

2. GEOLOGICAL BACKGROUND

The geology of the study area near Marikana is shown on the 1: 250 000 sheet 2526 Rustenburg (Council for Geoscience, Pretoria) (Walraven 1981). The region is underlain by (1) sedimentary bedrocks of the **Transvaal Supergroup**, and in particular the upper part of the **Pretoria Group** in the central part of the Transvaal Basin (Eriksson et al. 2006), as well as by (2) basic igneous intrusions of the **Bushveld Complex** (Cawthorne et al. 2006). These Precambrian bedrocks are dated at between 2 and 2.2 Ga (billion years old), well before the evolution of macroscopic multicellular organisms (cf McCarthy & Rubidge 2005). The ancient bedrocks are mantled with a range of much younger **superficial deposits**, such as scree and alluvium. Most of these younger deposits are probably quaternary to Recent in age.

The Pretoria Group is represented here by hornfels (baked mudrocks) and quartzites of the **Rayton Formation** that intervene stratigraphically between the Magaliesberg Formation quartzites and the Bushveld Complex (Walraven 1981, Eriksson et al. 2006). Exposure levels in the region are generally very poor. According to Walraven (1981) much of the Walraven Formation rocks represent xenolithic inclusions within the basic Bushveld igneous intrusions and have therefore been subjected to thermal metamorphism. The basic intrusive igneous rocks of the **Rustenberg Layered Suite** are dated to 2.06 Ga (billion years), i.e. Late Vaalian / Early Proterozoic age (Walraven 1981, Cawthorn et al. 2006). They form part of the **Bushveld Complex** which is the largest layered igneous complex in the world with the richest reserves of platinum group metals known (Eales 2001).

3. PALAEOLOGICAL HERITAGE

The Precambrian Bushveld rock units represented in the study area, consist entirely of basic to ultrabasic igneous rocks intruded at depth within the Earth's crust and are consequently unfossiliferous. Baking of the adjacent or included Pretoria Group sediments such as the Rayton Formation is expected to have destroyed all or most of their original fossil content. Unmapped superficial sediments in the area are generally of low palaeontological sensitivity.

4. CONCLUSIONS & RECOMMENDATIONS

The overall palaeontological sensitivity of the igneous and metasedimentary bedrocks in the Crusher plant development study area near Marikana is assessed as **VERY LOW**. Significant impacts on local fossil heritage resources are therefore not anticipated. It is therefore recommended that, pending the discovery of significant new fossils remains before or during construction, exemption from further specialist palaeontological studies and mitigation is granted for the proposed Crusher plant development near Marikana, North West Province.

In the case of any significant fossil finds during construction (e.g. vertebrate teeth, bones, burrows, petrified wood, shells, stromatolites), these should be safeguarded - preferably in situ - and reported by the ECO as soon as possible to SAHRA so that appropriate mitigation (i.e. recording, sampling or collection) by a palaeontological specialist can be considered and implemented.

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