J. SLADE & ASSOCIATES PTY. LTD.
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Consultant Geophysicists

INTERPRETATION OF THE AEROMAGNETIC DATA OVER THE WHITE HILL DAM AREA, HARTS RANGE, N.T.

ON BEHALF OF

KINEX PTY. LTD.
784 PACIFIC HIGHWAY,
GORDON, N.S.W.

BY

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1 INTRODUCTION

The aeromagnetic data over EL's 4463 & 4528, known as White Hill Dam Area, Harts Range N.T., was interpreted by J. Slade & Associates Pty. Ltd., on behalf of Kinex Pty. Ltd. The data was supplied in the form of contours of total magnetic intensity at a scale of 1:23,500 (approximately). The data was recorded by G.R.D. in 1970. The type of magnetometer used was not specified. The survey was flown in a north south direction at an altitude of 100 metres with flight lines spaced at 440 metres.

The magnetic data has been merged with detail geological mapping of the area. The Proterozoic Irindina Formation, a sequence of quartz feldspar, porphyroblastic biotite garnet and calcsilicates, covers much of the area. Interbedded with this Formation are the Cadney Creek Formation, (calcsilicates and magnetite gneiss) and the Blackfellow Bones Formation, (quartz feldspars with magnetite gneiss). The magnetite gneisses in these formations will be the source of the intense magnetic activity associated with the area. The area to the north of the two EL's has been intruded by the Devonian Mt. Riddock Formation, a mafic unit of hornblende and amphibolites. The intrusions appear to be conformable with the Irindina Formation and have been tightly folded. The central and southern portions of both EL's have been intruded by the Devonian Mt. Brassy Formation which is similar to the Mt. Riddock Intrusions although the latter is more pervasive and intrudes most formations. The south west of the area is mapped as the Ongeva Creek Formation, a magnetite rich granulite.

2 INTERPRETATION

The magnetic data were interpreted and the results presented on a base map at the same scale as the geology, (see accompanying Interpretation Map). This map shows the principal magnetic trends depicted by the magnetic highs, and a number of regional zones which include a possible alteration zone in the centre of the area. A north striking fault or contact across the regional grain of the formations has been identified. The movement along the fault has been interpreted as right lateral or, alternatively, the eastern block has been displaced to the south. This is partially confirmed from the geological mapping which shows the Blackfellow Bones Formation displaced to the south. The east west faults, in the south of the area, are evident in the magnetic data. The interpreted location of these faults indicates that they are approximately 300 metres south of the surface expression and have a southerly dip.

The mineralised zones at Copper Queen and White Lady have been plotted to show the relationship between the known mineralisation and the interpretation.

The area can be divided into five zones which have characteristic responses.

Zone 1

This zone, which is located in the north of the area, is relatively non magnetic and correlates with the folded sequence of Irindina Formation intruded by the Mt. Riddock amphibolites. Two synclinal structures have been plotted and a possible anticlinal structure in the west of the area has been interpreted from the magnetic data, see Interpretation Map.

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Zone 2

Zone 2 is located in the west of the area and correlates with a region of relatively magnetic linears. The region is bounded to the east by the northerly striking fault or contact. In certain places the magnetic linears are coincident with the mapped Mt. Bassy Formation which intrudes the Blackfellow Bones Formation. The magnetic pattern has been interpreted as a possible anticlinal structure. A small zone of possible alteration has been mapped on the northern contact.

Zone 3

Zone 3 is in the south west of the area and correlates with the Ongeva Formation. The magnetite rich granulites explain the above average, regional magnetic response. The area does not contain any extraordinary anomalies. The magnetic data indicates that this zone extends approximately 1000 metres to the north of the presently mapped boundary.

Zone 4

Zone 4 extends across the southern portion of the area and along the eastern boundary of EL4463. This region contains numerous minor linear magnetic anomalies with an easterly strike direction. These are related to the faulting in the area which would appear as a shear zone rather than discrete faults as mapped. As suggested earlier, the displacement of the magnetic response from the mapped surface expression of these faults indicates a dip to the south.

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Central Alteration Zone

In the centre of the area there is an anomalous zone which can be recognised in the magnetic data as a series of magnetic lows. These form three linked closures as shown on the Interpretation Map. This zone generally correlates with a region of Cadney Creek Formation which has been intruded by the Mt. Brassy Formation. The regions of positive magnetism correlate with the intrusive. The two known mineral deposits in the area, Copper Queen and White Lady, are located on the southern contact of the alteration zone. The magnetic lows can be linked as closures which have been interpreted as an aureole surrounding a major intrusive. Magnetite in the host rock has been removed or altered to a non magnetic ferrous mineral.

Surface mapping has shown that the gold mineralisation is controlled by a structure which emanates from the Copper Queen, travels west and then north east to near White Hill Dam. The magnetic data shows this to be on the contact of the alteration zone. The mineralisation would extend approximately 2000 metres west of Copper Queen and then swing north east for 1000 metres. The mineralised zone may not be continuous in a north easterly direction, but a second zone striking north east, 500 metres south of White Hill Dam probably matches the geochemical results.

3 CONCLUSIONS AND RECOMMENDATIONS

The interpretation of the magnetic data has identified a zone of alteration associated with a recent intrusion. This is evident in the magnetic data as a circular or arcuate low. The two, known mineral deposits in the area are located on the contact between the alteration zone and the host formation. Ground investigations should be carried out

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to sample the entire contact of the alteration zone, including the small area 3000 metres west of White Hill Dam.

Ground magnetic surveys would be the most suitable method of tracing possible extensions of the mineralisation. This interpretation should be reviewed when considering the geochemical results collected over the area.