COMINCO LTD.

EXPLORATION

WESTERN DISTRICT

NTS 106 C/10
64° 33' North
133° 00' West

INDUCED POLARIZATION AND

RESISTIVITY SURVEY

5362.50

BOB GROUP CLAIMS

BONNET PLUME RIVER

YUKON TERRITORIES

This report has been examined by the Geological Evaluation Unit and is recommended to the Commissioner to be considered as representation work in the amount of
$ 5362.50

Resident Geologist or
~~Resident Mining Engineer~~

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

D.R. BAXTER
Supervising Mining Recorder

Commissioner of Yukon Territory

Work performed during July 26-31, 1975

AUGUST 22, 1975

JAN KLEIN, P.ENG.

090026

TABLE OF CONTENTS

SUMMARY

An Induced Polarization (IP) and resistivity survey was executed along five lines over the BOB claims.

The results suggest different rock types to be present on the property.

Small chargeability highs might be of economic significance.

It is recommended that the data be correlated in detail with the geology of the grid area and that a geochemical survey be executed prior to any further work.

INTRODUCTION

A geophysical survey consisting of Induced Polarization (IP) and resistivity measurements was executed over the Bob Claim group, Bonnet Plume River area, Yukon Territories. The survey was performed by Eagle Geophysics Ltd. on behalf of Cominco Ltd. during the period of July 26-31, 1975 inclusive.

Physiographically, the Bob group lies within the northern Selwyn Mountains of the Yukon Territory approximately 115 air miles NE of Mayo in the Bonnet Plume River area.

The claims lie within the Mayo Mining District, with coordinates of 64° 33' north latitude and 133° 00' west longitude and are located on the N.T.S. claim sheet of 106 C/10.

The region is topographically one of high relief, the higher peaks reaching over 8,500' a.s.l. The Bob group is situated between 4,500' and 7,500' a.s.l.

Access to the property is by float-equipped fixed-winged aircraft from Mayo, 110 air miles NE to Pinguicula Lake then 15 miles SE via helicopter to the property (see Plate 91-75-L1).

The Bob group consists of 20 claims. The present survey consists of five, 2,000m long N-S directed lines. These lines are 100m apart and located in the center of the claim block covering claims Bob 1-8, 19 and 20 (see Plate 91-75-1).

The purpose of the survey was to detect lead and zinc mineralization in the rocks covering the survey area.

GEOLOGY

The Bob group occupies a small area underlain predominantly by Lower Paleozoic (Cambrian) rocks which were deposited in a supertidal to shallow marine environment in the northwestern margin of the Selwyn Basin. The Selwyn Basin, covering much of eastern-central Yukon and western Northwest Territories, is predominantly a clastic basin 200mi long and 70mi wide flanked on the east by the MacKenzie Arch and on the west by the Bonnet Plume High. It is believed that this basin was well established by Lower Paleozoic time.

In the Bonnet Plume River area, sandy dolomites, sandstones, quartzites and shales are present. For a detailed description of the geology is referred to a report by K.R.Pride entitled "1975 Assessment Report, Bob Group Claims, Bonnet Plume Area" dated August 6, 1975.

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INDUCED POLARIZATION AND RESISTIVITY SURVEY

I. Method

The survey was performed by John Lloyd, P.Eng., President of Eagle Geophysics of North Vancouver, assisted by one geophysicist and four helpers between July 26 and 31, 1975. The survey was performed using a Huntec 7.5KW Time Domain transmitter and two Huntec Mark-3 Time Domain receivers.

In all, 10km of line were surveyed, on five parallel lines spaced 100m apart. A pole-dipole array with a basic spacing, a=50m and separations n=1-4 was used. The potential dipole was to the north of the near current electrode.

Figure 1 shows the instrument parameters of the equipment used. The duty ratio between current on and off times is two, with the current on time being two seconds. The chargeabilities shown on the drawings (see below) were computed as follows: $M_a = (M_1 + 2M_2 + 4M_3 + 8M_4) \times t_p$.

II. Data Presentation

The following data is included with this report:

Plate 91-75-L1	Location plan on a scale of 1:250,000
Plate 91-75-1	Claim map on grid plan on a scale of 1:12,000

The drawings on a scale of 1:2,000 show the results in standard pseudo-section format. From top to bottom are shown the calculated apparent resistivity ρ_a in ohm-meters, the chargeability, M_a, in milliseconds and the apparent metal factor. The resistivity is calculated employing the formula $\rho_a = \frac{V_p}{I} \times K$ in which V_p and I are the primary voltage and current, and K is a geometrical factor dependent on the electrode configuration. The metal factor is defined as follows $\frac{M_a}{\rho_a} \times 1{,}000$. The plotting point is midway between the nearest current and potential electrodes (see figure on the drawings).

Dwg. No. IP-91-1	Line 200W
-2	100W
-3	00
-4	100E
-5	200E

.../3

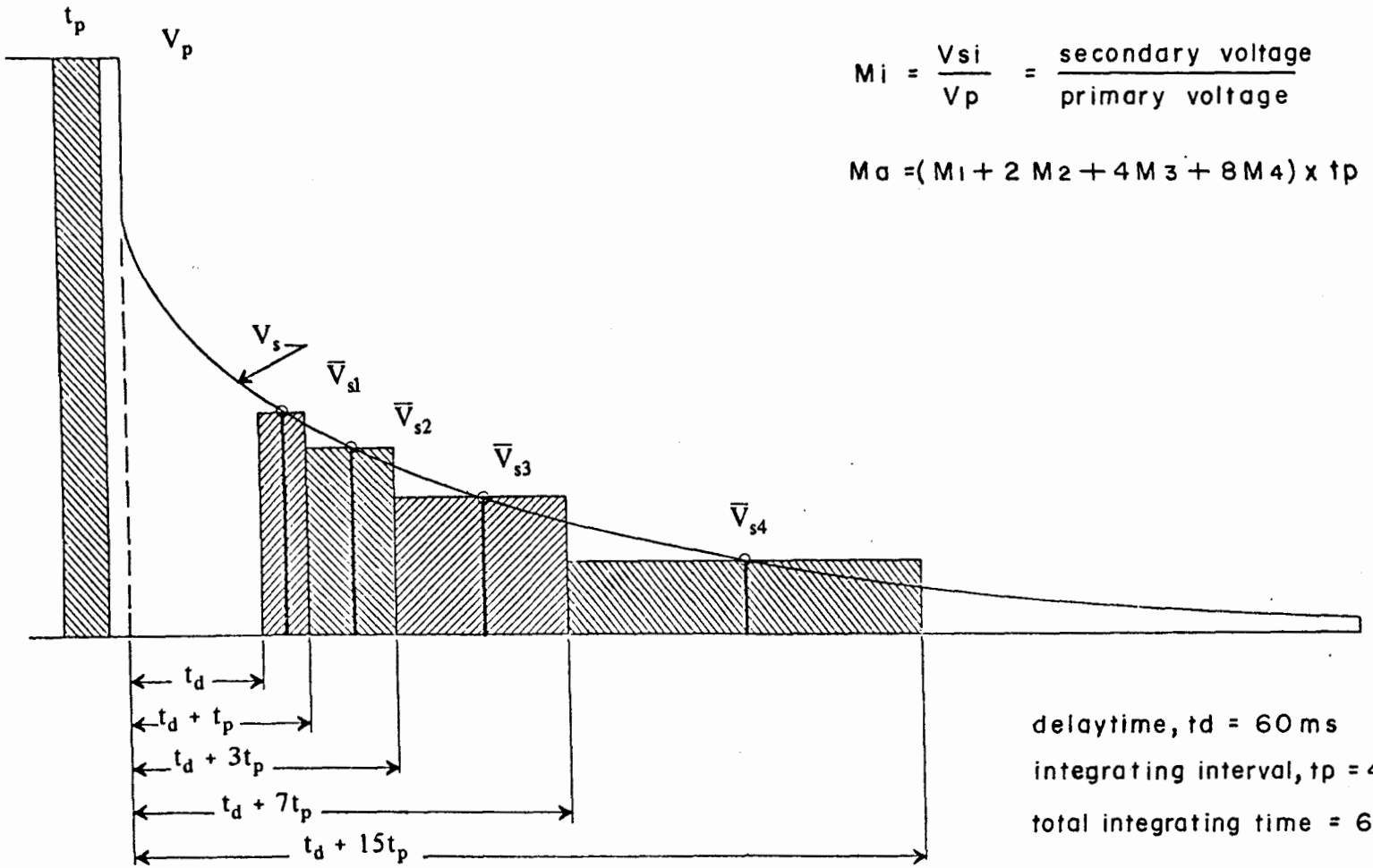

FIGURE : 1 Time domain decay curve showing sampling with the Huntec MK III receiver

A logarithmic contour interval is used on the drawings. The following contours are used: 1.0; 1.5; 2.0; 3.0; 5.0; 7.5; etc.

III. Results

The apparent resistivities show a wide range of values between 500 and 67,500 Ωm (ohm-meters).

The area north of Line 200W Station 450N and Line 100E Station 750N shows, in general, values less than 1,500 Ωm. Further south along the lines are areas with higher resistivities encountered. On most lines do they rise well above the 10,000 Ω m level between Stations 00 and 450S. Only on Line 200W appears this zone to be shifted further to the south. Near the end of the lines especially on Lines 00 and 100W do the resistivities drop again below 1,000 Ω m.

The chargeabilities ranging from 6.8 to 39.1 msecs, with most of the values falling between 12 and 18 msecs. A slight increase with depth is shown which suggestsan increase of polarizable material with depth. A somewhat similar picture is shown in the resistivity data. This pattern might suggest an overburden cover and/or some weathering of the top section of the rocks.

The extreme northern ends of the traverses show values below 10 msecs immediately followed by a small zone of higher than 20 msecs chargeabilities on Lines 200W-100E near Station 800N. A gradual increase in chargeabilities is again seen at the south-end of most of the lines.

The change in chargeabilities can be related to a change in rock types or to a change in polarizable materials within a rock type. The latter is normally of more economic significance than the former. In correlating the IP and resistivity results, one recognizes some coincidence on a broad scale. This suggests a change in rock types including overburden rather than in mineralization. Changes over shorter distances, these are more localized chargeability highs,might be more important for sulphide mineralization. The sharp high of 39.1 msec near Line 00 Station 300 to 400S correlates well with a known mineralized showing. Similar situations of a shallow origin might occur at other localities on the grid.

CONCLUSIONS

An IP and resistivity survey was executed along five traverses on the Bob claim group.

The results suggest a wide range in resistivities and chargeabilities for the rock types that are present in the grid area.

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Two types of sources can be recognized in the results.

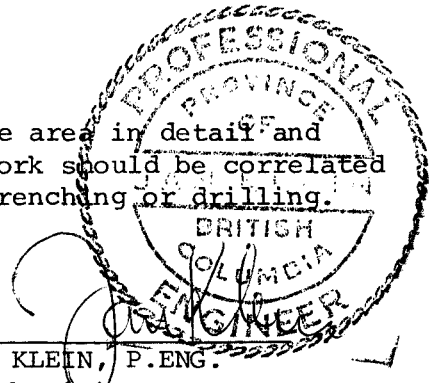
First of all, there are large areas reflected by chargeability values within in narrow range, e.g., Line 200W shows from Station 550S to 400N values ranging from 12-18 msec. This type of ranges can be considered the background of a rock type.

Secondly, there are variations in amplitudes over shorter distances. This type of high values might reflect anomalous concentrations of polarizable material. An example is present at Line 00 Station 300-400S where indeed a mineralized showing is located.

It is however not possible to determine from the geophysical results if the sources are of an economic value. Many other sources than economic sulphides are known to be causing chargeability highs, e.g., graphite, some clays, sericite, chlorites, etc. Only geochemical sampling, geological mapping and drilling might give an answer to the question of economic significance of an IP anomaly.

RECOMMENDATIONS

It is therefore recommended to map the geology of the area in detail and execute a geochemical survey. The results of this work should be correlated with the geophysical data prior to recommending on trenching or drilling.



Submitted by

JAN KLEIN, P.ENG.
Geophysicist

Endorsed for release by D. J. Kleine for W.T. Irvine

W.T.IRVINE, P.ENG.
Manager
Western District

/ct
August 22, 1975

Distribution

Mining Recorder (2)
Western District (1)
Geophysics File (1)

IN THE MATTER OF AN ACT RESPECTING
QUARTZ MINING IN THE YUKON TERRITORY

IN THE MATTER OF A GEOPHYSICAL SURVEY
CARRIED OUT ON MINERAL CLAIMS BOB#1-20
LOCATED IN THE MAYO MINING DISTRICT OF THE
YUKON TERRITORIES; MORE PARTICULARLY, N.T.S. 106 C/10

AFFIDAVIT

I, J. KLEIN OF THE CITY OF THE CORPORATION OF BURNABY IN THE PROVINCE OF BRITISH COLUMBIA, GEOPHYSICIST, MAKE OATH AND SAY:

1. THAT I AM EMPLOYED AS A GEOPHYSICIST BY COMINCO LTD., AND, AS SUCH, HAVE A PERSONAL KNOWLEDGE OF THE FACTS TO WHICH I HEREINAFTER DEPOSE;

2. THAT ANNEXED HERETO AND MARKED AS "EXHIBIT A" TO THIS MY AFFIDAVIT IS A TRUE COPY OF EXPENDITURES ON A GEOPHYSICAL SURVEY CARRIED OUT ON THE MINERAL CLAIMS BOB #1-20;

3. THAT THE SAID EXPENDITURES WERE INCURRED BETWEEN THE 26TH DAY OF JULY, 1975 AND THE 31ST DAY OF JULY, 1975, FOR THE PURPOSE OF MINERAL EXPLORATION ON THE ABOVE-NOTED CLAIM GROUP.

SWORN BEFORE ME AT THE CITY)
OF VANCOUVER IN THE PROVINCE)
OF BRITISH COLUMBIA THIS)
26th DAY OF AUGUST, 1975)

Geoffrey H. Nott)
A NOTARY PUBLIC IN AND FOR THE)
PROVINCE OF BRITISH COLUMBIA)

J. Klein
J. KLEIN

GEOFFREY H. NOTT NOTARY PUBLIC PROVINCE OF BRITISH COLUMBIA

EXHIBIT "A" STATEMENT OF EXPENDITURES

GEOPHYSICAL REPORT ON THE BOB GROUP CLAIMS

SITUATED AT

69° 33' NORTH LATITUDE

133° 00' WEST LONGITUDE

GEOPHYSICAL SURVEY BY EAGLE GEOPHYSICS LTD.	$3,965.00
DEMOBILIZATION OF GEOPHYSICAL CREW AND EQUIPMENT	1,397.50
	$5,362.50

SIGNED _____

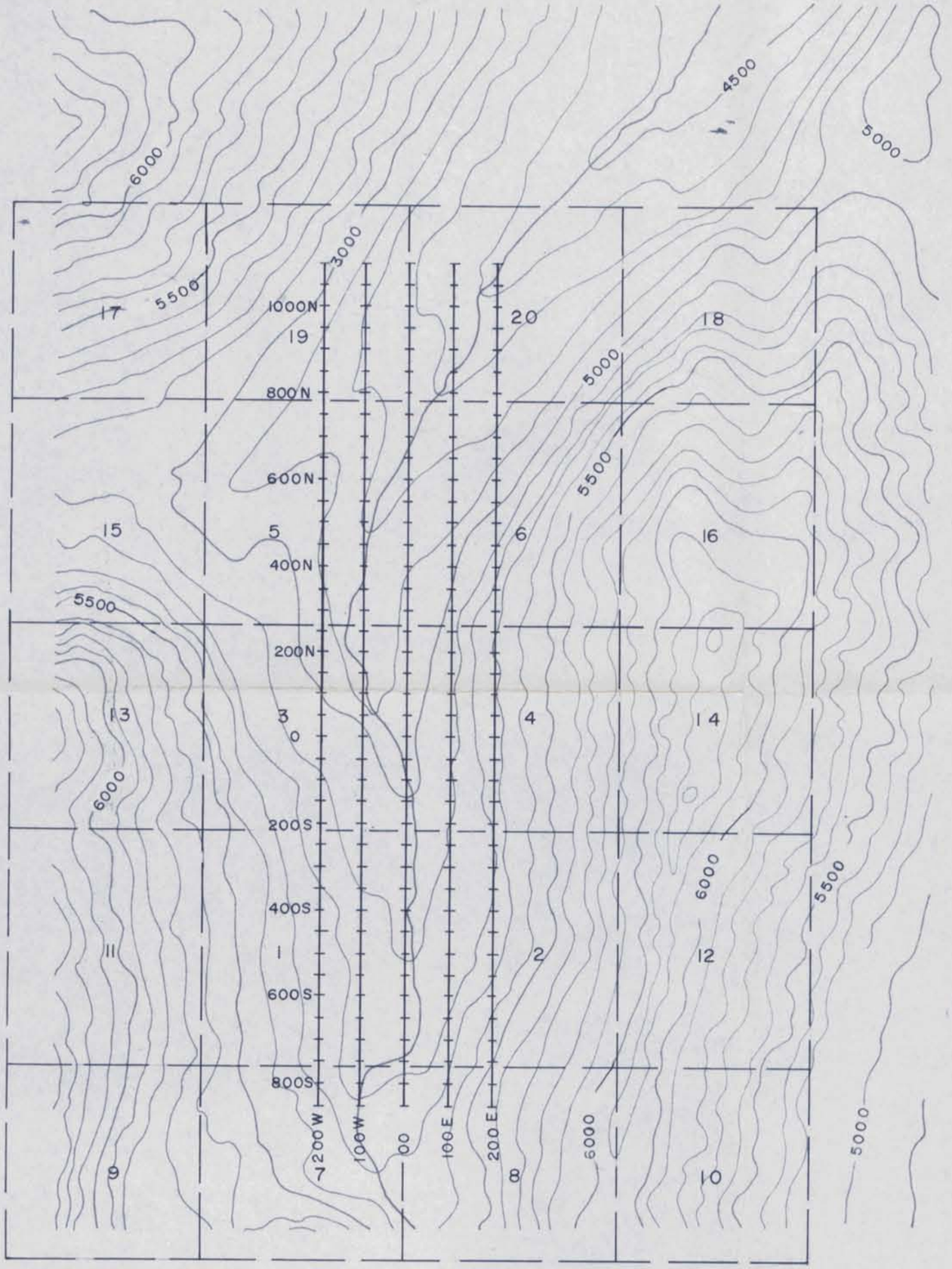
J. KLEIN, P. ENG.
GEOPHYSICIST

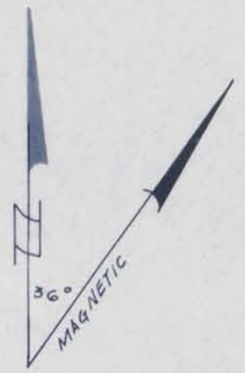
THIS IS EXHIBIT "A" TO THE STATUTORY DECLARATION OF EXPENDITURES RELATING TO THE GEOPHYSICAL SURVEY DECLARED BEFORE ME ON THE 26th DAY OF AUGUST, 1975.

_____

A NOTARY PUBLIC IN AND FOR THE
PROVINCE OF BRITISH COLUMBIA

GEOFFREY H. MOTT NOTARY PUBLIC





1975 GEOPHYSICS GRID
CLAIM BOUNDARY
TOPOGRAPHIC CONTOUR

METRES
0 200 400 600 800 1000

TO ACCOMPANY A REPORT BY J. KLEIN P.Eng.

BOB GROUP

Cominco

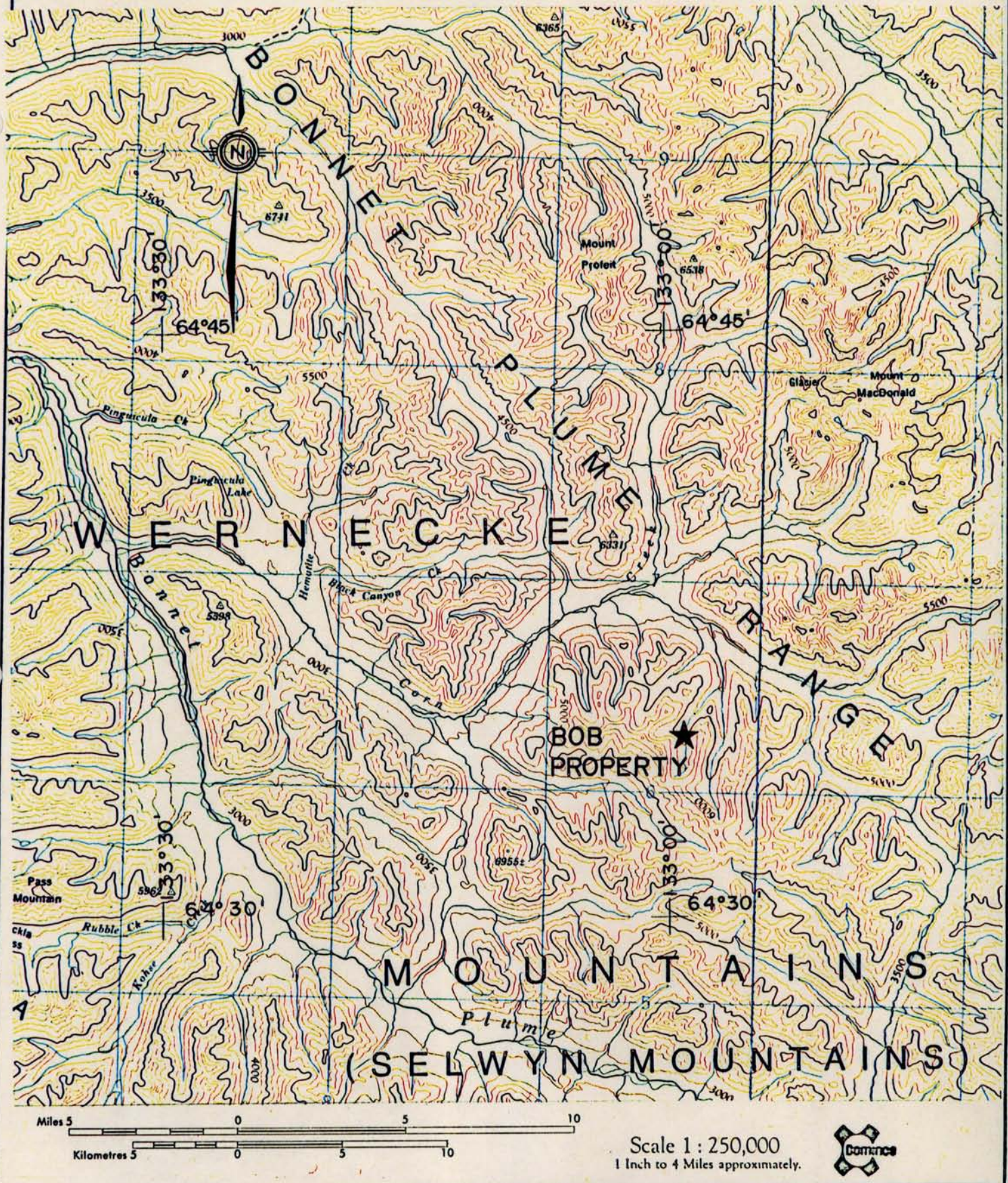
106 C/10

Drawn by:		Traced by:	
Revised by	Date	Revised by	Date

1975 GEOPHYSICS SURVEY
CLAIM MAP
BONNET PLUME AREA, MAYO M.D., YUKON

Scale: 1 : 12000 | Date: AUG., 1975 | Plate: 91-75-1

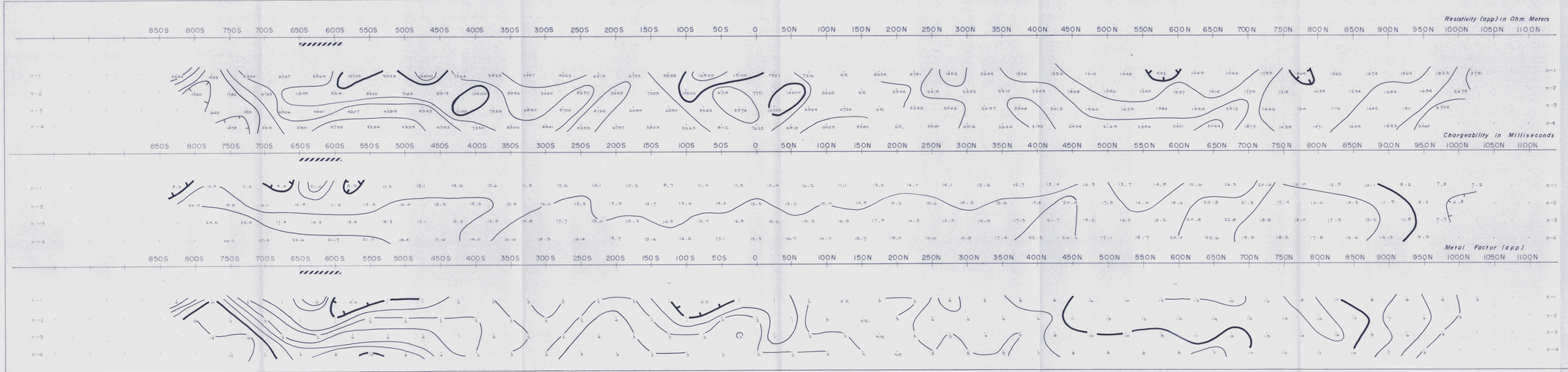
VANCAL A



NADALEEN RIVER
106C
YUKON TERRITORY
NORTHWEST TERRITORIES

BOB PROPERTY LOCATION MAP

Scale: AS SHOWN	Date: AUG., 1975	Plate: 91-75-L1



N.T.S. 106 C-10

DWG. NO. I.P-91-1

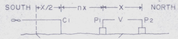
COMINCO LTD.

BOB PROPERTY

BONNET PLUME AREA, MAYO M.D., YUKON

LINE NO. 200W

POLE-DIPOLE ELECTRODE CONFIGURATION



PLOTTING POINT
n=1, 2, 3 & 4

SURFACE PROJECTION OF ANOMALOUS ZONES
DEFINITE
PROBABLE
POSSIBLE

SCALE 1:2,000

DATE SURVEYED JULY 1975 TO AUG. 1975

CONTOURS AT LOGARITHMIC INTERVALS
1, 10,
1.5, 2, 3, 5, 7.5

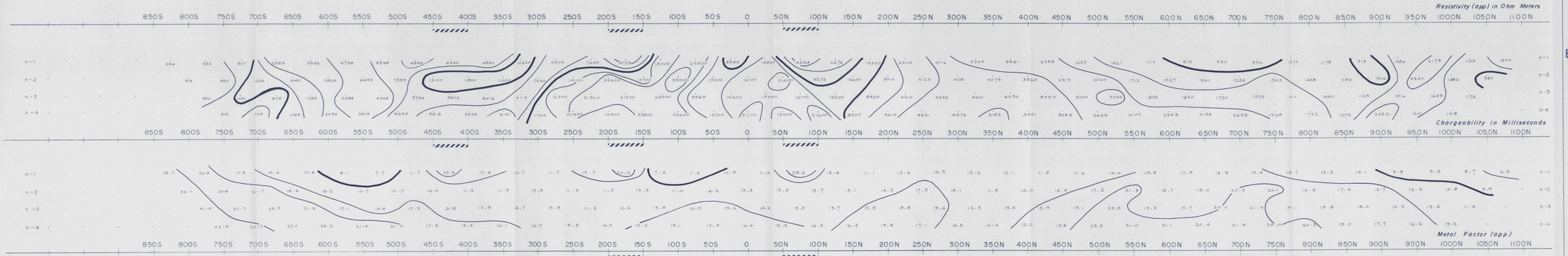
APPROVED

DATE AUGUST 25th 1975

TRANSMITTER: 7.5 KW TIME DOMAIN
RECEIVER: HUNTEC MK III TYPE

INDUCED POLARIZATION AND RESISTIVITY SURVEY
SURVEYED BY EAGLE GEOPHYSICS LTD. (JOHN LLOYD M.Sc. P.Eng.)

LINE 200W



N.T.S. 106 C-10

DWG. NO. I.P.-91-2

COMINCO LTD.

BOB PROPERTY

BONNET PLUME AREA, MAYO M.D., YUKON

LINE NO. 100 W

POLE-DIPOLE
ELECTRODE CONFIGURATION

SURFACE PROJECTION OF ANOMALOUS ZONES
DEFINITE
PROBABLE
POSSIBLE

SCALE 1" = 2,000

CONTOURS AT LOGARITHMIC INTERVALS
1, 10,
1.5, 2, 3, 5, 7.5

TRANSMITTER 7.5 KW TIME DOMAIN
RECEIVER HUNTEC MK III TYPE

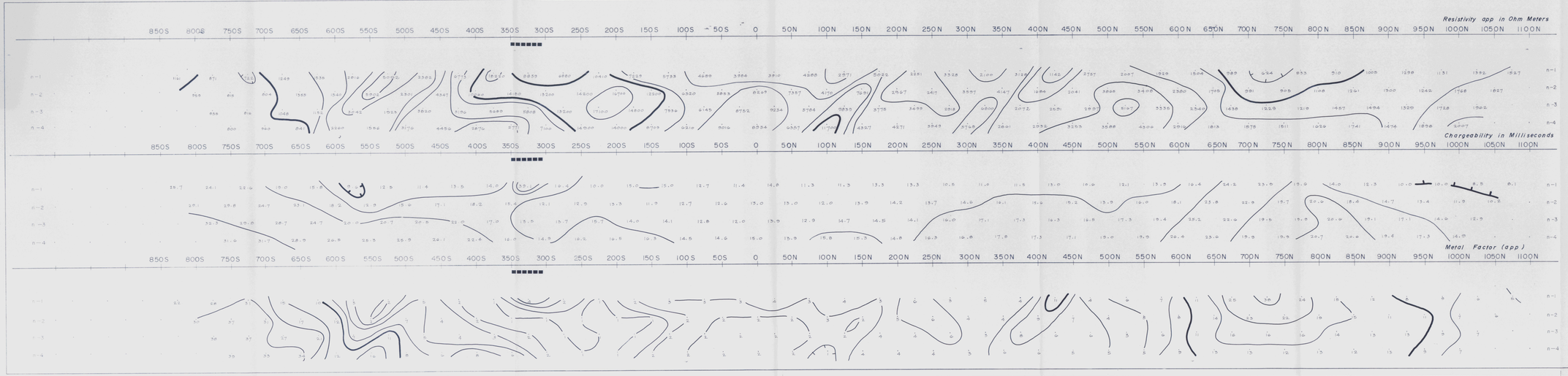
DATE SURVEYED JULY 1975

APPROVED

DATE AUGUST 25, 1975

INDUCED POLARIZATION AND RESISTIVITY SURVEY
SURVEYED BY EAGLE GEOPHYSICS LTD. (JOHN LLOYD M.Sc. P.Eng.)

LINE 100 W



N.T.S. 106 C-10 DWG. NO. I.P-91-3

COMINCO LTD.

BOB PROPERTY

BONNET PLUME AREA, MAYO M.D., YUKON

LINE NO. 00

POLE-DIPOLE ELECTRODE CONFIGURATION

SOUTH n x/2 -4 -3 -2 -1 C1 P1 V P2 1 2 3 4 n x NORTH

X=50 m

PLOTTING POINT n=1, 2, 3 & 4

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

SCALE 1:2,000

DATE SURVEYED JULY 1975

CONTOURS AT LOGARITHMIC INTERVALS 1, 10, 1.5, 2, 3, 5, 7.5

APPROVED

DATE AUGUST 25, 1975

TRANSMITTER: 7.5 KW TIME DOMAIN

RECEIVER: HUNTEC MK III TYPE

INDUCED POLARIZATION AND RESISTIVITY SURVEY

SURVEYED BY EAGLE GEOPHYSICS LTD. (JOHN LLOYD M.Sc. P.Eng.)

LINE 00

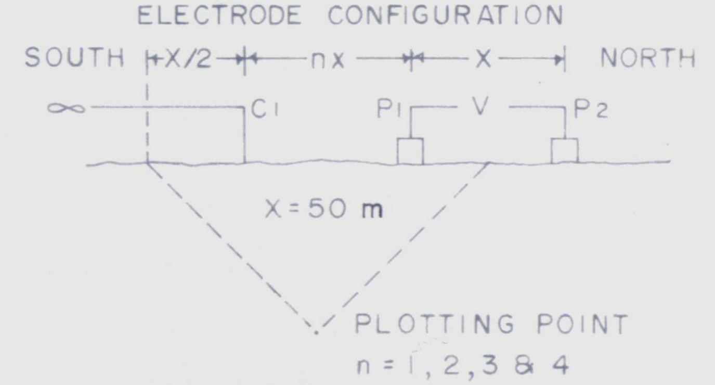
N.T.S. 106 C-10

DWG. NO. I.P.-91-4

COMINCO LTD.
BOB PROPERTY
BONNET PLUME AREA, MAYO M.D., YUKON

LINE NO. 100 E

POLE – DIPOLE
ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES
DEFINITE
PROBABLE
POSSIBLE

SCALE 1 : 2,000

DATE SURVEYED JULY 1975

CONTOURS AT LOGARITHMIC INTERVALS
1, 10,
1.5, 2, 3, 5, 7.5

APPROVED

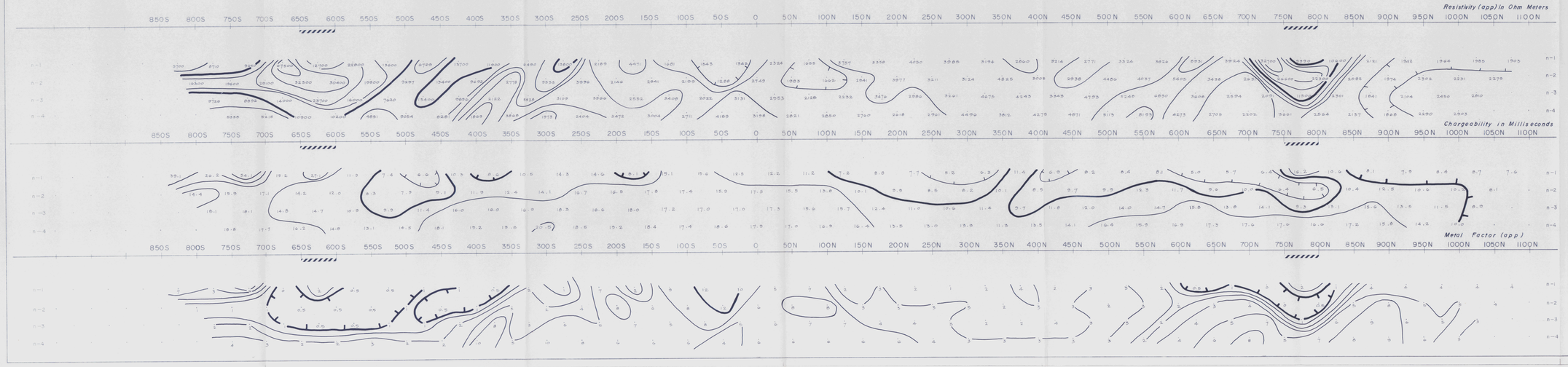
PROVINCE OF BRITISH COLUMBIA
JAN KLEIN
PROFESSIONAL ENGINEER

DATE AUGUST 25, 1975

TRANSMITTER: 7.5 KW TIME DOMAIN
RECEIVER: HUNTEC MKIII TYPE

INDUCED POLARIZATION AND RESISTIVITY SURVEY
SURVEYED BY EAGLE GEOPHYSICS LTD., (JOHN LLOYD M.Sc. P.Eng.)

LINE 100E



N.T.S. 106 C-10 DWG. NO. I.P-91-5

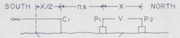
COMINCO LTD.

BOB PROPERTY

BONNET PLUME AREA, MAYO M.D., YUKON

LINE NO. 200 E

POLE-DIPOLE ELECTRODE CONFIGURATION



PLOTTING POINT
n=1, 2, 3 & 4

SURFACE PROJECTION OF ANOMALOUS ZONES
DEFINITE
PROBABLE
POSSIBLE

SCALE 1:2,000

DATE SURVEYED JULY 1979

APPROVED

DATE AUGUST 25, 1979

CONTOURS AT LOGARITHMIC INTERVALS
1, 10, 1.5, 2, 3, 5, 7.5

TRANSMITTER 7.5 KW TIME DOMAIN
RECEIVER - HUNTEC MK III TYPE

INDUCED POLARIZATION AND RESISTIVITY SURVEY
SURVEYED BY EAGLE GEOPHYSICS LTD. (JOHN LLOYD M.Sc. P.Eng.)

LINE 200E