

COMINCO LTD.

EXPLORATION

WESTERN DISTRICT

NTS: 93N

6332

Report on

COMBINED INDUCED POLARIZATION,
RESISTIVITY AND MAGNETOMETER SURVEY

on

JEAN PROPERTY TCHENTLO LAKE AREA
OMINECA MINING DISTRICT, B.C.

Work Performed : May 27 to June 30, 1977

Location : 55°05'N; 124°45'W

Claims : JW 23-40, 51-66, 79-
96, 110, 112, 113-128
JW 129-133 Fr.

**MINERAL RESOURCES BRANCH
ASSESSMENT REPORT**

NO. _____

July 25, 1977

Jan Klein, P. Eng.

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INTRODUCTION

During the period May 29 to June 30, 1977, Induced Polarization, Resistivity and Magnetometer surveys were carried out on the Jean Property, Tchentlo Lake area, Omineca Mining District, by Kenting Exploration Services Limited on behalf of Cominco Limited. W. Patterson was the Project Geophysicist in charge of the project.

The area is located about 96 Kilometers (60 miles) in a straight line north of Fort St. James, B.C. (Fig. 1).

The purpose of the IP survey was to map the subsurface distribution of polarizable material. In the survey area it is hoped that the polarizable material is copper mineralization. Non-economic minerals such as graphite, pyrite, and some clays produce similar polarization effects.

The claims covered in whole or in part by this survey are labelled: JW 23-40, 51-66, 79-96, 110, 112, 113-128, JW 129-133 Fr.

The survey was conducted out of a camp established directly south of the grid. Access was by fixed wing from Fort St. James, to Tchentlo Lake several miles north of the property and then by helicopter to the grid site.

SURVEY DETAILS

The survey equipment consisted of a 7.5 Kw Hunttec transmitter sytem, Hunttec Mk. III receivers, and a Geometrics G-816 proton magnetometer.

The Induced Polarization system was carried out in the time domain with a continuous sequence of "current on" time of 2.0 seconds, "current off" time 2.0 seconds, alternating pulses having reversed polarity. The receiver sampled the decay curve during the "current off" time after a delay of 120 milliseconds to avoid transient and coupling effects. The sample periods are as follows:

- M₁ 120 - 180 milliseconds after current turn-off
- M₂ 180 - 300 milliseconds after current turn-off
- M₃ 300 - 540 milliseconds after current turn-off
- M₄ 540 - 1020 milliseconds after current turn-off

The primary voltage V_p sample is obtained during the "current on" period.

Potential electrodes were porous pot, copper sulphate-copper, non polarizing electrodes.

The pole-dipole array was used through the survey with an "a" spacing of 122 meters (400 feet) and separations "n" of one, two, three, and four.

Computations involve a calculation of apparent chargeability and apparent resistivity.

The resistivity calculation is $R_a = \frac{V_p}{I}K$ where:

V_p is the primary voltage in millivolts

I is the current flowing between the two current electrodes in amperes

K is a constant which is dependent upon the array, spacing "a" and separation "n"

The chargeability values obtained from the Mk. III receiver were converted to the Newmont standard chargeability thus:

$$C = (M_1 + 2M_2 + 4M_3 + 8M_4) \times 0.6$$

The magnetic survey was carried out with a 30.5 meter (100 feet) station interval. Closures to base stations and drift corrections were made in the usual way.

The speed the Induced Polarization survey, extra helpers were hired June 4, 1977.

GEOLOGY

A description of the general geology was found in:

ARMSTRONG, J.E., 1965 Fort St. James Map Area
Cassiar and Coast Districts, B.C.
GSC Memoir 252

The survey area is surrounded by the Takla Group of interbedded volcanic and sedimentary rocks. The area of interest is intruded by the Omineca intrusions and the majority of the survey area is located within these intrusives.

Two areas containing weak copper mineralization and labelled zones "A" and "B" are located to the south of the 28N baseline. The location of the mineralization is apparently related to a fault contact between the Takla group (Upper Triassic), and the Omineca intrusives (Jurassic-Cretaceous?).

RESULTS

The Induced Polarization data is presented on 15 pseudo-sections showing apparent resistivity and apparent chargeability for each line (Fig. 3-17).

The magnetic data is presented in plan contoured form (Fig. 20).

DISCUSSION OF RESULTS

The results of the induced polarization survey confirm the known mineralized zones A and B (lines 88W and 48W south of BL 28N), but reveal little else of major interest.

A well defined anomaly centered at 82N on line 96W may correlate with a small frequency effect anomaly on line 112W at about 80N covered by a previous survey (McPhar 1973). The moderately high chargeability is accompanied by low resistivity values increasing the significance of this zone. The resistivity high to the north suggests a rock-type change placing the chargeability high along the contact. This is also supported by the magnetic data which shows a high locally and probably represents a more basic phase of the intrusives.

This feature continues to line 88W although weaker and possibly deeper than on line 96W.

The high resistivity zone mentioned previously is found on lines 96W, 88W, 80W, and 72W north of the 90N baseline. Resistivity values to 1,300 ohm meters suggests a change to a less fractured or altered rock type.

Low chargeability values on line 64W at 64N to 80N on the first electrode separation suggests a relatively deep overburden in this area.

The remaining feature of interest is the zone A and B anomalies found by previous surveys and crossed by only

two lines from the current survey. The anomaly is very strong on line 48W with chargeability values to 50 milliseconds. Generally, the mineralization appears to be shallow (50 meters or less to top). The anomaly is approximately 670 meters wide on this line (2S to 20N).

In general, the Induced Polarization and the magnetic results show limited variation and suggests some uniformity within the intrusive mass. No major trends are obvious from the data but a general east-west trend is indicated especially along Jean Creek.

The apparent misclosures on the magnetic survey with tie line 90N are poor due to incorrect location of line 90N and errors in chainage. Due to the fact that loop ties involved only about 10 gammas drift, drift/time corrections were not considered necessary.

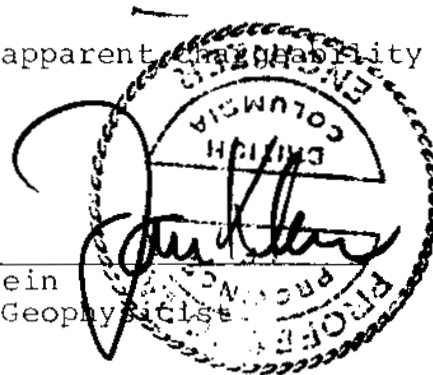
CONCLUSIONS AND RECOMMENDATIONS

A weak structural anomaly near the north end of line 96W was the only feature of interest in the Induced Polarization data. The resistivity contour map revealed a high resistivity feature at the north-west edge of the area possibly due to a rock type change. This fact is supported by the magnetic survey which suggests that a more basic phase of the intrusives occurs in this area.

No drilling would be recommended as the apparent chargeability anomaly is weak.

Report by: _____

Jan Klein
Chief Geophysicist



Endorsed for
Release by: _____

G. Harden
Manager, Exploration
Western District

/deb

Distribution:

- W.D. Files (1)
- Admin. Files (1)
- Mining Recorder (2)

Statements of Expenditure

JEAN IP SURVEY, GROUND MAGNETIC AND LINE CUTTING

- A. Costs applicable for work performed in period 15 May 1977 to 24 June 1977.
 B. Costs applicable for work performed in period 25 June to 30 June 1977.

For "A": Period 15 May to 24 June 1977

<u>Supervision:</u>	R.U. Bruaset, Burnaby B.C. May 28-31, June 1-3, June 13-15, 1977 10 days @ \$103/day	1,030.00
	J. Klein May 3 and June 8, 1977 2 days @ \$150/day	300.00
<u>Casual Hire:</u>	Edward Dionne, Fort St. James 1 day 19 May 1977	100.00
	Shauneen Henry, Fort St. James 14-24 June 1977 11 days @ \$45.00	495.00
	Cameron Cheal, Vancouver 1-3 June 1977 3 days @ \$63.00	189.00
<u>Camp Costs, Communication, freight:</u>	total	2,411.00
<u>Air transportation:</u>	Northern Mountain Helicopters Northern Thunderbird Air Prince George, B.C. total	5,168.00
<u>Ground Control:</u>	Martinson L&L Ltd., Powell River, B.C. 24 miles line cutting, helicopter landing sites, camp, air transportation and supervision total cost	8,018.00
<u>IP and Ground magnetic contract charges:</u>	Kenting Geophysics, Calgary, Alberta 24.77 miles of IP @\$800/mile 24.77 miles of magnetic survey @ \$25/mile	19,816.00 <u>613.00</u>
TOTAL COST UNDER "A" is		\$ 38,140.00

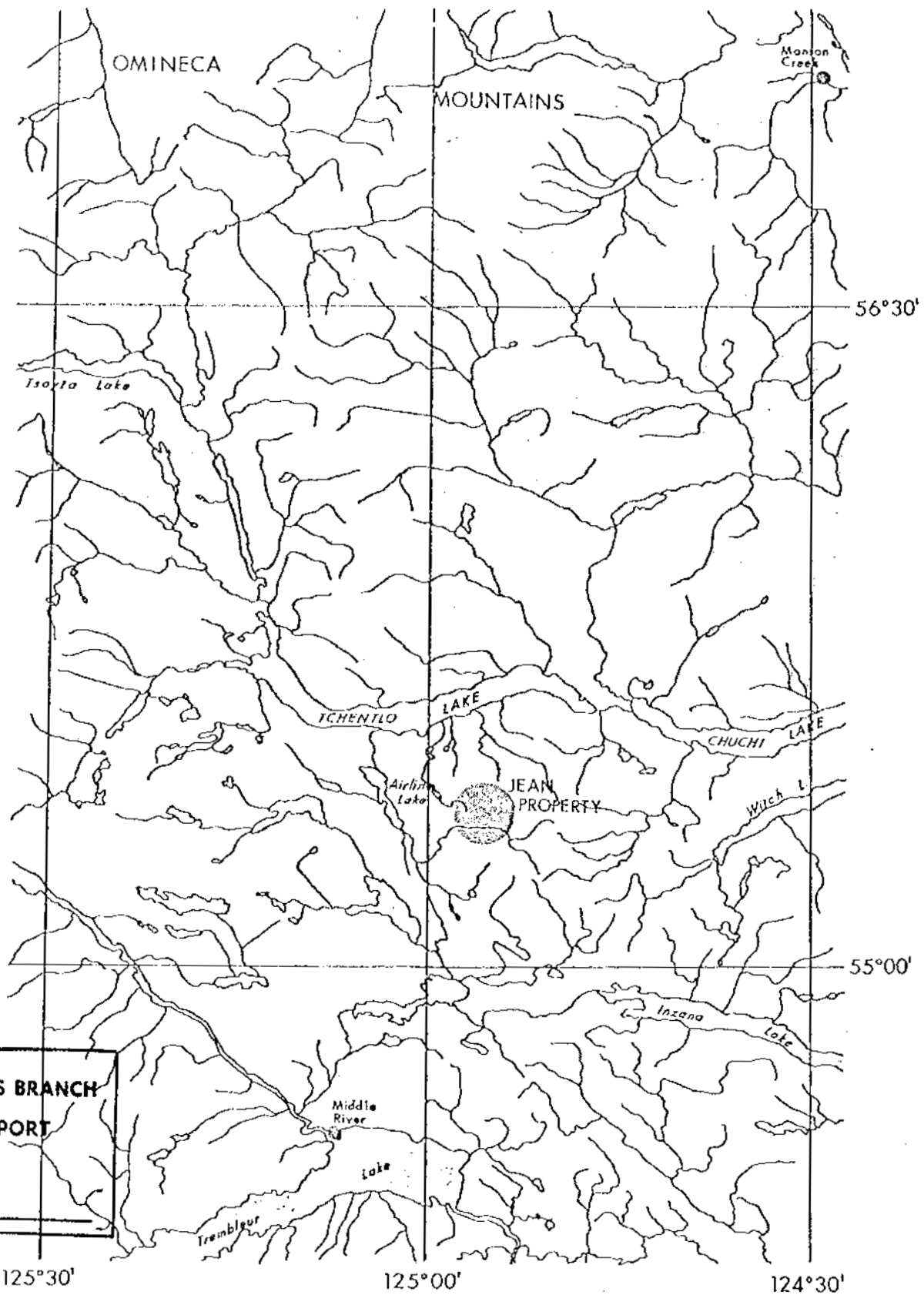
For "B": Period June 25-June 30, 1977

<u>Supervision:</u>	J. Klein, 1 day July 25 @ \$150/day	150.00
<u>Technical:</u>	S.S. Selke, North Vancouver, B.C. estimate 1 day <u>say</u> July 20	80.00
<u>Casual hire:</u>	Shauneen Henry, Fort St. James, B.C. June 25-30 6 days @\$45.00	270.00
<u>Air transportation:</u>	Northern Mountain Helicopters Northern Thunderbird Air, Fort St. James	1,387.00
<u>IP and Ground magnetics:</u>	Kenting Geophysics Calgary	
<u>Basic Contract</u>	3.03 miles of IP @ \$800.00 per mile 6.95 miles of ground magnetics @ \$25/mile Demobilization of IP crew (½ of \$4500) Interpretation	2,424.00 173.75 2,250.00 <u>2,000.00</u>
TOTAL COST UNDER "B" is		\$8,734.75

25 July 1977

Jan Klein, P. Eng.
Chief Geophysicist





MINERAL RESOURCES BRANCH
ASSESSMENT REPORT

NO. _____

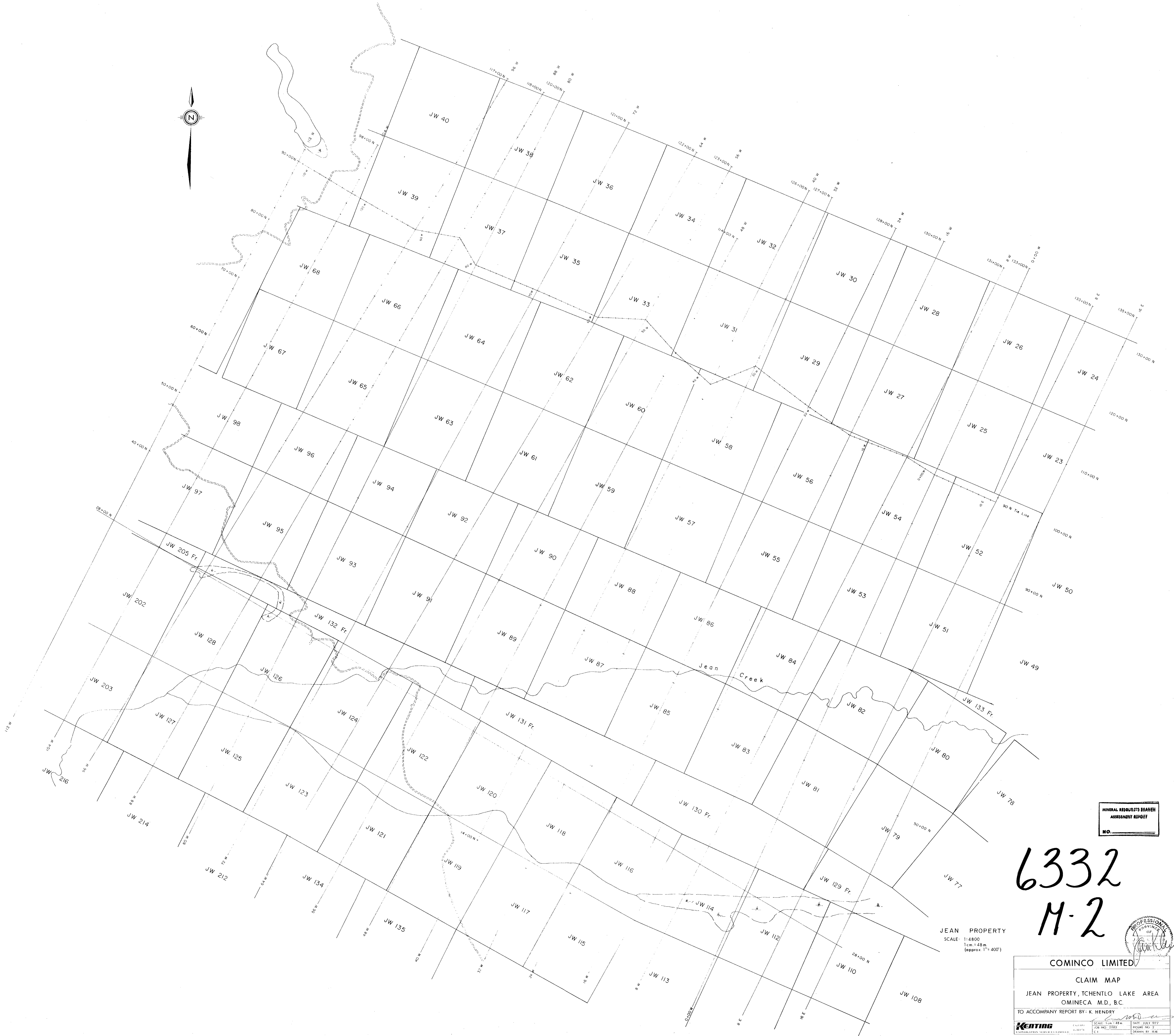
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LOCATION MAP

FIGURE NO. 1

6332

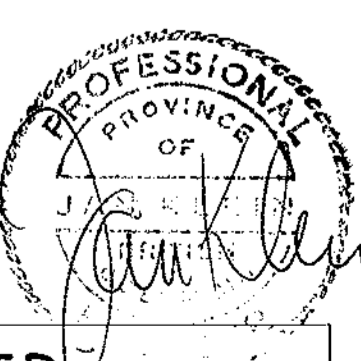
M-1



MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO.

6332
M-2

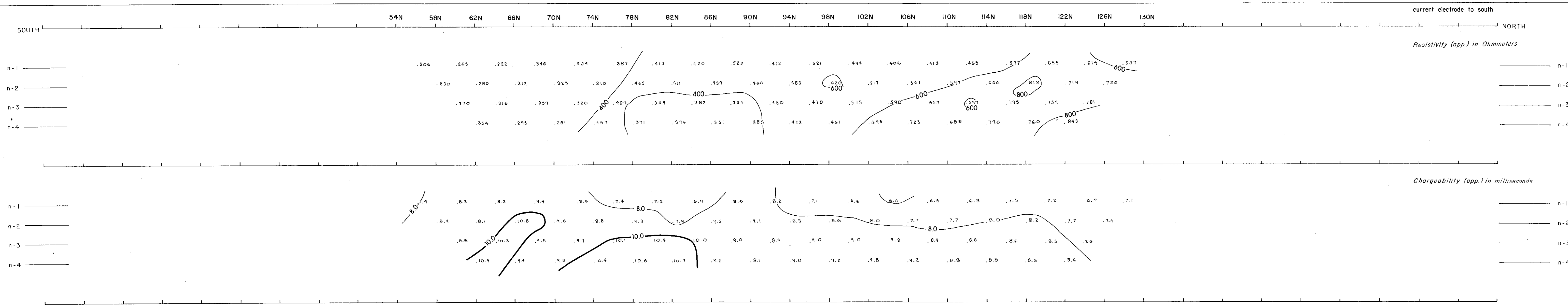
JEAN PROPERTY
SCALE: 1:4800
1 cm = 48 m
(approx 1" = 400')



COMINCO LIMITED
CLAIM MAP
JEAN PROPERTY, TCHENTLO LAKE AREA
OMINECA M.D., B.C.
TO ACCOMPANY REPORT BY: K. HENDRY

	SCALE: 1 cm = 48 m	DATE: JULY 1977
	CAD. NO. 2303	PROJECT NO. 2
	DATE: JULY 1977	DRAWN BY: JEM

LINE NO. - 16E



DWG. NO. - I.P. -

COMINCO LTD.

6332 M-3

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. _____

LINE NO. - 16E

ELECTRODE CONFIGURATION
--- X --- nX ---

x = 121.9m (400')

PLOTTING POINT
n-1, 2, 3 & 4

SURFACE PROJECTION OF ANOMALOUS ZONES

DATE SURVEYED: JUNE 1977

APPROVED: _____

DATE: _____

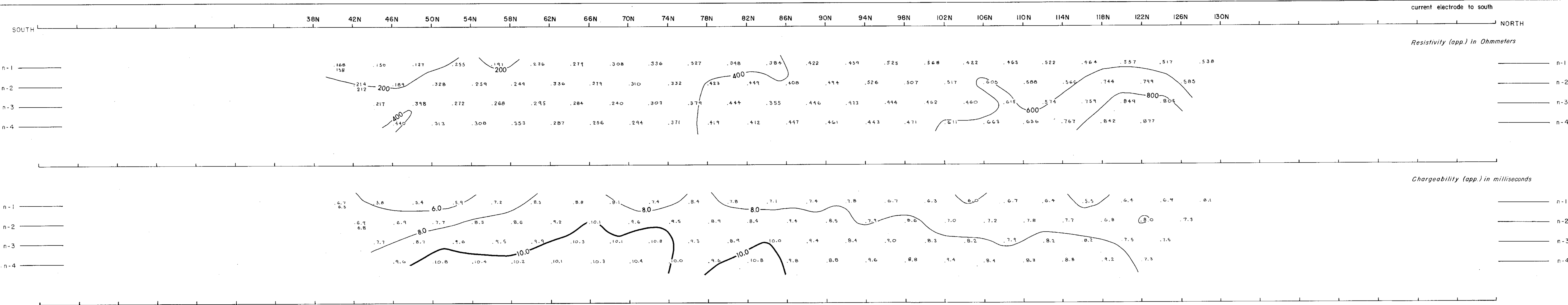
SCALE: 1 cm = 48m (1" = 400')

FIGURE NO. 3

INDUCED POLARIZATION AND RESISTIVITY SURVEY
SURVEYED BY: **Kenting** *[Signature]*
EXPLORATION SERVICES LIMITED

LINE NO. - 16E

LINE NO. - 8E

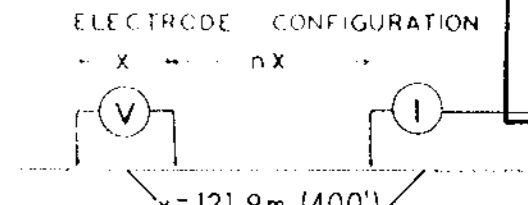


DWG. NO.-I.P.-

COMINCO LTD.

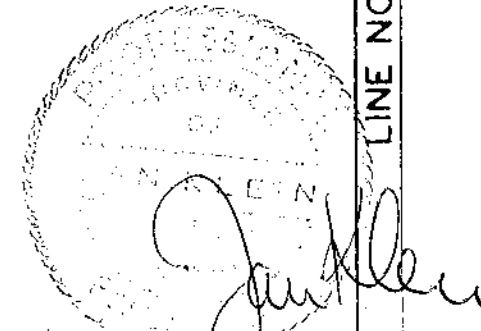
6332 M-4

LINE NO. - 8E
MINERAL RESOURCES BRANCH
ASSESSMENT REPORT



PLOTTING POINT
n-1, 2, 3 & 4
SURFACE PROJECTION
OF ANOMALOUS ZONES

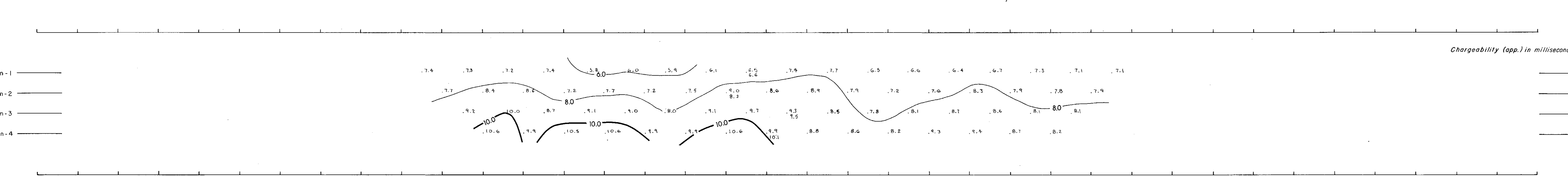
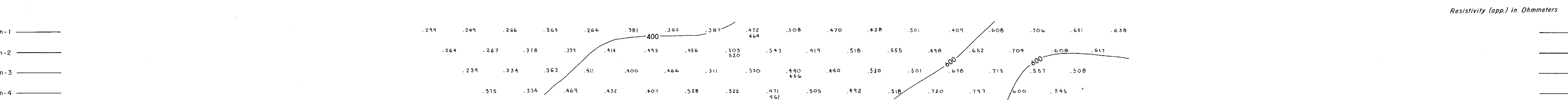
DATE SURVEYED: JUNE 1977
APPROVED: _____
DATE: _____
SCALE: 1cm. = 48m. (1" = 400')
FIGURE NO. 4




INDUCED POLARIZATION AND RESISTIVITY SURVEY
SURVEYED BY: **KENTING**
EXPLORATION SERVICES LIMITED

LINE NO. - 8E

SOUTH current electrode to south NORTH



DWG. NO.-I.P.-



COMINCO LTD.

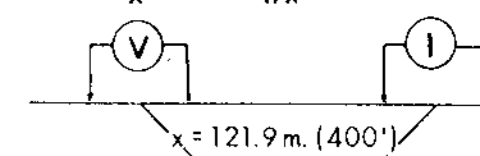
6332 M-5

LINE NO.- 0

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT

ELECTRODE CONFIGURATION

x ——— n x



PLOTTING POINT

n-1, 2, 3 & 4

SURFACE PROJECTION OF ANOMALOUS ZONES

DATE SURVEYED: JUNE 1977


APPROVED: _____

DATE: _____

SCALE: 1 cm. = 48m. (1" = 400')

FIGURE NO. 5

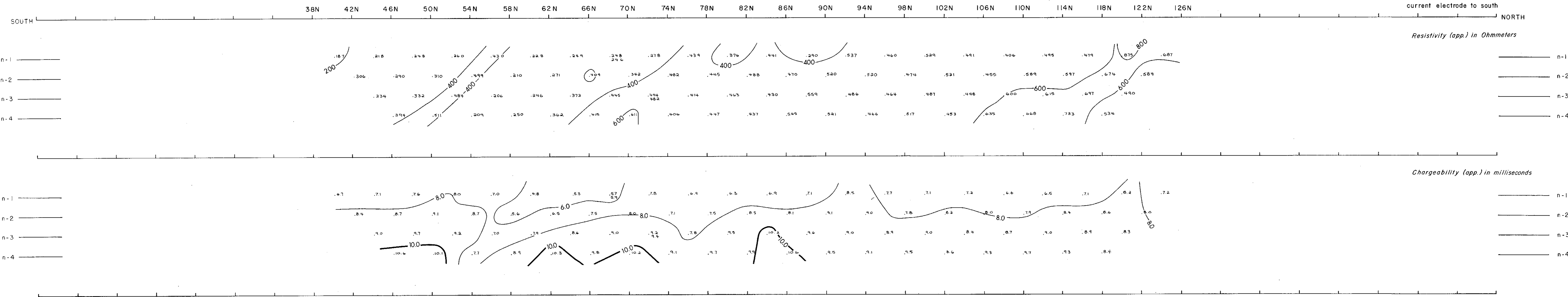
INDUCED POLARIZATION AND RESISTIVITY SURVEY

SURVEYED BY:  _____

LINE NO.- 0

LINE NO.- 0

LINE NO. - 8W



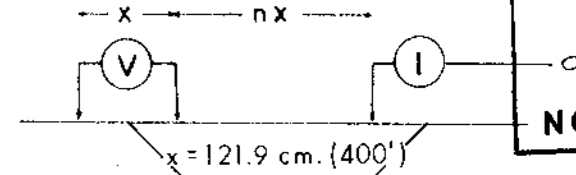
DWG. NO.-I.P.-

COMINCO LTD.

6332 M-6

LINE NO.- 8W

ELECTRODE CONFIGURATION



MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO.

PLOTTING POINT

n-1, 2, 3 & 4

SURFACE PROJECTION OF ANOMALOUS ZONES

DATE SURVEYED: JUNE 1977

APPROVED: _____

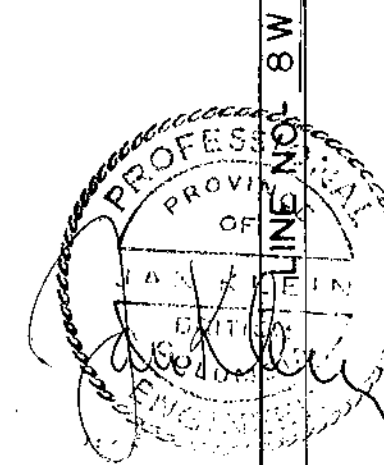
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SCALE: 1cm = 48m. (1" = 400')

FIGURE NO. 6

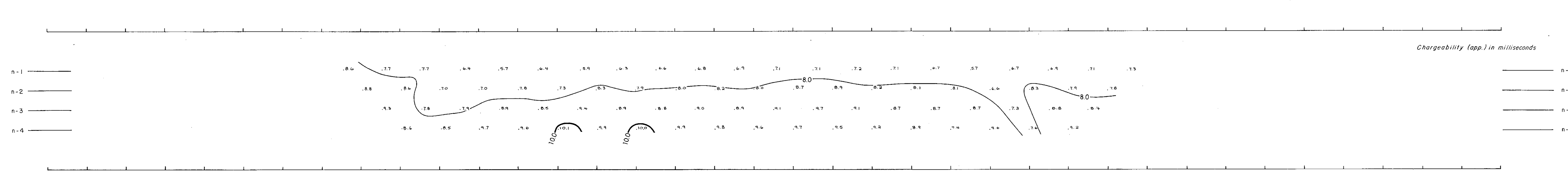
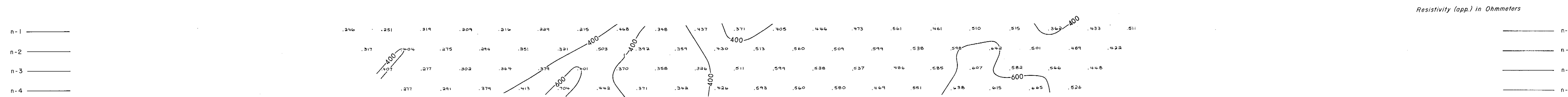
INDUCED POLARIZATION AND RESISTIVITY SURVEY

SURVEYED BY: **KENTING** EXPLORATION SERVICES LIMITED



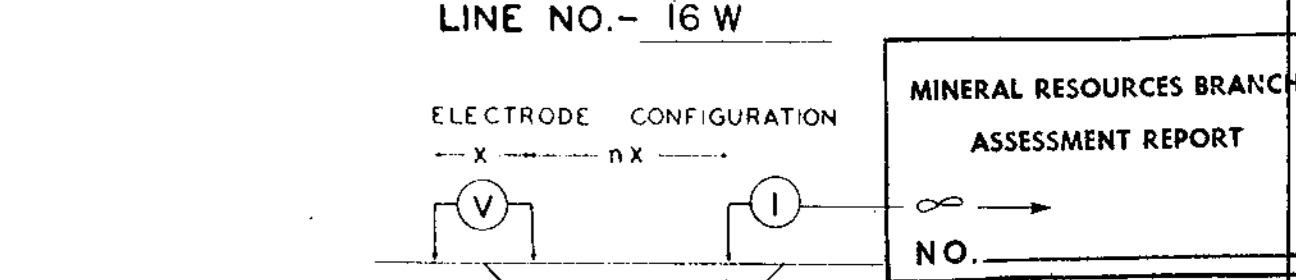
SOUTH current electrode to south

42N 46N 50N 54N 58N 62N 66N 70N 74N 78N 82N 86N 90N 94N 98N 102N 106N 110N 114N 118N 122N 126N NORTH



COMINCO DWG. NO.-I.P.-

COMINCO LTD.
6332 M-7



PLOTTING POINT
n-1, 2, 3 & 4
SURFACE PROJECTION OF ANOMALOUS ZONES

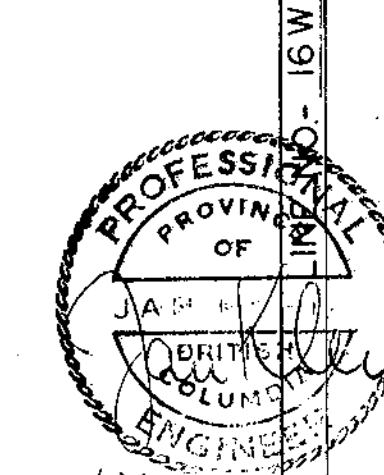
DATE SURVEYED: JUNE 1977

APPROVED: _____

DATE: _____

SCALE: 1cm = 48m. (1" = 400')

FIGURE NO. 7

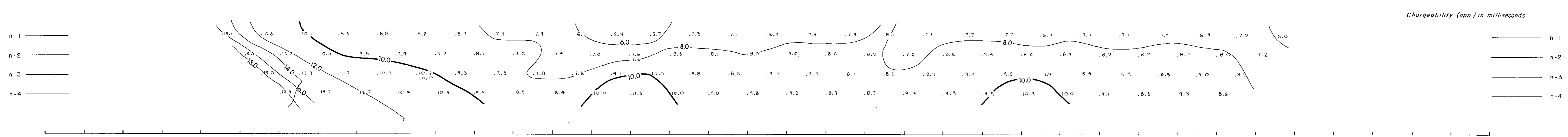
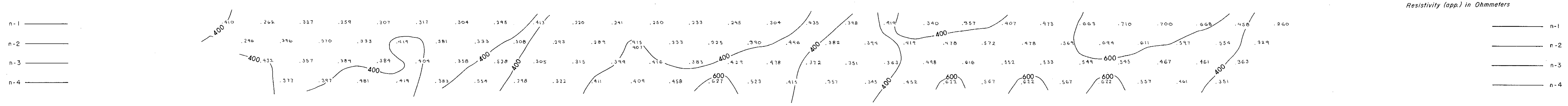


INDUCED POLARIZATION AND RESISTIVITY SURVEY
SURVEYED BY: **KENTING** *[Signature]*
EXPLORATION SERVICES LIMITED

LINE NO.- 16 W

SOUTH current electrode to south

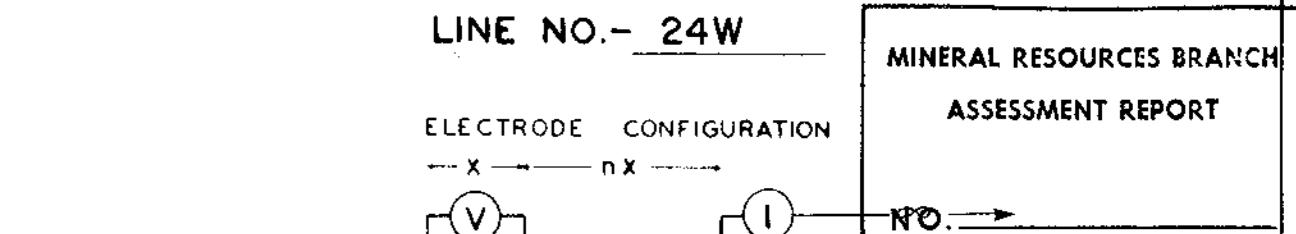
18N 22N 26N 30N 34N 38N 42N 46N 50N 54N 58N 62N 66N 70N 74N 78N 82N 86N 90N 94N 98N 102N 106N 110N 114N 118N 122N 126N 130N NORTH



DWG. NO.-I.P.-

COMINCO LTD.

6332 M-8



PLOTTING POINT
n-1, 2, 3 & 4
SURFACE PROJECTION OF ANOMALOUS ZONES

DATE SURVEYED: JUNE 1977

APPROVED: _____

DATE: _____

SCALE: 1 cm. = 48m. (1"=400')

FIGURE NO. 8

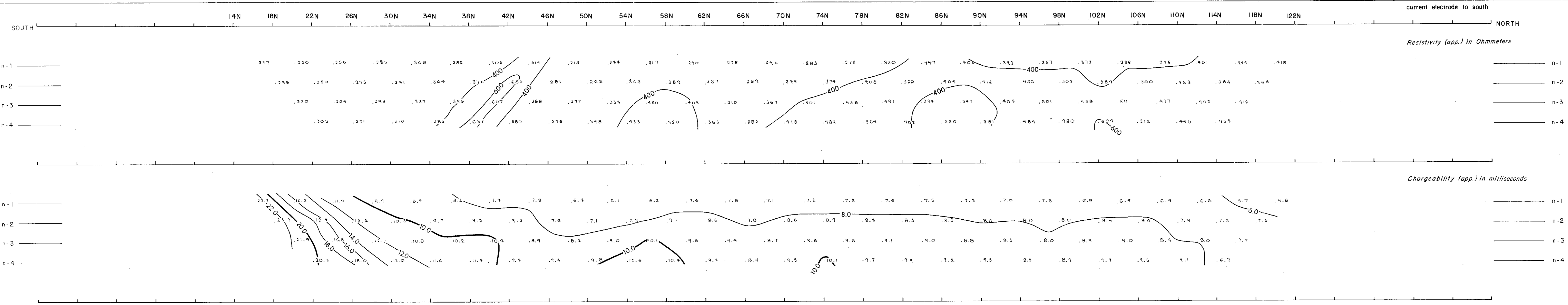
INDUCED POLARIZATION AND RESISTIVITY SURVEY

SURVEYED BY: **KENTING** EXPLORATION SERVICES LIMITED

LINE NO.- 24 W

LINE NO.- 24 W

LINE NO. - 32W



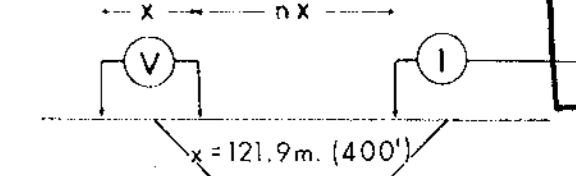
DWG. NO.-I.P.-

COMINCO LTD.

6332 M-9

LINE NO.- 32W

ELECTRODE CONFIGURATION



PLOTTING POINT

n-1, 2, 3 & 4

SURFACE PROJECTION OF ANOMALOUS ZONES

DATE SURVEYED: JUNE 1977

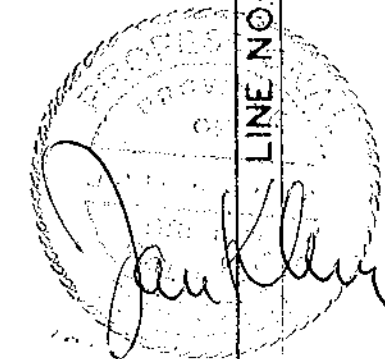
APPROVED:

DATE:

SCALE: 1 cm. = 48m. (1" = 400')

FIGURE NO. 9

MINERAL RESOURCES BRANCH ASSESSMENT REPORT



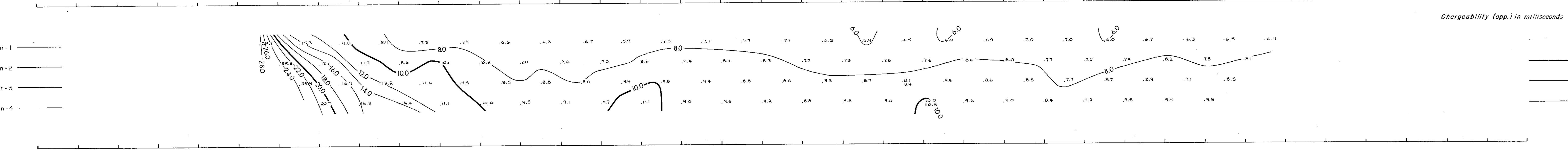
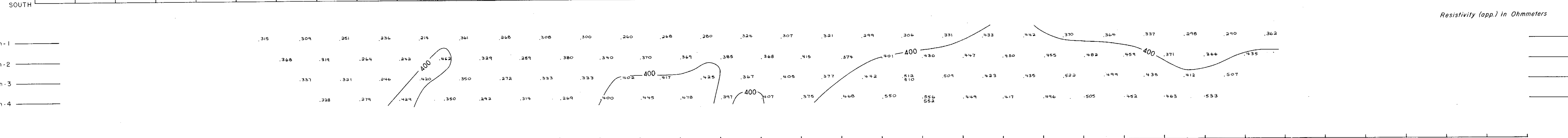
INDUCED POLARIZATION AND RESISTIVITY SURVEY

SURVEYED BY: KENTING EXPLORATION SERVICES LIMITED

current electrode to south

14N 18N 22N 26N 30N 34N 38N 42N 46N 50N 54N 58N 62N 66N 70N 74N 78N 82N 86N 90N 94N 98N 102N 106N 110N 114N 118N

SOUTH NORTH



DWG. NO.-I.P.-

COMINCO

COMINCO LTD.

6332 M-10

LINE NO.- 40W

ELECTRODE CONFIGURATION: n-x

MINERAL RESOURCES BRANCH ASSESSMENT REPORT

NO. _____

PLOTTING POINT: n-1, 2, 3 & 4

SURFACE PROJECTION OF ANOMALOUS ZONES

DATE SURVEYED: JUNE 1977

APPROVED: _____

DATE: _____

SCALE: 1cm = 48m. (1" = 400')

FIGURE NO. 10

INDUCED POLARIZATION AND RESISTIVITY SURVEY

SURVEYED BY: **KENTING** EXPLORATION SERVICES LIMITED

PROFESSIONAL ENGINEER

LINE NO.- 40W

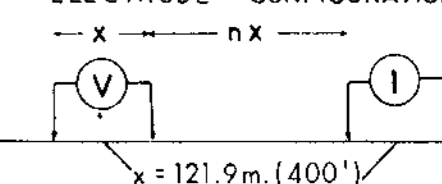


COMINCO LTD.

6332 M-12

LINE NO.- 56 W

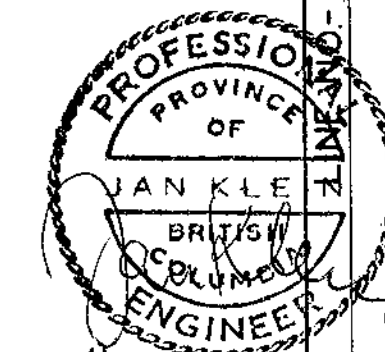
ELECTRODE CONFIGURATION



MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. _____

PLOTTING POINT
n-1, 2, 3 & 4
SURFACE PROJECTION
OF ANOMALOUS ZONES

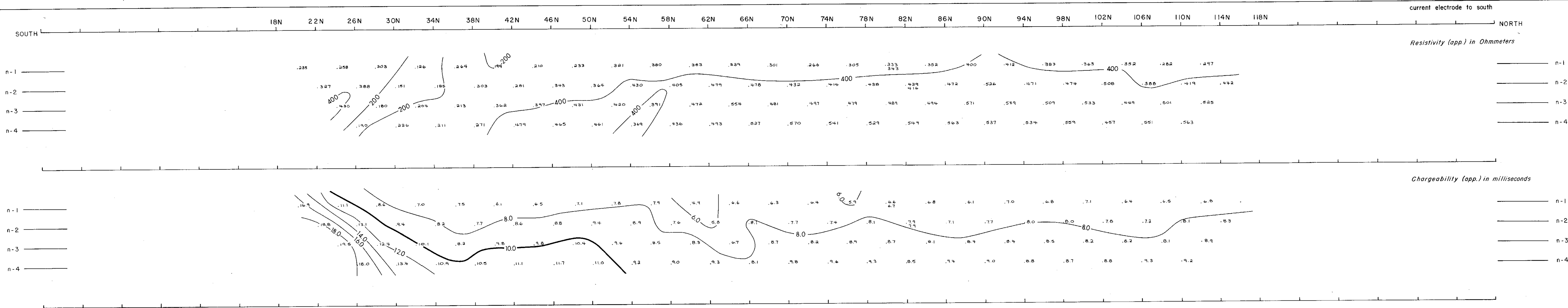
DATE SURVEYED: JUNE 1977
APPROVED: _____
DATE: _____
SCALE: 1cm. = 48m. (1" = 400')
FIGURE NO. 12



INDUCED POLARIZATION AND RESISTIVITY SURVEY

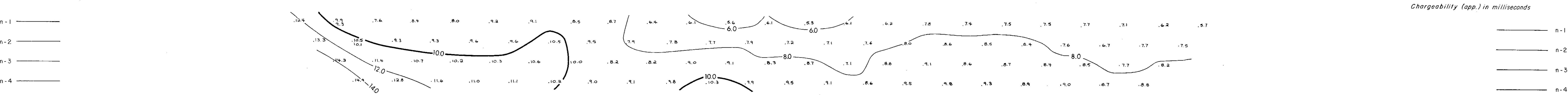
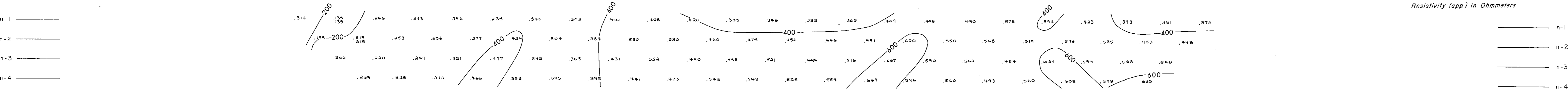
SURVEYED BY: **KENTING**
EXPLORATION SERVICES LIMITED

LINE NO. - 56 W



LINE NO- 64W

SOUTH 22N 26N 30N 34N 38N 42N 46N 50N 54N 58N 62N 66N 70N 74N 78N 82N 86N 90N 94N 98N 102N 106N 110N 114N 118N current electrode to south NORTH

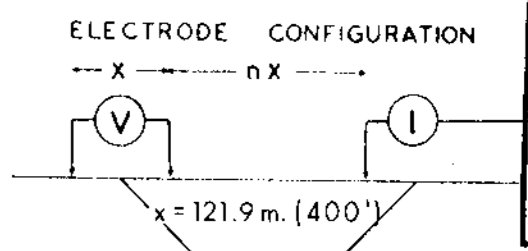


DWG. NO.-I.P.-

COMINCO LTD.

6332 M-13

LINE NO.- 64W



MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. _____

PLOTTING POINT
n-1, 2, 3 & 4
SURFACE PROJECTION OF ANOMALOUS ZONES

DATE SURVEYED: JUNE 1977
APPROVED: _____
DATE: _____
SCALE: 1cm = 48m. (1" = 400')
FIGURE NO. 13

LINE NO- 64W

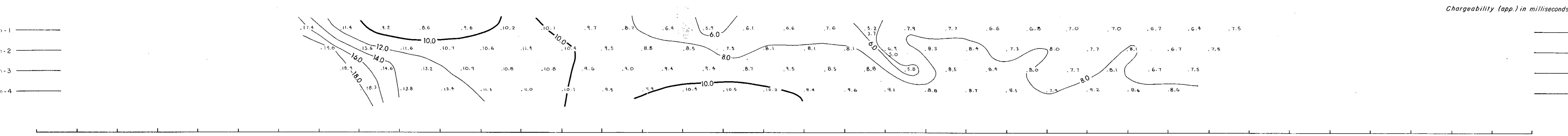
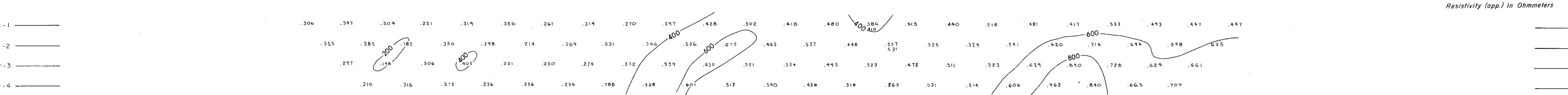
INDUCED POLARIZATION AND RESISTIVITY SURVEY
SURVEYED BY: **KENTING** EXPLORATION SERVICES LIMITED

LINE NO. - 72 W

SOUTH current electrode to south

22N 26N 30N 34N 38N 42N 46N 50N 54N 58N 62N 66N 70N 74N 78N 82N 86N 90N 94N 98N 102N 106N 110N 114N 118N

NORTH



DWG. NO.-I.P.-

COMINCO LTD.

6332 M-1A

LINE NO.- 72 W

MINERAL RESOURCES DRAMING ASSESSMENT REPORT

NO. _____

ELECTRODE CONFIGURATION

 x = 121.9m (400')

PLOTTING POINT
 n-1, 2, 3 & 4
 SURFACE PROJECTION OF ANOMALOUS ZONES

DATE SURVEYED: JUNE 1977

APPROVED: _____

DATE: _____

SCALE: 1cm. = 48 m. (1"=400')

FIGURE NO. 14

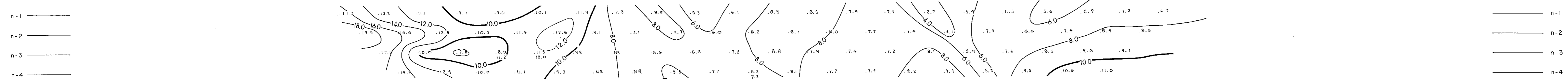
INDUCED POLARIZATION AND RESISTIVITY SURVEY

SURVEYED BY: **Kenting** EXPLORATION SERVICES LIMITED

LINE NO. - 72 W

26N 30N 34N 38N 42N 46N 50N 54N 58N 62N 66N 70N 74N 78N 82N 86N 90N 94N 98N 102N 106N 110N 114N

current electrode to south NORTH



DWG. NO.-I.P.-

COMINCO LTD.

6332 M-15

LINE NO.- 80 W

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. _____

ELECTRODE CONFIGURATION
X NX
x = 121.9m (400')

PLOTTING POINT
n-1, 2, 3 & 4
SURFACE PROJECTION OF ANOMALOUS ZONES

DATE SURVEYED: JUNE 1977
APPROVED: _____
DATE: _____
SCALE: 1cm = 48m (1" = 400')
FIGURE NO. 15

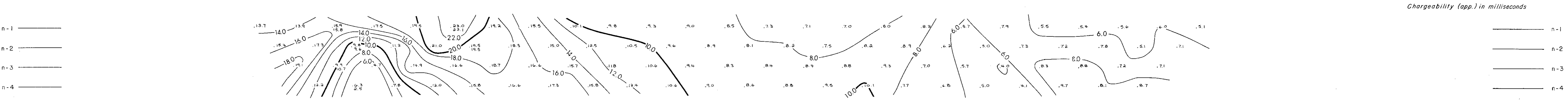
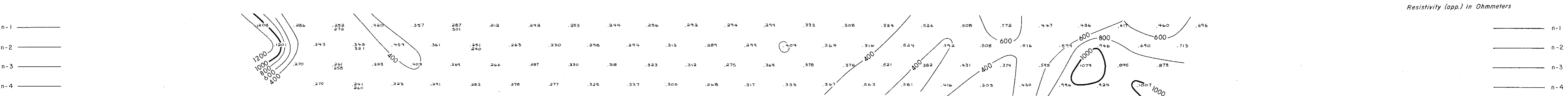
INDUCED POLARIZATION AND RESISTIVITY SURVEY
SURVEYED BY: **Kenting** EXPLORATION SERVICES LIMITED

LINE NO.-80 W

LINE NO.-80 W

LINE NO. - 88W

SOUTH 6N 10N 14N 18N 22N 26N 30N 34N 38N 42N 46N 50N 54N 58N 62N 66N 70N 74N 78N 82N 86N 90N 94N 98N 102N 106N current electrode to south NORTH



DWG. NO.-I.P.-

COMINCO LTD.

6332 M-16

LINE NO.- 88W

ELECTRODE CONFIGURATION

x = 121.9m. (400')

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT

NO. _____

PLOTTING POINT
n-1, 2, 3 & 4
SURFACE PROJECTION OF ANOMALOUS ZONES

DATE SURVEYED: JUNE 1977

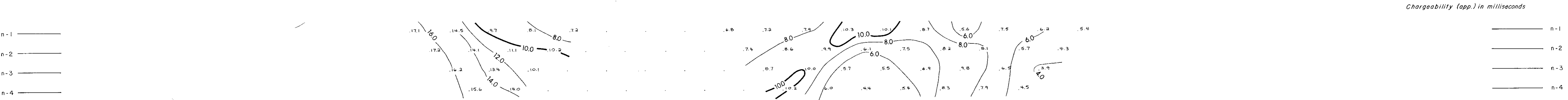
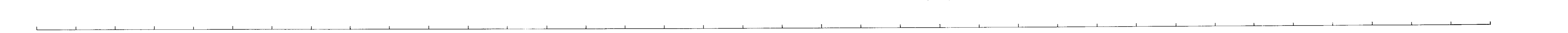
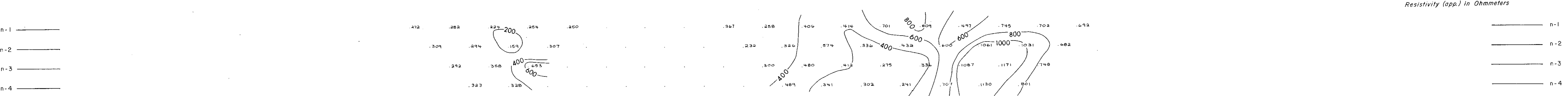
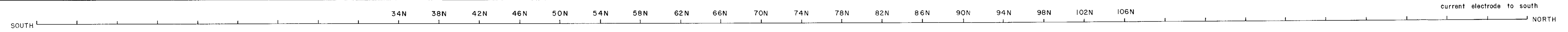
APPROVED: _____

SCALE: 1cm = 48m. (1" = 400')

FIGURE NO. 16

INDUCED POLARIZATION AND RESISTIVITY SURVEY
SURVEYED BY: **KENTING** EXPLORATION SERVICES LIMITED

LINE NO. - 96W



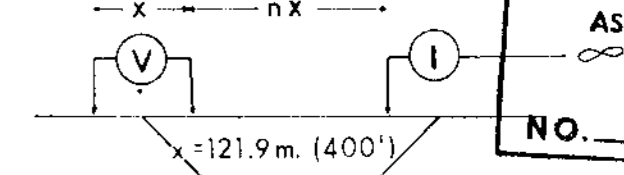
DWG. NO.-I.P.-

COMINCO LTD.

6332 M-17

LINE NO. - 96 W

ELECTRODE CONFIGURATION



MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. _____

PLOTTING POINT

n-1, 2, 3 & 4
SURFACE PROJECTION OF ANOMALOUS ZONES

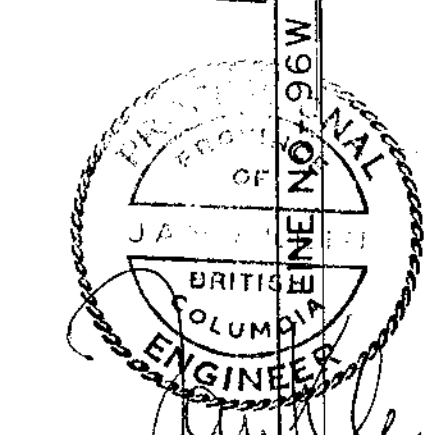
DATE SURVEYED: JUNE 1977

APPROVED: _____

DATE: _____

SCALE: 1cm = 48m. (1" = 400')

FIGURE NO. 17



INDUCED POLARIZATION AND RESISTIVITY SURVEY

SURVEYED BY: **KENTING** EXPLORATION SERVICES LIMITED

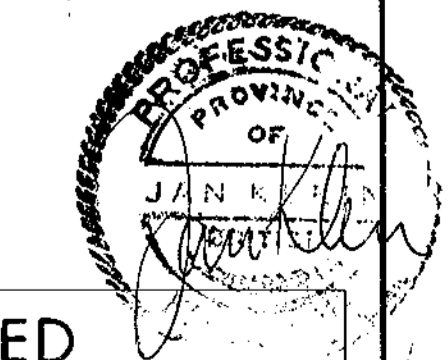


6332 M-18

SURVEY PARTICULARS
 INSTRUMENT: GEOMETRICS G801
 PROTON PRECESSION MAGNETOMETER
 STATION INTERVAL: 30.3m. (100 feet)
 CONTOUR INTERVAL: 100 gammas
 BASE LEVEL: 58,000 gammas

JEAN PROPERTY
 SCALE: 1:4800
 1cm = 48m
 (approx. 1" = 400')

MINERAL RESOURCES BRANCH
 ASSESSMENT REPORT
 NO. _____



COMINCO LIMITED
 MAGNETIC CONTOUR MAP
 JEAN PROPERTY, TCHENTLO LAKE AREA
 OMINECA M.D., B.C.
 TO ACCOMPANY REPORT BY: K. HENDRY

KENTING	CANADIAN ALBERTA	SCALE: 1cm = 48m	DATE: JULY 1977
ALBERTA REG. NO. 2523	ALBERTA	FIGURE NO. 10	DRAWN BY: J.S. & H.M.