EXPLORATION
NTS: 92H/9E

REPORT BY:
COMINCO LTD.
WESTERN DISTRICT
15 JULY 1980

GEOPHYSICAL REPORT
ON
INDUCED POLARIZATION, VLF, AND MAGNETICS SURVEYS
RED STAR PROPERTY
PRINCETON AREA, B.C.
SIMILKAMEEN MINING DIVISION
LATITUDE: 49°10' N - LONGITUDE: 120°35' W

FIELD WORK PERFORMED:
10 TO 20 JUNE 1980
ON CLAIM:
RED STAR CLAIM (18 UNITS)

REPORT BY:
ALAN R. SCOTT
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INTRODUCTION

The Red Star mineral claim straddle the Hope-Princeton Highway (#3) about one kilometer west of the confluence of the Pasayten and Similkameen Rivers. The present survey work was restricted to the portion of the claims immediately north of the highway. Plate 176-80-1 shows the general location of the property, and Plate 176-80-2 the location of the grid relative to the claims.

The work was done during the period 10-20 June 1980, and consisted of 16.5 line kilometers of induced polarization survey, 17 line kilometers of VLF electromagnetics survey, and 10 line kilometers of magnetics survey.

The exploration target is the massive sulphide volcanogenic type deposit. This report describes the procedures of the various geophysical surveys, presents the data, and discusses the results of those surveys.

GEOPHYSICAL SURVEYS

The geophysical surveys were done by a Cominco in-house crew. The party chief on the survey was S. Holland, geophysicist in training.

Induced Polarization

A Huntex Mk IV LOPO portable induced polarization transmitter, in combination with a Scintrex IPR-8 receiver, were used on the Red Star IP survey. Readings were taken in the time domain using a 2 second current on / 2 second current off alternating square wave signal. The chargeability values plotted are those for the M232 window from 650 to 1170 milliseconds after cessation of the current pulse. Units for the IPR-8 receiver are in millivolts per volt.
The Wenner electrode array was used on the survey with "a" spacings of 50 m and 150 m. This array was chosen primarily to ensure adequate signal strength from the relatively low power LOPO transmitter.

The apparent resistivity values are given in units of ohm meters and were calculated from the relation:

\[
\text{Apparent resistivity} = \frac{V}{I} \cdot K,
\]

where \( V \) is the voltage across the measuring electrodes during the current on a period \( I \), and \( K \) is a constant dependant on the "a" spacing and array geometry.

**VLF Electromagnetometer**

A Crone Radem VLF electromagnetometer was used for the VLF survey. The plotted values are the in phase dip angle of the resultant field and the horizontal component of the field strength. The dip angle data is plotted so as to give a right wave crossover over conductive bodies. The survey was looped to obtain drift corrections for the field strength values.

**Magnetometer**

A Scintrex MP-2 proton precession magnetometer was used on the magnetics survey. The instrument has a digital display which gives the value of the earth's total magnetic field to the nearest gamma. The data was corrected for diurnal changes by the standard base station looping method.

**DISCUSSION OF RESULTS**

The geophysical survey results are presented on accompanying Plates 176-80-3 to 16 inclusive (survey lines 0 to 13N). The numerical values of the chargeability (IP) and apparent resistivity are given in pseudosection format. This is a schematic form of presentation and no target depth or geometry is implied by it. In addition, the chargeability values are plotted as line profiles with anomalies coded as follows:

- Chargeability anomaly; a=50 m and a=150 m
- Chargeability anomaly; a=150 m only

The VLF and magnetic field data are plotted as line profiles. The dip angle values are plotted so as to give a right wave crossover over a conductive body. The location of such conductors is noted on the profiles by a heavy vertical line. The magnetometer survey was conducted only on lines 300 to 1000N. Magnetic field highs are indicated on the profiles by a heavy horizontal line between inflection points. (Note that this does not imply a width of the magnetic body. More data points would be required to obtain width and dip estimates).
Of the three geophysical surveys performed, IP, VLF, and magnetics, the IP (chargeability) is considered the most important parameter. Therefore the following discussion is biased towards the chargeability response.

Three distinct zones of high chargeability were detected on the survey. These are labelled A, B, and C on the profiles. Line to line correlation of these zones is very clear.

Zone A, the westernmost zone, is a relatively narrow anomaly and was detected at both the a=50 meter and a=150 meter electrode separations. The anomalous zone can be traced from line 100N; 575W to line 1000N; 600W. The near separation peak amplitude varies from 12.8 \( \text{mV} \) on line 600W to 39.0 \( \text{mV} \) on line 300N. On lines 200N to 700N, where the VLF chargeability response is strongest, there is a coincident VLF conductor. Zone A lies immediately east of a magnetic field high. There is a weak magnetic high coincident with Zone A on line 600N (525W).

Zone B, the central chargeability high, was detected only at the a=150 meter separation. The zone is defined on the profiles from line 300N to 1200N. The peak a=150 meter response of 37.0 \( \text{mV} \) is at line 600N; 275W. Zone B does not have a coincident VLF conductor but is coincident with a distinct magnetic field high.

Zone C, the easternmost chargeability high, is a very broad response zone and was detected at both the a=50 meter and a=150 meter separations. The anomaly is defined on the sections from line 400N; 100W to line 1200N; 275W-275E. The anomaly also gives a weak response on line 1300N. The strongest response from anomaly C is 59.5 \( \text{mV} \) (a=150 meters) at line 800N; 25W. Anomaly C lies in an area of low magnetic field values.

CONCLUSIONS

Portions of the Red Star mineral claims were surveyed with time domain IP, VLF electromagnetics, and total field magnetics in the summer of 1980.

Three distinct zones of anomalously high chargeability response were detected on the survey, and have been labelled as Zones A, B, and C on the profiles which accompany this report.

Zone A is a relatively narrow zone which lies on the east side of the contact of high magnetic susceptibility (on the west) to lower susceptibility (on the east and including Zone A). The strongest response of 39.0 \( \text{mV} \) is at line 300N; 525W. It is coincident with a VLF conductor on those lines where the IP response is strongest. Zone A was detected at both the a=50 meter and a=150 meter separations.

Zone B was detected only on the a=150 meter separation. The peak value of 37.0 \( \text{mV} \) is at line 600N; 275W. Zone B does not have a coincident VLF conductor, but is coincident with a distinct magnetic field high.
Zone C is a very broad anomaly, and was detected at both the a=50 meter and a=150 meter separations. The peak value of 59.5 N (a=50 meter) is at line 800N; 25W. Anomaly C is coincident with low (background) magnetic field values.

Respectfully Submitted By:  
Alan R. Scott, Geophysicist

Endorsed For Release By:  
G. Harden, Manager  
Exploration, Western District

ARS:hmr

Attachments.

Distribution.

Mining Recorder (2)  
Western District Files (1)  
Geophysics Files (1)
APPENDIX I

IN THE MATTER OF THE B.C. MINERAL ACT
AND IN THE MATTER OF A GEOPHYSICAL PROGRAMME
CARRIED OUT ON PORTIONS OF THE RED STAR MINERAL CLAIM
ON THE RED STAR PROPERTY
LOCATED 35 KM SOUTHWEST OF PRINCETON IN THE SIMILKAMEEN MINING DIVISION
OF THE PROVINCE OF BRITISH COLUMBIA, MORE PARTICULARLY
N.T.S.: 92H/9E

STATEMENT

I, Alan R. Scott, of the City of Vancouver, in the Province of British Columbia, make oath and say:-

1. THAT I am employed as a geophysicist by Cominco Ltd. and, as such have a personal knowledge of the facts to which I hereinafter depose;

2. THAT the annexed hereto and marked as "Appendix II" to this statement is a true copy of expenditures incurred on geophysical survey on the Red Star mineral claim;

3. THAT the said expenditures were incurred for the purpose of mineral exploration of the above noted claim between the 10th day of June and the 20th day of June, 1980.

Alan R. Scott, Geophysicist

15 July 1980.
APPENDIX II

RED STAR PROPERTY

STATEMENT OF EXPENDITURES

(Induced Polarization, VLF-EM, and Magnetics Surveys)

1. SALARIES

S. Holland, geophysicist in training
10-20 June 11 days @ $105. $1,155.

D. Milne, geophysical technician
10-20 June 11 days @ $105. 1,155.

E. Bernshaw, IP crewman
10-20 June 11 days @ $83. 913.

Y. Fortin, IP crewman
10-20 June 11 days @ $83. 913.

D. Campbell, IP crewman
10-20 June 11 days @ $83. 913.

J. Allen, IP crewman
10-20 June 11 days @ $83. 913.

$ 5,962.00

2. EQUIPMENT RENTALS

LOPO/IPR-8 IP Survey System, Mag, Radem VLF 1,665.10

4X4 Truck and Equipment Trailer 470.60

$ 2,135.70

3. OPERATING CHARGES

(Towards report, drafting, supervision)
Geophysical Survey 10 days @ $175/day $ 1,750.00

4. MISCELLANEOUS

Food, Lodging, Gas, Consumables $ 2,510.30

TOTAL EXPENDITURES $12,358.00

Alan R. Scott, Geophysicist
APPENDIX III

CERTIFICATION

I, Alan R. Scott, of 4013 West 14th Avenue, in the City of Vancouver, in the Province of British Columbia, do hereby certify:-

1. THAT I graduated from the University of British Columbia in 1970 with a B.Sc. in Geophysics;

2. THAT I am a member of the Association of Professional Engineers of the Province of Saskatchewan, the Society of Exploration Geophysicists of America, and the British Columbia Geophysical Society.

3. THAT I have been practising my profession for the past ten years.

Alan R. Scott, Geophysicist

15 July 1980.
LINE NO. 0

WENNER ELECTRODE CONFIGURATION

MINERAL RESOURCES BRANCH
A. D. MACDONALD, B.Sc.
MINERAL MAPPING TECHNICIAN
H. J. M. MACDONALD, B.Sc.
MINERAL MAPPING SUPERINTENDENT

SCALE 1:5000
DATE SURVEYED JUNE 11, 1970

CONTOUR INTERVALS:
APP. RES. — 100, 200, 500, 1000 Ohm.m
APP. CHARGE. — 0.5, 1.0 Mv/V

DATE

TRANSMITTER — HUNTEC LOPO MK IV
RECEIVER — SCINTREX IPR 8

"INDUCED POLARIZATION AND RESISTIVITY SURVEY
SURVEYED BY COMINCO LTD., EXPLORATION DIVISION"
LINE 300 N

Apparent Resistivity Ohm metres

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<th>1000W</th>
<th>800W</th>
<th>600W</th>
<th>400W</th>
<th>200W</th>
<th>80E</th>
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Apparent Chargeability Mv/V

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CHARGEABILITY PROFILE

-300 m
-200 m
-100 m
-50 m

CHARGEABILITY ANOMALY

-50 m S to 50 m N

CHARGEABILITY ANOMALY

-50 m N to 50 m S

DIP ANGLE

0° - +20°

V.L.F. FIELD STRENGTH

+20° - +320°

MAGNETOMETER SURVEY

GAMMAS

56500
56500
55750
55000
50000
50000
45000
40000
30000
25000
20000
15000
10000
5000
0

LINE 300 N

SCALE 1:5000

DATE SURVEYED JUNE 11/12/14

CONTOUR INTERVALS:
APP RES = 1.523375,1O Ohm metres
APP CHARG = 5.0 Mv/V

APPROVED

DATE

INDUCED POLARIZATION AND RESISTIVITY SURVEY
SURVEYED BY COMINCO LTD., EXPLORATION DIVISION
LINE 500 N

Apparent Resistivity Ohm metres

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Apparent Chargeability Mv/V

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CHARGEABILITY

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MAGNETOMETER SURVEY

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COMINCO LTD.
RED STAR GROUP
SIMILKAMEEN M.D., B.C.

LINE NO. 500 N

WENNER ELECTRODE CONFIGURATION

MINERAL RESOURCES BRANCH
ELECTRODE CONFIGURATION

DATE SURVEYED JUNE 11, 12, 15, 1980

SCALE 1:5000

CONTOUR INTERVALS:
APP. RES. 1, 1.5, 2, 3.5, 7.5, 10 ohm metres
APP. CHARGE 5, 10 Mv/V

INDUCED POLARIZATION AND RESISTIVITY SURVEY
SURVEYED BY COMINCO LTD., EXPLORATION DIVISION
**CHARGEABILITY ANOMALY**

**VLF CONDUCTOR (RIGHT WAVE CROSSOVER)**

**CRVNE QADCU STATION** (SEATTLE)

**SCINTREX MP-2 PROTRON PROCFELTAL FIELD**

**MAGNETOMETER SURVEY**

**N.T.S. 92 H 2E**

**DIAMOND**

**LINE 600 N**

**Apparent Resistivity Ohm metres**

**Apparent Chargeability Mv/V**

**MINERAL RESOURCES BRANCH**

**DATE SURVEYED: JUNE 11 & 12, 1980**

**APPROVED**

**DATE**

**TRANSMITTER: HUNTEC LOPO MK IV**

**RECEIVER: SCINTREX IPR 8**

**COMINCO LTD.**

**RED STAR GROUP**

**SIMILKAMEEN M.D., B.C.**

**LINE NO. 600 N**

**WENNER ELECTRODE CONFIGURATION**

**SCALE 1:5000**

**CONTOUR INTERVALS:**

- APP. RES. - 1, 1.5, 2, 2.5, 3, 3.5, 4, 5, 6 Ohm metres
- APP. CHARGE. - 5.0 Mv/V

**INDUCED POLARIZATION AND RESISTIVITY SURVEY**

**SURVEYED BY COMINCO LTD., EXPLORATION DIVISION**
COMINCO LTD.
RED STAR GROUP
SIMILKAMEEN M.D., B.C.

LINE NO. 800 N

Apparent Resistivity Ohm metres

N.T.S. 92 H 2E

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT

COMINCO LTD., EXPLORATION DIVISION

INDUCED POLARIZATION AND RESISTIVITY SURVEY
SURVEYED BY COMINCO LTD., EXPLORATION DIVISION

SCALE 1:5000

DATE SURVEYED: JUNE 1970

CONTOUR INTERVALS:
APR. RES. = 1.0252375 ohm metres
APR. CHARGE: = 0.250 mV/V

TRANSMITTER - HUNTEC LORO MK IV
RECEIVER - SCINTREX IP 6