

**Phase 1 Heritage Impact Assessment for establishment
of a vineyard on Portion 18 (Portion of Portion 15) of the
Farm Uitdraai No. 33, Prieska, NC Province.**



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Summary

A Phase 1 Heritage Impact Assessment was carried out for a proposed new agricultural development on the Farm Uitdraai No. 33 near Prieska in the Northern Cape Province. The site covers a 185 ha – area of low relief terrain on Portion 18 (Portion of Portion 15) of the farm, which is located between the Orange River and the R357 provincial road, and about 8.5 km southeast of Prieska. The site is capped by variable clasts of bedrock-derived gravels, surface limestones / reworked calcretes, and well - developed Quaternary sand. No fossils or potential fossil exposures were observed within superficial sediments or within rarely exposed and moderately significant Mbizane Formation deposits. 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 boundaries of the site. The proposed development will largely affect geologically recent and well-developed superficial overburden. These deposits are generally not expected to be fossiliferous in the absence of pans, springs or well-developed alluvial deposits. Although the farm is located within a region that has previously yielded ample archaeological evidence of prehistoric human occupation, visible evidence of Stone Age/Prehistoric occupation at the site is negligible. The survey area is assigned an archaeological site rating of Generally Protected C (Low significance), but it is noted that the potential occurrence of isolated and unmarked graves or intact subsurface archaeological finds not recorded during this survey can never be excluded. It is advised that the development can proceed, provided that the relevant heritage authority (SAHRA) and a qualified archaeologist be informed immediately in the event of potential archaeological exposure during the construction phase of the proposed development. Chance find protocols are included in the report.

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Introduction

A Phase 1 Heritage Impact Assessment was carried out for a proposed new agricultural development on Portion 18 (Portion of Portion 15) of the Farm Uitdraai No. 33 near Prieska 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, 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. Archaeological Impact Assessments (AIAs) and Palaeontological Impact Assessments (PIAs), or overarching Heritage Impact Assessments (HIAs) are most often specialist reports that form part of the wider heritage component of Environmental Impact Assessments (EIAs) required in terms of the National Environmental Management Act or of the Environment Conservation Act by the provincial Department of Environment Affairs; or Environmental Management Plans (EMPs) required by the Department of Minerals and Energy.

Legislative framework

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;
- 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).

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.

The significance or sensitivity of heritage resources within a particular area or region can inform the EIA process on potential impacts and whether or not the expertise of a heritage specialist is required. 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. In most cases it will be necessary to engage the professional opinion of a heritage specialist in determining whether or not further heritage specialist input in an EIA process is required.

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. The task also involved identification and assessment of possible palaeontological and archaeological heritage within the proposed project area, in accordance with section 9(8) and appendix 6 (“Specialist reports”) of the NEMA EIA Regulations, 2014 , whereby the specialist report takes into account the following 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.

Potential impacts on heritage resources are summarized in **Table 3** and site significance classification standards, as prescribed by SAHRA, were used for the purpose of this evaluation (**Table 4**).

Locality Data

1 : 50 000 scale topographic map 2922DB Prieska Oos

1 : 250 000 scale geological map 2922 Prieska

The site covers a 185 ha – area of low relief terrain on Portion 18 (Portion of Portion 15) of the Farm Uitdraai No. 33, located between the Orange River and the R357 provincial road and about 8.5 km southeast of Prieska in the Northern Cape Province (**Fig. 2 & 3**).

GPS coordinates of the survey area (**Fig. 2**):

- A) 29°40'51.55"S 22°50'39.22"E
- B) 29°40'48.38"S 22°50'52.52"E
- C) 29°41'6.36"S 22°50'57.63"E
- D) 29°41'12.35"S 22°51'58.36"E

- E) 29°41'24.97"S 22°51'58.75"E
- F) 29°41'28.85"S 22°51'12.16"E
- G) 29°41'22.16"S 22°51'1.13"E
- H) 29°41'23.57"S 22°50'47.73"E
- I) 29°41'40.14"S 22°50'8.29"E
- J) 29°41'28.79"S 22°50'3.84"E
- K) 29°41'10.05"S 22°50'42.80"E

Background

Geology

The study area is situated within the outcrop area of the Transvaal Supergroup, which are characterized by banded iron formations (BIF), haematite, crocidolite and chert layers located in the basinal facies of the Ghaap Group (Asbestos Hills Subgroup). 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).

Palaeontology

The banded iron formations (BIF) in the region possibly reflect Early Proterozoic environmental conditions following iron deposition as a result of the build-up of free oxygen in the oceans by cyanobacterial photosynthesis. Paleogene fossil assemblages are known from a crater- lake deposit within a volcanic pipe at Stompoor near Prieska and include a diversity of fish, frogs, reptiles, insects, and palynological remains (Smith 1988). Fluvial deposits from the ancient Koa Valley northwest of Prieska and south of Pofadder, has yielded fossil vertebrate bone as well as fossil wood (Partridge and Maud 2000). The Mbizane Formation is not considered to be highly fossiliferous, but low diversity non-marine ichnofossil assemblages have been recorded as well as scarce vascular plant remains associated with *Glossopteris* Flora, while palynomorphs are also likely to be present within finer-grained mudrock facies (Almond and Pether

2008). Except for a few bovid horn core remains found in lime quarries, there are no records of Quaternary fossils from the immediate vicinity of Prieska. A fossilized horn core of an extinct alcelaphine has been retrieved from alluvial sediments along the Ongers River near Britstown, while Florisian type faunal remains have been excavated from an archaeological site at Bundu Farm Pan near Copperton (Brink *et al.* 1995; Kiberd 2006).

Archaeology

The archaeological footprint in the area are primarily represented by Stone Age archaeology, rock art localities, structural remnants dating back to the Anglo Boer War and its aftermath (e.g. stone fort on top of the Prieska Koppie overlooking the town), as well as graveyards and other historical structures dating more than 60 years ago. The Stone Age archaeological footprint in the region is represented by Early, Middle and Later Stone Age sites associated with pans and alluvial contexts (**Fig. 5**), while the landscape in general is characterized by low-density surface scatters (Beaumont *et al.* 1995; Kiberd 2006). Rock engravings have been recorded in the younger valley fills along the steeper slopes located near the eastern and south-eastern margins of the Asbesberge north of Prieska (van Riet Low 1949). In addition, rock art sites have been recorded on a number of farms around Prieska, including Kleindoring, Wonderdraai and Omdraaisvlei. Historical ruins and graveyards associated with the asbestos mining industry during the first half of the 20th century are located at Kliphuis and Engeldewilgeboomfontein north of Prieska (**Fig. 6**). Further away, stone pipes and LSA artefacts have been recorded on the farm Doornkuil near Britstown, while prehistoric graves and clay pottery have been recorded along the Orange River south of Douglas. Before the town of Prieska was founded 1882, early travellers frequently encountered Koranna and Bushmen groups in the region (Burchell 1824; Raper 1987; Skead 2009). In fact, the name Prieska is derived from the Koranna word meaning “place of the lost she-goat”. The principal Khoikhoi inhabitants of the Middle Orange River were the Einiqua who belonged to the same language group as the Namaqua and Korana, namely the Orange River Khoikhoi (Penn 2005). The Einiqua occupied the area around and east of the Augrabies Falls while the Korana occupied the Middle-Upper Orange River further to the east towards Prieska (**Fig. 7**). A large number of burial cairns were excavated near the Orange River in the Kakamas area and appear to be related to Korana herders (Morris 1995). It is noted that while Bushmanland sites in the surrounding area

appear to be ephemeral occupations by small hunter-gatherer groups, substantial herder encampments found along the Orange River itself indicate that the banks and floodplains of the river were more intensely exploited (Morris & Beaumont 1991). Hinterland sites are mainly restricted rock shelters near mountainous terrain sand dune deposits, or around seasonal pans and springs (Beaumont et al. 1995). No Iron Age sites are expected to be found in this area as it falls outside the southwestern periphery of distribution of Iron Age settlement in the region (Humphreys 1976, **Fig. 7**).

Field Assessment

Underlying Mbizane Formation conglomerates are capped by variable clasts of bedrock-derived gravels, surface limestones / reworked calcretes (*T-Qc*), and well - developed Quaternary sand (*Qs*) (**Fig. 8**). No fossils or potential fossil exposures were observed within superficial sediments or within rarely exposed and moderately significant Mbizane Formation deposits (see **Fig. 4**, palaeosensitivity map). 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 boundaries of the site.

Impact Statement and Recommendation

Potential impacts are summarized in **Table 3**. The proposed development will largely impact geologically recent and well-developed superficial overburden. These deposits are generally not expected to be fossiliferous in the absence of pans, springs or well-developed alluvial deposits. The farm is located within a region that has previously yielded ample archaeological evidence of prehistoric human occupation. However, visible evidence of Stone Age/Prehistoric occupation at the site is negligible (**Fig. 9**). The survey area is assigned an archaeological site rating of Generally Protected C (Low significance, **Table 4**), but it is noted that the potential occurrence of isolated and unmarked graves or intact subsurface archaeological finds not recorded during this survey can never be excluded. Therefore, it is advised that the relevant heritage authority (SAHRA) and a qualified archaeologist be informed immediately in the event of potential archaeological exposure during the construction phase of the proposed project.

Palaeontological 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 or may have consolidated to form rock. Identification of anomalous / irregular shapes or forms on the landscape or in rocks is a first step in recognizing fossilized bone as potential fossil remains in the field. In some fossils the original bone was not lithified. It disappeared completely but left an impression or mould in the sediment. Sometimes leaf impressions are purely a kind of mould and/or cast of a leaf, but often some of the original leaf is left behind in a carbonized form in the impression. Trace fossils, such as footprints, burrows, and trails footprints and tracks provide information such as animal gait, lifestyle and social behavior.

- In the event fossil discovery by workers in the field, the **palaeontologist monitoring for fossil remains** during the construction phase of the must be alerted immediately.
- If, in the event that localized fossil material is discovered within or found eroding out of intact sedimentary **rocks** during the construction phase, it will in all probability resemble footprints on flat-surfaced rocks or it will look like rocks that resemble tree stumps, teeth, or objects with smooth rounded projections like a bearing or the curved area at the end of a bone.
- If, in the event that localized fossil material is discovered exposed or eroding out of **intact superficial overburden** (topsoils) during the construction phase, it will in all probability resemble modern- looking, but more or less lithified animal bones and teeth and it will most likely be those belonging to bovids (very common, late Neogene 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).

- The decision regarding the EA Application must be communicated to SAHRA and uploaded to the SAHRIS Case application.
- In the meantime, *ex situ* remains (fossils that were exposed and removed during the 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.
- *In situ* material remains (fossils that were identified or exposed, but not removed during the construction phase) must be kept in place and protected from further damage by covering it with light but rigid object like a box, bucket or metal sheet until further confirmation by the palaeontologist.

Archaeological Chance Finds Protocol for Developer

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).

- In the meantime, *potential archaeological structures such as stone-build enclosures, buildings or graves* must be avoided by a no-go buffer zone until further confirmation by the archaeologist. Smaller *in situ* material must be kept in place and protected from further damage by covering it with light but rigid object like a box, bucket or metal sheet.
- 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

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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 region.

Heritage Context	Heritage Resources	Impact
Palaeontology	Precambrian shallow marine and lacustrine stromatolites, organic-walled microfossils, Ghaap Plateau (Transvaal Supergroup) Palaeozoic and Mesozoic fossil remains, e.g. Karoo Supergroup Neogene regolith	Road cuttings, agricultural developments, Quarry excavation Bridge, road and pipeline construction (Quaternary alluvial deposits)
Archaeology Early Stone Age Middle Stone Age LSA - Herder Historical	Types of sites that could occur in the Free State include: Localized Stone Age sites containing lithic artifacts, animal and human remains found near <i>inter alia</i> the following: River courses/springs Stone tool making sites Cave sites and rock shelters Freshwater shell middens Ancient, kraals and stonewalled complexes Abandoned areas of past human settlement Burials over 100 years old Historical middens Structural remains Objects including industrial machinery and aircraft	Subsurface excavations including ground levelling, landscaping, foundation preparation, road building, bridge building, pipeline construction, construction of electrical infrastructure and alternative energy facilities, township development.
History	Historical townscapes, e.g. Kimberley Historical structures, i.e. older than 60 years Historical burial sites Places associated with social identity/displacement, e.g. Witsieshoek Cave, Oppermansgronde Historical mission settlements, e.g. Bethulie, Beersheba, Moffat Mission	Demolition or alteration work. New development.
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.	Demolition or alteration work. New development.
Relic Landscape Context	Battle and military sites, e.g. Magersfontein Precolonial settlement and burial sites Historical graves (marked or unmarked, known or unknown) Human remains (older than 100 years) Associated burial goods (older than 100 years) Burial architecture (older than 60 years)	Demolition or alteration work. New development.

Table 2. Examples of heritage resources located in the central interior of South Africa.

Historically, archaeologically and palaeontologically significant heritage sites & landscapes	Examples
Landscapes with unique geological or palaeontological history	Karoo Basin Beaufort Group sedimentary strata Glacial striations on Ventersdorp andesites Vredefort Dome World Heritage Site. Taung 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. Ghaap Plateau
Relic landscapes with evidence of past, now discontinued human activities	Wonderwerk Cave Stone Age deposits Cave sites and rock shelters in the Maluti Drakensberg region (rock art) Southern Highveld pre-colonial settlement complexes. Dithakong settlement complexes Rock engravings on Ventersdorp andesites
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). Kimberley
Battlefield Sites, burial grounds and grave sites older than 60 years.	Sannaspos Magersfontein

Table 3. Summary of impacts within the proposed study area.

Impact	Extent of Development	Duration	Probability of impact	Confidence	Mitigation	Rating
Impact of proposed development on palaeontological heritage	Local	Permanent	Low; Sterile superficial deposits (T-Qc, Qs); Mbizane Formation conglomerates & tillites	High	Phase 1 Evaluation	C (GP.C)
Impact of proposed development on archaeological heritage	Local	Permanent	Low: No <i>aboveground</i> evidence of <i>in situ</i> archaeological features, graves or structures older than 60 years	High	Phase 1 Evaluation	C (GP.C)

Table 4. 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 2. Aerial view of the study area.



Figure 3. General view of the study area looking northeast (above), east (below left) and south (below right).

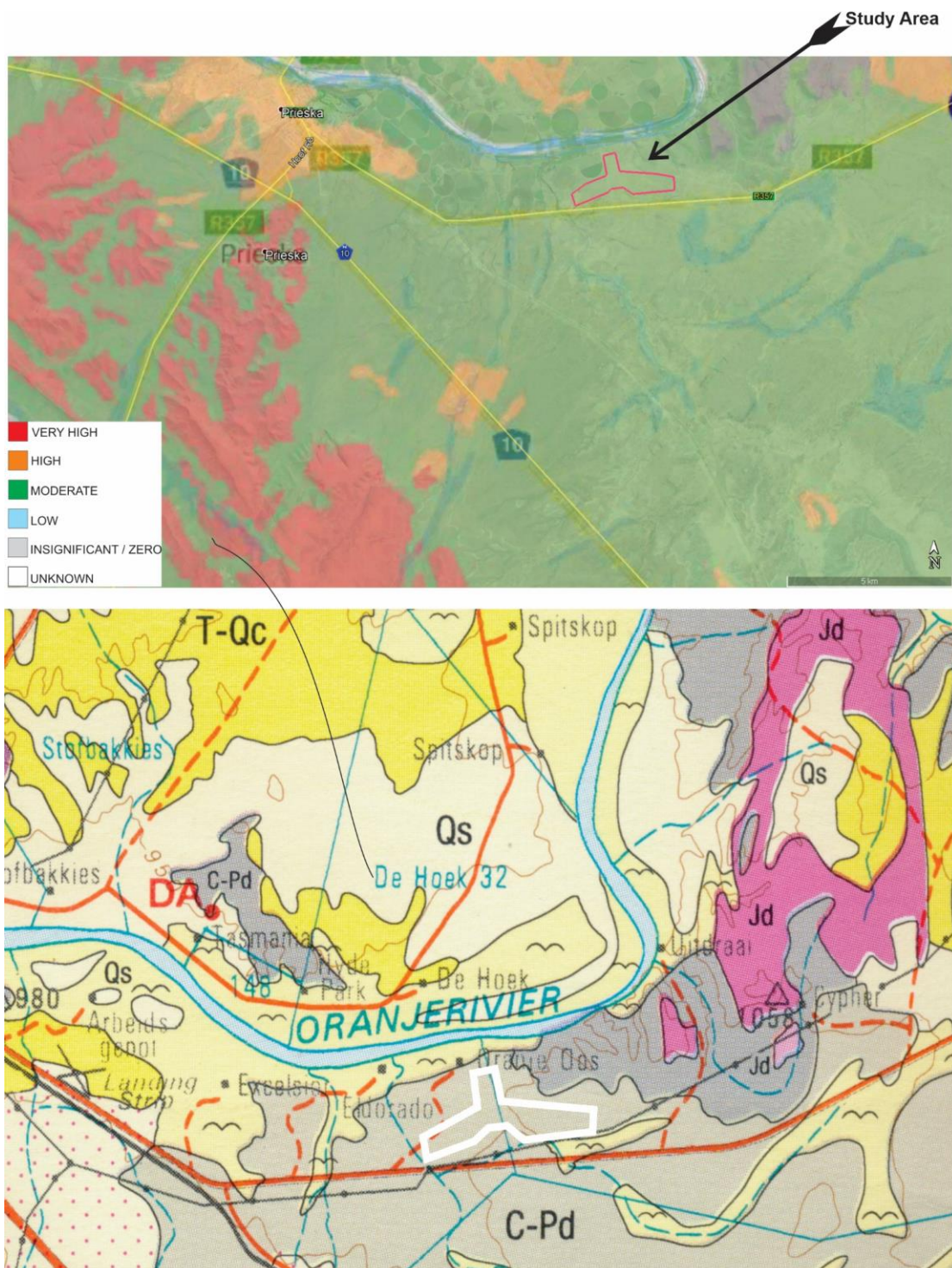


Figure 4. SAHRIS palaeosensitivity map of the area (above). According to the 1:250 000 scale geological map 2922 Prieska (below), the study area (white polygon) is primarily underlain by localized outcrops of the Karoo Supergroup, Mbizane Formation (*C-pd*), covered by variable clasts of surface gravels, Quaternary aeolian sands (*Qs*) and sandy soils.



Fig 5. Uncapped Stone Age surface scatters previously recorded on Orange River terraces between Douglas and Prieska (farms Marksdrift, Brakfontein, Nuwejaarsspruit and Kliphuis). ESA handaxe (above left), MSA parallel flake blade (above right), MSA Levallois core (below left & center) and LSA radial core (below right).

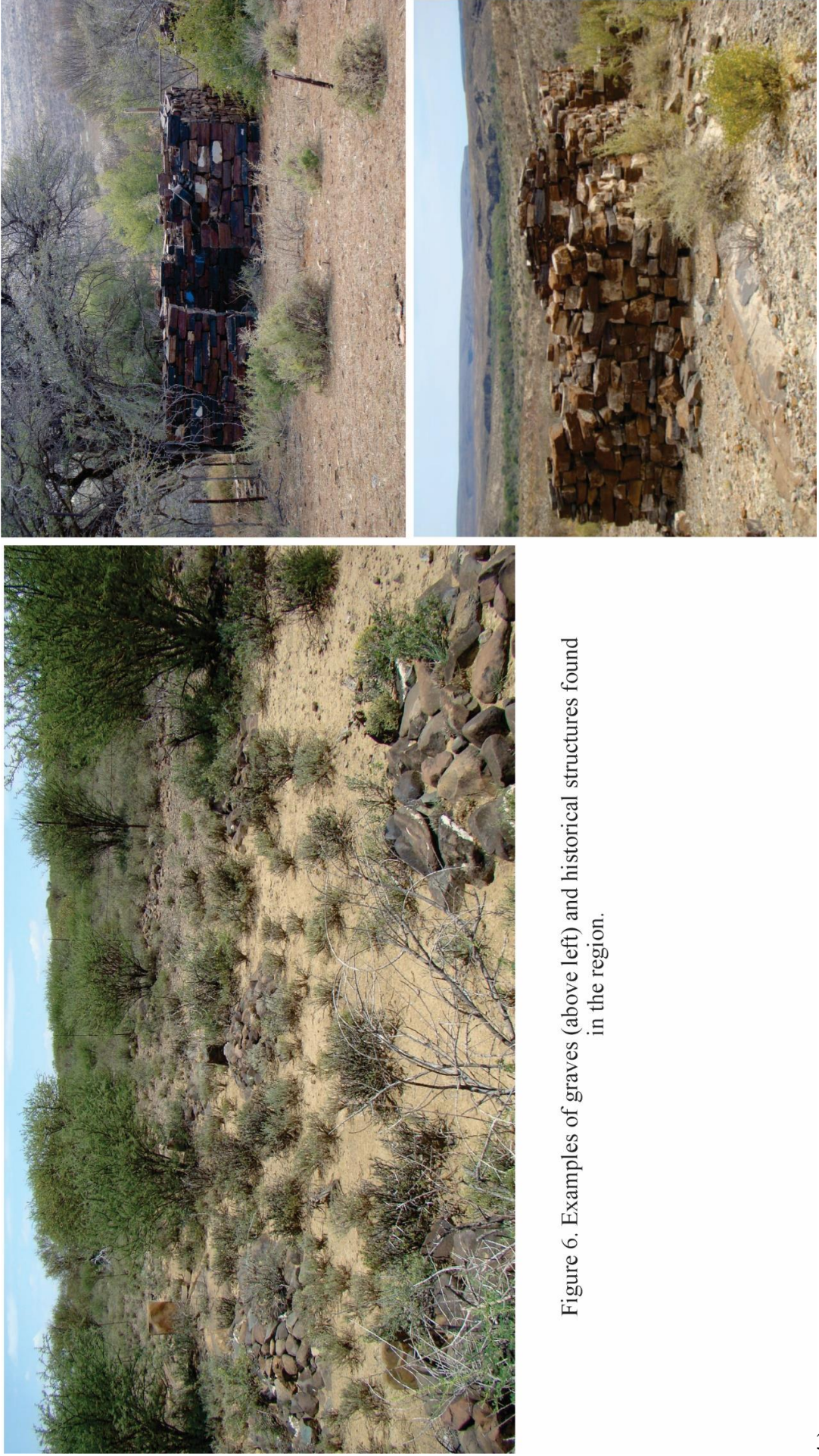


Figure 6. Examples of graves (above left) and historical structures found in the region.

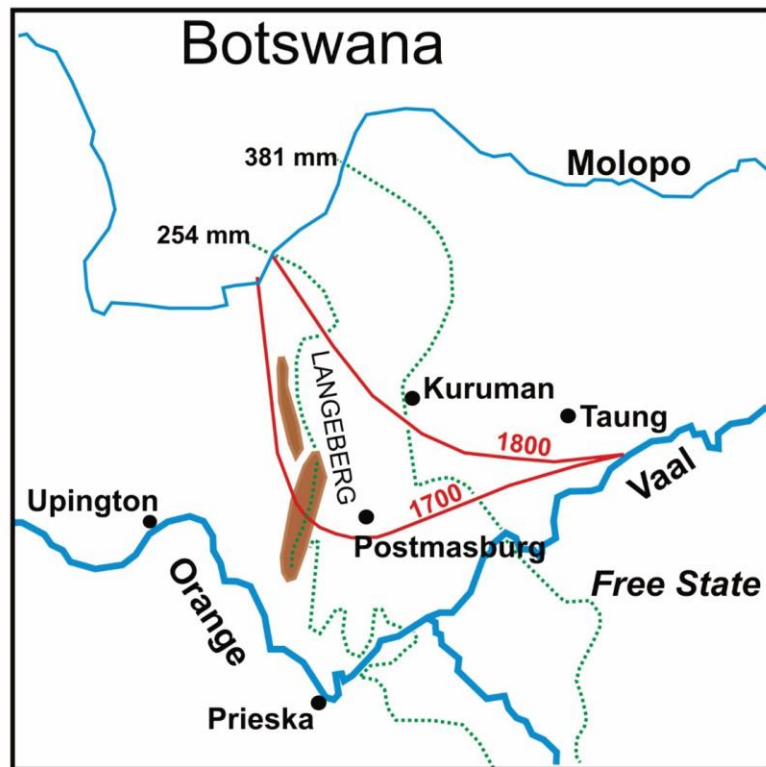
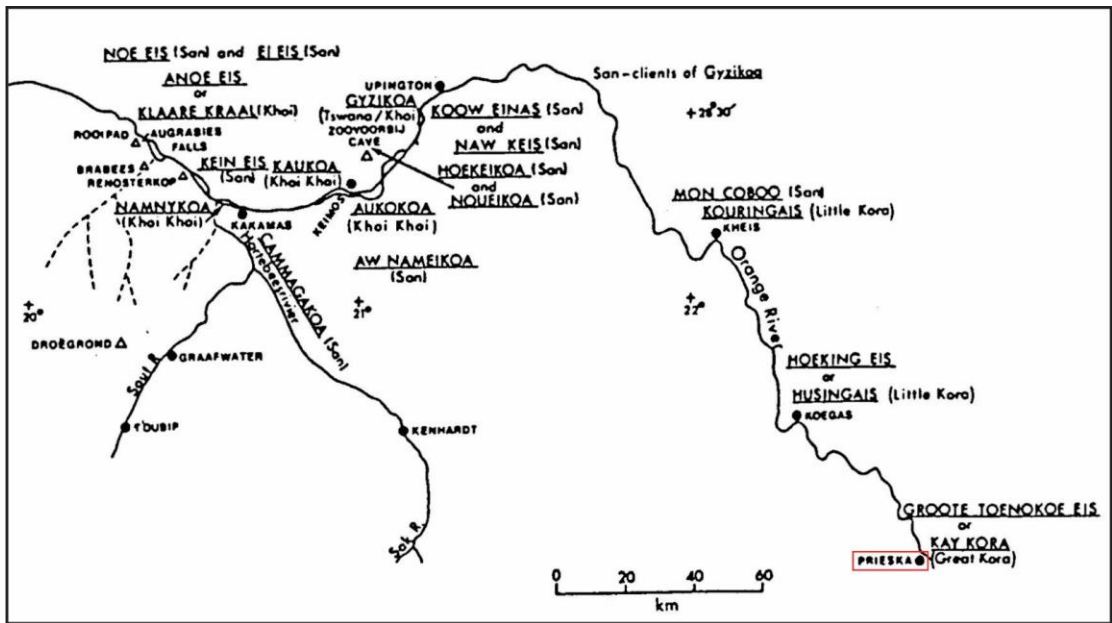


Figure 7. Distribution of Khoisan communities during the 18th century between Prieska and Kakamas (after Penn 1995) and southern limits of Tswana settlement during the 18th and 19th centuries (after Humphreys 1976).



Figure 8. Mbizane Formation conglomerates (above left), covered by variable clasts of bedrock-derived, surface gravels (above right & center), reworked calcretes ($T-Q_c$, below left) and thick deposits of Quaternary aeolian sand (Q_s , below right & center).
Scale 1 = 10 cm.



Figure 9. Layout showing degraded vs. undisturbed areas (above). One isolated and highly weathered, informal stone tool.
Scale 1 = 10 cm.