

**Palaeontological Impact Assessment for the proposed
Construction of two 7km long 88KV powerlines within
a 2km corridor between Grootpan and Brakfontein,
near Ogies, Mpumalanga
Province**

Desktop Study

**For
Royal HaskoningDHV (Pty) Ltd**

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Background

Eskom Distribution (Northern Region) proposes to construction two (2) 7 km long 88 kV power lines within a 2 km corridor between Grootpan and Brakfontein near Ogies. The existing power lines are located on GlencoreXstrata mining property. The mine has requested that Eskom remove the lines as they are within the operational footprint of the mine.

The project involves the dismantling of the existing power line and construction of two (2) new 7 km 88 kV power lines within a 2 km servitude corridor from Grootpan to Brakfontein. These lines ensure continuity of supply and access to electricity for the surrounding communities.

The response from SAHRA, CaseID :8026 is as follows: "SAHRA Archaeology, Palaeontology and Meteorites Unit requires the development to commission a Palaeontological Impact Assessment (PIA) because the palaeontological sensitivity of the underlying geology of proposed location is fossiliferous shales and sandstone of the Vryheid Formation and is considered Very High (<http://www.sahra.org.za/sahris/map/palaeo>).

"Interim Comment: SAHRA Archaeology, palaeontology and meteorites unit accepts the recommendations made in the AIA that no heritage resources will be disturbed by the proposed power line route and the proposed alternatives. At no point during construction should any damage be made to the heritage resources found and documented in the HIA."

As requested by Royal HaskoningDHV a Phase 1 or desktop Palaeontological Impact Assessment has been done by a professional palaeontologist, and if it is found that fossils occur in the area then a phase two study will be completed.

Methods and Terms of Reference

1. In order to determine the likelihood of fossils occurring in the affected area geological maps, literature, palaeontological databases and published and unpublished records must be consulted.
2. If fossils are likely to occur then a site visit must be made by a qualified palaeontologist to locate and assess the fossils and their importance.
3. Unique or rare fossils should either be collected (with the relevant SAHRA permit) and removed to a suitable storage and curation facility, for example a Museum or University palaeontology department or protected on site.

4. Common fossils can be sacrificed if they are of minimal or no scientific importance but a representative collection could be made if deemed necessary.

The published geological and palaeontological literature, unpublished records and databases were consulted to determine if there are any records of fossils from the sites and the likelihood of any fossils occurring there.

Geology and Palaeontology

The site for the proposed new powerlines (Figure 1) is in the Vryheid Formation (Figure 2) which is rich in coal deposits and therefore is likely to contain fossil plants in the shales between the coal seams, not within the coal seams per se (Cadle et al., 1993; Aitken, 1994). Based on this the SAHRIS palaeosensitivity map indicates that this area is red (high probability of fossils occurring there).

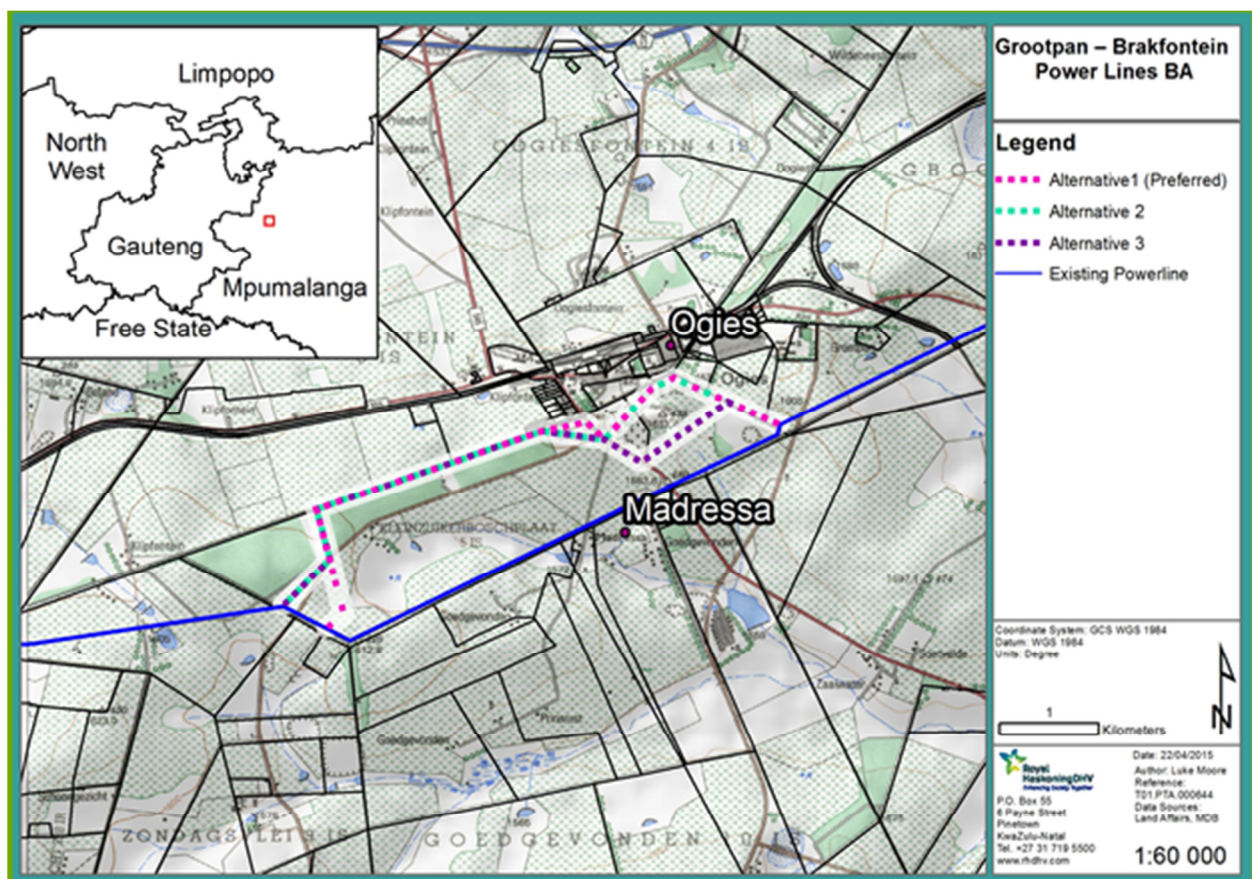


Figure 1: Location of the proposed power lines and position of the existing power lines to be removed. Map provided by Royal HaskoningDHV.

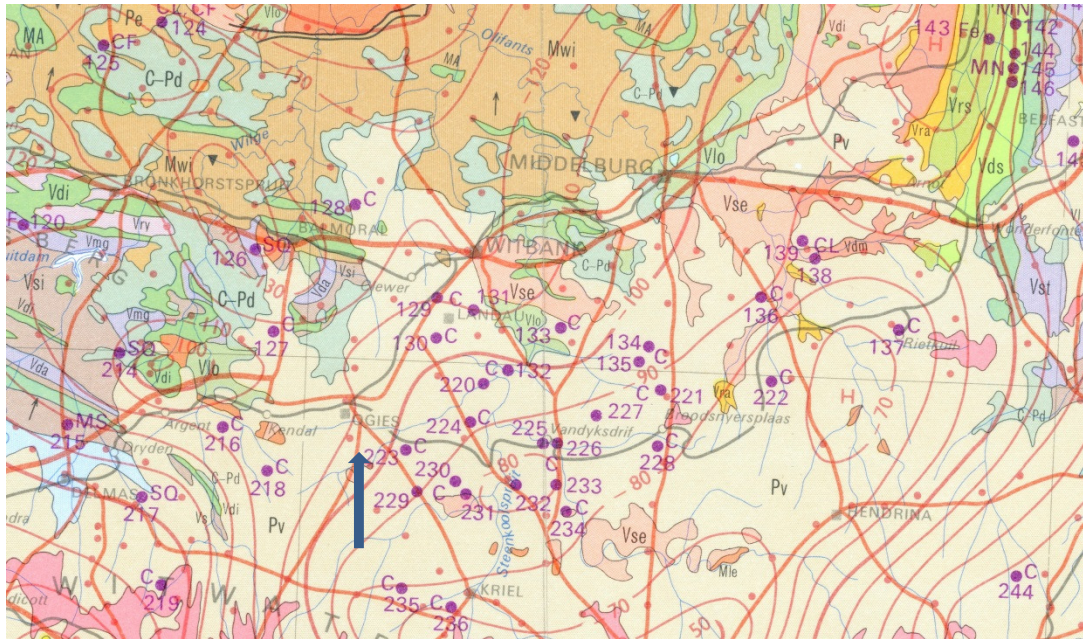


Figure 1. Geological map of the area around Ogies. The approximate location of the proposed power lines is indicated with the arrow. Abbreviations of the rock types are explained in Table 1. Map enlarged from the Geological Survey 1: 1 000 000 map 1984.

Symbol	Group/Formation	Lithology	Approximate Age
Jd	Jurassic	Dolerite dykes, intrusive	Jurassic, approx. 180 Ma
Pvo	Volkswest	shale	Middle Permian, Upper Ecca
Pv	Vryheid	Shales, sandstone, coal	Lower Permian, Middle Ecca
C-Pd	Dwyka	Tillite, sandstone, mudstone, shale	Upper Carboniferous to Lower Permian
Vse	Selons Rivier, Rooiberg Group	Red porphyritic rhyolite	Vaalian; >2100 Ma
Vm	Malmani subgroup	Dolomite, chert	Pretoria Group >2200Ma

Table 1: Explanation of symbols for the geological map and approximate ages (Eriksson et al., 2006; Johnson et al., 2006; Snyman, 1998).

Ogies is part of the Witbank Coal area which is rich in coal, has many collieries and has been mined for over 100 years. There are commonly five coal seams in this region and Ogies has all five seams (Snyman 1998, figure 15). The topmost seam, No 5, is 45m below the surface and is overlain by soil, shale and siltstone, and sandstone (ibid). Within this whole region, the most shallow topmost coal seam is at Belfast and this is 12m below the surface; coal is deeper at other sites (Snyman, 1998). The soils south of Ogies have been cultivated, as seen in the topographic map (Figure 1). Since the foundations for the pylons are most unlikely to

penetrate even the shallowest coal seam at 12m, and definitely not to 45m, the proposed construction of the powerline is most unlikely to affect any fossil materials. Furthermore, there are no records of fossil plants from this locality in the published literature or unpublished database at the Evolutionary Studies Institute, University of the Witwatersrand. Vertebrate fossils do not occur with plant fossils and none has been recorded for this area or very rarely for rocks of this age, Ecca.

It is highly unlikely that the construction of the powerline between Grootpan and Brakfontein, to the south of Ogies, Mpumalanga, will have any impact of the fossil plants associated with the coal seams.

Recommendation

If, in the unlikely event that fossil plant material is discovered during the construction of the powerlines, then it is strongly recommended that a professional palaeontologist be called to assess the importance and rescue them if necessary (with the relevant SAHRA permit).

If the fossil material is deemed to be of scientific interest then further visits by a professional palaeontologist would be required to collect more material. Only when the excavations for foundations have commenced will it be possible to see if there are any fossils so far above the coal seams.

Therefore, as far as the palaeontological heritage is concerned, the construction of the proposed lines along any of the three routes may proceed. No further palaeontological assessments are required.

References

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