# A GEOPHYSICAL REPORT ON AN INDUCED POLARIZATION SURVEY BEVELEY PROPERTY, NEAR USLIKA LAKE OMINECA MINING DIVISION, BRITISH COLUMBIA (56°, 125° SE) FOR DONNA MINES LTD.

| | |
|---|---|
| Claim Group Surveyed: | Robin 1,2,3,4 & 5<br>Beveley 1,2 & 4<br>Grouse 1,2 & 3<br>Pine, Balsam, Spruce & Willow<br>Donna 8 Fr. & 17 Fr. |
| Supervision and Report by: | R. K. Watson, B.A.Sc., P.Eng.<br>Geophysicist<br><br>W. A. Finney, B.Sc.<br>Geophysicist |

94C/3E

July 22nd - August 3rd, 1967

HUNTEC LIMITED

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# REPORT ON

# AN INDUCED POLARIZATION (I.P.) SURVEY

# OMINECA MINING DIVISION,

# BRITISH COLUMBIA

# (56°, 125° SE)

FOR

DONNA MINES LTD.

BY

HUNTEC LIMITED

VANCOUVER, B.C.

AUGUST 1967

# TABLE OF CONTENTS

# INTRODUCTION

## General

This report contains the results of an Induced Polarization survey carried out by Huntec Limited for Donna Mines Ltd. on the Beveley property in the Omineca Mining Division, British Columbia.

The purpose of the survey was to prospect for sulphide mineralization both in massive and disseminated form. Several small surface showings of mineralization are known in the property and the I.P. method was aimed at indicating extensions of these and locating areas of primary interest for further investigation.

The field work was carried out between July 22nd and August 3rd, 1967, under the direction of Mr. W. Finney. The survey was carried out along a grid of lines at 400 ft. intervals, oriented approximately east-west. Readings were taken at 200 ft. intervals along the line in the reconnaissance phase of the survey.

## The Property

The area surveyed lies within the Omineca Mining Division and is known as the Beveley Group. The mining claims surveyed include:

Robin 1, 2, 3, 4 & 5
Beveley 1, 2 & 4
Grouse 1, 2 & 3
Pine, Balsam, Spruce and Willow
Donna 8 Fr. & 17 Fr.

Access to the property was by road, about 200 miles in a general northerly direction from Fort St. James (Fig.A on Plate 1.

The surface geology of the area has been mapped in

detail over most of the area and shallow trenches have been excavated at several of the more promising mineralized showings. The area is situated on the southern limb of a NW - SE trending anticline which plunges gently to the north-west. The main rock types mapped are limestone, ferrodolomite, schist and shale of Palaeozoic age. The ore occurs mainly as bedding plane replacement bodies in the ferrodolomite and to a smaller extent in the limestone. The mineralization is thought to be associated with a fault zone which trends N 30° W through the south-west part of the survey area (Plate 1). A major fault approximately paralleling the picket lines crosses the property at line 44N and this cuts off the host rock exposing rocks of the older Proterozoic Tenakihi Group to the north.

## SURVEY SPECIFICATIONS

### The Equipment

The Induced Polarization equipment used was a 2.5 kw pulse-type instrument manufactured in Toronto by Huntec Limited. The following specifications apply:

| | |
|---|---|
| Type of Current | Direct Current broken at periodic intervals. Alternate pulse of opposite polarity. |
| Frequency | 1.5 seconds "current on" and 0.5 seconds "current off". |
| Integrating time | 400 milliseconds |
| Maximum power available | 2.5 kw |
| Maximum current available | 3.0 amps |

Measurements taken in the field were:

1. The current flowing through the current electrodes $C_1$ and $C_2$.
2. The primary voltage $V_p$ between the measuring electrodes during "current on".
3. The secondary voltage $V_s$ between the measuring electrodes during "current off".

The apparent chargeability ($M_a$) in milliseconds is calculated by dividing the secondary voltage by the primary voltage and multiplying by 400, which is the integrating time of the receiver unit. The apparent resistivity ($\rho_a$) is calculated by dividing $V_p$ by the current and multiplying by a factor appropriate to the geometry of the electrode array used.

### Electrode Configuration

The reconnaissance and detailed parts of the survey were carried out in the 3-array configuration. In this array the current electrode $C_1$ and the two potential

electrodes $P_1$ and $P_2$ are moved in unison along the survey line. The distance between $C_1$ and $P_1$ is designated by the quantity "a" and in the 3-array configuration the distance $P_1$ to $P_2$ is also kept equal to "a". All the reconnaissance data in this survey was obtained with the value of "a" equal to 200 feet.

Detailing of anomalies discovered in the reconnaissance phase was done by profiling the anomalies using different "a" values. This additional information facilitates the calculation of the depth, dip and location of the source rock as the value of "a" is a rough approximation to the depth penetration in each case.

Data Presentation

The data for the reconnaissance survey is shown on Plates 1 and 2, located at the back of this report. These plates are at a scale of 1" to 200', and show contours of apparent chargeability and apparent resistivity. Interpretation is indicated on these maps as outlines of interpreted positive bodies associated with the main anomalies. The outlines were determined by analysing the detailed profiles and might appear offset from the centre of the reconnaissance anomalies.

The detailed data is shown separately as profiles on Figures 1 to 4 at the back of this report, and these also show the location of interpretative causative bodies. Recommended diamond drill holes are shown on the profiles and on the reconnaissance apparent chargeability contour map.

## RESULTS AND INTERPRETATION

The main feature indicated on the apparent chargeability contour map (Plate 1) is the anomalous region west of the baseline extending from 22N to 30N approximately. Two separate peaks are indicated, each intersected by line 26N. Detailed profiles along 26N and 28N (Figs. 3 and 2), together with the reconnaissance contours, suggest a single chargeable body is the source of this anomaly. The interpreted chargeable body is shown on the detailed profile (Fig.3) and on Plate 1. Fig.3 also shows a "high" on the resistivity profile but this is not attributed to the interpreted mineralized body and is interpreted as being associated with a rock type of higher resistivity which is thought to exist to the north, north-west and south of the body. The resistivity results are discussed further at the end of this section. The depth to the top of the body is not well defined but may be of the order of 50 feet, therefore diamond drilling rather than trenching is recommended to test the anomaly. Two angled drill holes sited at 26+00N, 22+55E and 26+00N, 25+00E, and dipping 45°E and 45°W respectively are recommended. The drill hole locations are shown on Fig.3 and Plate 1.

High chargeability readings were recorded in the north-west corner of the grid and detailing was carried out along line 36N (Fig.1). The results indicate the source to be an elongated body centred at 16+50E and striking approximately 50° to the survey lines as outlined on Plate 1. The body is quite shallow, about 60 feet to the centre of chargeability, and it is believed that the top of it is at or near bedrock surface. The anomaly is typical of one produced by a steeply dipping lens or dyke and a diamond drill hole is recommended for further investigation. This should be located at 36+00N, 15+80E, and dip at 45°E.

Interpreted outlines of the body are shown on Plate 1 and Fig. 1.

Anomalous chargeability values occur on line 16N between 13E and 25E. This line was detailed at narrower spacings and the results indicate the source material consists of at least 3 narrow zones of mineralization as outlined on Plate 1 and Fig. 4. These zones are almost certainly quite shallow, probably reaching the surface and further investigation could be done by trenching, or a group of short drill holes.

At the extreme northern end of the property a series of high chargeability values were recorded along line 44N. These are considerably higher than those obtained on the neighbouring line 40N and there is a corresponding drop in the resistivity values (Plate 2). Insufficient data is available at this stage to interpret this thoroughly and it is only tentatively suggested that these high readings are due to a change of rock type encountered on the northern side of the fault zone which is almost coincident with 44N. It is possible that graphite or sulphide mineralization in the fault itself is causing the higher readings. If encouraging results arise out of drilling of anomalies outlined elsewhere, then further I.P. work to the north would be warranted.

Apparent chargeability values on the eastern and southern parts of the grid are generally quite low, varying between 2.0 - 3.5 milliseconds. Greater values occur at 40N, 33E to 35E; and 24N, 34E to 39E; but these were not considered important enough at the time of the survey to justify extra investigation. However, if further I.P. is carried out on the property in the future, then these two anomalous regions might be worth reconsidering.

Extremely low chargeability values observed along

line 4 N are probably due to a change of rock type, although there appears to be no geological evidence to support the idea of faulting or sharp contact in this region.

The resistivity contour pattern (Plate 2) is relatively complex, particularly in the western half of the property. An anomaly with approximate north-south strike extends from 12N to 24N and exhibits steep flanks on its northern and western limits. This zone of high resistivity cannot be attributed to any particular rock type, but the steep gradients suggest it is terminated to the north and west by abrupt contacts or possible faults. The interpreted contact or fault lines are shown on Plates 1 and 2. It is noted that the interpreted chargeable body centred at 26+00N, 23+00E is positioned close to the intersection of the two lines which is possibly a favourable location for mineralization.

## CONCLUSIONS AND RECOMMENDATIONS

The chargeable bodies causing the anomalies on lines 16+00N and 36+00N are probably limited in width and could consist, in the former case, of numerous narrow bodies. The mineralized bodies in both cases are shallow and might even reach bedrock surface. It is recommended that the anomalous zone on line 16+00N be tested by trenching or a grid of short percussion drill holes. One angled diamond drill hole is proposed for testing the anomaly on line 36+00N.

The main anomaly detected is centred at 26+00N, 23+20E and two angled diamond drill holes are recommended. These should be drilled to at least 300 feet as the source material here is thought to be deeper than in other anomalies, possibly centred at 100 ft. b.g.l.

## SUMMARY

An I.P. survey, totalling about six line miles, was carried out over the Beveley group of claims from July 20th to August 3rd, 1967. A background of moderate chargeability, between 2.5 - 3.5 milliseconds, was revealed with three zones of higher chargeability in the order of 15.0 - 20.0 milliseconds.

The anomalous zones were studied in detail and are interpreted as sufficiently strong and extensive to indicate possible metallic sulphide mineralization.

Three diamond drill holes are recommended to test two of the zones, and trenching or percussion drilling is recommended to test the third.

HUNTEC LIMITED

W. A. Finney

W.A. Finney, B.Sc.
Geophysicist


R. K. Watson

R.K. Watson, B.A.Sc.,P.Eng.
Geophysicist

# APPENDIX A

## ASSESSMENT CREDIT DATA

### Personnel Qualifications

| | |
|---|---|
| Survey Party Chief: | W. A. Finney, B.Sc., Geophysicist |
| Technical Supervisor: | R. K. Watson, B.A.Sc., P.Eng. Geophysicist |

### Personnel Employed on Survey

| Name | Occupation | Dates |
|---|---|---|
| R. K. Watson | Geophysicist | August 29th & 30th, October 11th, 1967 |
| W.A. Finney | Geophysicist | July 20th - August 3rd, August 26th - 30th, October 10th, 1967 |
| L. Amiot | Operator | July 20th - 27th, 1967 |
| B. O'Sullivan | Operator/Helper | July 20th - August 2nd, 1967 |
| T. Welch | Helper | July 20th - August 3rd, 1967 |
| J. Todd | Helper | July 29th & 31st, August 1st, 1967 |
| J. Hudson | Helper | July 28th, 1967 |
| D. Wilson | Drafting | September 15th, 18th - 20th, 1967 |
| E. Helkio | Drafting | September 25th - 29th, 1967 October 10th - 12th, 1967 |
| M. Vatcher | Typing | October 13th, 1967 (½ day) |

### Miles Surveyed

| | Line-Miles |
|---|---|
| Reconnaissance Phase | 5.2 |
| Detail Phase | 1.0 |
| Total | 6.2 |

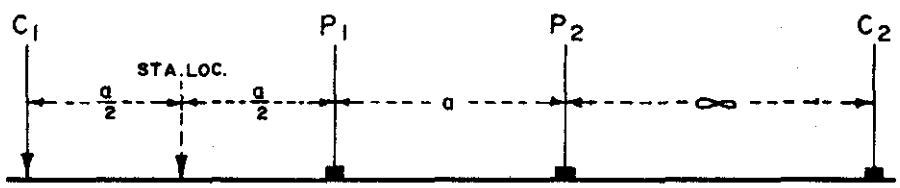
# DETAIL PROFILES of APPARENT CHARGEABILITY & RESISTIVITY

# DONNA MINES LIMITED

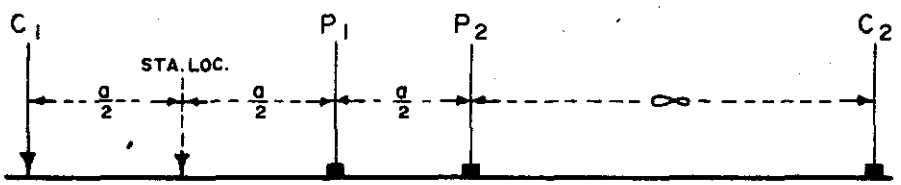
## BEVELEY GROUP

FIGS: — — — 1 To 4

### 3 - ELECTRODE ARRAY




### POLE - DIPOLE ARRAY




NOTE:

$P_1$ $P_2$ are Receiver Electrodes.

$C_1$ $C_2$ are Transmitter Electrodes.

LEGEND

- a = 50'
- a = 100'
- a = 200'
- a = 300'
- a = 400'
- a = 600'
- a = 800'

Horizontal Scale: 1 inch = 200 feet.

Vertical Scales:

Chargeability 1 inch = 10.0 milliseconds.

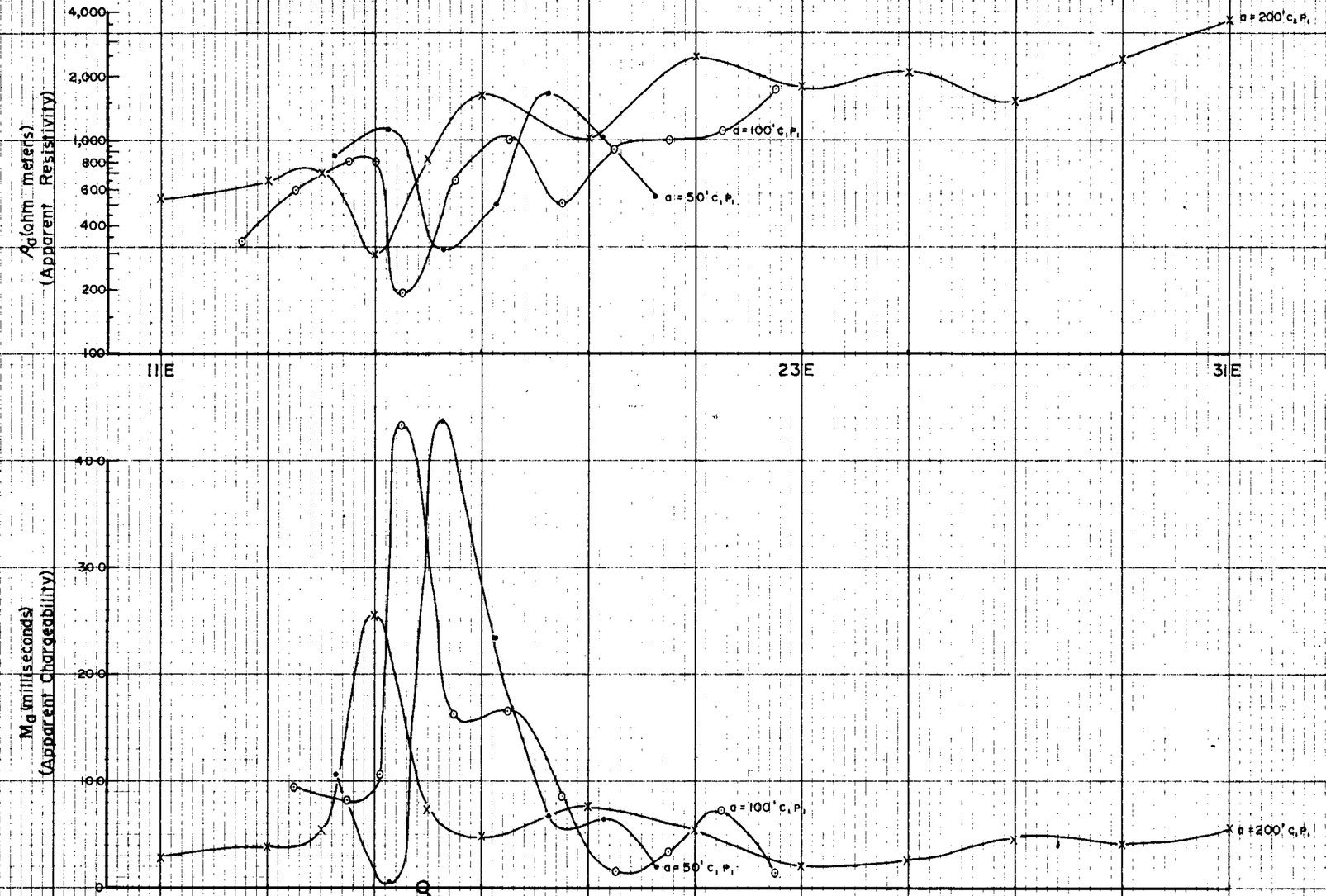
Resistivity 2 inches = 1 logarithmic cycle (ohm-meters)

DATE: JULY, AUG, 19

JOB No: DH-677

# INDUCED POLARIZATION SURVEY.

## DETAIL PROFILE: LINE – 36N.




LEGEND

ANOMALOUS ZONES

RECOMMENDED D.D. Holes

BEVELEY GROUP

R. K. Watson

To accompany report by W. A. Finney

R.K. Watson, B.A.Sc., P.Eng., Geophysicist.
W.A. Finney, B.Sc., Geophysicist.

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PH-677/67.

FIG.-1

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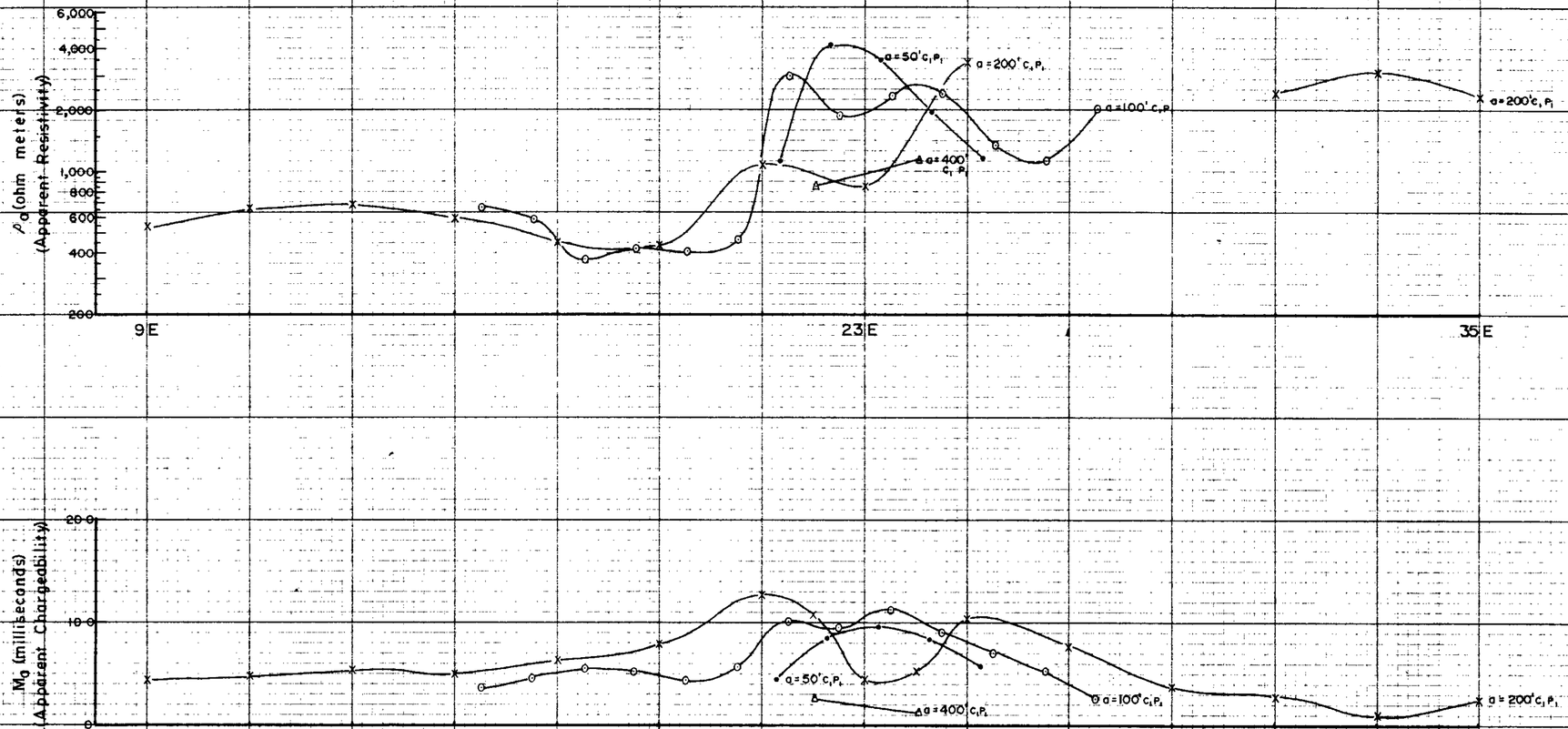
INDUCED POLARIZATION SURVEY

# DETAIL PROFILE: LINE - 28N.




BEVELEY GROUP

R.K. Watson

To accompany report by W.A. Finney

R.K. Watson, B.A.Sc., P.Eng., Geophysicist.
W.A. Finney, B.Sc., Geophysicist.
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RH-677/67

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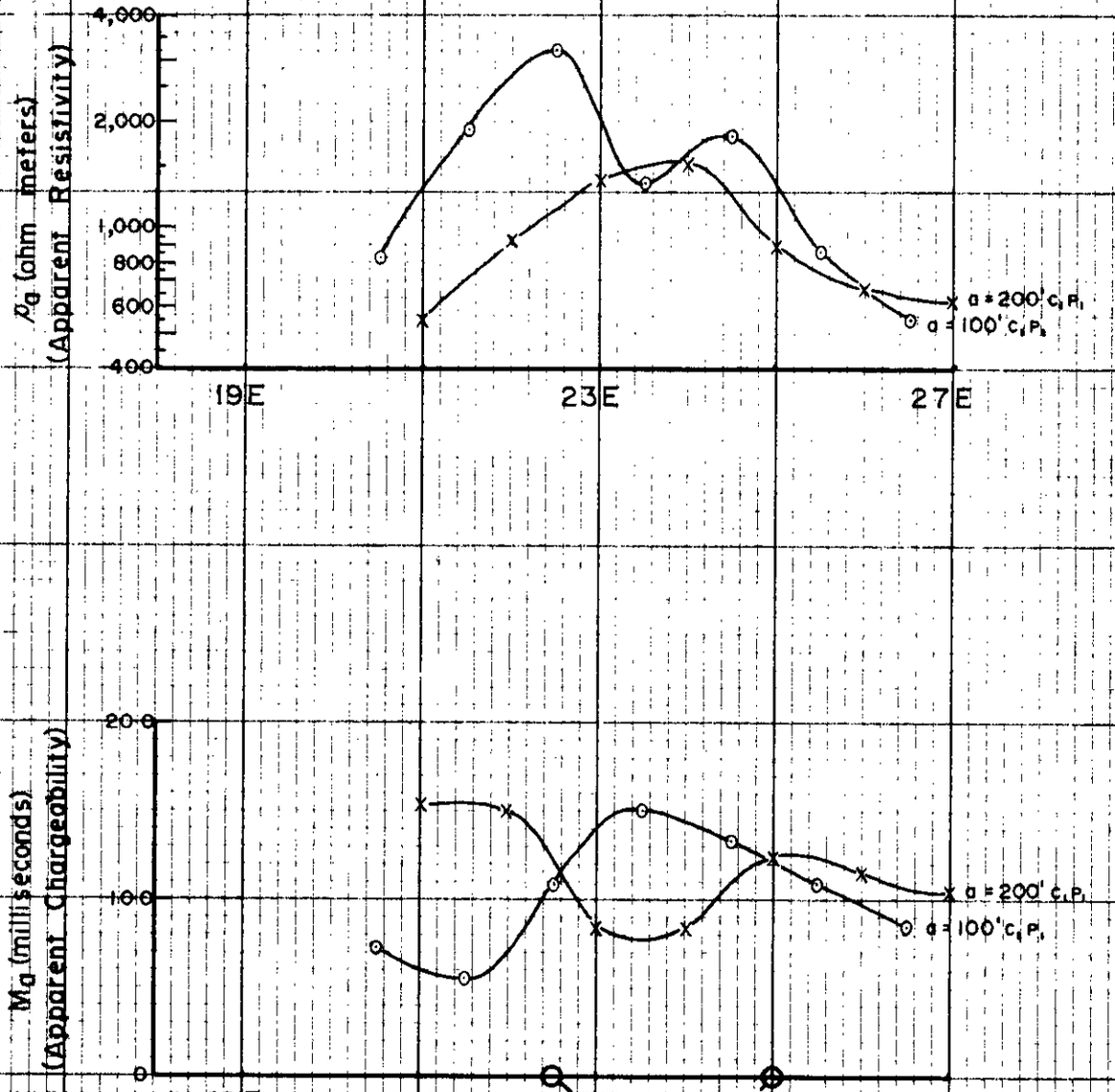
FIG.-2

# INDUCED POLARIZATION SURVEY

# DETAIL PROFILE: LINE - 26 N.




## LEGEND

ANOMALOUS ZONES

RECOMMENDED D.D. Holes

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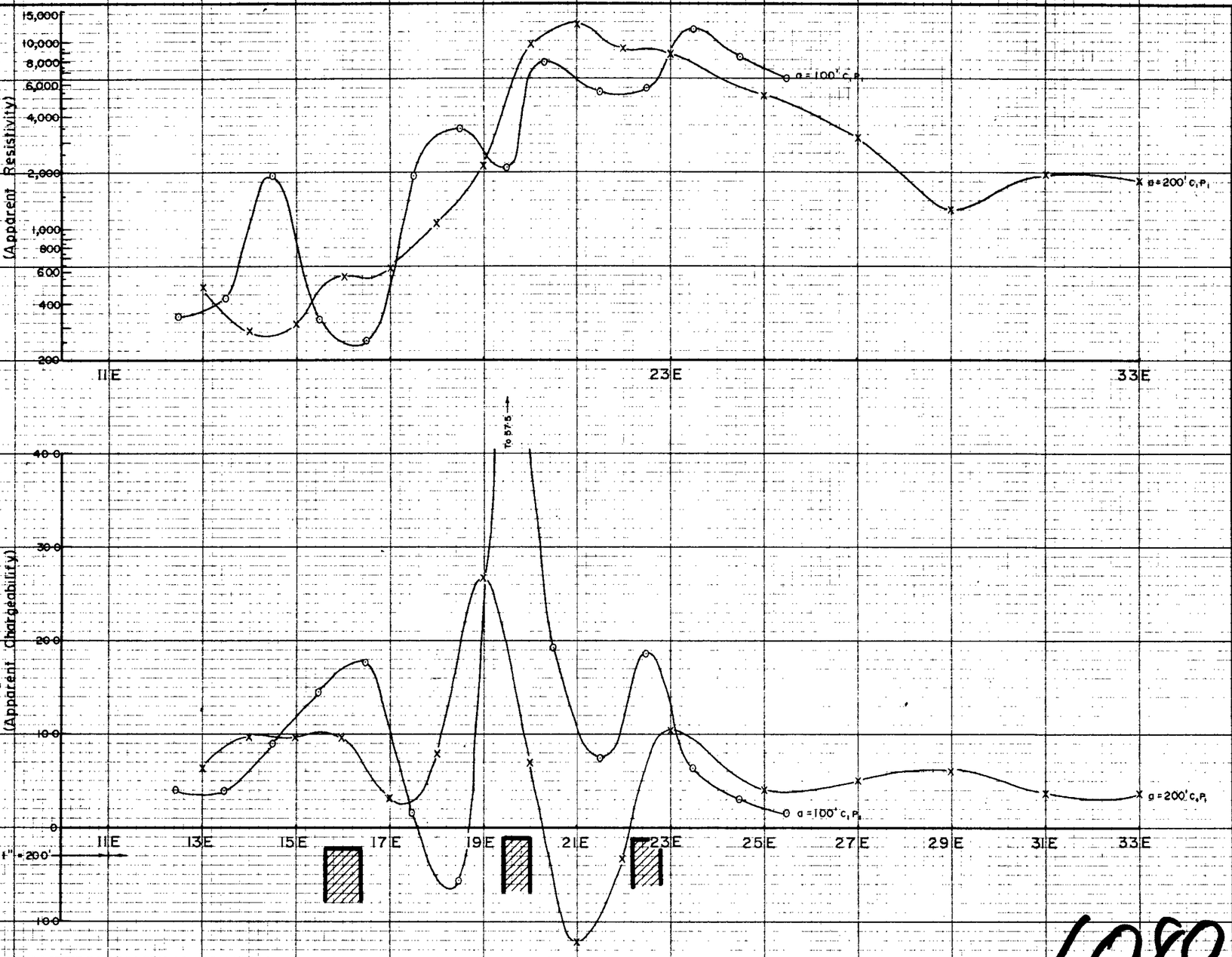
PH.-677/67.

1080

FIG.-3.

INDUCED POLARIZATION SURVEY

# DETAIL PROFILE LINE — 16 N.




LEGEND

ANOMALOUS ZONES

BEVELEY GROUP

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PH.-677/67

1080

FIG.-4

BEVELEY 3 | DONNA 3 | BEVELEY 4 | DONNA 21 | BEVELEY 1 | SILVER 2 | GROUSE 2 | BEVELEY 2 | DONNA 5 | DONNA 8 FR. | PINE | GROUSE 3 | SILVER 1 | SPRUCE | 16 FR. | GROUSE 1 | WILLOW | BALSAM | ROBIN 5 | ROBIN 2 | ROBIN 4 | DONNA 17 FR. | DONNA 23 | ROBIN 1 | DONNA 24 | 8 FR. | ROBIN 3 | RIDGE 2

B/L-30E

L-44N | L-40N | L-36N | L-32N | L-28N | L-26N | L-24N | L-22N | L-20N | L-16N | L-12N | L-8N | L-4N

9E | 11E | 13E | 15E | 17E | 19E | 21E | 23E | 25E | 27E | 29E | 31E | 33E | 35E | 37E | 39E | 41E | 43E | 45E | 47E

TRAIL | ROAD

## LOCATION MAP

Scale: 1 inch = 50 miles.

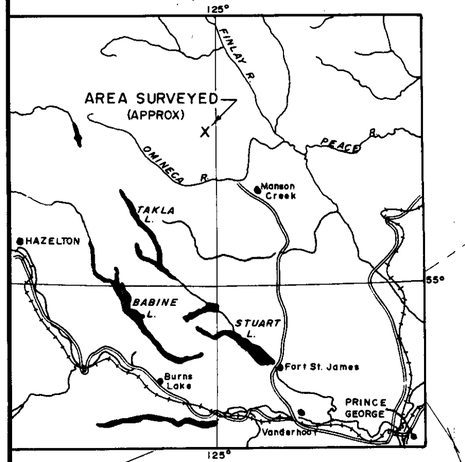



FIG.-A

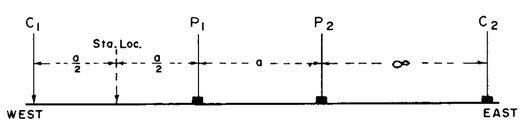
## LEGEND

- Outline of Interpreted Anomalous Body
- Section of Anomaly that was Detailed Showing Anomalous Zones
- Recommended D.D. Holes.
- Distance of Line Covered by Detail.
- Existing D.D. Holes
- Faults (Mapped)
- Fault or Contact (Interpreted)

N

3 - ELECTRODE ARRAY.

a = 200 feet.




INDUCED POLARIZATION SURVEY.

# DONNA MINES LIMITED.

(BEVELEY GROUP)

BEVELEY PROPERTY, OMINECA M.D., - B.C.

APPARENT CHARGEABILITY CONTOURS WITH INTERPRETATION.

CONTOUR INTERVAL: 2·0 milliseconds.

SCALE : 1 inch = 200 feet.

1080

R. K. Watson

To accompany report by W. A. Finney

R.K. Watson, B.A.Sc., P.Eng., Geophysicist.

W.A. Finney, B. Sc., Geophysicist.

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PLATE- I

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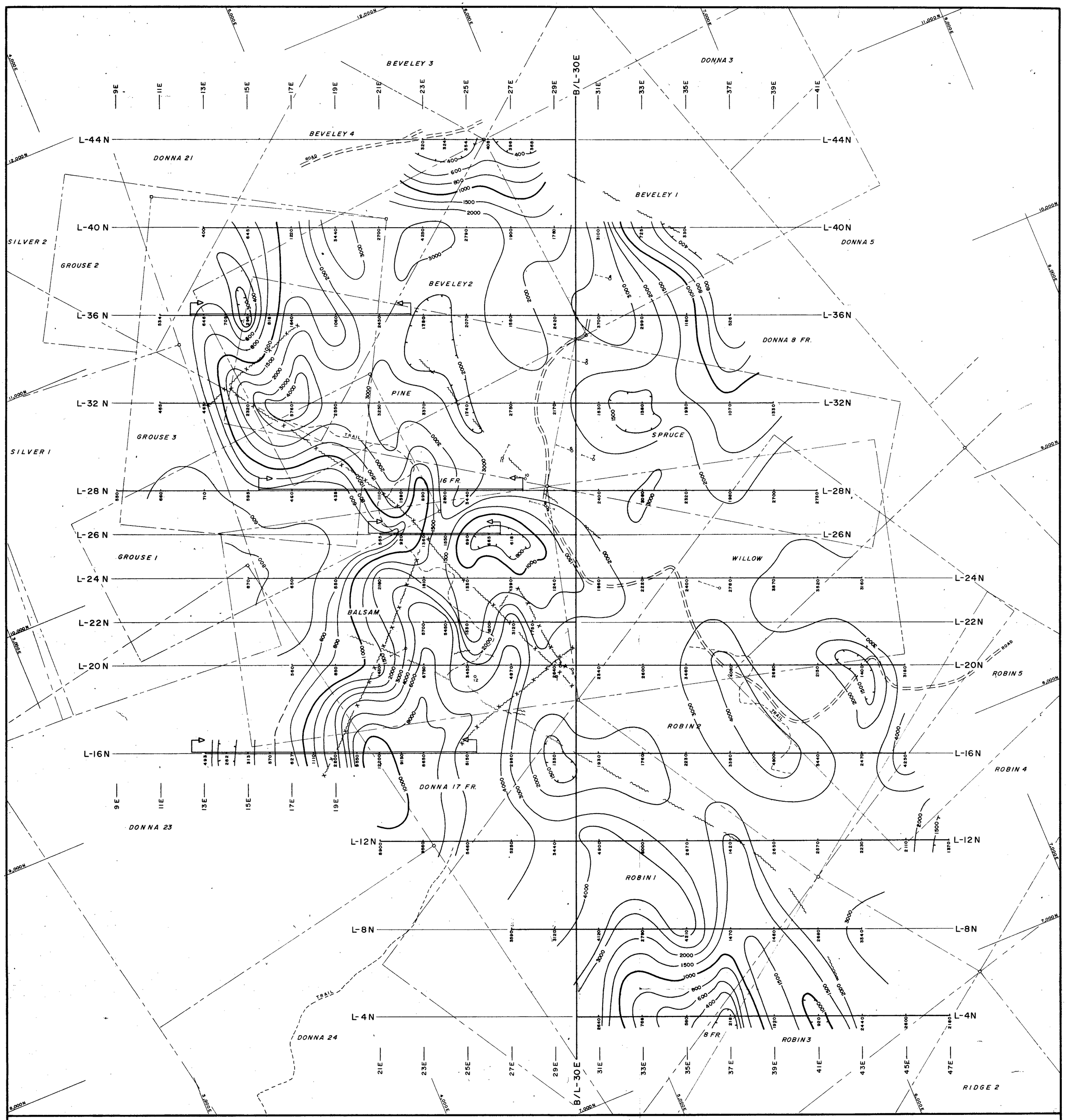


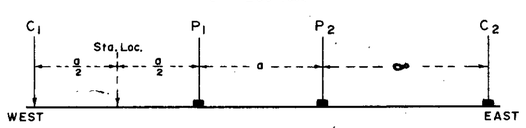

N

## LEGEND

- Distance of Line Covered by Detail
- Existing D.D. Holes
- Faults (Mapped)
- Fault or Contact (Interpreted.)

3 - ELECTRODE ARRAY.

a = 200 feet.




INDUCED POLARIZATION SURVEY.

# DONNA MINES LIMITED.

(BEVELEY GROUP)

BEVELEY PROPERTY, OMINECA M.D., - B.C.

## APPARENT RESISTIVITY CONTOURS.

CONTOURS AT (logarithmic intervals) 100, 150, 200, 300, 400, 600, 800, 1000, etc ohm-meters.

SCALE : 1 inch = 200 feet.

1080

To accompany report by R. K. Watson / W. A. Finney

R.K. Watson, B.A.Sc., P.Eng., Geophysicist.
W.A. Finney, B. Sc., Geophysicist.

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PLATE-2