483

REPORT ON

AN INDUCED POLARIZATION SURVEY

JERICHO PROPERTY

HIGHLAND VALLEY, BRITISH COLUMBIA

(50°, 121°, SE)

for

JERICHO MINES LIMITED

by

HUNTING SURVEY CORPORATION LIMITED

Toronto, Ontario

December, 1962

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INTRODUCTION

From August 27th. to September 7th. and from October 9th. to October 17th., 1962, an Induced Polarization (I.P.) survey was carried out by Hunting Survey Corporation Limited over part of the property owned and operated by Jericho Mines Limited.

The claims surveyed are as follows:

James 5 and 7

Kim 12

Bud 38 to 43 inclusive

Bob 2, 4, 6 and 9 to 14 inclusive

All claims form part of the Jericho property and are located in the Highland Valley, British Columbia (50°, 121°, SE).

The survey was performed by a five-man crew. The project geophysicist in charge of the survey and the technician-operator were E. L. Gregotski and F. H. Faulkner respectively of Hunting Survey Corporation Limited. Jericho Mines Limited provided the helpers for handling electrodes on the lines. They were G. Saarse, N. Fostershank and C. Luberge.

The geophysical survey was carried out along pre-cut and chained picket lines. The initial survey consisted of three lines, each 5,000 feet in length and 800 feet apart. These lines run approximately N30°E. Lines of the second survey were grouped into a separate grid

system, orientated similar to the original with their 0+00 chainage corresponding to the 10+00N chainage of the original grid. The basic coverage of the survey consisted of readings at 100-foot intervals, in some instances this was decreased to 50 feet. In this manner a total of 20,000 feet of profiles were obtained.

The data were obtained using the "three electrode array". This array consists of one current electrode (C_1), two potential electrodes (P_1 and P_2), the second current electrode (C_2) remaining fixed at "infinity". The data were obtained using electrode spacings of 100, 200 and 400 feet. Additional data were obtained where required with electrode spacings of 10, 20, 50 and 800 feet.

The Hunting pulse-type instrument is similar in design and operation to those described by R. W. Baldwin in "A Decade of Development in Overvoltage Survey", *A.I.M.E. Transactions*, Vol. 214, 1959. Power is obtained from a Volkswagen motor coupled to an 18 kw., 400 cycle generator which provides a maximum of 10,000 watts d.c. to the ground. The cycling rate is 1.5 seconds current on and 0.5 seconds current off, the pulses reversing continuously in polarity. The data collected in the field consists of careful measurement of the current (I) in amperes flowing through electrodes C_1 and C_2, the primary voltage (V_p) in volts appearing between P_1 and P_2 during the "current on" part of the cycle, and the secondary voltage or overvoltage appearing between electrodes P_1 and P_2 during the "current off" part of the cycle. The

latter voltage is integrated electronically with respect to time, to provide a measurement of polarization (V_s) in millivolt-seconds. The "apparent chargeability" in milliseconds is calculated by dividing the polarization (V_s) by the primary voltage (V_p). The "apparent resistivity" in ohm-meters is proportional to the primary voltage (V_p) divided by the measured current (I), the proportionality factor depending on the geometry of the array used. The resistivity and chargeability obtained are called "apparent" as they are the values which that portion of the earth sampled by the array must have if it were homogeneous. As the earth sampled is usually inhomogeneous, the calculated "apparent resistivity" and "apparent chargeability" are functions of the "true" resistivities and chargeabilities of the various sections of the earth sampled and of the geometry of those sections.

The results of the survey are shown on the individual profiles in the Appendix of this report. These profiles have a horizontal scale of 1 inch to 100 feet. The "apparent chargeability" is plotted at a vertical scale of 1.0 milliseconds per inch. The "apparent resistivity" is plotted on a vertical logarithmic scale of 2 inches per logarithmic cycle. The interpretation is presented in the form of a map at a scale of 1 inch to 100 feet. The map is located in a pocket at the rear of this report.

This report constitutes a review of Preliminary Reports submitted by E. L. Gregotski and C. W. Faessler to Jericho Mines Limited in September and October 1962. The interpretation and recommendations

herein are made after a careful re-examination of the I.P. results and are of a more specific and restricted nature than the general remarks made at the conclusion of the field work.

GENERAL GEOLOGY

The property is mostly covered by overburden that varies in thickness from zero to a possible depth greater than 100 feet. Observations of bedrock from outcrops, in the immediate vicinity of the survey area, indicate it to consist of granodiorite, in places containing malachite staining and minor amounts of molybdenite. Sulphide mineralization observed in the area appears to be primarily bornite and chalcopyrite.

INTERPRETATION

Due to the geometry of the mineralized zones which are the target of I.P. surveys in the Highland Valley, the usual approach to quantitative interpretation assuming a horizontally layered earth can seldom be applied. The complex problem of the combined effects of depth of burial, width, dip and true chargeability of a vertically mineralized zone plus the physical characteristics of the overburden and country rock have not been solved practically. However, certain rule-of-thumb plus the experience gained from test surveys over known ore bodies permit certain estimates to be made. Thus the maximum possible width of the causative bodies are indicated on the accompanying profiles, with the understanding that the body most probably is narrower than indicated. Rough depth estimates are possible in some cases, but is is necessary to know the electrode spacings at which maximum response is obtained; thus a minimum of three electrode spacings across the anomaly are usually required.

The interpretation of the survey data consists of a careful analysis of each individual profile. The results of this analysis are shown by appropriate symbols on the I.P. profiles in the Appendix of this report. These results are also transferred to the interpretation map in the pocket at the end of this report using the same symbols. Due to the high degree of complexity of the interpreted I.P. results

and to the absence of geological data in certain parts of the area, caused by the presence of overburden, no attempt was made to outline in plan form the various zones by use of contact or similar symbols. Instead, possible relationships between zones of different lines are shown by long arrows.

The symbols used warrant some further discussion. The "zones of special interest" (cross-hatched) represent the causative bodies of specifically recognizable anomalies measured from profiles observed with the shortest electrode spacings. Thus, the width indicated is the probable width nearest to the bedrock surface and need not represent the true width of the body at depth. The "zones of possible interest" (single-hatched) are anomalous zones which cannot be broken down into individual bodies, or zones which show lower chargeability (less mineralization) or greater depth. Special features of the I.P. data are indicated by arrows between limiting marks along the profile and are explained by notes, both on the profiles and on the map.

Estimated depth (h), or the limits thereof, are shown in feet. Where a maximum value of depth is shown, it is believed that more often than not the actual depth will be found to be one-half, or less, of the maximum shown. It is to be noted that these depths would be more properly called distances to the body, the distances being measured in a plane perpendicular to the line and to the ground surface. This is due to the fact that the I.P. method samples a certain volume of the earth

and therefore the causative bodies do not necessarily lie beneath the lines surveyed but could be located to one or the other side of the line. Such an occurrence is called a "side effect".

As previously explained, the mathematical problem of the relationship between the width, the depth and the true chargeability is not solved in the case of bodies of limited vertical cross sections. Thus, only a minimum chargeability in milliseconds is shown. Past experience shows that one percent sulphide by volume will cause a chargeability of 3 to 8 milliseconds. In other words, a minimum chargeability of 12 milliseconds indicates an absolute minimum sulphide content of 1.5%, but the sulphide content could also be greater than 4%. The sulphides may or may not be economical as the I.P. method does not differentiate between chalcopyrite and pyrite, for example.

The resistivity data obtained over the lines show no significant correlation with the I.P. anomalies. The variations in the resistivity values obtained are due mainly to changes in the overburden thickness and in overburden and bedrock resistivities.

The interpretation of the I.P. data based on all the available data, is presented in the following paragraphs.

Six lines were surveyed, three in the initial survey, Lines 1, 2 and 3, and another three, 2A, 2B and 2C, during the second survey. Of the lines surveyed only one, Line 3, showed no anomalous conditions.

On Line 1, a weak anomalous zone was located between 9+50N and 11+50N, having a response of approximately 1 millisecond above background. The causative body is at a depth of 75 feet or less.

Line 2A shows an anomalous section located between 1+00S and 5+50N. This zone is observed on three electrode spacings, 100, 200 and 400 feet, the highest chargeability reading being 4.4 milliseconds at 1+00N on the 200-foot electrode spacing. The shallowest depth obtained on this line is at 4+00N and is in the order of 100 feet or less and may be sufficiently shallow to be trenchable. The causative body appears to have a dip to the south.

On Line 2, a much stronger and very significant response of over 9 milliseconds was observed at 17+50N. This is the highest chargeability indicated during the two surveys. Electrode spacings of 10 feet, 20 feet, 50 feet, 100 feet, 200 feet and 400 feet were traversed across this zone. The high response obtained and the shape of the profiles indicates a narrow body of high chargeability at a shallow depth. The true chargeability could be as high as 100 milliseconds, which would suggest 10 to 20% sulphides by volume. The maximum width is estimated at 80 feet and the estimated depth is 25 feet, however the depth may be a little deeper but not greater than 75 feet. The 100-foot electrode spacing shows a weak suggestion that the body broadens at lower depths.

The survey of Line 2B indicated an anomalous section located between 3+00N and 5+00N. Its response is rather weak, being 1.5 milliseconds above background. The causative body is at a shallow depth, less than 100 feet, with a minimum chargeability of 3.2 milliseconds.

Two anomalous sections are observed on Line 2C, one between 0+00 and 1+50N, the other between 7+00N and 9+00N. Both zones appear to be associated with a thinning of the overburden. The section centered about 1+00N has a minimum chargeability of 3.6 milliseconds and indicates a narrow body at shallow depth. The maximum width is 150 feet and the depth is estimated to be approximately 100 feet. The second section centered at 8+00N has a minimum chargeability of 4.0 milliseconds and is caused by a body at a much greater depth.

Considering the narrow widths of the anomalies and therefore of the causative bodies, the observed chargeabilities can be significant. The trends of the individual bodies are difficult to assess due to the complexity of the pattern and the closeness of the bodies on each line. The accompanying interpretation map shows possible trend patterns based on information available. Although the trends may be considered to be fairly well established, their lateral extent and position is still open to question due to the possibility of side effects. Thus, it must be remembered that the bodies indicated may or may not reach a specific line, and may become more or less significant in between lines.

SUMMARY AND RECOMMENDATIONS

An Induced Polarization survey was carried out over part of the property of Jericho Mines Limited near Merritt, British Columbia. A number of anomalous zones were indicated that are probably due to the presence of sulphides. The strongest anomaly was located at 17+50N on Line 2 and gave a high chargeability response of over 9 milliseconds. All zones observed appear to be narrow, in the order of 100 feet, but may broaden with depth.

The economic significance of these zones must be determined by visual examination as the I.P. method cannot differentiate between economic and non-economic sulphide minerals.

It is, therefore, recommended that these anomalies be further investigated. There are two possible approaches to follow up on the results of the I.P. survey. The first is to complete and detail the present survey to properly define the anomalies detected so far and thereby to determine their strike extent and lateral position with respect to the lines surveyed. However, this approach may run the risk of outlining one or more pyritic bodies of no economic significance. Also the trend may be obtained by geological investigation of the adjacent outcrop areas.

Hence, the second approach of trenching and drilling to determine the nature of the sulphide mineralization may prove to be a less

costly method of examining the anomalous zones. Due to the absence of data from electrode spacings smaller than 100 feet, except on the anomaly on Line 2, it is not possible to guarantee that any zone is close enough to the surface to be trenchable. However, depth of overburden determinations by shallow refraction seismograph over each proposed trench location would quickly indicate the feasibility of trenching to bedrock. In drilling, it must be remembered that due to the wide intervals (400 feet) between lines, it is possible that the causative body does not reach the particular line on which the anomaly is observed.

It is recommended that trenching be carried out at the following locations:

Line 1 at 11+00N

Line 2A at 4+00N

Line 2 at 17+50N

Line 2B at 4+00N

Line 2C at 1+00N

If the overburden is too deep and trenching proves to be unfeasible, or does not provide the required information, then diamond drilling will be necessary. Drilling is recommended to investigate the following anomalies:

Line 2 at 17+50N

Line 2C at 8+00N

Should the results of the trenching and/or drilling prove encouraging

then, of course, further work should be undertaken to completely outline the anomalous zones.

HUNTING SURVEY CORPORATION LIMITED

E. B. Nicholls,
Geophysicist.

APPENDIX

I.P. Profiles : Lines 1
2
3
2A
2B
2C

line lies along a wide slashed line
say 4' wide

Jericho Mines
HUNTING SURVEY CORPORATION
August, September October -
1962.

1st: Three survey lines were cut and surveyed. Line #1 started on Bob 12 and continued North magnetic through Bob 14, Jericho 61 & 62. This line is a little over one mile in length. 1 mi

Line 2 was cut 800 feet East magnetic from line 1 and started on Bob 4 and continued through Bob 2, Jericho 53 and 64. This line paralleled Line 1 and is a little over 1 mile in length. 1 mi

Line 3 was cut 800 ft magnetic West from Line 1. It started on Bob 12 and crossed Bob 14, Jericho 61 and Jericho 62 and is a little over a mile in length. 1 mi

Line 2-A: This line was cut 400 ft West of magnetic Line 2 and paralleled. It started 800 ft North of the starting point of Line 2. It was continued for approximately 3/4 of a mile. This was an interpolated line. 3/4 mi

Line 2-B: This line was cut 400 ft East of magnetic of line 2 and 800 ft North magnetic of the starting point of Line 2. It started on Bob #2 and crossed Jericho 63 & 64. This line was approximately 3/4 of a mile in length. 3/4

Line 2-#: This line was 400 ft East magnetic of Line 2-B. It covered the same claims as Line 2-B. This line was approximately 3/4 of a mile in length following claims Bob 12, Bob 14, Jericho 61, Jericho 62, Bob 2, Jericho 63 & 64. The survey also embraces a small part on the West of Bob 1, Jericho 65 and 66.

Altogether the survey covered approximately 400 acres.

Hamilton B. Halley
Con. Geologist

STATEMENT OF EXPENDITURES - Jericho Mines I.P. Survey Costs

Line Cuttersand Survey Helpers

C. Luberge - Aug. 1-Sept. 30, 1962 - 60 days @$18.00---	$1,080.00
J. Fastershank-Aug.1-Sept.30, 1962 - 60 days @$18.00---	$1,080.00
N. Tenney - Aug. 1-Sept. 30, 1962 - 60 days @$18.00----	1,080.00
J. McKinnon - Aug. 1-Sept. 30, 1962- 60 days @$18.00---	1,080.00
Supervision - H.B. Hatch - 2 months @$500.00/month-----	1,000.00
Total	$5,320.00
Hunting Survey Corporation - I.P. Survey----------	5,735.00
Expense Total	$11,055.00

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

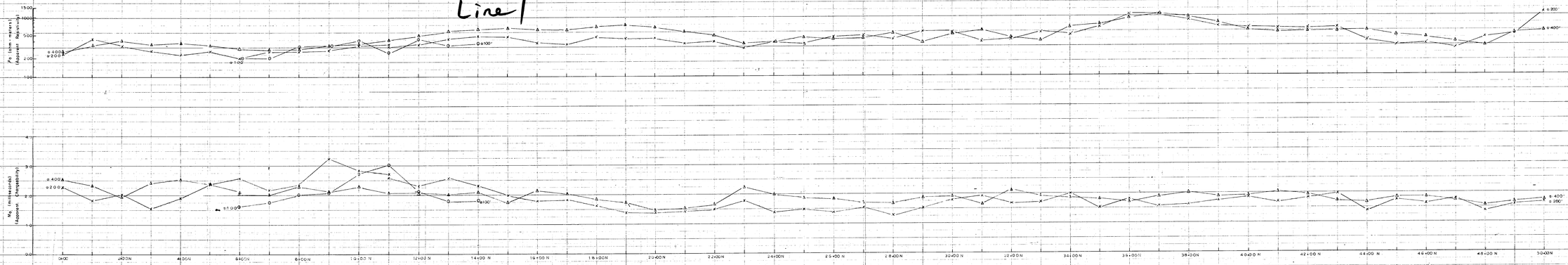
Delcared before me at the City of Vancouver in the Province of B. C., this 16th day of May 1963.

Gold Commissioner.

Certified Correct

H.B. Hatch.

Line 1



JERICHO MINES LIMITED
HIGHLAND VALLEY, B.C.
IP PROFILE - LINE 1
SEPTEMBER
1962

3-ELECTRODE ARRAY
STA. LO
C_2 P_2 P_1 C_1

LEGEND
Zone of interest

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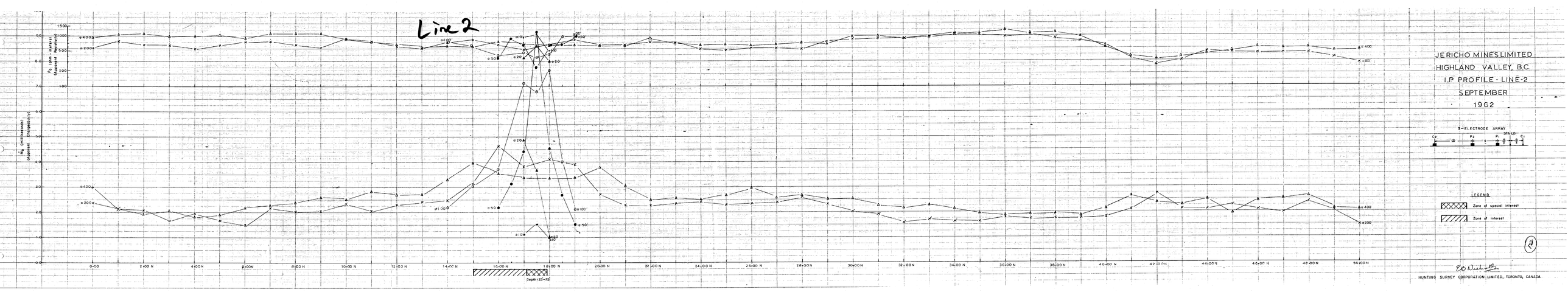
HUNTING SURVEY CORPORATION LIMITED, TORONTO, CANADA



JERICHO MINES LIMITED
HIGHLAND VALLEY, B.C.
I.P PROFILE - LINE-2
SEPTEMBER
1962

3-ELECTRODE ARRAY
STA I.D.

LEGEND

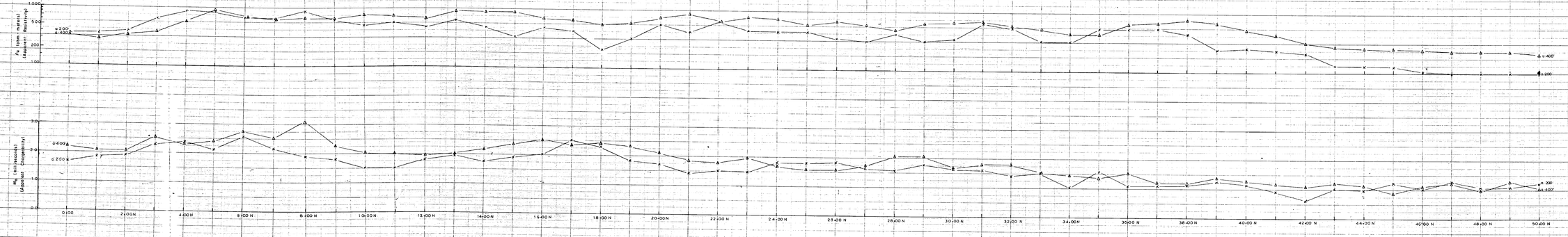
Zone of special interest

Zone of interest

E.O. Nicholls

HUNTING SURVEY CORPORATION LIMITED, TORONTO, CANADA

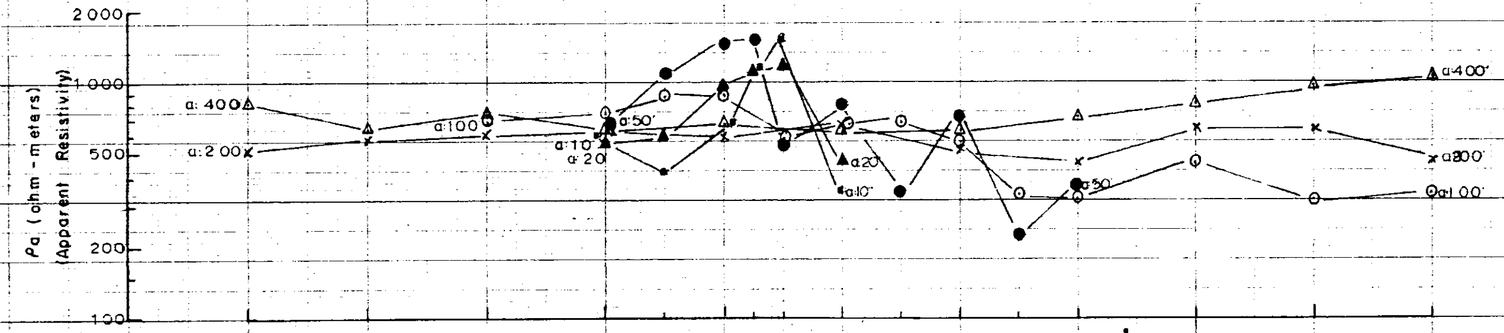
Line 3

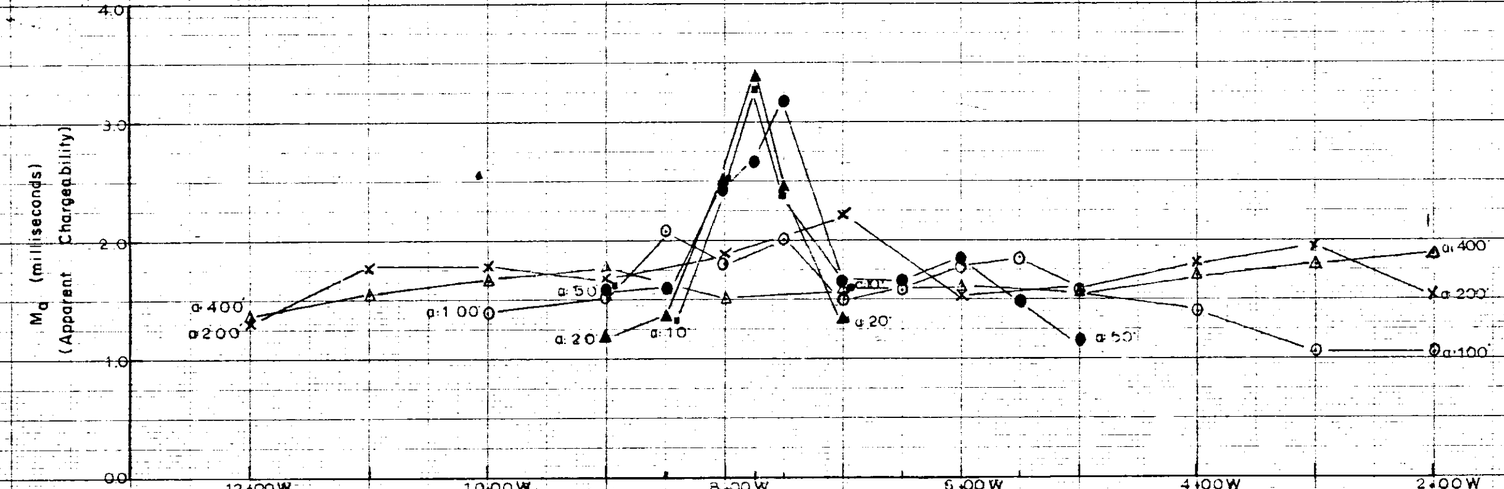


JERICHO MINES LIMITED
HIGHLAND VALLEY, B.C.
I.P. PROFILE - LINE-3
SEPTEMBER
1962

3 — ELECTRODE ARRAY

HUNTING SURVEY CORPORATION LIMITED, TORONTO, CANADA.





JERICHO MINES LIMITED

HIGHLAND VALLEY, B.C.

BORNITE RIDGE I.P. TEST

SEPTEMBER

1962

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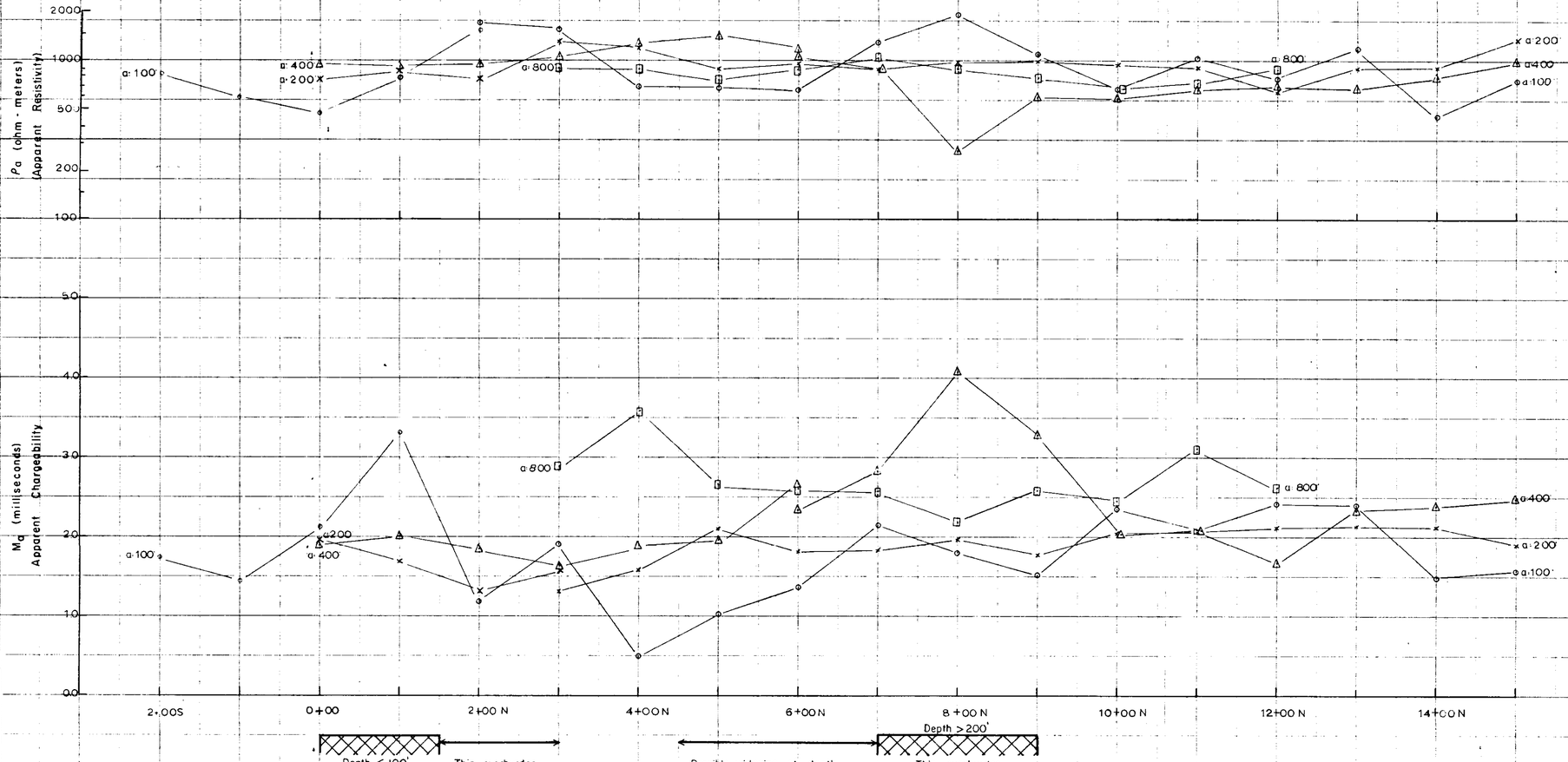
M4

R.B. Nichols

HUNTING SURVEY CORPORATION LIMITED, TORONTO, CANADA

JERICHO MINES LIMITED
HIGHLAND VALLEY, B. C.
IP PROFILE - LINE 2C
OCTOBER, 1962.



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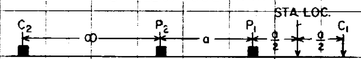


LEGEND

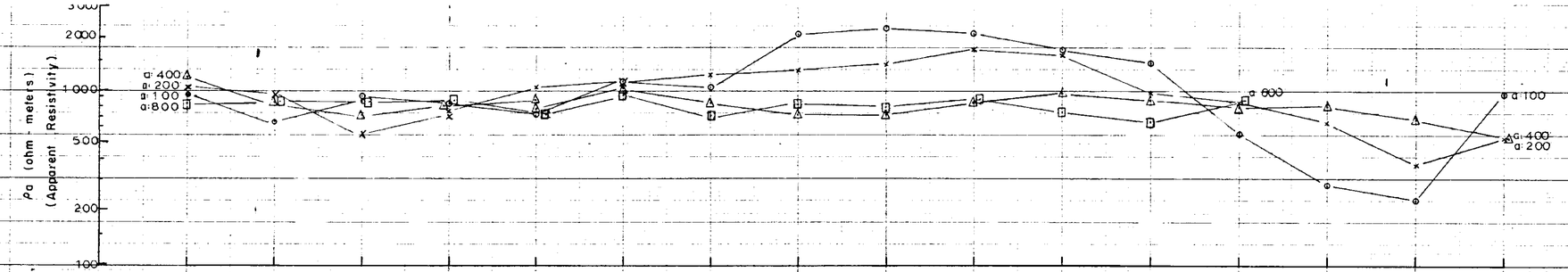
Zone of special interest

483

E.B. Nicholls

HUNTING SURVEY CORPORATION LIMITED, TORONTO, CANADA

JERICHO MINES LIMITED
HIGHLAND VALLEY, B.C.
I.P. PROFILE - LINE - 2B
OCTOBER, 1962.



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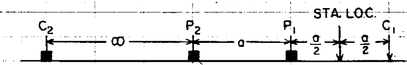
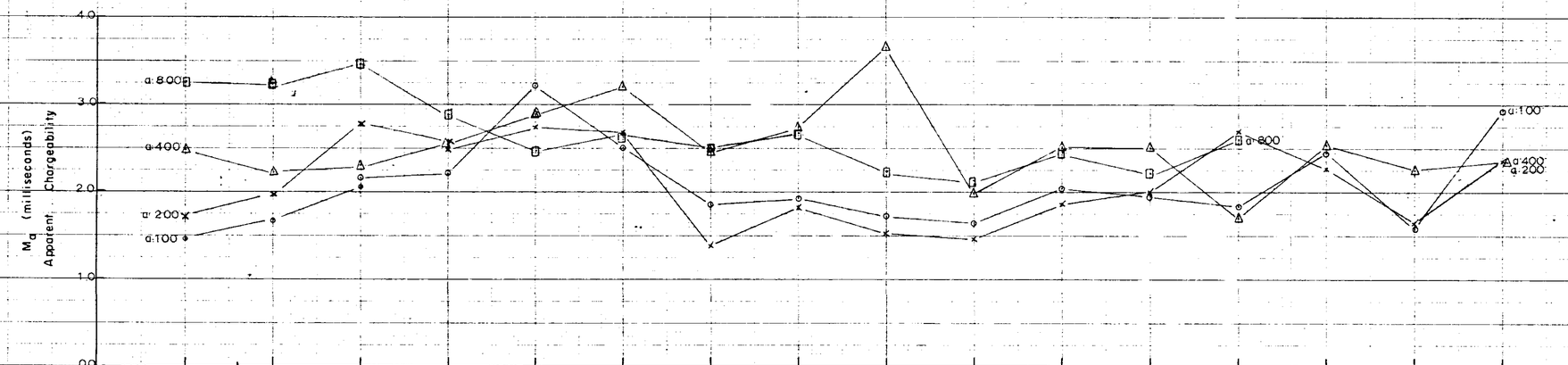
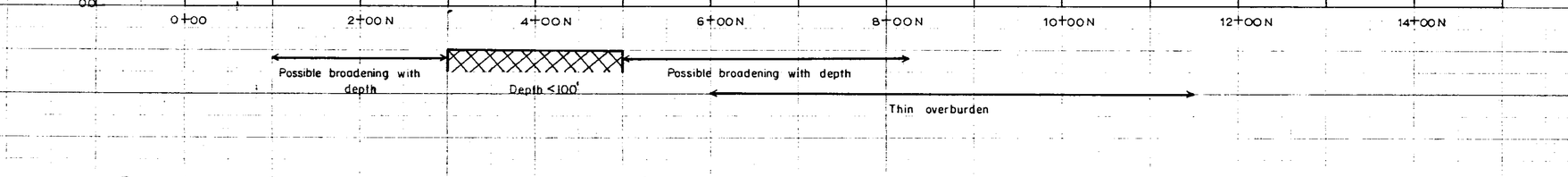






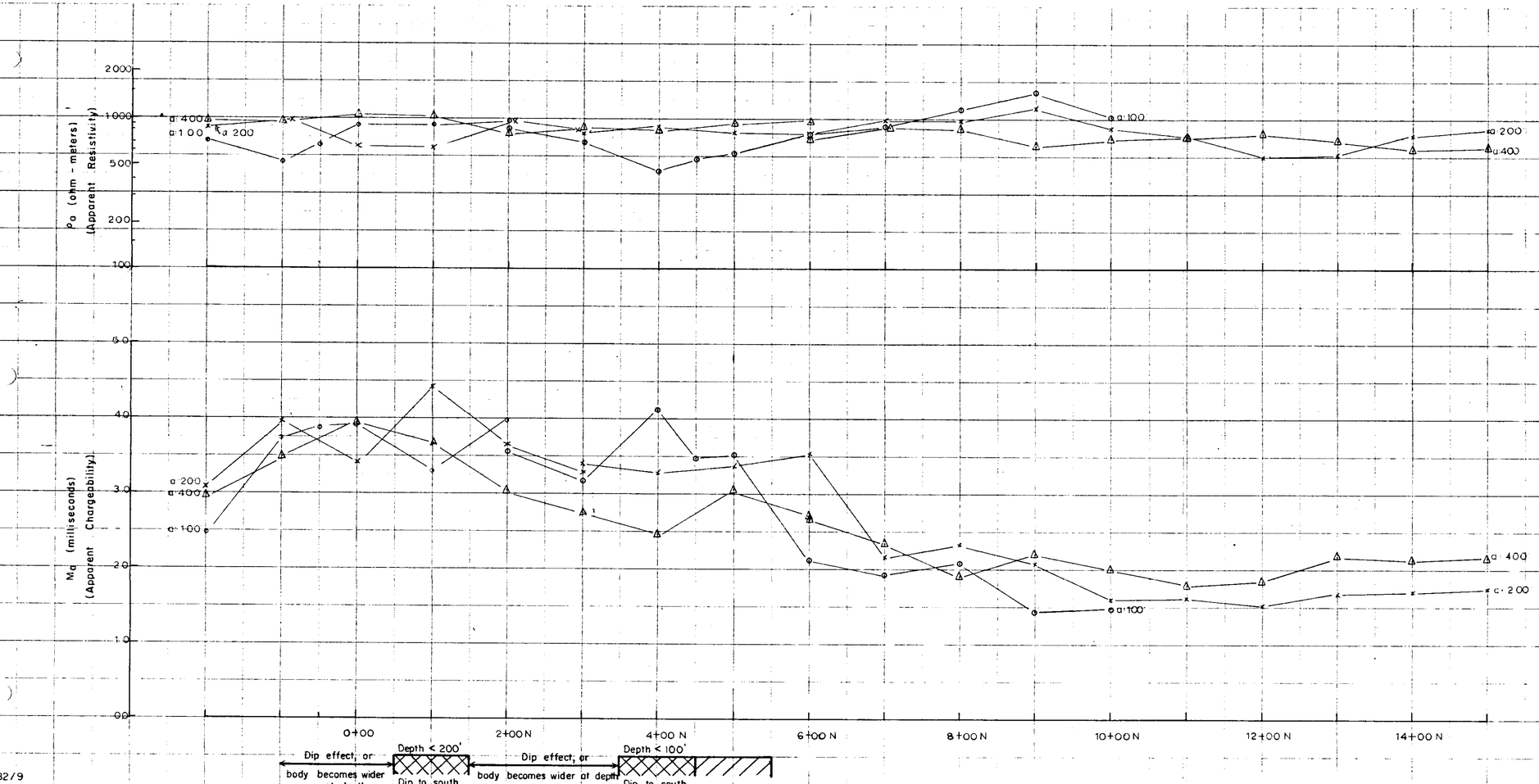
LEGEND

Zone of special interest

EB Wadsworth

HUNTING SURVEY CORPORATION LIMITED, TORONTO, CANADA

JERICHO MINES LIMITED
HIGHLAND VALLEY, B.C.
IP PROFILE - LINE - 2A
OCTOBER, 1962.



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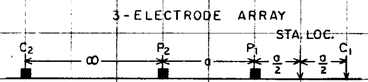

LEGEND

Zone of special interest

Zone of interest

E B Wedloffs

HUNTING SURVEY CORPORATION LIMITED, TORONTO, CANADA

32/9

25+00N

15+00N

5+00N

0+00

8+00N

L-3

25+00N

15+00N

5+00N

0+00

8+00N

L-1

25+00N

15+00N

5+00N

0+00

2+00S

L-2A

d. = 25'—75'

?

d. <100'

Dip effect, or body becomes wider at depth

d. <200'

Dip effect, or body becomes wider at depth

?

d.=75'

1 milliva above background

15+00N

5+00N

0+00

8+00N

L-2

Thin overburden

Possible broadening with depth

?

d. <100'

Possible broadening with depth

15+00N

5+00N

0+00

2+00S

L-2B

d.>200'

Possible widening at depth

Thin overburden

d.<100'

15+00N

5+00N

0+00

2+00S

L-2C

LEGEND

---- Zone of special interest

---- Zone of possible interest

d. <100' ------ Estimated limits of depth in feet

? ---- Possible trend

Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 483 MAP 1

483

JERICHO MINES LIMITED

HIGHLAND VALLEY, B. C.

INDUCED POLARIZATION SURVEY

DETAIL AREA

INTERPRETATION

SCALE: 1 inch = 100 feet

HUNTING SURVEY CORPORATION LIMITED, TORONTO, CANADA

E. B. Nicholls, Geophysicist

November, 1962

Report 483

JERICHO MINES LIMITED
NPL
HIGHLAND VALLEY
BRITISH COLUMBIA.
CANADA.

T. Gate — Trunk Gas Line
Witches Brook

Highway to Savona, Merritt & Kamloops.

57 JERICHO 58
55 JERICHO 56
53 JERICHO 54
51 JERICHO 52

Lake

JERICHO #68 | 1A JERICHO 1B | 9 JERICHO 10
#67/JERICHO #70 | 35 JERICHO 36 | 7 JERICHO 8
MARKS 3 | MARKS 2 | 73 JERICHO 72 | 33 JERICHO 34 | 5 JERICHO 6
MARKS 4 | MARKS 1 | 75 JERICHO 74 | 31 JERICHO 32 | 3 JERICHO 4
MARKS 5 | 4 HATCH 5 | 25 JERICHO | 27 JERICHO 29 | 11 JERICHO 2
MARKS 6 | 3 HATCH 6 | 26 JERICHO | 28 JERICHO 30 | 41 JERICHO 43
MARKS 7 | 2 HATCH 7 | 38 JERICHO | 39 JERICHO 40 | 42 JERICHO 44
MARKS 8 | 1 HATCH 8 | 12 JERICHO | 13 JERICHO | 50 JERICHO | 48 JERICHO 46
3 STIBBARD 4 | 8 STIBBARD 7 | 14 JERICHO | 15 JERICHO | 49 JERICHO | 47 JERICHO 45
1 STIBBARD 2 | 5 STIBBARD 6 | 16 JERICHO | 17 JERICHO
1 JERICHO JERICHO 24 | 18 JERICHO | 19 JERICHO
JAMES 8 | 20 JERICHO | 21 JERICHO
5 JAMES 7 | 22 JERICHO | 23 JERICHO
60 JERICHO 62 | 64 JERICHO | 66 JERICHO
3 JAMES 1
JAMES 6 | 4 JAMES 2 | 59 JERICHO 61 | 63 JERICHO | 65 JERICHO
19 BOB 20 | 13 BOB 14 | 2 BOB 1
11 BOB 12 | BOB | 3
9 BOB 10 | 6 BOB 5 | 87 JERICHO 86
17 BOB 18 | 8 BOB 7 | 85 JERICHO 84
15 BOB 16 | 27 BOB 28 | 83 JERICHO 82
5 GEM 6 | 25 BOB 26 | 81 JERICHO 80
3 GEM 4 | 23 BOB 24 | 79 JERICHO 78
1 GEM 2 | 21 BOB 22 | 77 JERICHO 76

Jericho Camps
Bridge
Mine Rd.
INDIAN RESERVE NO. 15.
Highland Valley
Highway to Asheroft.
Witches Brook
Geochemical anomalies
Base Line
Induction Polarization Anomalies
Malachite Hill
Mine Road
Bornite Ridge
PRICE SYNDICATE
BILLY LAKE
Scale 1500'

GAZA PROPERTY

Report 483

483

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 483 MAP 2

This plan has been prepared from sources believed reliable but exact locations are not certified.

R. FRANKLIN STIBBARD
Vancouver 5, B. C.
February 1st. 1963.