A lithological and structural study of the Witteberg Group (Cape Supergroup) with focus on the Witpoort Formation near Kirkwood, Eastern Cape

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ABSTRACT

This study of Late Palaeozoic Witteberg Group rocks (Cape Supergroup) near Kirkwood, Eastern Cape, focused mainly on quartzitic rocks because these rock types crop out in mountainous terrain where lithological and structural data collection was possible. A detailed structural analysis has been carried out and the results compared to the regional structural pattern of the Cape Fold Belt in the Eastern Cape.

Field methods include air photo interpretation of lithological and structural features, and the measurement of structural elements with the aid of a Brunton compass. Thin sections of the main rock types analysed by microscopic and SEM techniques show that arenaceous rocks are composed predominantly of quartz, whereas argillaceous rocks contain mainly micaceous minerals with lesser quartz, feldspar and iron oxides.

Strata are folded into open anticlines and synclines that plunge at shallow angles to the east-southeast as well as in the opposite direction and show northward vergence. The general east–west orientation of thrust faults, and their southward dips indicate that they formed during a northward-directed stress field that was present during the Late Palaeozoic. Predominantly south-dipping normal faults formed during the Mesozoic, as part of the process of the break-up of Gondwana.

Key words: Folds, thrust faults, normal faults, Cape Fold Belt.