Report on
COMBINED INDUCED POLARIZATION,
RESISTIVITY AND MAGNETOMETER SURVEY
on
JEAN PROPERTY TCHENTLO LAKE AREA,
OMINECA MINING DISTRICT, B.C.
for
COMINCO LIMITED

by

KENTING EXPLORATION SERVICES LIMITED

AUGUST 1978

LOCATION	About 96 kilometers north of Fort St. James, B.C.
	LATITUDE 55° 05' N LONGITUDE 124° 45' W NTS 93 N
FIELD OPERATION	July 3, 1978 to July 23, 1978
CLAIMS	Jean 2, 4, 5, 23-28, 37, 125, 126, 200
FRACTIONS	Jean 45, J.W. 144

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EXPLORATION SERVICES LIMITED

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INTRODUCTION

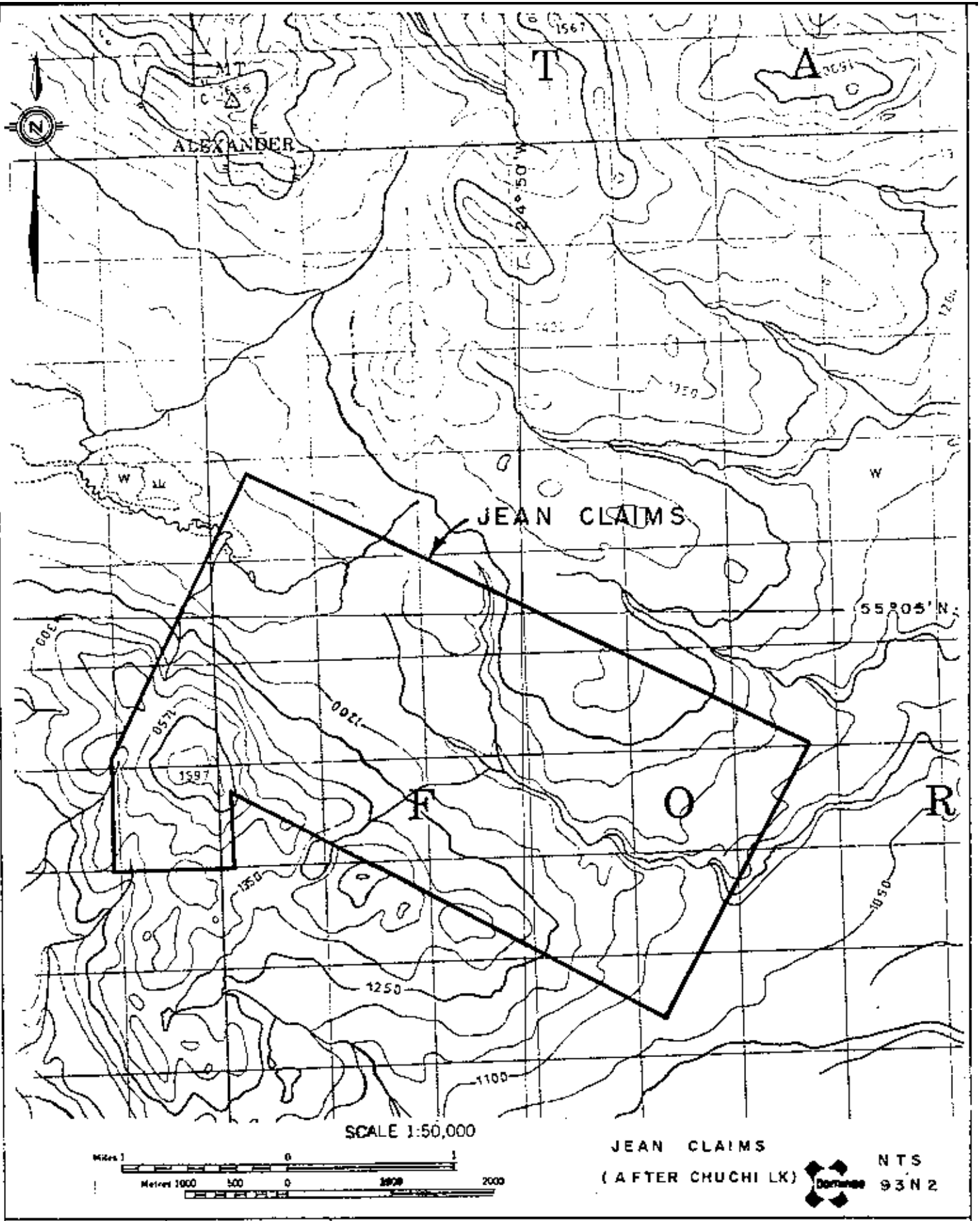
During the period of July 3, 1978 and July 23, 1978, Induced Polarization, Resistivity, and Magnetometer surveys were carried out on the Jean Property, Tchentlo Lake Area, Omineca Mining District, B.C., for Cominco Limited. W. Patterson was the Project Geophysicist in charge of the project.

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

The purpose of the I.P. 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 by this survey are known as the Jean Group and the locations of the claims and the survey lines are shown in Figure 2. Claims and Fractions covered are as follows:

Jean 2, 4, 6, 23-28, 37, 125, 126, 200
J.W. 144 Fraction
Jean 45 Fraction



Drawn by	Traced by
Recommended Date	Approved by Date

LOCATION MAP

OMINECA, M.D., B.C.

Scale	1:50,000	Date	JULY 1978	Plate

SURVEY DETAILS

The survey equipment consisted of a 7.5 kw Huntec transmitter system, Huntec Mk. III receiver, and a Geometrics G-816 proton magnetometer.

A. INDUCED POLARIZATION SURVEY

The Induced Polarization survey 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.

M_1 120 - 180 milliseconds after current turn-off
M_2 180 - 300 milliseconds after current turn-off
M_3 300 - 540 milliseconds after current turn-off
M_4 540 - 1020 milliseconds after current turn-off

The primary voltage Vp 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 $Ra = \frac{Vp}{I} K$ where:

Vp 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 approximate the Newmont standard chargeability thus:

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

B. MAGNETIC SURVEY

The magnetic survey was carried out with a 30.5 meter (100 feet) station interval. Closures were made to base stations which were established on the baseline and drift corrections were made to each of the survey loops.

GEOLOGY

A description of the general geology is provided 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 (Upper Triassic) of interbedded volcanic and sedimentary rocks. The area of interest is intruded by the Omineca intrusions (Jurassic - Cretaceous?).

RESULTS

The Induced Polarization data is presented as pseudo-sections showing apparent resistivity, apparent chargeability and metal factor (Figure 3 - 11). The second separation is also plotted on plan maps for resistivity and chargeability (Figure 12 - 13) at a scale of 1:48,000

The magnetic data is presented in plan contoured form. (Figure 14).

INTERPRETATION

The survey covered two separate areas, (1) Lines 16 E - 16 W and (2) Lines 80 E - 104 E, and as each shows different characteristics, they are treated separately.

The magnetic survey was only conducted over the first area (Lines 16 E - 16W)

1. LINES 16 E - 16 W

A distinct apparent chargeability anomaly is located on Lines 16 W and 8 W at approximately Staion 1 S. (Figure 12). This anomaly appears to be located near a contact with an area of higher resistivity values to the north. The anomaly is not fully defined to the west but the results indicate a dip to the north east with the resistivity results indicating a plunge of the higher resistivity material to the south-east.

This anomaly is terminated to the south - east and is probably faulted off by a structure close to Line 8 E.

High apparent chargeability values occur on the south end of Line 0 but those appear to be directly related to an area of higher resistivity and this could be due to a different rock type at this location. It is possible that the high values in this area could be related to the previous zone described on Lines 8 W and 16 W with an east - west fault causing the displacement.

The response obtained on Line 16 E is very complex in terms of appaent chargeability and apparent resistivity. High apparent chargeability values near the surface (Station 13 S) appear to be related to a contact compared to the high values at depth (9 N) which are directly related to lower apparent resistivity values.

The magnetic survey shows considerable variation which is characteristic of a banded series of rocks. There is some indication of a major break in trends between Lines 0 and 8 E and this fact probably controlled the location of the river in this area.

2. LINES 80 E - 104 E

An area of very high chargeability on Lines 80 E - 96 E is apparently terminated to the south east by an apparent displacement between Lines 96 E and 104 E. The general apparent chargeability values show an approximate south east trend and extend close to the surface (Line 96 E). The associated resistivities are very complex but there appears to be some correlation between the higher chargeability values and resistivity gradients suggesting a contact relationship. Dips appear to be to the north (Lines 80 E and 88 E) and the apparent lack of depth extent on Line 96 E may be due to faulting combined with side effects produced by the electrode array.

The general geology of this area appears to be completely different from the first with possibly the exception of Line 104 E.

CONCLUSIONS AND RECOMMENDATIONS

A number of distinct apparent chargeability anomalies were located during the survey and are worthy of further investigation to determine the source. Drilling is recommended on the individual anomalies at the following locations:

(1) Line 8 W Station 4 S
(2) Line 16 E Station 9 N
(3) Line 0 Station 13 S
(4) Line 80 E Station 1 N
(5) Line 88 E Station 7 S

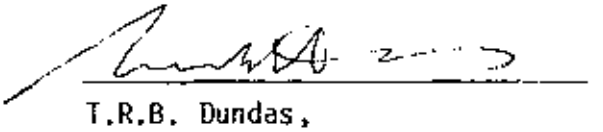
Respectively Submitted,

T.R.B. Dundas,
M. Sc., D.I.C., P. Geoph.
KENTING EXPLORATION SERVICES LIMITED

CERTIFICATE

I, Trevor R.B. Dundas, Hereby certify that:

1. I am a Geophysicist residing at 68 Brampton Crescent S.W. Calgary, Alberta.
2. I received a Bachelor of Science degree in Geology from Queen's University, Belfast in 1965, and M. Sc., and D.I.C. degree from Imperial College, University of London, in 1967. I have been practicing my profession since 1965.
3. I am a member of the Association of Professional Engineers, Geologists and Geophysicists of Alberta.
4. I have supervised and edited the writing of this report.
5. I am the Manager of the Geoscience Department, Kenting Exploration Services Limited and have been employed by the company since May, 1968.



T.R.B. Dundas,
M. Sc., D.I.C., P. Geoph.

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EXPLORATION SERVICES LIMITED

APPENDIX I

IN THE MATTER OF THE B.C. MINERAL ACT

AND IN THE MATTER OF A GEOPHYSICAL PROGRAMME

CARRIED OUT ON PORTIONS OF THE JEAN MINERAL CLAIMS

ON THE JEAN PROPERTY

LOCATED 96 KM NORTH OF FORT ST. JAMES IN THE OMINECA MINING DIVISION

OF THE PROVINCE OF BRITISH COLUMBIA, MORE PARTICULARLY

N.T.S.: 93N

S T A T E M E N T

I, ALAN R. SCOTT OF THE CITY OF VANCOUVER IN THE PROVINCE OF BRITISH COLUMBIA, 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 "APPENDIX II" TO THIS STATEMENT IS A TRUE COPY OF EXPENDITURES INCURRED ON GEOPHYSICAL SURVEY ON THE JEAN MINERAL CLAIMS;

3. THAT THE SAID EXPENDITURES WERE INCURRED BETWEEN JULY 3 TO JULY 23, 1978, FOR THE PURPOSE OF MINERAL EXPLORATION OF THE ABOVE NOTED CLAIMS.

Alan R. Scott
Geophysicist

ARS/deb
22 August 1978

APPENDIX II

JEAN PROPERTY 1978

STATEMENT OF EXPENDITURES

Salary - R.U. Bruaset 7 days @ $130.00	$ 910.00
Communication	$ 450.00
Surface Transportation	$ 295.00
Fixed Wing Transportation (N.T. Air)	$ 1,602.00
Helicopter Transportation (Northern Mtn. Helicopters)	$ 4,980.00
Camp Costs	$ 1,170.00
Ground Control 10.9 miles @ $300/mile Canadian Field Services Ltd.	$ 3,270.00
I.P. Contract Costs Kenting Geophysics	$ 14,200.00
Miscellaneous Equipment Costs	$ 501.00
Total Cost	$ 27,378.00

/deb

22 August 1978

Alan R. Scott,
Geophysicist

STATEMENT OF EXPENDITURES

FIELD WORK

W. Patterson	Geophysicist	July 3 - July 23, 1978
D. McPhearson	Operator	July 3 - July 23, 1978
J. Whetstone	Operator	July 3 - July 23, 1978
R. Porter	Helper	July 3 - July 23, 1978
T. Dundas	Chief Geoph. Interpratation	August 15 - August 17, 1978

MOBILIZATION AND DEMOBILIZATION	$ 2,125.00
Field Surveys (IP and Magnetic)	
15 days @ $ 725.00	$ 10,875.00
3 standby days @ $ 550.00	$ 1,650.00
Credit for Magnetic Survey (not complete)	($ 450.00)
TOTAL COST	$ 14,200.00

KENTING
EXPLORATION SERVICES LIMITED

KENTING

KENTING EXPLORATION SERVICES LIMITED

INVOICE 0621

Rec'd - She was processed on your ticket ws

August 03 19 7

MAKE CHEQUES PAYABLE TO:
KENTING EXPLORATION SERVICES LIMITED
5636 BURBANK CRESCENT S.E.
CALGARY, ALBERTA, CANADA T2H 1Z6

Cominco Limited
200 Granville Square
Vancouver, British Columbia
V6C 2R2

Attention: Mr. J. Klein / Chief Geophysicist

WE HAVE TODAY DEBITED YOUR ACCOUNT AS FOLLOWS

INVOICE NO. 0621
MONTH OF CHARGE July 19

Agreement for Geophysical Services
Kenting Project #2112
Fort Saint James British Columbia

Mobilization	50% of fixed fee		$4,250.00	2,125.00		
Operating July 6 - 23	15 days	@	725.00	10,875.00		
(Reduced for Standby)	3 days	@	550.00	1,650.00		
					14,650.00	
Less: Reduction (50%) in Field Work and Interpretation of Magnetic Data	9 days	@	50.00	(450.00)	(450.00)	
			Invoice Amount		$14,200.00	

112-030-WB2A

COMINCO
AUG 11 1978
EXPLORATION RESEARCH

APPENDIX III

C E R T I F I C A T I O N

I, ALAN SCOTT, OF 4013 W. 14th AVENUE IN THE CITY OF VANCOUVER, IN THE PROVINCE OF BRITISH COLUMBIA, DO HEREBY CERTIFY THAT: -

1. I graduated from the University of British Columbia in 1970 with a B.Sc. in Geophysics.

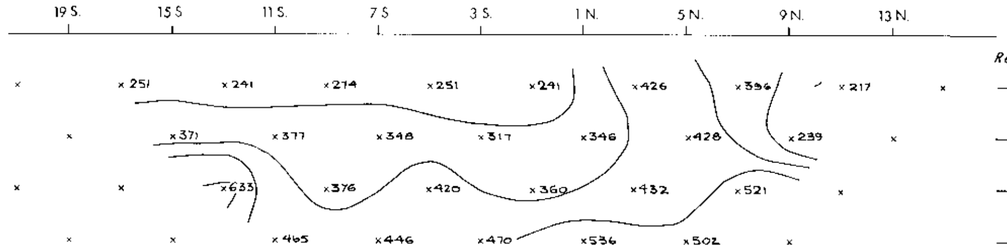
2. I am a member of the Association of Professional Engineers of the Province of Saskatchewan, the Society of Exploration Geophysicists of America, and the British Columbia Geophysical Society.

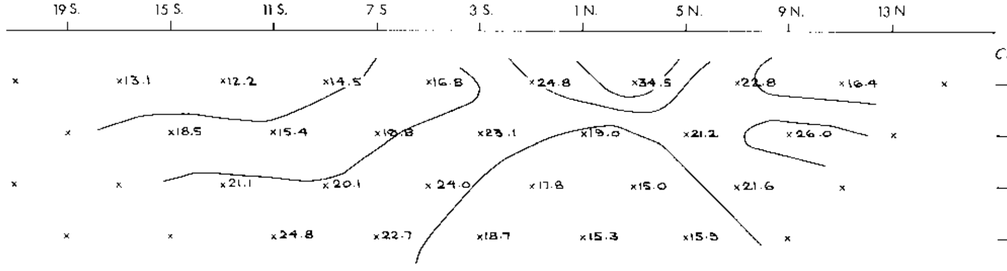
3. I have been practising my profession for the past eight years.

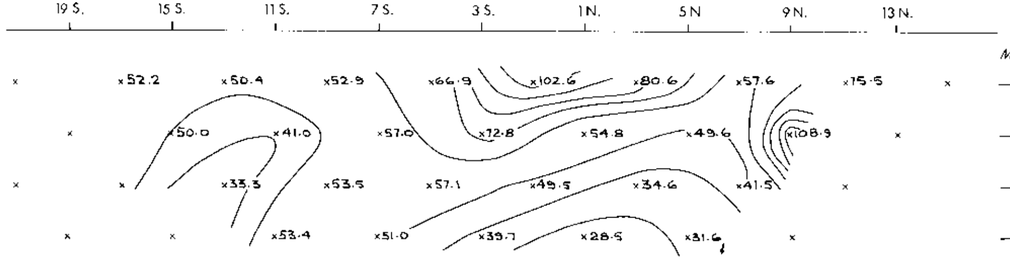
Alan R. Scott
Geophysicist

ARS/deb
22 August 1978

current electrode to North







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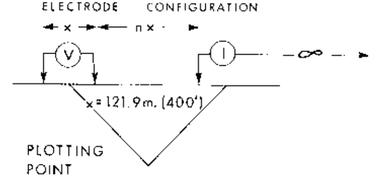
LINE NO.- 104 E.

ELECTRODE CONFIGURATION



DATE SURVEYED: JULY 1978

APPROVED: _____

DATE: AUGUST 1978

SCALE: 1:4,800 (1" = 400')

FIGURE NO. 3.

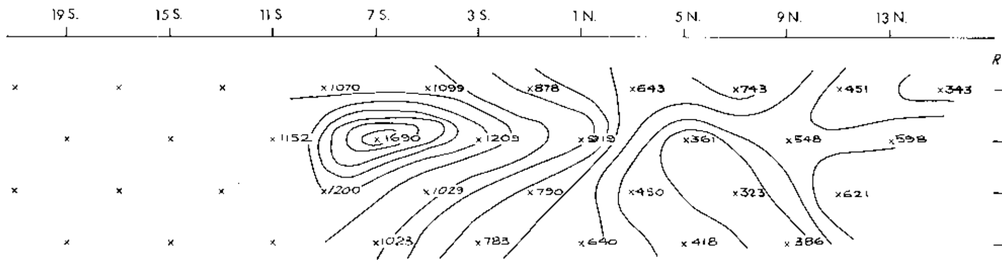
INDUCED POLARIZATION AND RESISTIVITY SURVEY

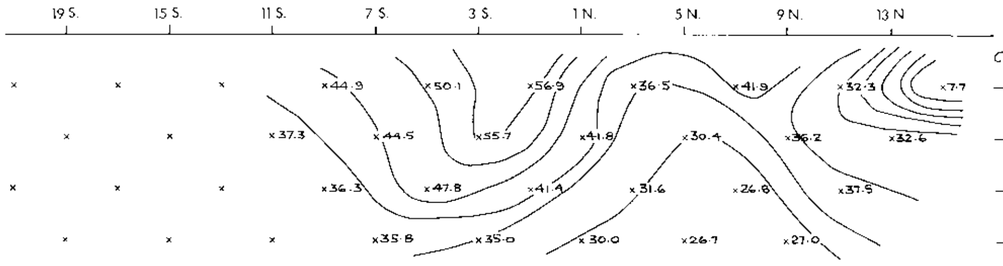
SURVEYED BY: KENTING EXPLORATION SERVICES LIMITED

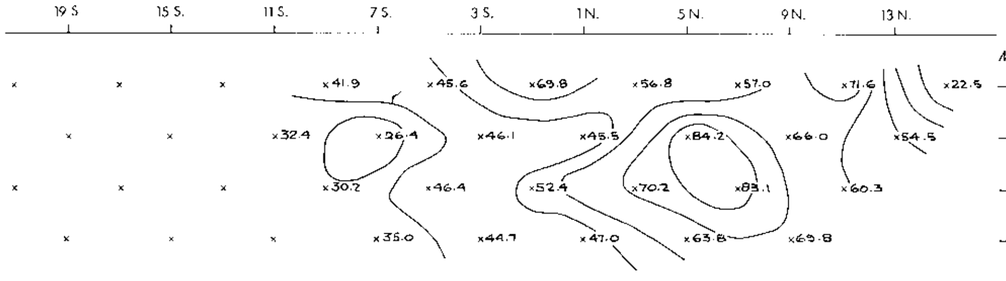
LINE NO.-

6948

current electrode to North

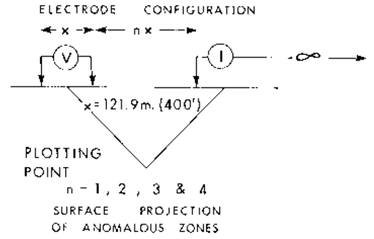






COMINCO LTD.

LINE NO.- 96.E.



DATE SURVEYED: JULY 1978

APPROVED: _____

DATE: AUGUST 1978

SCALE: 1:4,800 (1" = 400')

FIGURE NO. 4

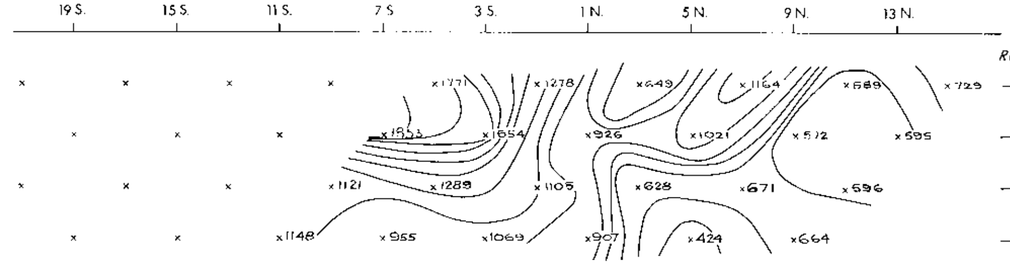
INDUCED POLARIZATION AND RESISTIVITY SURVEY

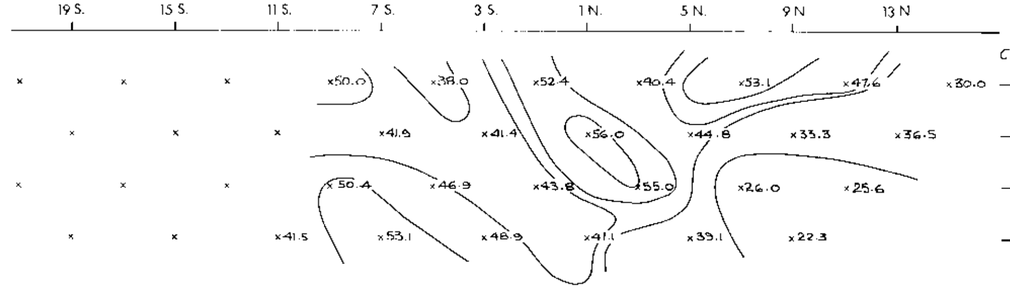
SURVEYED BY: KENTING EXPLORATION SERVICES LIMITED

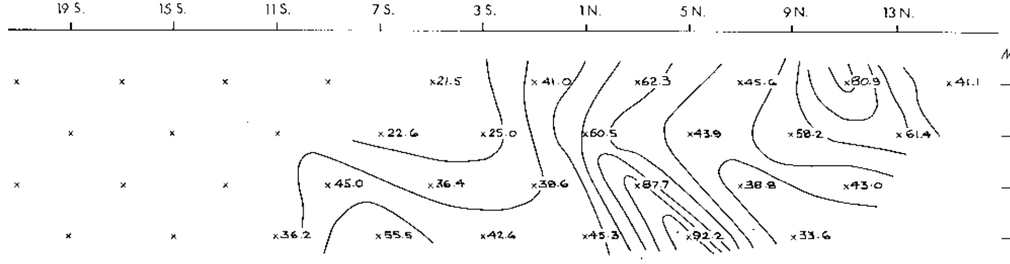
LINE NO.-

6948

current electrode to North







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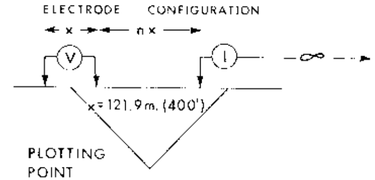
LINE NO.- 88.E.

ELECTRODE CONFIGURATION



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APPROVED: _____

DATE: AUGUST 1978

SCALE: 1:4,800 (1" = 400')

FIGURE NO. 5.

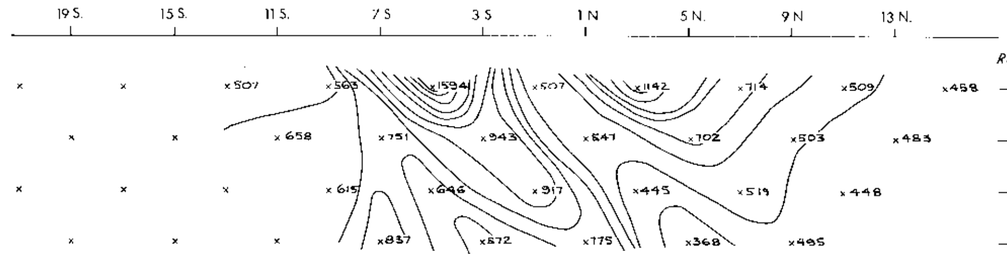
INDUCED POLARIZATION AND RESISTIVITY SURVEY

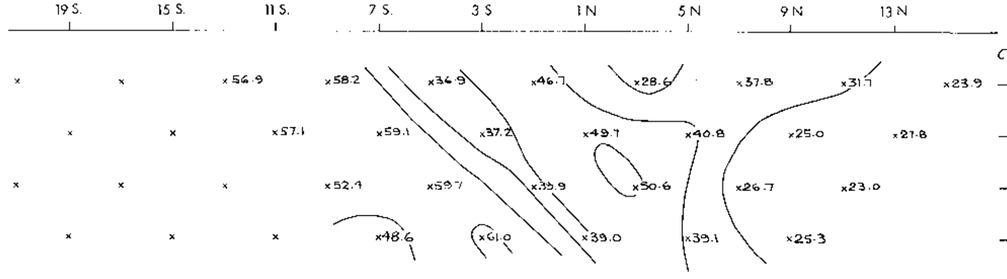
SURVEYED BY: KENTING EXPLORATION SERVICES LIMITED

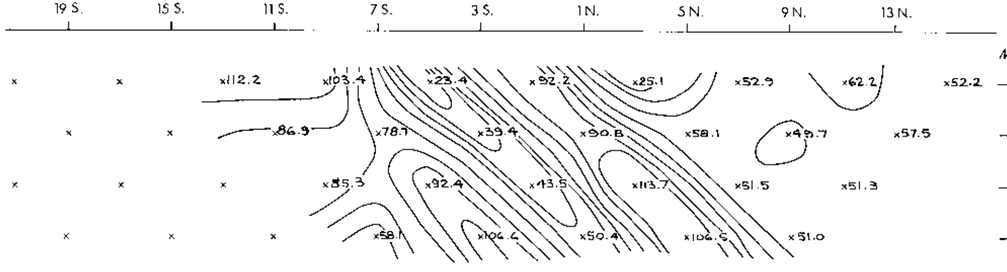
LINE NO.-

6948

current electrode to North







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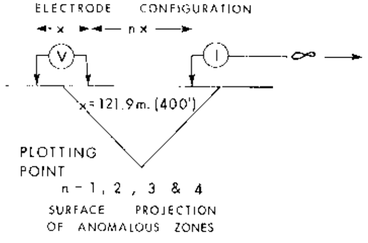

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APPROVED:

DATE: AUGUST 1978

SCALE: 1:4,800 (1" = 400')

FIGURE NO. 6.

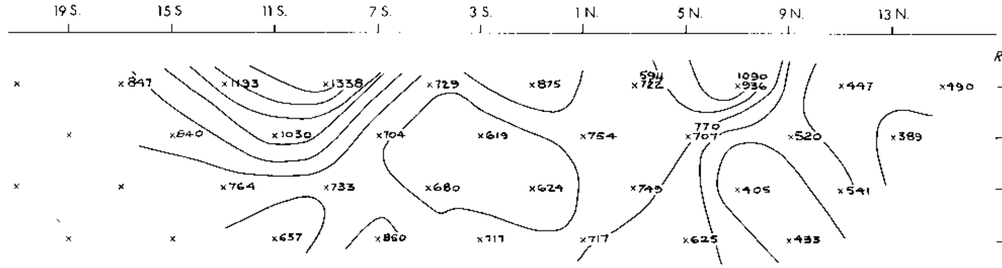
INDUCED POLARIZATION AND RESISTIVITY SURVEY

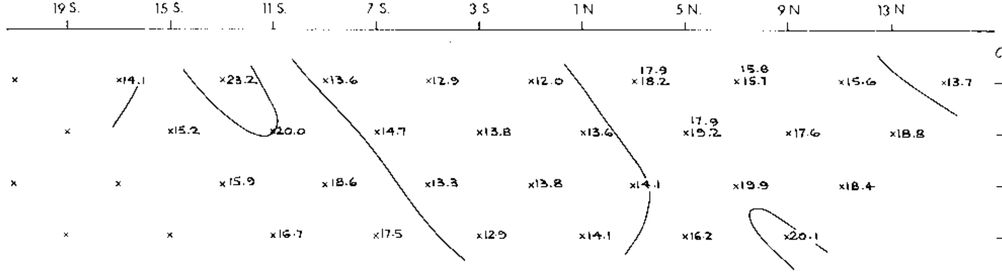
SURVEYED BY: KENTING EXPLORATION SERVICES LIMITED

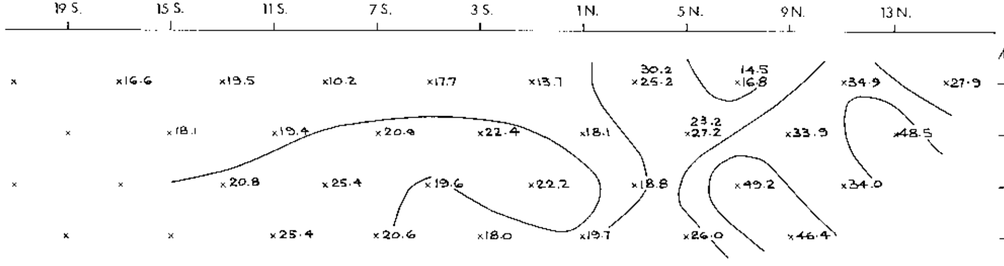
LINE NO.-

6948

current electrode to North







COMINCO LTD.

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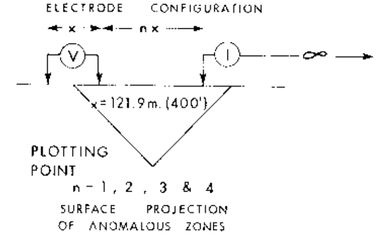


DATE SURVEYED: JULY 1978

APPROVED:

DATE: AUGUST 1978

SCALE: 1:4,800 (1" = 400')

FIGURE NO. 7

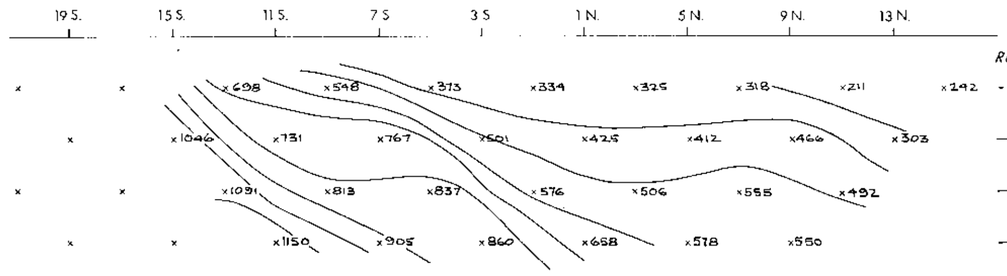
INDUCED POLARIZATION AND RESISTIVITY SURVEY

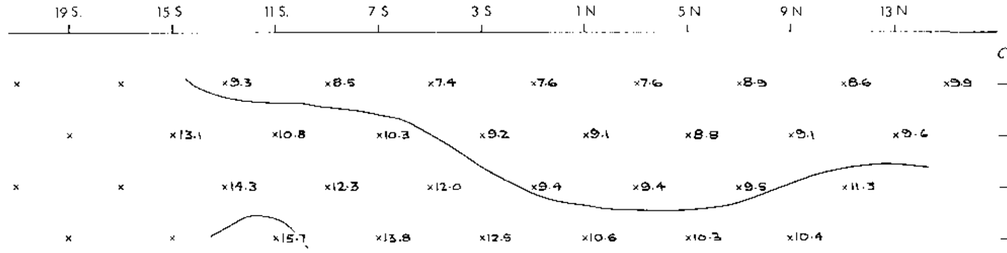
SURVEYED BY: KENTING EXPLORATION SERVICES LIMITED

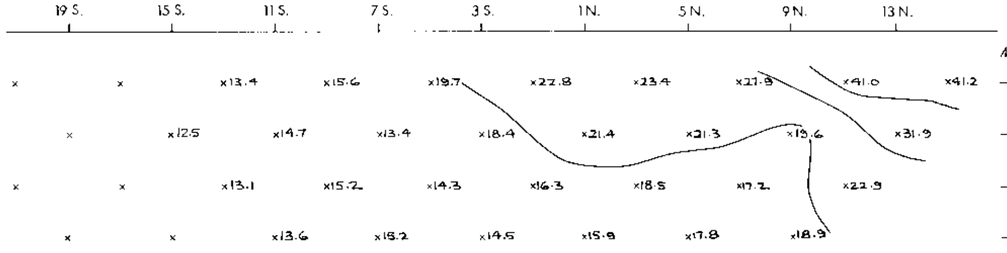
LINE NO.-

6948

current electrode to North



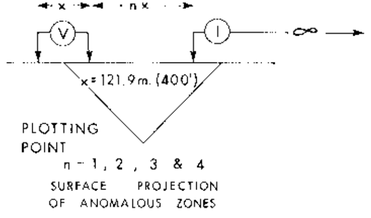




COMINCO LTD.

LINE NO. - 8.E.

ELECTRODE CONFIGURATION



DATE SURVEYED: JULY 1978

APPROVED: _____

DATE: AUGUST 1978

SCALE: 1:4,800 (1" = 400')

FIGURE NO. 8.

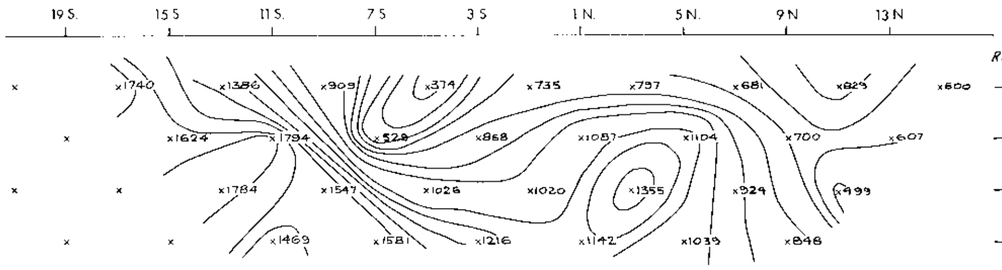
INDUCED POLARIZATION AND RESISTIVITY SURVEY

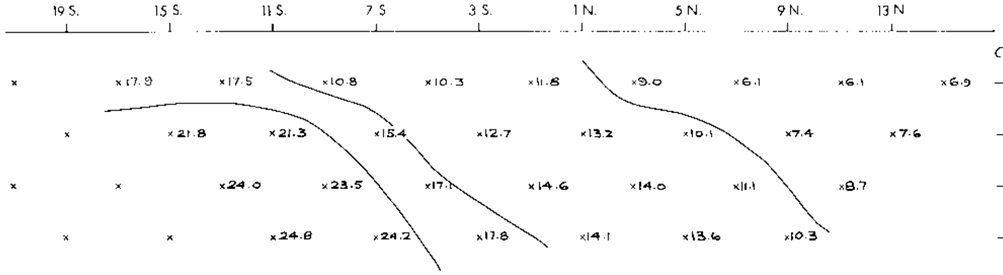
SURVEYED BY: KENTING EXPLORATION SERVICES LIMITED

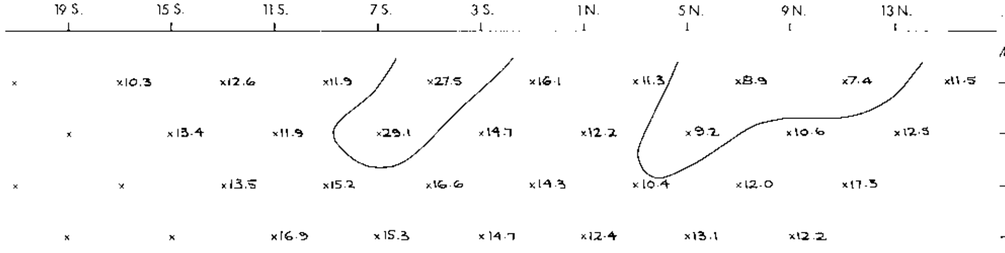
LINE NO.-

6948

current electrode to North



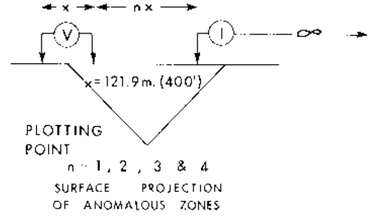




COMINCO LTD.

LINE NO.- Q+00

ELECTRODE CONFIGURATION



DATE SURVEYED: JULY 1978

APPROVED: _____

DATE: AUGUST 1978

SCALE: 1:4,800 (1" = 400')

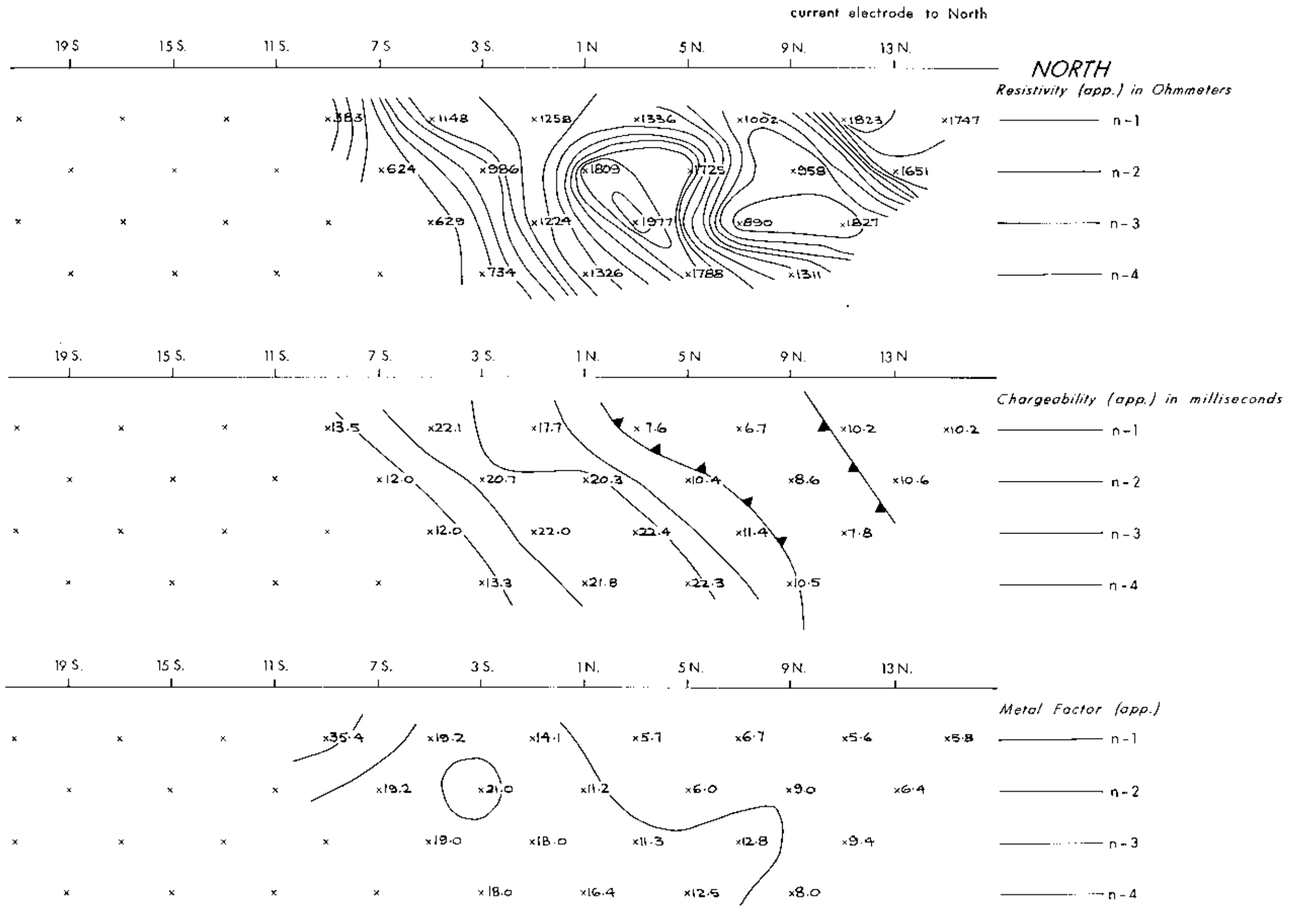
FIGURE NO. 9.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

SURVEYED BY: KENTING EXPLORATION SERVICES LIMITED

LINE NO.-

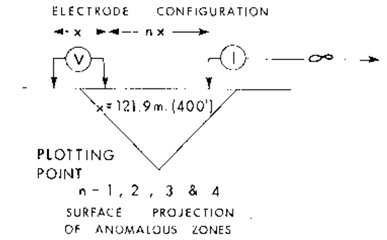
6948



COMINCO LTD.

LINE NO.- 8.W

ELECTRODE CONFIGURATION



DATE SURVEYED: JULY 1978

APPROVED:

DATE: AUGUST 1978

SCALE: 1:4,800 (1" = 400')

FIGURE NO. 10.

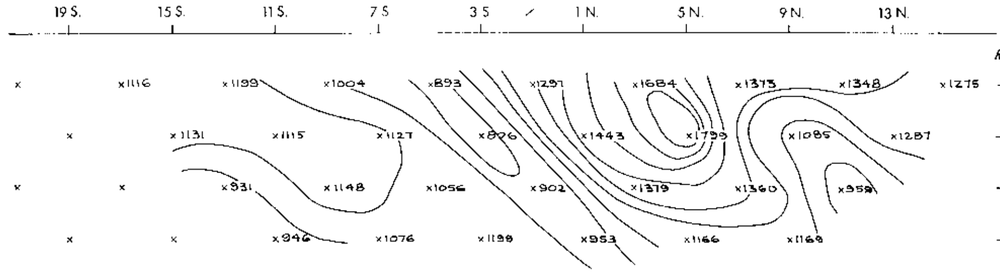
INDUCED POLARIZATION AND RESISTIVITY SURVEY

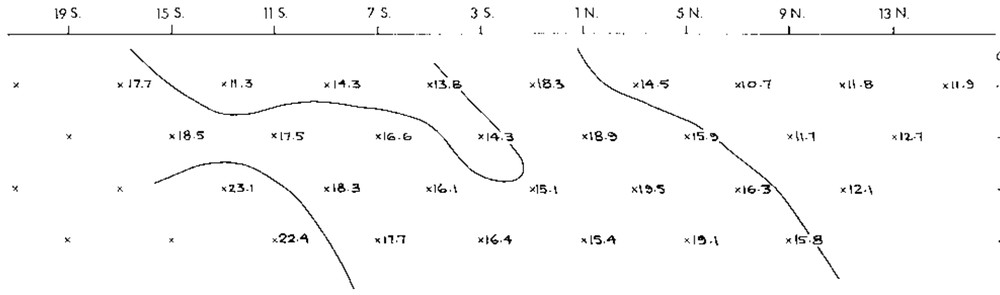
SURVEYED BY: KENTING EXPLORATION SERVICES LIMITED

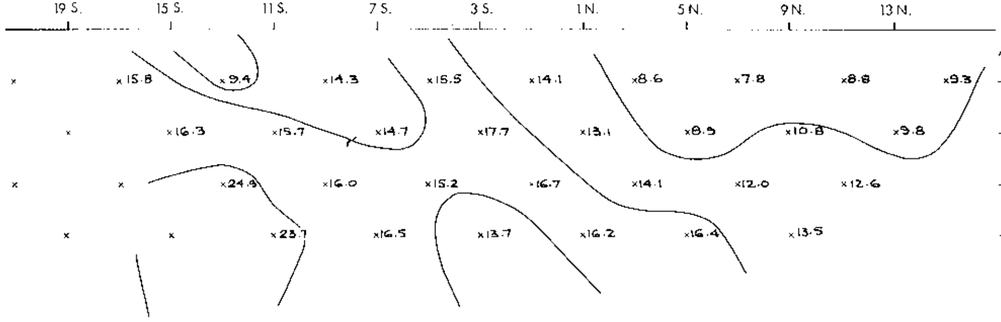
LINE NO.-

6948

current electrode to North



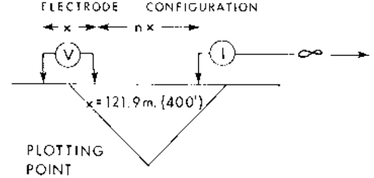




COMINCO LTD.

LINE NO.- 16 W.

ELECTRODE CONFIGURATION



DATE SURVEYED: JULY 1978

APPROVED: .....

DATE: AUGUST 1978

SCALE: 1:4,800 (1" = 400')

FIGURE NO. 11

INDUCED POLARIZATION AND RESISTIVITY SURVEY

SURVEYED BY: KENTING EXPLORATION SERVICES LIMITED

LINE NO.-

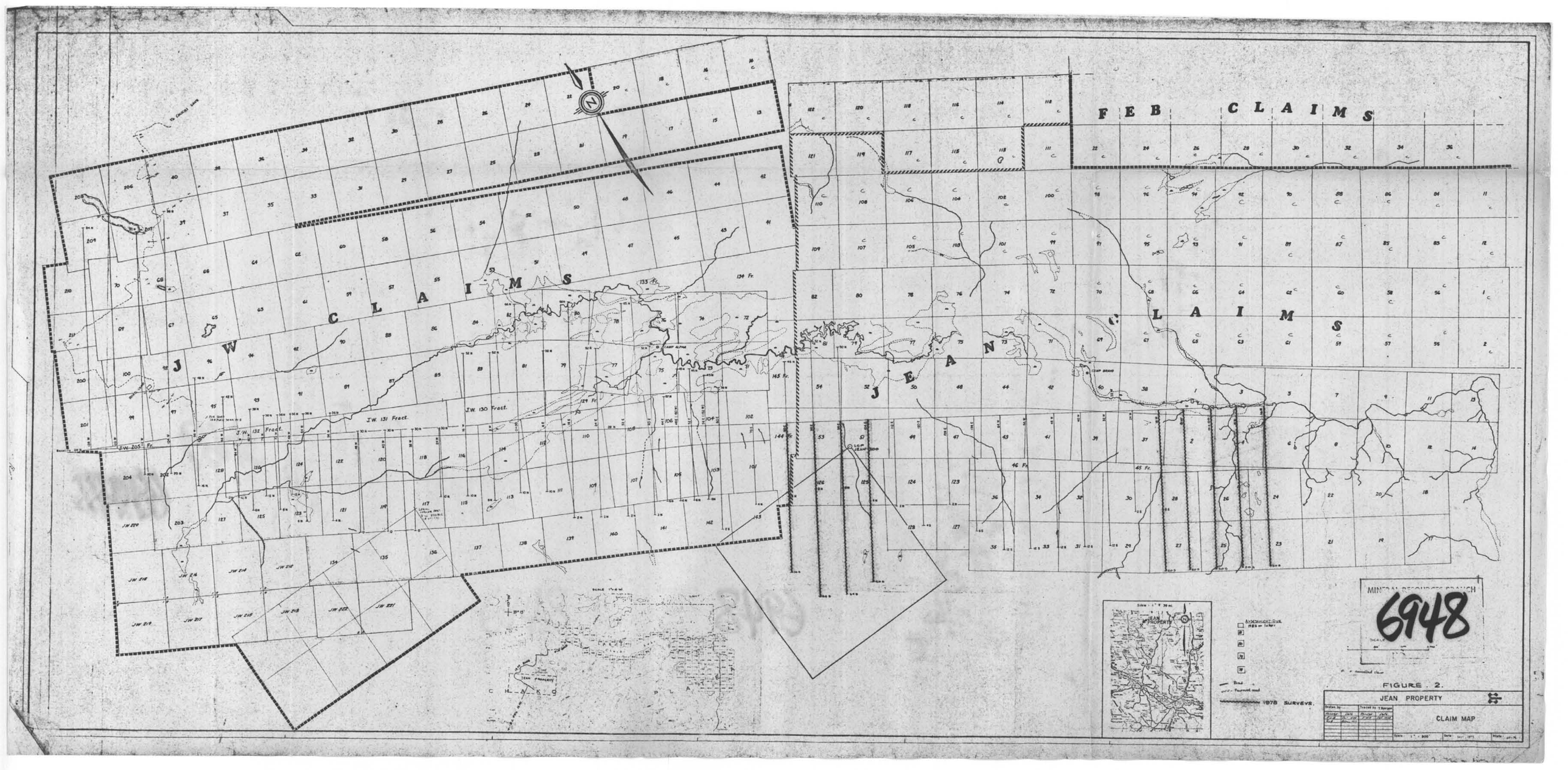


FIGURE 2.

JEAN PROPERTY

CLAIM MAP

FAULT : ?

CONTACT AREA. High Chargeability

JEAN PROPERTY

N.T.S. 93N/2

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

Chargeability (app.) in milliseconds (n=2) Current Electrode to North

Scale: 1" = 400' | Date: August 1978 | Plate: Figure 12

FORM 210-0690

JEAN PROPERTY

N.T.S. 93N/2

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

Apparent Resistivity ohm-meters (n=2) Current Electrode to North

Scale: 1" = 400' Date: August 1978 Plate: Figure 13

FORM 210-Jc83


6948
CAMP BRAVO
BL 28 N
BL 28 N
SCALE
0 400 800 1200 1600
FEET
0 100 200 300 400 500
METRES
JEAN PROPERTY
N.T.S. 93N/2
Drawn by:
Traced by:
Contour Interval 100 γ
Magnetometer Survey
Scale: 1" = 400'
Date: August 1978
Plate: Figure 14
FORM 210-0680