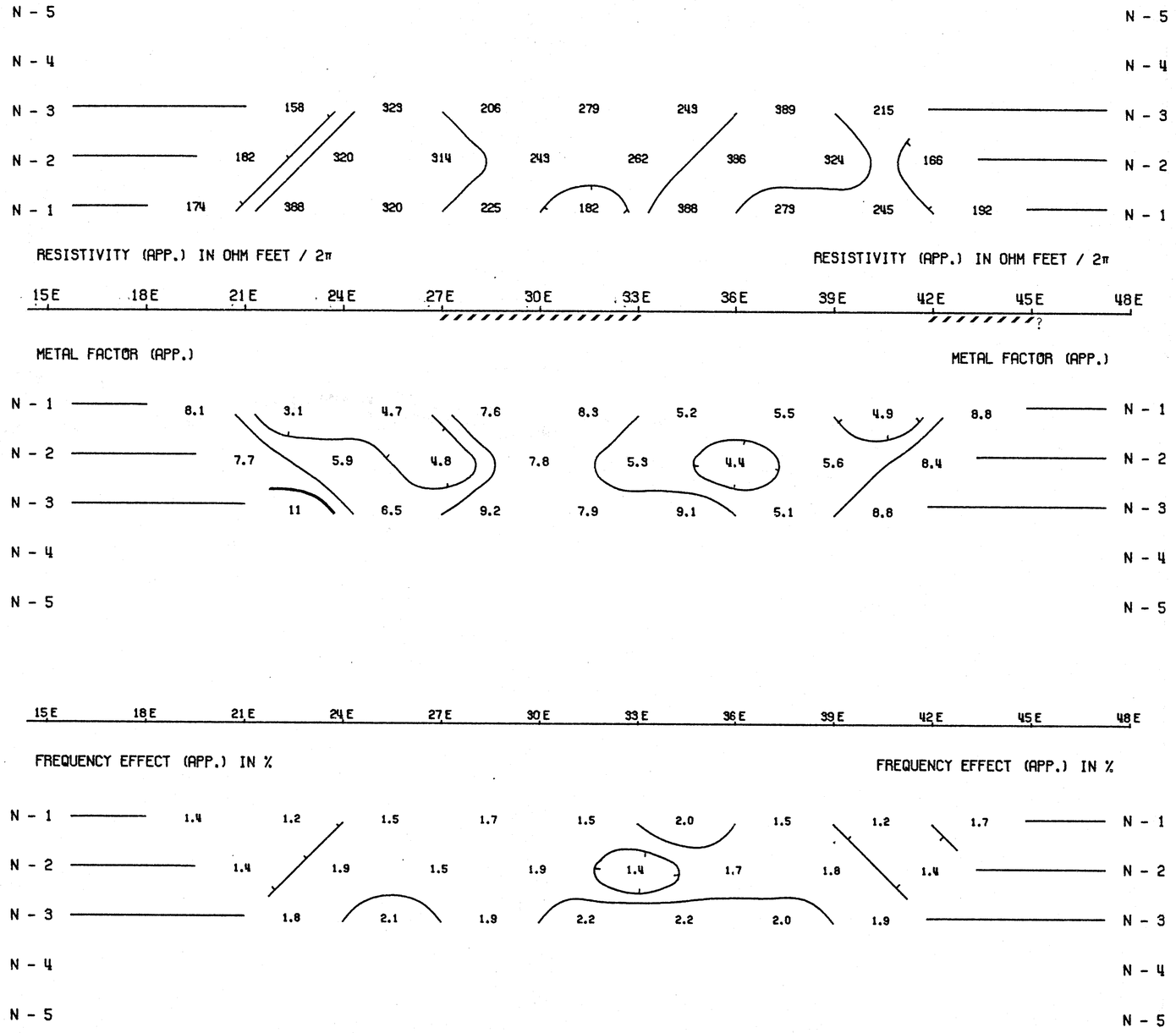
NOTE: CONTOURS AT LOGARITHMIC INTERVALS 1.-1.5-2.-3.-5.-7.5-10

McPHAR GEOPHYSICS LIMITED

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION



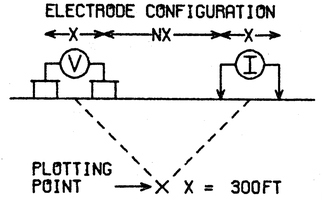
DWG. NO.- I.P.-5972-2

LUC SYNDICATE

BURN CLAIM GROUP, KWANIKA CREEK AREA
OMINECA M.D., B.C.

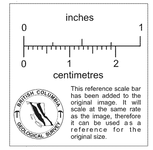
LINE NO.- 9600N

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE



FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: JUL 1972

APPROVED:

DATE: 2 Aug 72

NOTE: CONTOURS AT LOGARITHMIC INTERVALS 1.-1.5-2.-3.-5.-7.5-10

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

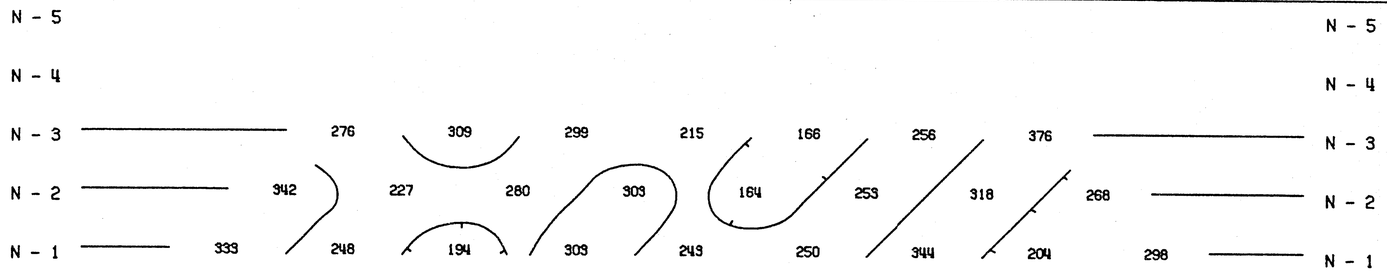
NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION

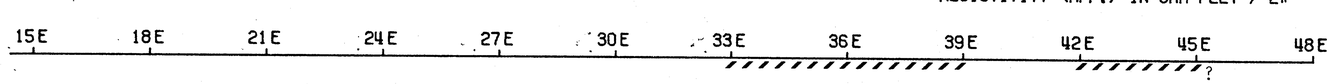
DWG. NO.- I.P.-5972-3

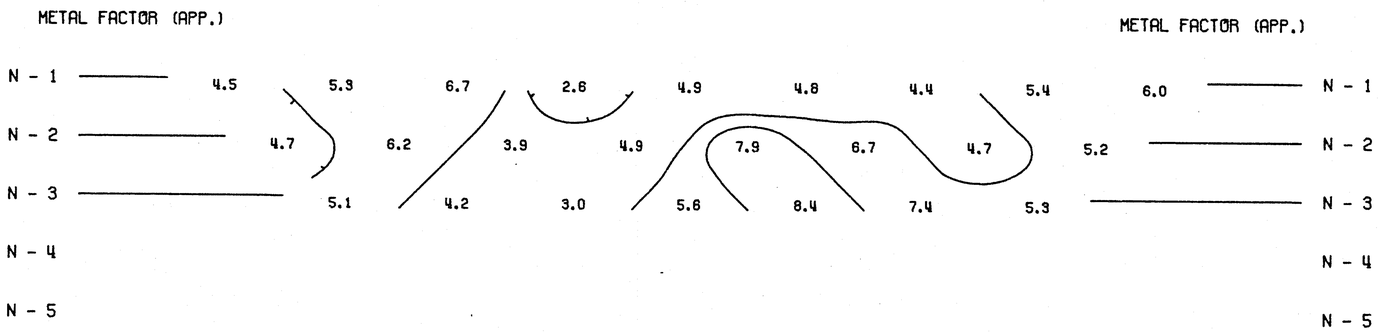
LUC SYNDICATE

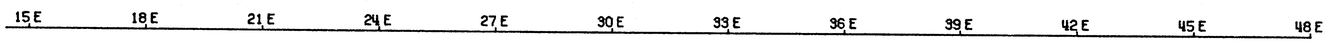
BURN CLAIM GROUP, KWANIKA CREEK AREA
OMINECA M.D., B.C.

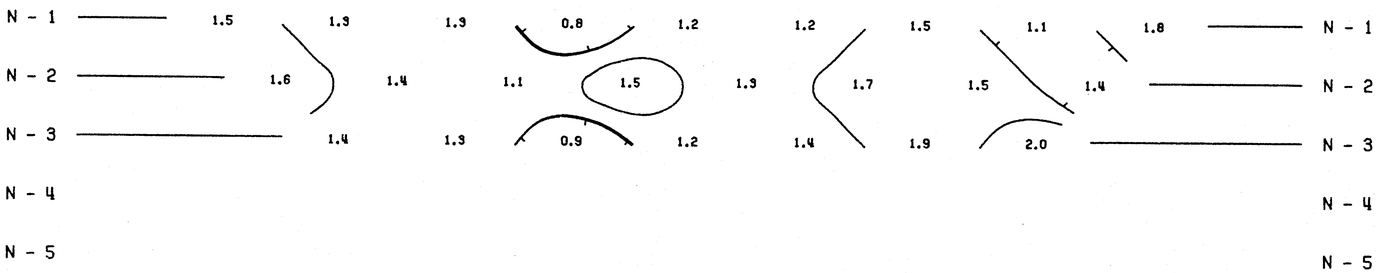
LINE NO.- 9200N

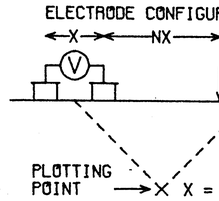










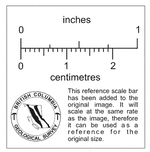


SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE



FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: JUL 1972

APPROVED:

NOTE: CONTOURS AT LOGARITHMIC INTERVALS 1.-1.5-2.-3.-5.-7.5-10

DATE: 22 Aug 72

McPHAR GEOPHYSICS LIMITED

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

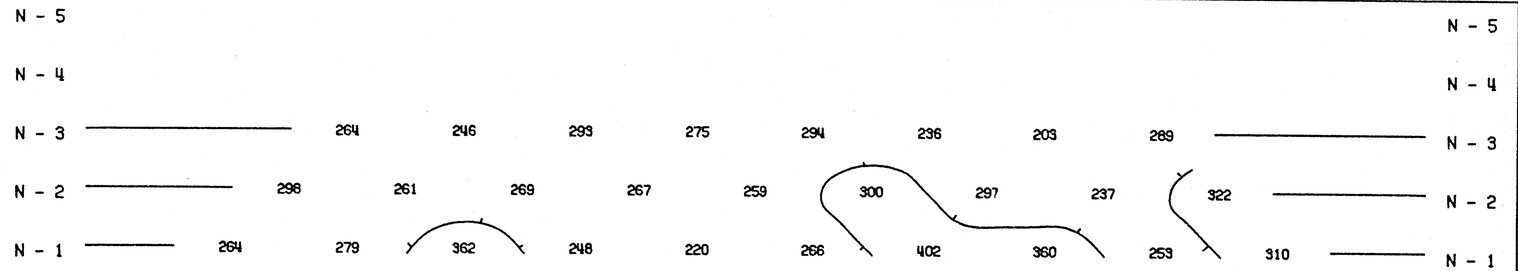
NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION

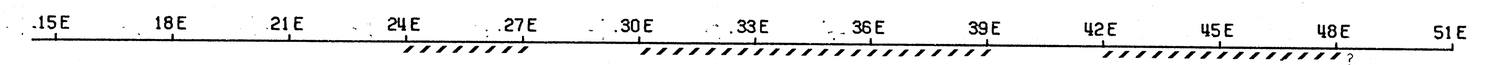
DWG. NO.- I.P.-5972-4

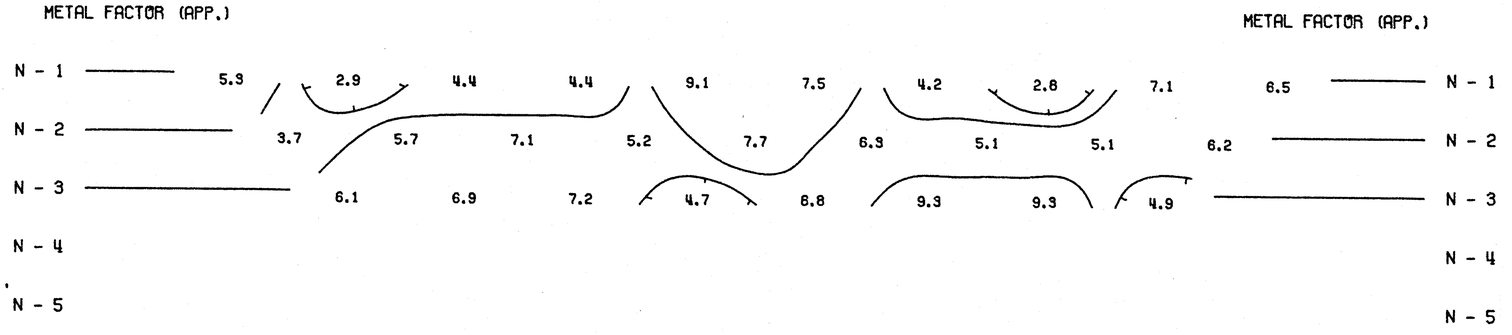
LUC SYNDICATE

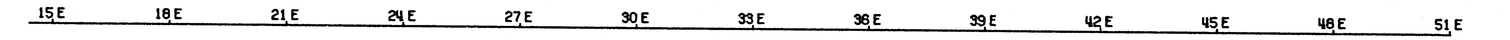
BURN CLAIM GROUP, KWANIKA CREEK AREA
OMINECA M.D., B.C.

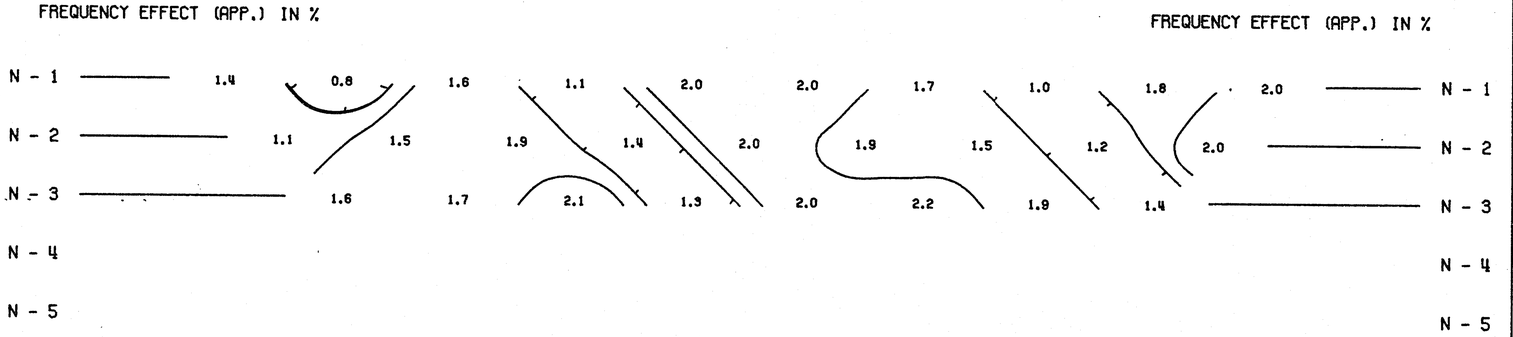
LINE NO.- 8800N

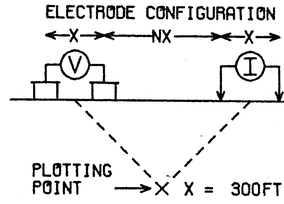










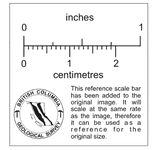


SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE ━━━

PROBABLE ┅┅┅

POSSIBLE ╱╱╱╱╱



FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: JUL 1972

APPROVED:

NOTE: CONTOURS AT LOGARITHMIC INTERVALS 1.-1.5-2.-3.-5.-7.5-10

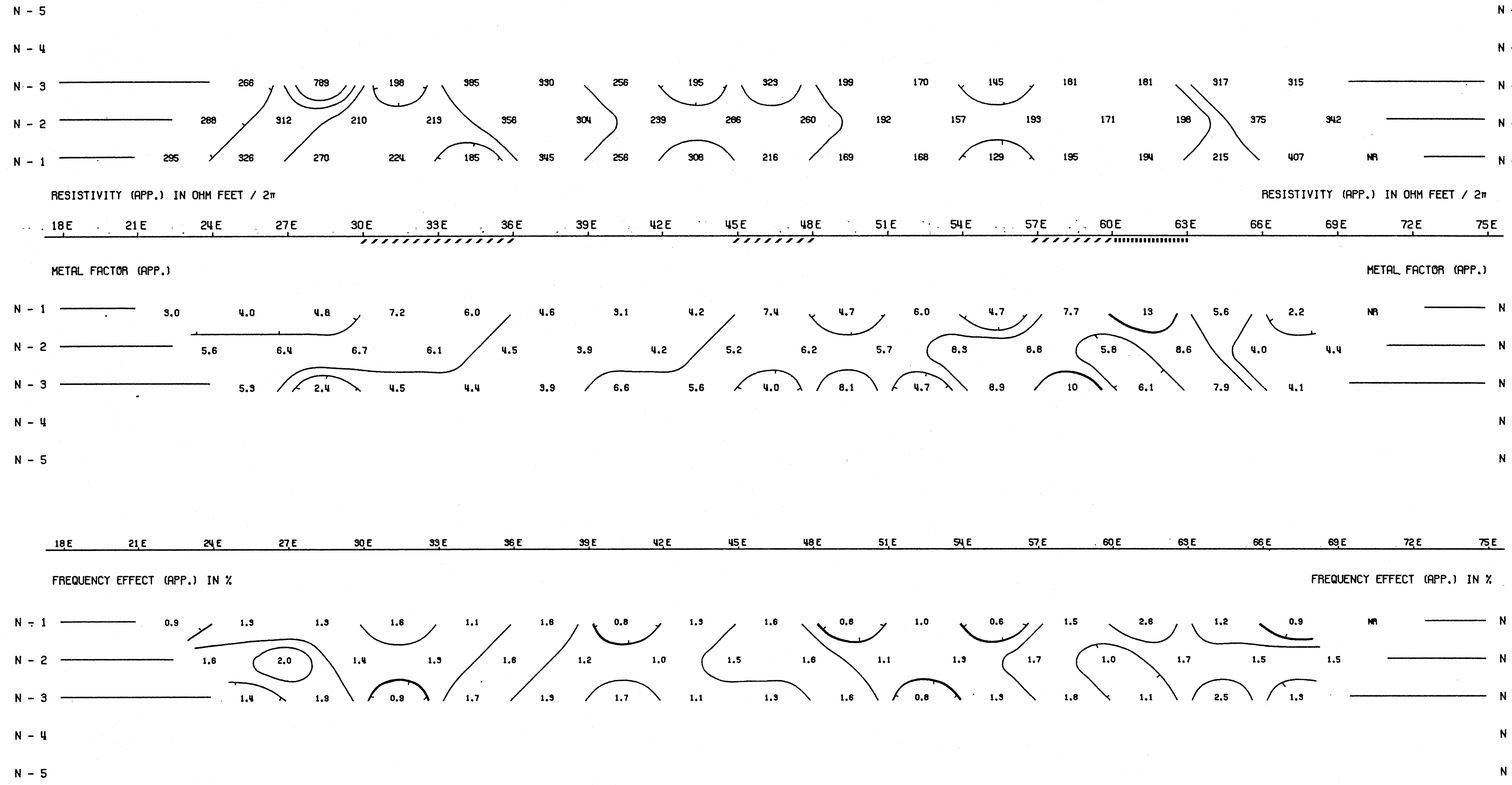
DATE: 23 Aug 72

McPHAR GEOPHYSICS LIMITED

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION



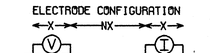
DWG. NO.- I.P.-5972-5

LUC SYNDICATE

BURN CLAIM GROUP, KWANIKA CREEK AREA
OMINECA M.D., B.C.

LINE NO.- 8400N

ELECTRODE CONFIGURATION



PLOTTING POINT → X = 300FT

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: JUL 1972

APPROVED:

DATE:

NOTE: CONTOURS AT LOGARITHMIC INTERVALS 1.-1.5-2.-3.-5.-7.5-10

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

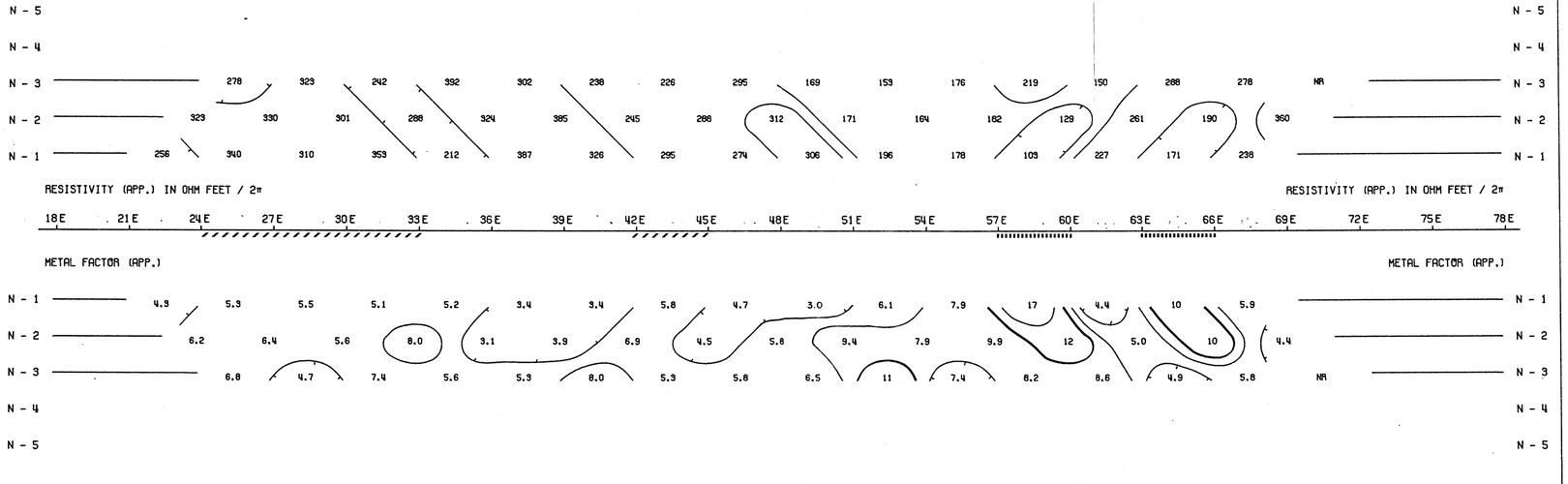
NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION

DWG. NO.- I.P.- 5972-6

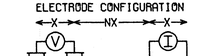
LUC SYNDICATE

BURN CLAIM GROUP, KWANIKA CREEK AREA
OMINECA M.D., B.C.

LINE NO.- 8000N



ELECTRODE CONFIGURATION



PLOTTING POINT → X = 300FT

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: JUL 1972

APPROVED:

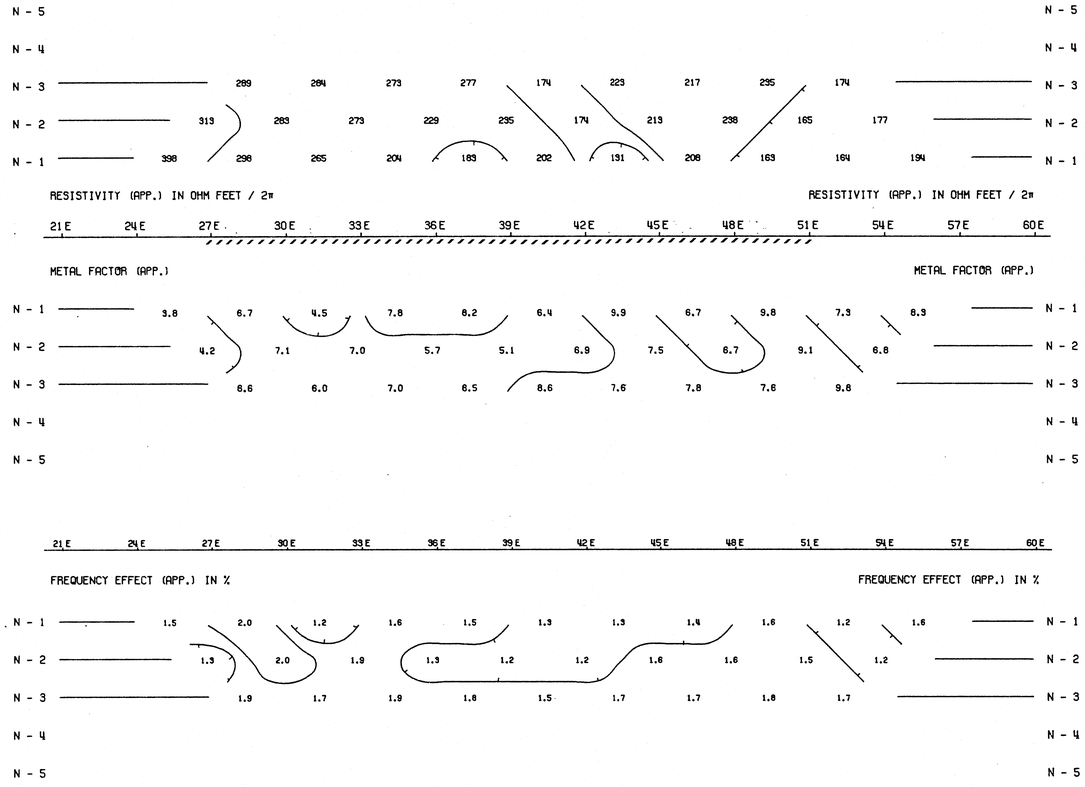
DATE:

NOTE: CONTOURS AT LOGARITHMIC INTERVALS 1.-1.5-2.-3.-5.-7.5-10

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION

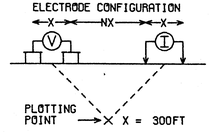


DWG. NO.- I.P.-5972-7

LUC SYNDICATE

BURN CLAIM GROUP, KWANIKA CREEK AREA
OMINECA M.D., B.C.

LINE NO.- 7600N



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: JUL 1972

APPROVED:

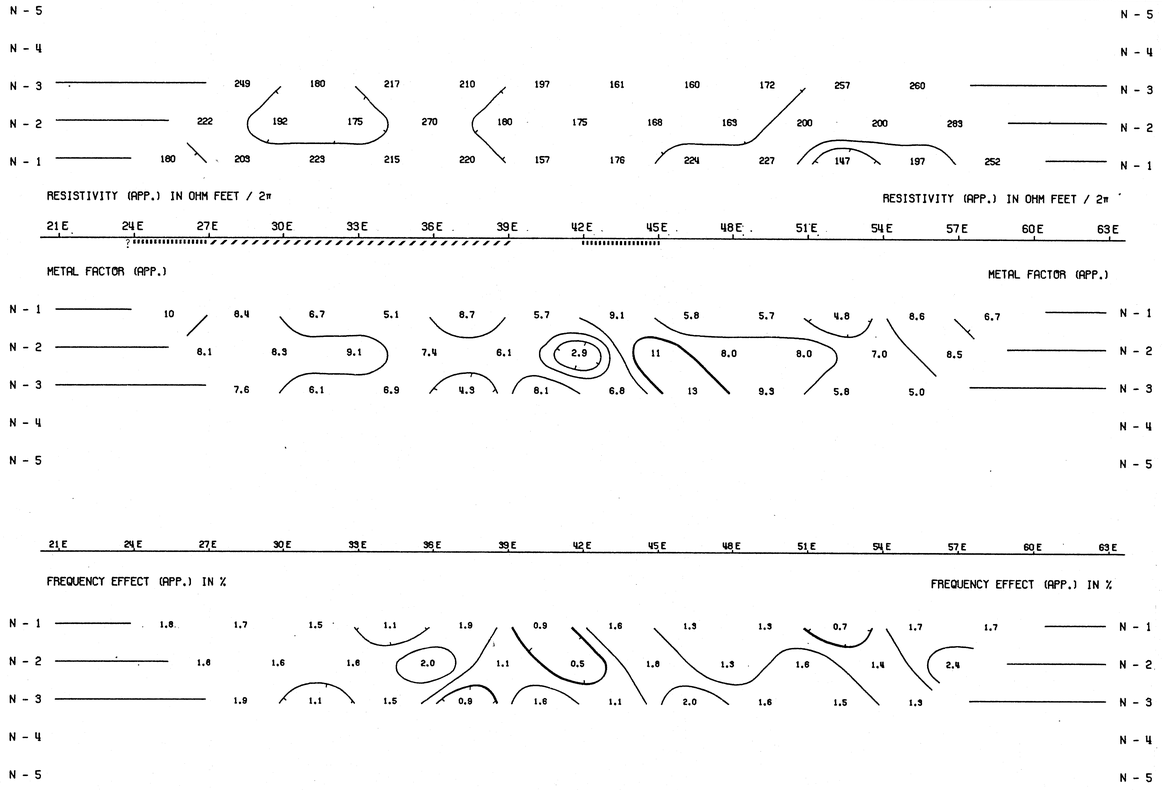
NOTE: CONTOURS AT LOGARITHMIC INTERVALS 1.-1.5-2.-3.-5.-7.5-10

DATE: Aug 72

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION



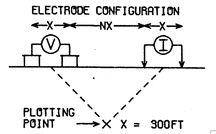
DWG. NO.- I.P.-5972-8

LUC SYNDICATE

BURN CLAIM GROUP, KWANIKA CREEK AREA
OMINECA M.D., B.C.

LINE NO.- 7200N

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: JUL 1972

APPROVED:

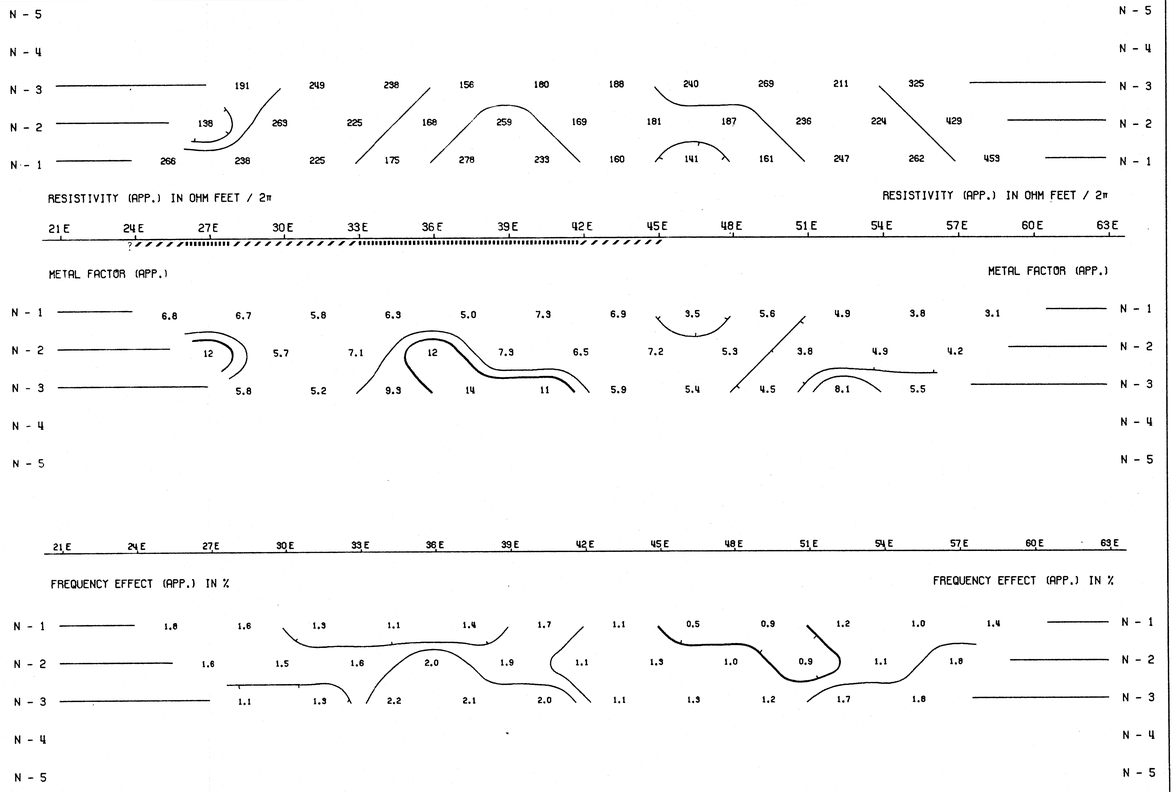
NOTE: CONTOURS AT LOGARITHMIC INTERVALS 1.-1.5-2.-3.-5.-7.5-10

DATE: 7th Aug 72

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY McPHAR COMPUTER DIVISION



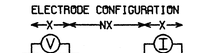
DWG. NO.- I.P.-5972-9

LUC SYNDICATE

BURN CLAIM GROUP, KWANIKA CREEK AREA
OMINECA M.D., B.C.

LINE NO.- 6800N

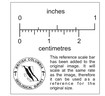
ELECTRODE CONFIGURATION



PLOTTING POINT → X = 300FT

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE



FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: JUL 1972

APPROVED:

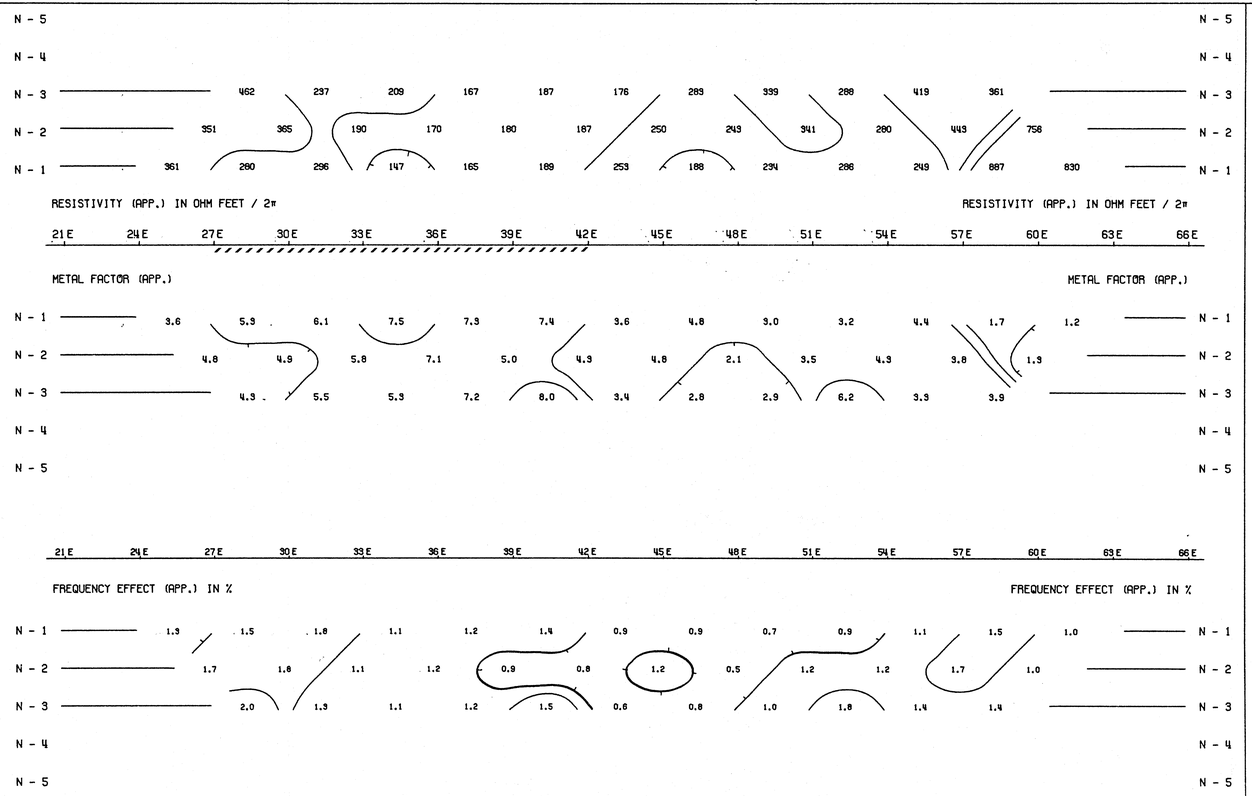
DATE:

NOTE: CONTOURS AT LOGARITHMIC INTERVALS 1.-1.5-2.-3.-5.-7.5-10

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION



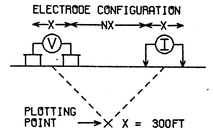
DWG. NO.- I.P.-5972-10

LUC SYNDICATE

BURN CLAIM GROUP, KWANIKA CREEK AREA
OMINECA M.D., B.C.

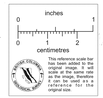
LINE NO.- 6400N

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE



FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: JUL 1972

APPROVED:

NOTE: CONTOURS AT LOGARITHMIC INTERVALS
1.-1.5-2.-3.-5.-7.5-10

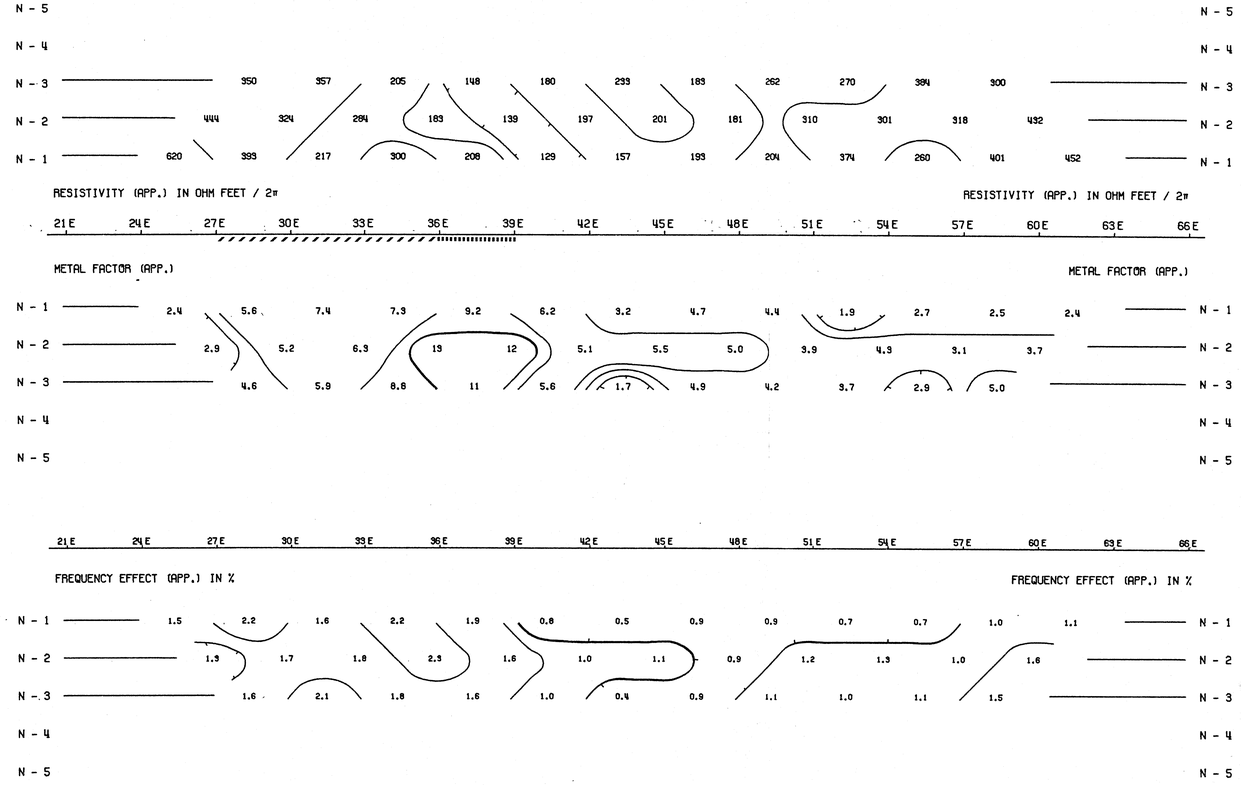
DATE: Aug 72

McPHAR GEOPHYSICS LIMITED

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION



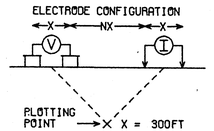
DWG. NO.- I.P.-5972-II

LUC SYNDICATE

BURN CLAIM GROUP, KWANIKA CREEK AREA
OMINECA M.D., B.C.

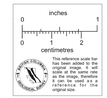
LINE NO.- 6000N

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE



FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: JUL 1972

APPROVED:

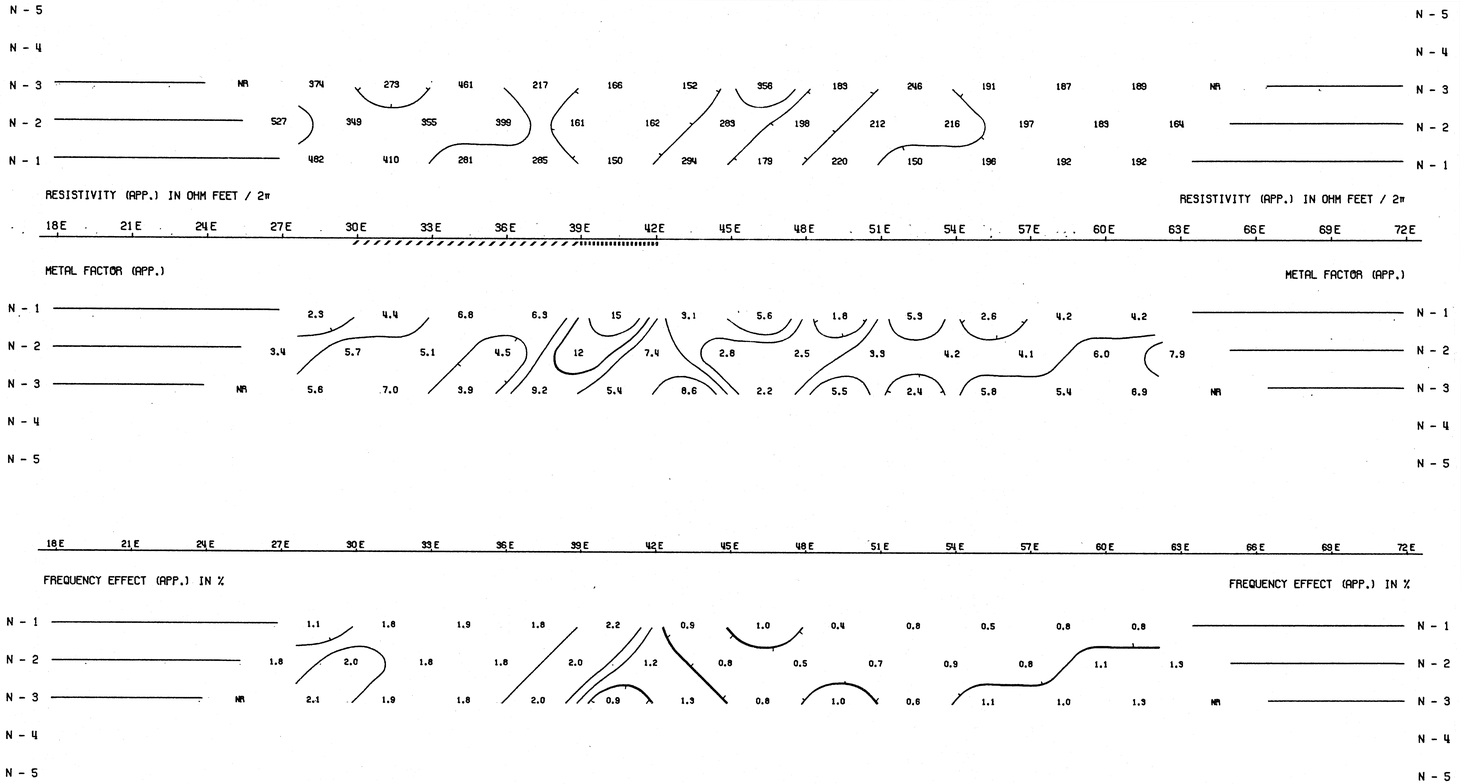
NOTE: CONTOURS AT LOGARITHMIC INTERVALS 1.-1.5-2.-3.-5.-7.5-10

DATE: 7 Aug 72

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY McPHAR COMPUTER DIVISION



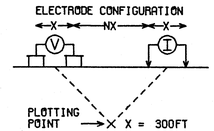
DWG. NO.- I.P.-5972-12

LUC SYNDICATE

BURN CLAIM GROUP, KWANIKA CREEK AREA
OMINECA M.D., B.C.

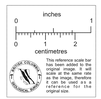
LINE NO.- 5600N

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE



FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: JUL 1972

APPROVED:

DATE:

NOTE: CONTOURS AT LOGARITHMIC INTERVALS 1.-1.5-2.-3.-5.-7.5-10

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

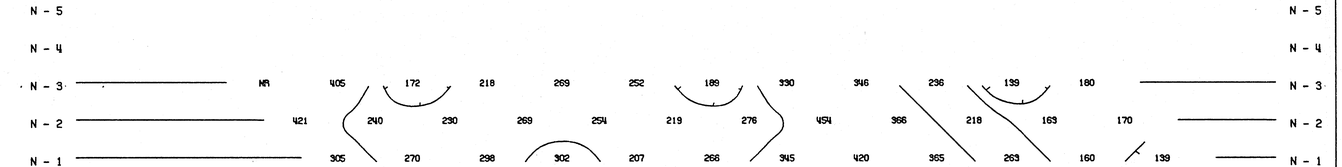
NOTE: THIS PLOT WAS PRODUCED BY McPHAR COMPUTER DIVISION

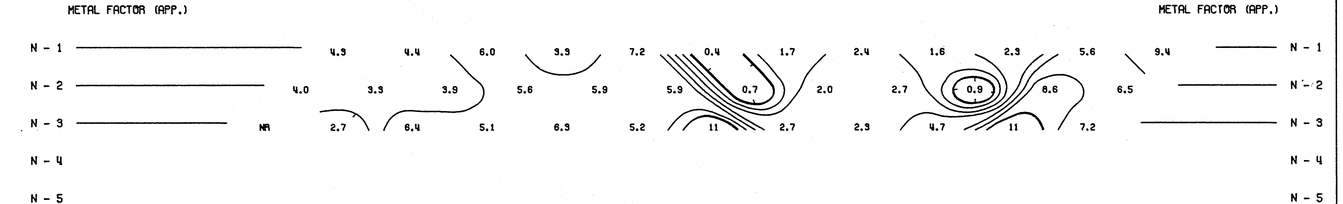
DWG. NO.- I.P.-5972-13

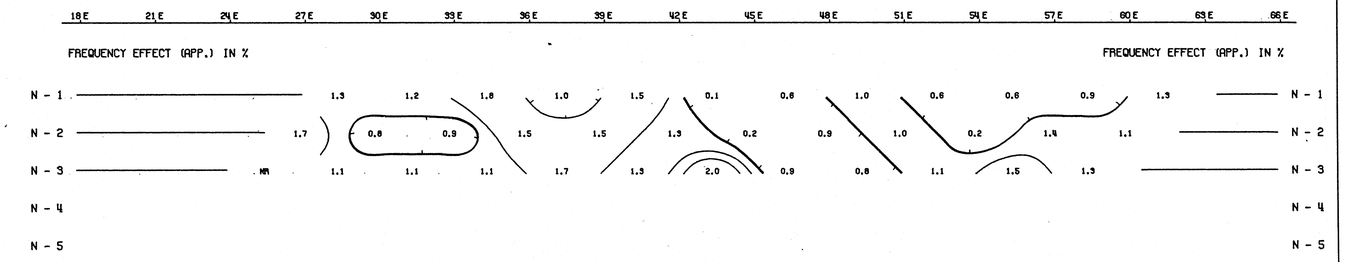
LUC SYNDICATE

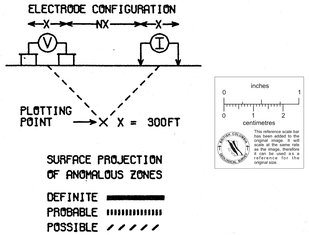
BURN CLAIM GROUP, KWANIKA CREEK AREA
OMINECA M.D., B.C.

LINE NO.- 5200N









FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: JUL 1972

APPROVED:

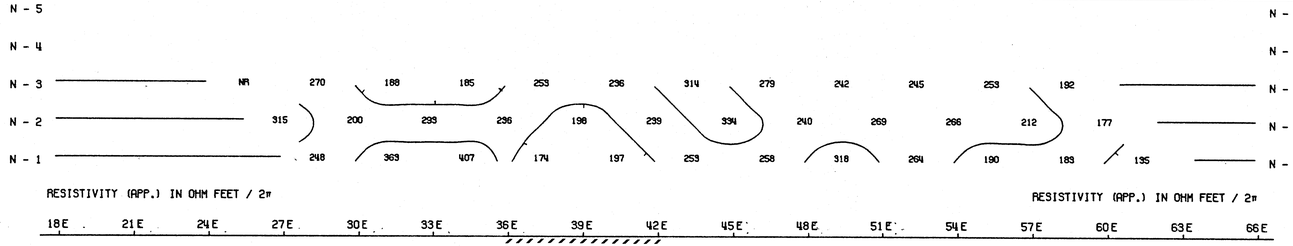
NOTE: CONTOURS AT LOGARITHMIC INTERVALS 1.-1.5-2.-3.-5.-7.5-10

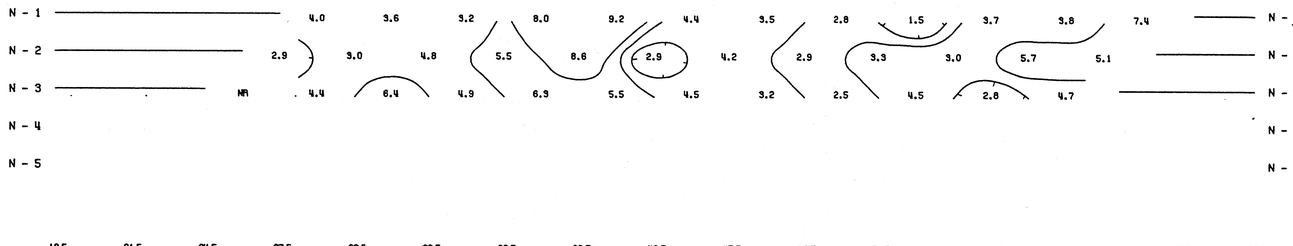
DATE: 22 Aug 72

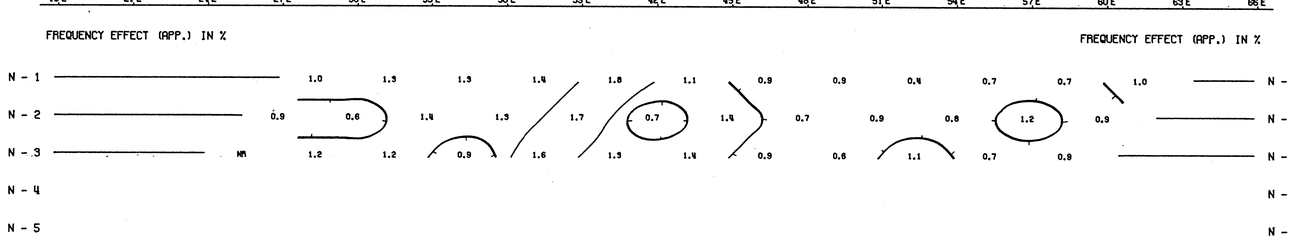
McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY McPHAR COMPUTER DIVISION







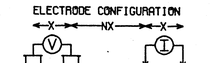
DWG. NO.- I.P.-5972-14

LUC SYNDICATE

BURN CLAIM GROUP, KWANIKA CREEK AREA
OMINECA M.D., B.C.

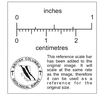
LINE NO.- 4800N

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE



FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: JUL 1972

APPROVED:

NOTE: CONTOURS AT LOGARITHMIC INTERVALS 1.-1.5-2.-3.-5.-7.5-10

DATE: August 73

McPHAR GEOPHYSICS LIMITED

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

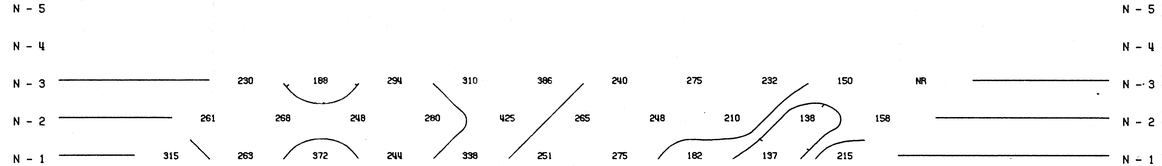
NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION

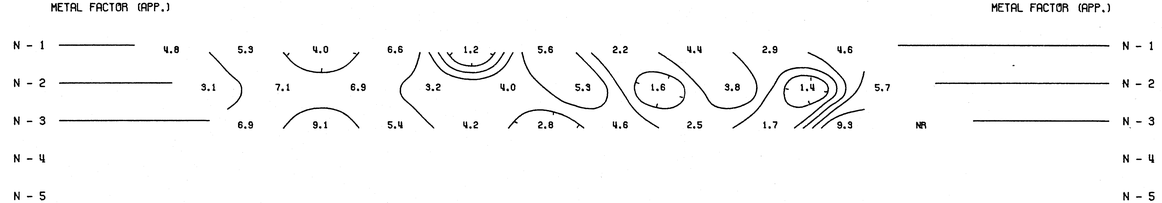
DWG. NO.- I.P.-5972-15

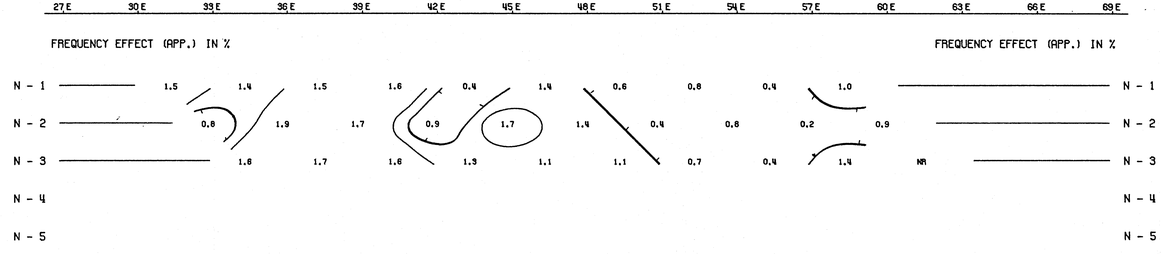
LUC SYNDICATE

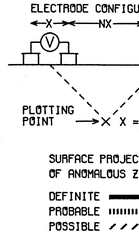
BURN CLAIM GROUP, KWANIKA CREEK AREA
OMINECA M.D., B.C.

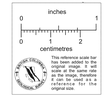
LINE NO.- 4400N











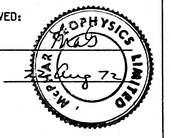
FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: JUL 1972

APPROVED:

NOTE: CONTOURS AT LOGARITHMIC INTERVALS 1.-1.5-2.-3.-5.-7.5-10

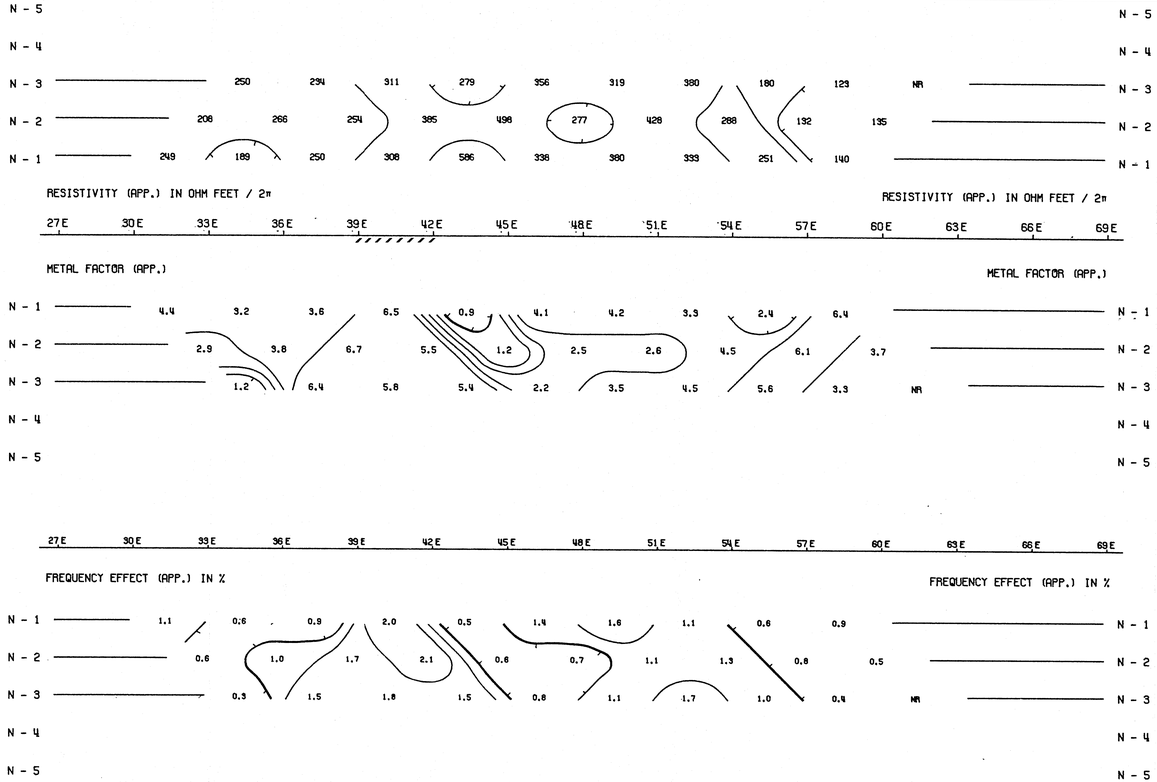
DATE:



McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY McPHAR COMPUTER DIVISION



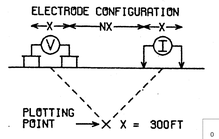
DWG. NO.- I.P.-5972-16

LUC SYNDICATE

BURN CLAIM GROUP, KWANIKA CREEK AREA
OMINECA M.D., B.C.

LINE NO.- 4000N

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: JUL 1972

APPROVED:

NOTE: CONTOURS AT LOGARITHMIC INTERVALS
1.-1.5-2.-3.-5.-7.5-10

DATE: 22 Aug 72

McPHAR GEOPHYSICS LIMITED

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION