Phase 1 Heritage Impact Assessment for proposed new Petrol Station on farm Platfontein 68, Kimberley, NC Province.

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Summary

A Phase 1 Heritage Impact Assessment was carried out for a proposed new petrol station development on the farm Platfontein 68, near Kimberley, NC Province. The site covers a 3 ha area situated on relatively high ground just southwest of the large Platfontein playa, next to the R31 provincial road between Kimberley and Barkley West. The study area comprises low topography terrain, primarily affected by low impact human activity, including littering and pedestrian movement (informal paths and tracks). Proposed development will primarily affect wind-blown sandy topsoil underlain by dolerite bedrock and localized surface calcretes, not considered palaeontologically significant. In accordance with the types and ranges of heritage resources as outlined in the National Heritage Resources Act (No 25 of 1999), there is no aboveground evidence for historical structures or material of cultural significance, archaeological or palaeontological. The site is assigned a heritage rating of General Protection C. It is advised that the proposed development can proceed provided that all related actions are strictly confined to the demarcated footprint.

Contents

Introduction

A Phase 1 Heritage Impact Assessment was carried out for a proposed new petrol station development on the farm Platfontein 68, near Kimberley, NC Province (**Fig. 1**). The extent of the proposed development (over 5000 m2) falls within the requirements necessary for a Heritage Impact Assessment (HIA) as required by Section 38 (Heritage Resources Management) of the South African National Heritage Resources Act (Act No. 25 of 1999). The site visit and subsequent assessment took place in February 2014. The task involved identification of possible archaeological and palaeontological sites or occurrences in the proposed zone, an assessment of their significance, possible impact by the proposed development and recommendations for mitigation where relevant.

Methodology

The palaeontological and archaeological significance of the affected area was evaluated via a desktop study using existing field data, database information, published literature and geological maps. This was followed up with a field assessment by means of a pedestrian survey and investigation of exposures and outcrop within the footprint. A Garmin Etrex Vista GPS hand model (set to the WGS 84 map datum) and a digital camera were used for recording purposes. Site significance classification standards, as prescribed by SAHRA, were used for the purpose of this evaluation (**Table 1**).

Description of the Affected Area

Maps: 1:50 000 topographical map 2824 DA Barkley West

1:250 000 geological map 2824 Kimberley

General Site Coordinates (**Fig. 2**):

A) 28°42'25.61"S 24°40'35.12"E
B) 28°42'29.99"S 24°40'40.63"E
C) 28°42'33.52"S 24°40'37.22"E
D) 28°42'28.95"S 24°40'31.47"E

The site covers a 3 ha area situated next to the R31 provincial road between Kimberley and Barkley West on the farm Platfontein 68 (**Fig. 2 & 3)**.

Background

Palaeontology

From oldest to youngest, the geology around the affected area is made up of Permian Ecca shales (Prince Albert Formation, *Ppr*), Jurassic dolerite intrusions (*Jd,* Karoo Dolerite Suite), Quaternary calcretes, surface limestones/calcretes (*Qc*) and Kalahari Group aeolian sands (*Qs*) (**Fig. 4**).

Basinal strata of the Prince Albert Formation from the lowermost Ecca Group (*Pw*), outcropping to the north of the development footprint, potentially contains fossil-bearing, laminated mudrocks with petrified wood, invertebrates, fish, coprolites and palynomorphs from calcareous concretions previously recorded near Douglas (Anderson 1976, McLachlan 1976, Visser *et al.,* 1977-78)**.**

The occurrence of Plio-Pleistocene fossil remains is largely restricted to the alluvial gravel terraces of the Vaal River northeast of Kimberly and overbank sediments of the Modder and Riet Rivers situated to the east (Cooke 1949; Maglio and Cooke 1978; Partridge and Maud 2000; Churchill *et al.* 2001; Rossouw 2006). Gravel terraces of the Vaal River contain sandy lenses that have yielded several extinct vertebrate taxa.

Archaeology

The heritage footprint in the region is primarily represented by Stone Age sites and assemblages, either capped or occurring as surface occurrences, rock engraving sites, glacial pavements and structural remnants dating back to the Kimberley Diamond Rush of the 1870's and the Anglo Boer War (**Fig. 5**). The early exploitation of the Vaal River Gravels by diamond diggers and the resulting development of infrastructure in the

region exposed a wealth of archaeological sites that contributed to the development of prehistoric archaeology in southern Africa (Sohnge *et al*. 1937; Helgren 1979; Beaumont and Morris 1990; Forssman et al. 2010). As a result, Stone Age archaeological sites in the region are generally associated with, and mostly restricted to a variety of lacustrine contexts as well as the alluvial gravel terraces of the Vaal River. Some important sites located within 40 km of study area include

- an abundance of Fauresmith and Acheulian artifact assemblages found in an andesite cobble and worn exotics matrix capped by a thick layer of red sand at Nooitgedacht near The Bend on the Vaal;
- an abundance of Acheulian artifact assemblages found in thick calcrete deposits at Doornlaagte (a declared national monument), some 20 km east of Schmidtsdrif.
- the famous Nooitgedacht Glacial Pavements situated near the banks of the Vaal River consisting of multiple striations on amygdaloidal Ventersdorp andesite that was produced by an ice age that commenced in early Carboniferous times. In addition to the glacial striations the site is also known for its rock engravings.
- ESA and MSA stone tools uncovered during mining operations between 1930 and 1955 at Pniel (Powers Site) near Nooitgedacht.
- Canteen Koppie, which is the location of the first alluvial diamond diggings in South Africa that continued up until the 1920's. Proclaimed a National Monument in 1948, the alluvial gravels capping the underlying bedrock at the site has yielded a wealth of ESA stone tools while MSA lithics have been recovered from within the layer of red sands overlying the terrain.
- A large number of *Fauresmith* bifaces occuring *in situ* within Quaternary-age surface deposits at Kromrand (Lebensraum) 22 km southwest of Boshof, shows extent of southeastern distribution of ESA between the Vaal and Modder Rivers.
- A vast number of rock engravings in the region (e.g. Wildebeestfontein), that are consistently found on dolerite.

Also, while dolerites are not considered palaeontologically significant, they can be a valuable archaeological resource since Stone Age lithic artefacts in the region 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 often found near dolerite-shale contact zones.

The lower Vaal River basin region was central to the dynamics of colonial expansion along the Northern Cape frontier zone and its impact on the Khoisan societies of the Cape interior (Penn 2005). The proposed development footprint is located west northwest of Kimberley's historical Diamond Route as related to the Kimberley Diamond Rush of the 1870's (Morton 1877; Williams 1902; Van Zyl 1986). Diamonds were discovered on the farms Dorstfontein and Dutoitspan in 1870 and at Bultfontein and Vooruitzicht in 1871 (**Fig. 6).** The first diamond mines became known as Old De Beers Mine. Later that year miners from the Old De Beers Mine discovered what would become the richest diamond mine in the world, namely the Kimberley Mine (Big Hole), known initially as New Rush or Colesberg Kopje. Another rich diamond deposit was discovered on the farm Benaauwdheidsfontein in 1890, later to become known as the Wesselton Mine.

Major battles occurred between the British and Boer forces in late 1899 south of the study area. In November 1899, British general Methuen successfully fought the Boers at Belmont, Graspan and Modder River, while the Boers defeated the British forces at Magersfontein in December 1899 (Amery 1905; Von der Heyde 2013).

Field Assessment

The affected area lies on relative high ground, just southwest of the large Platfontein playa and within a dolerite outcrop area (Karoo Dolerite Suite) that is capped by Quaternary-age surface calcretes and aeolian sand (**Fig. 7**). Unlike the Wildebeestkuil rock engraving site located about 5 km to the northwest, the study area comprises low topography terrain, primarily affected by low impact human activity, including littering and pedestrian movement (informal paths and tracks). There are no indications of open site, Stone Age accumulations, rock engravings, or prehistoric structures within the footprint area. There is also no evidence of informal graves or historical structures older than 60 years within the confines of the footprint.

Impact Statement & Recommendation

The proposed development will primarily affect wind-blown sandy topsoil underlain by dolerite bedrock and localized surface calcretes, not considered palaeontologically significant. In accordance with the types and ranges of heritage resources as outlined in

the National Heritage Resources Act (No 25 of 1999), there is no aboveground evidence for historical structures or material of cultural significance, archaeological or palaeontological. The site is assigned a heritage rating of General Protection C (**Table 1**). It is advised that the proposed development can proceed provided that all related actions are strictly confined to the demarcated footprint.

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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 and have no interest in secondary or downstream developments as a result of the authorization of this project.

Yours truly,

September 2022

Tables & Figures

Table1. 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

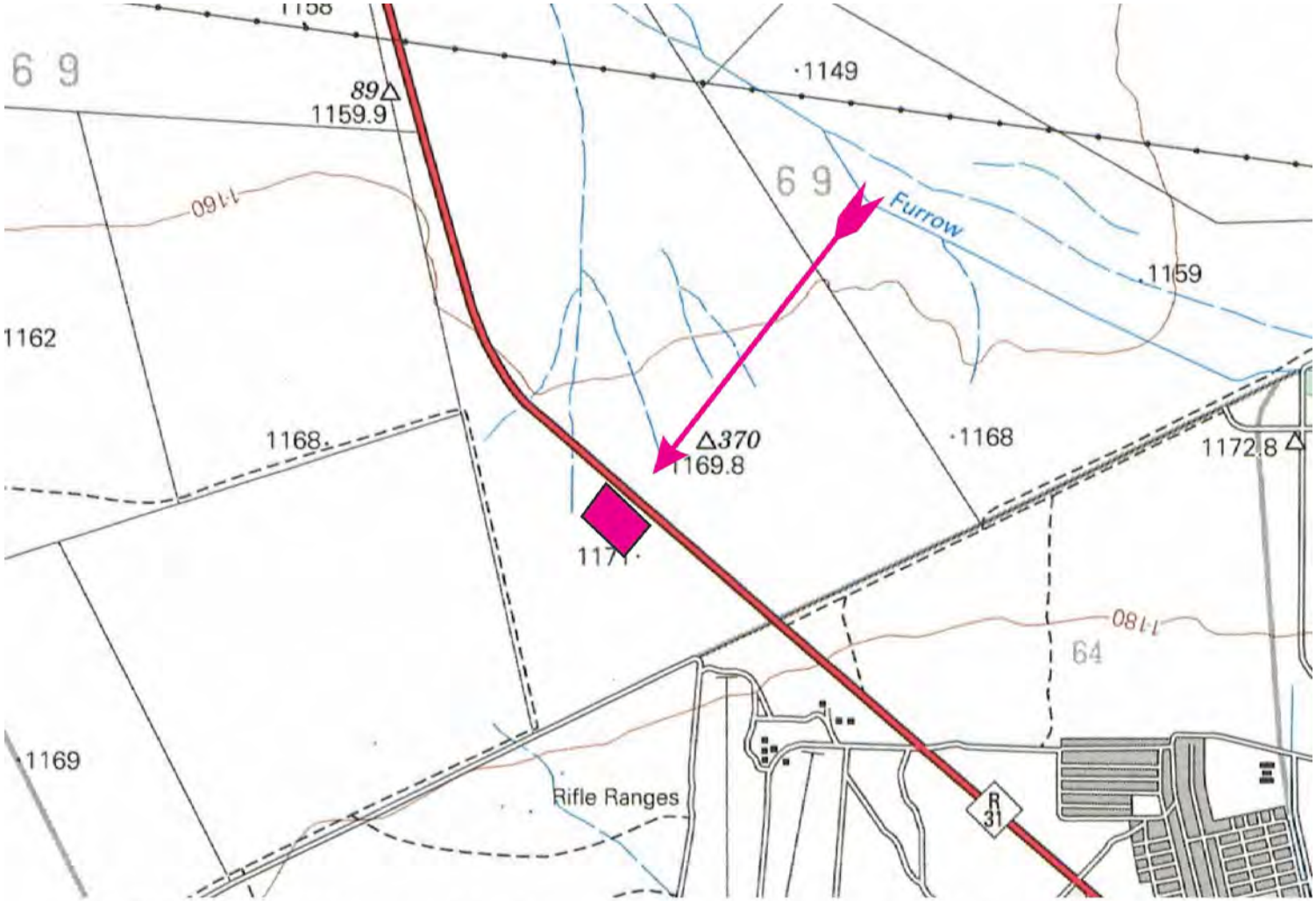


Figure 1. Map of the proposed development area marked on portion of 1:50 000 scale topographic map 2824DA Barkley West.

Figure 2. Aerial view and layout of the proposed study area.

Figure 3. General view of the terrain, looking south (east) and northeast (below).

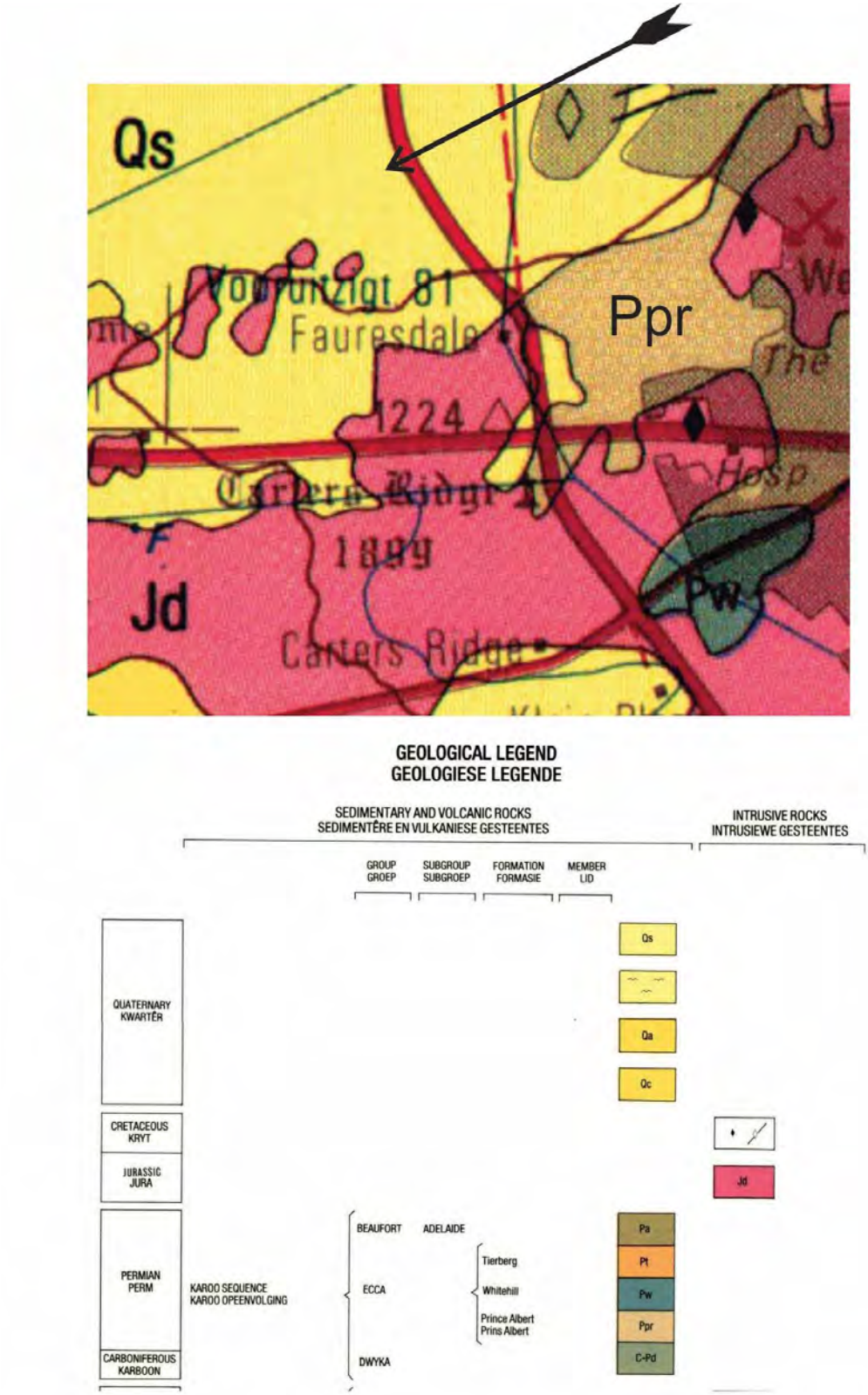
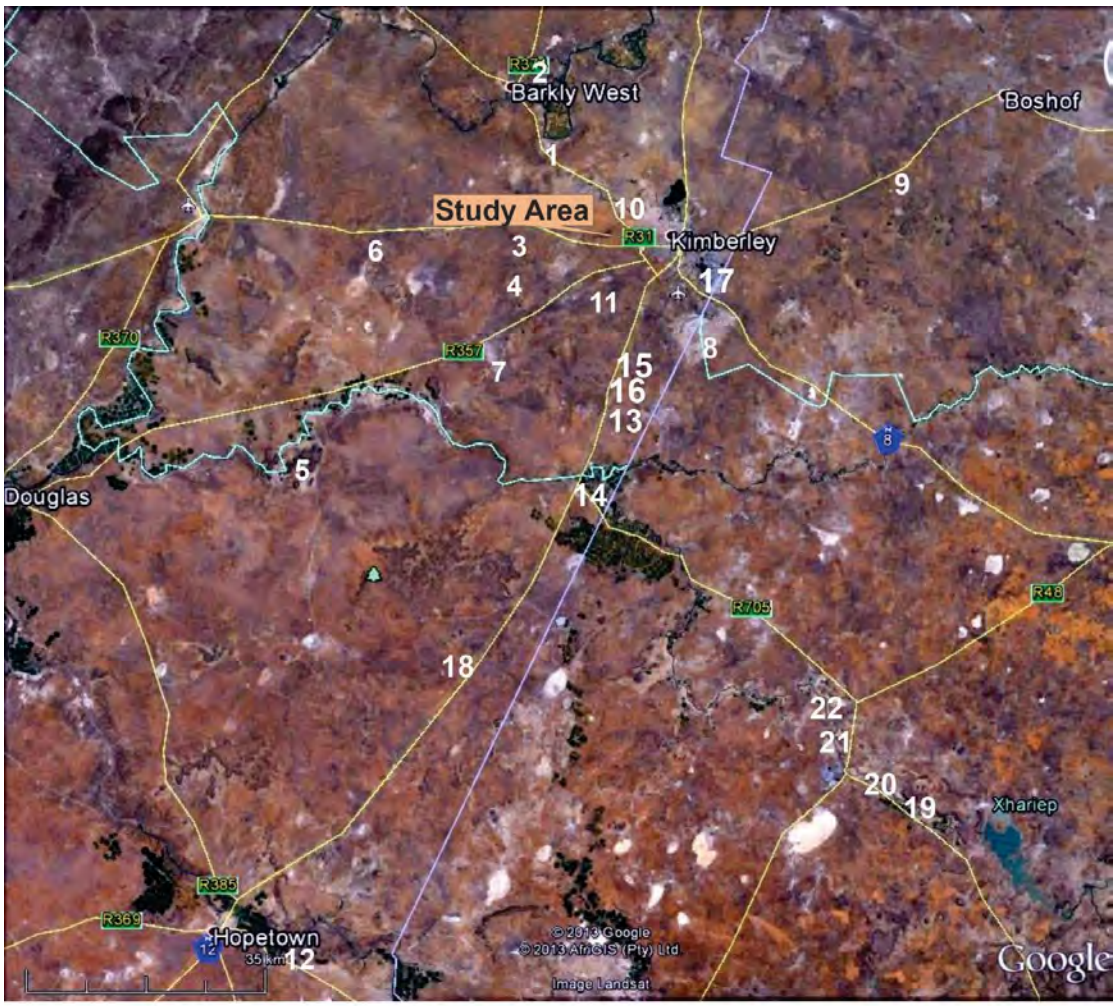


Figure 4. According to 1:250 000 scale geological map 2824 Kimberley, geology in the area is represented by Permian Ecca shales (Prince Albert Formation, *Ppr*) , Jurassic dolerite intrusions (*Jd*, Karoo Dolerite Suite), Quaternary calcretes, surface limestones/calcretes (*Qc*) and Kalahari Group aeolian sands (*Qs)*.



1. Pniel, Nooitgedacht & Powers Site - ESA, MSA and LSA
2. Canteen Koppie - ESA
3. Rooidam - ESA
4. Biesiesput - MSA
5. Driekopseiland - Glacial striations, Rock engravings
6. Doornlaagte - ESA
7. Kareevloer - ESA, MSA
8. Alexandersfontein - 'palaeo-lake'
9. Liebensraum - ESA
10. Wildebeestkuil - Rock engravings
11. Witpan - Rock engravings
12. Orange River Station, Blockhouse & Concentration Camp - Anglo-Boer War
13. Battle of Magersfontein - Anglo-Boer War
14. Battle of Modder River - Anglo-Boer War
15. Graveyard - Anglo-Boer War
16. Fortifications - Anglo-Boer War
17. Beaconsfield historical landscape
18. Battle of Graspan & Enslin - Anglo-Boer War
19. Florisian fossil vertebrate locality
20. Florisian fossil vertebrate locality
21. Type R settlement
22. Type R settlement

Figure 5. Distribution of heritage sites in the region.

Figure 6. Overlay of Kimberley's historically significant mining areas as related to the Kimberley Diamond Rush of the 1870's (modified from General planof the diamond fieldsin Report of the Surveyor of Mines dated February 28th 1883.

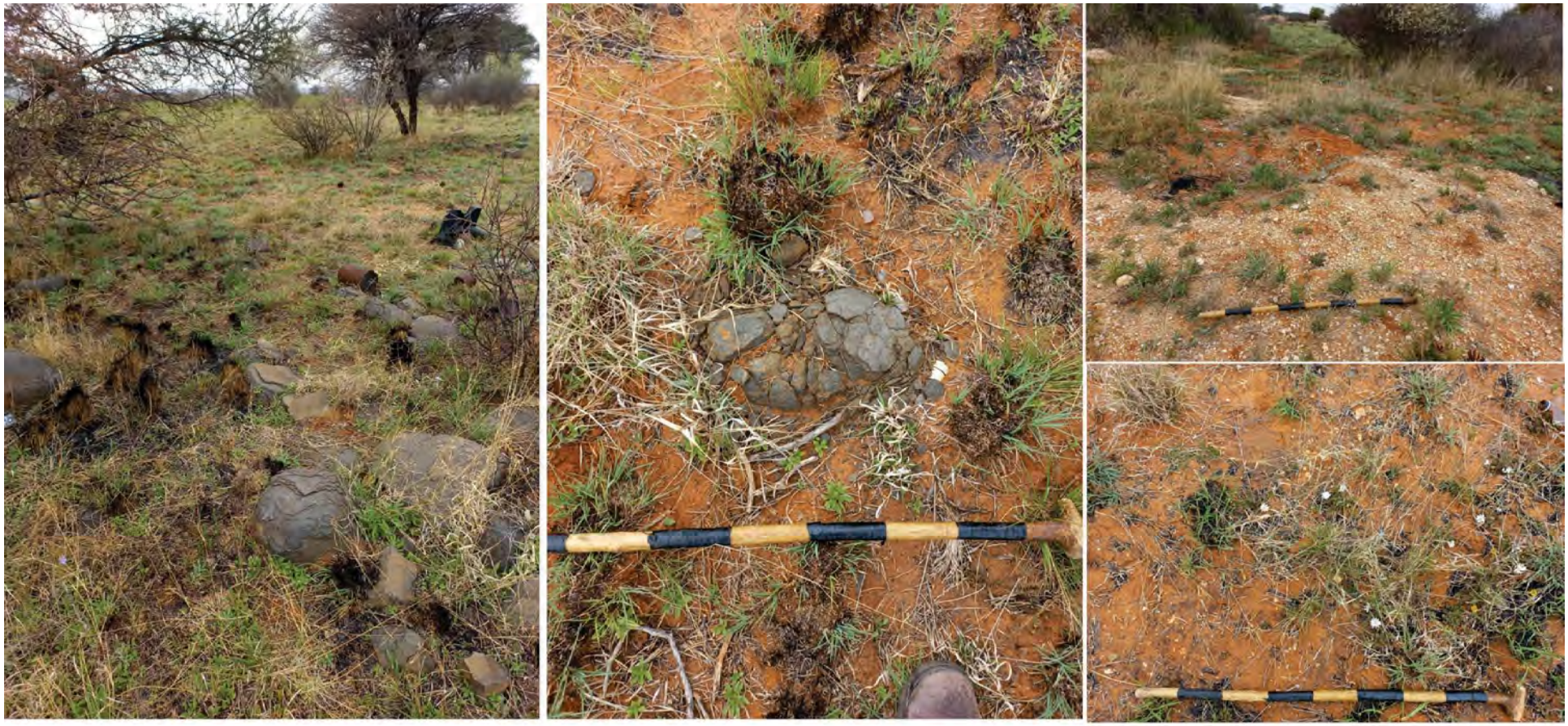


Figure 7. Dolerite outcrop (left & center) capped by geologically recent surface calcretes (top right) and aeolian sand (below right). Scale 1 = 10 cm.

Appendix 1 – Survey Track Log

Index	Coordinates
1	S28 42.446 E24 40.570
2	S28 42.614 E24 40.617
3	S28 42.614 E24 40.617
4	S28 42.552 E24 40.688
5	S28 42.552 E24 40.688
6	S28 42.470 E24 40.606
7	S28 42.470 E24 40.606
8	S28 42.551 E24 40.628
9	S28 42.551 E24 40.628
10	S28 42.583 E24 40.556
11	S28 42.583 E24 40.556
12	S28 42.615 E24 40.575
13	S28 42.615 E24 40.575
14	S28 42.508 E24 40.496
15	S28 42.508 E24 40.496
16	S28 42.536 E24 40.550
17	S28 42.464 E24 40.553
18	S28 42.483 E24 40.515