4842

104 G/7W

104G/7W

REPORT ON THE INDUCED POLARIZATION AND RESISTIVITY SURVEY ON THE SCHAFT CREEK PROPERTY, LIARD MINING DIVISION, B.C. FOR HECLA MINING CO. OF CANADA LIMITED

BB, MU, SNO, BIRD, NOV, EMU, DAVE, PIT

BY

PHILIP G. HALLOF, Ph. D.

AND

MARION A. GOUDIE, B.Sc.

NAME AND LOCATION OF PROPERTY:

SCHAFT CREEK PROPERTY, B.C.
LIARD MINING DIVISION, B.C. 57°N - 131°W
DATE STARTED: SEPTEMBER 16, 1973
DATE FINISHED: OCTOBER 1, 1973

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McPHAR GEOPHYSICS

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1. INTRODUCTION

We have recently completed an Induced Polarization and Resistivity survey on the Schaft Creek property of Hecla Mining Company of Canada Limited, in the Liard Mining Division, British Columbia. The property is situated at 57° N latitude and 131° W longitude in the southeast sector of the quadrant, 37 miles south-southeast of Telegraph Creek, B.C. Access is by aircraft from Terrace and Smithers, B.C.

The Schaft Creek property lies on the east flank of the Hickman Batholith, a major granitic pluton of the Coast Intrusions, intruded into Triassic andesites and pyroclastic rocks. On the east of the property lies Mess Creek valley, which may be an area of major faulting.

Copper-molybdenum mineralization occurs in feldspathized and intensely fractured andesites. Hypabyssal monzonite and quartz monzonite occur with mineralisation and may represent zones of particularly intense

Skeeter Lake Grid

Line	Electrode Intervals	Dwg. No.
13000N	200 feet	IP 6111-1
8000N	200 feet	IP 6111-2
5000N	200 feet	IP 6111-3
1000S	200 feet	IP 6111-4

Mess Creek Grid

28000N	200 feet	IP 6111-5
26500N	200 feet	IP 6111-6
25500N	200 feet	IP 6111-7

Also enclosed with this report is Dwg. I.P.P. 3606, a plan map of the Mess Creek Grid at a scale of 1" = 400', and Dwg. I.P.P. 4922, a plan map of the Skeeter Lake 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 these plan maps 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 alteration activity.

The area has been the subject of extensive exploration since its discovery by prospectors in 1956, including IP surveys and over 100,000 feet of diamond drilling. The present survey was carried out to extend geophysical coverage to the east of known mineralization and to continue systematic coverage of areas thought to be geologically similar to the Liard copper deposit. Two areas, six miles apart, were surveyed.

The work was completed in September 1973, using a McPhar P660 high power variable frequency IP unit operating at 0.3 Hz and 5.0 Hz over the following claims:

BB	17, 18, 39, 44, 48, 51, 52, 58, 65, 66, 69, 70, 77, 78, 79 Fr.
MU	3, 5
SNO	1
EIRD	2
NOV	1, 2, 3, 4, 6, 17, 18, 19, 20
EMU	3 Fr.
DAVE	2 Fr.
PIT	51, 52, 53, 54

These claims are held under option from Liard Copper Mines Limited by Hecla Mining Company of Canada, 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.

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 two grids which were surveyed on the Schaft Creek property lie six miles apart, so each grid will be described separately.

Skeeter Lake Grid

The four IP lines on this grid are widely separated, so that no anomalous trend can be successfully indicated. In general, the underlying rocks are highly resistive, varying from 200 to over 6000 $\rho_a/2\pi$ ohm feet. The IP data suggest a complex geology, with the possibility that alteration and mineral emplacement has been followed by silicification. Metal factor values over this type of deposit are not as diagnostic as they generally are, so for this reason, both metal factor anomalies and frequency effect anomalies have been shown on the plan map and data strips and both will be discussed.

Line 13000N

A metal factor anomaly extends from 0 to 14E, varying from possible to probable. The frequency effect anomaly is possible and extends from 0 to 8E. From 8E to 14E, the decrease in frequency effects is accompanied by a decrease in resistivities, suggesting a weaker source for the anomaly. A definite change in rock type is indicated at 16E.

Line 8000N

This line represents the most complex geology of the grid. A weak anomaly (M.F.) from 0 to 2E corresponds to a much broader, stronger frequency effect anomaly which is possible from 6W to 2W, probable from 2W to 0, definite from 0 to 4E and possible from 4E to 6E. The strong frequency effects which are fairly constant from 0 to 4E correspond with resistivities which change from 400 $\rho a/2\pi$ ohm feet to 1433 $\rho a/2\pi$ ohm feet - this effect strongly suggests post-mineralization silicification at this point.

Possible anomalies of both types occur from 8E to 10E. A possible M.F. anomaly from 12E to 16E appears as a definite F.E. anomaly from 14E to 18E, flanked by possible anomalies to 12E and 20E. Again there is a large variation in resistivities corresponding to the F.E. anomaly.

A probable, shallow M.F. anomaly from 24E to 26E reflects lowered resistivity rather than mineralization, since there is a corresponding decrease in frequency effects. This is also true of the possible, shallow M.F. anomaly from 28E to 30E.

Line 5000N

A possible M.F. anomaly from 4W to 2E indicates a source with the top near 100' in depth. From 3E to 5E a probable M.F. anomaly reflects a source at some depth. A possible M.F. anomaly from 6E to 8E may be continuous at depth with the probable to possible anomaly from 10E to

14E.

The F.E. anomaly is continuous from 16W to 16E . From 16W to 2W, the top of the source is near 100' in depth, then the source is less than 100' deep from 2W to 16E. This anomaly and the M.F. anomaly correlate well from 10E to 12E, where the source appears to be relatively narrow. A possible anomaly with the top of the source near 200' in depth extends from 22E to 26E, incomplete.

Line 10000S

A probable M.F. anomaly from 18W to 14W has no corresponding F.E. anomaly and may reflect altered, barren or very weakly mineralized rock.

A possible M.F. anomaly has the source on n = 4 - a corresponding possible F.E. anomaly reflects a narrow, shallow source. A probable to possible, shallow M.F. anomaly is not confirmed by the frequency effects.

A frequency effect anomaly from 16E to 30E varies from possible to probable. The top of the source varies from less than 100' to 200' in depth, with the magnitude of the effects increasing with depth.

Mess Creek Grid

Three long lines were surveyed on this grid, Line 28000N, Line 26500N and Line 25500N. This is also a high-resistivity environment. The IP results located only one anomaly on the three lines. On Line 25500N, a probable to possible frequency effect and a possible metal factor anomaly extend from 130E to 122E, incomplete at the end of the line.

4. CONCLUSIONS AND RECOMMENDATIONS

The IP results on the Skeeter Lake grid indicate that the geology of the underlying rocks is complex and the IP interpretation must take this into account. It is known that the mineralization in the area is associated with faulting, fracturing and intense alteration. The overall pattern of the results suggest that mineral emplacement has been followed by silicification of the host rocks in some part, but not completely. Since the high resistivities of silicious rocks results in decreasing metal factors, both metal factor anomalies and frequency effect anomalies have been mapped and discussed. As the lines are too widely separated on the grid to be able to discern any anomalous trend, each line was discussed separately. The central portion of the grid appears to be the most promising sector for further investigation, i.e. from Line 8000N to Line 5000N and to the north and south of these lines.

Should drill hole locations be required at this time, the following locations are suggested:

Line 8000N	-	vertical holes drilled to a depth of 150' beneath the following stations: 4W; 1E; 16E.

Drilling results should then be evaluated and correlated with the IP data before further recommendations are made.

The Mess Creek grid contained only one anomaly on the west end of Line 25500N.

McPHAR GEOPHYSICS COMPANY

Philip G. Hallof,
Geophysicist

Marion A. Goudie,
Geologist.

Dated: November 23, 1973

ASSESSMENT DETAILS

PROPERTY: Schaft Creek Property		MINING DIVISION: Liard
SPONSOR: Hecla Mining Co. of Canada Limited		PROVINCE: British Columbia
LOCATION: Telegraph Creek, B.C.		
TYPE OF SURVEY: Induced Polarization		
OPERATING MAN DAYS:	32	DATE STARTED: September 16, 1973
EQUIVALENT 8 HR. MAN DAYS:	48	DATE FINISHED: October 1, 1973
CONSULTING MAN DAYS:	3	NUMBER OF STATIONS: 229
DRAUGHTING MAN DAYS:	7	NUMBER OF READINGS: 2376
TOTAL MAN DAYS:	58	MILES OF LINE SURVEYED: 8.41

CONSULTANTS:

Philip G. Hallof, 15 Barnwood Court, Don Mills, Ontario.
Marion A. Goudie, 739 Military Trail, West Hill, Ontario.

FIELD TECHNICIANS:

A. Wilcox, R.R.#3, 12761 Sodom Road, Niagara Falls, Ontario.
K. Hoeberg, 602 Windsor Street, Kamloops, B.C.
Plus 2 Helpers: supplied by client

DRAUGHTSMEN:

B. Boden, 103 Petworth Crescent, Agincourt, Ontario.
V. Young, 64 Highcourt Crescent, Scarborough, Ontario.

McPHAR GEOPHYSICS COMPANY

Philip G. Hallof,
Geophysicist

Dated: November 23, 1973

INTERIM* STATEMENT OF COST

Hecla Mining Co. of Canada Limited - Schaft Creek Property - IP Survey
Liard Mining Division, B.C.

Crew: A. Wilcox & K. Hoeberg

8 days Operating:		
7½ days @ \$265.00/day		\$1,987.50
½ day @ \$250.00/day		125.00
2½ days Travel)		
½ day Preparation)	7 days @ \$100.00/day	700.00
4 days Standby)		

Expenses

Transportation -		
fares, bus, taxi	106.49	
Meals and Accommodation	110.97	
Freight	52.81	
	270.27	
+ 10%	27.03	
		297.30
		\$3,109.80

McPHAR GEOPHYSICS COMPANY

Philip G. Hallof,
Geophysicist.

*Note: This statement reflects at least 90% of the total cost; there may be a few minor charges not yet received by us and hence not included in the foregoing.

Dated: November 23, 1973

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 Barnwood 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 Hecla Mining Co. Of Canada 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 23rd day of November 1973

Philip G. Hallof, Ph.D.

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 23 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 Hecla Mining Co. of Canada 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 23rd day of November 1973

Marion A. Goudie

Marion A. Goudie, B.Sc.

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

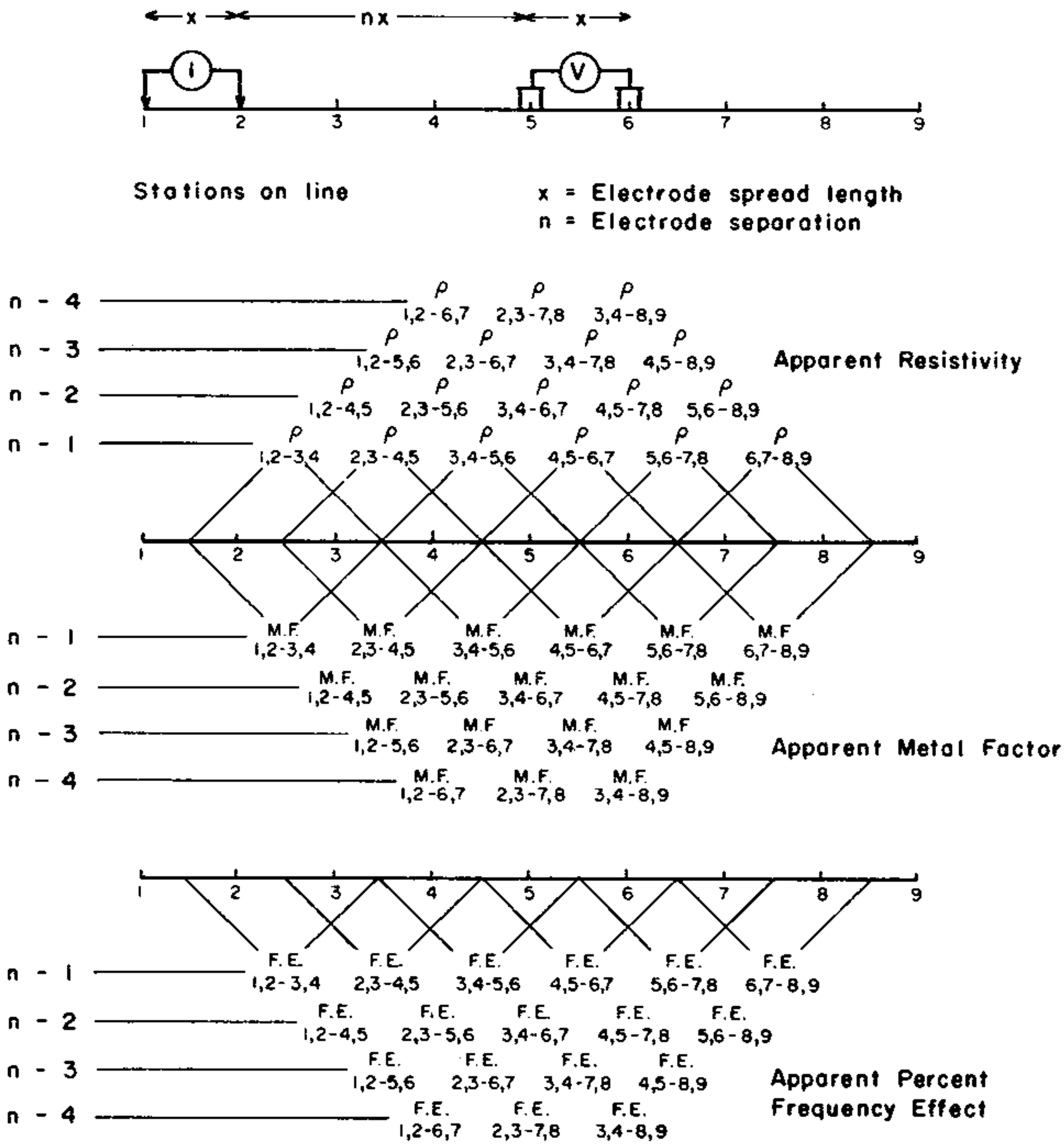
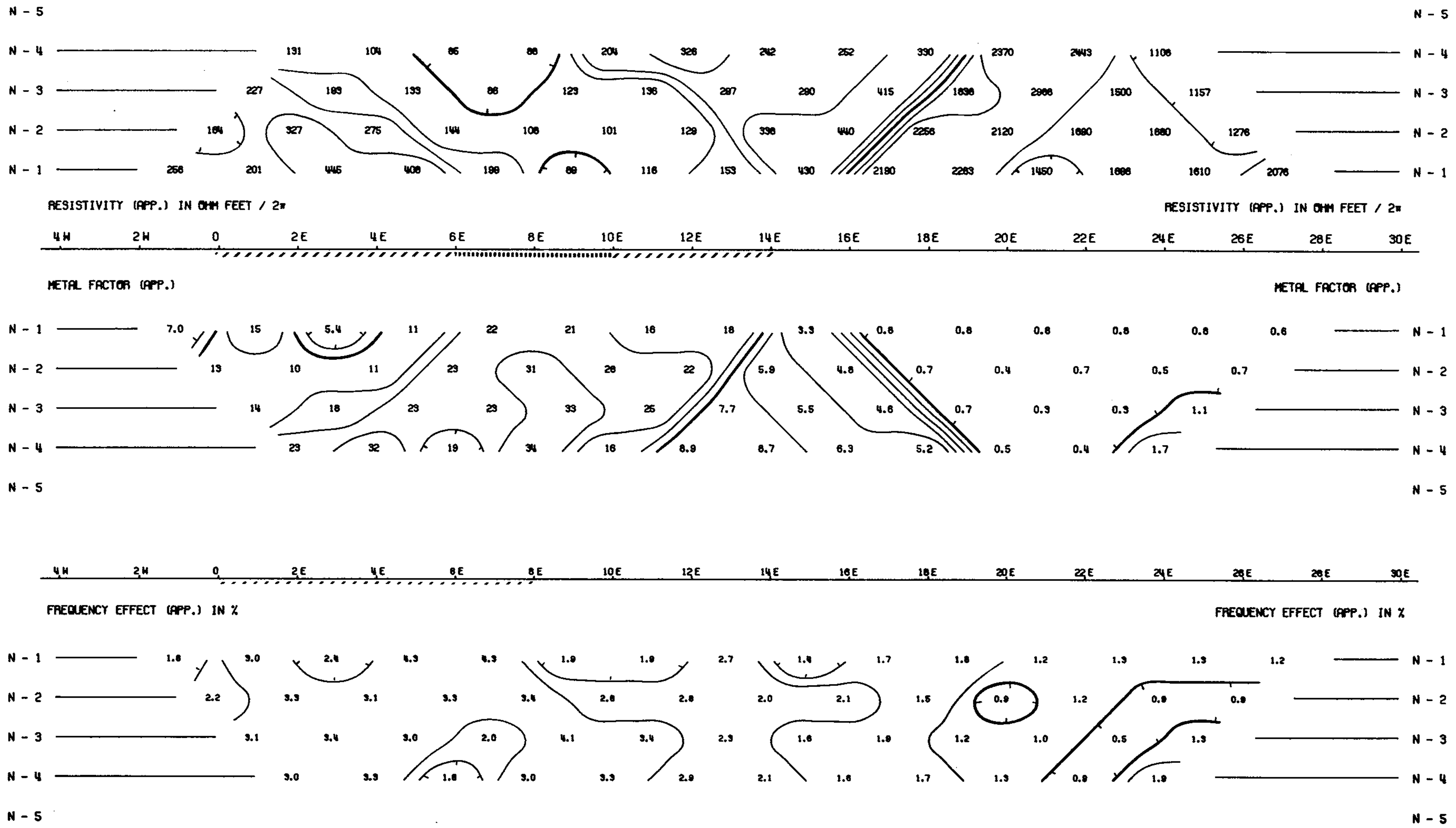


Fig. A



DWG. NO.- I.P.-6111-1

HECLA MINING COMPANY OF CANADA LTD.

SCHAFT CREEK PROPERTY, LIARD M.D., BRITISH COLUMBIA

LINE NO.- 13000N

ELECTRODE CONFIGURATION

PLOTTING POINT X = 200FT

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: SEP 1973

APPROVED:

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

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA PHILIP G. HALLOF

DATE:

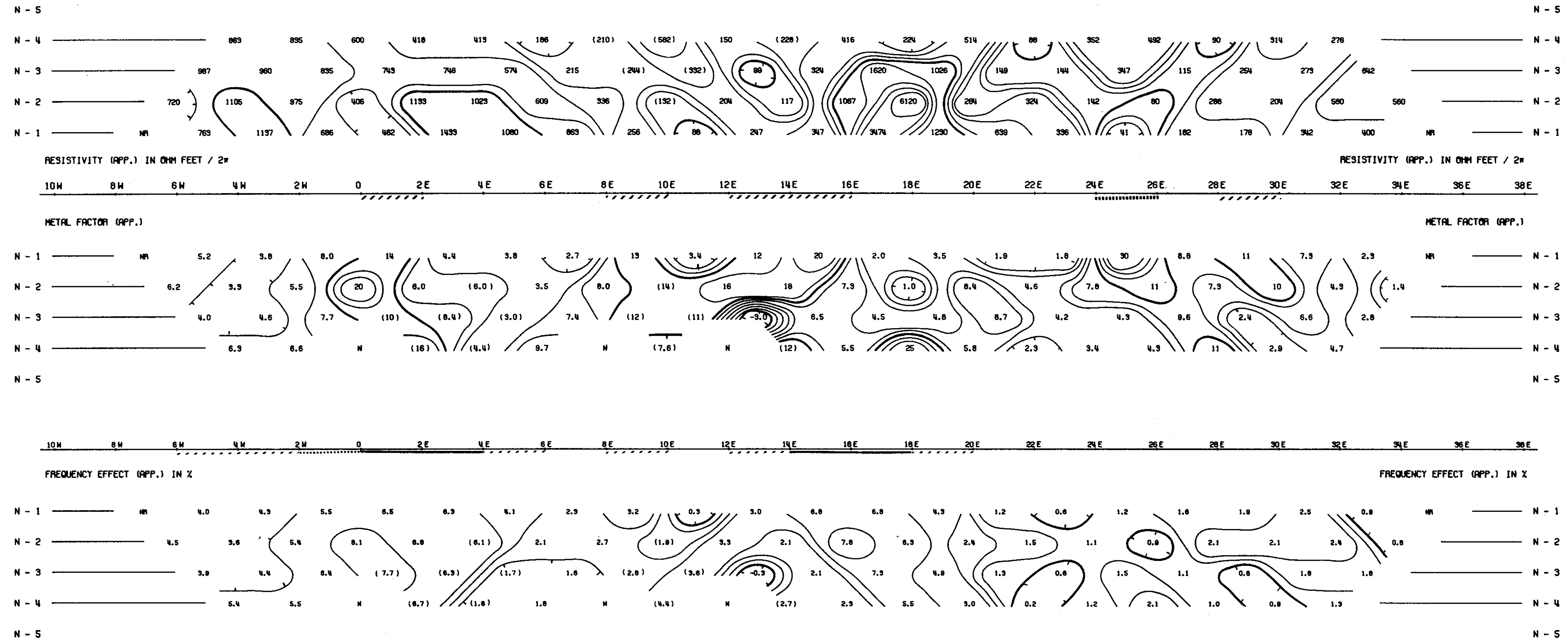
Expiry Date: February 25, 1974

4842

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION

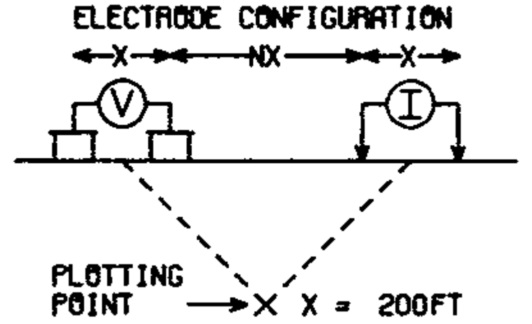


DWG. NO.- I.P.-6111-2

HECLA MINING COMPANY OF CANADA LTD.

SCHAFT CREEK PROPERTY, LIARD M.D.,
BRITISH COLUMBIA

LINE NO.- 8000N



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: SEP 1973

APPROVED

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

DATE

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA PHILIP G. HALLOF
11/23/73

Expiry Date: February 25, 1974

4842

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION

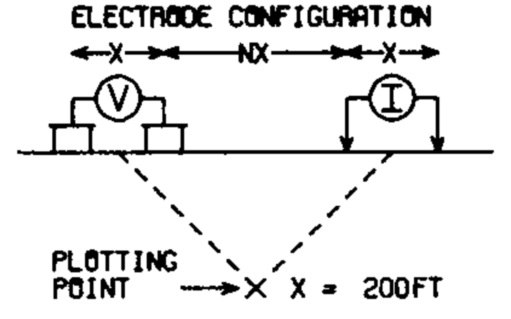
DWG. NO.- I.P.-6111-3

HECLA MINING COMPANY OF CANADA LTD.

SCHAFT CREEK PROPERTY, LIARD M.D., BRITISH COLUMBIA

LINE NO.- 5000N

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

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

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: SEP 1973

APPROVED:

DATE: 11/23/73

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — PHILIP G. HALLOF

Expiry Date: February 25, 1974

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

4842

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY McPHAR COMPUTER DIVISION

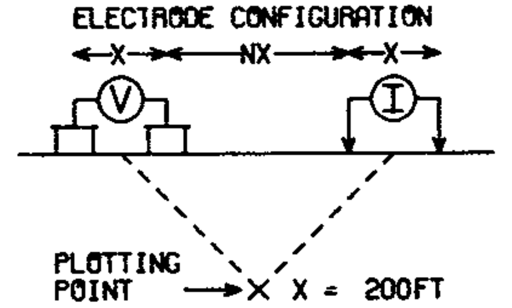
DWG. NO.- I.P.-6111-4

HECLA MINING COMPANY OF CANADA LTD.

SCHAFT CREEK PROPERTY, LIARD M.D., BRITISH COLUMBIA

LINE NO.- 1000 S

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: SEP 1973

APPROVED:

DATE:

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — PHILIP G. HALLOF

Expiry Date: February 25, 1974

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

4842

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY McPHAR COMPUTER DIVISION

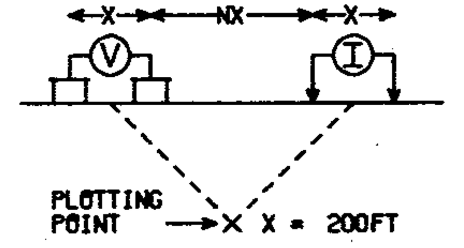
DWG. NO.- I.P.-6111-5

HECLA MINING COMPANY OF CANADA LTD.

SCHAFT CREEK PROPERTY, LIARD M.D., BRITISH COLUMBIA

LINE NO.- 28000N

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: SEP 1973

APPROVED:

PROFESSIONAL ENGINEER, PROVINCE OF BRITISH COLUMBIA, PHILIP G. HALLOF

DATE:

Expiry Date: February 25, 1974

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

4842

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION

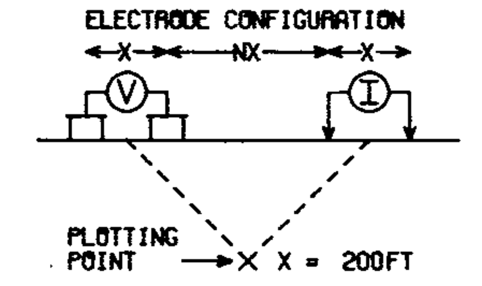
DWG. NO.- I.P.-6111-6

HECLA MINING COMPANY OF CANADA LTD.

SCHAFT CREEK PROPERTY, LIARD M.D., BRITISH COLUMBIA

LINE NO.- 26500N

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: SEP 1973

APPROVED:

DATE:

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA PHILIP G. HALLOF

Expiry Date: February 25, 1974

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

4842

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION

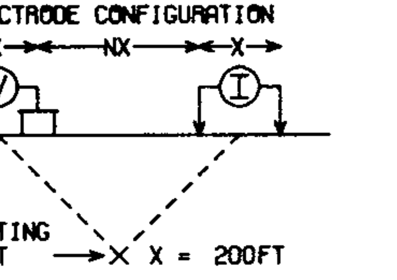
DWG. NO.- I.P.-6111-7

HECLA MINING COMPANY OF CANADA LTD.

SCHAFT CREEK PROPERTY, LIARD M.D.,
BRITISH COLUMBIA

LINE NO.- 25500N

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: SEP 1973

APPROVED:

DATE:

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA PHILIP G. HALLOF

Expiry Date: February 25, 1974

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

4842

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION

DWG. IPP 4922

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

PLAN MAP

SURFACE PROJECTION OF ANOMALOUS ZONES

	M.F. Anomalie		F.E. Anomalie
DEFINITE	▬▬▬	DEFINITE	────
PROBABLE	┉┉┉┉	PROBABLE	·········
POSSIBLE	\\\\\\\\	POSSIBLE	- - - - -

Number at the end of anomaly indicates electrode interval

HECLA MINING COMPANY OF CANADA LTD.

SCHAFT CREEK PROPERTY, SKEETER CREEK GRID

LIARD M.D., BRITISH COLUMBIA

SCALE

ONE INCH EQUALS FOUR HUNDRED FEET

4842 M2

Department of Mines …

NO. 4842 MAP #2

PROFESSIONAL ENGINEER · PROVINCE OF BRITISH COLUMBIA

DATE: NOVEMBER 1973

11/23/73

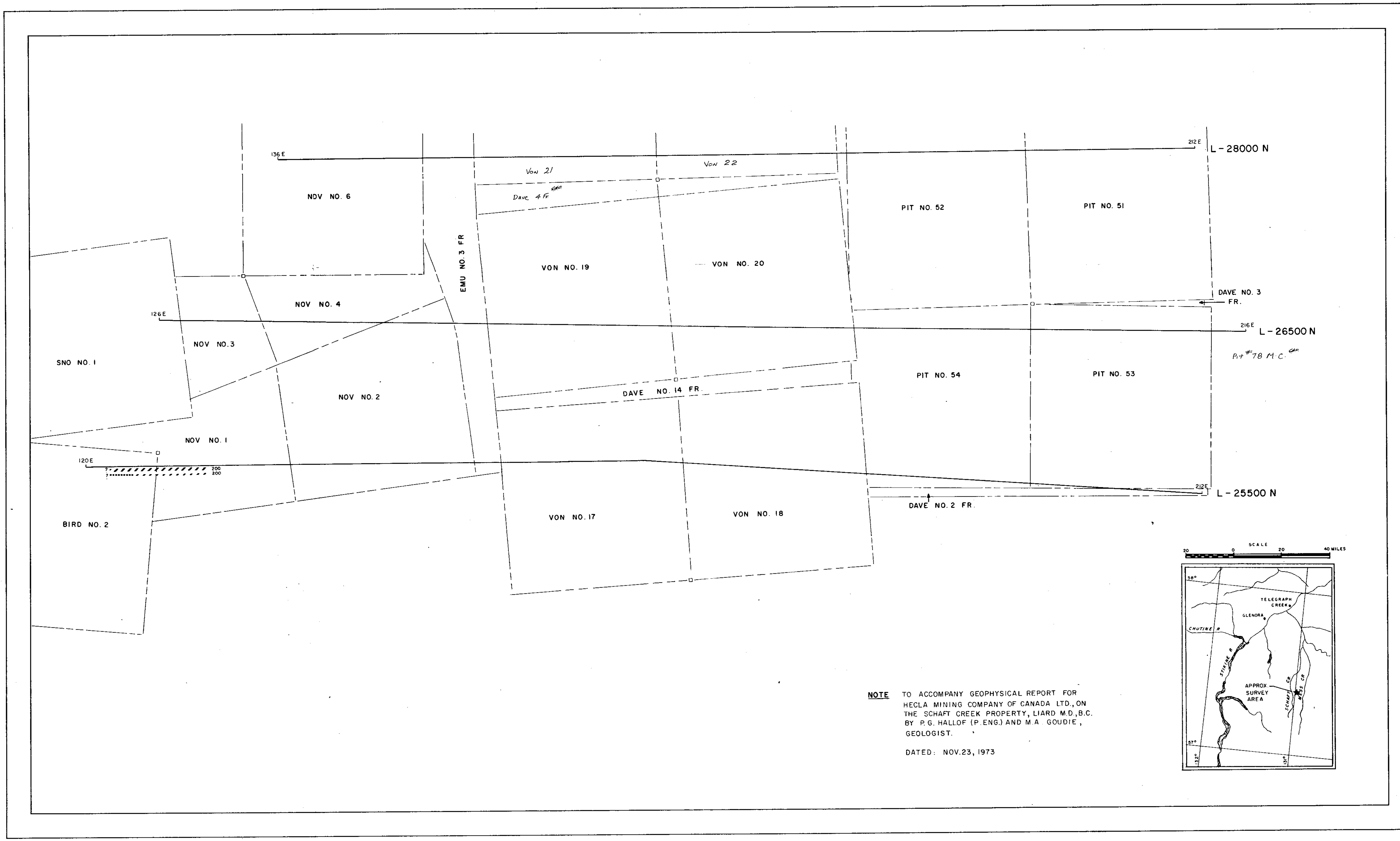
Expiry Date: February 25, 1974

DWG. IPP 4922

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

PLAN MAP



SURFACE PROJECTION OF ANOMALOUS ZONES

	M.F. Anomalie		F.E. Anomalie
DEFINITE	▬▬▬	DEFINITE	▬▬▬
PROBABLE	▮▮▮▮▮▮	PROBABLE	....
POSSIBLE	\\\\\\\\	POSSIBLE	- - - - -

Number at the end of anomaly indicates spread used

HECLA MINING COMPANY OF CANADA LTD.

SCHAFT CREEK PROPERTY, MESS CREEK GRID

LIARD M.D., BRITISH COLUMBIA

SCALE

ONE INCH EQUALS FOUR HUNDRED FEET

Department of Mines and Petroleum Resources Assessment Report NO. 4842 MAP #1

4842 M1

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA PHILIP G. HALLOF APPROVED ... ER 1973

11/23/73

Expiry Date: February 25, 1974