Phase 1 Heritage Impact Assessment for establishment of a 22kVa powerline on farm Lanyon Vale 376 near Douglas, Frances Baard District Municipality, NC Province.

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Summary

A Phase 1 Heritage Impact Assessment was carried out for a proposed installation of 876 m – long 22kVa powerline on Farm Lanyon Vale near Douglas in the Northern Cape Province. The proposed linear development will largely be impacted by the installation of nine to ten singular poles in geologically recent (Holocene) overbank deposits. These alluvial deposits generally yield Florisian vertebrate fossils at substantial depth due to infilling and high sediment loads near the active river. The farm is located within a region that has previously yielded ample archaeological evidence of prehistoric human occupation. However, visible / aboveground evidence of Stone Age/Prehistoric occupation at the site is lacking due to degradation of the natural veld by prior agricultural and landscaping activities, including a landing strip. It is also located at least 150 m away from the closest farmstead. The 986 m-long linear footprint is assigned an archaeological site rating of Generally Protected C (Low significance). It is also noted that the potential occurrence of isolated and unmarked graves or intact subsurface archaeological finds not recorded during this survey can never be excluded, but given the nature of the proposed development, likelihood of impact on subsurface palaeontological or archaeological finds is considered low. Nevertheless, it is advised that the relevant heritage authority (SAHRA) be informed immediately in the event of potential heritage exposure during the installation of the powerline.

Introduction

A Phase 1 Heritage Impact Assessment was carried out for a proposed installation of 876 m – long 22kVa powerline on Farm Lanyon Vale near Douglas in the Northern Cape Province (**Fig 1**). The region's unique and non-renewable archaeological and palaeontological heritage sites are 'Generally' protected in terms of the National Heritage Resources Act (Act No 25 of 1999) and may not be disturbed at all without a permit from the relevant heritage resources authority. The NHR Act requires that all heritage resources, that is, all places or objects of aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance are protected. Thus any assessment should make provision for the protection of all these heritage components, including archaeology, shipwrecks, battlefields, graves, and structures over 60 years of age, living heritage and the collection of oral histories, historical settlements, landscapes, geological sites, palaeontological sites and objects.

The Act identifies what is defined as a heritage resource, the criteria for establishing its significance and lists specific activities for which a heritage specialist study may be required. In this regard, categories of development listed in Section 38 (1) of the NHR Act are:

- The construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- The construction of a bridge or similar structure exceeding 50m in length;
- Any development or other activity which will change the character of the site;
- Exceeding 5000 m² in extent;
- Involving three or more existing erven or subdivisions thereof;
- Involving three or more subdivisions thereof which have been consolidated within the past five years;
- Costs of which will exceed a sum set in terms of regulations by the South African Heritage Resources Agency (SAHRA).
- The rezoning of a site exceeding 10 000 m².
- Any other category of development provided for in regulations by the South African Heritage Resources Agency (SAHRA).

Methodology

The 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 (site visit) of the affected area. A Garmin Etrex Vista GPS hand model (set to the WGS 84 map datum) and a digital camera were used for recording purposes. Relevant archaeological and palaeontological information, maps, Google Earth images and site records were consulted and integrated with data acquired during the on-site inspection.

Terms of reference:

- Identify and map possible heritage sites and occurrences using available resources.
- Determine and assess the potential impacts of the proposed development on potential heritage resources;
- Recommend mitigation measures to minimize potential impacts associated with the proposed development.

Site significance classification standards, as prescribed by SAHRA, were used for the purpose of this evaluation (**Table 1**).

Locality Data

1 : 50 000 scale topographic map 2923AC Nuwejaarskraal

1 : 250 000 scale geological map 2922 Prieska

The proposed footprint runs parallel and about 50 m from the right bank of the Orange River, covering a distance of ~896 m over a low relief floodplain (**Fig. 2 & 3**).

GPS coordinates of the proposed power line footprint (**Fig. 2**):

A) 29°17'7.82"S 23°14'55.25"E
B) 29°17'21.46"S 23°14'25.62"E
C) 29°17'21.87"S 23°14'22.29"E

Background

According to the 1: 250 000 scale geological map 2922 Prieska, the study area is underlain by localized outcrops of Mbizane Formation mudstone and sandstone successions, tillites and conglomerates (*C-Pd,* **Fig. 4**) The Mbizane Formation represents valley and inlet fill deposits left behind on Ventersdorp basement rocks by retreating glaciers about 300 million years ago. The Dwyka-aged palaeovalleys bear

evidence of glaciated pavements, consisting of well-preserved polished surfaces striations on basement rocks, which are found throughout the region. The Mbizane Formation is a largely heterolithic unit recognized in the upper part of the Dwyka Group of the Karoo Supergroup (Von Brunn & Visser 1999).

A desktop Heritage Impact Assessment conducted for a Prospecting Rights application on the same farm notes the potential for Stone Age lithics and colonial heritage resources along the Orange River and that a farmstead near the proposed powerline may be protected by section 34 of the NHRA, including burial grounds that are often associated with historical farmsteads (SAHRIS Case ID 12422 https://sahris.sahra.org.za/cases/lanyonvale-376-nc12154pr).

Field Assessment

The river dissects Mbizane Formation conglomerates that are capped by well - developed superficial deposits (overbank sediments / alluvium) derived from the Orange River. (**Fig. 5**). No fossils or potential fossil exposures were observed within superficial sediments at ~15 m above riverbed. There was no evidence of *in situ* Stone Age archaeological material, either as capped assemblages or distributed as surface scatters on the landscape within the boundaries of the proposed development footprint. There are also no indications of rock art (engravings), stonewalled structures or historically significant buildings older than 60 years, or aboveground evidence of graves within the immediate vicinity of the linear footprint.

Impact Statement and Recommendation

The proposed linear development will largely be impacted by the installation of nine to ten singular poles in geologically recent (Holocene) overbank deposits (**Fig. 5**). These alluvial deposits generally yield Florisian vertebrate fossils at substantial depth due to infilling and high sediment loads near the active river (**Fig. 6**). The farm is located within a region that has previously yielded ample archaeological evidence of prehistoric human occupation. However, visible / aboveground evidence of Stone Age/Prehistoric occupation at the site is lacking due to degradation of the natural veld by prior agricultural and landscaping activities, including a landing strip (**Fig. 7 & 8**). It is also located at least 150 m away from the closest farmstead. The 986 m-long linear footprint is assigned an archaeological site rating of Generally Protected C (Low significance (**Table 1)**. It is also noted that the potential occurrence of isolated and unmarked graves or intact

subsurface archaeological finds not recorded during this survey can never be excluded. However, given the nature of the proposed development, likelihood of impact on subsurface palaeontological or archaeological finds is considered low. Nevertheless, it is advised that the relevant heritage authority (SAHRA) be informed immediately in the event of potential heritage exposure during the installation of the powerline.

References

Case 17907 - Interim Comment from SAHRA In terms of Section 38(2), 38(3) of the National Heritage Resources Act (Act 25 of 1999).

Proposed Lanyon Vale diamond prospecting project in the Frances Baard District Municipality, Northern Cape Province. Desktop HIA report conducted by Exigo[3] SAHRIS Case ID 12422

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.

Palaeontological and Archaeological Chance Find Protocol for Developer

"Fossil" means the remains or traces of plants and animals that lived long ago, which has been buried and dug up, and most fossils are found where they became buried in layers of sand or mud a long time ago. *"Strata"* means layers and "stratigraphy" is the study and working out of the sequence of the layers of sediment that settled into low-lying areas long ago. *"Sediment"* or *"deposit"* means of sand, mud, etc, which settled down to form a recognizable geological unit. It may still be loose in this case (e.g. alluvium). Identification of anomalous / irregular shapes or forms on the landscape is a first step in recognizing fossilized bone as potential fossil remains in the field. In the event of potential fossil discovery finds must be reported to the SAHRA APM Unit (Tel. 021 462 5402). immediately. If, localized fossil material is discovered within ***intact superficial overburden*** (topsoils and overbanks deposits in this case), it will in all probability resemble modern- looking, but more or less lithified animal bones, crania, horn cores and teeth, and it will most likely, but not exclusively belong to bovids (very common, late Pleistocene/Holocene fossils belonging to the biological family of very common ruminant mammals that includes wildebeest,

buffalo, antelopes, etc.). If any newly discovered palaeontological resources prove to be significant, a Phase 2 rescue operation may be required subject to permits issued by South African Heritage Resources Agency (SAHRA). In the meantime, *ex situ* remains (fossils that were exposed and removed during construction phase) must be wrapped in paper towels or heavy duty tin foil and stored in a safe place. The material should not be washed or cleaned in any way.

Any subsurface evidence of archaeological sites or remains, e.g. stone tool artifacts, bone or ostrich eggshell fragments, charcoal and ash heaps, or remnants of stone-made structures or unmarked graves found during construction phase of development, must be reported to the SAHRA APM Unit (Tel. 021 462 5402). If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit must be alerted immediately. A professional archaeologist must be contracted as soon as possible to inspect the findings. If newly discovered heritage resources prove to be of archaeological significance, a Phase 2 rescue operation may be required, subject to permits issued by SAHRA

Tables and Figures

Table 1. Field rating categories as prescribed 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

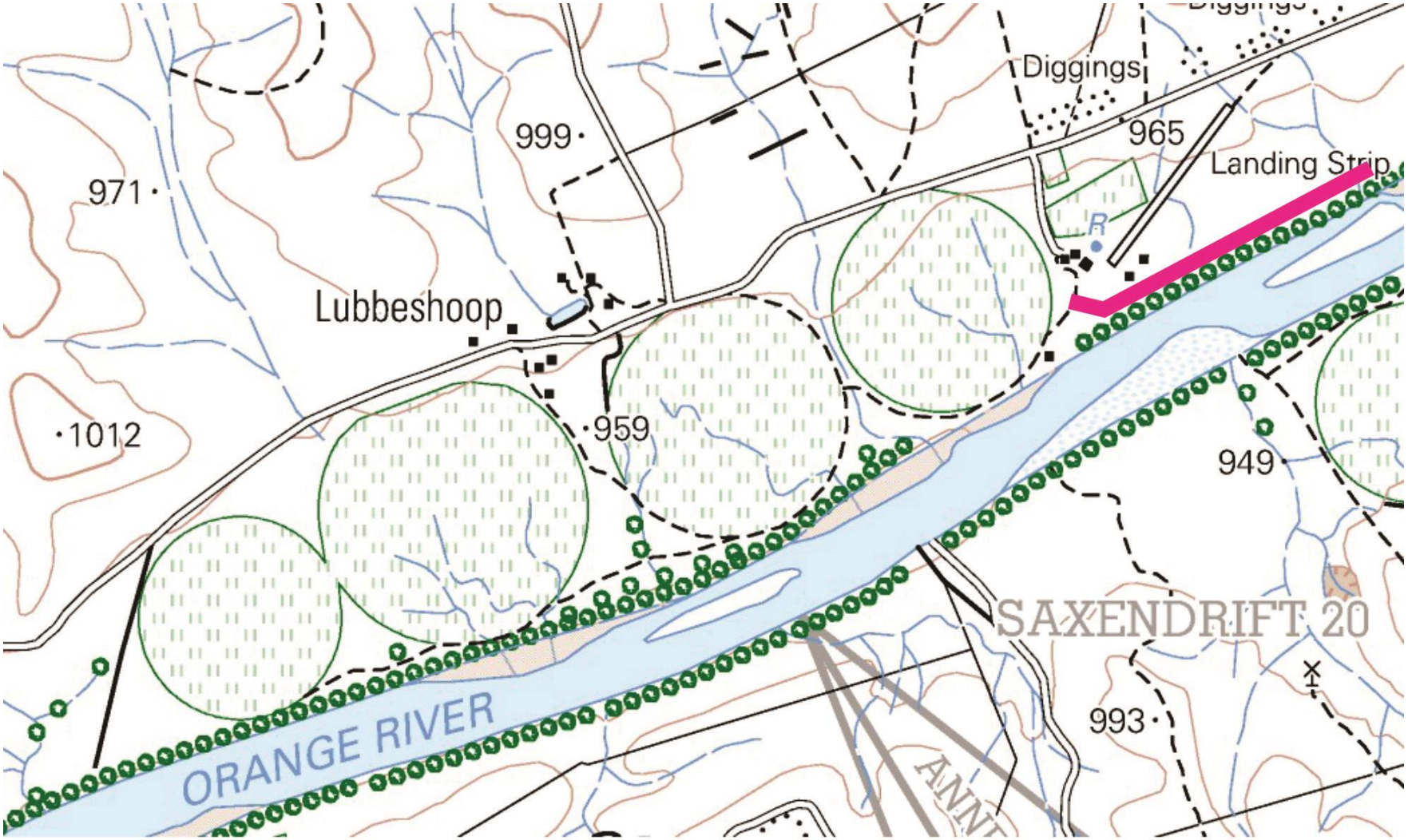

Figure 1. Map of proposed powerline marked on portion of 1: 50 000 scale topographic map 2923AC Nuwejaarskraal.

Figure 2. Aerial view of the linear footprint

Figure 3. General view of the site, looking southwest.

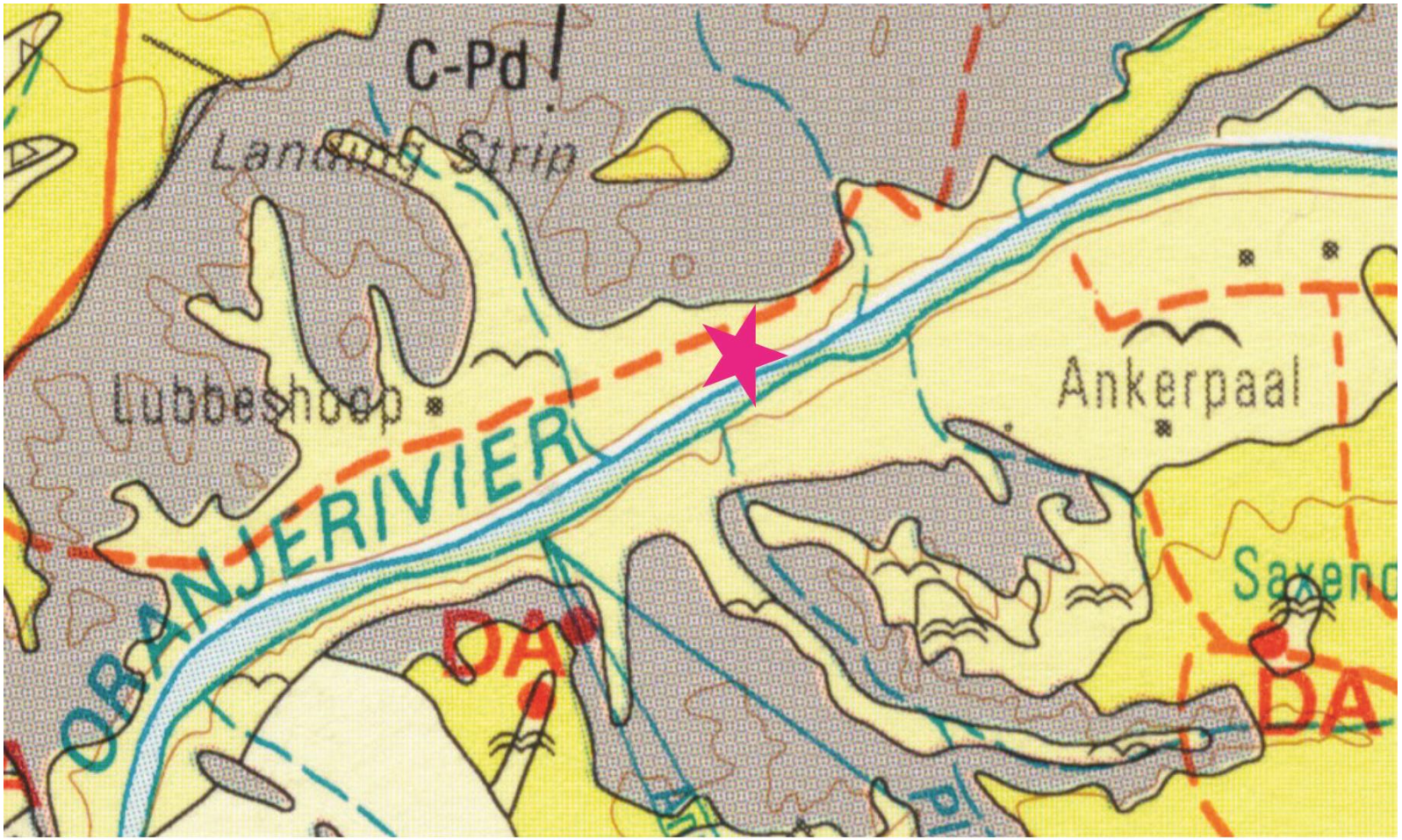

Figure 4. According to the 1: 250 000 scale geological map 2922 Prieska, the study area (star) is underlain by localized outcrops of Mbizane Formation mudstone and sandstone successions, tillites and conglomerates (C-Pd) and geologically recent alluvium (flying bird symbol).

Figure 5. The footprint is underlain by a sandy, alluvial overburden.
Scale 1 = 10 cm

Figure 6. Example of depth of vertebrate fossil exposures in Holocene alluvial deposits in close proximity of the Vet River.

Figure 7. Evidence of degraded veld along the path of the proposed powerline, looking east (above) and northeast (below).

Figure 8. Evidence of degraded terrain along the path of the proposed powerline, looking northeast (above) and west (below).