5324

94E/2W

REPORT ON THE INDUCED POLARIZATION AND RESISTIVITY SURVEY ON THE 94E/2W RAT CLAIM GROUP, DUNCAN LAKE AREA OMINECA MINING DIVISION, B.C. FOR DL, RAT CRAIGMONT MINES LIMITED

BY

ASHTON W. MULLAN, B.Sc. P.Eng.

AND

PHILIP G. HALLOF, Ph.D.

NAME AND LOCATION OF PROPERTY:

RAT CLAIM GROUP, DUNCAN LAKE AREA, B.C.
OMINECA MINING DIVISION, B.C. 57°02'N - 126°47'W
DATE STARTED: SEPTEMBER 1, 1974
DATE FINISHED: SEPTEMBER 17, 1974

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

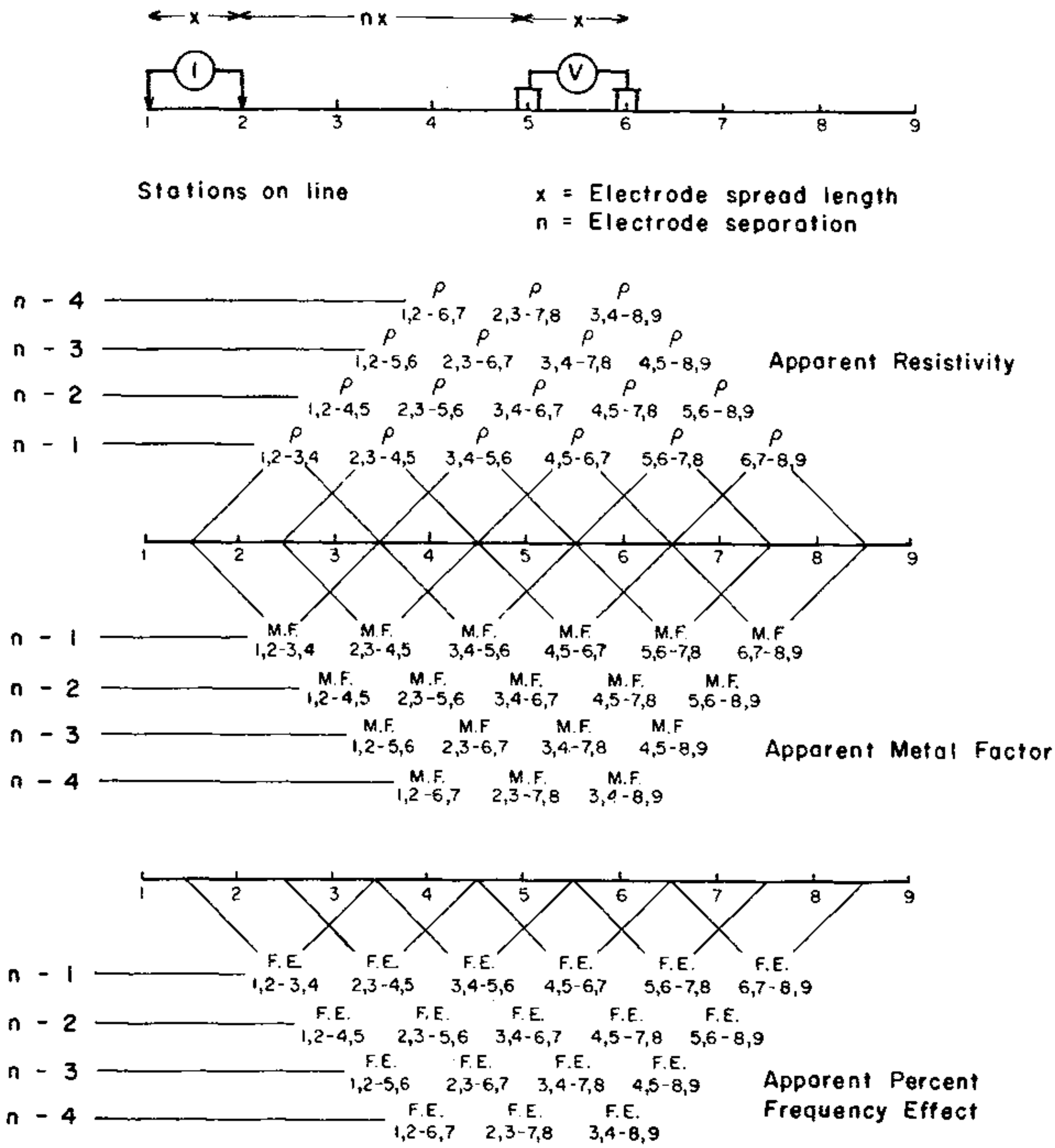

Fig. A

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McPHAR GEOPHYSICS

REPORT ON THE INDUCED POLARIZATION AND RESISTIVITY SURVEY ON THE RAT CLAIM GROUP, DUNCAN LAKE AREA, OMINECA MINING DIVISION, B.C. FOR CRAIGMONT MINES LIMITED

1. INTRODUCTION

An Induced Polarization and Resistivity survey has been completed on the Rat Claim Group for Craigmont Mines Ltd. The survey was requested by Mr. N.B. Vollo, Exploration Manager.

The Rat Group is located 155 miles north of Smithers in the Omineca Mining Division, B.C. The centre of the property is located at 57°02' north latitude and 126°47' west longitude. Access is by fixed wing aircraft to Duncan Lake.

The property is underlain by porphyries which have intruded quartzite and andesite of the Takla Group. Sustut conglomerate overlies these rocks to the south.

Pyrite is abundant in the altered Takla rocks surrounding the porphyries. Low grade copper mineralization occurs in altered porphyry intrusives.

The object of the IP survey was to define the mineralized area and to search for patterns to guide further exploration work.

The survey field work was carried out in September, 1974. A McPhar P660 variable frequency IP system was used for the survey operating at 0.3 and 5.0 Hz.

2. DESCRIPTION OF CLAIMS

The Rat Group property is held under an option agreement by Craigmont Mines Ltd. The group consists of the following claims:

- DL 1 - 26 inclusive
- DL Fraction
- RAT 7 - 10 inclusive
- RAT 15, 17 and 19

3. PRESENTATION OF RESULTS

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

Line	Electrode Interval	Dwg. No.
800W	200 feet	IP 6242-1
0	200 feet	IP 6242-2
800E (upper)	200 feet	IP 6242-3
800E (lower)	200 feet	IP 6242-4
1600E	200 feet	IP 6242-5
2400E	200 feet	IP 6242-6

Line	Electrode Intervals	Dwg. No.
3200E	200 feet	IP 6242-7
4000E	200 feet	IP 6242-8
4800E	200 feet	IP 6242-9
5600E	200 feet	IP 6242-10
6400E	200 feet	IP 6242-11

Also enclosed with this report is Dwg. I.P.P. 5026, a plan map of the RAT Claim Group Grid at a scale of 400' = 1". 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 400' electrode intervals the position of a narrow sulphide body can only be determined to lie between two stations 400' 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 Grid and Claim information shown on Dwg. I.P.P. 5026 has been taken from maps made available by the staff of Craigmont Mines Ltd. Careful attention should be paid to chainage errors and errors in marking pickets that were discovered during the survey and have been shown on the data plots.

4. DISCUSSION OF RESULTS

An interpretation of the resistivity survey results is shown on Dwg. RP-5027. With this method of presentation, the approximate contacts between rock units of equal resistivity are interpreted on the data plots. These contacts are then transferred to the plan map and the zones of approximately equal resistivity are correlated from line to line. This obviously results in a generalized picture of the sub-surface resistivity configuration. This is particularly true if the geologic picture is complex or if there are dipping contacts, etc.

The resistivity plan shows an area of higher resistivity in the NW quadrant of the grid and a second elongate zone along the NE grid boundary. These zones of higher resistivity either reflect the intrusive porphyries or unaltered, less porous, members of the Takla Group.

Numerous weak to moderate magnitude induced polarization anomalies were located on the grid. On the basis of similarity of IP response and resistivity environment, these IP anomalies have been correlated into 6 zones.

Zone "A" extends SE from Line 800W to Line 2400E. It occurs within a moderately low resistivity environment. Frequency effects are of medium magnitude and the source appears shallow relative to the 200 foot electrode interval.

Zone "B" could be an extension of Zone "A" and displays similar characteristics. It can be traced SE from Line 2400E to Line 4800E where it appears to terminate.

Zone "C" is located in the SE portion of the property. The IP anomaly can be traced SE from Line 4000E. It extends off the survey grid both to the NE and SE. The source of the IP effects is shallow and the frequency effect magnitude is moderate.

Zone "D" is located along the NE grid boundary extending NW from Line 2400E to beyond Line 800E. Line 0 and Line 800W did not extend far enough to the NE to detect this zone. The anomaly is of moderate magnitude, the source is shallow and it occurs within a moderate resistivity environment.

Zone "E" is a very weak IP anomaly that is located in the north central portion of the survey grid. The zone displays weak to medium magnitude frequency effects and occurs within a relatively high resistivity environment. The source of the anomaly is shallow.

Zone "F" lies south of Zone "E" but is located within a lower resistivity environment. This zone is characterized by weak frequency effects and appears shallow except on Line 3200E where moderate depth to the source is indicated.

Weak IP anomalies occur on the west end of most grid lines where Sustat volcanics are believed to occur.

Several other very weak anomalies occur elsewhere on the grid. They would only be considered of interest if they correlate with other favourable conditions.

5. SUMMARY AND CONCLUSIONS

An Induced Polarisation and Resistivity survey of the Rat Claim Group located a number of anomalous IP zones in varying resistivity environments.

Resistivity highs in the NW portion of the property and along the NE grid boundary may reflect intrusive porphyries.

An earlier geochemical survey located copper anomalies that show reasonably good correlation with the resistivity highs.

The IP anomalies have been correlated into six zones designated Zone "A" to Zone "F" inclusive. Zone "A" and Zone "B" are moderate in magnitude and occur in a relative resistivity low. These anomalies may reflect pyrite in altered Takla formations.

Zone "C" is similar in magnitude to Zone "A" and Zone "B" but occurs within a slightly higher resistivity background.

Zone "D" is associated with higher resistivities, shows some correlation with a geochemical anomaly, and may be positioned over an intrusive.

Zone "E" occurs within a high resistivity environment which is understood to reflect an altered quartz monzonite. A copper geochemical anomaly correlates with this zone. A drill hole near Line 2400E intersected an altered quartz monzonite containing copper mineralization. The hole appears to have tested a weak part of the IP anomaly that forms the zone.

Zone "F" occurs on or near the contact with Sustat volcanics. There is no obvious geochemical response in this vicinity.

Geological investigations carried out to date may give further information regarding the source of the IP effects in some of the zones. Where no obvious explanation is available, additional investigation is warranted. Zone "D" and Zone "E" both show good geochemical correlation and merit careful attention. Since most of the anomalies correlated to form the zones indicate a shallow source, the source could be better located and evaluated using shorter electrode intervals.

McPHAR GEOPHYSICS COMPANY

A. W. Mullan,
Geologist

Philip G. Hallof,
Geophysicist

Dated: November 25, 1974

ASSESSMENT DETAILS

PROPERTY: Rat Claim Group

MINING DIVISION: Omineca

SPONSOR: Craigmont Mines Limited

PROVINCE: British Columbia

LOCATION: Duncan Lake Area

TYPE OF SURVEY: Induced Polarization

OPERATING MAN DAYS:	55	DATE STARTED: September 1, 1974
EQUIVALENT 8 HR. MAN DAYS:	82½	DATE FINISHED: September 17, 1974
CONSULTING MAN DAYS:	3	NUMBER OF STATIONS: 286
DRAUGHTING MAN DAYS:	10	NUMBER OF READINGS: 2250
TOTAL MAN DAYS:	95½	MILES OF LINE SURVEYED: 10.4

CONSULTANTS:
A. W. Mullan, 1440 Sandhurst Place, West Vancouver, B.C.
P. G. Hallof, 15 Barnwood Court, Don Mills, Ontario.

FIELD TECHNICIANS:
P. Makulowich, 669 Valdes Drive, Kamloops, B.C.
N. Thomson, 5196 Moscrop, Burnaby, B.C.
Plus 3 Helpers: Supplied by Client

DRAUGHTSMEN
R. Peer, 10 Carabob Court, Apt. 402, Agincourt, Ontario.
B. Boden, 103 Petworth Crescent, Agincourt, Ontario.
V. Young, 64 Highcourt Crescent, Scarborough, Ontario.

McPHAR GEOPHYSICS COMPANY

Philip G. Hallof,
Geophysicist

Dated: November 25, 1974

STATEMENT OF COST

Craigmont Mines Limited - IP Survey - Rat Group
Omineca Mining Division

Crew: P. Makulowich - N. Thomson

11 days Operating:

10 days	@	$350.00/day	$3,500.00
1 day	@	$335.00/day	335.00
1 day Travel	)		
3 days Standby	) 6 days @ $140.00/day		840.00
2 days Preparation	)		

Crew expenses (prorated 11/21)

Air Fare	58.67	
Excess Baggage	11.74	
Freight	173.46	
Supplies	1.00	
Meals	7.07	
Telephone & Telegraph	2.50	
Taxis	11.00	
	265.44	
+ 10%	26.54	
		291.98
		$4,966.98

McPHAR GEOPHYSICS COMPANY

Philip G. Hallof,
Geophysicist

Dated: November 25, 1974

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.

1. 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 over 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 securieis of Craigmont Mines 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 Vancouver

This 25th day of November, 1974

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
A. W. MULLAN

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

CERTIFICATE

I, Philip George Hallof, of the City of Toronto, Province of Ontario, do hereby certify that:

1. I am a geophysicist residing at 15 Earnwood Court, Don Mills, Ontario.

2. I am a graduate of the Massachusetts Institute of Technology with a B.Sc. Degree (1952) in Geology and Geophysics, and a Ph.D. Degree (1957) in Geophysics.

3. I am a member of the Society of Exploration Geophysicists and the European Association of the Exploration Geophysicists.

4. I am a Professional Geophysicist, registered in the Province of Ontario, the Province of British Columbia and the State of Arizona.

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 Craigmont Mines 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 25th day of November, 1974

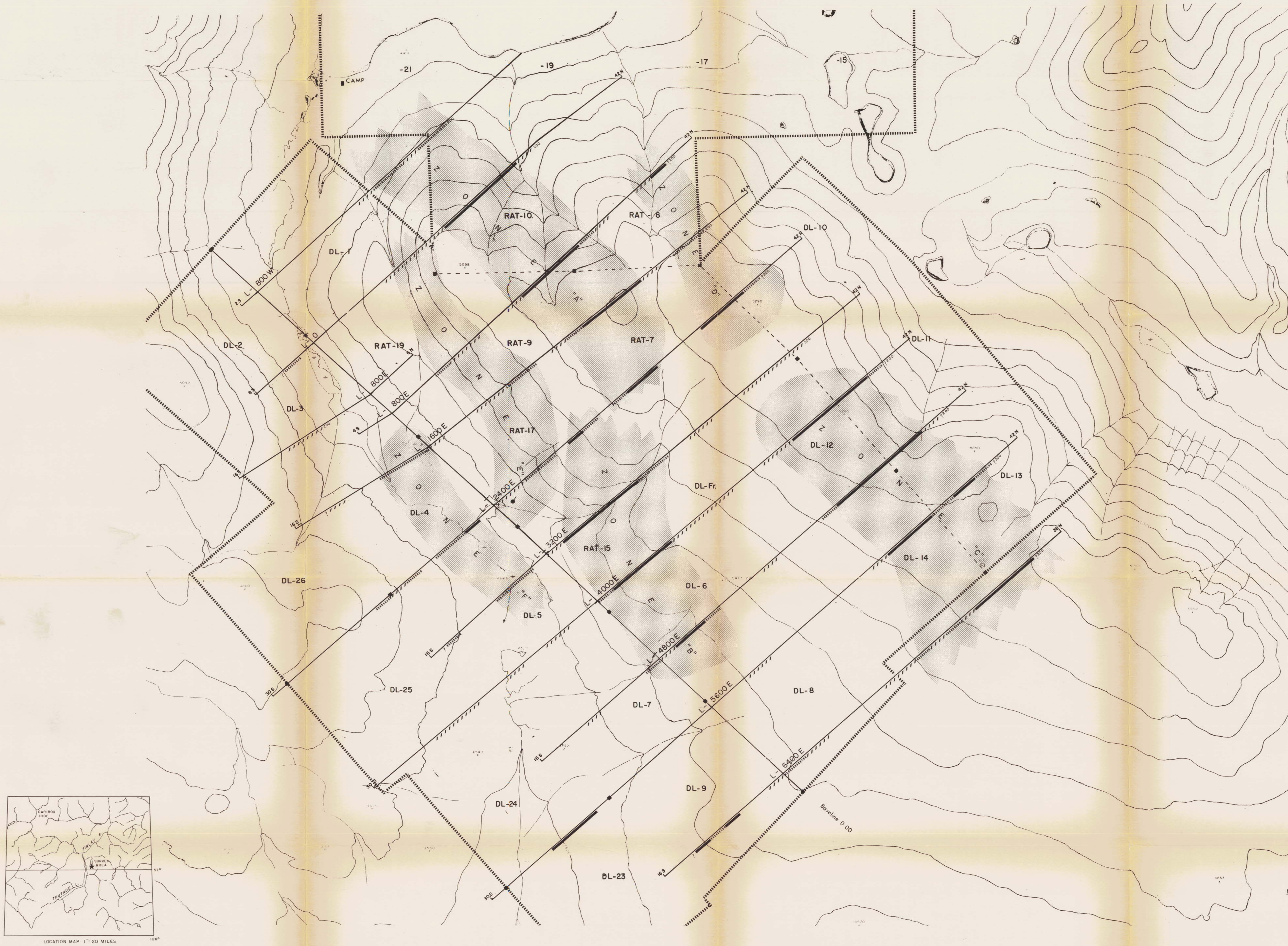
Philip G. Hallof, Ph.D.

DWG. I.PP 5026

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

PLAN MAP



NOTE TO ACCOMPANY GEOPHYSICAL REPORT FOR CRAIGMONT MINES LIMITED ON THE RAT CLAIM GROUP, DUNCAN LAKE AREA, OMINECA M.D., B.C. BY A.W. MULLAN P.ENG. GEOLOGIST AND P.G. HALLOF P.ENG. GEOPHYSICIST. DATED NOV. 25, 1974.

5324
MAP 1

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

Number at the end of anomaly indicates spread used.

CRAIGMONT MINES LIMITED

RAT CLAIM GROUP

DUNCAN LAKE AREA, OMINECA M.D., B.C.

SCALE

1" = 400'

ANOMALOUS I.P. ZONE

Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 5324 MAP #1

DRAWN: GLS
DATE: NOV 1974
APPROVED: Philip G. Hallof
DATE: 11/25/75

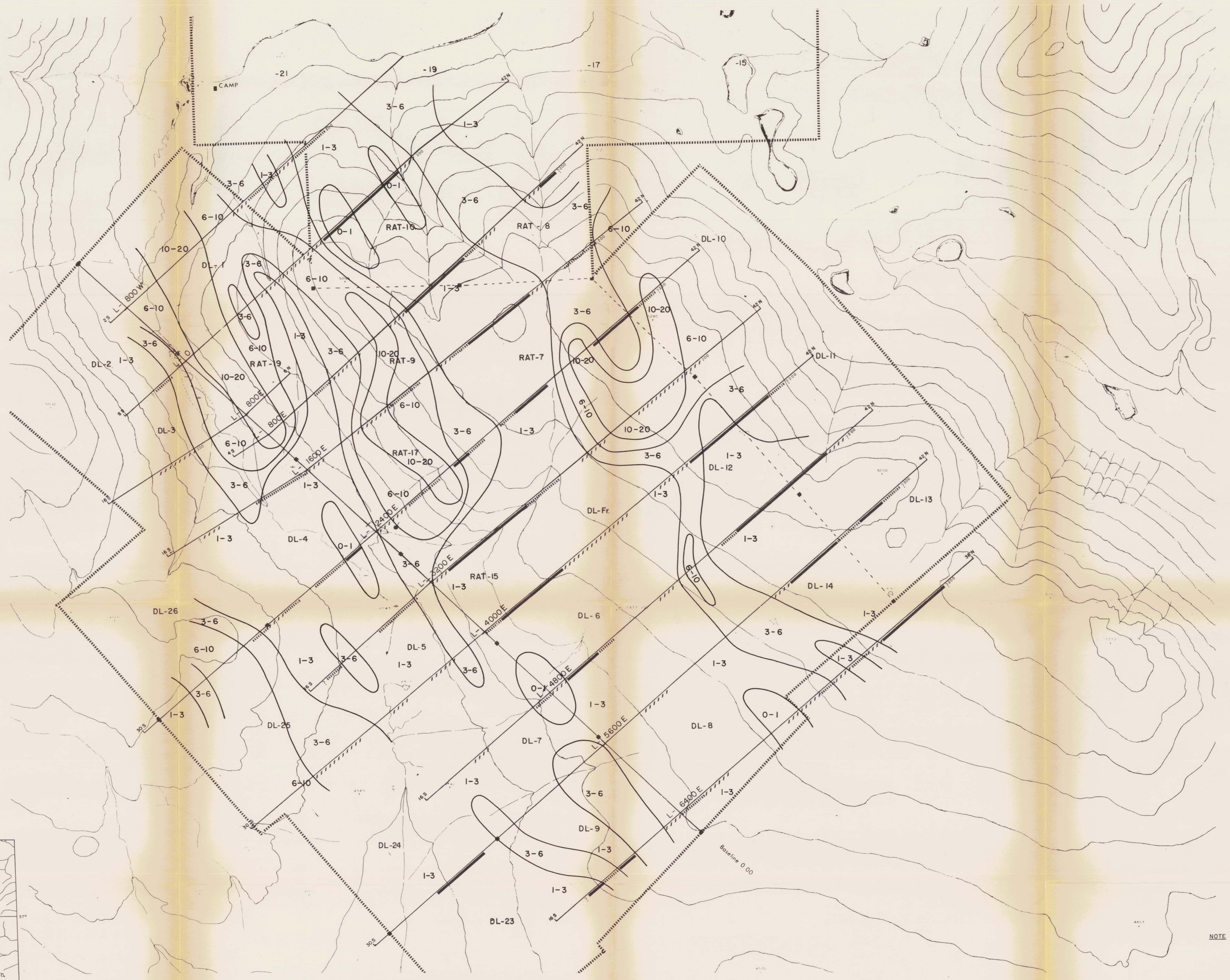
DWG. I.PP 5026

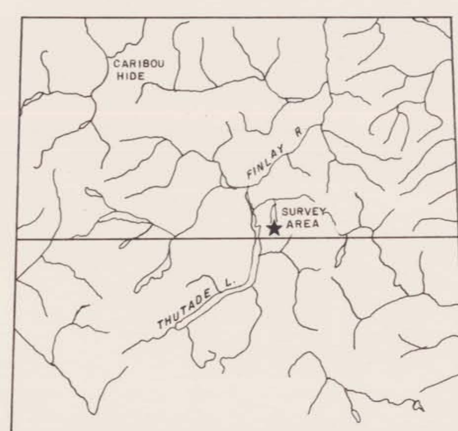
DWG. R.P. 5027

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

PLAN MAP





CODE	$\rho a/2\pi$ OHM FEET LEVEL IN ZONE
10-20	1000-2000
6-10	600-1000
3-6	300-600
1-3	100-300
0-1	0-100

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5324 MAP 2

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

Number at the end of anomaly indicates spread used.

CRAIGMONT MINES LIMITED

RAT CLAIM GROUP

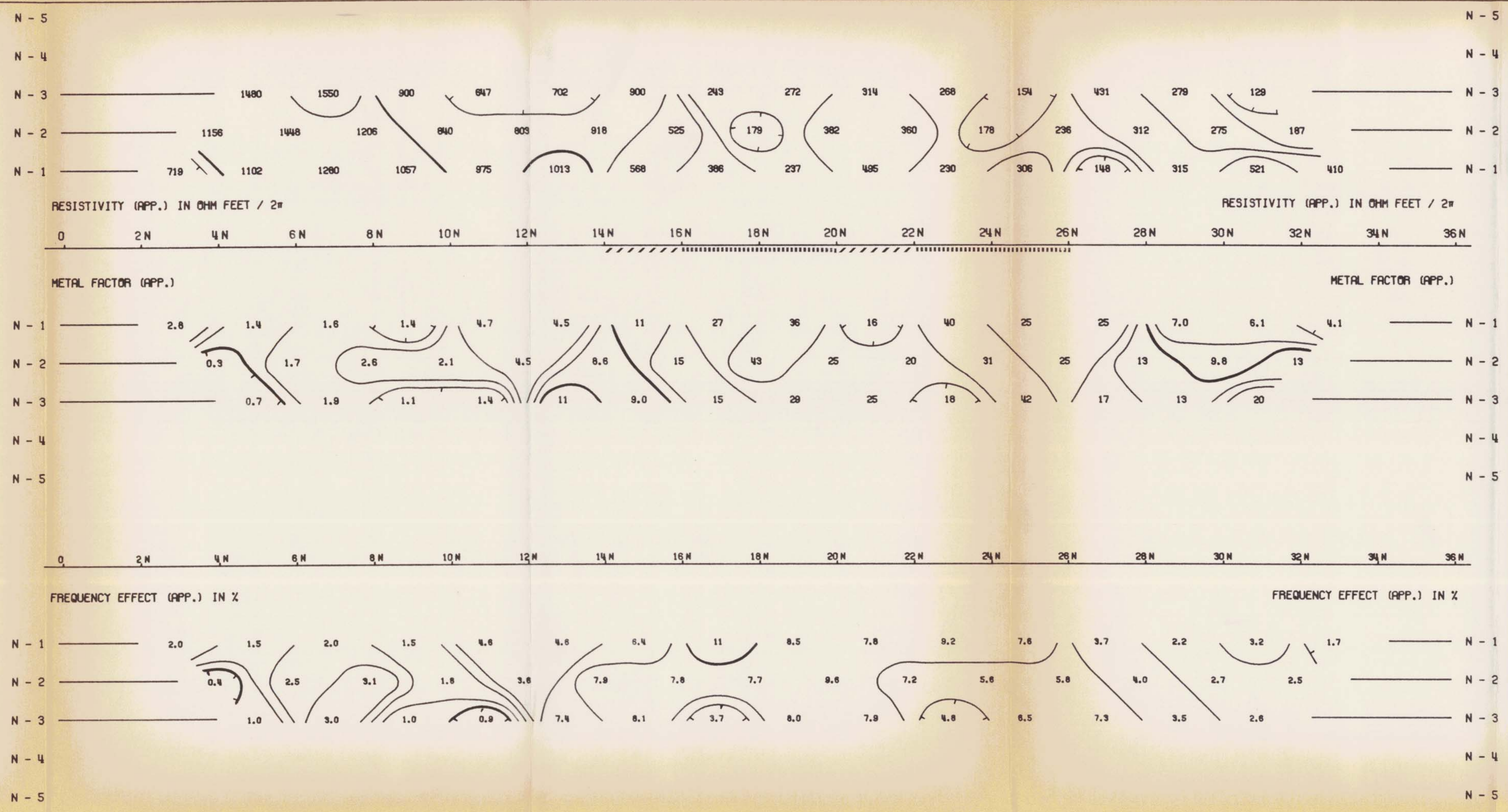
DUNCAN LAKE AREA, OMINECA M.D., B.C.

SCALE

1" = 400'

DRAWN: SCE DATE: NOV. 1974 APPROVED: DATE: 11/25/74

DWG. R.P. 5027



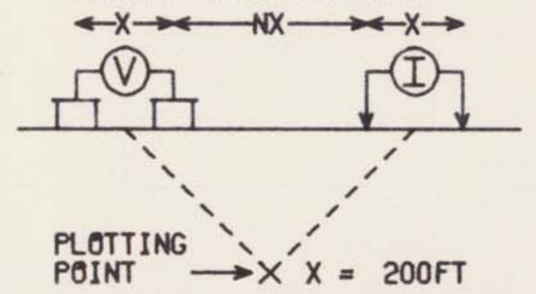
DWG. NO.- I.P.-6242-1

CRAIGMONT MINES LIMITED.

RAT CLAIM GROUP, DUNCAN LAKE AREA, OMINECA M.D., B.C.

LINE NO.- 800W

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: SEP 1974

APPROVED: Philip G. Hallof

DATE: 11/25/74

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

PROFESSIONAL ENGINEER P. G. HALLOF PROVINCE OF BRITISH COLUMBIA

Expiry Date: February 25, 1975

5324 I.P. 1

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION

DWG. NO.- I.P.-6242-2

CRAIGMONT MINES LIMITED.

RAT CLAIM GROUP, DUNCAN LAKE AREA, OMINECA M.D., B.C.

LINE NO.- 0

ELECTRODE CONFIGURATION

PLOTTING POINT X = 200FT

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: SEP 1974

APPROVED: Philip G. Hallof

DATE: 11/25/74

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

PROFESSIONAL ENGINEER P. G. HALLOF PROVINCE OF BRITISH COLUMBIA

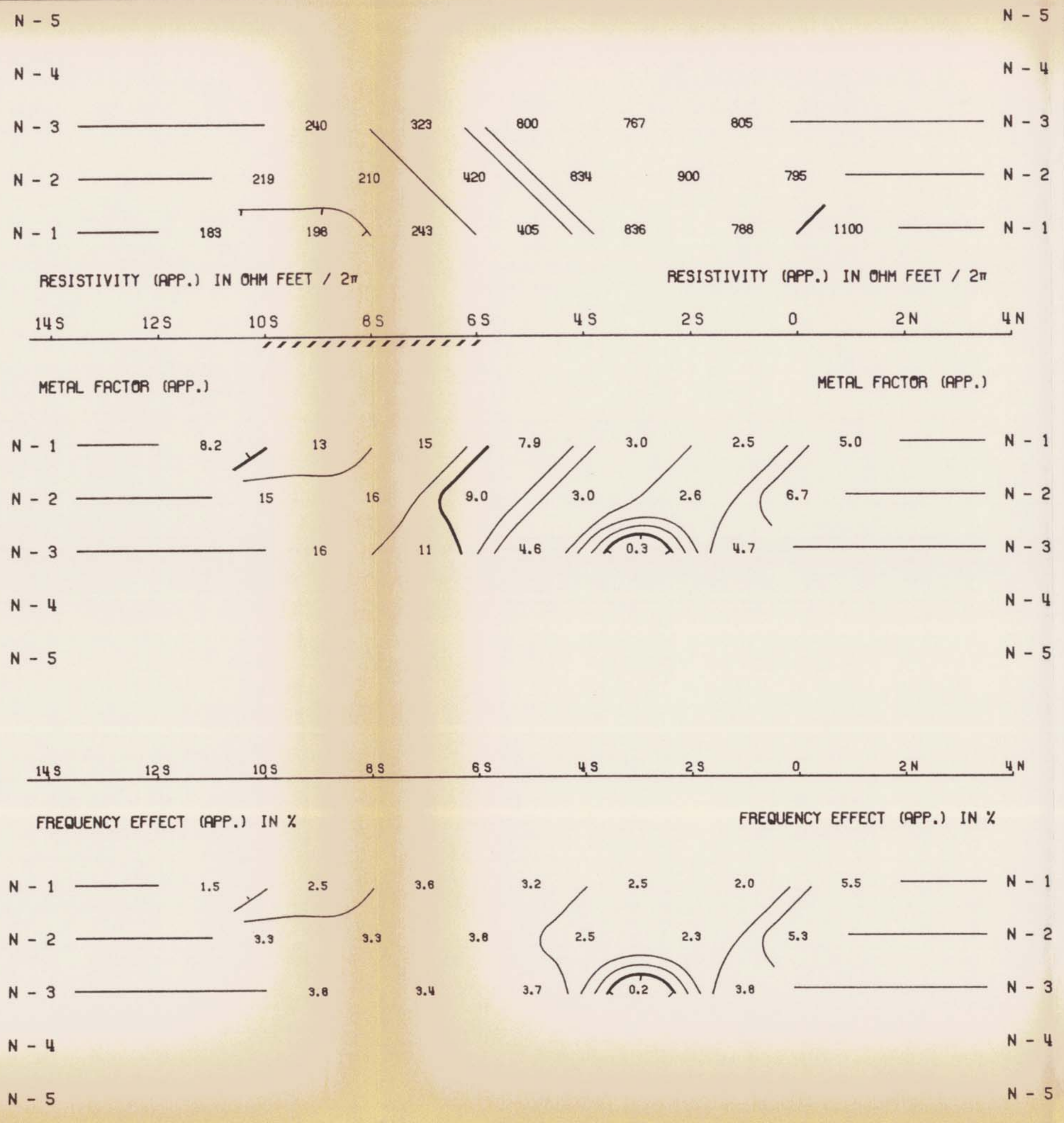
Expiry Date: February 25, 1975

5324 I.P. 2

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION



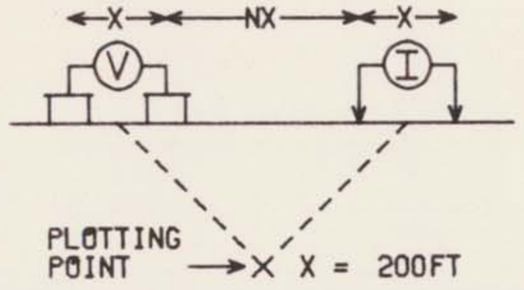
DWG. NO.- I.P.-6242-3

CRAIGMONT MINES LIMITED.

RAT CLAIM GROUP, DUNCAN LAKE AREA, OMINECA M.D., B.C.

LINE NO.- 800E (UPPER)

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: SEP 1974

APPROVED: Philip G. Hallof

DATE: 11/26/74

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

5324 I.P.3

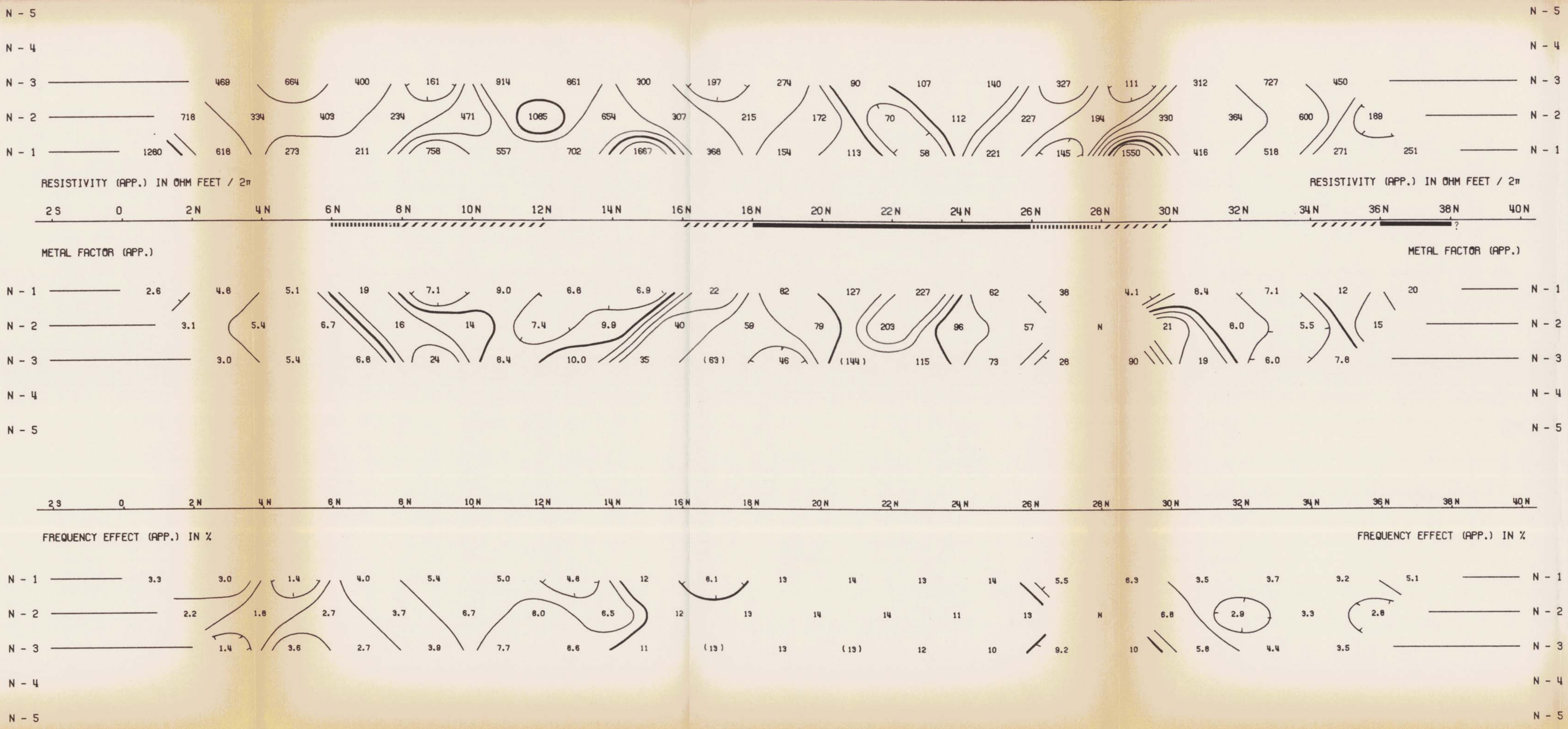
PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA

Expiry Date: February 25, 1975

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION



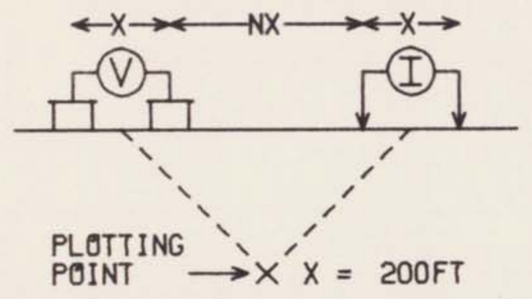
DWG. NO.- I.P.-6242-4

CRAIGMONT MINES LIMITED.

RAT CLAIM GROUP, DUNCAN LAKE AREA, OMINECA M.D., B.C.

LINE NO.- 800E(LOWER)

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE ▬▬▬
PROBABLE ||||||||||||
POSSIBLE /////

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: SEP 1974

APPROVED: Philip G. Hallof

DATE: 11/25/74

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

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA

Expiry Date: February 25, 1975

5324 I.P.4

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION

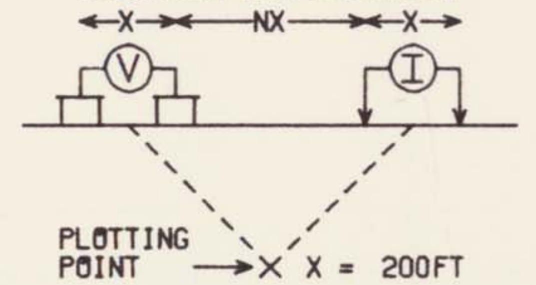
DWG. NO.- I.P.-6242-5

CRAIGMONT MINES LIMITED.

RAT CLAIM GROUP, DUNCAN LAKE AREA, OMINECA M.D., B.C.

LINE NO.- 1600E

ELECTRODE CONFIGURATION



PLOTTING POINT → X X = 200FT

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: SEP 1974

APPROVED: Philip G. Hallof

DATE: 11/25/74

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

PROFESSIONAL ENGINEER P. G. HALLOF BRITISH COLUMBIA

Expiry Date: February 25, 1975

5324 I.P.5

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION

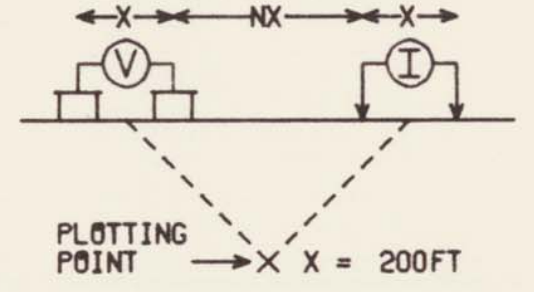
DWG. NO.- I.P.-6242-6

CRAIGMONT MINES LIMITED.

RAT CLAIM GROUP, DUNCAN LAKE AREA, OMINECA M.D., B.C.

LINE NO.- 2400E

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: SEP 1974

APPROVED: Philip G. Hallof

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

DATE: 11/25/74

5324 I.P.6

PROFESSIONAL ENGINEER P. G. HALLOF PROVINCE OF BRITISH COLUMBIA

Expiry Date: February 25, 1975

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION

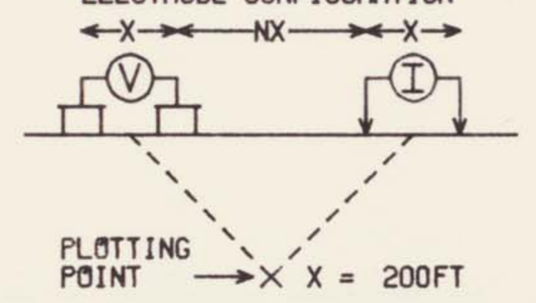
DWG. NO.- I.P.-6242-7

CRAIGMONT MINES LIMITED.

RAT CLAIM GROUP, DUNCAN LAKE AREA, OMINECA M.D., B.C.

LINE NO.- 3200E

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: SEP 1974

APPROVED: Philip G. Hallof

DATE: 11/25/74

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

5324 I.P7

PROFESSIONAL ENGINEER, PROVINCE OF BRITISH COLUMBIA, P. G. HALLOF
Expiry Date: February 25, 1975

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION

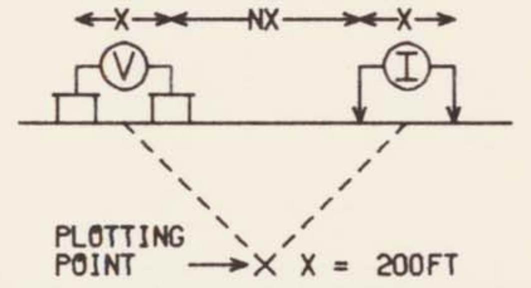
DWG. NO.- I.P.-6242-8

CRAIGMONT MINES LIMITED.

RAT CLAIM GROUP, DUNCAN LAKE AREA, OMINECA M.D., B.C.

LINE NO.- 4000E

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: SEP 1974

APPROVED: Philip G. Hallof

DATE: 11/25/74

PROFESSIONAL ENGINEER, PROVINCE OF BRITISH COLUMBIA, P. G. HALLOF
Expiry Date: February 25, 1975

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

5324 I.P.8

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION

DWG. NO.- I.P.-6242-9

CRAIGMONT MINES LIMITED.

RAT CLAIM GROUP, DUNCAN LAKE AREA, OMINECA M.D., B.C.

LINE NO.- 4800E

ELECTRODE CONFIGURATION

X — NX — X

PLOTTING POINT X = 200FT

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: SEP 1974

APPROVED:

DATE: 11/25/74

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

5324 I.P.9

Expiry Date: February 25, 1975

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY McPHAR COMPUTER DIVISION

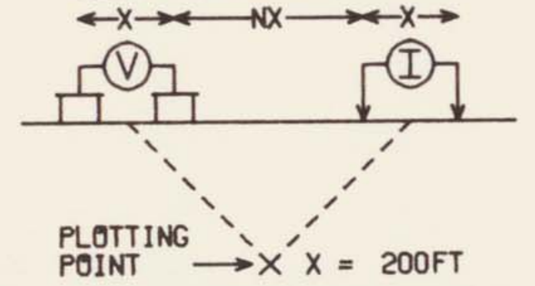
DWG. NO.- I.P.-6242-10

CRAIGMONT MINES LIMITED.

RAT CLAIM GROUP, DUNCAN LAKE AREA, OMINECA M.D., B.C.

LINE NO.- 5600E

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: SEP 1974

APPROVED: Philip G. Hallof

DATE: 11/25/74

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

5324 I.P.10

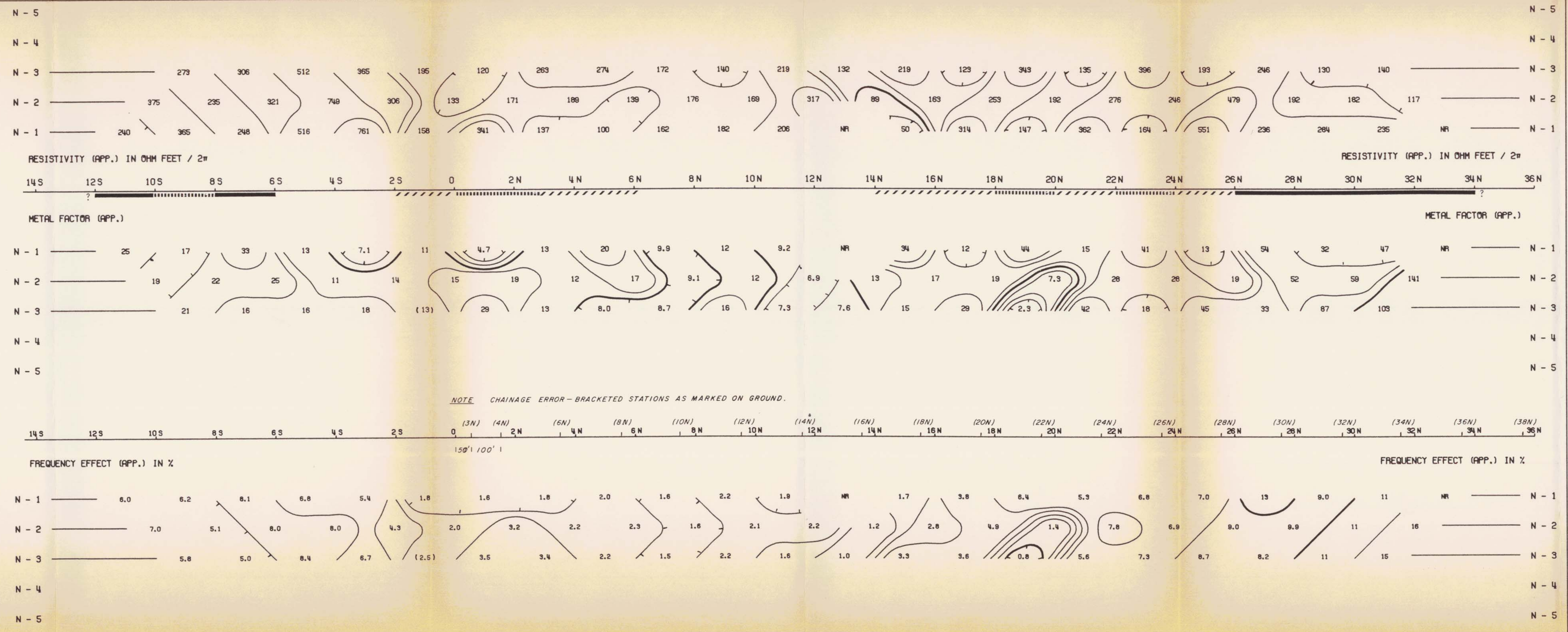
PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA P. G. HALLOF

Expiry Date: February 25, 1975

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION



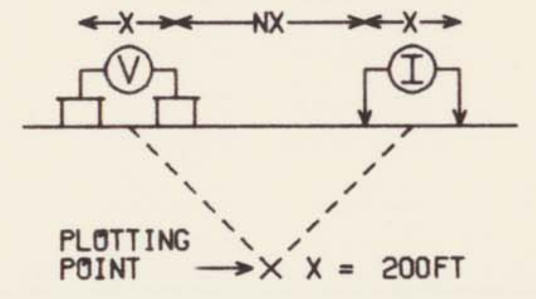
DWG. NO.- I.P.-6242-11

CRAIGMONT MINES LIMITED.

RAT CLAIM GROUP, DUNCAN LAKE AREA, OMINECA M.D., B.C.

LINE NO.- 6400E

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: SEP 1974

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

APPROVED: Philip G. Hallof

DATE: 11/25/74

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA P. G. HALLOF
Expiry Date: February 25, 1975

5324 I.P. 11

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY McPHAR COMPUTER DIVISION