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Pre-liminary Geophysical Interpretation and Modeling of the Magnetic Data in the Eiseb Area, Omaheke Region, Namibia

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This research project is located in an area covered by Kalahari sand in the north-western part of Namibia, close to the Namibia/Botswana border. There is limited rock exposure due to the Kalahari sand cover, and thus the purpose of this study is to use geophysical and remote sensing data to evaluate the possibility of finding potential economic deposits.

Airborne magnetic and radiometric data were processed and a variety of filter products applied such as first vertical (1vd) derivative, analytical signal (AS) and residual. An integrated study was conducted using these data and a recent drilled water borehole in the study area. Geosoft's proprietary VOXI 3D inversion modeling software was used in this analysis.

The produced maps and geophysical inversion products clearly located bodies with magnetic anomalies beneath the Kalahari sand. Two magnetic plug like bodies, 3 kilometers apart, are revealed. They have been displaced by a fault which has the same east-western orientation as an associated river channel. The interpreted magnetic bodies have been identified close to malachite mineralisation encountered in drill-chips of a borehole that was drilled close to the magnetic anomaly. Magnetic stratigraphy is evident in the total magnetic intensity (TMI) image. The 1vd image enhances shallow, short-wavelength magnetically anomalous sources, whereas the AS data were useful in correctly positioning the sources as well as in mapping the source contacts. From the results obtained to date, the area looks economically promising. It is therefore suggested that the plug-like bodies might be the continuation of the Matchless Copper Belt or other sulphide bearing deposits of the Kalahari Copper Belt. Ground magnetic, gravity and resistivity geophysical surveys are planned in the near future in order to delineate and define the two plug-like units.

The geophysical interpretation has added significant value in locating potential economic mineralization under the Kalahari cover in eastern Namibia, where the drilled thickness of 170m cover does not discourage exploration and makes the area favourable for potential development of economic deposits.

References:

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[2] Dentith M and Mudge S.T (2014) Geophysics for the Mineral Exploration Geoscientist, Spain, Grafos SA, Arte sobre papel

