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#7135

A Geophysical Report

on

An Induced Polarization Survey

Keystone & Rover Grids

Coquihalla Valley Area, B.C.
(49°41'N, 121°01'W)

N.T.S. 92H/11E

Survey Dates: July 21st - Aug. 14th, 1978

by

Peter E. Walcott, P.Eng.

November 1978

A REPORT

ON

AN INDUCED POLARIZATION SURVEY

Coquihalla Valley Area, B.C.

FOR

WESTERN MINES LIMITED

Vancouver, British Columbia

BY

PETER E. WALCOTT & ASSOCIATES LIMITED

Vancouver, British Columbia

NOVEMBER 1970

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INTRODUCTION

Between July 21st and August 14th, 1970, Peter E. Walcott & Associates Limited carried out a limited induced polarization (I.P.) survey over part of a property located in the Coquihalla Valley area of British Columbia, held by Western Mines Limited.

The survey was carried out over five lines in two areas of the property known as the Keystone and Rover areas respectively.

First to fifth separation measurements of apparent chargeability (the I.P. response parameter) and resistivity were made using the "Pole- dipole" method of surveying with a 300 metre dipole and 150 metre station interval.

The data are presented in profile form on Maps W-257-1 to 5 that accompany this report.

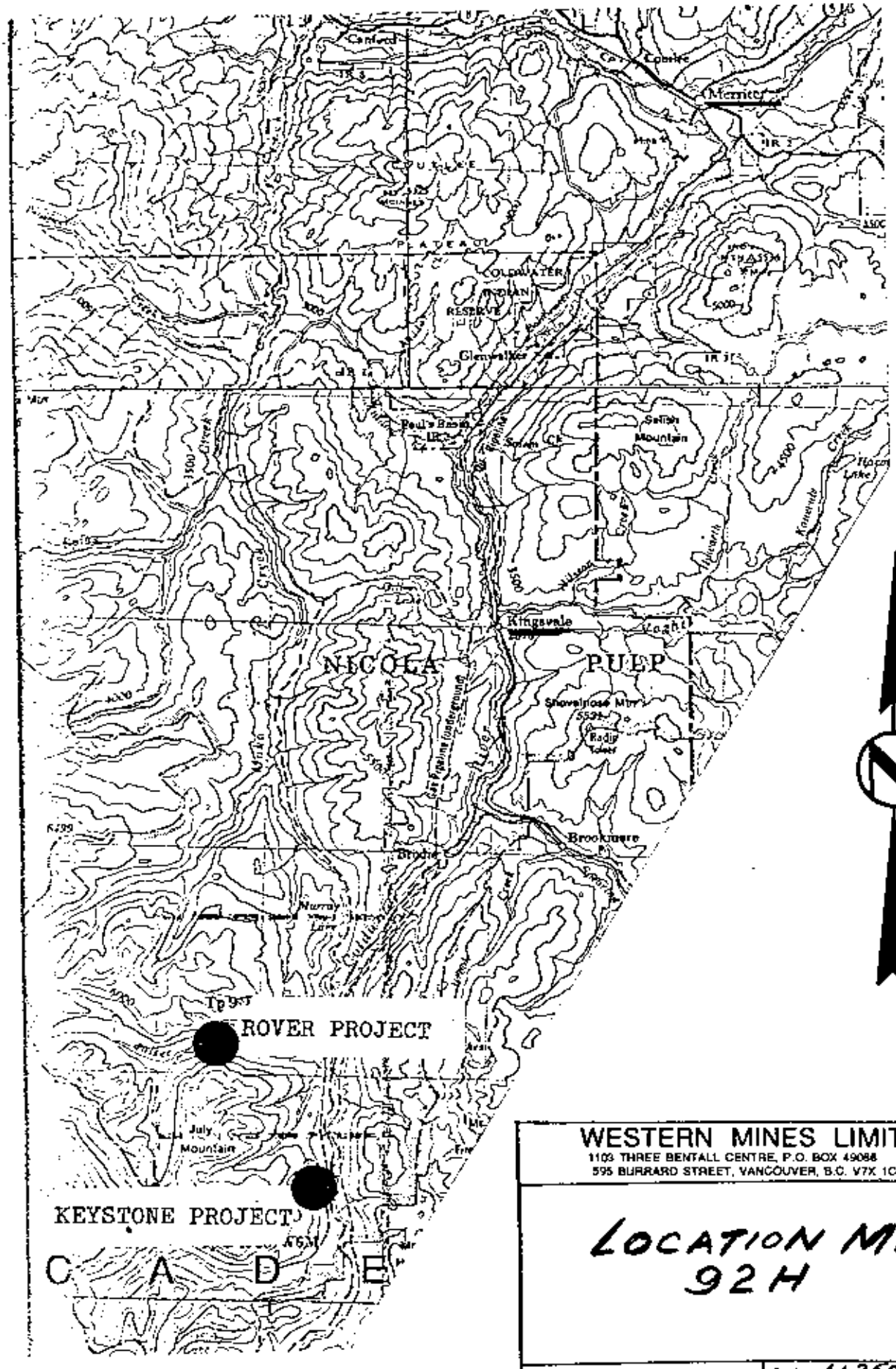
Initially the "dipole-dipole" method of surveying was tried but was abandoned when currents of less than 0.2 amps were obtained between transmitting electrodes.

PROPERTY, LOCATION AND ACCESS

The property is located in the Nicola Mining Division of British Columbia.

It is situated on the west side of the main road some 4 miles north of Coquihalla Lake.

Access was obtained along the Coquihalla highway by means of truck from the town of Hope, some 30 miles to the southwest.

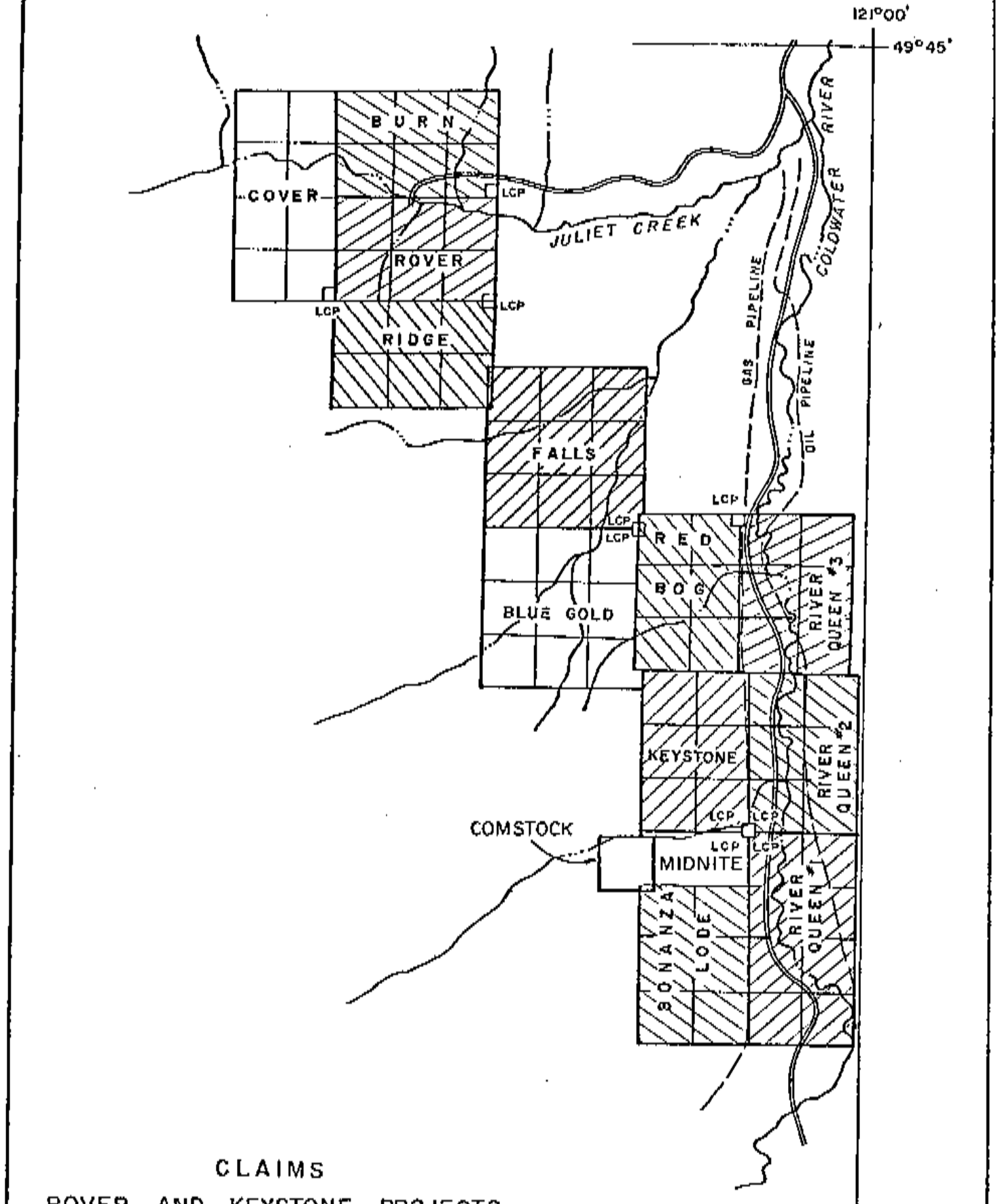


WESTERN MINES LIMITED
1103 THREE BENTALL CENTRE, P.O. BOX 49088
595 BURRARD STREET, VANCOUVER, B.C. V7X 1C4

LOCATION MAP 92H

Drawn By:
Drafted By:
Date: 6/28 Revised:

Scale: 1:250,000
Contour Interval:
Drawing No. CWS



CLAIMS

ROVER AND KEYSTONE PROJECTS

92 H/11E

0 1 2 MILES

0 1000 2000 METERS

K. W. Livingstone, Nov. 1977

PURPOSE.

The purpose of the survey was to try and see if any substantially sized areas of sulphide mineralization were located at depth on the property, the occurrences of which were suggested by the favourable geological environment and known surface mineralization.

GEOLOGY.

The reader is referred to reports held by Western Mines Limited.

PREVIOUS WORK.

Previous work on the property included prospecting, geological mapping, adit drifting, magnetic surveys and limited induced polarization surveys with a 400 foot dipole.

For a detailed study of the above the reader is referred to reports held by Western Mines Limited.

SURVEY SPECIFICATIONS

The induced polarization (I.P.) survey was carried out using a pulse system manufactured by Huntec Limited of Metropolitan Toronto, Ontario.

The system consists basically of three units: a receiver (Mk III), a transmitter and a motor generator. The transmitter, which provides a maximum of 7.5 kw d.c. to the ground, obtains its power from a 7.5 kw 400 c.p.s. three phase alternator driven by a gasoline engine. The cycling rate of the transmitter is 2 seconds "current-on" and 2 seconds "current-off" with the pulses reversing continuously in polarity.

The data recorded in the field consists of careful measurements of the current (I) flowing through electrodes C_1 and C_2, the primary voltage (V_p) appearing between the two potential electrodes, P_1 and P_2, during the "current-on" part of the cycle, and four samples of the M factor (the secondary or overvoltage, Vs, normalized with respect to the primary voltage V_p in percent at preselected positions on the decay curve).

The apparent resistivity (P_a) in ohm metres is proportional to the ratio of the primary voltage and the measured current, the proportionality factor depending on the geometry of the array used. The apparent chargeability, M_a, in milliseconds is computed as a single composite factor from the four M parameters by weighing

i.e. $$M_a = t_p \frac{(M_1 + 2M_2 + 4M_3 + 8M_4)}{100}$$

over an integration time from t_d to $t_d + t_p$

where t_d = delay time in milliseconds

t_p = basic integrating time in milliseconds

The survey was carried out using the "pole-dipole" method of surveying. In this method the current electrode, C_1, and the two potential electrodes, P_1 and P_2, are moved in unison along the survey line. The spacing "na" (n an integer) between C_1 and P_1 is kept constant for each traverse at a distance roughly equal to the depth to be explored by that traverse, while that of P_1 - P_2 (the dipole) is kept constant at "a". The second current electrode C_2 is kept constant at "infinity".

SURVEY SPECIFICATIONS cont'd

Thus on this survey five separation measurements (n = 1 to 5) with a dipole of 300 metres were made at 150 metre station intervals along the survey lines. A delay time of 240 milliseconds and a total integration time of 900 milliseconds were used for the chargeability processing.

DISCUSSION OF RESULTS.

(a) Keystone grid.

The results of the three profiles run in this area are shown on plates W-257-1 to 3. Their background and general constitution are similar to those obtained by Nielsen in 1972 using similar equipment and a smaller dipole.

Unfortunately each traverse crossed the gas and oil pipelines of West Coast Transmission. These pipelines carry considerable d.c. current at low voltage for anticorrosion purposes, the pipelines in question being affected by voltage and current from three rectifiers.

Some cultural I.P. effects are to be expected from these pipelines and are clearly evident from the chargeability plots on Lines 8 S and 0, Maps W-257-2 and 3 respectively. Here the highest chargeability reading is obtained on the fifth separation reading, where the measured signal is the weakest, on Line 0 when the receiver location is over the pipeline. Similar but lower effects are obtained on the n = 5 readings on Line 8 S and the baseline where the magnitude of the measured signal was greater due to higher transmitted currents.

Further perusal of the resistivity and chargeability data generally shows a half dipole displacement of the peaks towards the current pole. As the station plot is midway between the current pole and the nearest electrode of the measuring dipole the readings appear related to the measuring dipole location and a shift of the plotting point to the leading electrode location of the dipole will superimpose most of the peaks, and centre the cultural effects of the pipelines above their location.

The writer has accordingly shifted the data in determining the anomaly location shown on these profiles.

The resistivity survey though greatly affected by variable overburden conditions, dry top soil in places and the steep topography, indicates the presence of a large resistivity low, 100 to 200 ohm metres, on the grid, as evidenced by the results on the baseline, low 6 S to 3 N, on Line 0, low 0 to 6 E, and on Line 8 S, the low centred around 3 E. This low is interpreted as being caused by the breccia.

The chargeability results on the baseline show the presence of two strongly anomalous zones near or on the interpreted breccia-intrusive contact, the zone to the south extending under the pipeline.

DISCUSSION OF RESULTS cont'd

Furthermore as the high responses were obtained were no electrodes were over or near the pipelines the writer has attempted to filter out the pipeline response by ignoring any readings where a measuring electrode is on or near a pipeline location.

This leaves apparent chargeability anomalous expressions on Lines 0 and 8 S near or under the pipelines on or near the interpreted breccia-intrusive contact.

Chargeability readings of 15 to 20 milliseconds are observed over the resistivity low on the Baseline. This presumably reflects low grade sulphide mineralization within the breccia.

(b) Rover grid.

The results of the two profiles run here are shown on plates W-257-4 and 5.

Similar background resistivity and I.P. effects to those observed on the Keystone grid were obtained here.

A small chargeability anomaly caused by a shallow limited source is discernible on Line 5.S centred around 6 E. Its highest response is exhibited on the first separation, with virtually no response on the third, fourth and fifth separation respectively.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Between July 21st and August 14th, 1978, Peter E. Walcott & Associates Limited carried out five I.P. traverses over a property, located in the Coquihalla Valley of British Columbia, for Western Mines Limited.

Three of these profiles were obtained on the Keystone grid, where the gas and oil pipelines of West Coast Transmission underlie the grid, while the other two concerned the Rover grid.

After qualitative filtering for the cultural effects of the pipelines was applied on the Keystone grid a half-donut shape trace of anomalous chargeability readings was observed around a large resistivity low, believed by the writer to correspond to the breccia and deepening overburden.

The causative source of this anomalous zone is thought to be sulphide mineralization, most of which is presumably pyrite.

As a result the writer recommends that the breccia-intrusive contact and the anomalous I.P. zone be further investigated. However before attempting to plan additional work this data should be studied in conjunction with the known geology and information obtained for the recently drilled borehole, neither of which is the writer reasonably familiar with at the present time.

Respectfully submitted,

PETER E. WALCOTT & ASSOCIATES LIMITED

Peter E. Walcott, P.Eng.
Geophysicist

Vancouver,
British Columbia

November 1978

APPENDIX

COST OF SURVEY

Peter E. Walcott & Associates Limited provided a crew and equipment on a daily basis. Mobilization and draughting costs were extra so that the total cost of services provided was $20,916.64.

PERSONNEL EMPLOYED ON SURVEY

Name	Occupation	Address	Dates
Peter E. Walcott	Geophysicist	Peter E. Walcott & Assoc. 605 Rutland Court, Coquitlam, B.C.	Sept. 14th - 15th, Oct. 20th, Nov. 5th 7th and 21st, 1978
G. MacMillan	Geophysical Operator	" "	July 21st - Aug. 14 Sept. 14 - 18th, Oct. 18th - 20th, Nov. 12th, 1978
J. Flanagan	"	" "	July 21st - Aug. 14 1978
J. Mandryk	"	" "	"
P. Charlie	Helper	" "	"
J. Charlie	"	" "	"
K. Scott	"	" "	July 24th - Aug. 14 1978
G. MacMillan	Cook	" "	July 21st - Aug. 14 1978
J. Walcott	Typing	" "	Nov. 21st, 1978

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 sixteen years.

3. I am a member of the Association of Professional Engineers of British Columbia, Ontario and the Yukon Territory.

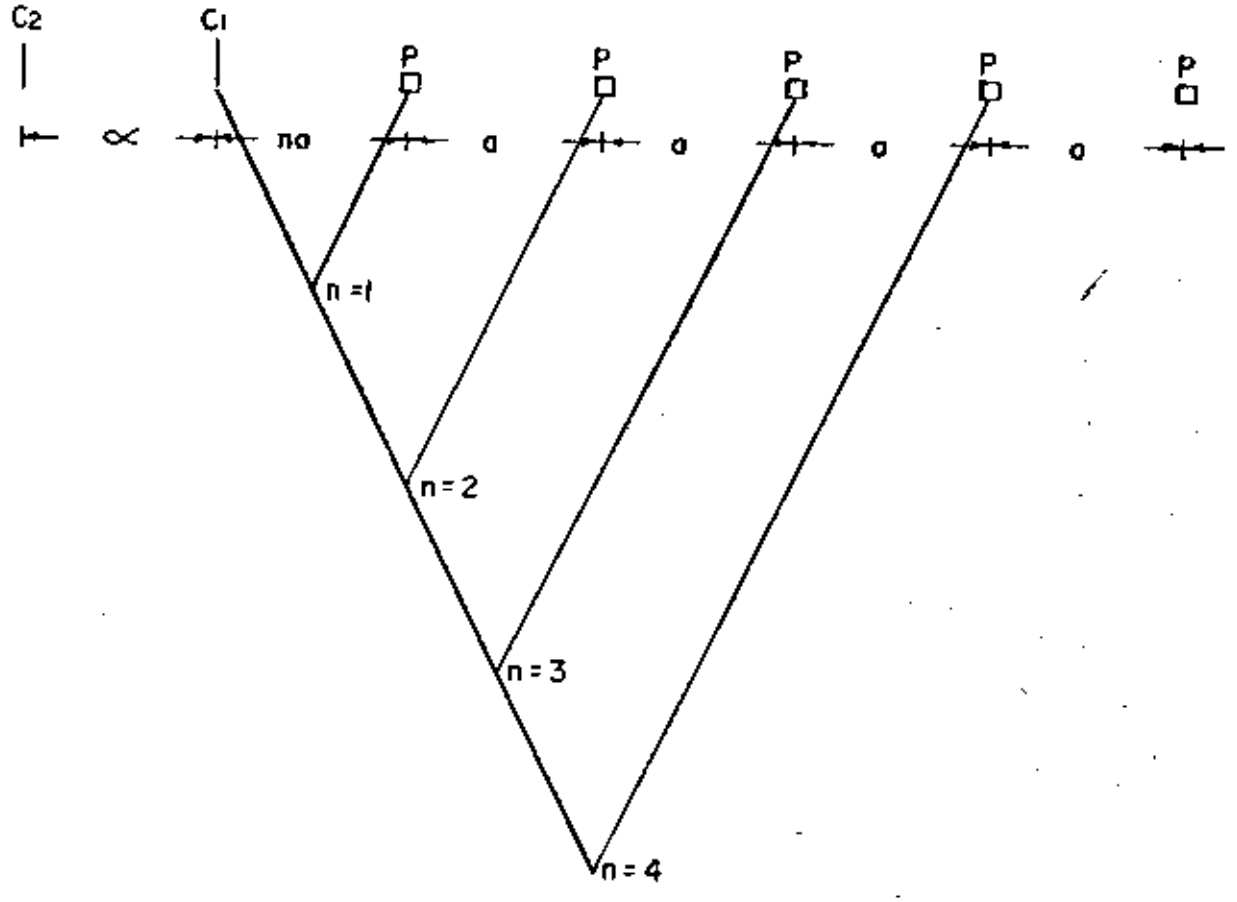
4. I hold no interest, direct or indirect in the securities or properties of Western Mines Limited, nor do I expect to receive any.

Peter E. Walcott, P.Eng.

Vancouver,
British Columbia,

November 1978

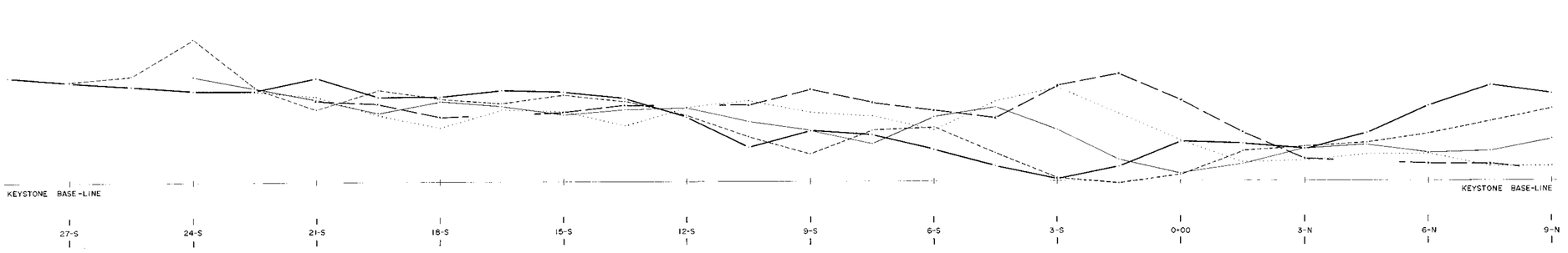
POLE-DIPOLE ARRAY

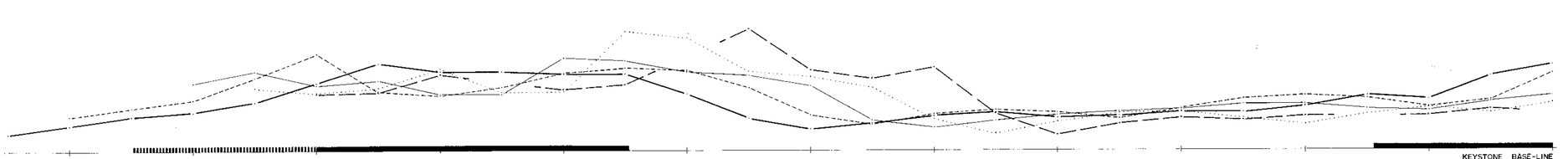


ANOMALOUS ZONE

POSSIBLE ANOMALOUS ZONE

part 1 of 2





ELECTRODE CONFIGURATION – THREE ARRAY

7135

WESTERN MINES LIMITED

DRY CREEK PROPERTY ; NICOLA MINING DIVISION ; B.C.

HUNTEC MARK-III RECEIVER

INDUCED POLARIZATION SURVEY

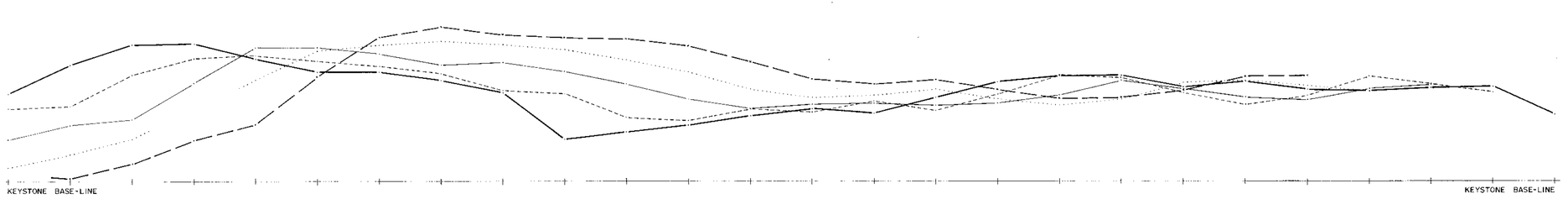
PROFILES OF APPARENT RESISTIVITY & CHARGEABILITY

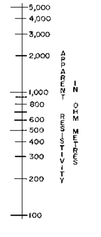
SCALE 1:5000

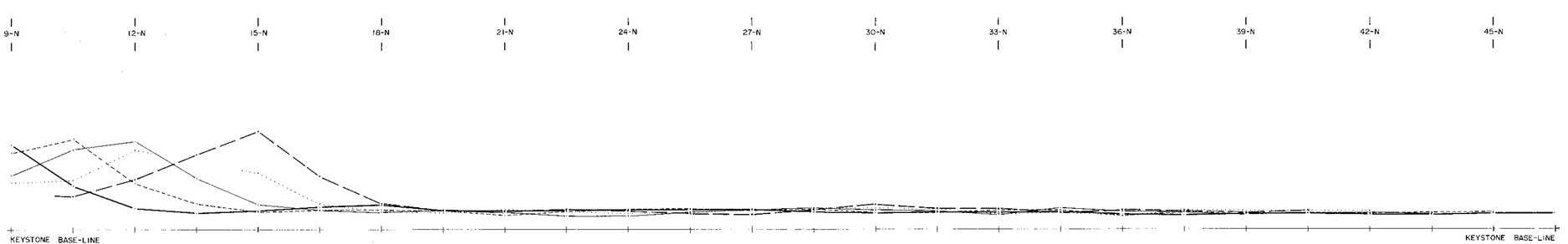
MAP No. W-257-1-A
TO ACCOMPANY A REPORT BY
PETER E. WALCOTT, P. Eng.

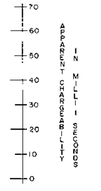
PETER E. WALCOTT & ASSOC. LTD
AUGUST – 1978

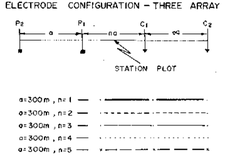
part 1 of 2











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HUNTEC MARK-III RECEIVER

INDUCED POLARIZATION SURVEY

PROFILES OF APPARENT RESISTIVITY & CHARGEABILITY

SCALE 1:5000

MAP No. W-257-1-B
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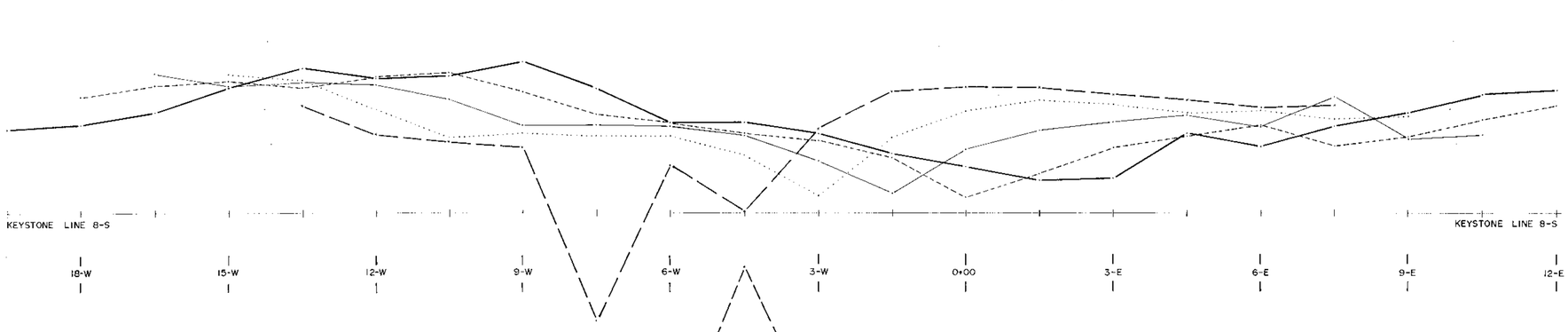
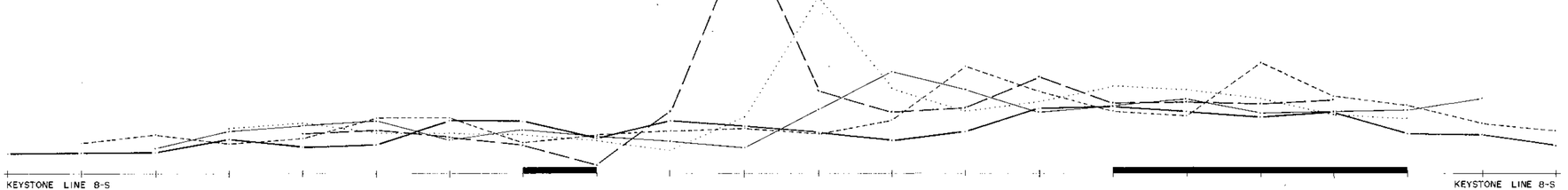
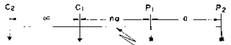
part 1 of 2





ELECTRODE CONFIGURATION – THREE ARRAY



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a=300m, n=3
a=300m, n=4
a=300m, n=5

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WESTERN MINES LIMITED

DRY CREEK PROPERTY; NICOLA MINING DIVISION, B.C.

HUNTEC MARK-III RECEIVER

INDUCED POLARIZATION SURVEY

PROFILES OF APPARENT RESISTIVITY & CHARGEABILITY

SCALE 1:5000

MAP No. W-257-2
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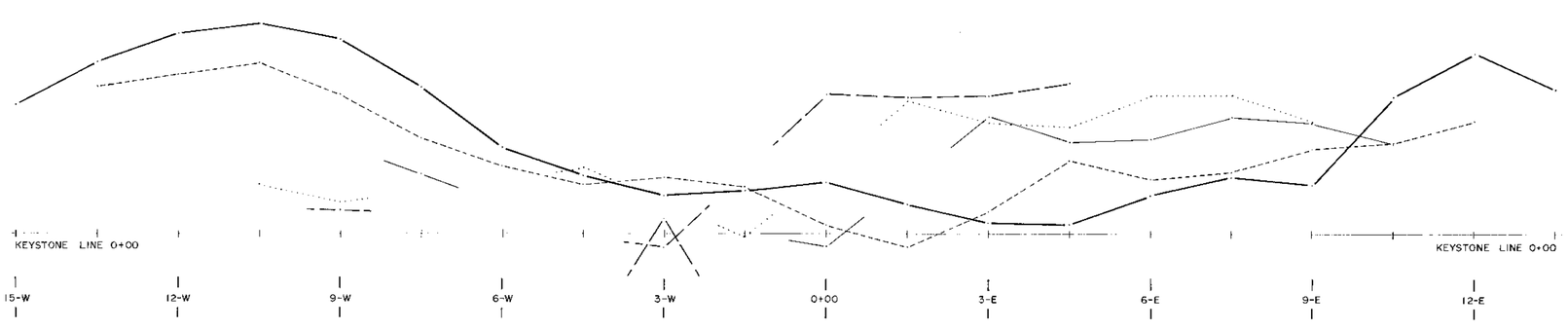
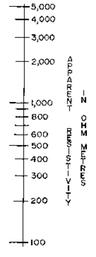
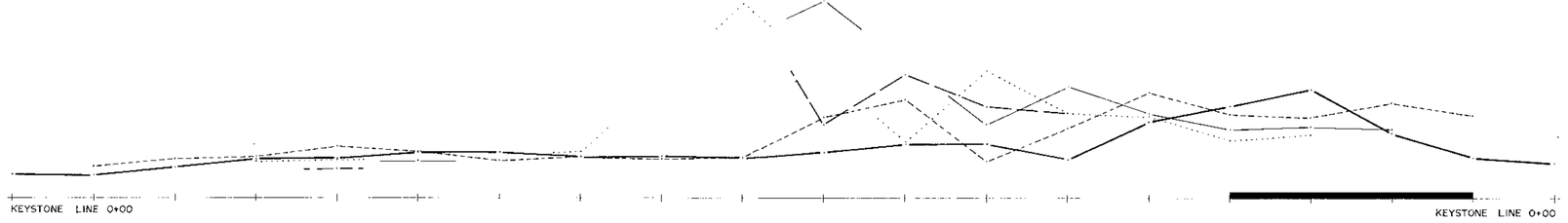
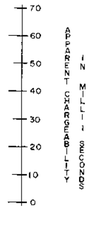
AUGUST – 1978

part 1 of 2

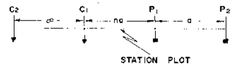








ELECTRODE CONFIGURATION - THREE ARRAY



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DRY CREEK PROPERTY ; NICOLA MINING DIVISION ; B.C.

HUNTEC MARK-III RECEIVER

INDUCED POLARIZATION SURVEY

PROFILES OF APPARENT RESISTIVITY & CHARGEABILITY

SCALE 1:5000

MAP No. W-257-3
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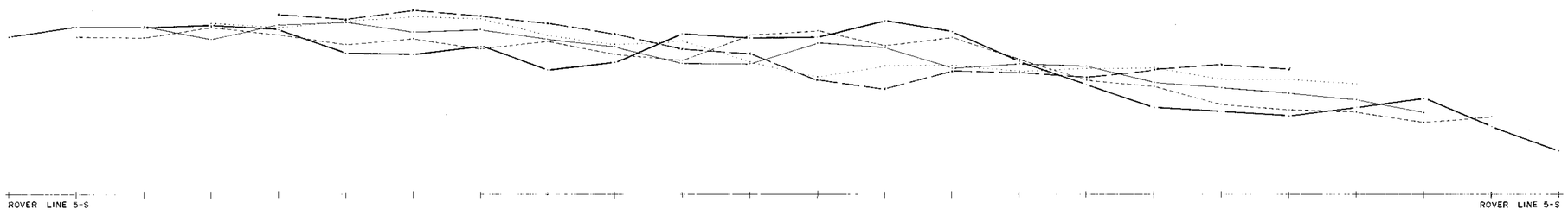
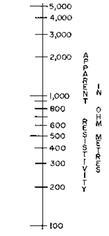
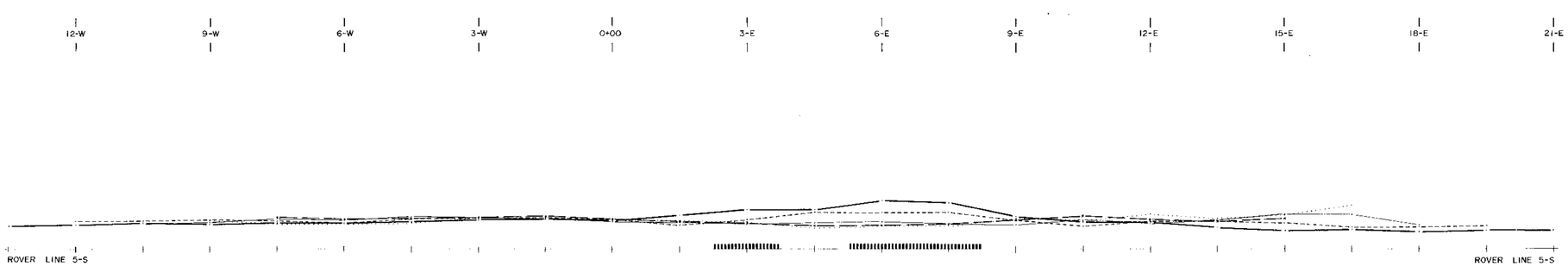
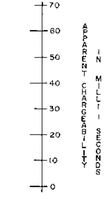
AUGUST - 1978

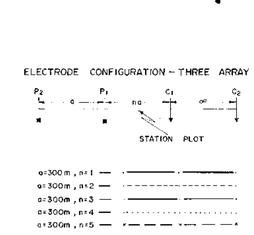
Part 1 of 2











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DRY CREEK PROPERTY ; NICOLA MINING DIVISION ; B.C.

HUNTEC MARK-III RECEIVER

INDUCED POLARIZATION SURVEY

PROFILES OF APPARENT RESISTIVITY & CHARGEABILITY

SCALE 1=5000

MAP No. W-257-4
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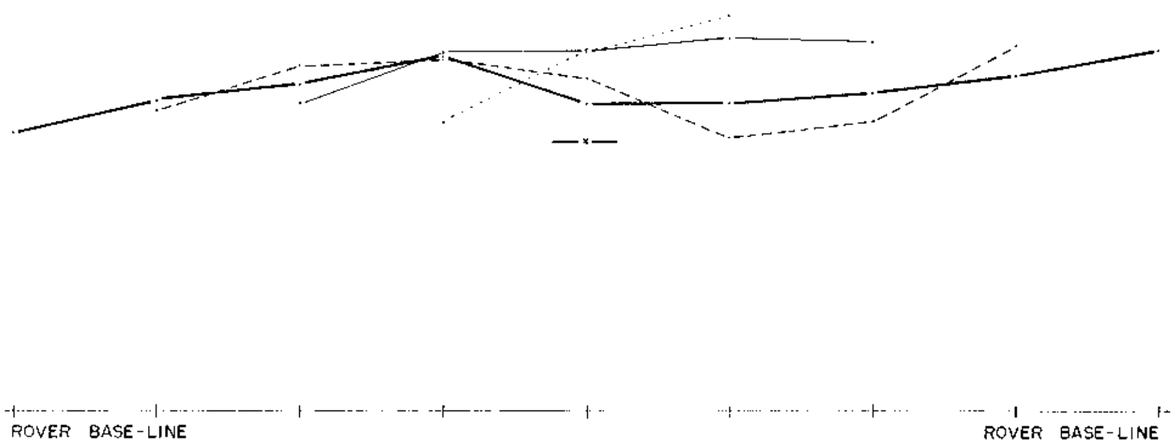
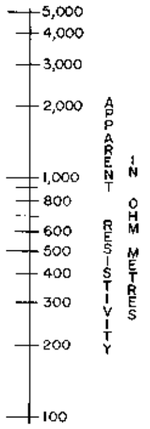
part 1982





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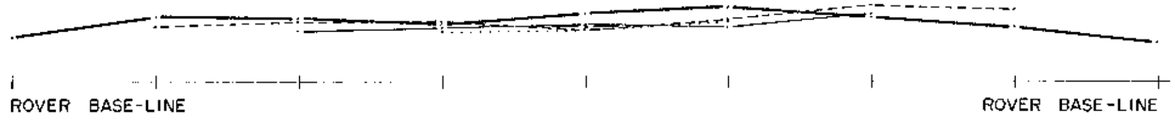
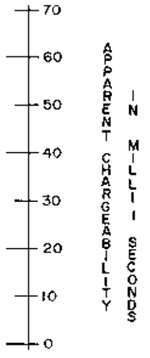
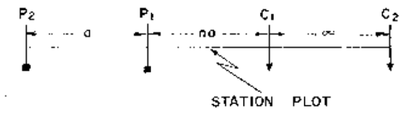




ELECTRODE CONFIGURATION - THREE ARRAY



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a=300m , n=2
a=300m , n=3
a=300m , n=4
a=300m , n=5

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WESTERN MINES LIMITED

DRY CREEK PROPERTY ; NICOLA MINING DIVISION ; B.C.

HUNTEC MARK-III RECEIVER

INDUCED POLARIZATION SURVEY

PROFILES OF APPARENT RESISTIVITY & CHARGEABILITY

SCALE 1:5000

MAP No. W-257-5
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