A Geophysical Report On

800992

An Induced Polarization Survey Over

Seymour Lake Property, Near Smithers

Omineca Mining Division, British Columbia (54°, 127°, S.W.)

For

Buval Mines Limited

Claims Covered: SEYMOUR 7 to 12 inclusive

CANADIAN/AMERICAN CITIZEN CLAIMS
- Lots 7171 and 7238

Supervision by: A.R. Dodds, B. Sc., Geophysicist.

Report by: P.E. Walcott, P. Eng., Consulting Geophysicist.

October 26th to November 2nd, 1966

HUNTEC LIMITED

A GEOPHYSICAL REPORT ON

AN INDUCED POLARIZATION SURVEY

SEYMOUR LAKE PROPERTY, NEAR SMITHERS

OMINECA MINING DIVISION, BRITISH COLUMBIA

(54°, 127°, S.W.)

FOR

BUVAL MINES LIMITED

BY

HUNTEC LIMITED

TORONTO, ONTARIO

JANUARY, 1967

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INTRODUCTION

Between October 26th, and November 2nd, 1966, Huntec Limited carried out an Induced Polarization (I. P.) survey over a property held by Buval Mines Limited and located in the Smithers area of British Columbia.

The survey was conducted along picket lines turned off at 200 foot intervals from a N 75° W baseline and chained at 100 foot intervals.

Reconnaissance chargeability (the I. P. response parameter) measurements were made every 200 feet using the "three-electrode array" method of surveying with an electrode separation of 200 feet. Where necessary additional measurements were made at appropriate station intervals using multiple electrode spacings to further examine possible anomalies.

Simultaneous readings of resistivity were made in addition to these chargeability measurements and in all 2.41 miles of reconnaissance and 0.13 miles of detail surveying were completed.

The reconnaissance data are presented in contoured form on 1":200 feet plan maps of the line grid, while the detail data are presented in profile form. The profile scales are one inch to 4 milliseconds and 2 inches per logarithmic cycle for chargeability and resistivity respectively.

PROPERTY AND LOCATION

The Seymour Lake property of Buval Mines Limited is in the Omineca Mining Division of British Columbia. It is situated approximately three miles south of the town of Smithers (54°, 127°, S.W.). Access is by the old Sil-Van Mine road.

The following claims, representing part of the property were surveyed:

Seymour 7 to 12 inclusive.

Canadian/American Citizen claims - Lots 7171 and 7238.

General Geology from W.M.S., June 23/66.

The area is underlain by the Hazelton volcanic-sedimentary group of Jurassic to Cretaceous age. This assemblage of rocks consists for the most part of andesitic volcanics with distinct sedimentary sequences.

Surface exposures of intrusive rocks of granodioritic composition occur at widely separated locations in the mineralized area of Hudson Bay Mountain. These suggest the presence of a major granodiorite body within the central mass of the mountain.

Regional trends, as observed within the Hazelton Group, are northwesterly with transverse thrust faults trending easterly. Minor but significant north-easterly trending joint and fracture sets appear to

be closely related to the system of mineralized northeasterly trending fissures and shears that spring from the major Central Silver Creek fault.

Mineralization is principally of the fracture filling type with ore structures ranging from simple veins to joint stockworks and general fracture boxworks.

SURVEY SPECIFICATIONS

The survey was carried out using a Huntec pulse-type Induced Polarization unit, comprised basically of a transmitter, receiver and motor generator.

In this system a gasoline motor, coupled to a 2.5 kw, 400 cycle three-phase generator allows the transmitter to provide a maximum of 2.5 kilowatts d.c. to the ground at a cycling rate of 1.5 seconds "current on" and 0.5 seconds "current off", the pulses reversing continuously in polarity.

The data recorded in the field consist of careful measurements of the current (I) in amperes flowing through electrodes C_1 and C_2, the primary voltage (V_p) appearing between the potential electrodes, P_1 and P_2, during the "current on" part of the cycle and a secondary or over-voltage (V_s) appearing between P_1 and P_2 during the "current off" part of the cycle. 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 sampling time in milliseconds of the receiver unit. The apparent resistivity (ρ_a) 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 resistivity and chargeability obtained are called "apparent" as they are values which that portion of the earth sampled would have if it were homogeneous. As the earth

sampled is usually inhomogeneous, the calculated apparent resistivity and apparent chargeability are functions of the actual resistivities and chargeabilities of the rocks.

The survey was carried out using the "three-electrode array" system. In this system, the current electrodes (C_1) and the two potential electrodes, P_1 and P_2, are moved in unison along the survey lines. The spacing between them is kept constant for each traverse, at a figure roughly equal to the depth to be explored by that traverse. The second current electrode (C_2) is kept fixed at "infinity".

Thus, on a three electrode traverse with a spacing of 200 feet, a body lying at a depth of 100 feet will produce a strong response, whereas one at a depth of 200 feet will produce a weaker one. By running subsequent traverses at different electrode spacings, more precise estimates can be made of depth to the top of causative bodies, as well as more information on the geometry and extent of the bodies.

The "three-electrode array" with a 200 foot electrode separation was used over the entire survey area to try and detect zones of sulphide mineralization. Subsequent detail work was then done with 100 and 400 foot electrode separations respectively along ~~certain lines~~ line E only as deemed necessary to give additional information for the selection of drilling targets.

INTERPRETATION PROCEDURES

Induced Polarization interpretation procedures have been most completely developed in situations of horizontal layering and for bodies of large lateral extent such as porphyry coppers. The complex problem of resolving the combined effect of depth, width, dip and true chargeability of steeply dipping bodies, together with the physical characteristics of overburden and country rocks have not been completely solved theoretically. The interpreter must, therefore, use empirical solutions, plus experience gained from surveys over known bodies in other areas in addition to existing type curves.

The interpretation submitted in this report indicates anomalous zones which could correspond to disseminated sulphide mineralization. The actual bodies, if existent, are probably smaller than the indicated zones as shown on the accompanying maps. Estimates of depth to the top of mineralization have been made by virtue of the three-electrode data. Drill holes have been spotted based on these depths and positions of the probable causative body.

Estimates of average percentage sulphide have been made. These are minimum estimates as they are based on the value of the observed chargeabilities and not on the true chargeabilities of the anomalies themselves. They are necessarily approximate as the relationship

between chargeability and percentage sulphide is affected by such things as grain size, resistivity contrast, quantity and nature of absorbed water, degree of interconnection of mineralization, and other factors. The rule-of-thumb used in this interpretation, based on past experience, is that 1% by volume of sulphide mineralization corresponds to between 5 and 15 milliseconds of true chargeability.

DISCUSSION OF RESULTS

The Induced Polarization survey, as performed with a 200 foot electrode separation, divides the property into two areas of different chargeability background, as can be seen on the contoured map of the data.

The resistivity survey, which was done simultaneously with the I.P. survey, indicates a similar situation, and the contacts in each case appear to coincide with the line of demarkation between the rock-exposed hill and the overburden-filled valley.

A zone of chargeability highs occurs within the outcrop area, as shown on the map. The outline is simple and of maximum extent as determined by the 200 foot electrode separation. However, the anomalous zone could conceivably be narrower and more complex.

As the anomalous conditions are believed to be caused by sulphide mineralization, detail Induced Polarization work was done on Line E to give additional information for the possible selection of drilling targets using 100, 200 and 400 foot electrode separations. Unfortunately, the 400 foot work could not be fully completed due to the rugged terrain. The results, as shown on the accompanying profile, appear to indicate a shallow causative body dipping steeply to the south. This probable body has a down dip extension of at least some 175 feet

and an average estimated minimum sulphide content of 1 to 2% by volume.

As the conditions appear suitable, trenching is recommended to test the nature of the anomalous zone, to be followed by a borehole, preferably a 60° one if possible, collared on Line E and drilled northwards on line so as to intersect station 0+50S at 125 feet perpendicularly below the surface.

Should trenching not be practical nor suffice, further Induced Polarization work should be done at suitable electrode spacings on Line B prior to selection of further boreholes.

In closing, it should be noted that while it is the writer's belief that the higher chargeability background on the hillside is mostly attributable to a change in the material sampled, as indicated by the higher resistivity values, this may not necessarily be the case, as this whole area could be anomalous. This ambiguity could, however, best be resolved by surveying two of the lines with a different electrode separation in an effort to delineate additional anomalous zones.

SUMMARY AND RECOMMENDATIONS

Between October 26th and November 2nd, 1966, Huntec Limited carried out an Induced Polarization (I. P.) survey over the Seymour Lake property of Buval Mines Limited, located near Smithers, British Columbia.

The survey indicated the presence of a possible zone of mineralization. Multiple electrode spacing work done over this zone suggested the causative source to be shallow.

Trenching and drilling have been recommended to test the nature of the interpreted mineralization. The location of a borehole has been suggested, as described in the previous section.

Should trenching prove impractical or inadequate, further Induced Polarization work at multiple spacing should be done prior to selecting additional borehole locations.

Respectfully submitted,

HUNTEC LIMITED

Peter E. Walcott, P. Eng.
Consulting Geophysicist.

Andrew R. Dodds, B. Sc.
Geophysicist.

APPENDIX

Survey Data

Claims Surveyed:

The following mineral claims were covered in whole or in part by the survey:

Seymour 7 to 12 inclusive.

Canadian and American Citizen claims -

Lots 7171 and 7238.

Line-miles Surveyed:

The survey comprised two phases: reconnaissance (covering all lines once with one electrode separation), and detail (resurveying selected lines with different electrode separations). The number of line-miles of readings taken in each phase was as follows:

	Line-miles	Stations
Reconnaissance	2.41	74
Detail	0.13	9
Total	2.54	83

Man-days Required

The number of man-days required to complete this survey was:

	Man-days
Operating geophysical equipment	28
Interpretation and report writing	2
Drafting	3
Typing	1/2
	33 1/2

same country as Barringer

Personnel Employed on Survey:

Name	Occupation	Address	Dates
P. E. Walcott	Consulting Geophysicist	Rexdale, Ontario	Dec. 28, 29, 1966
A. R. Dodds	Geophysicist	1450 O'Connor Dr., Toronto 16, Ont.	Nov. 14, 21, 1966
A. Schamotta	Geophysical Operator	"	Oct. 26-Nov. 2, 1966
G. Boulay	"	"	"
R. Carisse	"	"	"
R. O'Brien	Helper	Smithers, B. C.	"
D. Lovie	Drafting	1450 O'Connor Dr., Toronto 16, Ont.	Jan. 11, 12, 13, 1967
L. Brunton	Typing	"	Jan. 13, 1967

SEYMOUR 12

SEYMOUR 11

AMERICAN CITIZEN
L. 7238

SEYMOUR 9

SEYMOUR 10

CANADIAN CITIZEN
L. 7171

SEYMOUR 7

SEYMOUR 8

BASELINE

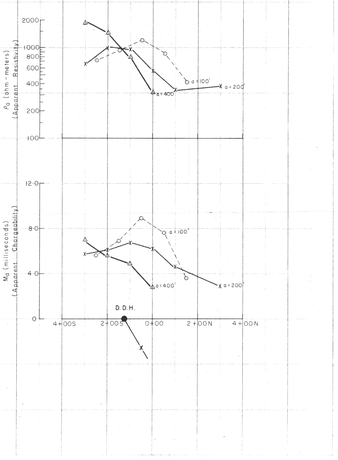
LEGEND

Zone of interest

Area of known outcrop

D.D.H. Recommended diamond drill hole

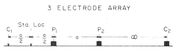
DETAIL PROFILES — LINE E



APPARENT CHARGEABILITY CONTOURS
WITH INTERPRETATION

CONTOUR INTERVAL : 10 milliseconds

3 ELECTRODE ARRAY



CONTOUR MAPS 3-ELECTRODE ARRAY, a = 200', P_1-P_2 = 200'
(Pole - Dipole Array, a = 200', P_1-P_2 = 100' where figures bracketed)

DETAIL PROFILES 3-ELECTRODE ARRAY, a AS MARKED

SEYMOUR 12

SEYMOUR 11

AMERICAN CITIZEN

SEYMOUR 9

SEYMOUR 10

CANADIAN CITIZEN

SEYMOUR 7

SEYMOUR 8

BASELINE

APPARENT RESISTIVITY CONTOURS

CONTOURS AT (logarithmic intervals) 100, 150, 200, 300,
400, 600, 800, 1000, 1500 ohm-meters

BUVAL MINES LIMITED

INDUCED POLARIZATION SURVEY

SEYMOUR LAKE PROPERTY

OMINECA MINING DIVISION, B.C.

SCALE : 1 inch = 200 feet

To accompany report by
for P.E. Walcott, P.Eng., Geophysicist

HUNTEC LIMITED, Toronto, Canada — January, 1967

PH 559-2/67