

Appendix 1

Palaeontological Desktop Assessment of the Ntukwini access road and causeway on local road L2722 near Dundee, KZN Province.

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Executive Summary

A desktop palaeontological impact assessment was conducted for the upgrading of an existing 1.111 km – long access road and causeway off D1268 on local road L2722. The affected area is underlain by Ecca Group sediments represented by the lowermost (early Permian) Pietermaritzburg Formation. It is expected that the proposed development will impact on Ecca Group sedimentary bedrock (Pietermaritzburg Formation) and geologically recent superficial sediments (alluvium, residual soils). Potential palaeontological impact resulting from this particular development is considered low. The study area is assigned a site rating of General Protection C (GP C).³

Introduction

A desktop heritage impact assessment was conducted for an upgrading by the KZN Department of Transport (DOT), of an existing access road to a type 7A gravel road approximately 1.111 km in length and 6 m in width that conforms to DOT standards. The existing road will be upgraded in one of Dundee villages off D1268 on local road L2722 (**Fig. 1**).

Methodology

The affected area was evaluated on the basis of existing field data, geological maps and published literature. The study area is rated according to field rating categories as prescribed by SAHRA (**Table 1**).

Locality data

1 : 50 000 scale topographic map: 2830DC Nadi

1 : 250 000 scale geological map 2830 Dundee

Approximate site coordinates (**Fig. 2**): 28°49'18.78"S 30°34'30.42"E to 28°49'40.05"S 30°34'45.25"E.

Geology and Paleontological Background

The study area is underlain by Ecca Group sediments represented by dark, silty mudrocks of the lowermost (early Permian) Pietermaritzburg Formation (Lindstrom 1987; Johnson 2006) (**Fig. 2**). The succession comprises thinly laminated, carbonaceous siltstone or shale (Lindstrom 1987). Sedimentary rocks in the region are intruded by Jurassic dolerites (Karoo Dolerite Suite) and are capped by younger, unconsolidated Quaternary formations of the Maputoland Group.

The Pietermaritzburg Formation is generally considered to be moderately sensitive in terms of paleontological heritage (**Fig. 3**). It is by and large barren, although trace fossils have been recorded from the upper layers of the formation by Lindstrom (1987). Dolerites in the form of dykes and sills are common in the region and are not palaeontologically significant. Younger and localized fossil-rich alluvial exposures, assigned to the Quaternary Cornelia Formation, are found about 200 km to north of Dundee. There is currently no record of Quaternary fossil remains or exposures from the area.

Impact Statement and Recommendations

It is expected that the proposed development will impact on Ecca Group sedimentary bedrock (Pietrmaritzburg Formation) and geologically recent superficial sediments (alluvium, residual soils). Potential palaeontological impact resulting from this particular development is considered low. The study area is assigned a site rating of General Protection C (GP C).

References

- Johnson, M.R. *et. al.* 2006. Sedimentary Rocks of the Karoo Supergroup. **In:** M.R. Johnson, *et. al.* (eds). *The Geology of South Africa*. Geological Society of South Africa.
- Linstrom W. 1987. The Geology of the Dundee Area. Explanation Sheet 2830 (1:250 000). Geological Survey of. South. Africa.5

Tables and Figures

Table 1. Field rating as proposed by SAHRA

Field Rating	Grade	Significance	Mitigation
National Significance (NS)	Grade 1	-	Conservation; national site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; provincial site nomination
Local Significance (LS)	Grade 3A	High significance	Conservation; mitigation not advised
Local Significance (LS)	Grade 3B	High significance	Mitigation (part of site should be retained)
Generally Protected A (GP.A)	-	High/medium significance	Mitigation before destruction
Generally Protected B (GP.B)	-	Medium significance	Recording before destruction
Generally Protected C (GP.C)	-	Low significance	Destruction

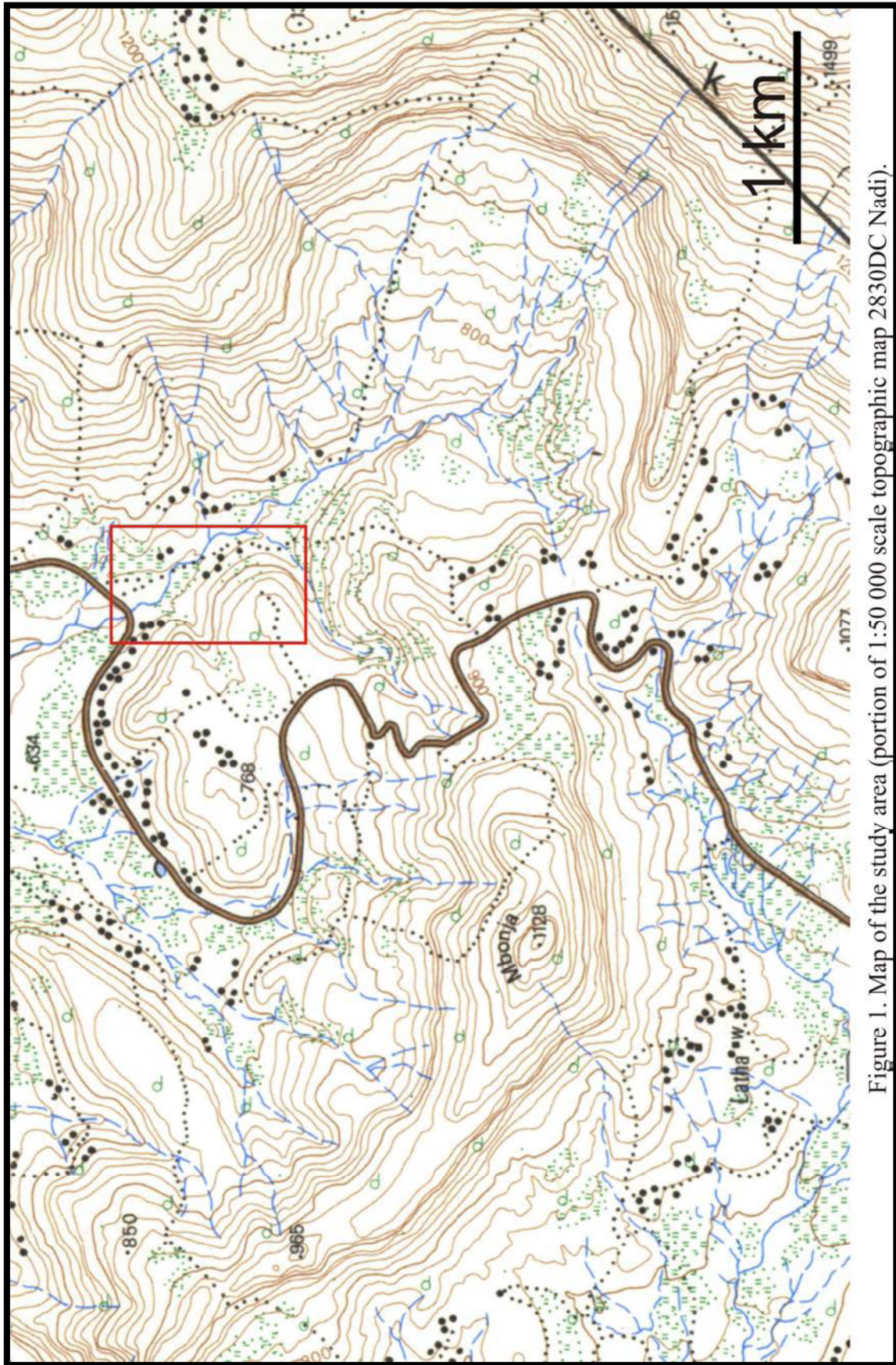


Figure 1. Map of the study area (portion of 1:50 000 scale topographic map 2830DC Nadi).

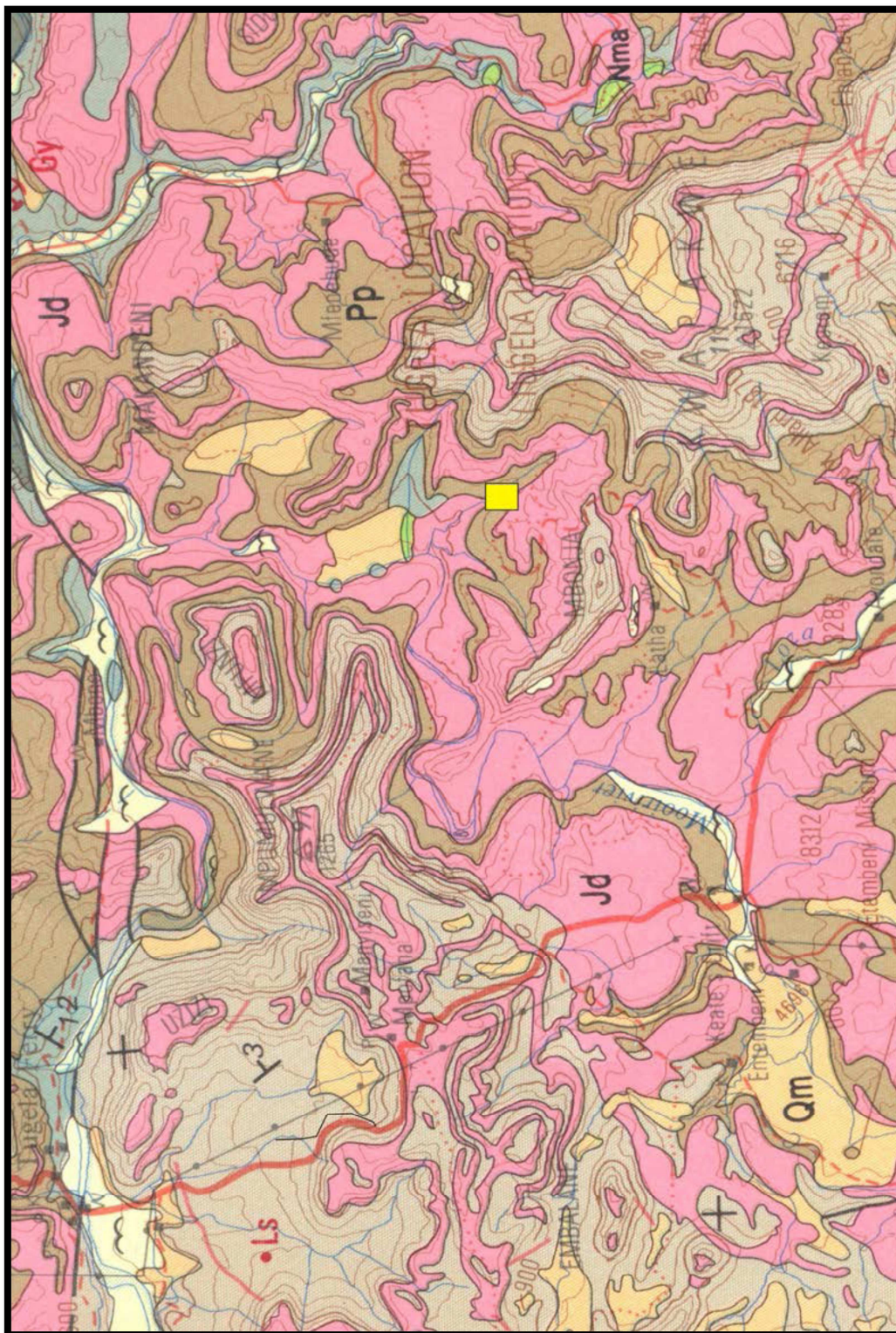


Figure 2. Portion of 1:250 000 scale geological map 2830 Dundee. The study area (yellow rectangle) is primarily underlain by Pietermaritzburg Formation mudrocks (Ecca Group).

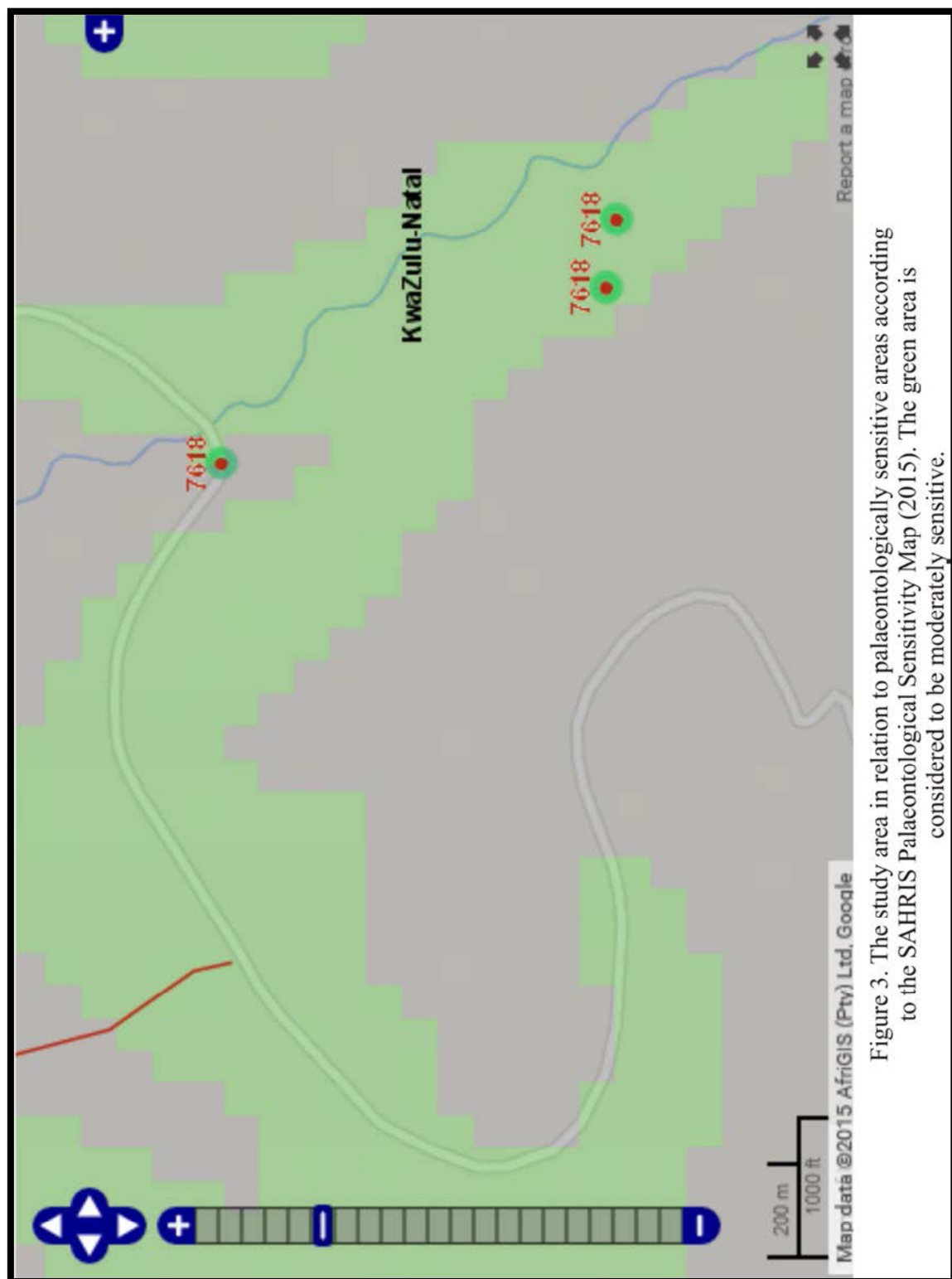


Figure 3. The study area in relation to palaeontologically sensitive areas according to the SAHRIS Palaeontological Sensitivity Map (2015). The green area is considered to be moderately sensitive.