Report On An Induced Polarization Survey Coal Harbour Area, B. C.

Island Copper
884315

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SUMMARY

An induced polarization survey on the present property has revealed increased chargeability responses in four zones ranging from small to extensive in area. The amplitude of the present responses could arise from bedrock containing 1% to 3% by volume of metallically conducting mineralization such as sulphides, graphite or other minerals known to give induced polarization responses.

One increased chargeability zone, approximately 800' X 2000' coincides with an area mapped as underlain by pyroclastic rocks which contain sulphide mineralization.

Detailed induced polarization surveying using shorter electrode spacings may be warranted to attempt to find places where the material of anomalous chargeability comes nearest surface. This would direct surface geological examination, possibly aided by trenching, or could be used to locate exploratory drill holes in the areas of highest metallic content.

If presently available geological information indicates that diamond drilling is warranted immediately, the best locations would be in the areas of highest response for the 400' electrode spacings within the designated high chargeability zones.

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REPORT ON
AN INDUCED POLARIZATION SURVEY
COAL HARBOUR AREA, BRITISH COLUMBIA
ON BEHALF OF
INSPIRATION CONSOLIDATED COPPER CO. LTD.

INTRODUCTION

During the period from August 2, to August 11, 1970, a geophysical field party under the direction of Mr. Tony Guernier executed an induced polarization survey in the Coal Harbour area, British Columbia, on behalf of Inspiration Consolidated Copper Co. Ltd.

The property lies on the north shore of Rupert Inlet and includes the settlement of Coal Harbour however the centre of the survey area was approximately 1 mile northwest of Coal Harbour. The property is accessible by truck. The survey area is largely logged off and hilly with swampy areas.

The claims covered, in whole or part, by the present survey are listed on the title page of this report and are shown on Plate 2, on the scale of 1" = 200'.

Scintrex Mk VI time-domain (pulse-type) induced polarization equipment has been employed on this property. The transmitting unit had a rating of 2.5 kw. and equal on and off times of 2.0 seconds. The receiving unit was a remote, ground-pulse type triggered by the rising and falling primary voltages set up in the ground by the transmitter. The integration of the transient polarization voltages takes place for 0.65 seconds after a 0.45 second delay time following the termination of the current-on pulse.

The purpose of an induced polarization survey is to map the

subsurface distribution of metallically conducting mineralization near the lines covered. In the present area such mineralization could include chalcopyrite, bornite, pyrite and other sulphide minerals. As well, metallic conductors such as magnetite and graphite can give chargeability responses not always distinguishable from sulphide mineralization.

The accompanying copy of H. O. Seigel's paper entitled "Three Recent Irish Discovery Case Histories Using Pulse-Type Induced Polarization", gives a description of the phenomena involved in this type of survey, the equipment employed, the field procedures and the nature of the results obtained over various base metal ore bodies.

For the present survey a baseline was laid out oriented east-west and grid lines were established perpendicular thereto. The grid line spacing was 400' for the area south of the baseline while a line spacing of 800' was adopted for three survey lines north of the baseline. The present survey totalled approximately 12 line miles.

The three electrode array with electrode spacings of 400' and 800' and station intervals of 200' was employed for reconnaissance purposes.

GEOLOGY

The geology of the present property has been studied by MacDonald Consultants Limited and is the subject their reports and maps. Two geology maps, on the scales of 1" = 1000' and 1" = 200' have been made available to the writer.

Most of the present property is mapped as being underlain by tuff, pyroclastics or feldspar porphyry. A granodiorite intrusion

is mapped just north of the survey area while shale and conglomerates lie to the south.

The goal of the present survey was to search for a large body containing disseminated sulphide mineralization, the upper surface of which would occur within 600' of the ground surface. Sulphides have been observed to occur within the pyroclastic rocks.

DISCUSSION OF RESULTS

Plate 2, on the scale of 1" = 200', shows an interpretation of the geophysical results as well as some mapped contacts taken from MacDonald Consultants' maps. Areas exhibiting increased chargeability responses as well as a contact between higher and lower resistivity material are shown.

Plate 3, also on the scale of 1" = 200', shows the chargeability results in profile form. Different symbols explained in the legend are used to show the results taken with the 400' and 800' electrode spacings. The vertical scale is 1" = 20.0 milliseconds.

Plate 4, shows the resistivity results in profile form. The vertical scale is logarithmic, with 2" = 1 logarithmic cycle, and the line trace taken as 100 ohm-metres. The plan scale is 1" = 200'.

The chargeability results indicate that over much of the survey grid the background values are generally less than 10.0 milliseconds. With this background a uniform subsurface distribution of 1% by volume of metallically conducting mineralization would be expected to add approximately 8.0 milliseconds to the background level. Since deposits of low concentrations of base metal sulphides of sufficient dimensions may have economic significance, areas exhibiting

chargeabilities in excess of 10.0 milliseconds may be worthy of further investigation. The interpreted boundaries of four such areas are shown on Plate 2.

The resistivity profiles are seen to be quite uniform with resistivities ranging from 100 to 1000 ohm-metres. The resistivity of most of the grid area is in the 500 to 1000 ohm-metre range while one area in the southeastern part of the grid, possibly corresponding to the feldspar porphyry rocks, shows resistivities of approximately 200 ohm-metres. Over most of the grid the resistivity values are seen to be approximately the same for the two electrode spacings however in places they are slightly higher for the 800' spacings. This would indicate that the overburden may have a lower resistivity than the bedrock, a normal occurrence.

The extensive high chargeability area in the north part of the grid has peak chargeabilities in excess of 30.0 milliseconds. This amplitude of response could arise from bedrocks containing the equivalent of 3% by volume of metallically conducting material. There is no distinct difference in resistivty between the high chargeability area and the lower chargeability rocks to the south. The area is mapped as underlain by tuff and lies just south of a granodiorite intrusive.

The increased chargeability area in the southwestern part of the grid shows peak chargeabilities in excess of 20.0 milliseconds which could arise from a subsurface concentration of up to about 2% by volume of metallically conducting material. It is noted that the peak chargeabilities are greater for the 400' spacings than for the 800' spacings which may indicate that the chargeable material may have

a limited depth extent. Additional profiles employing varying electrode spacings would be necessary to confirm this possibility. The resistivities in this high chargeability zone are in the same range as for most of the rest of the grid. As shown on Plate 2, the high chargeability zone is seen to coincide very well with an area mapped as underlain by pyroclastic rocks.

The two smaller high chargeability areas exhibit peak chargeabilities in the range of 20.0 milliseconds and could arise from bodies containing 2% to 3% by volume of metallically conducting material. The electrode spacings used for reconnaissance purposes are too wide to give good definition of these bodies and precise interpretations are therefore not possible. The anomalous zones lie within the same resistivity horizon as the two larger high chargeability zones.

CONCLUSIONS AND RECOMMENDATIONS

The present induced polarization survey has indicated four zones which may contain sufficient metallically conducting mineralization to warrant further investigation. One of the high chargeability areas coincides with a pyroclastic rock type which has been observed to contain sulphide mineralization.

Additional induced polarization surveying would allow more quantitative interpretation of the locations, depths below surface, attitude and possible metallically conducting content of the anomalous bodies. Such interpretations could lead to examination of the anomalous material near-surface and/or precisely located diamond drill holes in the areas of highest metallically conducting content.

Since, on the basis of the geophysical data alone, all of the high chargeability zones are of potential interest, geological and geochemical data should be considered in determining priorities for further exploration. If drilling is considered to be warranted immediately the best locations would be in the areas of highest response for the 400' electrode spacings.

Respectfully submitted,

SEIGEL ASSOCIATES LIMITED

Jon G. Baird, B.Sc., P.Eng.
Geophysicist

Vancouver, B. C.
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