1100

PART 1

REPORT ON

AN INDUCED POLARIZATION (I.P.) SURVEY

PITT, SE, EXPLORER & DD MINERAL CLAIMS,

NEW WESTMINSTER MINING DIVISION,

BRITISH COLUMBIA

for

CARIBBEAN EXPLORATION CORPORATION
822 - 510 West Hastings Street,
Vancouver 1, B.C.

by

ROBERT E. CHAPLIN, B.Sc., P.Eng.,
1761 Drummond Drive,
Vancouver 8, B.C.

OCTOBER, 1967

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INTRODUCTION

This report contains the results of an induced polarization survey carried out by R.E. Chaplin for Caribbean Exploration Corporation on a property known as "Boise Creek", which contains the Pitt, SE, Explorer and DD mineral claims, lying some 7 miles northwest of the north end of Pitt Lake in the New Westminster Mining Division of British Columbia, latitude 49° 36' 14"N., longitude 122° 43' 30"W.

The purpose of this survey was to prospect for sulphide mineralization (copper and molybdenum) in disseminated form. The method of induced polarization has been shown to be capable of detecting metallic sulphides to as low as 2% by volume.

The field work was carried out between June 27th and July 1st, July 10th and July 14th, August 15th and August 18th, 1967. The crew was under the direction of the writer during the first part, Mr. Devin Trussell during the second part, and Mr. W. Kowalski during the third part. Dr. S. Ward, Geophysical Consultant, advised on the program.

PROPERTY

The property location is shown on an insert in the survey results map. The property is accessible by helicopter from West Vancouver, or Pitt Meadows.

The claims are underlain by intrusive rocks and remanent pendants of dioritized volcanic and sedimentary rocks, and the I.P. survey was designed to test an area of near surface showings of molybdenite and chalcopyrite within a pyritic gossan zone. The gossan zone trends in a northerly direction.

Property (continued)....

The survey consisted of two east-west lines of 6,400 feet each, and one north-south line of 6,000 feet. The east-west lines are sub-parallel, and approximately 1,200 feet apart (on each side of Boise Creek). The east-west lines are referred to as the "Base Line" and "Line 12 North". The north-south line is referred to as "Line 8 East". Readings were taken at 400 ft. intervals.

SURVEY SPECIFICATIONS

The induced polarization equipment used was a 1.0 kilowatt frequency-type instrument manufactured in Cambridge, Massachussetts, U.S.A., by Geoscience Incorporated.

The following specifications apply:

Type of Current	A.C. at 3 c.p.s. and 0.1 c.p.s.
Maximum Current Available	2 amps
Maximum Power Available (in ground)	0.8 kw.

Measurements Taken in the Field Were:

1. Current flowing through current electrodes C_1 and C_2.
2. Voltage V_H, between potential electrodes at high frequency (3.0 c.p.s.).
3. Percent change in V_H between potential electrodes at low frequency (0.1 c.p.s.), or the percent frequency effect.
4. Notations on self-potential effect.

Survey Specifications-Measurements Taken in Field (continued)....

The percent frequency effect is read directly on the receiver console. The apparent resistivity is calculation of the basis of V_H (measurement 2). V_H is converted to Vc by a calibrated graph.

Apparent Resistivity for Dipole-Dipole Configuration $P/2\pi = (X)\frac{Vc}{I}(n)(n+1)(n+2)$

X = Electrode spread length in feet

n = Electrode separation in feet

Vc = Calculated voltage between potential electrodes (mv)

I = Current supplied to current electrodes (ma)

Electrode Configuration:

A Dipole-Dipole configuration was used. Current is applied to the ground at five points (X) feet apart. The potentials are measured at two other points (X) feet apart, in line with the current electrodes. The distance between the nearest current and potential electrodes is an integer number (n) times the basic distance (X).

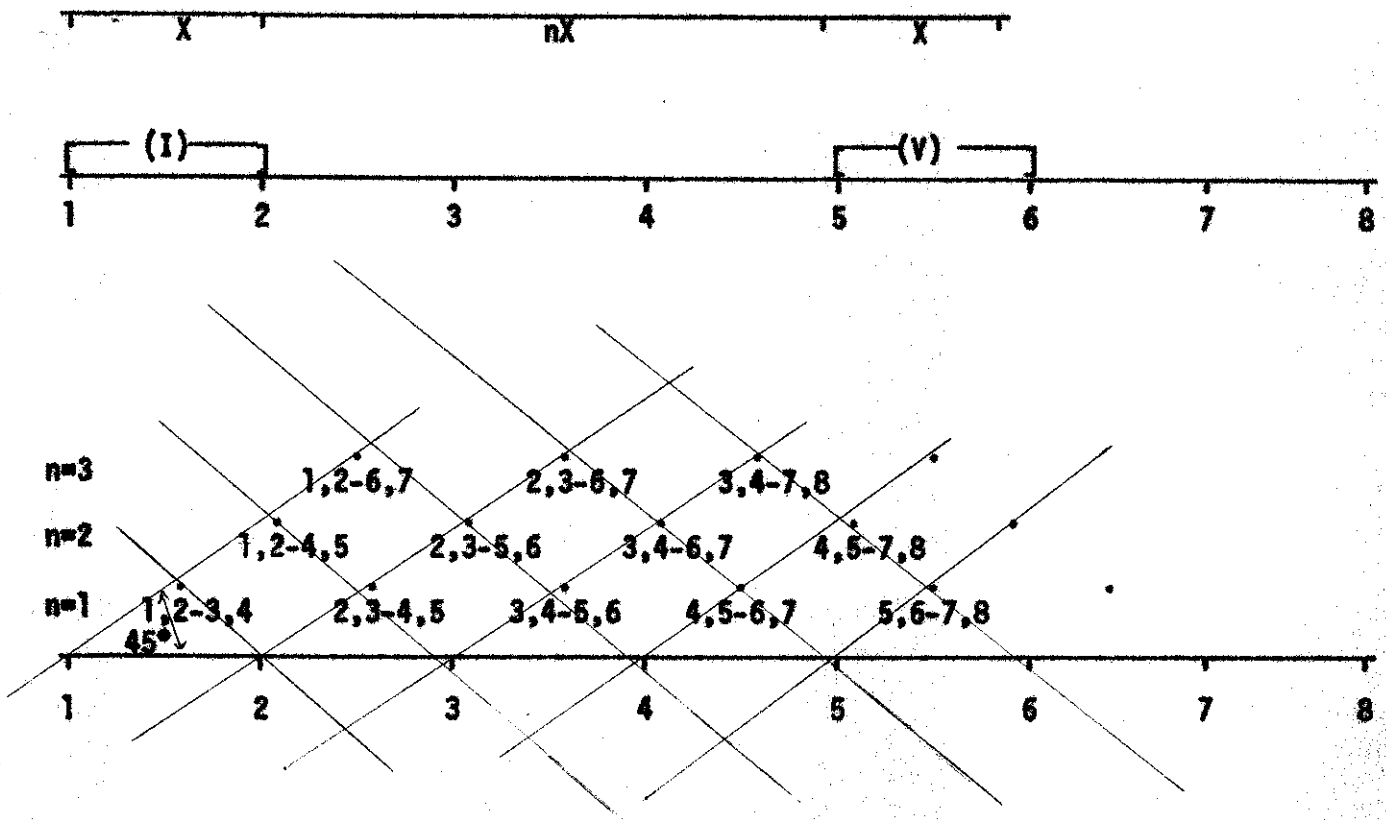
In this survey, three traverses are made with values of (n) = 1, 2, 3 and 4.

The separation between sender and receiver electrodes is only one factor which determines the depth to which the ground is being sampled in any particular measurement. The interpretation of the results from any given survey must be carried out using the combined experience gained from the field, model and theoretical investigations. The position of the electrodes when anomalous values are measured, must be used in the interpretation.

Survey Specification (continued)....

Data Presentation:

Method used in plotting Dipole-Dipole configuration:



(may also be plotted below the line)

It can be seen that the depth of measurement is increased for larger values of (n).

RESULTS AND INTERPRETATION

The results of the I.P. survey show a large zone of high percent frequency effect on the Base Line between 10E and 24E. The apparent resistivity forms a coincident low on the N = 2, 3 and 4 separations. The resulting metal factor calculation clearly shows the existence of an anomalous zone at a moderate depth of burial below the topographic surface. There is no obvious coincident magnetic nor electromagnetic pattern. Soil geochemistry indicates a possible superimposed molybdenum (4 times background) and copper (3 times background) anomaly associated with the above I.P. anomaly. It may be that the east-west traverse crosscuts the geologic structure of the sulphide zone; however, the breadth of the metal factor section indicates that a possible sheared zone may subparallel the direction of the traverse line.

A second, relatively deep anomalous zone occurs between 14 West and 3 East.

Line 12 North contains a large zone of high percent frequency effect between 22E. and 38E. The resulting metal factors plot indicates an intense anomaly on n = 3 and 4 separations between 21E. to 28E. (several hundred feet below surface).

Elsewhere on Line 12 North, the percent frequency contrast is apparent on the n = 4 separation between 0 and 10 West. A high metal factor is similarly observed to coincide with the high percent frequency effect.

A near surface metal factor effect is located between 6E. and 14E. on Line 12 North. The percent frequency effect is within high background range; however, the apparent resistivity is anomalously low.

Results and Interpretation (continued)....

A coincident molybdenum anomaly is located on the latter zone.

The topographic profile accompanying Line 12 North indicates that a diamond drill collar (D.D.H. No. 1) should adequately test the last mentioned anomaly. Gash Creek is the site of an extensive gossan zone exposed by stream action.

Line 8+00E. shows an anomalous apparent metal factor effect between 17N. and 23N. on n = 2 and 3 separations. The effect is due primarily to a subsurface volume of lower resistivity. A similar effect occurs between 8N. and 12N. Both anomalous zones originate in the subsurface. Coincident with the zones are anomalous molybdenum and copper geochemical profiles. There is no coincident magnetic profile.

The anomalies are most likely due to a fractured area containing disseminated sulphides. The sulphides may contain molybdenite and chalcopyrite.

A subsurface testing program is recommended on the above anomalous zones to the n = 2 and 3 separations (from 600 feet to 900 feet below surface).

Pyrite is ubiquitous and is the major causative sulphide contributing to the induced polarization anomaly. Copper (chalcopyrite) and molybdenum (molybdenite) are associated with the pyritic zone. Systematic subsurface testing is required to determine the economic significance of the obtained geophysical anomalies described above.

SUMMARY

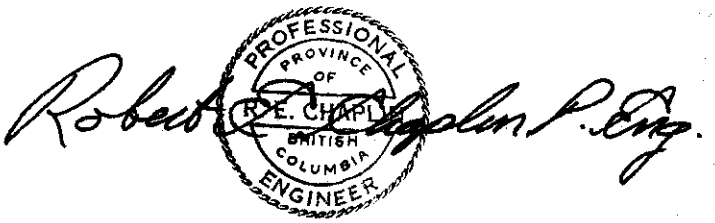
1) An induced polarization was carried out on Caribbean Exploration Corporation's Boise Creek property.

2) The results of the survey showed widespread anomalous areas in which pyrite, chalcopyrite and molybdenite have been noted.

3) Systematic subsurface testing is required to determine the presence of economic amounts of copper and molybdenum.

Respectfully submitted,

Robert E. Chaplin, P.Eng.



Robert E. Chaplin, P.Eng.,
October, 1967.

APPENDIX

FOOTAGE SURVEYED: . . . . . 18,800 feet.

PERSONNEL EMPLOYED ON SURVEY:

		Date 1967
W. Shuttleworth (B.Sc.),	Geologist	July 10-14th
D. Philip,	Helper	June 27-July 1st
Robert Chaplin (B.Sc.)	P.Eng. & Operator	June 27-July 1st
B. Talbot,	Draftsman	
I. Wilson,	Typist	
I. Fischer,	Helper	Aug. 15-18th
D. Bowers	Operator	Aug. 15-18th
D. Trussell (M.Sc.)	Operator	July 10-14th
W. Kowalski,	Operator	Aug. 15-18th
C. Hatch,	Operator	June 27-July 1st & July 10-14th
R. Olson,	Helper	All employed during June 27-July 1st, July 10-July 14th & Aug. 15-Aug. 18th.
C. Forster,	Helper	
A. Schwehr,	Helper	
A. Fry,	Helper	
R. Tousdell,	Helper	
B. Brusen,	Helper	

COST OF SURVEY:

I.P. Equipment and 2 Operators	$2,800.00
Labor digging and salting holes, cost of salt, detergent, foil, etc.	1,330.00
TOTAL	$ 4,130.00

memorandum for authorization

AUTHOR'S QUALIFICATIONS

Graduate University of British Columbia, B.Sc.
Geological Engineering, 1958.

17 years' practical experience in mineral exploration.

Owns and operates the I.P. equipment used in this survey.

Has used equipment for 1 year prior to this date, under the supervision of Dr. D.W. Smellie, Ph.D., Consulting Geophysicist.

The current survey was at the direction of Dr. S. Ward, Professor, Department of Mineral Engineering, University of California, Berkeley, California, who visited the field operation in July, 1967.

The writer has no interest in, nor anticipates any interest in the foregoing mineral claims.

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
R. E. CHAPLIN

Robert E. Chaplin P.Eng.

Robert E. Chaplin, P.Eng.,
October 14th, 1967.

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Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1100 MAP 3

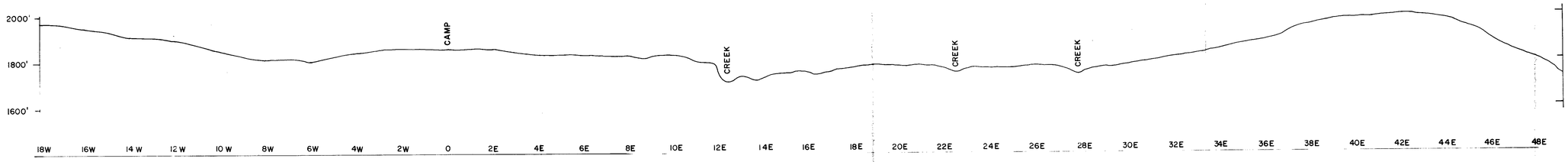
BOISE CREEK PROJECT
CARIBBEAN EXPLORATION CORPORATION
NEW WESTMINSTER M.D., B.C.
IDEALIZED CLAIM MAP

SCALE 0 1000 2000 3000 4000 FEET

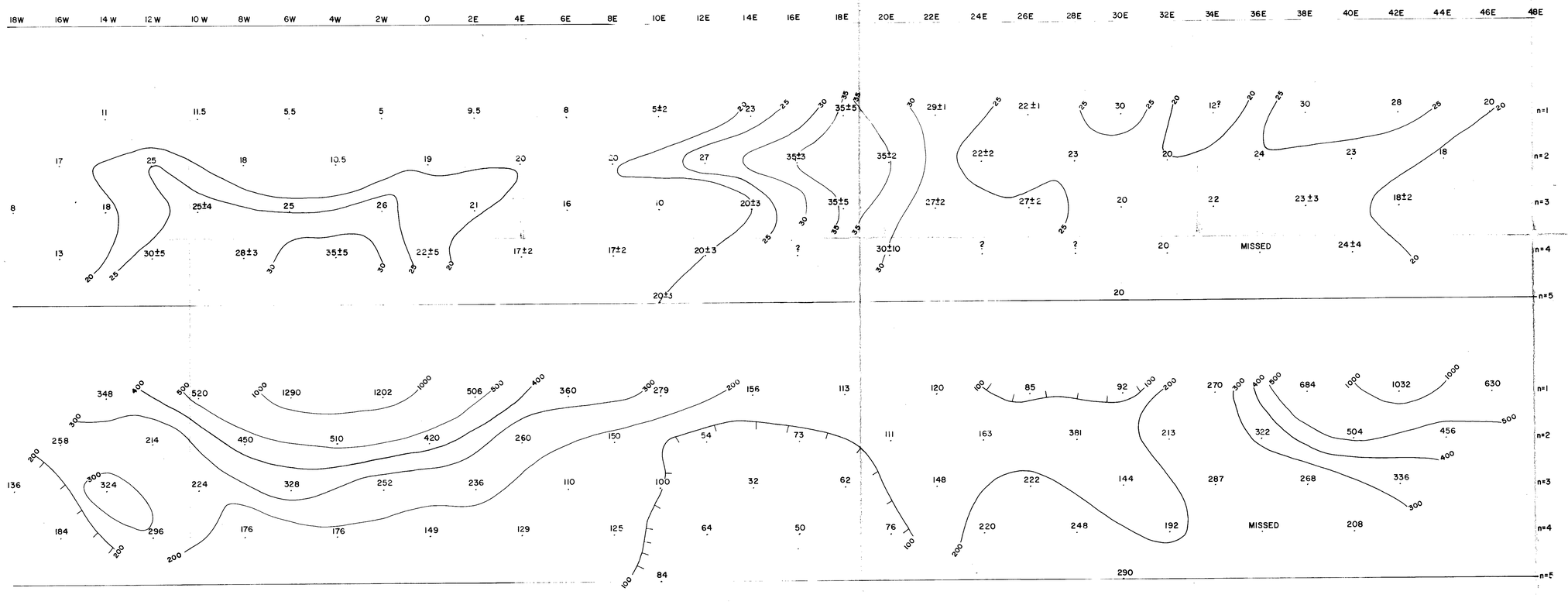
CW & G Ltd. Drwg. No. 757 Oct. 1967

1100

To Accompany Geophysical Report
(Induced Polarization) by R. E. Chaplin, P.Eng.
14 Oct., 1967



TOPOGRAPHY



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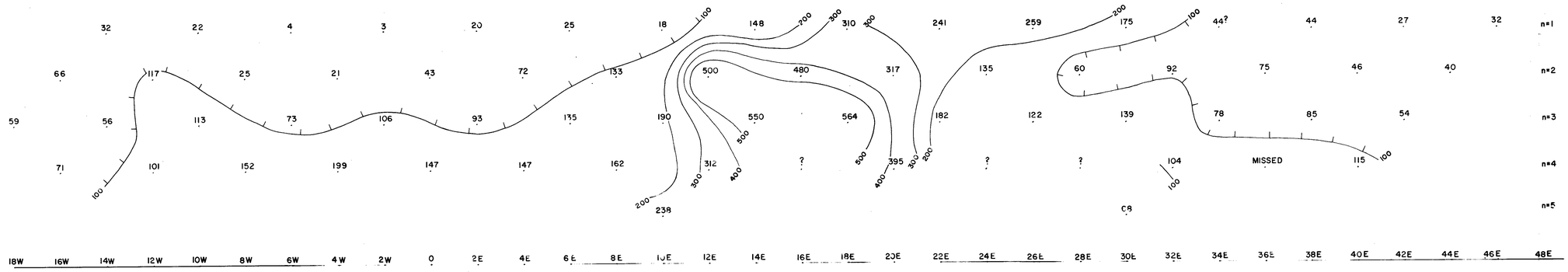
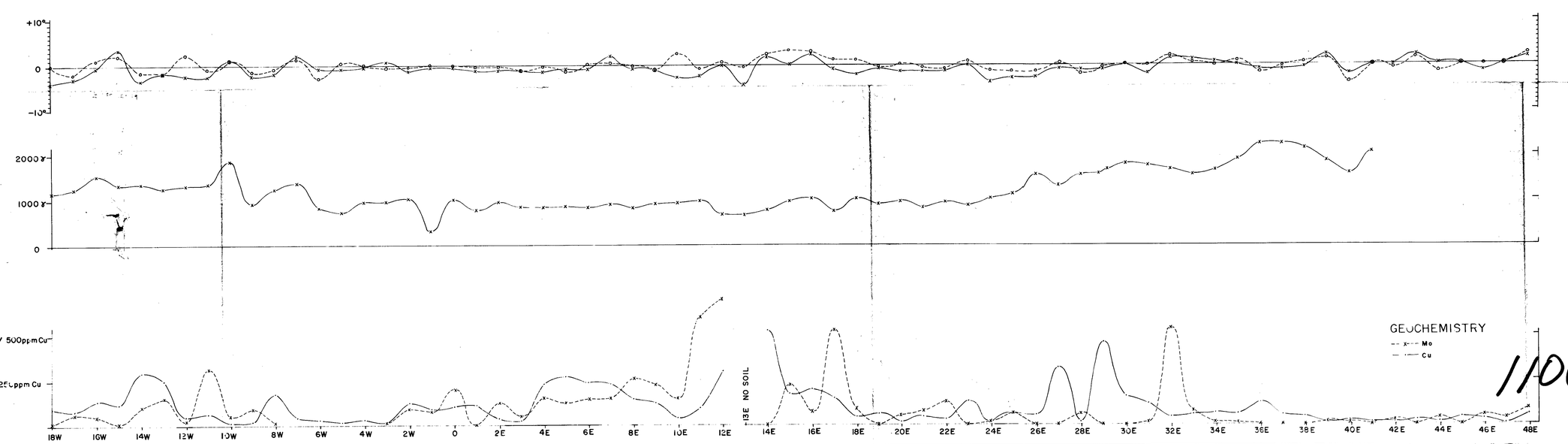




JEM
HIGH FREQUENCY
LOW FREQUENCY

MAGNETICS

GEOCHEMISTRY
Mo
Cu

Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1100 MAP

BOISE CREEK

CARIBBEAN EXPLORATION CORP.
NEW WESTMINSTER M.D., B.C.

COMPOSITE GEOPHYSICAL PROFILES
BASE LINE 18+00W TO 48+00E

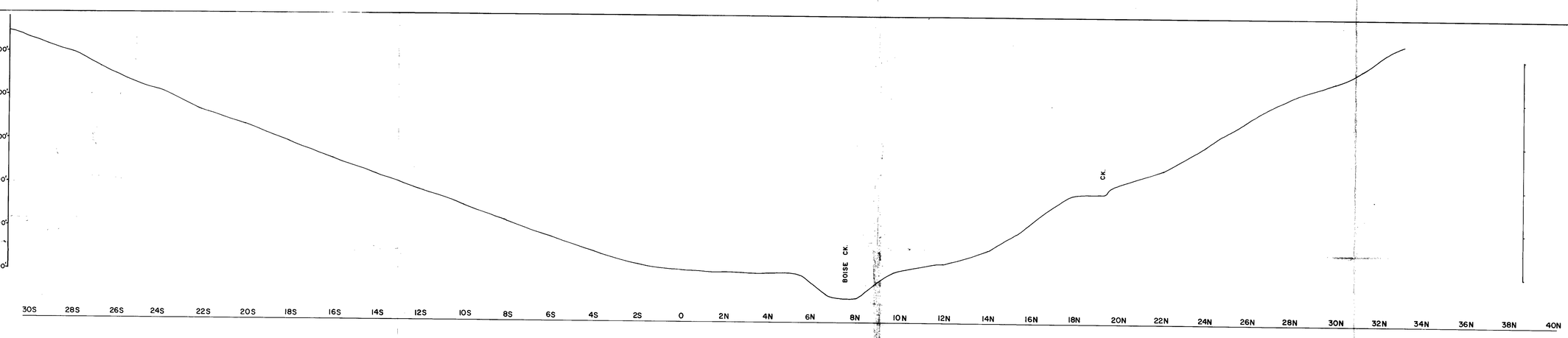
SCALE 0 100 200 400 600 FEET

C.W.B.G. LTD. DRWG. NO. 667
DATE: AUG., 1967.

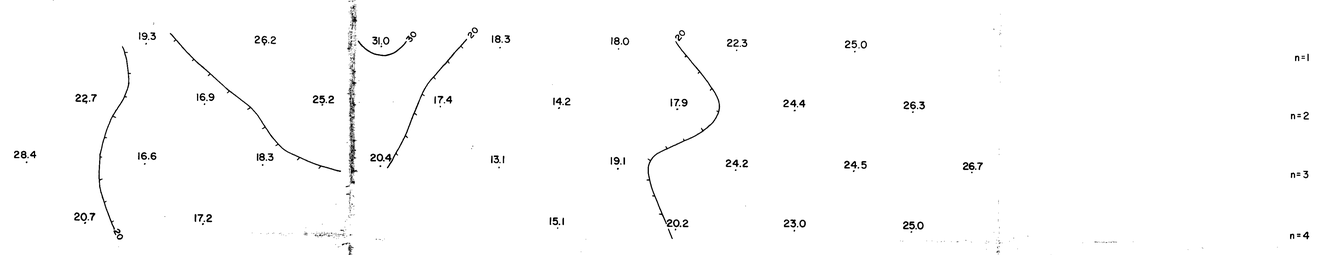
1100

To Accompany Geophysical Report (Induced Polarization) by R.E. Chaplin, P.Eng. in Oct., 1967

TOPOGRAPHY



$P.F.E.)_a$



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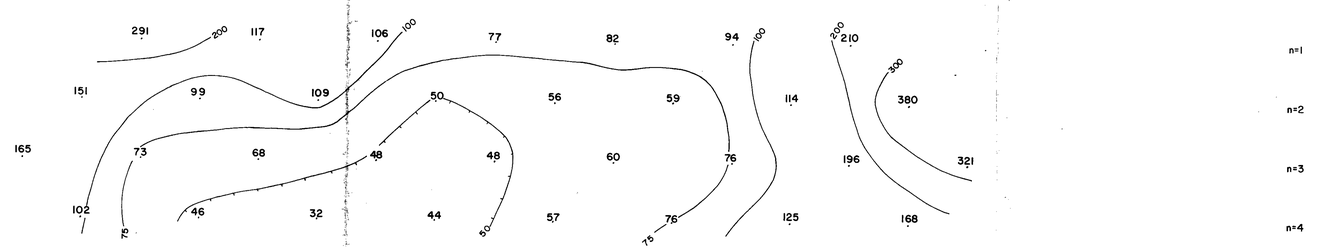
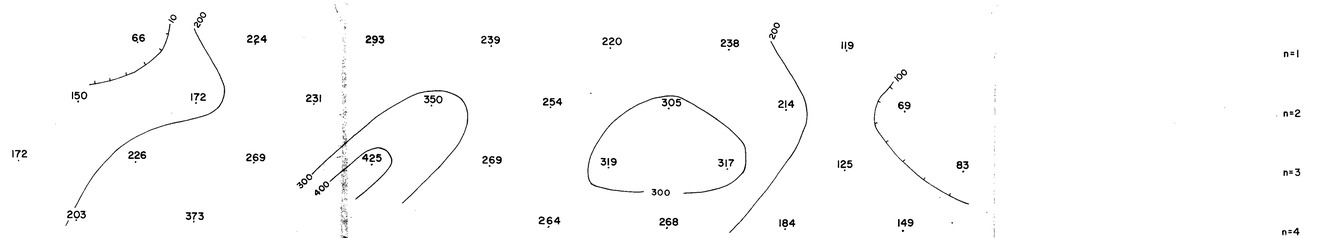
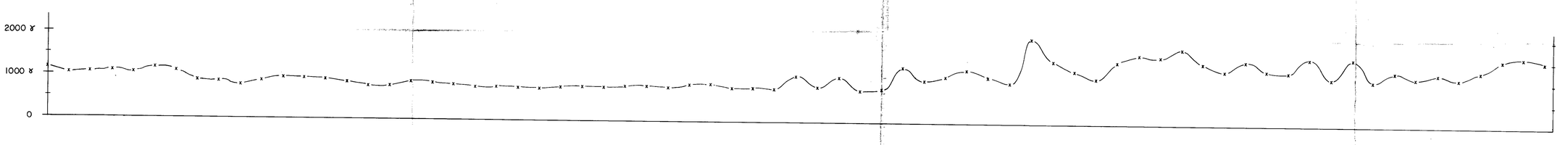


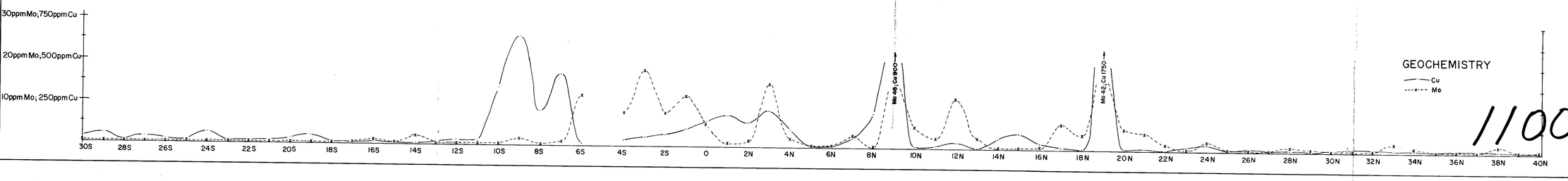
INDUCED
POLARIZATION

$M.F.)_a$





MAGNETICS



GEOCHEMISTRY
Cu
Mo

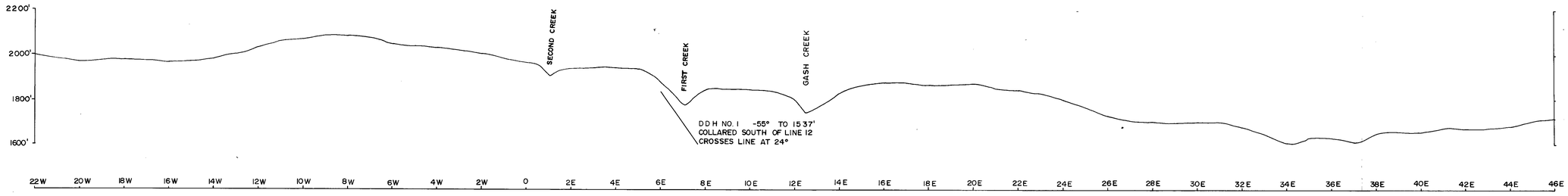
BOISE CREEK
CARIBBEAN EXPLORATION CORP.
NEW WESTMINSTER M.D., B.C.
COMPOSITE GEOPHYSICAL PROFILES
LINE 8E: 30+00S TO 40+00N

SCALE 0 100 200 400 600 FEET

C.W. & G. LTD. DRWG. NO. 1689
DATE: AUG., 1967.

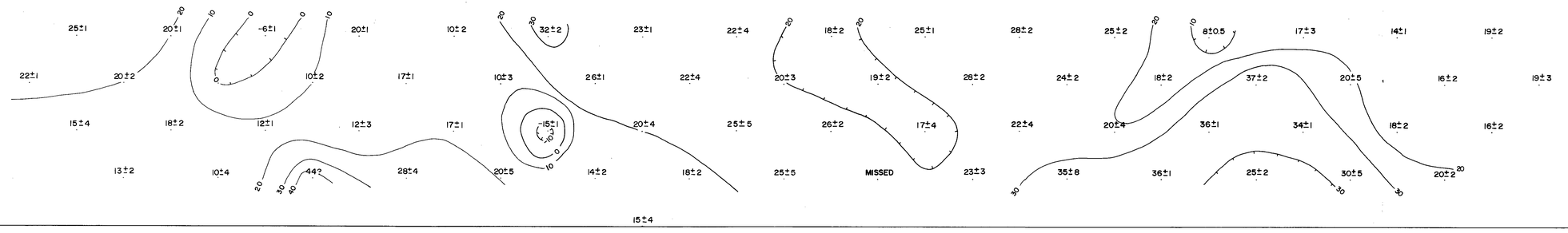
1100

To Accompany Geophysical Report (Induced Polarization) by R.E. Gamblin, P.Eng. 14 Oct., 1967

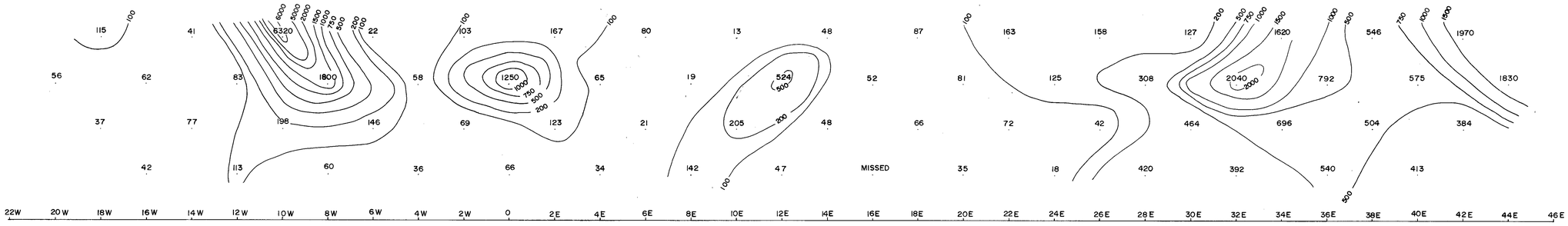


TOPOGRAPHY

PFE) a

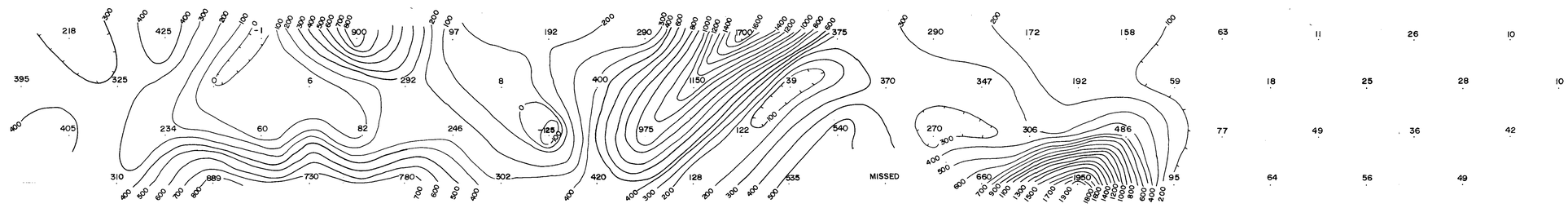


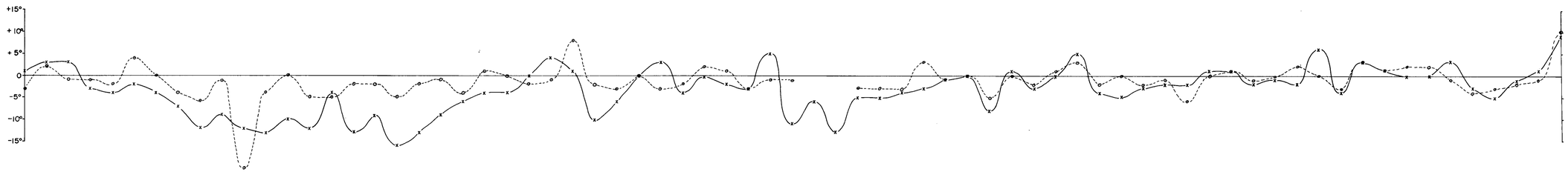
$\frac{\rho}{2\pi}$



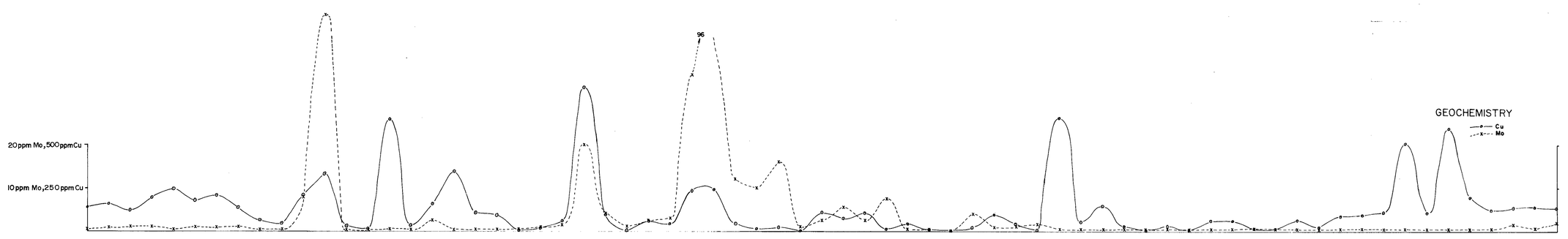
INDUCED POLARIZATION

MF) a





JEM
HIGH FREQUENCY
LOW FREQUENCY



GEOCHEMISTRY
Cu
Mo

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1100 MAP 6

BOISE CREEK

CARIBBEAN EXPLORATION CORP.
NEW WESTMINSTER M.D., B.C.
COMPOSITE GEOPHYSICAL PROFILES
LINE 12N: 22W TO 46E

SCALE 0 200 400 600 FEET

C W & G LTD. DRWG. NO. 688 JULY, 1967
To Accompany Geophysical Report (Induced Polarization) by R.B. Chaplin, P.Eng. 14 Oct., 1967

1100

Part 2 of 2

GEOPHYSICAL REPORT

BOISE CREEK 1 TO 7 GROUPS

SEVEN MILES NORTHWEST OF PITT LAKE
NEW WESTMINSTER MINING DIVISION
49° / 122° NW

BY

STANLEY H. WARD, Ph.D., P.ENG.

CERTIFIED BY

P.H. BLANCHET, B.A.Sc., P. ENG.

FOR

B & T MINES LIMITED
BERTRAM I. NESBITT
FLAGSTONE MINES LIMITED
CARIBBEAN EXPLORATION CORPORATION

DATE SURVEY STARTED: JANUARY 15, 1967
DATE SURVEY COMPLETED: MARCH 13, 1967

2 parts

CHAPMAN, WOOD & GRISWOLD LTD.
NORTH VANCOUVER, BRITISH COLUMBIA

1100

PART 2

REPORT ON

AN AEROMAGNETIC SURVEY OF EXPLORER, DD, SE AND PITT MINERAL CLAIMS

NEW WESTMINSTER MINING DIVISION
BRITISH COLUMBIA

FOR

CARIBBEAN EXPLORATION CORPORATION
810 - 510 WEST HASTINGS STREET
VANCOUVER 1, B.C.

BY

STANLEY H. WARD, Ph.D., P.ENG.
2204 - 1200 ALBERNI STREET
VANCOUVER 5, B. C.

CERTIFIED BY

P. H. BLANCHET, B.A.Sc., P.ENG.
133 EAST 14TH STREET
NORTH VANCOUVER, B.C.

October, 1967

CHAPMAN WOOD & GRISWOLD LTD.

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REPORT ON AEROMAGNETIC PROSPECTING OF BOISE CREEK PROJECT FOR CARIBBEAN EXPLORATION CORPORATION

INTRODUCTION

On January 23 and 24, 1967, personnel of Chapman, Wood & Griswold Ltd. prospected the area of the Boise Creek Project with a helicopter-borne magnetometer. This work was conducted by P. H. Blanchet for the purpose of obtaining an approximate indication of the distribution of magnetite in the vicinity of the Boise Creek Project. It was hoped that knowledge of the distribution of magnetite might enhance knowledge of the geologic environment and in particular might aid in localizing drilling targets.

PROCEDURE

A Varian Associates proton precession magnetometer, model M4937A, was used in conjunction with a Bell G3B1 helicopter to permit continuous magnetic measurements to be made over the entire area of the Project. The magnetic sensor was towed about 60 feet below and behind the helicopter while the associated electronic equipment was mounted inside the bubble of the helicopter. The noise level of the magnetometer was about 2 gammas during the survey.

The helicopter was flown at a mean terrain clearance of about 400 feet as estimated by eye. Positioning of the

helicopter and subsequent flight path recovery were made by visually estimating the lateral position of the helicopter and marking this position on a topographic map frequently while on a traverse across the area. Flight lines were spaced approximately every quarter mile and three tie lines were added to check diurnal drift and to provide additional coverage.

The lateral departure from a perfect quarter-mile spacing of lines was usually less than 1/8 mile, while variations from the nominal 400 foot terrain clearance were apt to be as much as +400 feet over deep V valleys and as much as -200 feet over sharp ridges. Because the magnetometer work was designed as <u>prospecting</u>, and not as <u>surveying</u>, those departures from flight control could be tolerated. Tighter flight control would demand use of a flight path recovery camera, a radio altimeter, and numerous reflights; all of these factors would have led to a cost considered to be prohibitive in light of the purpose of the work.

A total of 124 line miles was flown covering an area of approximately 25 square miles.

The resulting data are presented on paper charts by the magnetometer. The values from these charts have been transferred to the plan map of C. W. and G.Ltd. Drawing No.502 and contoured at 100 gamma intervals by personnel of C. W. and G. Ltd.

LOCATION, DESCRIPTION AND ACCESS*

The Boise Creek Project is located in the Coast Mountains some thirty miles north-easterly from Vancouver. The relatively steep slopes on either side of the east-west valley of Boise Creek are heavily timbered. At present, the only practical means of access is by helicopter.

GEOLOGY*

The rocks of the area seem to be almost entirely intrusive, falling into a quartz-diorite or diorite classification. The content and nature of the mafic minerals appears from reports to be variable. A high degree of silicification is reported in the central gossaniferous area.

INTERPRETATION

From the plan map of C. W. and G. Ltd. Drawing No.582, it is evident that a ring of irregular magnetic highs, surrounding the mineral showings, has been traced by the magnetometer. Several interpretations of this magnetic pattern are possible.

First, the highs could represent a concentration of magnetite formed, in a reducing environment, within the diorite. Second, the internal low could reflect the

* For more detailed descriptions of Location, Description and Access and of Geology, reference is directed to "Cariboo Exploration Corporation, Boise Creek Project, Progress Report No.1, January 31, 1967, C. W. and G. Ltd.

destruction of magnetite in an oxidizing environment over a limited region of the diorite. Third, the content of magnetite, throughout that portion of the diorite which has been flown, is constant, but the ring anomaly is due to the combined effects of the magnetic attraction of topographic highs and the reduction of terrain clearance over the topographic highs.

Regardless of the source of the ring high, we observe the relatively linear magnetic lows labelled A, B, C and D in coincidence with topographic depressions and airborne lineaments. If in fact lows A and B are caused by destruction of magnetite in zones spanning major fractures, then these zones could be favourable for the occurrence of economic mineralization. Particular attention then, should be paid to the intersection of lows A and B.

The character of the magnetic signature in the Boise Creek area is similar to those found over some porphyry copper deposits in the south-western United States, although allowance must be made for the effect of topography which could substantially modify deductions presented herein.

CONCLUSIONS AND RECOMMENDATIONS

No small target area has been delineated, but some broad guides for possible ore occurrence have been indicated by the magnetics. In view of the importance of linear

structural features as ore controls in general, and in view of the possible relationship between magnetics and lineaments, it is recommended that consideration be given to mapping of all major faults and shears by means of an airborne AFMAG survey.

Test drilling of the several possibly different geologic environments suggested by the magnetics should be contemplated as should orientation surveys using induced polarization apparatus.

S. H. Ward, Ph.D., P. Eng.

March 13, 1967

I certify that this is a valid copy of an original report, signature and seal

SUMMARY OF COSTS

LINE MILES SURVEYED		- 124 Miles
AREA SURVEYED		- 25 Sq. Miles
PERSONNEL EMPLOYED		-
S. H. Ward	Consultant	- January 15 - March 13, 1967
P. H. Blanchet	Operator	- January 15 - March 1, 1967
V. W. Shuttleworth	Project Geologist	- January 15 - March 1, 1967
R. Nygaard	Draftsman	- February, 1967

COST

Magnetometor Unit	$ 240.00
Geologist - Observer	$ 240.00
Helicopter	$ 1,350.00
Data Reduction	$ 900.00
Consulting	$ 140.00
Total	$ 2,870.00

Declared before me at the City of Vancouver, in the Province of British Columbia, this 26 day of October 1967, A.D.

V. W. Shuttleworth

Jill Turner

A Commissioner for taking Affidavits within British Columbia or
A Notary Public in and for the Province of British Columbia.
Sub-mining Recorder

C E R T I F I C A T E

I, PETER H. BLANCHET, of the Municipality of Langley, B. C., do hereby certify that:

1) I personally know Dr. Stanley H. Ward and know him to be:
   a) a geophysicist residing at 8119 Phaeton Drive, Oakland California,
   b) a graduate of the University of Toronto with a B.A.Sc., degree (1949) in Engineering Physics (Geophysics) and a Ph.D. degree (1952) in Physics (Geophysics),
   c) a member of the Association of Professional Engineers of British Columbia, and to have:
   d) been practicing his profession for 18 years,
   e) no direct or indirect interest, nor does he expect to receive any interest, direct or indirect, in the property or any related securities,
   f) supervised and consulted on the work described in this report.

2) I am a graduate of the University of British Columbia with a B.A.Sc. degree (1943) in Geological Engineering.

3) I am a member of the Association of Professional Engineers of British Columbia.

4) I am a geologist and have been practicing my profession for 24 years.

5) I neither have nor expect any kind of interest in the property or related securities.

6) I performed the work described in this report.

Peter H. Blanchet, B. A. Sc., P. Eng.

Dated at North Vancouver, B. C.
this 25th day of October, 1967

BOISE CREEK PROJECT

CARIBBEAN EXPLORATION CORPORATION

NEW WESTMINSTER M.D., B.C.

AEROMAGNETIC FLIGHT PLAN

SCALE 0 1000 2000 4000 6000 FEET

C.,W. & G. LTD. DRWG. NO.:-758 OCT., 1967.

To Accompany Geophysical Report

By S.A. Ward, P. Eng. 13th March, 1967

1100

SCALE 0 1000 2000 3000 4000 FEET

CARIBBEAN EXPLORATION CORPORATION

BOISE CREEK PROJECT

RECONNAISSANCE AEROMAGNETIC PLAN

MAGNETIC CONTOUR INTERVAL – 100 GAMMAS

MAGNETIC DEPRESSION

NOMINAL TERRAIN CLEARANCE – 350'

CW&G Date: MAR. 1967 Drwg. No. 582

To Accompany Geophysical Report (Normag)

By S.H. Ward, P.Eng. 13th March, 1967

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