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REPORT ON THE INDUCED POLARIZATION AND RESISTIVITY SURVEY ON THE COUGAR GRID, BABINE LAKE AREA, OMINECA MINING DIVISION, B.C. FOR NITTETSU MINING COMPANY LIMITED

BY

MARION A. GOUDIE, B.Sc.

AND

A.W. MULLAN, B.Sc.

NAME AND LOCATION OF PROPERTY

COUGAR GRID, BABINE LAKE AREA,
OMINECA MINING DIVISION, B.C. 54°N, 126°W - NE

DATE STARTED - JULY 22, 1971

DATE FINISHED - AUGUST 7, 1971

TABLE OF CONTENTS

McPHAR GEOPHYSICS

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.

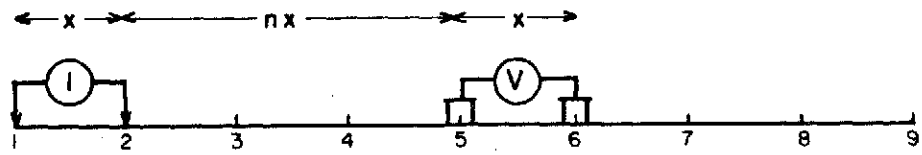
In some situations spurious noise, either man made or natural, will render it impossible to obtain a reading. The symbol "N" on the data plots indicates a station at which it is too noisey to record a reading. If a reading can be obtained, but for reasons of noise there is some doubt as to its accuracy,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

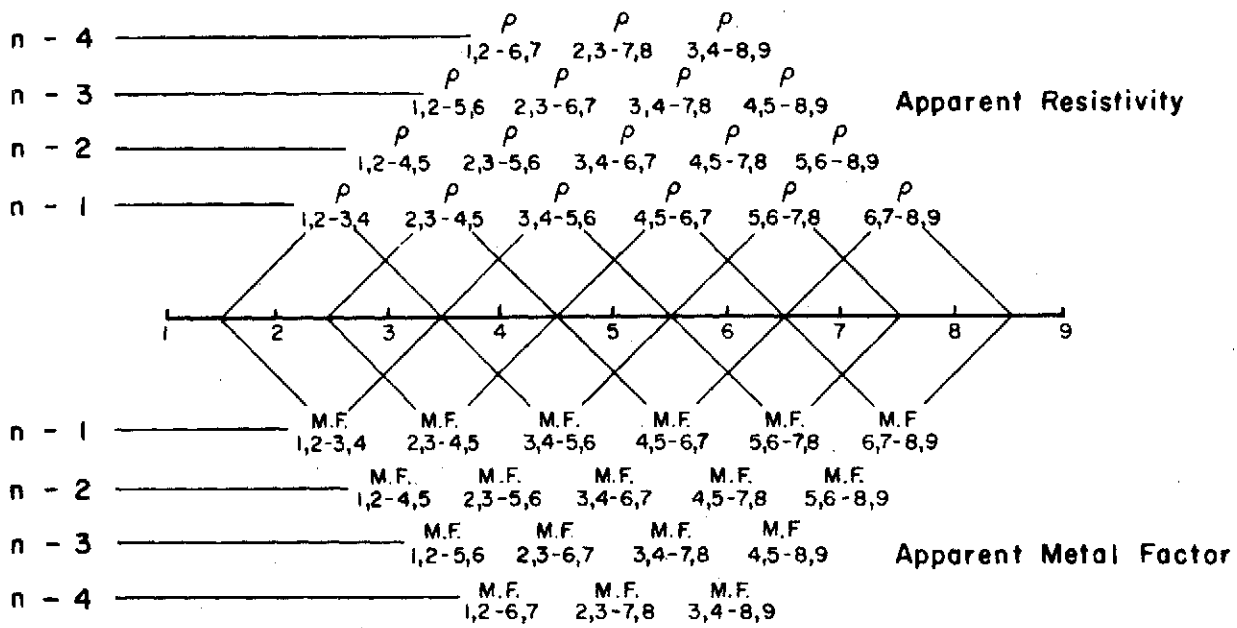
The symbol "NR" indicates that for some reason the operator did not attempt to record a reading although normal survey procedures would suggest that one was required. This may be due to inaccessible topography or other similar reasons. Any symbol other than those discussed above is unique to a particular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



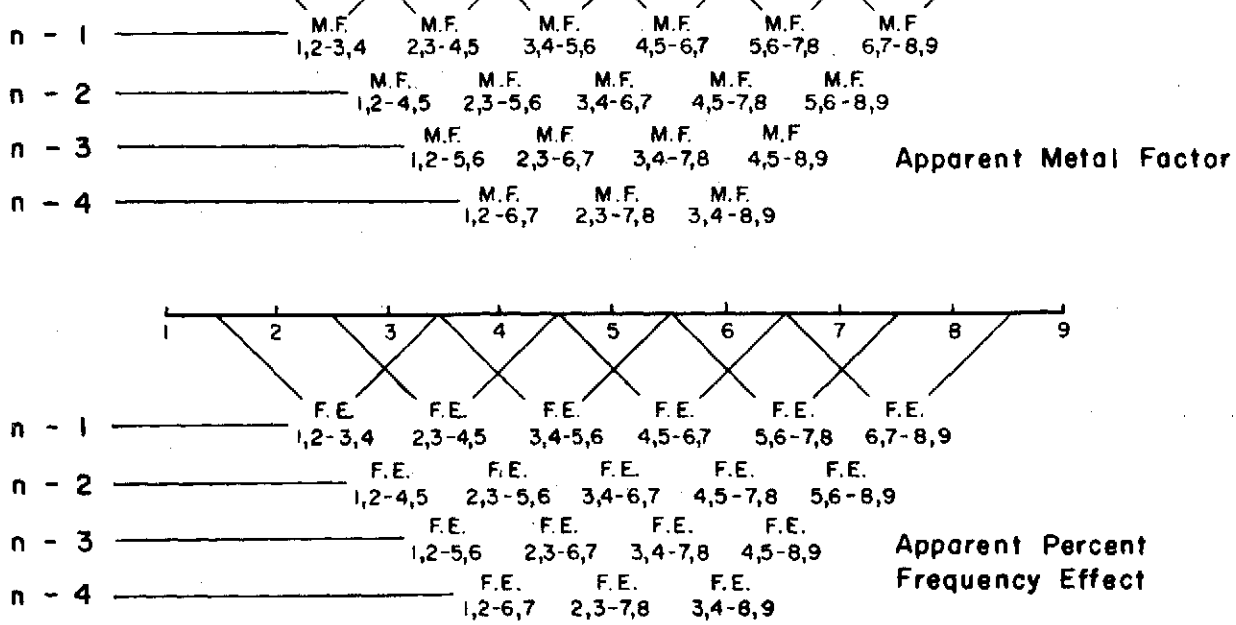


Fig. A

McPHAR GEOPHYSICS LIMITED

REPORT ON THE INDUCED POLARIZATION AND RESISTIVITY SURVEY ON THE COUGAR GRID, BABINE LAKE AREA, OMINECA MINING DIVISION, B.C. FOR NITTETSU MINING COMPANY LIMITED

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1. INTRODUCTION

At the request of the company, an Induced Polarization and Resistivity survey has been completed on the Cougar Grid, Babine Lake Area in the Omineca Mining Division, British Columbia, for Nittetsu Mining Company Limited. The Cougar claims are situated in the northeast quadrangle of the 1° quadrilateral whose southeast corner is at 54°N latitude and 126°W longitude.

The Cougar claims are covered heavily with glacial drift. There are scattered outcrops of volcanic rocks to the north and west and granite and basic Jurassic rocks to the east of the grid. It is understood that a previous geochemical survey located geochemical anomalies which sparked an interest in the area.

The IP survey was carried out to locate any sources of metallic mineralization in the area which would be of economic interest.

The IP survey was carried out in July and August, 1971, using a McPhar P660 high power variable frequency IP unit operating at 0.3 and 5.0 Hz. over the following claims:-

Cougar Claim Group #1

37, 39, 36, 38, 40, Cougar 1 fr., 8, 6, 4, 2, 9, 7, 5, 3, 1.

Cougar Claim Group #2

45, 47, 44, 46, 48, 79, 50, 49, 78, 52, 51, 54, 53, 56, 65, 67, 69, 66, 68, 70.

These claims are assumed to be owned or held under option by Nittetsu Mining Company Limited.

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.
6400N	200 feet	IP 5832-1
5600N	200 feet	IP 5832-2
4800N	200 feet	IP 5832-3
4000N	200 feet	IP 5832-4
3200N	200 feet	IP 5832-5
2400N	200 feet	IP 5832-6
1600N	200 feet	IP 5832-7
800N	200 feet	IP 5832-8
0	200 feet	IP 5832-9
800S	200 feet	IP 5832-10
1600S	200 feet	IP 5832-11
2400S	200 feet	IP 5832-12
3200S	200 feet	IP 5832-13

Also enclosed with this report is Dwg. I.P.P. 4816, a plan map of the Cougar Grid at a scale of 1" = 500'. 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 200' electrode intervals the position of a narrow sulphide body can only be determined to lie between two stations 200' 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.

3. DISCUSSION OF RESULTS

The resistivities in the survey grid are moderate to low. A broad anomalous zone has been located which is open to the northeast and extends from Line 6400N southwest to Line 0. Southwest of Line 0, the anomalies are narrow and discontinuous across the lines. Several lines which are representative are described below.

Line 6400N

The broad anomaly from 44W, where it is incomplete, to 14W, is complex in pattern. It may reflect more than one source of concentrated metallic mineralization embodied within a zone of disseminated mineralization. The definite portions of the zone from 41W to 38W and from 33W to 27W represent concentrated sources at a depth near 100'. The remainder of the anomaly represents a more disseminated type of mineralization.

Line 4000N

The two separate anomalies may be continuous at depth.

Line 1600N

The possible portion of the anomaly from 34W, where it is incomplete, to 26W, appears to represent a disseminated type of mineralization. The remainder of the anomaly is definite, with the magnitude of the anomaly increasing with depth. Similar anomalies are found on Line 4800N and Line 3200N.

Line 800N

There may be three separate main sources represented by the anomalies on this line. A strong, narrow, source from 18W to 20W extends to some depth and may represent a vein or dyke-like type of source. A shallow, positive portion of the anomaly from 16W to 14W has a source with the top at a depth of less than 100'. Alternately, these two anomalies may represent a shallow source centred from 16W to 18W. Detail with 100' electrode intervals is needed to better define the source. The definite anomaly from 4W to 8W is shallow, with the top of the

source at less than 100', with good depth extent. The weaker anomalies may represent disseminated mineralization.

Line 1600S

The only definite anomaly south of Line 0 is on this line from 3W to 5W. The anomaly increases in magnitude with depth.

4. CONCLUSIONS AND RECOMMENDATIONS

The IP survey has located a broad, complex, anomalous zone. Since there is no surface indication of the type of country rock underlying the drift, it would seem that the primary concern, at this point in the exploration program, is to identify the source, or sources, of the anomalies. It should be noted that the most concentrated metallic source is not necessarily the most economic, i.e. pyrite may provide a much stronger anomaly than chalcopyrite. Therefore it would be advisable to test the sources of both stronger and weaker anomalies.

If drilling is carried out and obtains interesting results, intermediate parallel lines should be surveyed between the present lines from 800S to the north to determine whether there is a continuity between the stronger portions of the anomalies. Line 6400N, Line 5600N, Line 4000N, Line 3200N, Line 2400N and Line 1600N would also need to be extended to the northwest to completely outline the anomalous zone.

Some suggested locations for drilling follow:-

Line 4800N - a hole collared at 22W, drilled at an angle of 45° to the west to test the anomaly to a depth of 400 vertical feet below 26W.

Line 4000N - an inclined hole to pass under 12W at a vertical depth of 200'.

Line 800N - 1) to test the anomaly at a vertical depth of 100' below 19W.

2) to test the anomaly at a vertical depth of 100' below 6W.

McPHAR GEOPHYSICS LIMITED

Marion A. Goudie,
Geologist.

A.W. Mullan
Geologist.

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
A. W. MULLAN

Dated: September 13, 1971

ASSESSMENT DETAILS

PROPERTY: Cougar Grid

MINING DIVISION: Omineca

SPONSOR: Nittetsu Mining Company Limited

PROVINCE: British Columbia

LOCATION: Babine Lake Area

TYPE OF SURVEY: Induced Polarization

OPERATING MAN DAYS:	49	DATE STARTED: July 22, 1971
EQUIVALENT 8 HR. MAN DAYS:	73.5	DATE FINISHED: August 7, 1971
CONSULTING MAN DAYS:	3	NUMBER OF STATIONS: 315
DRAUGHTING MAN DAYS:	5	NUMBER OF READINGS: 3,240
TOTAL MAN DAYS:	81.5	MILES OF LINE SURVEYED: 11.4

CONSULTANTS:

Marion A. Goudie, 739 Military Trail, West Hill, Ontario.
A.W. Mullan, 1440 Sandhurst Place, West Vancouver, B.C.

FIELD TECHNICIANS:

M. McDonald, 6135 Bow Crescent, N.W. Calgary, Alberta.
D. Adams, 3127 8th Avenue W. Vancouver, B.C.
Plus 3 helpers:
T. McDonald, 6135 Bow Crescent, N.W. Calgary, Alberta.
W. Schlogle, 2129 Skeena Street, Vancouver, B.C.
D. Corrigall,(Jr.) General Delivery, Nanaimo, B.C.

DRAUGHTSMEN:

K. Kingsbury, 58 Oak Avenue, Richvale, Ontario.
J. Preager, 20 Esterbrooke Avenue, Apt. 705, Willowdale, Ontario.
N. Lade, 299 Jasper Avenue, Oshawa, Ontario.

McPHAR GEOPHYSICS LIMITED

Marion A. Goudie,
Geologist.

Dated: September 13, 1971

INTERIM SUMMARY OF COST

Nittetsu Mining Company Limited - Cougar Grid, Babine Lake Area
Omineca Mining Division, B.C. - IP Survey

Crew 2 men:-	M. McDonald D. Adams				
12-1/4 days	Operating		@ $265.00/day	3,246.25	
1 day	Travel	)			
1-3/4 days	Bad Weather	) 3-1/4 days	@ $100.00/day	325.00	
½ day	Preparation	)			
1 day off					N.C.
					3,571.25
Expenses					
Air Fare		39.60			
Vehicle Expense		416.14			
Meals and Accommodation		43.61			
Telephone and Telegraph		4.07			
Supplies		55.29			
		558.71			558.71
Extra Labour					1,273.07
					$5,403.03

McPHAR GEOPHYSICS LIMITED

Marion A. Goudie

Marion A. Goudie,
Geologist.

Dated: September 13, 1971

CERTIFICATE

I, Marion A. Goudie, of the City of Toronto, Province of Ontario, do hereby certify that:

1. I am a Geologist residing at 739 Military Trail, West Hill, Ontario.

2. I am a graduate of the University of Western Ontario with a B.Sc. Degree (1950) in Honours Geology.

3. I am a member of the Geological Society of America.

4. I have been practising my profession for 20 years.

5. I have no direct or indirect interest, nor do I expect to receive any interest directly or indirectly, in the property or securities of Nittetsu Mining Company Limited or any affiliate.

6. The statements made in this report are based on a study of published geological literature and unpublished private reports.

7. Permission is granted to use in whole or in part for assessment and qualification requirements but not for advertising purposes.

Dated at Toronto

This 13th day of September 1971

Marion A. Goudie

Marion A. Goudie, B.Sc.

CERTIFICATE

I, Ashton W. Mullan, of the City of Vancouver, in the Province of British Columbia, hereby certify:

1. That I am a Geologist and a fellow of the Geological Association of Canada with a business address at Suite 811, 837 West Hastings Street, Vancouver, B.C.

2. That I am registered as a member of the Association of Professional Engineers of the Provinces of Ontario and British Columbia.

3. That I hold a B.Sc. degree from McGill University.

4. That I have been practising my profession as a geologist for about twenty years.

5. I have no direct or indirect interest, nor do I expect to receive any interest directly or indirectly, in the property or securities of Nittetsu Mining Company Limited or any affiliate.

6. The statements made in this report are based on a study of published geological literature and unpublished private reports.

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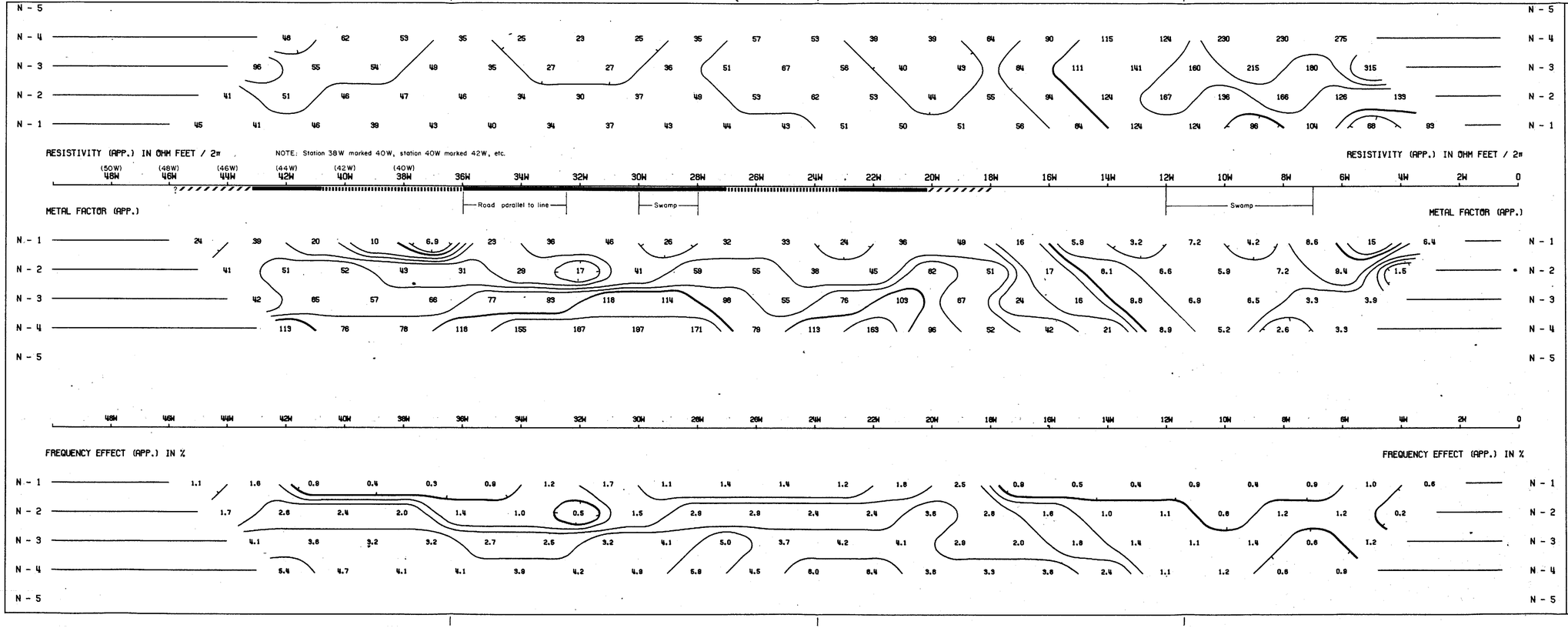
Dated at Toronto

This 13th day of September 1971

A. W. Mullan, B.Sc., P.Eng.

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
A. W. MULLAN



DWG. NO.- I.P.-5832-2

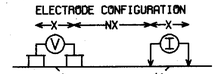
NITTETSU MINING CO. LTD.

COUGAR GRID, BABINE LAKE 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 1971

APPROVED:

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

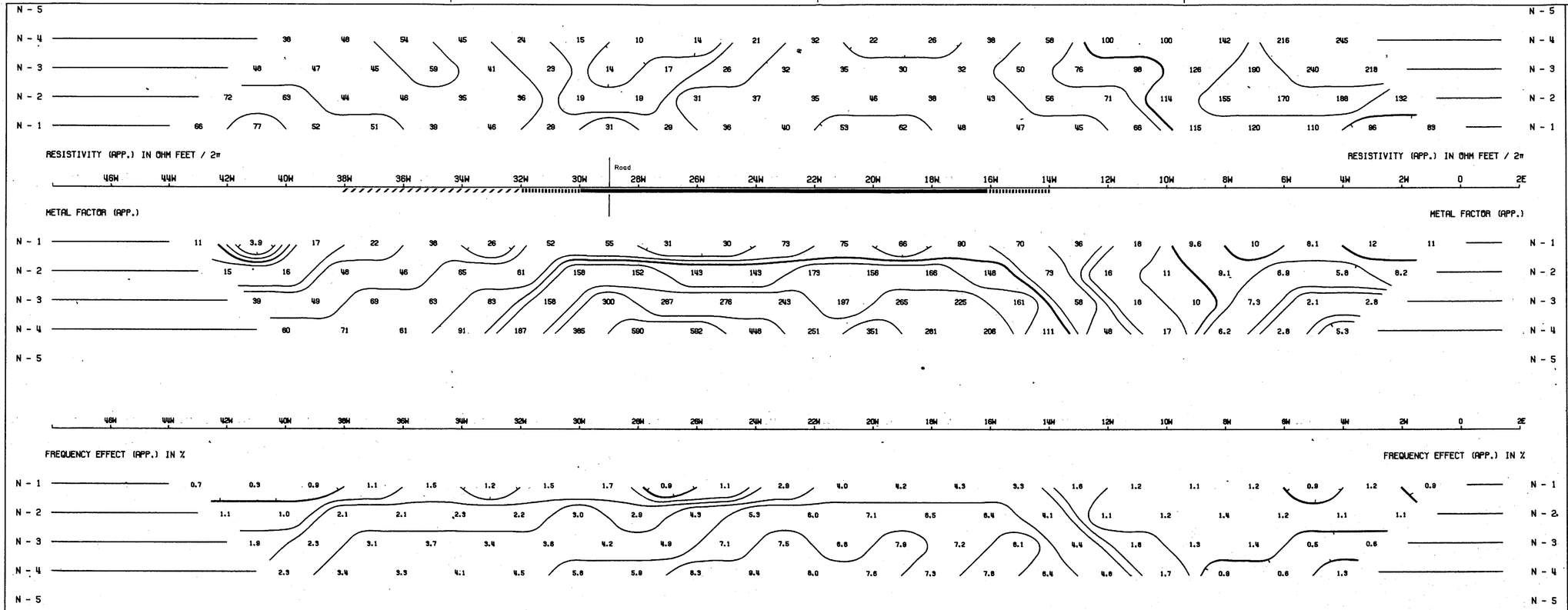
DATE: Sept 13 1971

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA A. W. MULLAN

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED WITH AN IBM 360/65 COMPUTER AND A CALCOMP PLOTTER



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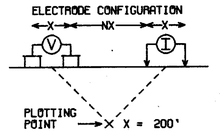
NITTETSU MINING CO. LTD.

COUGAR GRID, BABINE LAKE 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 1971

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

APPROVED:

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
A. W. MULLAN
DATE: JAN 13, 1971

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

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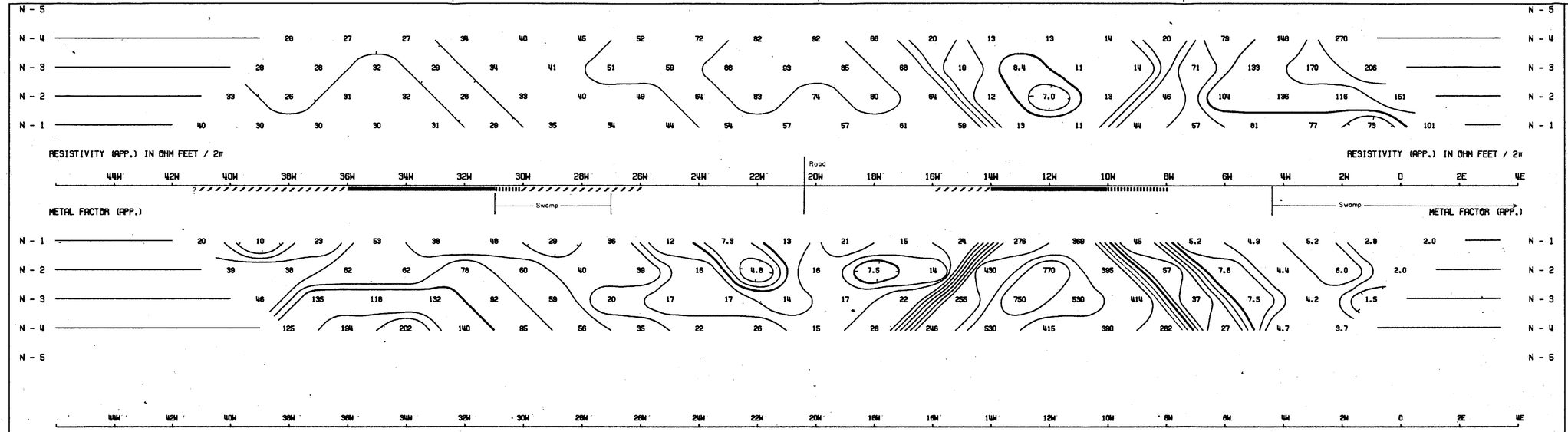

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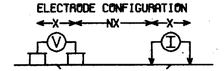
NITTETSU MINING CO. LTD.

COUGAR GRID, BABINE LAKE 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 1971

APPROVED:

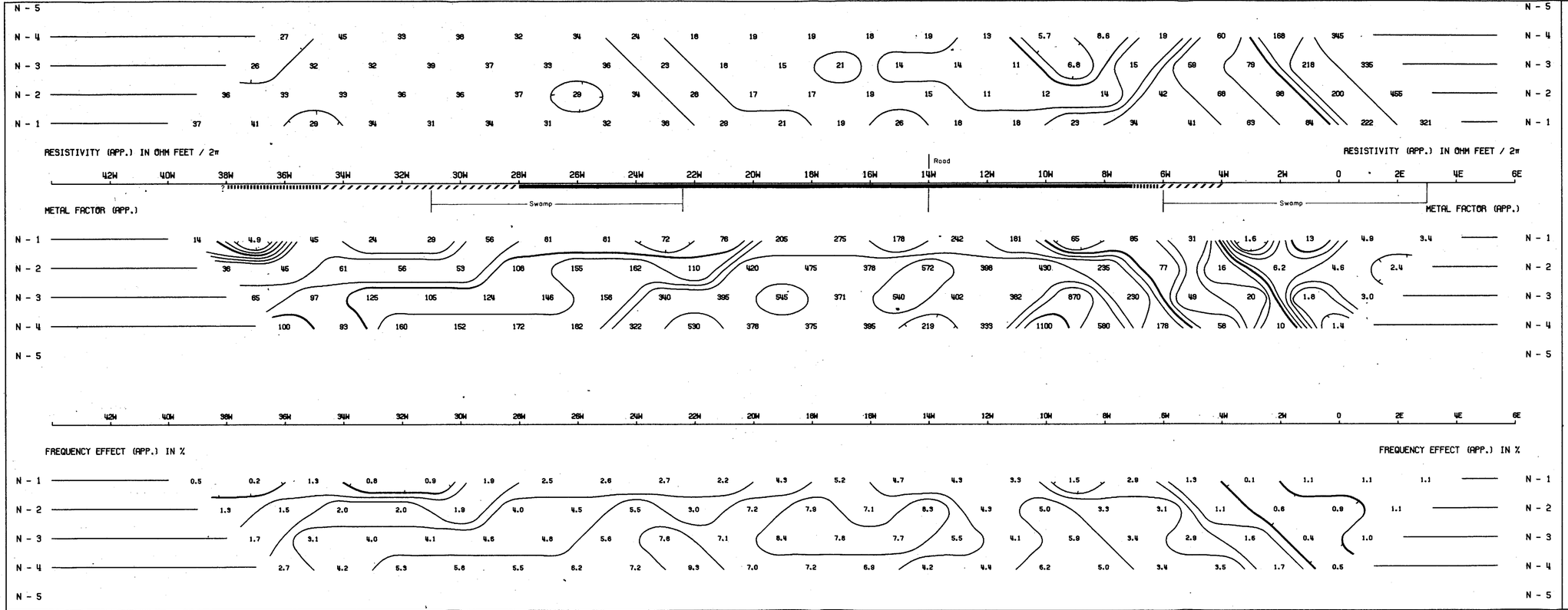
NOTE: CONTOURS AT LOGARITHMIC INTERVALS 1.-1.5-2.-3.-5.-7.5-10

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA A. W. MULLAN DATE: OCT 13, 1971

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED WITH AN IBM 360/85 COMPUTER AND A CALCOMP PLOTTER



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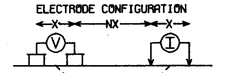
NITTETSU MINING CO. LTD.

COUGAR GRID, BABINE LAKE AREA

OMINECA M.D., B.C.

LINE NO.- 3200N

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: JUL 1971

APPROVED:

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

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA A. W. MULLAN DATE Sept 13, 1971

McPHAR GEOPHYSICS

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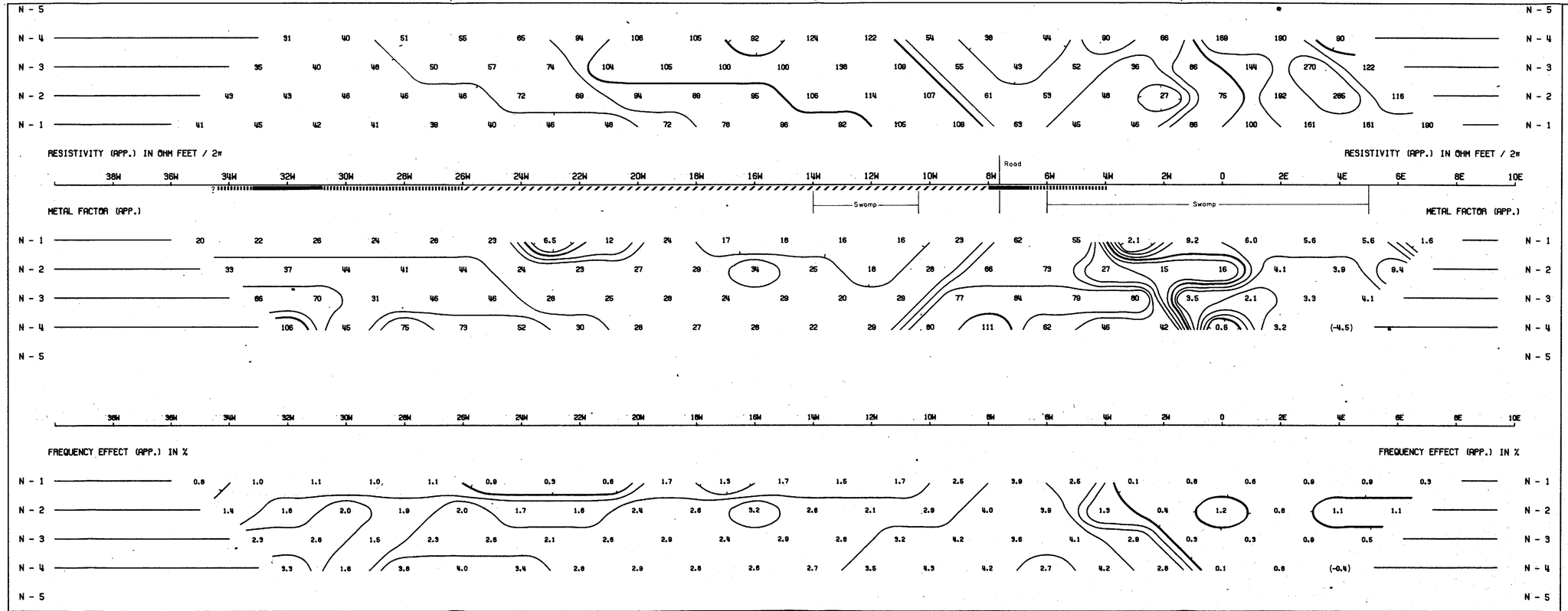


DWG. NO.- I.P.-5832 - 6

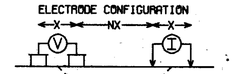
NITTETSU MINING CO. LTD.

COUGAR GRID, BABINE LAKE AREA

OMINECA M.D., B.C.

LINE NO.- 2400N

ELECTRODE CONFIGURATION



PLOTTING POINT → X = 200'

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: JUL 1971

APPROVED:

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

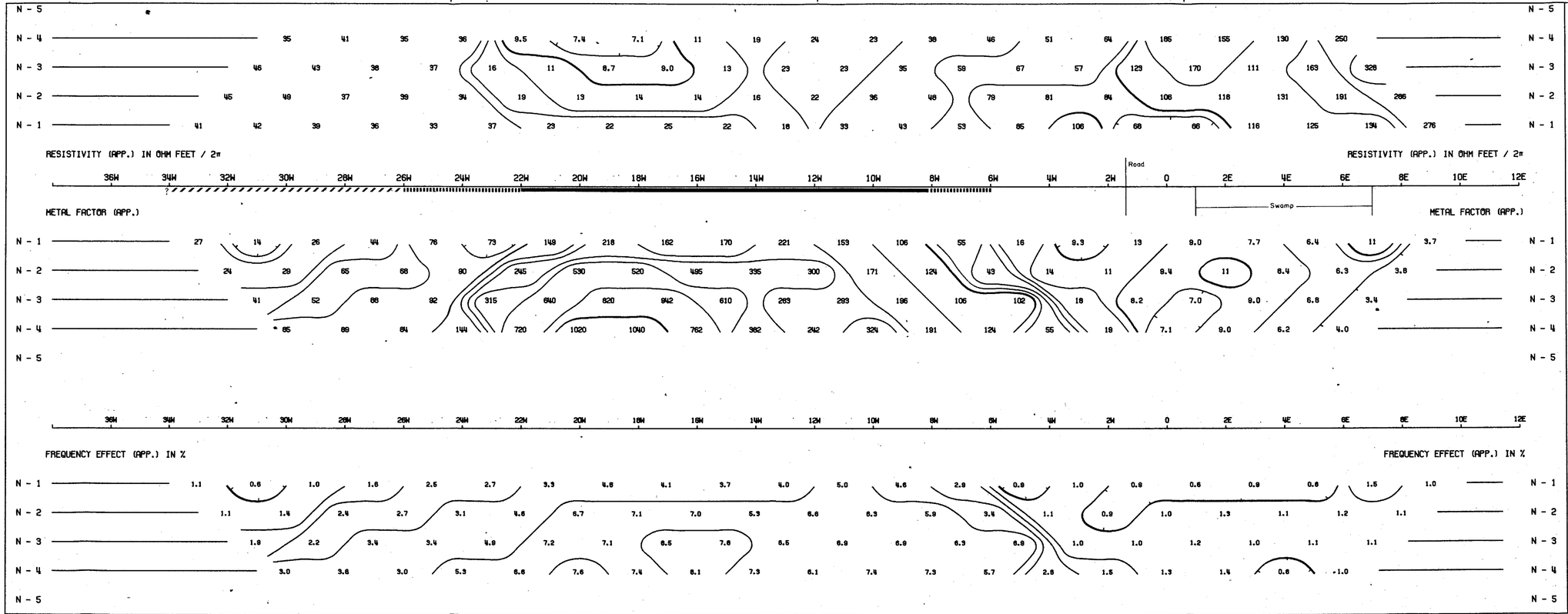
DATE: SEPT. 1971

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA A. W. MULLAN

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED WITH AN IBM 360/65 COMPUTER AND A CALCOMP PLOTTER



DWG. NO.- I.P.-5832-7

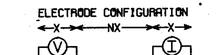
NITTETSU MINING CO. LTD.

COUGAR GRID, BABINE LAKE AREA

OMINECA M.D., B.C.

LINE NO.- 1600N

ELECTRODE CONFIGURATION



PLOTTING POINT → X = 200'

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE ——————

PROBABLE ||||||||||||||

POSSIBLE / / / / / /

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: JUL 1971

APPROVED:

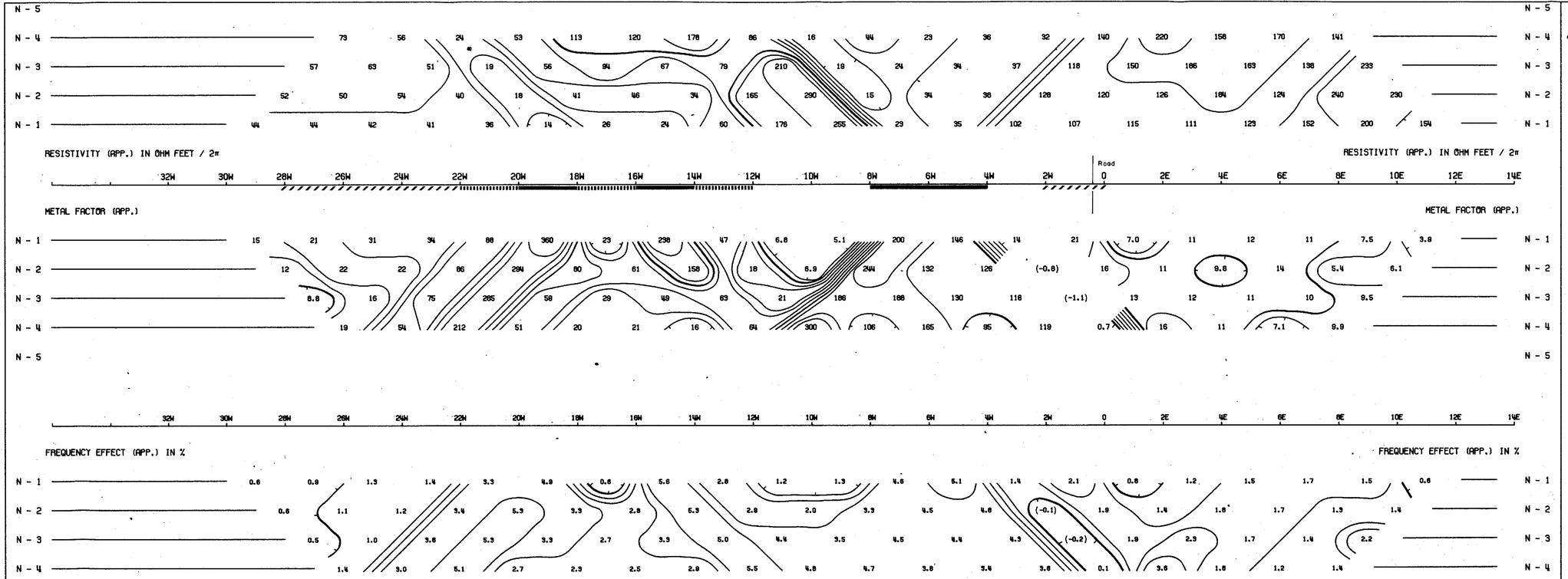
NOTE: CONTOURS AT LOGARITHMIC INTERVALS 1.-1.5-2.-3.-5.-7.5-10

PROFESSIONAL ENGINEERS PROVINCE OF BRITISH COLUMBIA A. W. MULLAN DATE Dec 3, 1971

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED WITH AN IBM 360/65 COMPUTER AND A CALCOMP PLOTTER



DWG. NO.- I.P.-5832-8

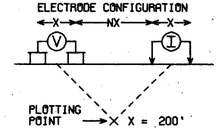
NITTETSU MINING CO. LTD.

COUGAR GRID, BABINE LAKE AREA

OMINECA M.D., B.C.

LINE NO.- 800N

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: JUL 1971

APPROVED:

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

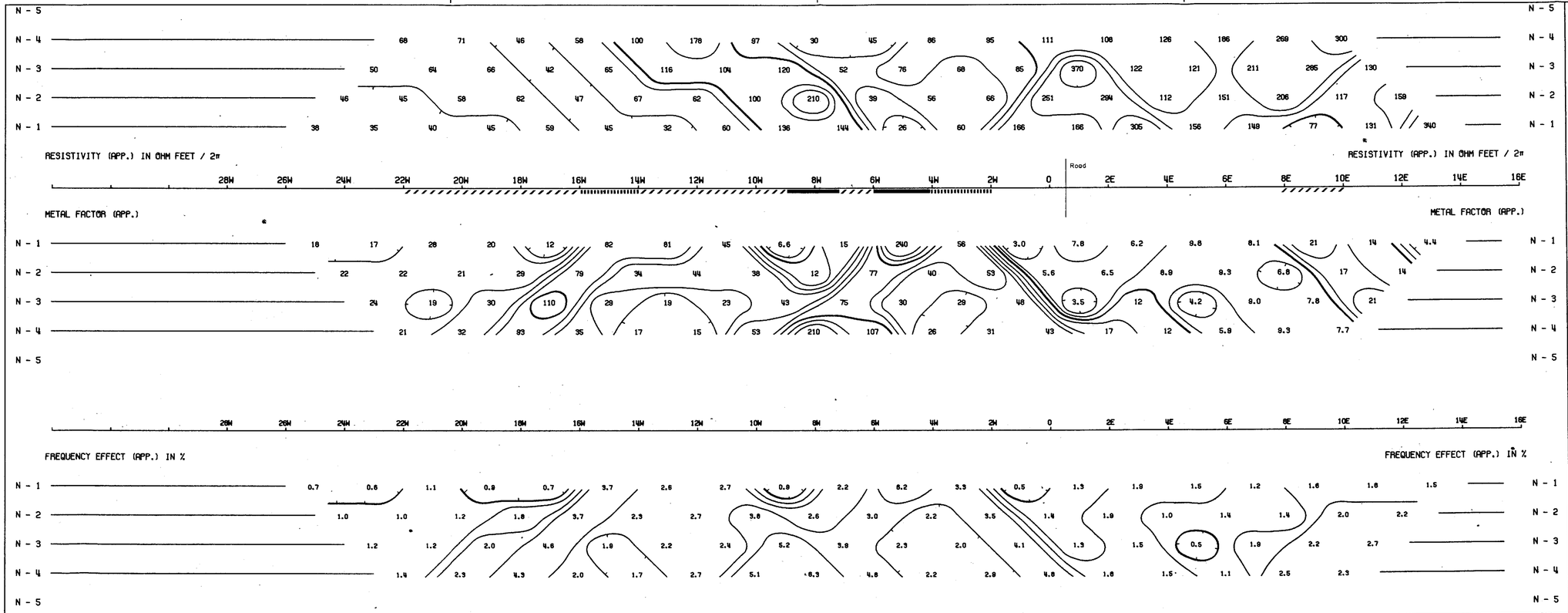
PROFESSIONAL ENGINEER'S SEAL
PROVINCE OF BRITISH COLUMBIA
A. W. MULLAN
ENGINEER

DEC 3, 1971

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED WITH AN IBM 360/65 COMPUTER AND A CALCOMP PLOTTER



DWG. NO.- I.P.-5832-9

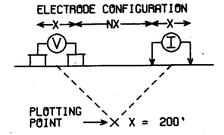
NITTETSU MINING CO. LTD.

COUGAR GRID, BABINE LAKE AREA

OMINECA M.D., B.C.

LINE NO.- 0

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: AUG 1971

APPROVED:

DATE:

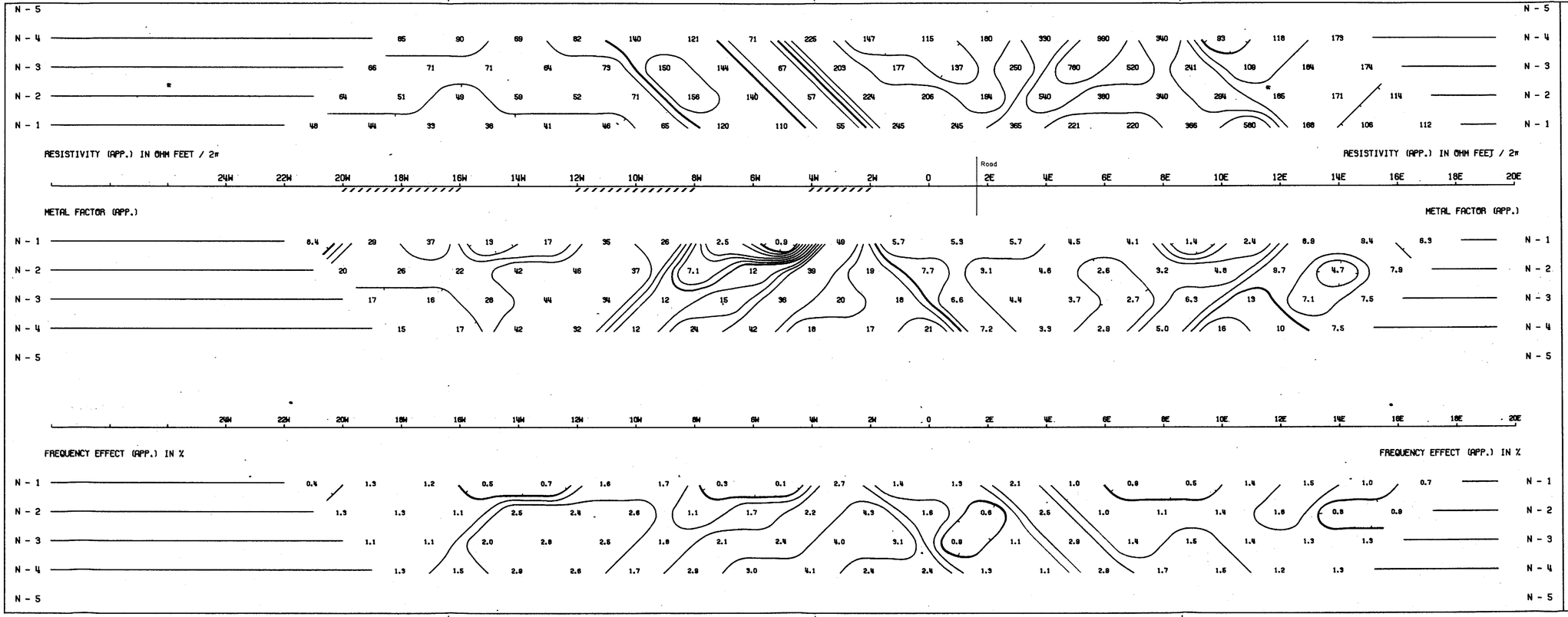
NOTE: CONTOURS AT LOGARITHMIC INTERVALS 1.-1.5-2.-3.-5.-7.5-10

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA A. W. MULLAN 1971

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED WITH AN IBM 360/65 COMPUTER AND A CALCOMP PLOTTER



DWG. NO.- I.P.-5832-10

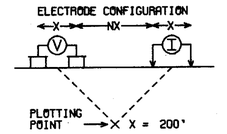
NITTETSU MINING CO. LTD.

COUGAR GRID, BABINE LAKE AREA

OMINECA M.D., B.C.

LINE NO.- 800S

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE ——————

PROBABLE ||||||||||||||||

POSSIBLE / / / / / /

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: AUG 1971

APPROVED:

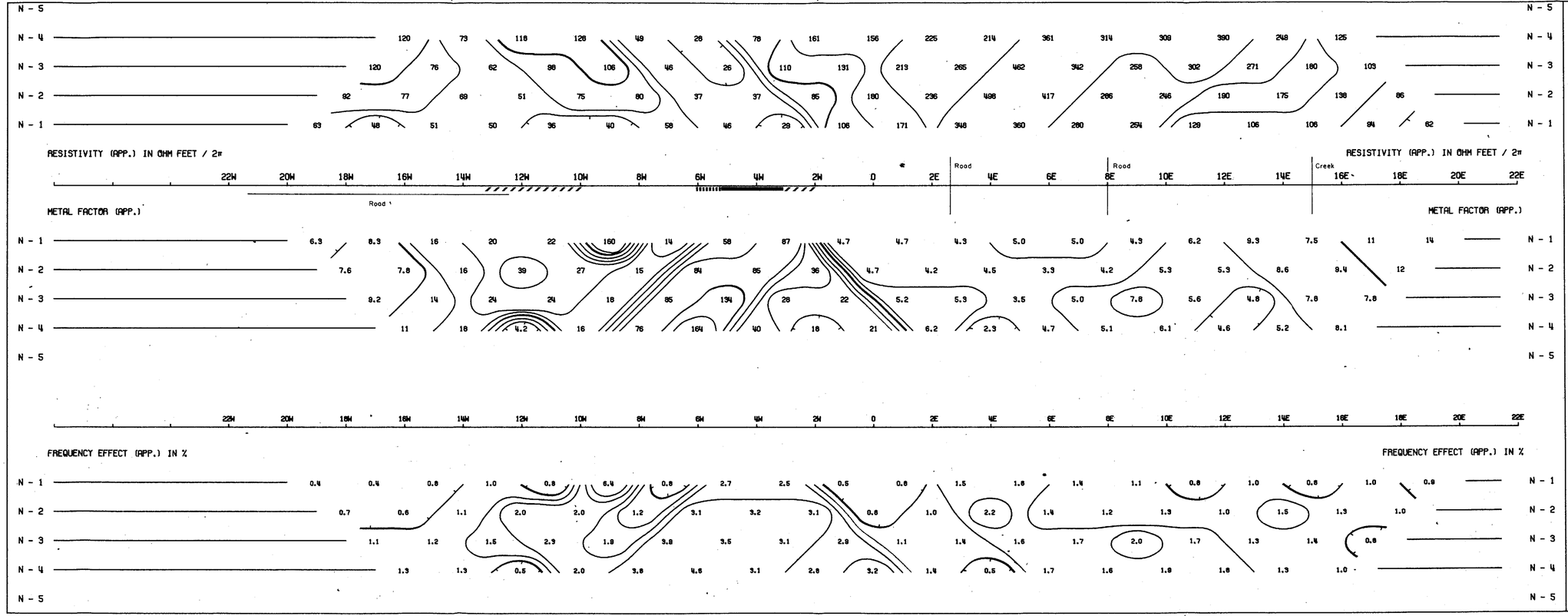
NOTE: CONTOURS AT LOGARITHMIC INTERVALS 1.-1.5-2.-3.-5.-7.5-10

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA DATE: SEPT 24 1971 A. W. MULLAN BRITISH COLUMBIA ENGINEER

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED WITH AN IBM 360/65 COMPUTER AND A CALCOMP PLOTTER



DWG. NO.- I.P.-5832-11

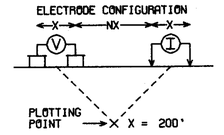
NITTETSU MINING CO. LTD.

COUGAR GRID, BABINE LAKE AREA

OMINECA M.D., B.C.

LINE NO.- 1600S

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: AUG 1971

APPROVED:

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

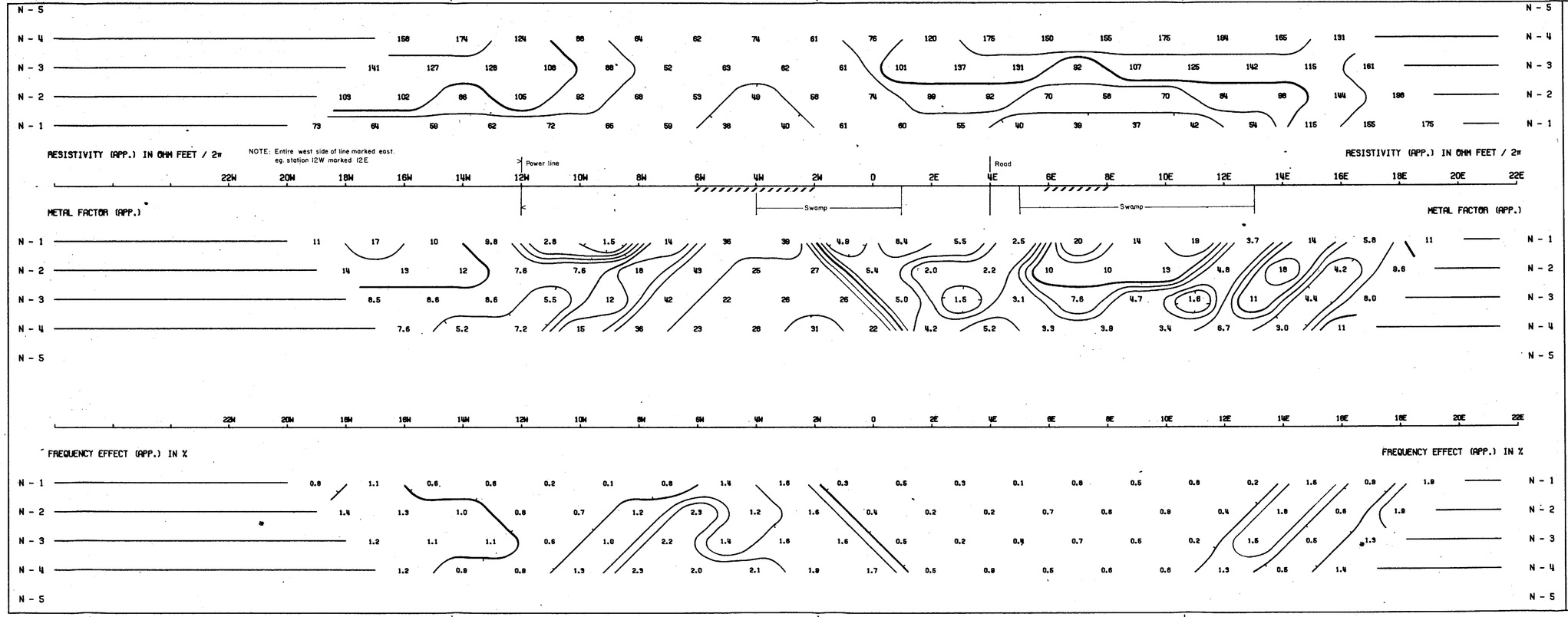
DATE: 1971

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA A. W. MULLAN

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED WITH AN IBM 360/65 COMPUTER AND A CALCOMP PLOTTER



DWG. NO.- I.P.-5832-12

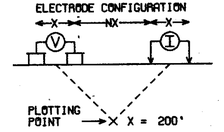
NITTETSU MINING CO. LTD.

COUGAR GRID, BABINE LAKE AREA

OMINECA M.D., B.C.

LINE NO.- 2400S

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: AUG 1971

APPROVED:

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

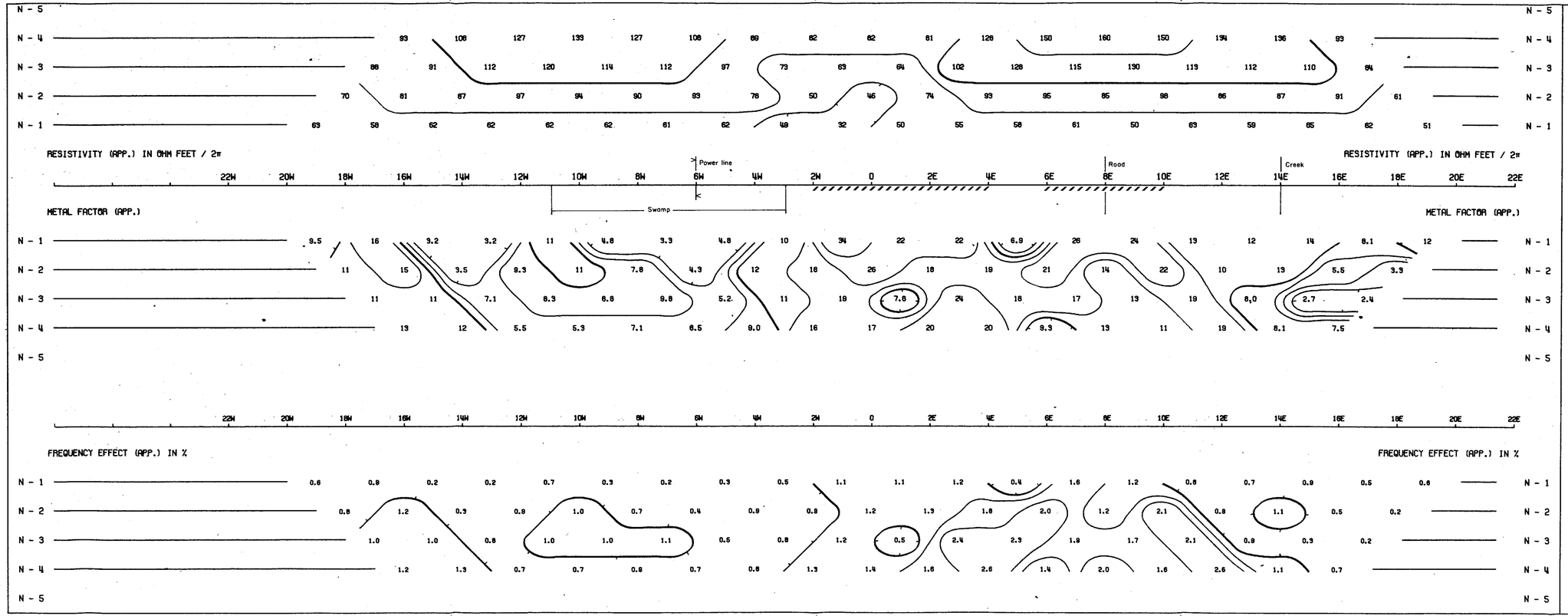
DATE: AUG 13, 1971

PROFESSIONAL ENGINEER PROVINCE OF B.C. A. W. MULLAN BRITISH COLUMBIA ENGINEER

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED WITH AN IBM 360/65 COMPUTER AND A CALCOMP PLOTTER



DWG. NO.- I.P.-5832-13

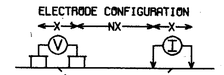
NITTETSU MINING CO. LTD.

COUGAR GRID, BABINE LAKE AREA

OMINECA M.D., B.C.

LINE NO.- 3200S

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: AUG 1971

APPROVED:

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

DATE: 1971

PROFESSIONAL ENGINEER OF A.W. MULLAN BRITISH COLUMBIA ENGINEER

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED WITH AN IBM 360/65 COMPUTER AND A CALCOMP PLOTTER

DWG. IPP - 4816

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

PLAN MAP

LOCATION MAP

Scale: 1" = 4 miles (approx.)

NOTE:

TO ACCOMPANY GEOPHYSICAL REPORT BY A.W. MULLAN, (P. ENG.) AND M.A. GOUDIE, GEOLOGIST, FOR NITTETSU MINING CO. LTD., ON THE COUGAR GRID, BABINE LAKE AREA, OMINECA M.D., B.C.

DATE: SEPT. 13, 1971

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

200 ft. spread used.

NITTETSU MINING CO. LTD.

COUGAR GRID, BABINE LAKE AREA

OMINECA M.D., B.C.

SCALE

ONE INCH EQUALS FIVE HUNDRED FEET

Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3262 MAP #1

M-1

3262

DRAWN: B.L.M.
SEPT. /1971
APPROVED:
A.W. MULLAN
PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
DATE: Sept. 13, 1971

DWG. IPP - 4816

48+00 W
44+00 W
40+00 W
36+00 W
32+00 W
28+00 W
24+00 W
20+00 W
16+00 W
12+00 W
8+00 W
4+00 W
0+00 BASE-LINE
4+00 E
8+00 E
12+00 E
16+00 E
20+00 E

L 72+00 N
Line not cut
L 64+00 N
L 56+00 N
L 48+00 N
L 40+00 N
L 32+00 N
L 24+00 N
L 16+00 N
L 8+00 N
L 0+00
L 8+00 S
L 16+00 S
L 24+00 S
L 32+00 S

ROAD
MAIN
COUGAR 2 FR
COUGAR 1 FR

41 43 45 47 80
42 44 46 48 79
31 33 35 37 39 50 49 78
32 34 36 38 40 52 51 77
54 53 76
12 10 8 6 4 2
11 9 7 5 3 1 55 75
57 74
58
65 67 69 71 60 59
66 68 70 72 73

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
A. W. MULLAN
OCT 20 1971

NITTETSU MINING CO., LTD.

COUGAR GROUP

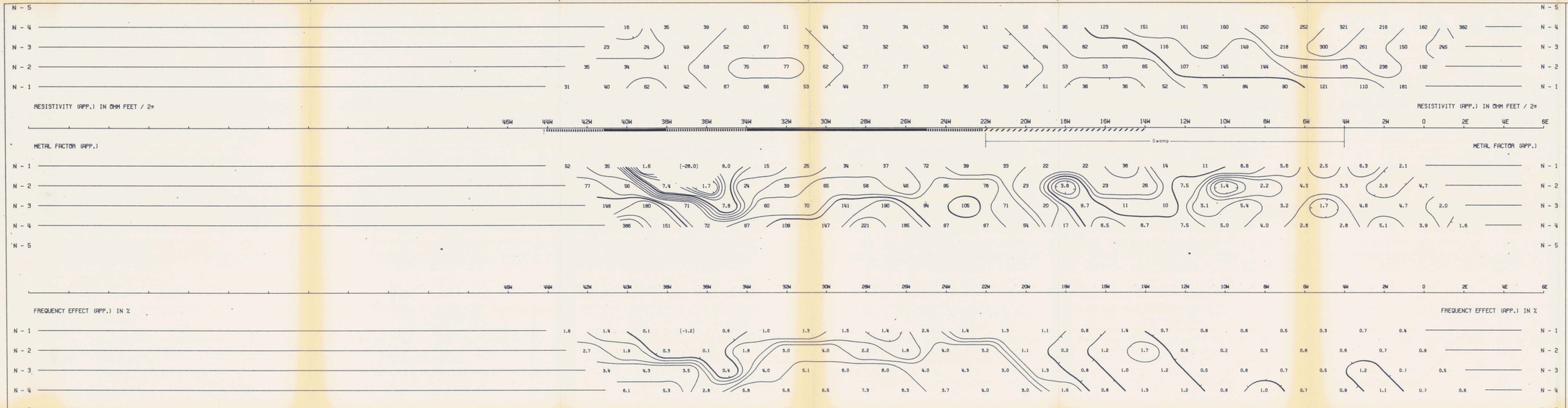
BABINE LAKE AREA

GRID AND CLAIM LOCATIONS

500 0 500 1000
SCALE IN FEET

SEPT. 30, 1971

W.G.S.



3262

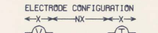
DWG. NO.- I.P.-5832-1

NITTETSU MINING CO. LTD.

COUGAR GRID, BABINE LAKE 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 1971

APPROVED:

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

DATE: Sept 16, 1971

A.W. MULLAN
BRITISH COLUMBIA
PROFESSIONAL ENGINEER

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED WITH AN IBM 360/65 COMPUTER AND A CALCOMP PLOTTER