

HYDROTHERMAL MAPPING OF MARU SCHIST BELT, NORTH-WESTERN NIGERIA USING REMOTE SENSING TECHNIQUE

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ABSTRACT

Mineral deposits are well known to be associated with hydrothermal alteration. In north-western Nigeria however, the Maru schist belt is known to be endowed with iron mineralization occurring as Banded Iron Formation (BIF). Land sat Enhanced Thematic Mapper (ETM+) data of the study area were evaluated using colour composite Images produced for lithological mapping in order to identify the alteration zones.

The technique employed in the processing of hydrothermal altered zones for these imageries is band ratio. This includes the use of Chica – Olma ratio, Abrams ratio and Kauffmann ratio. As a result, iron oxides and hydroxyl minerals were detected in the area. Some ratio images were displayed in gray tones in order to show the extent of alteration within this schist belt. False color composite was also used for lithologic mapping of the different rock type in the area. A new geological map was generated and compared to an already published map of the study area. Comparison between the different band ratios techniques show a close correlation between iron altered zones which are also well known for Iron mineralisation.

The results show that the band rationing technique proved to be effective in mapping zones of mineralisation. It is therefore concluded that the remote sensing technique can be applied for lithologic and hydrothermal alteration mapping within the Maru schist belt, Northwest Nigeria.

KEYWORDS: Banded Iron Formation, Band Ratio, False Colour Composite, Hydrothermal Alteration, Schist Belt