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GEOPHYSICS

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PROGRESS REPORT

on

GROUND FOLLOW-UP OF THE
STAVERTON AIRBORNE MAGNETIC SURVEY

SHEPHERD & MURPHY MINE AREA

for

MT. LYELL MINING & RAILWAY CO., LTD.

by

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2nd July, 1968.

INTRODUCTION

This report covers part of the follow up of the airborne magnetic anomalies of the Staverton Area in Tasmania. The present survey is over the area of the Shepherd and Murphy Mine Area.

The work including the reduction and plotting of the results was carried out by personnel of the Mt. Lyell Mining & Railway Co. Ltd.

The geology discussed was supplied with the results at an approximate scale of 3 inches equals 1000 ft.

DISCUSSION OF RESULTSContoured Results

The results as supplied have been checked and minor alterations made where necessary. The 500 gamma contour interval is large but satisfactory for the magnitude of the anomalies obtained. No attempt has been made to contour the lows, designated -ve on the contours themselves but read as +ve on the magnetometer*, however the values of the lows have been indicated. Likewise the highs have not been contoured at 500 gamma intervals above 3000 gammas but the peak values have been annotated.

By comparison with the geological map of the area surrounding the mine, it would appear that the Tertiary Basalt is without appreciable magnetic expression and it is likely that the magnetic anomalies come from sources below the basalt.

*The McPhar M700 magnetometer is wired for Northern hemisphere use and therefore all highs register as -ve in Australia.

Similarly the magnetic activity over the Moina Sandstones does not appear to have any relationship to its boundaries and therefore can be assumed to be from sources other than the sandstone.

The large magnetic highs seem to be associated with the Skarn and the Bismuth Creek Fault is well outlined. The high centres are disposed about the fault as a centre line in exactly the same manner as the skarn.

Although an area of highs lies to the south of the main skarn outcrop, the intensity of these is much less and it cannot be postulated that the skarn underlies the basalt and in fact the previous drilling indicates the opposite.

No expression of the Sub-Basaltic Lead is present in the contours and the plotted positions of the lodes do not appear at first sight to correspond in anyway with the contours, however the strike of the basalt covered anomalies is generally E-W which is the strike direction of the lodes. The relation of the lodes to the magnetics will be discussed in greater detail under the heading of Magnetic Profiles.

The airborne magnetic anomaly has separated into several centres in the ground work but would still appear to be an overall isolated high. The ground traverses did not extend far enough to the south to check on the presence of the low evident in the airborne results.

The airborne anomaly composed of a closely related high and low centre suggested a shallow seated source and the ground results confirm this. The depth of cover will be discussed further under Magnetic Profiles.

Magnetic Profiles

Contouring, while giving a good generalised picture for comparison with geology does not contain all the available information and therefore the profiles will now be examined for more detail.

All traverses show a magnetic high or highs and there is, in general, an E-W striking magnetic belt. On line 1 is a medium intensity anomaly which is the result of a series of parallel sources suggesting bedding. There is a fairly sharp cut off on the southern side and a gradual dying away on the northern side. This could indicate a northerly dip, but must be treated cautiously, because it is not borne out by other eastern traverses with the possible exception of line 2.

The anomaly increases in intensity on line 2 and then reduces again on lines 3 and 4. There are two anomalies on line 4. These again combine on line 5 with a sharp increase in intensity but with at least three sources to the anomaly. The intensity progressively increases with further multiple sources up to line 7.

On line 8 the anomaly has been depressed but increases again in intensity on lines 9 and 10 but again dies away on line 11.

The drop away on line 8 corresponds with the Bismuth Creek Fault. An examination of the field result sheets shows that while the occurrence of basaltic rubble and outcrop can produce minor anomalies these do not appear to be related to the major anomalies.

On line 2 there is a small outcrop of skarn (?) on the northern edge of the anomaly and this raises the question of whether the skarn does in fact extend to the west and is the source of all the magnetic activity.

On line 4 there is a sudden dip at the peak of the anomaly (2000) and an outcrop of vesicular basalt has been noted. This is possibly coincidence or perhaps the outcrop has a local effect on the overall anomaly. If basalt is the source of the magnetic anomaly then it is different from the overlying Tertiary basalt.

On line 7 the magnetic anomaly coincides very well with the skarn outcrop as it does also on line 8.

On line 10 the anomaly cuts off sharply on the southern side right at the intersection of the line with the Bismuth Creek Fault. The northern side dies off much more gently and suggests a northerly or north easterly dip. This could be the dip of the beds or the dip of the fault.

Line 11 suggests that the end of the anomalous source has been passed.

Considering the anomaly peaks as separate indicators and plotting these on the contour plan gives the result shown (Figure 1).

Although these lines follow the contour pattern in general they however give a picture which leads to a more definite interpretation.

Line A would appear to extend westwards from No. 2 lode while line C could be the westward extension of No. 6 lode and line B perhaps a combination of Nos. 4 & 5 lodes. Lines B & C appear to intersect or split off from Line A.

The above thinking is original and no confirming evidence is present in the geology. The hypothesis is put forward for comment.

Allowing the above idea, then line D is worthy of investigation. Lines D and C both appear to disappear in the region of the Bismuth Creek Fault. Lines C' and C'' could be the cross fault continuation of either D or C or both.

CONCLUSIONS

From the above discussion several factors are evident:-

1. The airborne magnetic anomaly of the Staverton survey has been confirmed and detailed. The character is much the same.
2. Neither the Tertiary Basalt or the Moina Sandstone appears to have any connection with the magnetic anomalies.
3. The skarn appears to have a connection with the overall magnetic pattern and it is suggested that there is a possibility of the skarn extending to the west under the basalt.
4. The Bismuth Creek Fault has an expression in the magnetics.

5. The magnetic contours agree in strike with the plotted positions of the known lodes but does not necessarily outline them.
6. The sources of the anomalies are shallow.
7. The peaks of the anomalies when plotted on the contour and traverse plan (Figure 1) suggest a relationship between the known lodes and magnetics. This suggestions is original and as far as known without any geological backing.

RECOMMENDATIONS

Consideration should be given to the line-up of peaks summarised in point 7 above and its possible connection with known geology. The author would appreciate early information on any thoughts on its feasibility.

Very detailed magnetics in the vicinities of the line-up A, B and C on lines 4, 5, 6 and 7 is recommended. A station spacing of 10 to 20 feet is suggested on these and intermediate lines. Because of the closeness of the readings, lines away from surface contamination are necessary even if this means bending or changing the direction of the lines. Line D should be checked but should be given a lower priority.

A drilling recommendation has not been made as a comment on this report is considered necessary before doing so.

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Can we do anything other than follow Webb's suggestions?

MAGNETOMETER SURVEY SHEPHERD AND MURPHY MINE AREA

