COMINCO LTD.

EXPLORATION

NTS: 92 F/2

WESTERN DISTRICT

INDUCED POLARIZATION AND RESISTIVITY SURVEY

MT. McQUILLAN PROPERTY

ALBERNT M.D., B.C.

Worked performed: May 11 - 27, 1977

Location: 49°07'N-124°36'W

Claims: SOL 1-40 and SOL 2

(12 units)

OCTOBER 1977

Jan Klein

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MT. McQUILLAN PROPERTY

ALBERNI M.D., B.C.

INTRODUCTION

This report pertains to the combined Induced Polarization and Resistivity Survey in the Mt. McQuillan, Port Alberni area, British Columbia, for Cominco Limited, by Kenting Exploration Services Limited.

The survey crew began work after arriving May 11, 1977, and departed May 27, 1977. The crew was under the direction of W.A. Patterson, Geophysicist.

The purpose of the survey was to provide Induced Polarization coverage adjacent to an area where different ranges of charge-ability readings were observed in a survey executed in 1976.

SURVEY SPECIFICATIONS

A Huntec 7.5 KW transmitter-motor generator set was used in combination with Huntec Mk. III IP receivers. The current on time and duty ratio were: two seconds current on, two seconds off, two seconds on current reversed. The receiver sampling and delay times were: 60 milliseconds period and 120 milliseconds delay. Four samples of the delay curve were taken and the times are as follows:

- 120 180 milliseconds corresponds to M $_1$
- 180 300 milliseconds corresponds to M₂
- 300 540 milliseconds corresponds to M₃
- 540 1020 milliseconds corresponds to $\rm M_4$

The primary voltage $V_{\tilde{D}}$ sample is obtained near the end of the two second "current on" period.

The pole-dipole inline array was used with a spacing of 200 feet. Separations of n=2 and n=3 only were used. The current electrode C was always to the north of the survey dipole.

RESULTS

.b

The results are plotted in pseudo-section form for each line and on contoured plan maps for resistivity and chargeability.

The resistivity values are calculated using Ra = K $\frac{Vp}{T}$ where

K is a constant dependent upon the array and spacing, Vp is the primary voltage in millivolts, and I is the transmitted current in amperes flowing between C and the reference electrode.

The four chargeability samples M1, M2, M3 and M4 are combined to give a Newmont standard type chargeability C.

$$C = (M_1 + 2M_2 + 4M_3 + 8M_4) 0.6$$

The N=2 and N=3 resistivity and chargeability data was filtered to smooth it for contouring in plan form. A three point filter was used thus:

2N	4 N
	
.a	.d

.c

for station 2N the filtered value = $\frac{a+b+c}{3}$

GEOLOGY

MULLER, J.E. and CARSON, D.J.T., 1969 Geology and Mineral Deposits of Alberni Map-Area, B.C. 92F GSC Paper 68-50

INTERPRETATION

A broad, high chargeability, low resistivity anomaly is the dominant feature.

Line 4W is anomalous from 44N to the south end, 16N. Moderately low values at 16N suggest the southern limit of the anomaly. It would seem possible that the anomaly may extend further up the mountain.

The magnitude of the chargeability (50 msecs and over) suggests several percent sulphides in some areas. Chargeability peaks occur at 21 to 23N, 27 to 29N, 32 to 43N, and 38 to 50N. The first zone is the strongest and appears to be relatively deeper. The second zone at 27 to 29N is smaller and shallow. The third and fourth zones are not as sharply defined and may represent small lateral variations in sulphide content.

A resistivity "contact" at 40N coincides with the north edge of the anomaly. The high resistivity to the north is typical of massive intrusive rock. South of the "contact", the very low resistivity suggests metamorphed volcanic sediments (S icker group). Variations within the metamorphics could also account for the large resistivity variations.

Line 8W is similar with the northern chargeability contact at approximately 38N. High chargeability zones occur at: south of 18N (the end of the line) a shallow zone at 22 - 24N, a relatively deep, strong zone at 27 to 30N, and a moderately strong zone at 33 to 36N.

The resistivity "contact" is at approximately 36N.

The southwest trend of the anomaly places the northern extent of high chargeability at approximately 34N on Line 12W. High chargeability zones occur at 16 - 23N, and 28 - 30N. The former zone is the strongest with chargeability values to 61.9 milliseconds.

The associated resistivity is higher in this area than on previous lines suggesting a rock-type gradation into the very high resistivity material found to the north and west of the anomaly.

Lines 16W, 20W, and 24W exhibit very high resistivity and generally low chargeability. Anomalous chargeability values are found at 24 to 27N on Line 24W.

CONCLUSIONS AND RECOMMENDATIONS

The 1977 induced polarization and resistivity survey over part of the Mt. McQuillan property extended the area of high chargeabilities, detected during 1976, further westwards.

The geophysical data should be correlated with geological, geochemical and drill hole results, collected to date, prior to executing further work.

Report by:

Jan Klein, P Eng. Chief Geophysicist

Endorsed for Release by:

G. Harden Manager, Exploration Western District

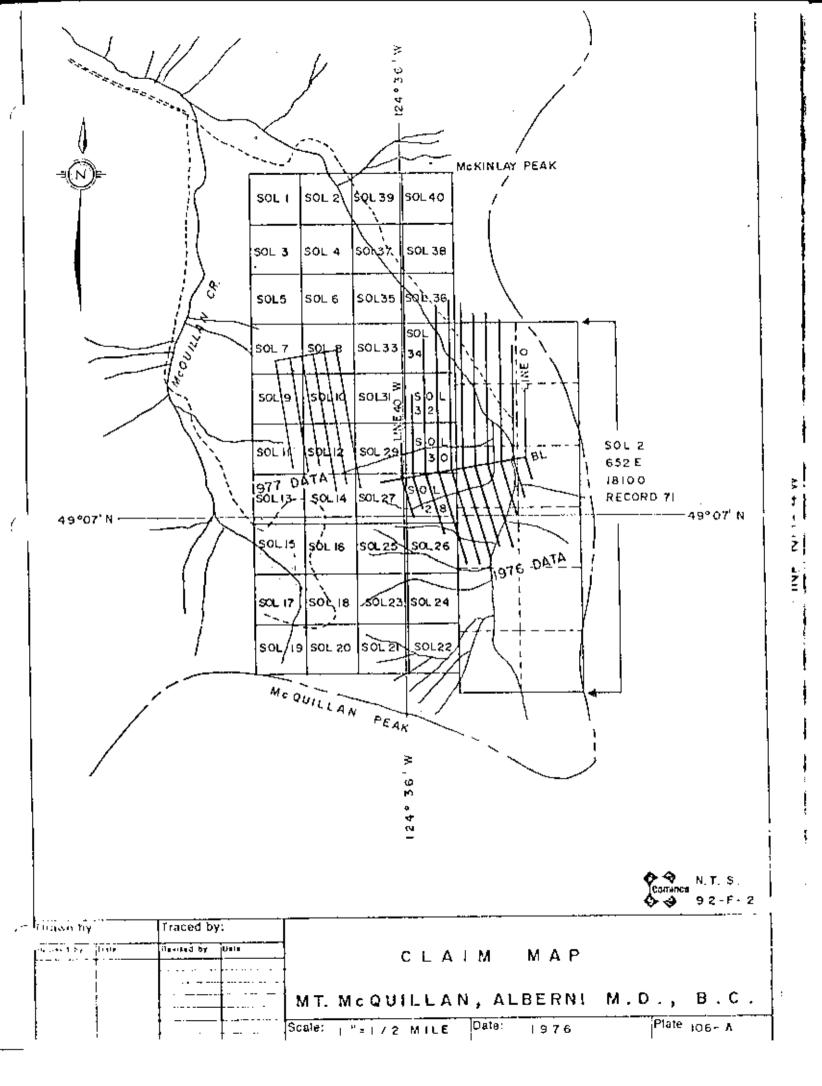
JK/deb 5 October 1977

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COMINCO LTD.

EXPLORATION NTS: 92 F/2

WESTERN DISTRICT

INDUCED POLARIZATION AND RESISTIVITY SURVEY

MT. McQUILLAN PROPERTY

ALBERNI M.D., B.C.

Work Performed: May 11-27, 1977

Location: 49°07'N-124°36'W

Claims: SOL 1-40 and SOL 2

(12 units) held by Coast Copper Ltd.

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Plate 106-A	Claim Map and Grid lay-out on a scale of l"=1/2 mile
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WESTERN DISTRICT

INDUCED POLARIZATION AND RESISTIVITY SURVEY

MT. McQUILLAN PROPERTY

ALBERNI M.D., B.C.

INTRODUCTION

This report pertains to the combined Induced Polarization and Resistivity survey in the Mt. McQuillan, Port Alberni area, British Columbia, for Cominco Limited, by Kenting Exploration Services Limited.

The survey crew began work after arriving May 11, 1977, and departed May 27, 1977. The crew was under the direction of W.A. Patterson, Geophysicist.

The purpose of the survey was to provide Induced Polarization coverage adjacent to an area where different ranges of charge-ability readings were observed in a survey executed in 1976.

PROPERTY OWNERSHIP, LOCATION AND ACCESS

Coast Copper, through an agreement with CanPac Minerals and Pan Canadian Petroleum, controls the rights to the area under investigation. Base metal rights are part of the Esquimalt and Nanaimo Railway Grant, and precious metal rights are protected by the Sol 1-40 mineral claims, and Sol # 2 claim (12 units), held by Coast Copper Ltd. The property is managed by Cominco Ltd. The 1977 survey grid covers the following claims in whole or in part: SOL 7 - 14, 27 and 29.

The property is located 12 miles SE of Port Alberni, B.C. on a ridge extending southerly from the junction of McQuillan and China Creeks.

No presently useable roads enter the property itself. However, McMillan Bloedel Ltd. maintains excellent roads to within 2 miles of it.

To date geological mapping, geochemical and some geophysical work has been executed on the property.

GEOLOGY AND MINERALIZATION

The rocks underlying the Mt. McQuillan area belong to one of three types: (1) Sicker Group Volcanics, (2) Island Intrusives (Jurassic), and (3) Tertiary Intrusions. The Sicker Group is represented by a dark, massive andesite, which is occasionally fragmental. In places it contains disseminated pyrite. The volcanics are intruded by a Jurassic diorite stock and by acid dikes. The contact area of the diorite is indistinct and hybrid in nature. Most of the sulphide mineralization which is present occurs either in the hybrid zone or adjacent to and within narrow rhyolite or quartz-feldspar porphyry dikes or sills throughout the area.

There are three zones of low-grade mineralization that are substantiated by geochemical results. These are located near 36N, 16N and 8S along line 4W (1977 grid) and extend further to the west, downslope. Chalcopyrite occurs frequently in these areas, but in isolated and minute amounts together with abundant pyrite and pyrrhotite.

The three zones are similar in most respects. The northeasterly trending fracture system appears to have controlled introduction of quartz-feldspar porphyry dikes, a few mineralized quartz veins, and many mineralized quartz veinlets and joints. The zones are conspicuous by their rusty appearance. The host rocks are andesite volcanics and porphyry dikes. Very little metallic mineralization was detected in the diorite and the purplish volcanics.

Total metallic sulphide mineralization may be up to 5% but most of it is pyrite and pyrrhotite. Some effects of leaching appear at the surface. The extremely low copper assays (± 0.1%) in the 2 northern zones may indicate that the chalcopyrite occurs mainly in thin fractures and quartz veinlets within the volcanics. In the porphyry dikes sulphides are disseminated in the matrix. Molybdenite is occasionally visible, and minor gold and silver values were obtained in some assays.

SURVEY SPECIFICATIONS

A Huntec 7.5 KW transmitter-motor generator set was used in combination with Huntec Mk. III IP receivers. The current on time and duty ratio were: two seconds current on, two seconds off, two seconds on current reversed. The receiver sampling and delay times were: 60 milliseconds period and 120 milliseconds delay. Four samples of the delay curve were taken and the times are as follows:

120 - 180 milliseconds corresponds to M_{χ}

180 - 300 milliseconds corresponds to M2

300 - 540 milliseconds corresponds to M3

540 - 1020 milliseconds corresponds to M_A

The primary voltage Vp sample is obtained near the end of the two second "current on" period.

The pole-dipole inline array was used with a spacing of 200 feet. Separations of n=2 and n=3 only were used. The current electrode C was always to the north of the survey dipole.

RESULTS

The results are plotted in pseudo-section form for each line and on contoured plan maps for resistivity and charge-ability.

The resistivity values are calculated using Ra \approx K $\frac{Vp}{T}$ where

K is a constant dependent upon the array and spacing, Vp is the primary voltage in millivolts, and I is the transmitted current in amperes flowing between C and the reference electrode.

The four chargeability samples M₁, M₂, M₃ and M₄ are combined to give a Newmont standard type chargeability C.

$$C = (M_1 + 2M_2 + 4M_3 + 8M_4) 0.6$$

The N=2 and N=3 resistivity and chargeability data was filtered to smooth it for contouring in plan form. A three point filter was used thus:

2N 4N

.a .d

.b .c

for station 2N the filtered value = $\frac{a+b+c}{3}$

INTERPRETATION

A broad, high chargeability, low resistivity anomaly is the dominant feature.

Line 4W is anomalous from 44N to the south end, 16N. Moderately low values at 16N suggest the southern limit of the anomaly. It would seem possible that the anomaly may extend further up the crest of the mountain.

The magnitude of the chargeability (50 msecs and over) suggests several percent sulphides in some areas. Chargeability peaks occur at 21 to 23N, 27 to 29N, and 32N to 40N. The first zone is the strongest and appears to be relatively deeper. The second zone at 27 to 29N is smaller and shallow. The third zone is not as sharply defined and may represent small lateral variations in sulphide content. This area of anomalous responses is underlain by Sicker Volcanics.

A resistivity "contact" at 40N coincides with the north edge of the anomaly. The high resistivity to the north is typical of massive intrusive rock. South of the "contact", the very low resistivity suggests metamorphed volcanic sediments (Sicker group). Variations within the metamorphics could also account for the large resistivity variations and possible IP variations as well.

The responses along line 8W are similar, with the northern chargeability contact at approximatley 38N. High chargeability zones occur at: 18N (the end of the line) a shallow zone at 22 - 24N, a relatively deep, strong zone at 27 to 30N, and a moderately strong zone at 33 to 36N.

The resistivity "contact" is at approximately 36N. Again, Sicker group volcanics underly this line.

The southwest trend of the anomaly places the northern extent of high chargeability at approximately 34N on line 12W. High chargeability zones occur at 16 - 23N, and 28 - 30N. The former zone is the strongest with chargeability values to 61.9 milliseconds.

The associated resistivities are higher in this area in the comparable zones along the previous lines suggesting change in rock-type.

Lines 16W, 20W, and 24W exhibit very high resistivity and generally low chargeability. Anomalous chargeability values are found at 24 to 27N on line 24W. No outcrops are found in this area.

CONCLUSIONS AND RECOMMENDATIONS

The 1977 induced polarization and resistivity survey over part of the Mt. McQuillan property extended the area of high chargeabilities, detected during 1976, further westwards.

The large area of anomalous responses can reflect several percent of sulphides by volume, but might also be caused by non-economic alteration products.

The geophysical data should be correlated with geological, geochemical and drill hole results, collected to date, prior to executing further work.

Report by:

Jan Klein, P. Eng. Chief Geophysicist

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Endorsed for Release by:

G. Harden Manager, Exploration Western District

JK/deb 5 October 1977 Revised 20 March 1978

Distribution: W.D. Files (1)
Admin. Files (1)

Mining Recorder (3)

DOMINION OF CANADA:

PROVINCE OF BRITISH COLUMBIA.

In the Matter of

RELATING TO EXPENDITURES OF A GEOPHYSICAL SURVEY ON THE NT. MCQUILLAN PROPERTY, ALBERNI MINING DIVISION

STATUTORY DECLARATION

To Wit:

- JAN KLEIN, PROFESSIONAL ENGINEER
- of THE MUNICIPALITY OF RICHMOND

in the Province of British Columbia, do solemnly declare that

- Copies of a report regarding geophysical surveys on certain mineral claims situated in the Alberni Mining Division are being filed with the Mining Recorder in Vancouver.
- Attached hereto, and marked with the letter "A" upon which I have signed my name at the time of declaring hereof, is a statement of expenditures incurred in connection with the Induced Polarization and Resistivity survey of the said claims showing in addition the dates during which those making the said survey performed their work.

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

Declared before me at the City

of Vancouver

in the

Province of British Columbia, this

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day of October, 1977

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INDUCED POLARIZATION AND RESISTIVITY SURVEY COSTS

MT. McQuillan Property, Sol 1-40 AND Sol 2,

12 UNITS CLAIMS, ALBERNI MINING DIVISION.

 $N.T.S. 92F/2: 49^{\circ}07'N - 124^{\circ}36'W$

 $\rm IP$ and resistivity survey done under contract by Kenting Exploration Services bimited during the period May 11 - 27, 1977 incl.

1.	Survey Cost for 8 miles of traverse including mobilization, camp and local	
	transportation	\$ 17,200.00
2.	Line cutting by Martinson	\$ 1,360.00
3.	Supervision, drafting, interpretation and report	
	Drafting by J.P. Snyder	\$ 190.00
	Interpretation by J. Klein	\$ 450.00
	Supervision by J.J. Lajoie	\$ 375.00

TOTAL:

Signed:

Jan Klein,

THIS IS EXHIBIT "A" TO THE STATUTORY DECLARATION OF JAN KLEIN DECLARED BEFORE ME THIS _____ DAY OF OCTOBER, 1977.

A COMMISSIONER FOR TAKING AFFILMVIT

