Phase 1 Heritage Impact Assessment of a proposed new cemetery site on the Remainder of the farm Nalisview 2835 near Bloemfontein, Free State Province.

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Executive Summary

A foot survey of the terrain revealed no evidence for the accumulation and preservation of intact fossil material within these superficial Quaternary sediments. Outcrop visibility is generally poor along the footprint, but fine- to coarse-grained, sandstone outcrop is occasionally exposed. The survey also revealed no evidence of *in situ* Stone Age archaeological material, capped or distributed as surface scatters on the landscape. There are also no indications of rock art (engravings on dolerite outcrop), prehistoric structures, Anglo Boer War sites, graves or buildings with historical significance older than 60 years within the boundaries of the study area. There are no major archaeological grounds to suspend excavation activities within the proposed development footprint. The proposed development footprint is assigned a site rating of Generally Protected C (GP.C). Excavations related to the digging of graves may have an adverse affect on subsurface bedrock sediments that may well be of palaeontological interest. Even so, the likelihood of palaeontological impact is considered low, because of the low relief terrain. There are no major palaeontological grounds to suspend the proposed development, but in the unlikely event that fossils are encountered during such excavations, it must be protected and their locality marked. The South African Heritage Resources Agency or National Museum in Bloemfontein should then be notified immediately so that the appropriate steps can be taken to collect and remove the material. The access road footprint forms part of an existing road and will not affect palaeontological or archaeological heritage, but an existing tree gum grove may be of historical interest. Trees associated with historical settlements or farmsteads, that are older than 60 years old, are generally protected as heritage sites with cultural significance. Their removal or destruction will require the appropriate consent and a destruction permit from SAHRA. While many of the trees appear to be younger than 60 years old, the age of several specimens may well be older. It is advised that, as a prerequisite, specialist input is obtained from a botanist in order to ascertain the age of the trees located within the proposed impact zone.

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Introduction

A Phase 1 Heritage Impact Assessment was carried out for a proposed new cemetery on the Remainder of the farm Nalisview 2835 near Bloemfontein in the Free State 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, section 35) and may not be disturbed at all without a permit from the relevant heritage resources authority. As many such heritage sites are threatened daily by development, both the environmental and heritage legislation require impact assessment reports that identify all heritage resources including archaeological and palaeontological sites in the area to be developed, and that make recommendations for protection or mitigation of the impact of the sites.

The primary legal trigger for identifying when heritage specialist involvement is required in the Environmental Impact Assessment process is the National Heritage Resources (NHR) Act (Act No 25 of 1999). 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

a) exceeding 5000 m² in extent; or

b) involving three or more existing erven or subdivisions thereof; or

c) involving three or more subdivisions thereof which have been consolidated within the past five years;

- The rezoning of a site exceeding 10 000 m²; or
- Any other category of development provided for in regulations by the South African Heritage Resources Agency (SAHRA).

If a heritage resource is likely to be impacted by a development listed in Section 38 (1) of the NHR Act a heritage assessment will be required either as a separate HIA or as the heritage specialist component (AIA or PIA) of an EIA.

A range of contexts can be identified which typically have high or potential cultural significance and which would require some form of heritage specialist involvement (**Table 1**). This may include formally protected heritage sites or unprotected, but potentially significant sites or landscapes (**Table 2**). The involvement of the heritage specialist in such a process is usually necessary when a proposed development may affect a heritage resource, whether it is formally protected or unprotected, known or unknown. In many cases, the nature and degree of heritage significance is largely unknown pending further investigation (e.g. capped sites, assemblages or subsurface fossil remains). On the other hand, it is also possible that a site may contain heritage resources (e.g. structures older than 60 years), with little or no conservation value.

Methodology

The archaeological significance of the affected area was evaluated through a desktop study and carried out 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 archaeological information, aerial photographs 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.

Field Rating

Site significance classification standards as prescribed by SAHRA (2005) for archaeological sites were used for the purpose of this report (**Table 3**).

Locality data

1 : 50 000 scale topographic map: 2926 AA Bloemfontein

1 : 250 000 scale geological map 2924 Bloemfontein

The study area is located on the Remainder of the farm Nalisview 2835, about 13 km south of the Bloemfontein CBD and east of the N6 national road, on route to Reddersburg (**Fig. 2 & 3**).

General site coordinates (**Fig. 2**):

A) 29°14'30.41"S 26°13'45.01"E

B) 29°14'22.11"S 26°14'7.74"E

C) 29°14'34.74"S 26°14'40.44"E

D) 29°15'23.14"S 26°14'18.39"E

E) 29°15'19.09"S 26°14'0.24"E

F) 29°14'56.38"S 26°14'2.18"E

G) 29°14'49.88"S 26°13'44.60"E

Background

Palaeontology

According to the 1 : 250 000 scale geological map 2924 Bloemfontein, Nalisview 2835 is situated within the Beaufort Group, Adelaide Subgroup (Karoo Supergroup), which is primarily represented by late Permian sedimentary rocks, made up of alternating sandstone and mudstone layers (*Pa*) associated with stream and floodplain deposits (Theron 1963; Johnson *et al.* 2006). Jurassic-age dolerite intrusions, in the form of sills and dykes, occur extensively around the area (*Jd*). Quaternary to recent residual deposits, comprising unconsolidated soils, alluvial sediments and sheet wash deposits, cover the underlying sedimentary rocks. The sedimentary rocks are

generally accepted to be Late Permian in age and are assigned to the *Dicynodon* Assemblage Zone (Kitching 1995). The *Dicynodon* AZ is characterized by the co-occurence of two therapsids, *Dicynodon* and *Theriognathus* as well as a diversity of less dominant vertebrate taxa, while trace fossils of invertebrates and vertebrates as well as *Glossopteris* flora plants have also been described (**Fig. 4**).

Archaeology

The Stone Age archaeological record of the Bloemfontein region spans back to the Middle Stone Age. Prehistoric archaeological remains previously recorded in the region include numerous occurrences of *in situ* Middle and Later Stone Age artefacts eroding out of the overbank sediments where they are often found in association large mammal fossil remains (Broom 1909; Churchill *et al*. 2000; Rossouw 1999, 2000, 2006). Stone tools and mammal vertebrate fossils have been recorded from various alluvial contexts along the nearby Modder River north and east of Bloemfontein and include the extinct species *Equus capensis, Megalotragus priscus, Pelorovis antiquus, Antidorcas* fossil remains from sealed and or exposed alluvial contexts. Cranial remains of *Pelorovis antiquus* have also been recorded in overbank sediments of the Tierpoort River south of the study area. The incidence of surface scatters usually decreases away from localized areas such as alluvial contexts and dolerite-shale contact zones when stone tools largely occur as contextually derived individual finds in the open veld. Stone tools are mostly made of hornfels, a fine-grained isotropic rock found in the hot-contact zone between the dolerites and shales in the area. As a result, stone tool factory sites are commonly found near dolerite-shale contact zones. The study area is located outside the south-western periphery of distribution of Late Iron Age stone-walled settlements in the Free State (Maggs 1976).

Field Assessment

The site is characterized by flat, open grassland that shows signs of past crop farming activities on modern substrate comprised of light brown to red calcareous soils of varying depth (**Fig. 5**). A foot survey of the terrain revealed no evidence for the accumulation and preservation of intact fossil material within these superficial Quaternary sediments. Outcrop visibility is generally poor along the footprint, but fine- to coarse-grained, sandstone outcrop is occasionally exposed (**Fig. 6**). The survey also revealed no evidence of *in situ* Stone Age archaeological material, capped or distributed as surface scatters on the landscape. There are also no indications of rock

art (engravings on dolerite outcrop), prehistoric structures, Anglo Boer War sites, graves or buildings with historical significance older than 60 years within the boundaries of the study area.

Impact Statement and Recommendation

The nature of the proposed development will almost certainly have an adverse affect on residual topsoils (Quaternary sediments) that are largely degraded as a result of prior farming activities. While it is considered unlikely that the proposed development will result in any significant archaeological impact, excavations related to the digging of graves may have an adverse affect on subsurface bedrock sediments and may well be of palaeontological interest. Even so, the likelihood of palaeontological impact is considered low, because of the low relief terrain. There are no major palaeontological grounds to suspend the proposed development, but in the unlikely event that fossils are encountered during such excavations, it must be protected and their locality marked. The South African Heritage Resources Agency or National Museum in Bloemfontein should then be notified immediately so that the appropriate steps can be taken to collect and remove the material. There are no major archaeological grounds to suspend excavation activities within the proposed development footprint. The proposed development footprint is assigned a site rating of Generally Protected C (GP.C).

The access road footprint forms part of an existing road and will not affect palaeontological or archaeological heritage, but an existing tree gum grove (see **Fig. 2 A- B**), also indicated on a historical topographic map of the area, may be of historical interest (**Figs. 2 A-B, 7 & 8**). Trees associated with historical settlements or farmsteads, that are older than 60 years old, are generally protected as heritage sites with cultural significance. Their removal or destruction will require the appropriate consent and a destruction permit from SAHRA. While many of the trees appear to be younger than 60 years old, the age of several specimens may well be older. It is advised that, as a prerequisite, specialist input is obtained from a botanist in order to ascertain the age of the trees located within the proposed impact zone.

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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.

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Tables and Figures

Table 1: Relationship between different heritage contexts, heritage resources likely to occur within these contexts, and likely sources of heritage impacts in the Free State.

Heritage Context	Heritage Resources	Impact
Palaeontology	• Palaeozoic and Mesozoic fossil remains, e.g. Karoo Supergroup. • Neogene regolith, e.g. Quaternary alluvial deposits, lacustrine sediments, natural springs, pans	Subsurface excavations including ground levelling, landscaping & foundation preparation, road cuttings, quarries, mining development, bridge and pipeline construction , new cemeteries, construction of electrical infrastructure and alternative energy facilities, township development, demolition or alteration work.
Archaeology Early Stone Age Middle Stone Age LSA - Herder	• Localized Stone Age sites, containing cultural remains, animal and human remains found near or at *inter alia* the following: river courses and natural springs; pans and natural deflation hollows; stone tool making sites (e.g. dolerite contact zones); cave sites and rock shelters; freshwater shell middens; • Ancient, kraals and stonewalled complexes; • Abandoned areas of past human settlement and burials sites over 100 years old	
Historical	• Historical sites and structures older than 60 years old, including rubbish dumps/middens; • Objects, including industrial machinery, older than 60 years; • Burial sites, e.g. concentration camps; • Burial architecture older than 60 years; • Graves (marked or unmarked, known or unknown); • Places associated with social identity/displacement, e.g. Witsieshoek Cave; • Mission settlements, e.g. Bethulie and Beersheba	
Natural Landscapes	• Formally proclaimed nature reserves • Evidence of pre-colonial occupation • Scenic resources, e.g. view corridors, viewing sites, • Historical structures/settlements older than 60 years • Geological sites of cultural significance.	
Relic Landscapes	• Battle /military sites and graveyards • Pre-colonial settlements	

Table 2. Examples of heritage resources located in the Free State Province.

Historically, archaeologically and palaeontologically significant heritage sites & landscapes	**Examples**
Landscapes with unique geological or palaeontological history	Karoo Basin Beaufort Group sedimentary strata Vredefort Dome World Heritage Site.
Landscapes characterised by certain geomorphological attributes where a range of archaeological and palaeontological sites could be located.	Vaal, Modder and Riet River valleys Pans, pandunes and natural springs of the Free State panveld.
Relic landscapes with evidence of past, now discontinued human activities	Cave sites in the Maluti Drakensberg region Southern Highveld pre-colonial settlement complexes.
Landscapes containing concentrations of historical structures.	Concentration camps & cemeteries from the South African War.
Historical towns, historically significant farmsteads, settlements & routes	Batho historical township area in Mangaung (Bloemfontein).
Battlefield Sites, burial grounds and grave sites older than 60 years.	

Table 3. 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

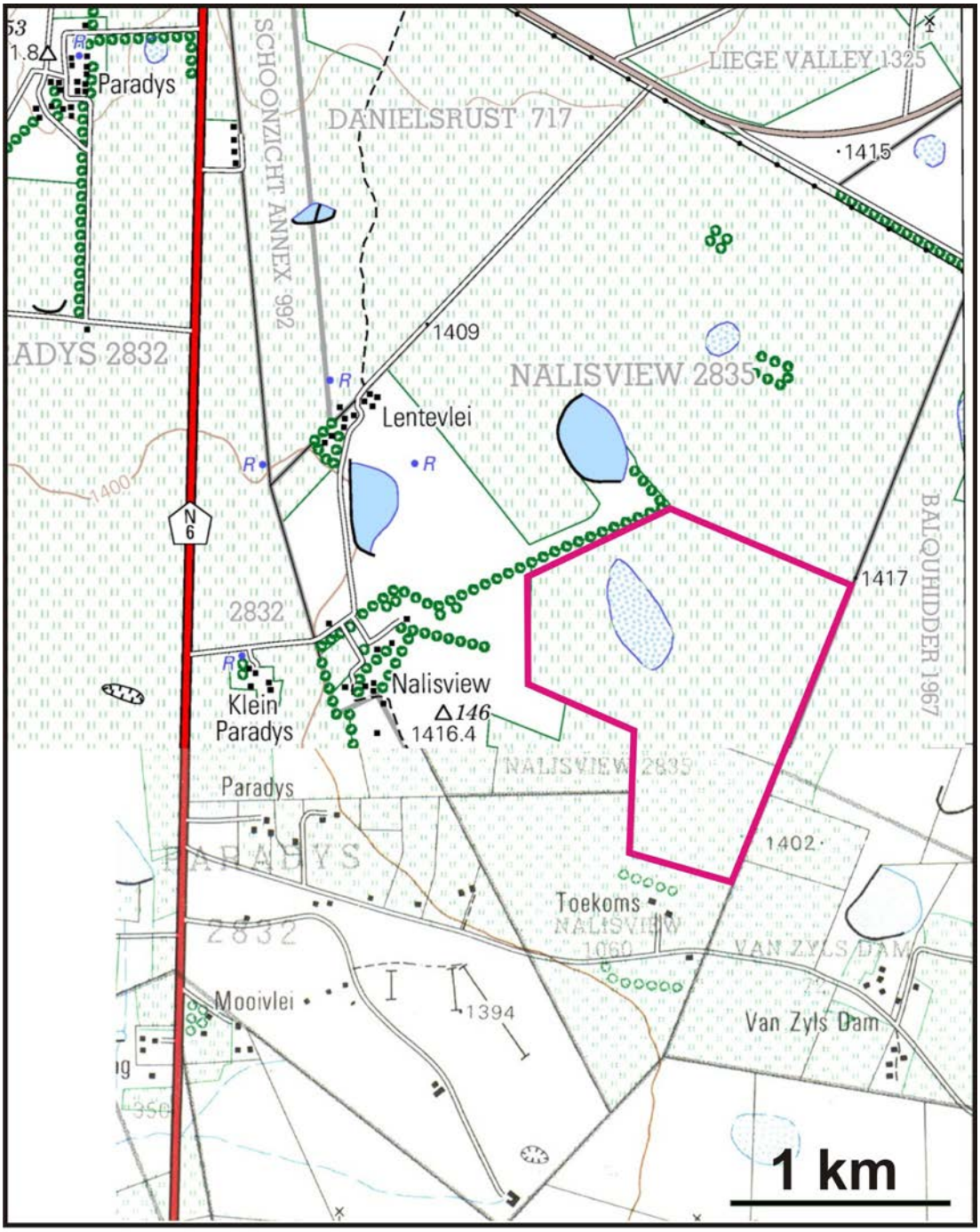

Figure 1. Remainder of Nalisview 2835 (portion of 1:50 000 scale topographic map 2926AA Bloemfontein & 2926AC Tierpoort Dam).

Figure 2. Aerial view of the study area.

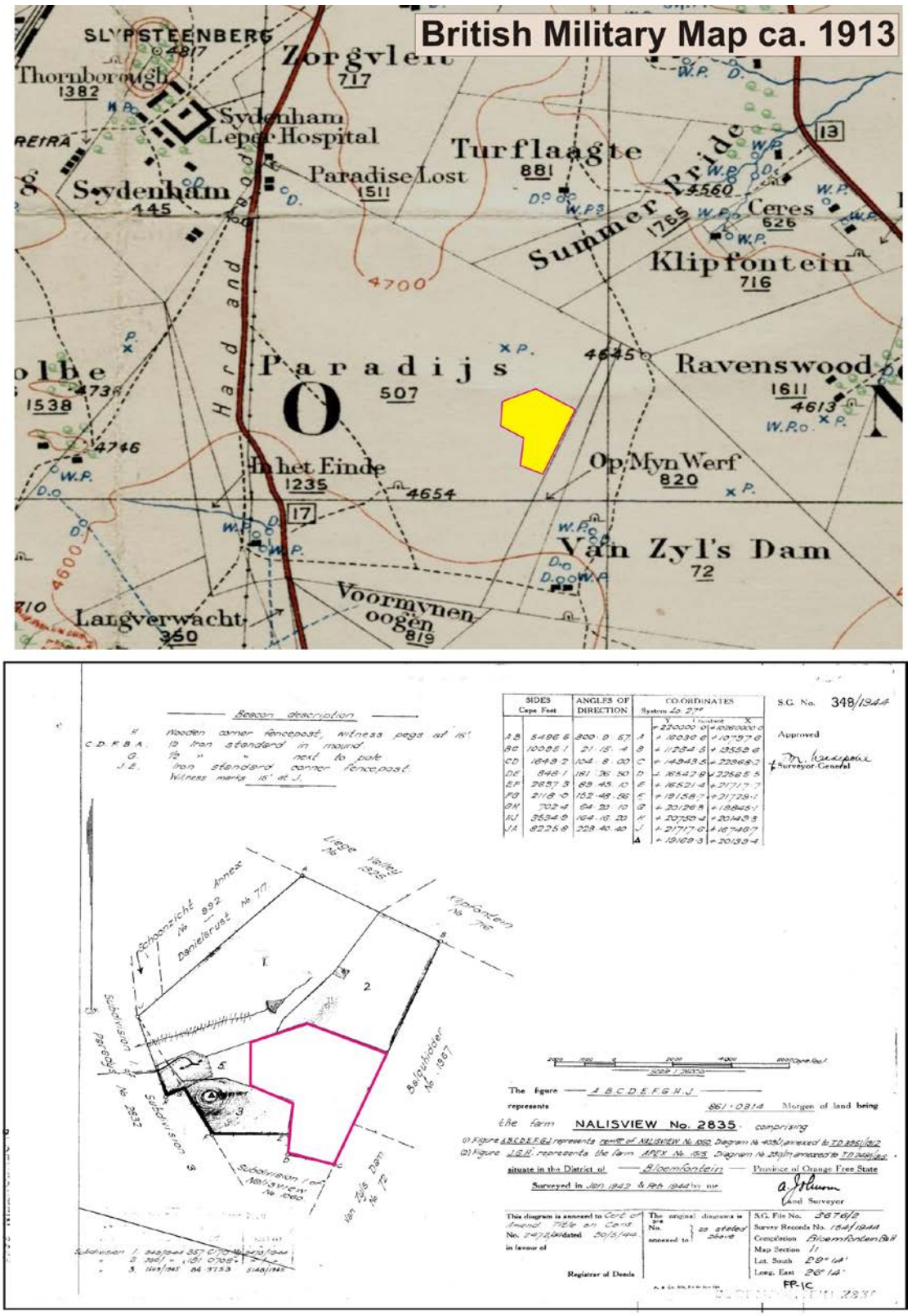

Figure 3. Historical map of the study area ca. 1913 (top) and layout on a subdivisional diagram of Nalisview 2835 registered in 1944 (bottom).

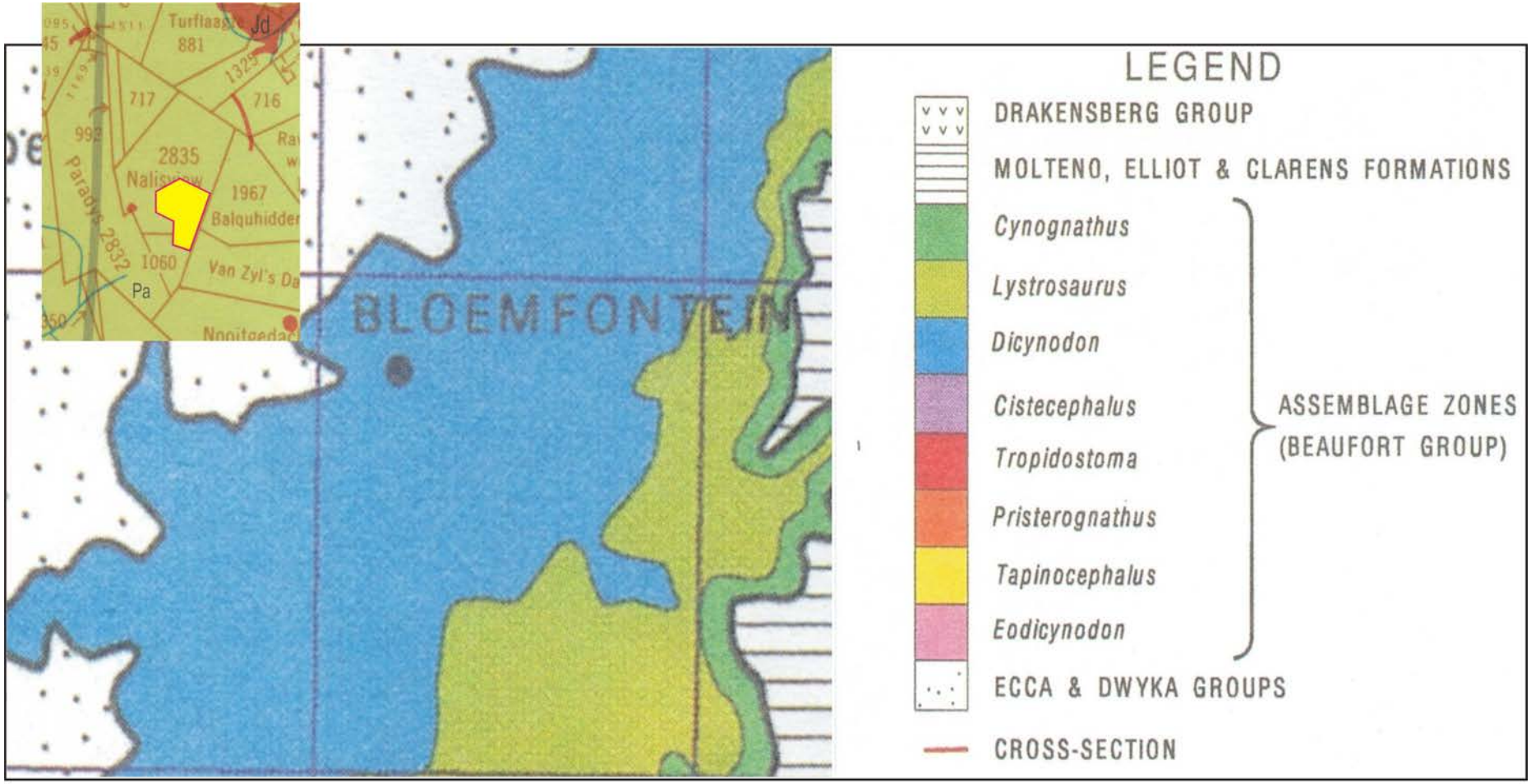

Figure 4. Distribution of vertebrate biozones of the Beaufort Group (after Rubidge 1995) and extract of geological map 2926 Bloemfontein with layout of the development footprint (inset).

Figure 5. Outcrop visibility is generally poor as a result of the low topography terrain, with fine- to coarse-grained, sandstone outcrop only occasionally exposed.

Figure 6. General view of the study area looking east (top) and northeast (below).

Figure 7 Existing access road and tree gum grove (right).

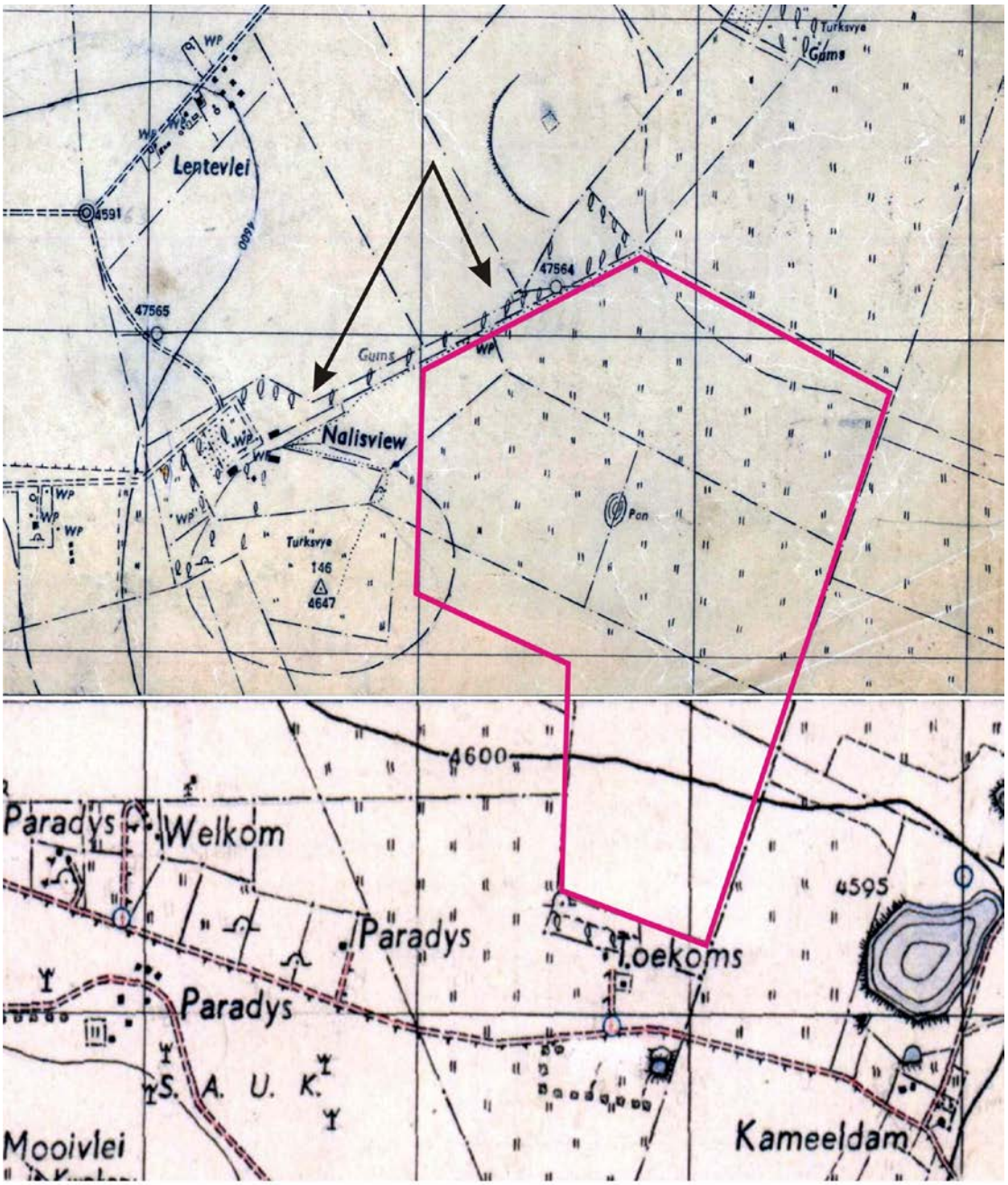

Figure 8. Layout of the proposed footprint indicated on portion of 1:18000 scale topographic maps 2926 EF2 Kafferrivier and 2926 C1 Bloemfontein ca. 1948. Tree gum grove indicated by arrows.