

5951

A REPORT

ON

AN INDUCED POLARIZATION SURVEY

Nahwitti Lake, British Columbia

92L/12

FOR

RIO TINTO CANADIAN EXPLORATION LTD.

Vancouver, British Columbia

BY

PETER E. WALCOTT & ASSOCIATES LIMITED

Vancouver, British Columbia

May 1976

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
No. 5951

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INTRODUCTION

Between March 15th and 19th 1976, Peter E. Walcott & Associates Limited carried out an induced polarization test survey over part of a property, located on the north side of Nahwitti Lake, Port Hardy area, British Columbia, for Rio Tinto Canadian Exploration Ltd.

The survey was carried out over three flagged lines, two approximately running north south and the other east west as shown on the accompanying maps.

Measurements (first to fourth separation) of apparent resistivity and frequency effect (the I.P. response parameter) were made using the "dipole - dipole" method of surveying with frequencies of 5 and 0.3 Hz. 100 Foot dipoles were used on the two north south lines while 200 foot dipoles were used on the east west line.

The data are presented in contour form on individual line profiles that are contained in this report.

PROPERTY, LOCATION AND ACCESS

The property is located in the Nanaimo Mining District of British Columbia and consists of the following claims:

FTR	1 - 15
JEAN	1 - 10
LAKE	1

The claims are situated on the northwest end of Nahwitti Lake, a small lake some 20 miles from Port Hardy along the Holberg road.

Access is obtained by means of two wheel drive vehicle from Port Hardy along the above mentioned road.

PREVIOUS WORK

Previous work on the property consisted of soil sampling, magnetic, electromagnetic and self potential surveys, pack sack and regular diamong drill holes.

The majority of this work was carried out by Falconbridge Nickel Mines Ltd. and the results are documented in reports held by Rio Tinto Canadian Exploration Ltd.

PURPOSE

The purpose of the survey was to try to delineate using the I.P. technique the possible down dip projection of the favourable showing occurring on the contact between the Karmutsen Volcanics and the Quatsino Limestone.

GEOLOGY

The reader is referred to the forementioned reports held by Rio Tinto Canadian Exploration Ltd.

SURVEY SPECIFICATIONS

The induced polarization (I.P.) survey was carried out using a system manufactured by McPhar Geophysics Limited of Don Mills, Ontario. Measurements with this system are made in the frequency domain.

The system basically consists of three units, a receiver, a transmitter and a motor generator. The transmitter, which obtains its power from the 2.5 kw 400 cycle generator driven by a gasoline engine, injects current into the ground at two electrodes C₁ and C₂ at two preselected frequencies, while the receiver, a very stable and sensitive potentiometer tuned to the frequency selected, makes measurements of observed voltages across the potential electrodes P₁ and P₂.

The data recorded in the field consists of careful measurements of the current (I) flowing through electrodes C₁ and C₂, the voltage (V) appearing between the potential electrodes P₁ and P₂ on the low frequency, and the "percentage apparent frequency effect" appearing between P₁ and P₂ (the receiver is designed to measure directly:

$$\text{the \%age F.E.} = \frac{(P_a \text{ low} - P_a \text{ high}) \times 100}{P_a \text{ high}}$$

The apparent resistivity (P_a) in ohm feet is proportional to the ratio of the measured voltage and current, the proportionality factor depending on the geometry of the array used. In Practise $\frac{P_a}{2\pi}$ is plotted.

A third parameter termed the "metal factor" is also calculated by dividing the apparent frequency effect by $\frac{P_a}{2\pi}$ and multiplying by 1,000.

The survey was carried out using the "dipole - dipole" electrode array. This electrode configuration and the methods of presenting the results are illustrated in the appendix. Depth penetration with this array is increased or decreased by increasing or decreasing "a" and/or "n".

In practise, the equipment is set up at a particular station of the line to be surveyed; three transmitting dipoles are laid out to the rear, measurements are made for all possible combinations of transmitting and receiving dipoles, the latter consisting of two porous pots filled with an electrolyte copper sulphate solution "a" feet apart, up to the fourth separation, i.e. n = 4; the equipment is moved 3 "a" feet along the line to the next set-up.

A 100 foot dipole was used on Lines 1 and 2 while a 200 foot dipole was used on Line 3.

DISCUSSION OF RESULTS

Originally the idea was conceived of running I.P. lines parallel to the limestone-volcanic contact over the limestones south of the contact using appropriate dipole lengths in an effort to determine the existence and dip of the possible down dip extension of the surface showing.

However at the time of planning no consideration was given to the possibility that graphitic horizons could occur within the limestone unit, a fact that was readily established on surveying the first north south line.

Thus the high frequency effects and low resistivities obtained on the survey appear to be due to argillaceous limestone, and for the most are confined to the central hill.

This is borne out by the 10 foot dipole work on the hill along Line 3 between Lines 1 and 2 where 1st to 7th separation measurements were made with resulting higher frequency effects and lower resistivities with increasing depth - see appendix for results.

This zone of higher frequency effects and lower resistivities also roughly conforms with the S.P. anomaly obtained by Falconbridge on a previous survey.

The possibility exists that some sulphides could be associated with the higher frequency effects near the limestone-volcanic contact where the resistivities change more abruptly than the frequency effects i.e. the frequency effects are still high for higher resistivity values, and there is a definite resistivity contrast between the volcanics (high resistivity) and the limestones (low resistivity).

However this is more speculative than diagnostic as the effect of the argillaceous limestone effectively mask any hope of seeing and/or tracing the possible sulphide zone as previously envisioned.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Between March 15th and 19th, 1976 Peter E. Walcott & Associates Limited carried out an induced polarization test survey over part of a property for Rio Tinto Canadian Exploration Ltd.

The property, the FTR, JEAN & LAKE claims, is situated on and around the shores of Nahwitti Lake, some 20 miles northwest of the town of Port Hardy, British Columbia.

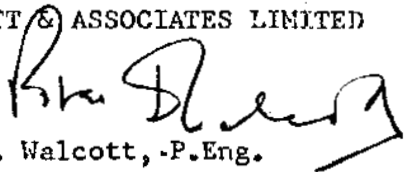
The I.P. survey outlined an area of higher frequency effects and lower resistivities corresponding to the location of outcropping and suboutcropping argillaceous limestones.

These limestones effectively masked any hope of locating and defining the possible sulphide zone occurring at the contact with the volcanics at depth.

As a result of the survey the writer concludes that it is not possible to define the proposed target by means of geophysical techniques - no magnetic response is associated with the sulphides - and suggests that the only way to probe for the possible down dip extension of the known sulphides is to drill a hole under the hill from the lake edge.

Respectfully submitted,

PETER E. WALCOTT & ASSOCIATES LIMITED


Peter E. Walcott, -P.Eng.
Geophysicist

Vancouver, B.C.

May 1976

COST OF SURVEY

Peter E. Walcott & Associates Limited undertook the survey on a daily basis. Mobilization and draughting charges were extra so that the total cost of services provided was \$2,343.76.

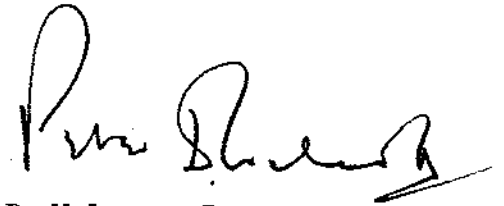
PERSONNEL EMPLOYED ON SURVEY

<u>Name</u>	<u>Occupation</u>	<u>Address</u>	<u>Dates</u>
Peter E. Walcott	Geophysicist	605 Rutland Court Coquitlam, B.C.	March 15 - 19, 76 May 6th, 1976
R.V. Longe	Geologist	Rio Tinto Canadian Exploration Ltd., Vancouver, B.C.	March 15 - 16th, 1976
J. White	Helper	General Delivery Port Hardy, B.C.	March 16 - 19th, 1976
T. Smith	"	"	"
T. Wilson	"	"	March 18th - 19th, 1976
J. Winfield	Draughting	Altair Drafting Serv. Vancouver, B.C.	May 12th - 13th, 1976
J. Walcott	Typing	605 Rutland Court Coquitlam, B.C.	May 12th, 1976

CERTIFICATION

I, Peter E. Walcott, of the Municipality of Coquitlam, British Columbia, hereby certify that:

1. I am a graduate of the University of Toronto in 1962 with a B.A.Sc. in Engineering Physics, Geophysics Option.
2. I have been practising my profession for the last fourteen years.
3. I am a member of the Association of Professional Engineers of British Columbia, Ontario and the Yukon Territory.
4. I hold no interest, direct or indirect, in the securities or properties of Rio Tinto Canadian Exploration Ltd., nor do I expect to receive any.



Peter E. Walcott, P.Eng.

Vancouver,
British Columbia -

May 1976

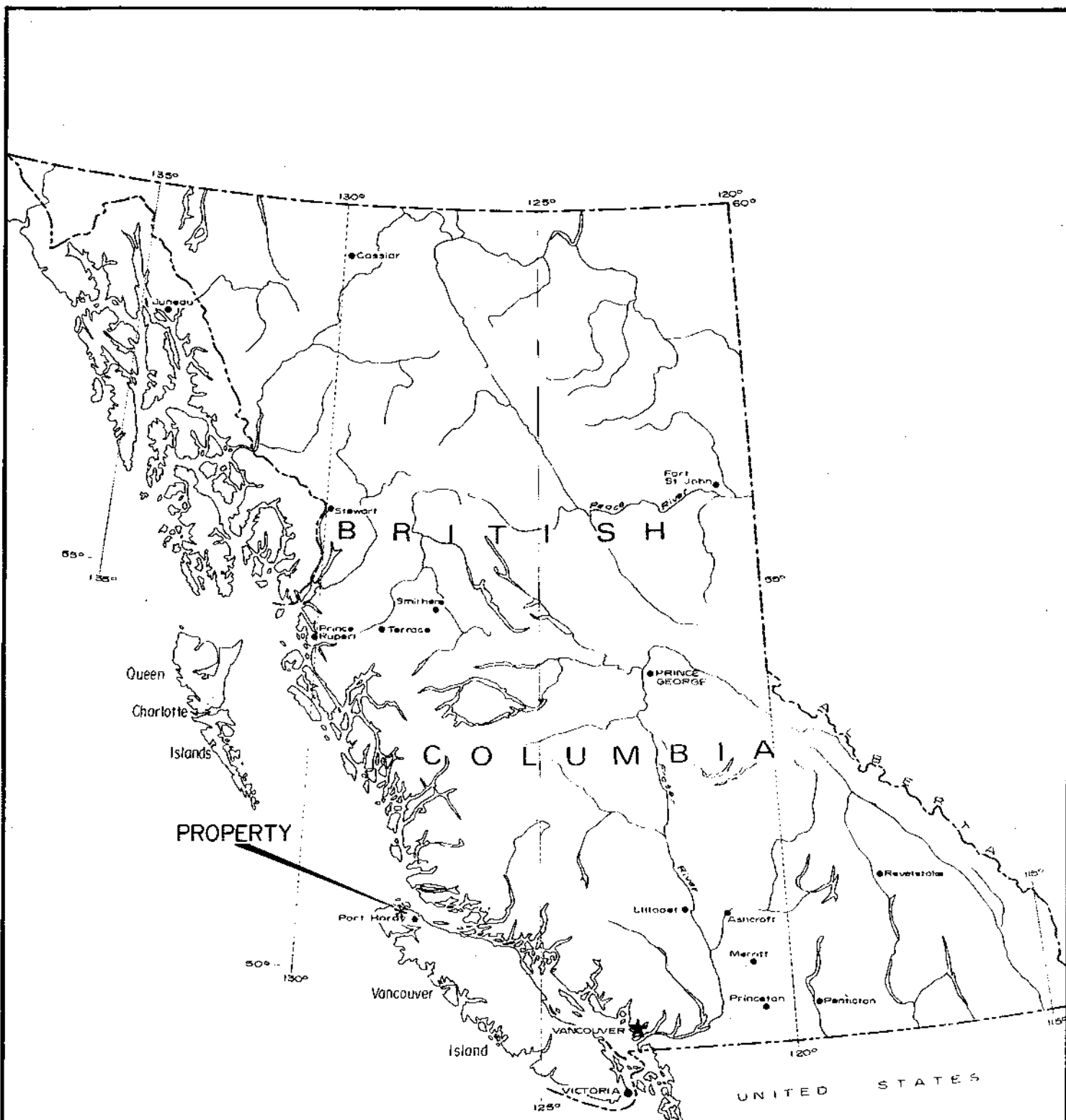
10 FOOT EXPANDER ON LINE 3

Transmitting dipole kept fixed, receiving dipole moved.

Separation	$P_a/2 T_T$	% F.E.
1	738	2.9
2	748	4.5
3	690	4.5
4	616	4.5
5	449	5.5
6	339	7.0
7	220	8.2

A P P E N D I X

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RIO TINTO CANADIAN EXPLORATION LTD.
 FTR, JEAN, LAKE CLAIMS; NANAIMO M.D., B.C.
**PROPERTY LOCATION
 MAP**
 MILES 0 50 100 200 MILES
 MAP NO W-216-1 PETER E. WALCOTT & ASSOC. LTD
 TO ACCOMPANY A REPORT BY
 PETER E. WALCOTT P.Eng., DATED MAY-1976



L-2 L-1

0 0

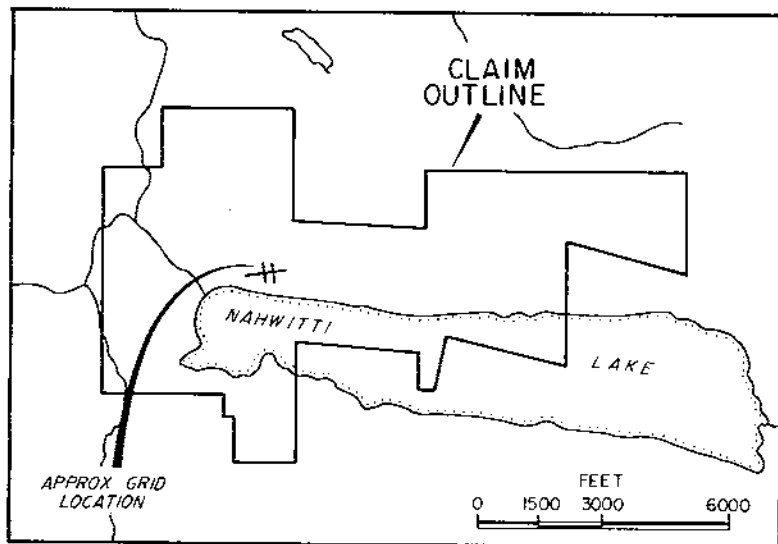
Slide area
9+75W

Along trail

Showing 2+00S

Trench
6+75W

L-3

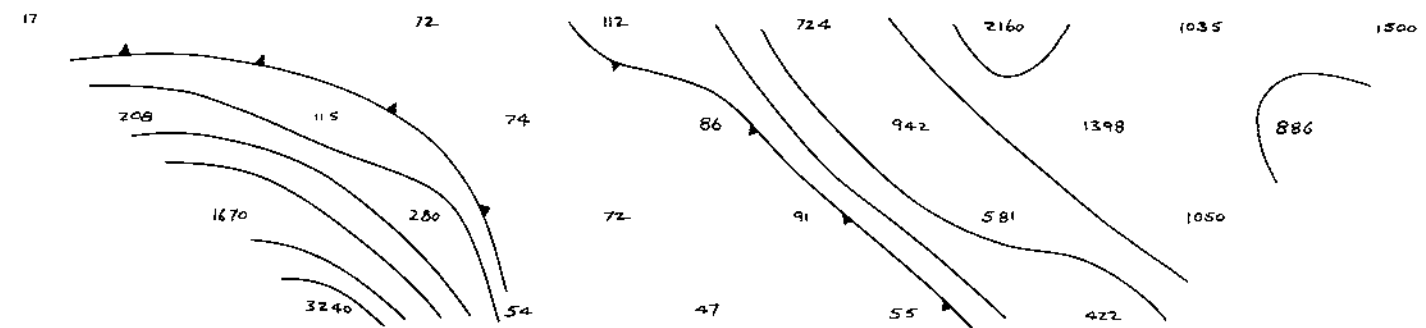
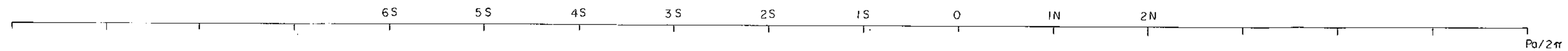


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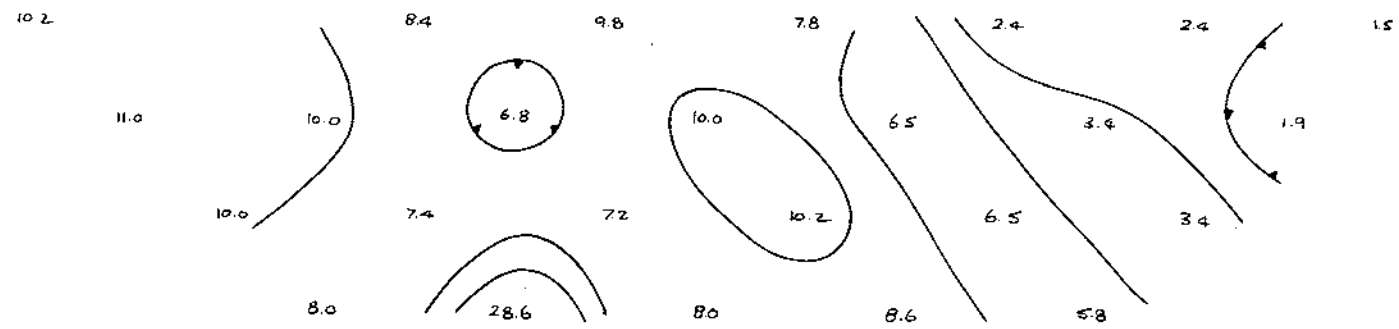
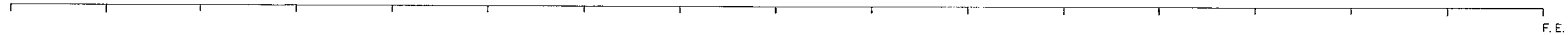
RIO TINTO CANADIAN EXPLORATION LTD.
FTR, JEAN, LAKE CLAIMS; NANAIMO M.D., B.C.
CLAIMS & GRID
LOCATION

FEET 100 50 0 100 200 300 FEET

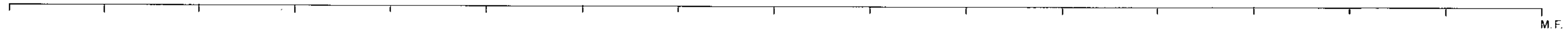
MAP NO. W-216-2 PETER E. WALCOTT & ASSOC. LTD.
TO ACCOMPANY A REPORT BY
PETER E. WALCOTT P.Eng., DATED MAY-1976



- N=1
- N=2
- N=3
- N=4



- N=1
- N=2
- N=3
- N=4



- N=1
- N=2
- N=3
- N=4

RIO TINTO CANADIAN
EXPLORATION LTD.

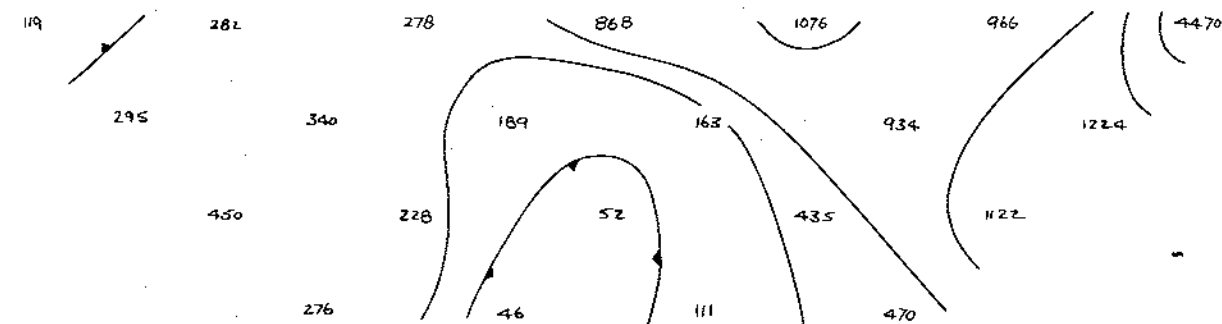
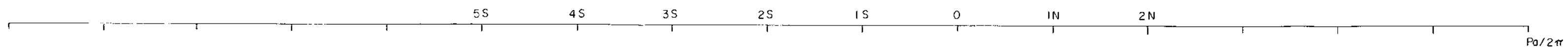
FTR, JEAN, LAKE CLAIMS

L-1

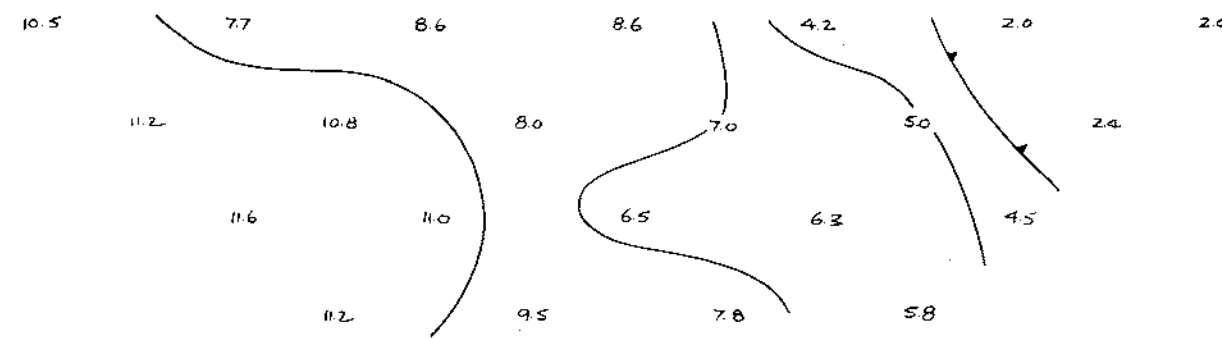
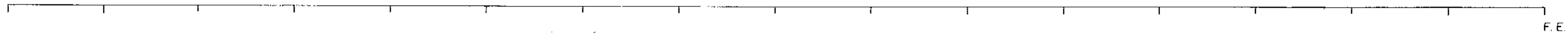
a = 100'
FREQUENCY 0.3 & 5.0 C.P.S.

SCALE: 1" = 100'

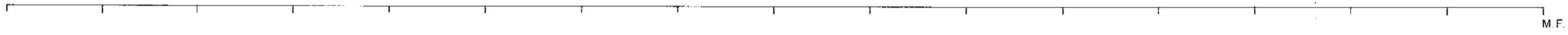
MINERAL RESOURCES BRANCH
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- N=1
- N=2
- N=3
- N=4



- N=1
- N=2
- N=3
- N=4



- N=1
- N=2
- N=3
- N=4

RIO TINTO CANADIAN
EXPLORATION LTD.

FTR, JEAN, LAKE CLAIMS

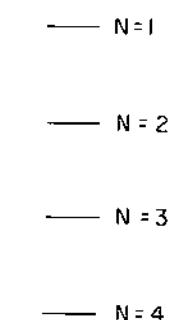
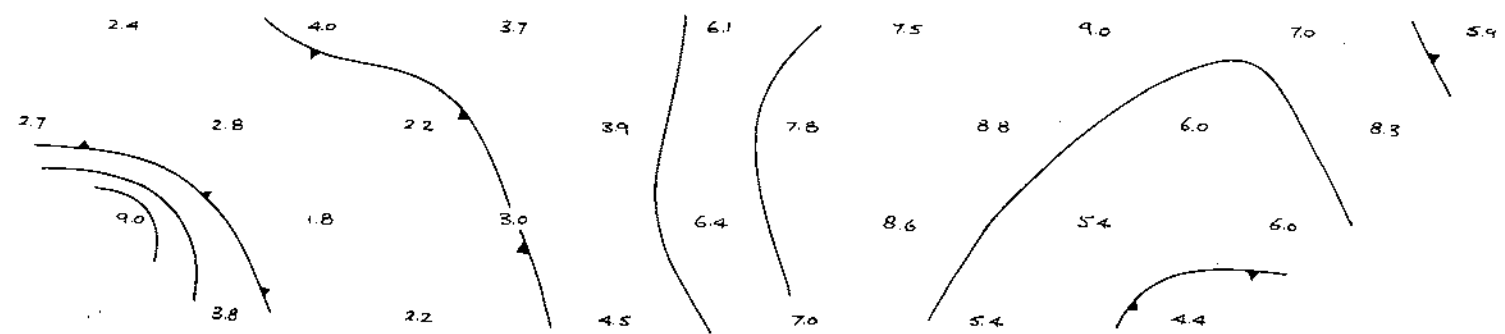
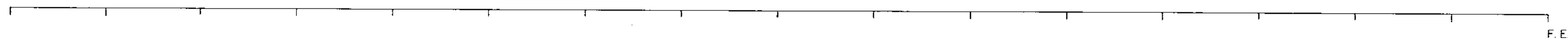
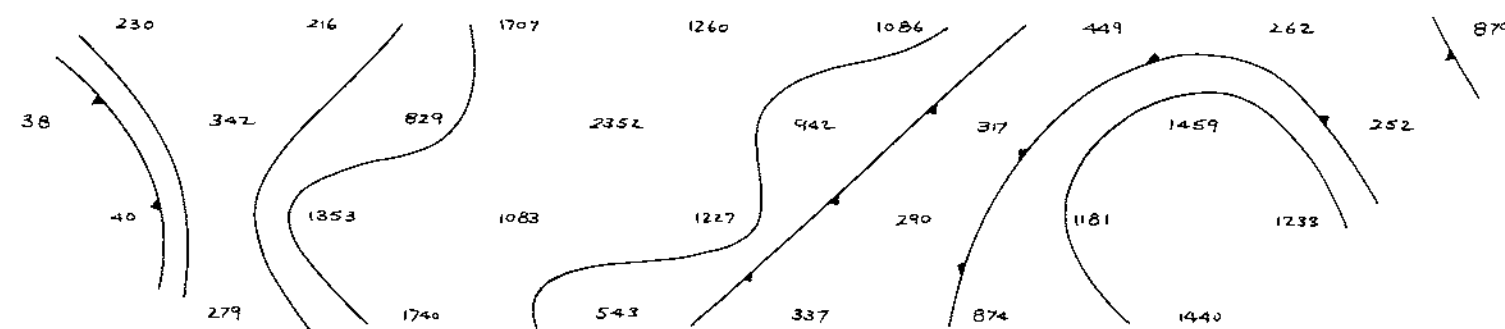
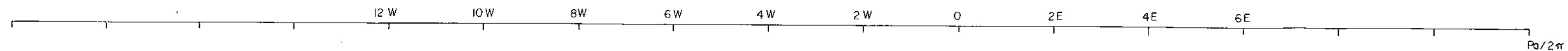
L.-2

a = 100'

FREQUENCY 0.3 & 5.0 C.P.S.

SCALE: 1" = 100'

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RIO TINTO CANADIAN
EXPLORATION LTD.

FTR, JEAN, LAKE CLAIMS

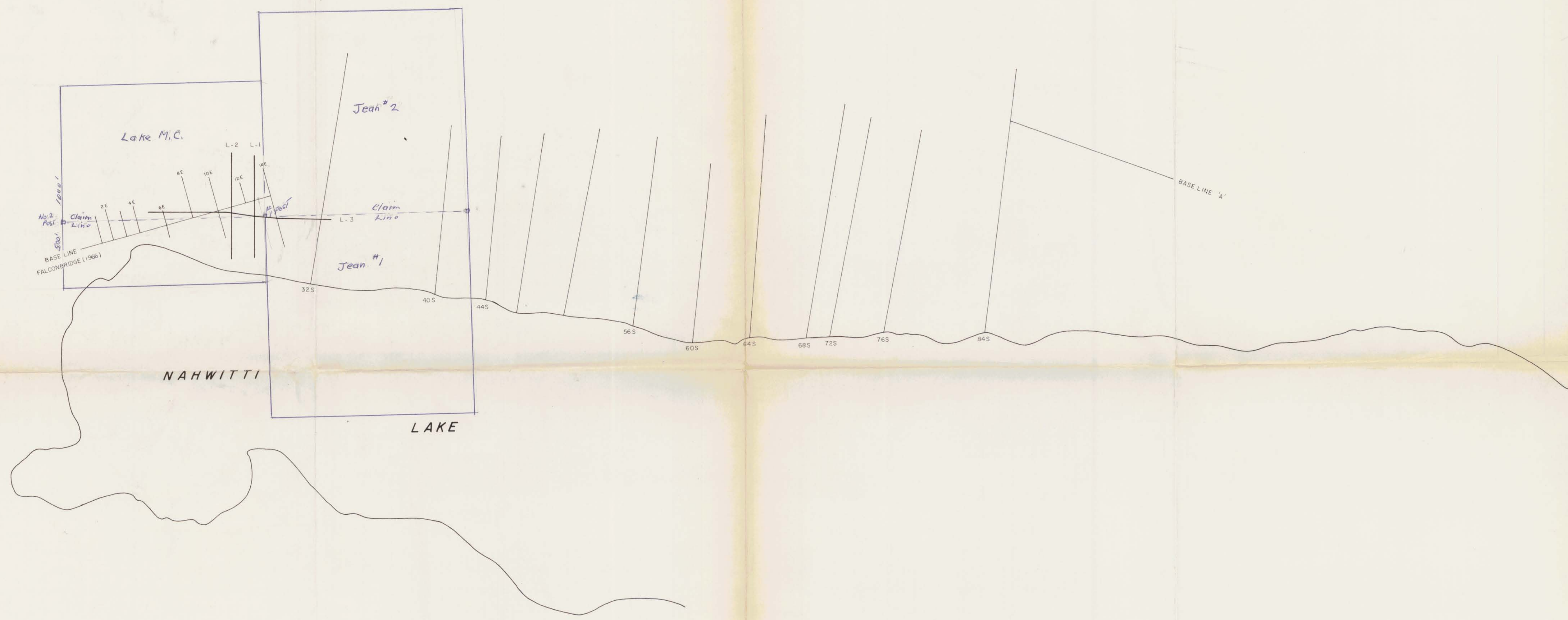
L.-3

a = 200'

FREQUENCY 0.3 & 5.0 C.P.S.

SCALE: 1" = 200'

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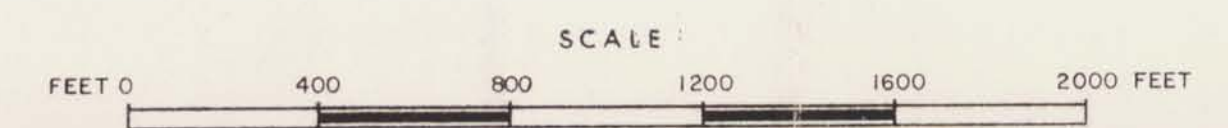
M-1

MINERAL RESOURCES BRANCH
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MAP NO. #1



1976 Grid Lines Labelled L-1, L-2 and L-3

N.T.S 92L/12



NAHWITTI LAKE PROSPECT	
GRID LINES	
	DWG.