

Palaeontological desktop study of a proposed new Borrow Pit on the farm Nels Poortjie 103 near Copperton, NC Province.

Report prepared by Dr L. Rossouw, PO Box 38806 Langenhovenpark 9330.

8 February 2017

Summary

The proposed development footprint is underlain by non-fossiliferous Precambrian basement rocks and superficial deposits (aeolian sands) of low to very low palaeontological sensitivity. Given the paucity of fossil-bearing sediments and lack of exposure due to the low topography terrain, potential impact on palaeontological heritage resources within the proposed borrow pit footprint is considered very low. As far as the palaeontological heritage is concerned, the proposed development may proceed with no further palaeontological assessments required.

Introduction

The report is a preliminary assessment of potential palaeontological impact with regard to planned development of a new borrow pit on the farm Nels Poortjie 103, situated approximately 7.5 km due east of Copperton in the Northern Cape Province (**Fig. 1**). The proposed footprint covers a 5 ha area located on open, low relief terrain (**Fig. 2**).

Site coordinates:

- A) 29°55'32.48"S 22°22'58.27"E
- B) 29°55'32.58"S 22°23'2.26"E
- C) 29°55'42.60"S 22°23'0.75"E
- D) 29°55'42.59"S 22°22'55.03"E

Methodology

The assessment was carried out in accordance with National Heritage Resources Act 25 of 1999 with the aim to assess the potential impact on palaeontological heritage resources that may result from the proposed development. The palaeontological significance of the affected

areas were evaluated through a desktop study and carried out on the basis of existing field data, database information and published literature.

Assumptions and Limitations

The assessment provided within this report is based upon a desktop study without the benefit of a site visit. As such, the presentation of geological units present within the study area is derived from 1:250 000 geological maps that may vary in their accuracy. It is also assumed, for the sake of prudence, that fossil remains are always uniformly distributed in fossil-bearing rock units, although in reality their distribution may vary significantly.

Geology

According to the 1:250 000 scale geological map of the area (2922 Prieska), the proposed development footprint is underlain by Precambrian basement rocks that are metamorphic in origin (*Ms*, *Mv*, *Mu*) and palaeontologically significant sedimentary bedrock strata represented by small outcrops of the Permo-Carboniferous Mbizane Formation (*C-Pd*, Dwyka Group, Karoo Supergroup) that are capped Late Cenozoic (Quaternary) superficial deposits of the Gordonia Formation (*Qg*) (**Fig. 3**).

Palaeontology

The glacially-related sediments of the Mbizane Formation (Dwyka Group, *C-Pd*), is regarded as a heterolithic unit recognized in the upper part of the Dwyka Group of the Karoo Supergroup and is characterized by mudstone and sandstone successions, tillites and conglomerates that were laid down when Dwyka glaciers scoured out valleys and depressions in pre-Karoo rocks during the Permo-Carboniferous, *c.* 300 Ma years ago (Von Brunn & Visser 1999). The Mbizane Formation is not considered to be highly fossiliferous, but low diversity non-marine ichnofossil assemblages have been recorded as well as scarce vascular plant remains associated with *Glossopteris* Flora, while palynomorphs are also likely to be present within finer-grained mudrock facies (Almond and Pether 2008). Superficial deposits are primarily represented by windblown Gordonia Formation (Kalahari Group) sand, surface gravels and alluvium along stream incisions. The geologically recent aeolian sand overburden in the region is generally not considered to be fossiliferous, Localized fossil-rich alluvial exposures, assigned to the Quaternary have been retrieved from alluvial sediments along the

Ongers River near Britstown, while Florisian type faunal remains have been excavated from an archaeological site at Bundu Farm Pan near Copperton (Brink *et al.* 1995; Kiberd 2006).

Impact Statement

The desktop investigation indicates that the proposed borrow pit footprint is underlain by non-fossiliferous Precambrian rocks that are capped by superficial deposits (aeolian sands) of low to very low palaeontological sensitivity. The impact area is not situated in or near pan deposits (considered to be potentially fossiliferous in the region). Given the paucity of fossil-bearing sediments and lack of exposure due to the low topography terrain, potential impact on palaeontological heritage resources within the proposed borrow pit footprint is considered very low.

Recommendations

As far as the palaeontological heritage is concerned, the proposed development may proceed with no further palaeontological assessments required. If, in the unlikely event that localized fossil material is discovered within the sandy overburden during the operational phase of the project, it is recommended that a professional palaeontologist be called to record and rescue the fossils where necessary.

References

- Almond, J.E. & Pether, J. 2008. *Palaeontological heritage of the Northern Cape*. Interim SAHRA technical report, 124 pp. Natura Viva cc, Cape Town.
- Brink, J.S., de Bruijn, H., Rademeyer, L.B. and van der Westhuizen, W.A. 1995. A new *Megalotragus priscus* (Alcelaphini, Bovidae) from the central Karoo, South Africa. *Palaeontologia africana* 32: 17-22
- Kiberd, P. 2006. Bundu Farm: a report on archaeological and palaeoenvironmental assemblages from a pan site in Bushmanland, Northern Cape, South Africa. *South African Archaeological Bulletin* 61: 189-201.
- Von Brunn, V. & Visser, J.N.J. 1999. Lithostratigraphy of the Mbizane Formation (Dwyka group). *South African Committee for Stratigraphy, Lithostratigraphic Series No. 32*, 10 pp. Council for Geoscience, Pretoria.

DECLARATION OF INDEPENDENCE

I, Lloyd Rossouw, declare that I act as an independent specialist consultant. I do not have or will not have any financial interest in the undertaking of the activity other than remuneration for work as stipulated in the terms of reference. I have no interest in secondary or downstream developments as a result of the authorization of this project and have no conflicting interests in the undertaking of the activity.

A handwritten signature in black ink, appearing to read 'L Rossouw', written in a cursive style.

08 / 02 / 2017

Figures

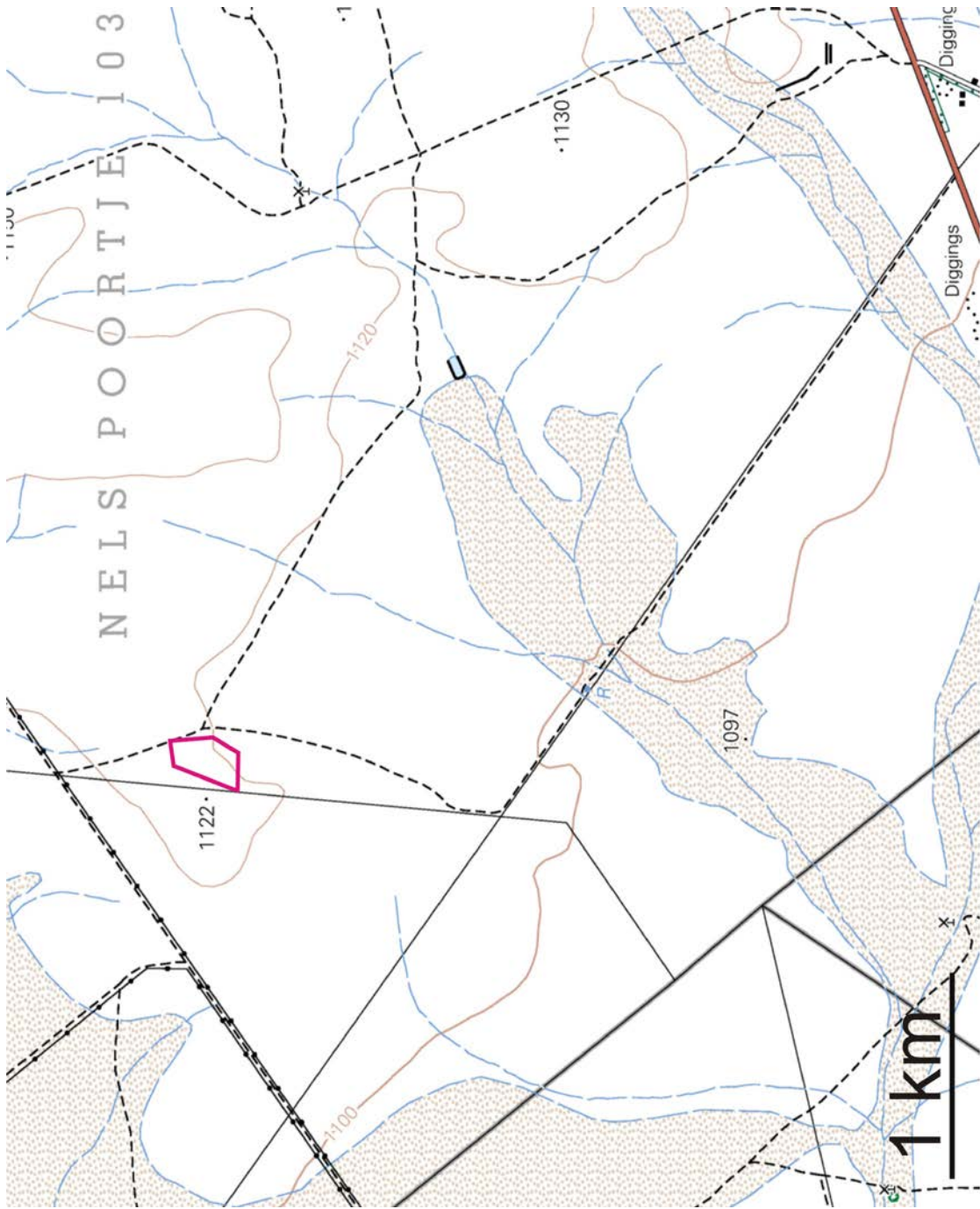


Figure 1. Map of the proposed borrow pit footprint on farm Nels Poortjie 103 (portion of 1:50 000 scale topographic map 2922CD Copperton).

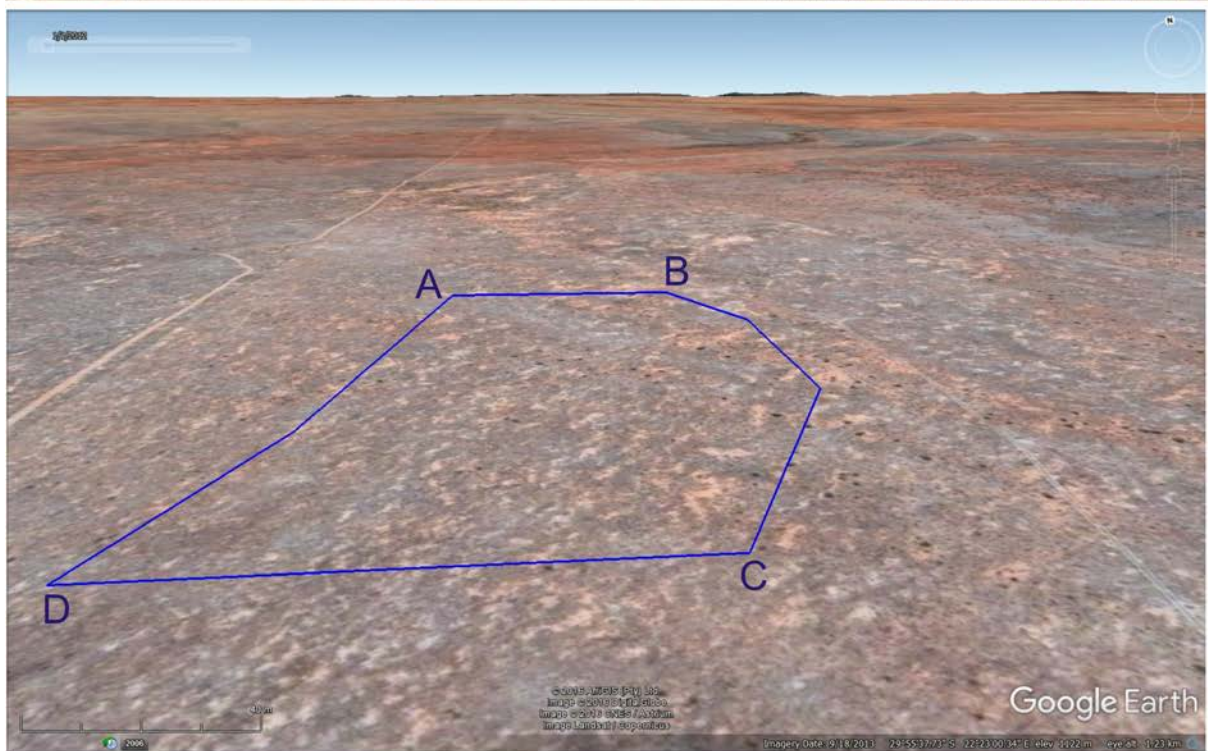


Figure 2. Aerial view of the study area in relation to the position of Copperton (above) and oblique view of the footprint, looking due north (below).

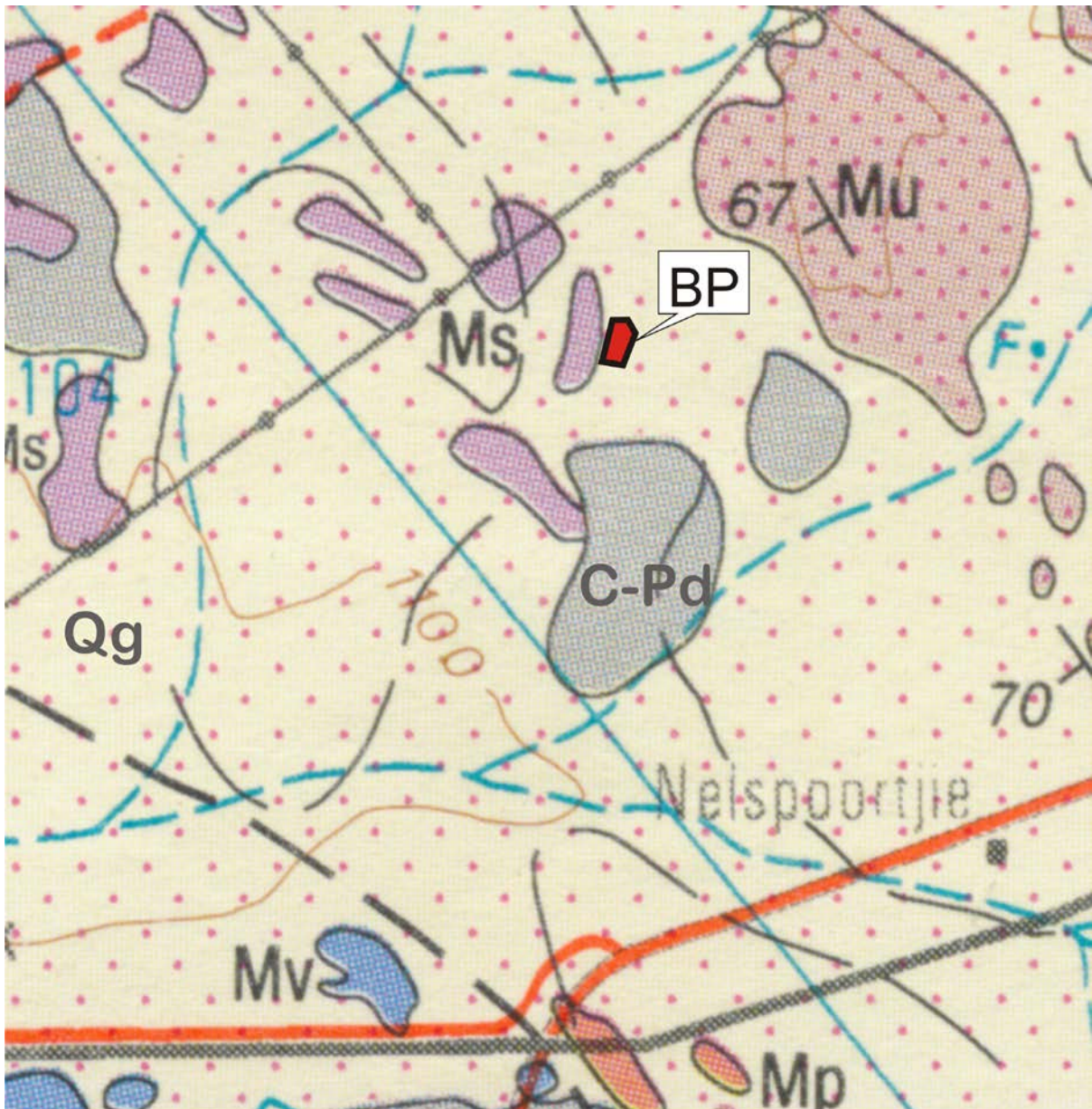


Figure 3. Portion of 1:250 000 scale geological map 2922 Prieska, showing the geology of the area. The area is underlain by Precambrian basement rocks that are metamorphic in origin (*Ms*, *Mv*, *Mu*) and palaeontologically significant sedimentary bedrock strata represented by small outcrops of the Permo-Carboniferous Mbizane Formation (*C-Pd*, Dwyka Group, Karoo Supergroup) that are capped Late Cenozoic (Quaternary) superficial deposits of the Gordonia Formation (*Qg*, Kalahari Group).