

# **Phase 1 Palaeontological Impact Assessment for a new 19 ha agricultural development on Farm 413 near Keimoes, NC Province.**

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## **Summary**

The proposed development footprint is underlain by palaeontologically insignificant Keimoes Suite granites that are capped by palaeontologically sterile superficial deposits (Kalahari Group calretes and sandy soils). As far as the palaeontological heritage is concerned, the proposed development may proceed with no further palaeontological assessments required.

## **Introduction**

A Phase 1 Palaeontological Impact Assessment was carried out for a new 19ha agricultural development on the Farm 413 near Keimoes in the Northern Cape Province (**Fig.1**).

1 : 50 000 scale topographic map 2820DB Keimoes

1 : 250 000 scale geological map 2820 Upington

The 19 ha study area is located 8 km due west of Neilersdrift next to the R359 provincial road and about 1 km south of the Orange River (**Fig. 2**). Site coordinates of the proposed development footprints are as follows:

A) 28°44'29.63"S 20°53'57.21"E

B) 28°44'35.27"S 20°54'4.24"E

C) 28°44'38.22"S 20°54'23.32"E

D) 28°44'40.74"S 20°54'23.96"E

E) 28°44'46.17"S 20°53'56.51"E

F) 28°44'36.48"S 20°53'51.71"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 area was evaluated on the basis of existing field data, database information and published

literature. This was followed by a field assessment by means of a pedestrian survey. A Garmin Etrex Vista GPS hand model (set to the WGS 84 map datum) and a digital camera were used for recording purposes. Relevant publications, aerial photographs (incl. Google Earth) and site records were consulted and integrated with data acquired during the on-site inspection.

## **Background**

According to the 1 : 250 000 scale geological map of the area (2820 Upington, Council for Geoscience, Pretoria) the proposed development footprint is underlain by well-developed, superficial pedogenic deposits located on Keimoes Suite granites known as Friersdale Charnockite, which is a rare type of granite of igneous-metamorphic origin with Rb-Sr ages ranging between 1000-1090 Ma ago (Cornell *et al.* 2012) (**Fig. 3**). It is not considered to be palaeontological significant because of the metavolcanic nature of the strata. The superficial sediments within the study area are made up of Kalahari Group (Quaternary) calcretes. While carbonate-rich overbank deposits associated with large river courses can be potentially fossiliferous, there are currently no records of Quaternary fossil localities within the vicinity of Keimoes.

## **Field Assessment**

The study area consists of low topography terrain capped by an admixture of weathered bedrock (granites) as well as Kalahari Group calcretes, sand and sandy soils (**Fig. 4**). Investigation of superficial cuttings and shallow excavation pits located within the study area revealed no evidence of Quaternary fossil remains or exposures (**Fig. 5**).

## **Impact Statement and Recommendations**

The chances of palaeontological impact resulting from the proposed development are considered to be very low to improbable. 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 superficial overburden during the construction phase of the project, it is recommended that a professional palaeontologist be called in to record and rescue the fossils where necessary.

## References

Cornell, D.H, Å. Pettersson, A & Simonsen S.L. Zircon U-Pb Emplacement and Nd-Hf Crustal Residence Ages of the Straussburg Granite and Friersdale Charnockite in the Namaqua-Natal Province, South Africa. *SA Journal of Geology* 115(4): 465 – 485.

## 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', with a large, stylized initial 'L'.

28 / 03 / 2017

Figures

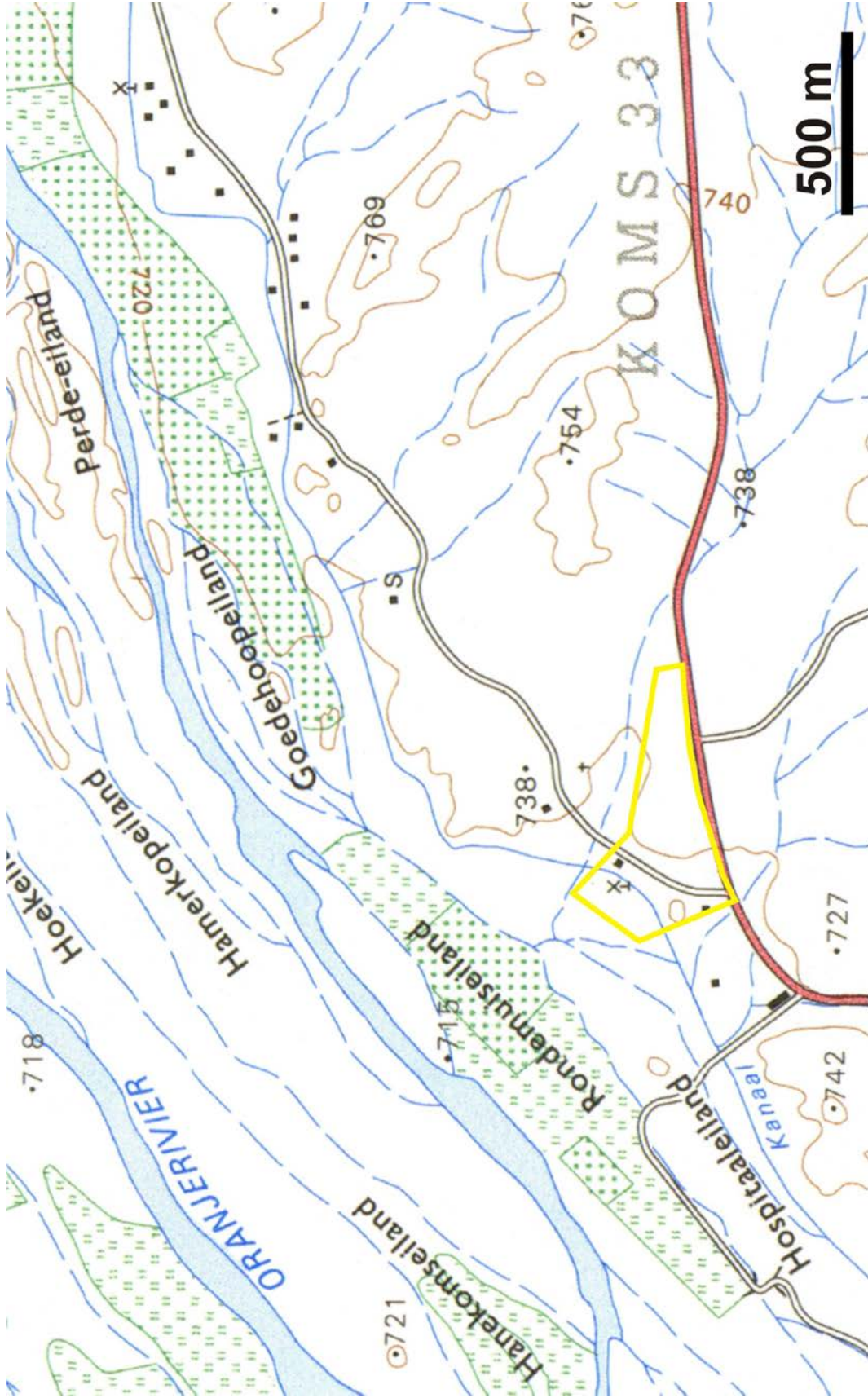


Figure 1. Map of the proposed development footprint (portion of 1:50 000 scale topographic 2820DB Keimoes).



Figure 2. Aerial view of the study area.

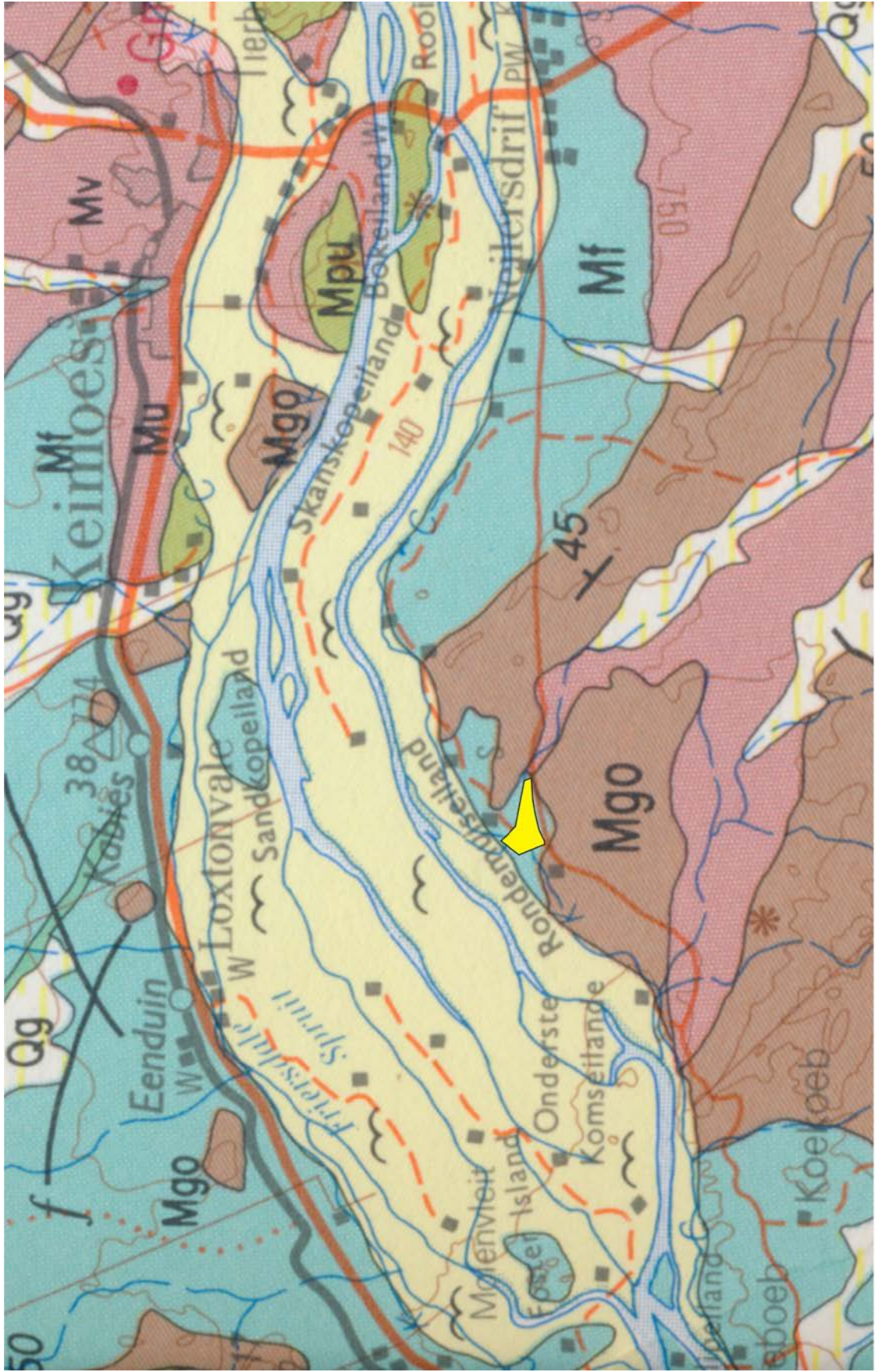


Figure 3. Portion of 1:250 000 scale geological map of the area (2820 Upington, Council for Geoscience, Pretoria). The study area (yellow polygon) is underlain by Keimoes Suite granites (Friersdale Charnockite, *Mf*).



Figure 4. The study area is capped by an admixture of weathered bedrock (granites) as well as calcretes, sand and sandy soils, looking west (top left) northwest (top right) and southeast (bottom).



Figure 5. Shallow exploration pits and trenches exposing carbonate-rich but palaeontologically sterile pedogenic soils.