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GEOPHYSICS

Q3745

SECOND PROGRESS REPORT

ON

LEAVERTON GEOPHYSICAL RESULTS

(MOINA SHEETS 1 & 2)

for

Mt. Lyell Mining & Railway Co. Ltd.

by

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Consulting Geophysicist

March, 1969.

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INTRODUCTION

This report follows on from a previous report on Moina Sheet 2 (Shepherd & Murphy) (July, 1968). Since this report additional magnetics have been carried out on this area and also on Moina Sheet 1. Electromagnetics using the McPhar VHEM have been read on both areas. The author visited the area in the company of Messrs Reid & Foster from 10th to 12th February, 1969.

Drilling recommendations have been made for line 8W Moina Sheet 1, dependent on the possibility of further EM work being impractical. For Sheet 2, further EM work has been recommended to pinpoint drilling sites on lines 6AE and 7E.

MOINA SHEET 2

Discussion of Results

Two main features are immediately evident. The Bismuth Creek Fault and the distribution of the skarn about this fault.

The position of the fault as given on the geological plan agrees very well with the magnetics and electromagnetics. To the south the magnetics are quiet and do not reflect the fault.

The EM results also outline the Bismuth Creek Fault as cross-overs. These show good agreement with the plotted position except for line 8E where there is very little EM activity. Some cross faulting may be the cause of the lack of an EM anomaly or just the absence of any mineralization at this point.

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The EM anomalies suggest that there is considerable mineralization along the fault and the anomalies which appear on lines 11E and 7E where the magnetic expression is absent suggest that there is mineralization other than magnetite.

Magnetic Results: The major magnetic activity appears to be associated with the skarn and suggests that the skarn underlies the basalt to the west possibly deepening to the west. This is further suggested by the anomaly associated with the outcrop of Og on line 2E.

Some discrepancy occurs between the magnetic anomaly and the skarn outcrop on line 10E. Reference to the earlier small scale geological map (used in previous report) suggests that there is some doubt on the position of this outcrop. The shape of the anomaly suggests a dip to the east, suggesting that the fault also dips to the east. The depth of cover of the anomaly east of the fault is also greater, suggesting that the fault is downthrown to the east. Within the skarn the magnetics are separated into a group of high intensity highs and lows suggesting shallow sources.

Electromagnetic: As mentioned earlier the Bismuth Creek Fault is well positioned by the EM results. This shows that the fault is mineralized.

The EM anomalies of any significance appears to be associated with the Bismuth Creek Fault and the skarn. The source of the magnetic anomaly on line 10E is very close to the fault and is undoubtedly associated with the E.M. anomaly on this line.

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The EM results over the skarn outcrop to the west of the Bismuth Creek Fault suggest a zone of mineralization extending from line 6AE to 7AE and to be composed of several parallel beds. The anomalies could be associated with the lode 6 of the Shepherd & Murphy lode system.

The lodes 1 to 5 do not appear to have any appreciable EM expression and also do not appear to have any relationship to the skarn, or magnetics. This could be due to the small size of the lodes and a smaller EM separation may be necessary to pick them up.

Magnetic Trends: The magnetic results show several lineaments which could reflect faulting.

As discussed previously the Bismuth Creek Fault (A.A.) is well outlined in both magnetics and E.M.

A second break is evident in the magnetics along line BB on figure No. 1. This strikes a little east of north and forms a western margin to the skarn. Previously it was mentioned that the EM results did not show an anomaly on line 8E and this is the approximate point of intersection of AA and BB.

Within the Skarn the magnetic trends appear to be random, however on the western side of the area outlined as representing skarn in the region of lines 4E and 4AE, there is a definite gradient striking a little west of north (CC) and the possibility of a fault cutting off the skarn must be considered.

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To the west of CC the strike of the magnetics is approximately NW again suggesting that CC is a line of change.

The depth of the anomalies to the west of CC suggest an increase of cover and the possibility of a down throw to the west of CC.

The above discussion suggests that the skarn is bordered by at least 3 faults. That the skarn underlying basalt to the west is still a possibility.

MOINA SHEET 1

Discussion of Results

Magnetic Results: The main feature on this sheet is the centre of high magnetic activity on lines 7W to 9W. This appears indicative of skarn.

The skarn appears to outcrop at the southern extremity of line 8AW and the depth of cover increases towards the north. It appears to shelve under the tertiary basalt to the north and possibly to the west also.

A separate small centre of magnetic activity appears at the northern end of line 7W and suggests a separate body of skarn, or a section faulted from the main body. This suggests the possibility of a fault striking approx NW to NNW through Line 7W 3000S (DD).

The strike of the magnetic trends (See figure 2) is approximately E.W. and this trend persists within the skarn in contrast to the random trends on sheet 2.

A second fault is possible running approximately north south to the west of line 10W (EE). This and the previous fault enclose the skarn.

A third fault bordering the skarn on the south and striking approximately NW must also be considered a possibility (FF). This is a situation very similar to that on Moina Sheet 2.

Electromagnetic Results: Several anomalies are present in the EM results and the largest of these lines in the skarn on line 8W and is in an area of magnetic disturbance.

Fault DD appears to have expression as EM cross overs on lines 8W and 7W and 6W. Fault EE is parallel to the traverse direction and hence cannot pass through any EM results, however, the disturbed character of line 11W could be an expression of the fault. Fault FF could have EM expressions on traverse 8W to 11W.

The large EM anomaly on line 8W (3600S) lines up with an anomaly on line 7W and a small one on line 9W suggesting a conductive source up to 2000 ft. long. On line 8W the anomaly spans several magnetic centres but would appear to be associated with a magnetic high centred near 3400S. This magnetic anomaly also extends to lines 7W and 9W. It is a broad anomaly suggesting a depth of cover of the order of 100 ft. to the magnetic source.

There is a difference of strike direction between the magnetic and EM anomalies. It is possible that the EM is due to near surface conductive material while the magnetic pole is at a depth of 100 ft. This would agree with the suggested northerly dip.

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The EM anomaly on line 11W has already been mentioned. As opposed to the fault source suggestion it could be to the expression of a conductive source at 2100S extending out to line 12W.

A further anomaly is present on lines 8W and 9W at approximately 2500S. The centre of magnetic disturbance at the northern end of 7W is also a centre of EM disturbance.

Rather than enumerate a whole series of EM anomalies which it is almost impossible to trace from traverse it would be better to concentrate the immediate attention on the anomalies within the skarn and a recommendation will be made to this effect.

RECOMMENDATIONS

Moina Sheet 1

If possible, the EM broadside method could be tried between traverse 8W and 9W and also between traverses 7W and 8W. This recommendation is based on the author's memory that this area was sufficiently open for broadside work. There is no point in carrying out this work if the area is not open.

Depending on the type of drilling equipment available, two recommendations are given (subject to the broadside EM not being possible):-

1. Diamond Drill
   Collared at 3200S depressed 45° to the south 500 feet long.

2. Vertical Percussion or Diamond

3300S	200 ft. deep
3400S	200 ft. deep
3550S	200 ft. deep

CONCLUSIONS & RECOMMENDATIONS

Moina Sheet 2

It is evident that several sources are responsible for the EM anomalies on traverses 6AE and 7E. The nature of the terrain prevents effective broadside EM and so there is no point in making a recommendation.

The magnetics do not show a clear cut similarity to the E.M. This was also the case on sheet 1.

In an attempt to make the location of a drill site or sites simpler it is recommended that EM with a shorter separation be carried out on lines 7E and 6AE. Separations of 100 ft. and 200 ft. are suggested.

John E. Webb.
Geophysicist.

LINE 1 E | LINE 2 E | LINE 3 E | LINE 4 E | LINE 4A E | LINE 5 E | LINE 5A E | LINE 6 E | LINE 7 E | LINE 7A E | LINE 8 E | LINE 9 E | LINE 10 E | LINE 11 E | LINE 12 E | LINE 13 E | LINE 14 E | LINE 15 E | LINE 16 E

BL

00

500

1000

1500

2000

2500

3000

3500

A

B

C

SKARN CONTACT (?)

SKARN

C

B

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MOINA SHEET 2
MAGNETIC TRENDS

FIG 1

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LINE 17 W

LINE 16 W

LINE 15 W

LINE 14W

LINE 13 W

LINE 12 W

LINE 11W

LINE 10 W

LINE 9 W

LINE 8 W

LINE 7 W

LINE 6 W

LINE 5 W

LINE 4 W

LINE 3 W

LINE 2 W

LINE 1 W

LINE 0

E

D

F

E

F

D

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MOINA SHEET 1
MAGNETIC TRENDS

FIG. 2.

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