

3280

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3280 MAP

REPORT ON
AN INDUCED POLARIZATION SURVEY
HARRISON LAKE AREA, BRITISH COLUMBIA
ON BEHALF OF
G. M. EXPLORATIONS LIMITED (N.P.L.)

by
Peter J. Fominoff, B.A.Sc.
and
Richard O. Crosby, B.Sc., P.Eng.
September 27, 1971

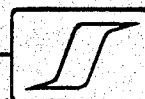
CLAIMS:
Name
Ni 332-337, 339, 351, 357

LOCATION:
About 20 miles north of Harrison Hot Springs, B. C.
East side of Harrison Lake
New Westminster Mining Division
121° 49° NW

DATES:
August 25 to September 4, 1971

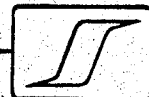
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SUMMARY

The induced polarization survey has revealed several zones of increased chargeability responses. Areas of higher priority have been established by correlating all available geological, geochemical and magnetic data with the induced polarization survey results. To test the areas of higher priority 1100 feet of drilling has been recommended. Reinterpretation of the results is recommended as more data becomes available.



REPORT ON
AN INDUCED POLARIZATION SURVEY
HARRISON LAKE AREA, BRITISH COLUMBIA
ON BEHALF OF
G. M. EXPLORATIONS LIMITED (N.P.L.)

INTRODUCTION

During the period August 28 to September 4, 1971, a geophysical field party under the direction of Mr. Christian Zogg, executed an induced polarization survey in the Harrison Lake area, British Columbia on behalf of G. M. Explorations Limited (N.P.L.).

The property lies about 20 miles north of Harrison Hot Springs and is reached by a gravel road negotiable by a pick-up truck. The property is located on a steep hillside and is heavily forested. It is typical of the rugged west coast mountain terrain.

The claims covered, in whole or part, by this survey are listed on the title page of this report and are shown on Plate 4 on a scale of 1 inch = 400 feet.

Scintrex Mk VII time-domain (pulse-type) induced polarization equipment has been employed on this property. The transmitting unit had a rating of 2.5 kilowatts and equal on and off times of 2.0 seconds. The receiving unit was a remote, ground-pulse type triggered by the rising and falling primary voltages set up in the ground by the transmitter. The integration of the transient polarization voltages takes place for 0.65 seconds after a 0.45 second delay time following the termination of the current on pulse.

The purpose of an induced polarization survey is to map the subsurface distribution of metallicly conducting mineralization beneath the grids covered. In the present area such mineralization could include



chalcopyrite, pyrite, pyrrhotite and other metallic sulphide minerals. Metallic minerals such as graphite and magnetite as well as non-metallic minerals such as chlorite and sericite can give responses not always distinguishable from sulphide mineralization.

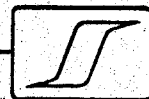
The three electrode array was employed for the survey. For this electrode array, one current electrode and two potential electrodes traverse the profiles with an interelectrode spacing called "a". The second or "infinite" current electrode is placed a distance greater than 5a from the measuring point which is defined as the midpoint between the moving current electrode and the near potential electrode. For the reconnaissance survey observations were taken for a = 100 feet and 200 feet. Station intervals were 100 feet. For detail some observations were also taken with a = 50 feet and 50 foot station intervals.

The grid surveyed consisted of a base line oriented north-south, six tie lines of various lengths oriented east-west and one road oriented northeast-southwest. A plan map of the grid is shown on Plate 4. The survey totalled about 5.9 line miles.

GEOLOGY

A local geology map on the scale of 1 inch = 500 feet compiled by G. M. Explorations Limited (N.P.L.) has been made available to the writers. The grid area is underlain by a complex assemblage of acidic, mafic and ultramafic rocks. The acidic rocks are mostly diorites. The mafic rocks are gabbros and the ultramafics consist of pyroxenites, peridotites, hornblendites and undifferentiated ultramafics.

The induced polarization survey was a ground follow-up to an air magnetometer survey flown by Seigel Associates Limited in June 1970 and



It can be concluded from the results taken with both the 400 foot and the narrower electrode spacings, that a much better defined target is obtained with narrower spaced electrodes when a small body is sought.

The resistivities on the average are greater for the wider electrode spacing indicating that the more conductive near surface layer of overburden and weathered rock does not have as much effect on wider electrode spacings.

In addition the 200 foot electrode spacing induced polarization data has been contoured. Plate 6 is a chargeability contour plan with a 4.0 millisecond contour interval and Plate 7 is a resistivity contour plan with a logarithmic contour interval. The contour values are indicated on Plate 7.

The chargeability contours have been heavily shaded to show areas of greater than 20.0 millisecond chargeability and lightly shaded to show areas of chargeabilities between 12.0 and 20.0 milliseconds. The contours show two north-south areas of decreased chargeabilities. One area is at the eastern ends of the grid lines and the other is between about 15 W and 21 W on all grid lines. The areas below 10.0 milliseconds which comprise the major portions of the two zones are interpreted to contain less than 1 percent by volume of metallicly conducting material within 150 feet of ground surface. Most of the remaining portions of the grid show chargeabilities in excess of 12.0 milliseconds. It is recommended that areas of greater than 20.0 milliseconds chargeability all be investigated by hand trenching on the steep mountain slopes since overburden is not expected to be very thick.

The resistivity data does not show any direct correlation with areas of chargeability increases. Some areas of decreased resistivity



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| Plate 5 - Geophysical Profiles 400 foot electrode spacings | 1 inch = 500 feet |
| Plate 6 - Chargeability Contour Map | 1 inch = 500 feet |
| Plate 7 - Resistivity Contour Map | 1 inch = 500 feet |
| Plate 8 - Grid and Claim Location Map | 1 inch = 500 feet |



APPENDIX

DISCUSSION

Additional surveying has been completed on Lines 4-22, 4-23 and along the road on Grid Area 4. The results are presented on Plate 5 on the base scale of 1 inch = 500 feet. The vertical scale for the profiles is 1 inch = 20.0 milliseconds for chargeability and 2 inches = 1 logarithmic cycle with line trace taken as 1000 ohm-meters for resistivity.

The chargeability variations as expected are much less sharp when taken with the 400 foot electrode spacings than when taken with the narrower spacings. The chargeable material content is averaged over a much larger volume of rock and thus small sources produce a much smaller above background response. The chargeability peak on Line 4-22 reaches 18.0 milliseconds when taken with the 400 foot electrode spread. The same peak when taken with the 100 foot spread reaches 26.0 millisecondd. The other peaks on Line 4-22 cannot be correlated directly to those obtained with narrower spacings.

The chargeabilities on Line 4-23 show two zones of slightly above background increases which may be approximately correlated with two zones of much sharper increases when measured with narrower electrode spacings.

A sharp chargeability increase reaching 41.0 milliseconds is seen on the road between 4 W and 6 W. This increase is not seen on the narrower spaced profiles. The source of the increase would have to be more than 150 feet below ground surface and contain at least 4.0 percent by volume of metallicly conducting material.



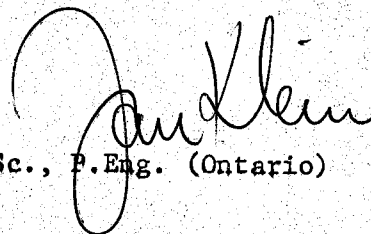
correspond to known fault locations. Areas of less than 3600 ohm-meters have been shaded and may indicate the locations of faults or fault zones.

Respectfully submitted,

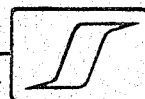
SEIGEL ASSOCIATES LIMITED



Peter J. Fominoff, B.A.Sc.
Geophysicist



Jan Klein, M.Sc., P.Eng. (Ontario)
Geophysicist



interpreted by R. O. Crosby in a report published on August 15,

The target of the present survey was copper-nickel sulphide mineralization which is expected to be associated with the mafic and ultramafic rocks detected by the air magnetometer survey. The mineralization sought would be similar to that of the nearby producing Giant Mascot Mine.

Geochemical and ground magnetometer data has been made available by G. M. Explorations Limited (N.P.L.) to the writers and is used as supporting data in the interpretation of the induced polarization results.

DISCUSSION OF RESULTS

Plates 2 and 3 on the scale of 1 inch = 400 feet show the chargeability (induced polarization characteristic of the rock) and the resistivity results respectively in profile form. The vertical scales for these profiles are 1 inch = 10.0 milliseconds for chargeability and 2 inches = 1 logarithmic cycle with the base line taken as 1000 ohm-meters for resistivity.

The background chargeability is unusually variable ranging from about 1.0 millisecond to about 12.0 milliseconds. The average background response on Lines 4 - 24 to 4 - 26 is about 10.0 milliseconds. Such a background indicates a widespread distribution of about 1 percent by volume of metallicly conducting material. The lateral distribution of the material is very complex as seen from the chargeability profiles. The chargeability sources are near surface and narrow. By correlating the chargeability results with available geological, geochemical and magnetic data, areas of priority in further investigation have been established.

Chargeability responses on Lines 4-22 and 4-23 show definite increases above background and can be correlated between the two lines.



At the western portion of Lines 4-22 and 4-23 maximum responses from the 200 foot electrode spacings reach 29.0 milliseconds. The anomalous zone extends from 21 W to 28 W on Line 4-22 and from 21 W to 29 W on Line 4-23. On the eastern portion of the lines the chargeability responses reach about 25.0 milliseconds. The anomalous zone extends from 8 W to 14 W on Line 4-22 and from 5 W to 9 W and 11 W to 15 W on Line 4-23. All of these zones of increased chargeability are located on the flanks of magnetic highs. The chargeability increases all lie in ultramafic rock and are coincident with geochemical copper and nickel increases.

Two other areas of priority have been chosen by similarly correlating the induced polarization results with the geological, geochemical and magnetic data. Between 14 W and 17 W on Line 4-47 the chargeability responses reach 22.0 milliseconds on the 200 foot electrode spacings and between 11 W and 18 W on Line 4-25 the responses reach 19.0 milliseconds. These two areas are also coincident with geochemical nickel and copper increases and are located on the flanks of magnetic highs.

The resistivity range is from a minimum of about 1000 ohm-meters to a maximum of about 20,000 ohm-meters. A known fault zone appears as a resistivity drop on Lines 4-23 to 4-26, between 12 W and 16 W on each line. The complex geology of the area is reflected in the complexity of the resistivity responses. There is no direct correlation between the chargeability and the resistivity responses.

CONCLUSIONS AND RECOMMENDATIONS

The induced polarization survey has revealed several zones of induced polarization responses which have been given a higher priority in further exploration work. Other zones of increased chargeability which may



warrant further exploration have been located.

The priority zones for further exploration have been discussed in the preceding section. The zone of chargeability increases on the eastern ends of Lines 4-22 and 4-23 has been drilled near Line 4-23 between 13 W and 15 W and nickel-copper bearing sulphides have been found. Other drill hole locations have been established by choosing locations with similar induced polarization magnetic, geological and geochemical characteristics as at the drilled area. Accessibility may also be an important factor in choosing drill hole locations.

The following four drill holes are recommended for immediate follow-up to the induced polarization survey.

| <u>COLLAR</u> | <u>DIP</u> | <u>DIRECTION</u> | <u>MINIMUM DEPTH</u> |
|-------------------|------------|------------------|----------------------|
| L 4-22; 11 + 50 W | -45° | East | 300 feet |
| L 4-23; 26 + 50 W | -45° | East | 300 feet |
| L 4-47; 16 W | -60° | East | 250 feet |
| L 4-25; 16 + 50 W | -60° | East | 250 feet |

As more data is obtained from drilling and further geological explorations, the present induced polarization results should be reinterpreted so that more information may be gained from the complex responses. Additional drill hole locations can be recommended based upon the present induced polarization survey results.

Respectfully submitted,

SEIGEL ASSOCIATES LIMITED

Peter J. Fominoff
 Peter J. Fominoff, B.A.Sc.
 Geophysicist

Richard O. Crosby
 Richard O. Crosby, B.Sc., P.Eng.
 Geophysicist

Vancouver, B. C.
 September 27, 1971



DOMINION OF CANADA:
PROVINCE OF BRITISH COLUMBIA.
To Wit:

In the Matter of

a geophysical survey on behalf of
G. M. Explorations Limited (N.P.L.)

I, L. A. Merrifield for Seigel Associates Limited
of 750 - 890 West Pender Street, Vancouver

in the Province of British Columbia, do solemnly declare that an induced polarization survey has been executed on some Ni claims, Grid Area No. 4, Harrison Lake area, British Columbia between August 25 to September 4, 1971. The following expenses were incurred:

| | | | |
|--|-----------------------|-------------------|-----------------|
| (1) Wages: | | | |
| C. Zogg | 11 days @ \$35.00/day | \$385.00 | |
| K. Murbach | 11 days @ \$27.50/day | 302.50 | |
| R. Amis | 11 days @ \$27.50/day | 302.50 | |
| B. Crosby | 11 days @ \$27.50/day | 302.50 | |
| H. P. Wenzeler | 11 days @ \$27.50/day | 302.50 | |
| | | <u>\$1,595.00</u> | \$1,595.00 |
| (2) Transportation & shipping to the job | | | 18.98 |
| (3) Transportation on the job | | | 191.31 |
| (4) Food & living expenses | | | 64.55 |
| (5) Use of geophysical equipment | | | |
| 11 days @ \$30.00/day | | | 330.00 |
| (6) Paid to Seigel Associates Limited to cover geophysicist's supervision, calculating, plotting and fairdrawing data and preparation of final reports. | | | <u>1,160.00</u> |
| | | | \$3,359.84 |

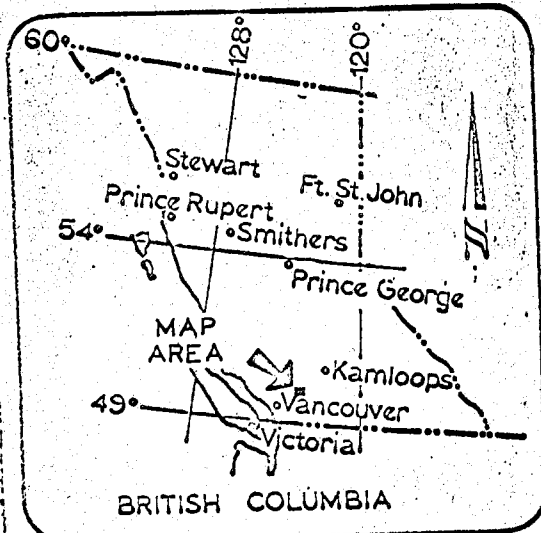
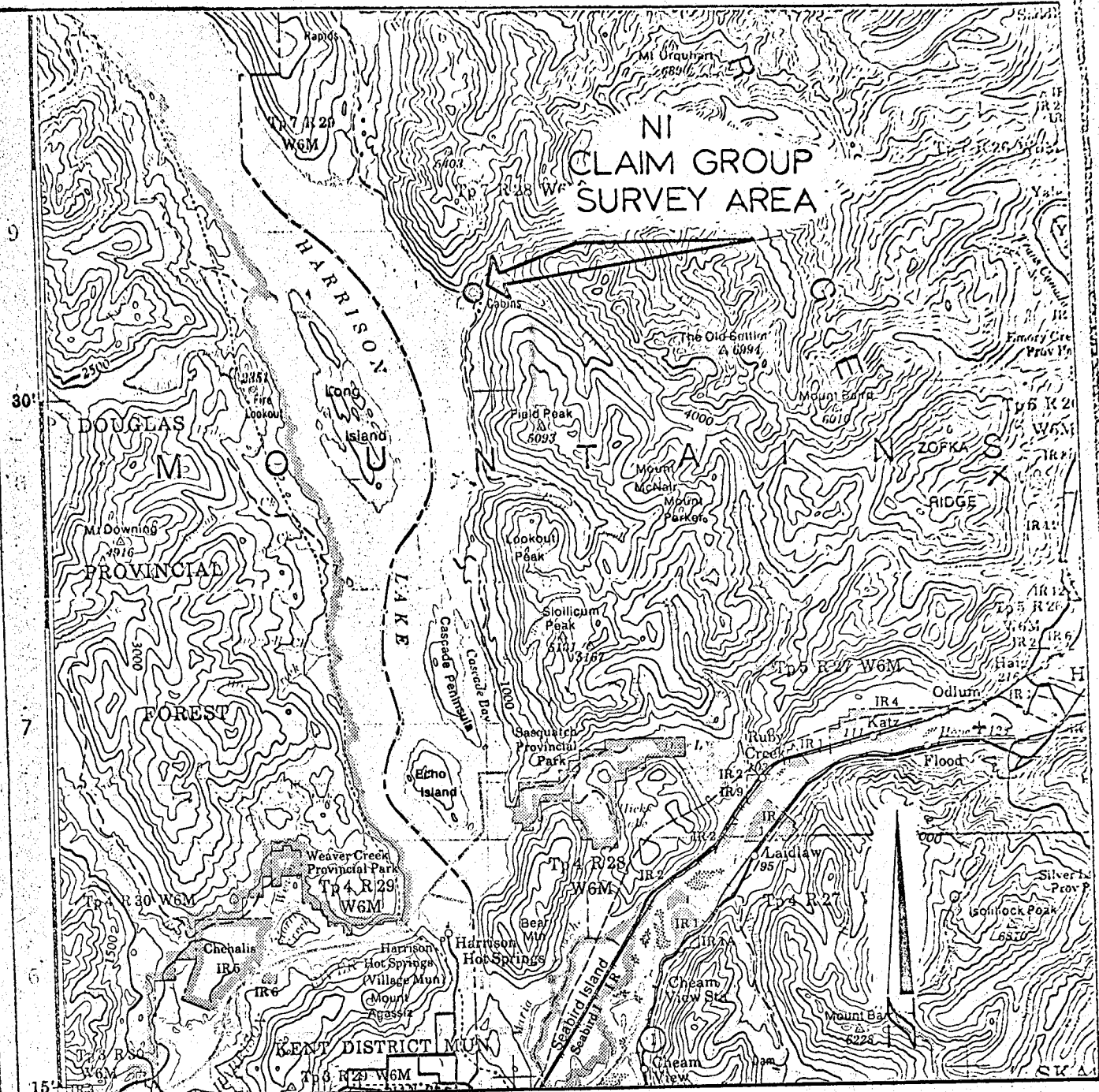
And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act."

Declared before me at the City
of Vancouver, in the
Province of British Columbia, this 28th
day of September, 1971, A.D.

L.A. Merrifield

Julius J. Turner
A Commissioner for taking Affidavits within British Columbia or
A Notary Public in and for the Province of British Columbia.

SUB-MINING RECORDER



| | |
|---|---|
| GM. EXPLORATIONS LTD. | NICKEL SYNDICATE |
| <p>LOCATION MAP</p> <p>NI GROUP</p> <p><i>Richard O. Crook</i></p> | |
| HARRISON LAKE AREA | |
| SCALE 1 : 250,000 | |
| Survey by SEIGEL ASSOCIATES LIMITED AUGUST 1971 | <p style="font-size: 2em; font-weight: bold;">PLATE 1</p> |





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- LEGEND**
- LINE COVERED WITH I.P.
 - ROAD
 - 100' ELEVATION CONTOUR INTERVAL
 - CREEK
 - CLAIM LIMIT
CLAIM POST
CLAIM NAME AND NUMBER

PLATE 8
 G.M. EXPLORATIONS LTD.
 NICKEL SYNDICATE
 GRID AREA No.4
 HARRISON LAKE AREA, BRITISH COLUMBIA

**INDUCED POLARIZATION SURVEY
 GRID AND CLAIM**

SCALE 1inch= 500 feet

SURVEY BY SEIGEL ASSOCIATES LIMITED SEPT. 1971

TO ACCOMPANY A GEOPHYSICAL REPORT BY
 R.J.FOMINOFF AND J.KLEIN DATED SEPTEMBER 27, 1971


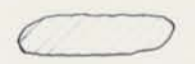
Paul Klein



08855

3280

LEGEND

-  LINE TRACE WITH RESISTIVITY VALUES IN OHM-METRES
-  AREA OF RESISTIVITY LOWER THAN 3600 OHM-METRES

THE FOLLOWING CONTOURS WERE PLOTTED:

- 2500 OHM-METRES
- 3600 " "
- 5500 " "
- 8000 " "
- 12000 " "
- 18000 " "
- 25000 " "
- 36000 " "
- 56000 " "

NOTES

SCINTREX MK VII INDUCED POLARIZATION INSTRUMENTATION

THREE ELECTRODE ARRAY

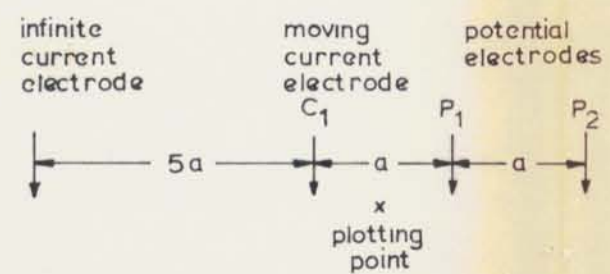


PLATE 7

G.M. EXPLORATIONS LTD.
 NICKEL SYNDICATE
 GRID AREA No. 4
 HARRISON LAKE AREA, BRITISH COLUMBIA

INDUCED POLARIZATION SURVEY
 RESISTIVITY CONTOUR PLAN
 200' ELECTRODE SPACING

SCALE 1 inch = 500 feet



SURVEY BY SEIGEL ASSOCIATES LIMITED SEPT. 1971

TO ACCOMPANY A GEOPHYSICAL REPORT BY
 P.J. FOMINOFF AND J. KLEIN DATED SEPTEMBER 27, 1971



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LEGEND

- LINE TRACE WITH CHARGEABILITY VALUES IN MILLISECONDS
- 4 MILLISECOND CONTOUR INTERVAL
- AREA OF CHARGEABILITY HIGHER THAN 12 MILLISECONDS
- AREA OF CHARGEABILITY HIGHER THAN 20 MILLISECONDS

NOTES

SCINTREX MK VII INDUCED POLARIZATION INSTRUMENTATION

THREE ELECTRODE ARRAY

infinite current electrode moving current electrode potential electrodes

5a a a a

x plotting point

PLATE 6

G.M. EXPLORATIONS LTD.

NICKEL SYNDICATE

GRID AREA No. 4

HARRISON LAKE AREA, BRITISH COLUMBIA

INDUCED POLARIZATION SURVEY

CHARGEABILITY CONTOUR PLAN

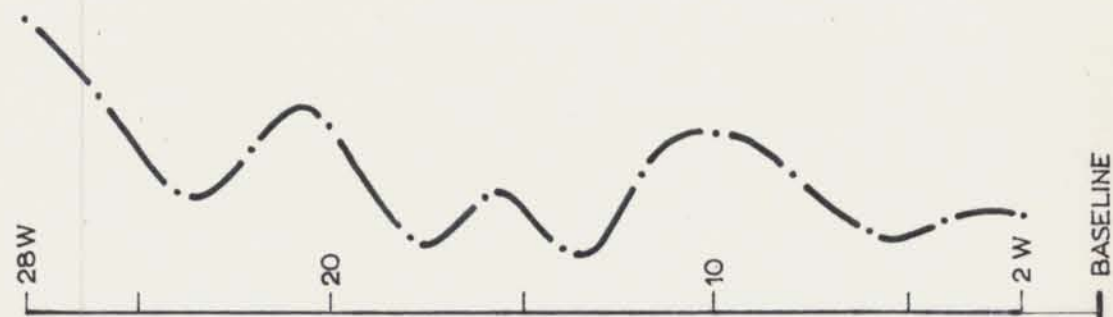
200' ELECTRODE SPACING

SCALE 1 inch = 500 feet

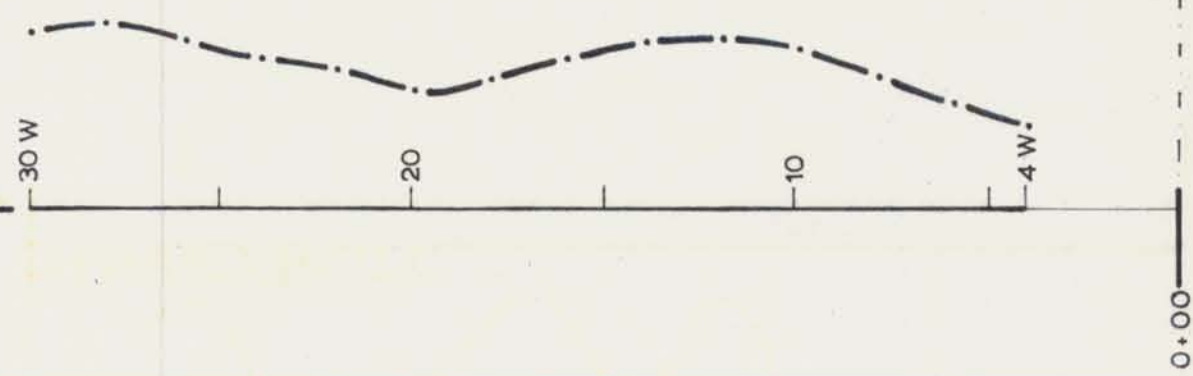
500' 0 500'

CHARGEABILITY

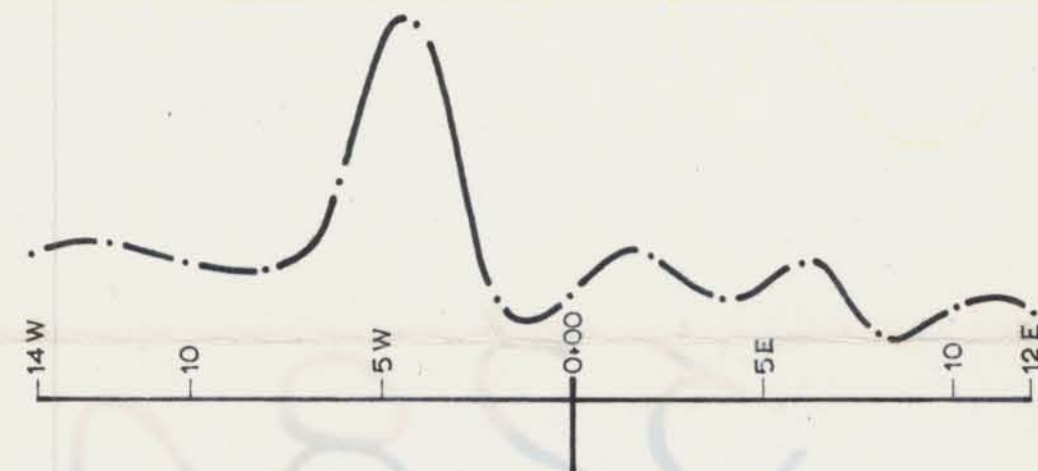
CHARGEABILITY SCALE IN MILLISECONDS



L 4-22



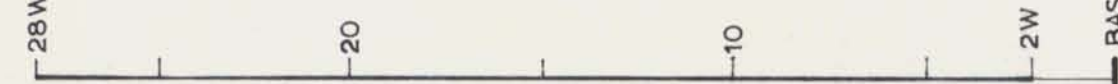
L 4-23



ROAD

RESISTIVITY

28W



30W



3280

LEGEND

CHARGEABILITY SCALE : 1 inch = 20 MILLISECONDS
ELECTRODE SPACING : a = 400'

RESISTIVITY SCALE : 2 inches = 1 LOGARITHMIC CYCLE WITH LINE TRACE TAKEN AS 1000 OHM-METRES

ELECTRODE SPACING : a = 400'

NOTES

SCINTREX MK VII I.P. INSTRUMENTATION

THREE ELECTRODE ARRAY

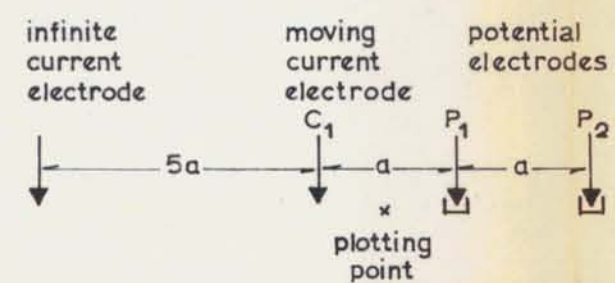


PLATE 5

G.M. EXPLORATIONS LTD.
NICKEL SYNDICATE
GRID AREA No 4
HARRISON LAKE AREA · BRITISH COLUMBIA

INDUCED POLARIZATION SURVEY
CHARGEABILITY AND RESISTIVITY PROFILES

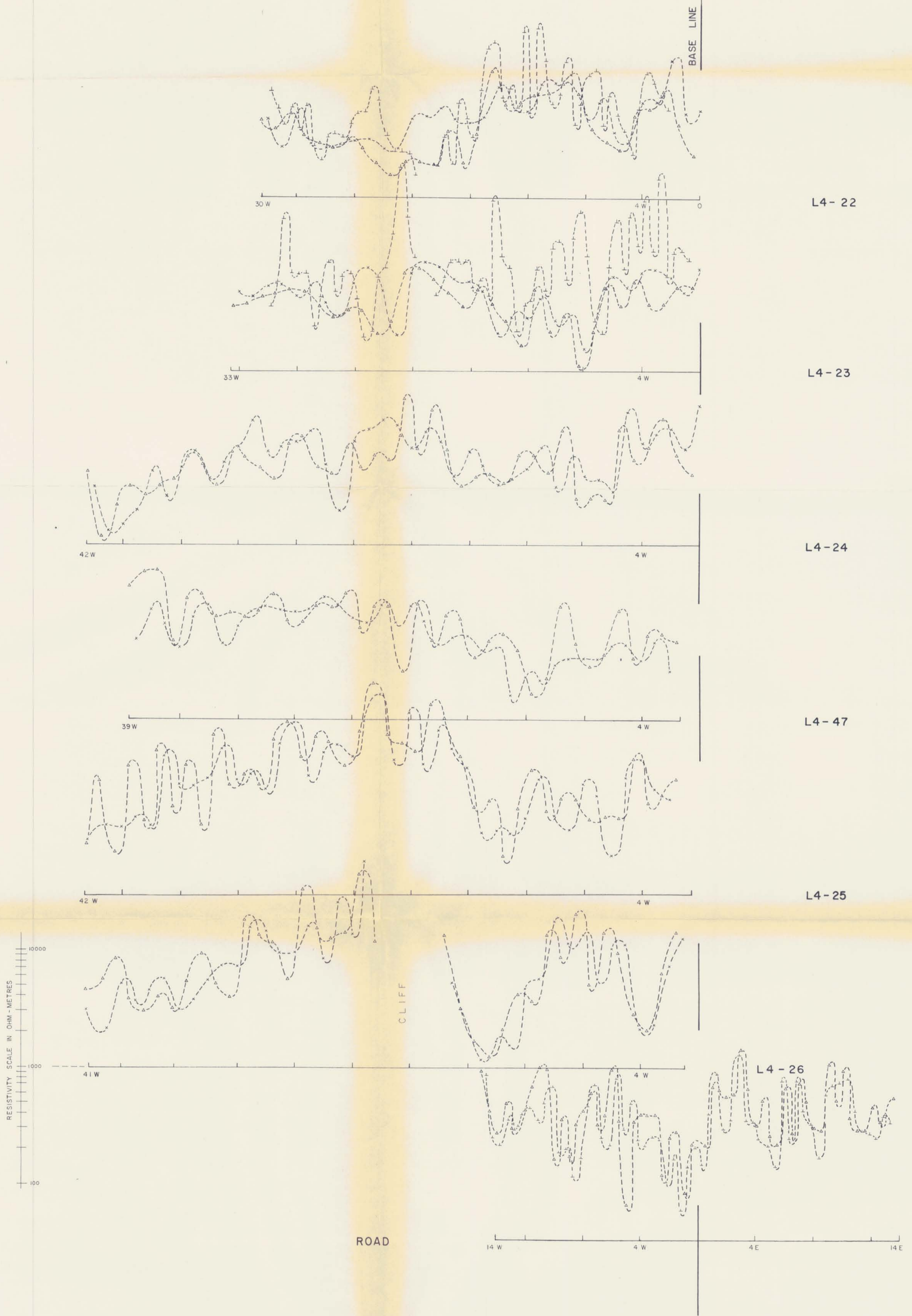
SCALE 1 inch = 500 feet



SURVEY BY SEIGEL ASSOCIATES LIMITED SEPT. 1971

TO ACCOMPANY A GEOPHYSICAL REPORT BY
R.J. FOMINOFF AND J. KLEIN DATED SEPTEMBER 27, 1971

Handwritten signature



LEGEND

RESISTIVITY SCALE: 1 inch = 1 LOGARITHMIC CYCLE
WITH LINE TRACE TAKEN
AS 1000 OHM - METRES

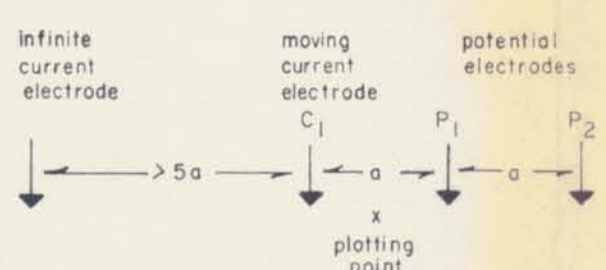
ELECTRODE SPACING a = 200' ---x---x---
 a = 100' ---△---△---
 a = 50' ---▲---▲---

INTERLINE SPACING NOT TO SCALE

NOTES

SCINTREX MK VII INDUCED POLARIZATION
INSTRUMENTATION

THREE ELECTRODE ARRAY



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3280 MAP #3

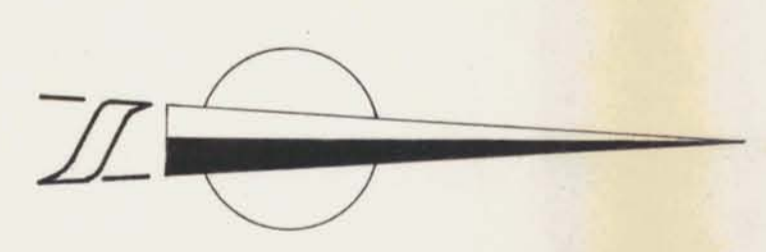
PLATE 3
G. M. EXPLORATIONS LTD.
NICKEL SYNDICATE
HARRISON LAKE AREA, BRITISH COLUMBIA
INDUCED POLARIZATION SURVEY
RESISTIVITY PROFILES

SCALE 1 inch = 400 feet
400 feet 0 400 feet

SURVEY BY SEIGEL ASSOCIATES LIMITED SEPT. 1971

TO ACCOMPANY A GEOPHYSICAL REPORT
P.J. FOMINOFF and R. O. CROSBY DATED SEPT. 27, 1971

Richard O. Crosby

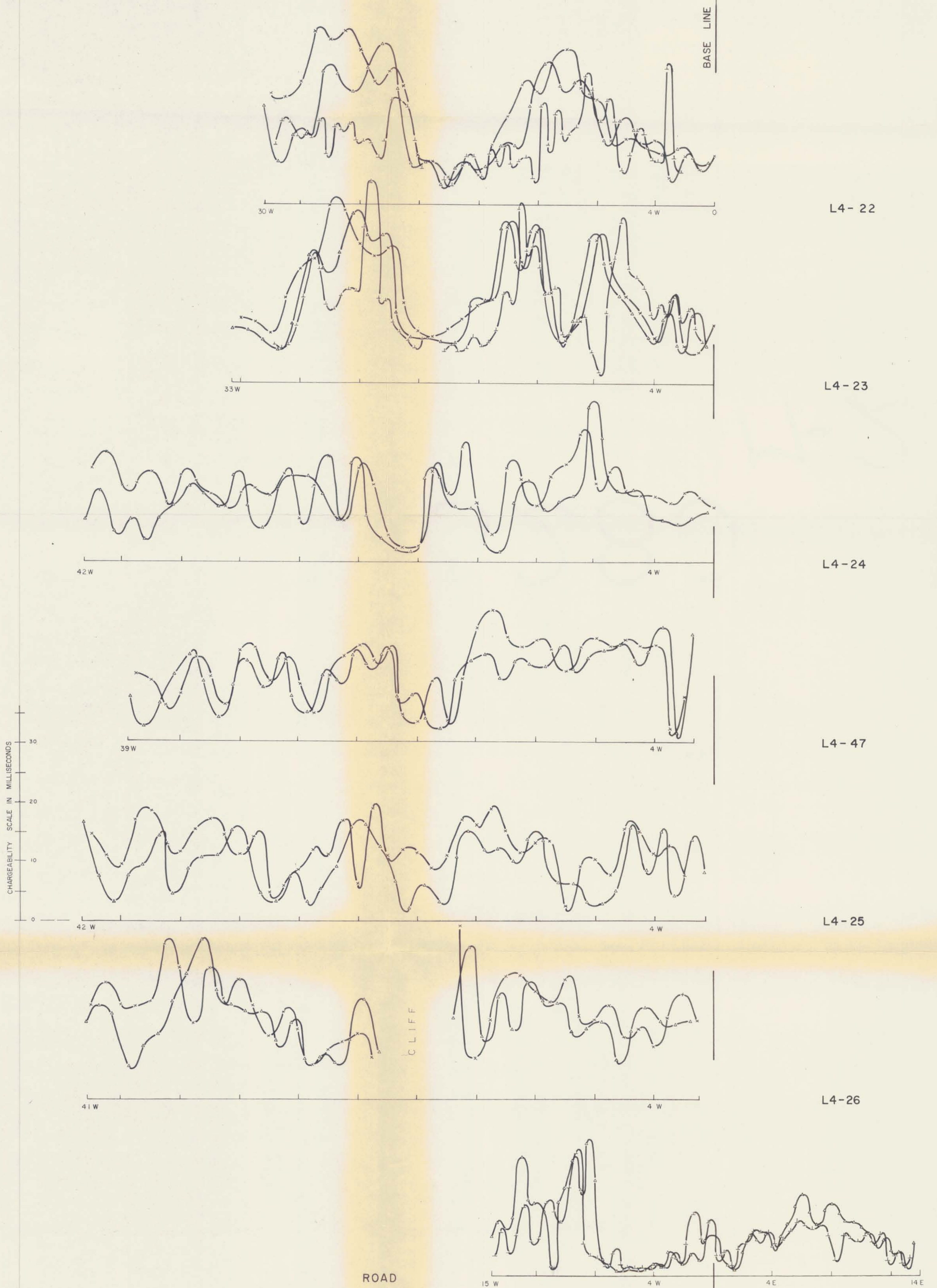


Department of
 Mines and Petroleum Resources
 ASSESSMENT REPORT
 NO. 3280 M.P. #4

PLATE 4
 G.M. EXPLORATIONS LTD.
 NICKEL SYNDICATE
 HARRISON LAKE AREA, BRITISH COLUMBIA
 GRID AND CLAIMS
 Ni CLAIMS
 SCALE 1inch=400 feet
 400' 0 400'
 SURVEY BY SEIGEL ASSOCIATES LIMITED SEPT. 1971

Richard O. Crosby

TO ACCOMPANY A GEOPHYSICAL REPORT BY
 R.J.FOMINOFF AND R.O.CROSBY DATED SEPT. 27, 1971



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M-2

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3280 MAP #2

LEGEND

CHARGEABILITY SCALE: 1" = 10 MILLISECONDS

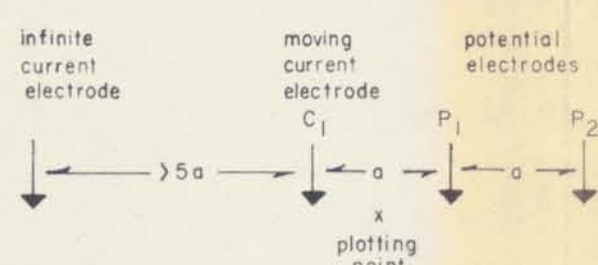
ELECTRODE SPACING
 $a = 200'$ — x — x —
 $a = 100'$ — Δ — Δ —
 $a = 50'$ — ▴ — ▴ —

INTERLINE SPACING NOT TO SCALE

NOTES

SCINTREX MK VII INDUCED POLARIZATION INSTRUMENTATION

THREE ELECTRODE ARRAY



TO ACCOMPANY A GEOPHYSICAL REPORT BY
P.J. FOMINOFF and R.O. CROSBY DATED SEPT. 27, 1971

PLATE 2
 G. M. EXPLORATIONS LTD.
 NICKEL SYNDICATE
 HARRISON LAKE AREA, BRITISH COLUMBIA
 INDUCED POLARIZATION SURVEY
 CHARGEABILITY PROFILES
 SCALE 1 inch = 400 feet
 400feet 0 400feet
 SURVEY BY SEIGEL ASSOCIATES LIMITED SEPT. 1971

Richard O. Crosby