



Structures at the base of the Upper Group 2 chromitite layer, Bushveld Complex, South Africa, on Karee Mine (Lonmin Platinum)

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Abstract

Exposures in a now-infilled pit mined for platiniferous UG2 chromitite in the Bushveld Complex, South Africa, are described. The layer of chromitite is underlain by anorthosite, providing a dramatic colour contrast. The interface between these two rock types shows evidence of various scales of irregularities. In plan view, small circular depressions, less than 3 cm across and 5 mm deep, occupy about 20% of the surface. Between them, the contact is planar. The anorthosite, immediately underlying the chromitite, has a planar fabric visible in thin sections that is not disturbed beneath these small depressions. Another set of depressions occurs, about 40 cm in diameter and with variable depth (< 40 cm). Again they are approximately circular. Larger structures, called potholes, reach several metres. No regular distribution pattern is apparent in any of these structures.

Several possible processes are reviewed for the origin of these irregularities, especially the small-scale structures, but none explains all the features noted. These processes include remelting, diapirism, impact-generated dimpling, gas escape, and interference rippling. We present a photographic record of these structures, but present no definitive model for their interpretation.

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1. Introduction

The accumulation mechanisms of layers in large mafic igneous complexes can be likened to sedimentary processes, either clastic or chemical (Naslund and McBirney, 1996). As with sedimentary rocks, they are therefore liable to experience periods of non-deposition and erosion, producing nonconformities,

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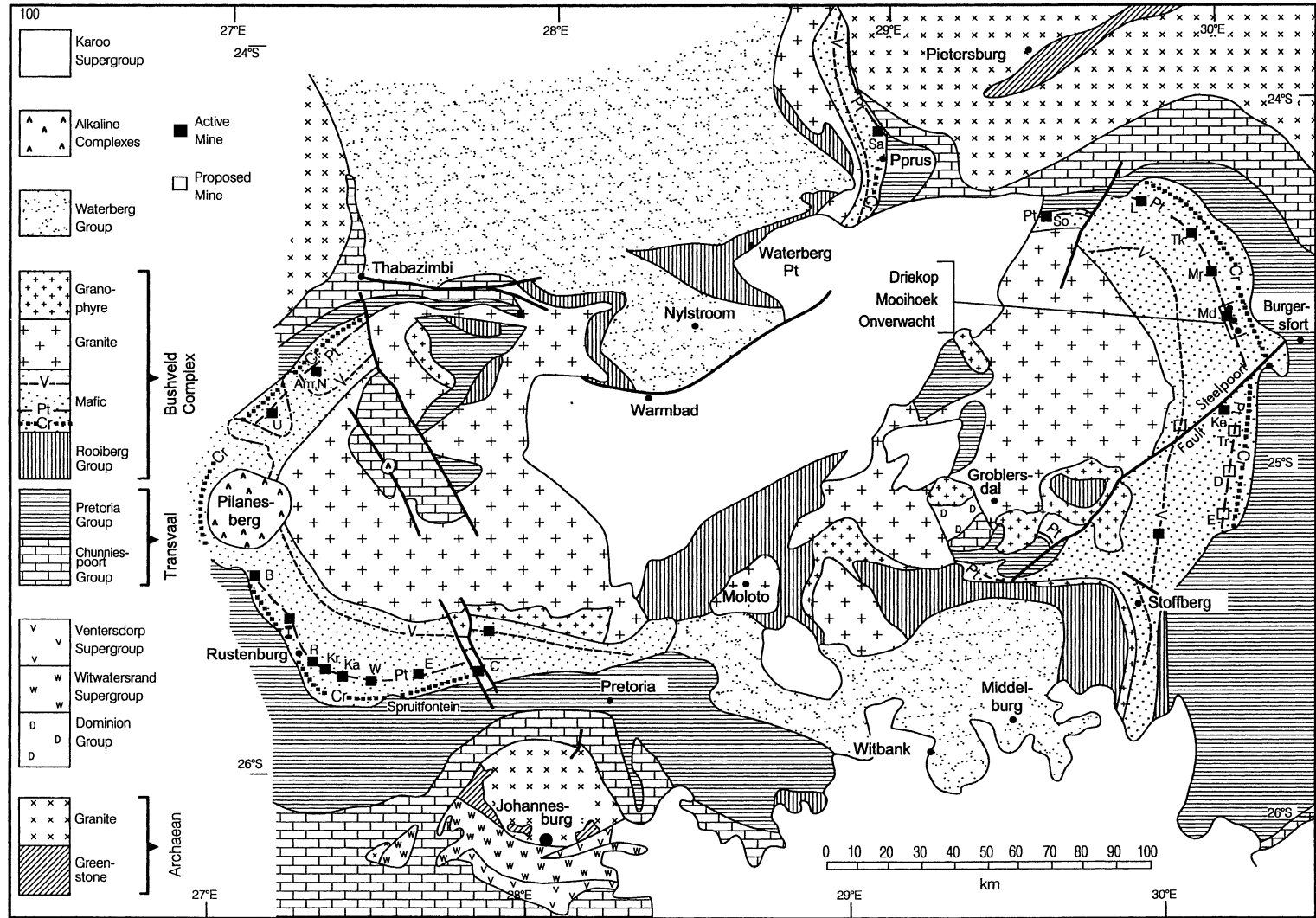


Fig. 1. General geological map of the Bushveld Complex (adapted from many sources given by Eales and Cawthorn, 1996). All the platinum mines (Merensky and UG2 Reefs) are denoted by squares (open squares—planned mines). The locality of Karee Mine is indicated as Ka, east of Rustenburg.

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