

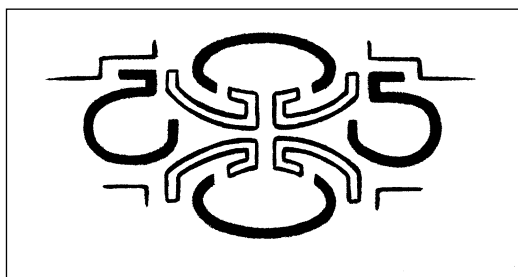
Cultural Heritage Impact Assessment:

Phase 1 Investigation for a Proposed Environmental Authorisation Application of Mr Petrus Van Der Walt Vermeulen for the proposed Prospecting Right for the prospecting of Diamonds Alluvial (DA), Diamonds General (D), Diamonds in Kimberlite (DK) and Diamonds (DIA) on Portion 3 of the Farm Deelfontein 237 RD near Hopetown, Thembelihle Local Municipality, Pixley Ka Seme District Municipality, Northern Cape



For

Project Applicant Petrus Van Der Walt Vermeulen	Environmental Consultant Milnex 189 CC P.O. Box 1086 4 Botha Street Schweizer-Reneke 2780 Tel No: (018) 011 1925 Fax No: (053) 963 2009 e-mail: christiaan@milnex-sa.co.za
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By
Francois P Coetzee
Heritage Consultant
ASAPA Professional Member No: 028
99 Van Deventer Road, Pierre van Ryneveld,
Centurion, 0157
Tel: (012) 429 6297
Fax: (012) 429 6091
Cell: 0827077338
coetzfp@gmail.com

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Executive Summary

This report contains a comprehensive heritage impact assessment investigation in accordance with the provisions of Sections 38(1) and 38(3) of the *National Heritage Resources Act* (Act No. 25 of 1999) (NHRA) and focuses on the survey results from a cultural heritage survey as requested by Milnex CC. Milnex CC was contracted by Mr Petrus Van Der Walt Vermeulen as the independent environmental consultant to undertake the Basic Assessment Report (BAR) and EMPr process for a prospecting right for the prospecting of Diamonds Alluvial (DA), Diamonds General (D), Diamonds in Kimberlite (DK) and Diamonds (DIA) on Portion 3 of the Farm Deelfontein 237 RD near Hopetown, Thembelihle Local Municipality, Pixley Ka Seme District Municipality, Northern Cape. The Basic Assessment Report (BAR) and EMPr process for Environmental Authorisation for the proposed diamond prospecting is conducted in terms of the National Environmental Management Act (Act No. 107 of 1998) (NEMA).

Site No	Site Type	Field Rating of Significance	Direct Impacts	Significance of Impact before Mitigation	Significance of Impact after Mitigation	Proposed Mitigation
1	Historical house complex	Historical livestock enclosures	Generally protected C: Low significance	80 (High)	5 (Low)	<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase
2	Historical house complex	Rock Art (engravings)	Generally protected A: High significance	80 (High)	5 (Low)	<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase
3	Historical house complex	Historical livestock enclosures	Generally protected C: Low significance	80 (High)	5 (Low)	<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase
4	Graveyard	Historical livestock enclosure	Generally protected B: Medium significance	80 (High)	5 (Low)	<ul style="list-style-type: none"> Fenced off and gate installed Maintain a buffer zone of 50 metres during prospecting phase
5	Historical house complex	Historical farmhouse complex	Generally protected B: Medium significance	80 (High)	5 (Low)	<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase
6	Historical stone kraals	Graveyard	Generally protected A: High significance	80 (High)	5 (Low)	<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase
7	Historical stone kraals	Historical livestock enclosures (with spring)	Generally protected C: Low significance	80 (High)	5 (Low)	<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase
8	Historical house complex	Historical farm house complex with enclosures	Generally protected C: Low significance	80 (High)	5 (Low)	<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase
9	Historical house complex	Rock art (engravings)	Generally protected A: High significance	80 (High)	5 (Low)	<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase

A total of nine sites were recorded during the survey which include one graveyard (Site 6) and six historical farmhouse complexes and other historical structures (Sites 1, 3, 4, 5, 7 and 8) and two large rock art sites (Sites 2 and 9). The historical farmhouses and other associated structures mostly date to the late 1800s to early 1900s and are associated with early farming activities. However, some of the headstones in the graveyard date to early 1800s which indicate a possible earlier occupation window in area. Early maps confirm that by the late 19th century the farms were already well established. Please note that the Doctor's Kraal complex is associated with a veterinary service that was provided probably from the 1890s. Although most sites correlate or overlap, note that the survey conducted by Van Ryneveld (2013a) recorded a total of 27 sites. This adds to the high density of the distribution of heritage sites on the farm.

In this regard please note the following proposed mitigation measures:

- Take note of the position of the existing heritage sites;
- A buffer zone of 50 metres should be maintained;
- The graveyard should be fenced off with a gate installed; and
- Care should be taken to prevent any indirect impacts on the historical structures.

It is therefore recommended, from a cultural heritage perspective that the proposed prospecting initiatives may proceed, dependent on adherence to the proposed mitigation measures.

Also, please note:

If the exhumation and reburial of the graveyards are envisaged it will entail social consultation and permit application. Other legislative measures which may be pertinent include the Removal of Graves and Dead Bodies Ordinance (Ordinance No. 7 of 1925), Regulations Relating to the Management of Human Remains (GNR 363 of 22 May 2013) made in terms of the National Health Act No. 61 of 2003, Ordinance on Exhumations (Ordinance No. 12 of 1980) as well as any local and regional provisions, laws and by-laws that may be in place. Note that unmarked graves are by default regarded as older than 60 years and therefore falls under the NHRA (Act No. 25 of 1999, Section 36).

Archaeological deposits usually occur below ground level. Should archaeological artefacts or skeletal material be revealed in the area during development activities, such activities should be halted, and a university or museum notified in order for an investigation and evaluation of the find(s) to take place (*cf.* NHRA (Act No. 25 of 1999), Section 36 (6)).

Definitions and abbreviations

Midden:	Refuse that accumulates in a concentrated heap.
Stone Age:	An archaeological term used to define a period of stone tool use and manufacture
Iron Age:	An archaeological term used to define a period associated with domesticated livestock and grains, metal working and ceramic manufacture
LIA:	Late Iron Age sites are usually demarcated by stone-walled enclosures
NHRA:	National Heritage Resources Act (Act No. 25 of 1999)
SAHRA:	South African Heritage Resources Agency
SAHRIS:	South African Heritage Resources Information System
PHRA-G:	Provincial Heritage Resources Authority - Gauteng
GDARD:	Gauteng Department of Agriculture and Rural Development
HIA:	Heritage Impact Assessment
DMR:	Department of Mineral Resources
I&APs:	Interested and Affected Parties

I, Francois Coetzee, hereby confirm my independence as a cultural heritage specialist and declare that I do not have any interest, be it business, financial, personal or other, in any

proposed activity, application or appeal in respect of the listed environmental processes, other than fair remuneration for work performed on this project.



Francois P Coetzee
Cultural Heritage Consultant
Accredited Archaeologist for the SADC Region
Professional Member of ASAPA (CRM Section) Reg no: 28

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1. Introduction and Terms of Reference

Milnex CC was contracted by Mr Petrus Van Der Walt Vermeulen as the independent environmental consultant to undertake the BAR and EMPr process for the proposed prospecting right application without bulk sampling for the prospecting of Diamond (Alluvial), Diamond (General), Diamonds (Kimberlite) & Diamonds (DIA) including associated infrastructure on Portion 3 of the Farm Deelfontein 237 RD. The property is located approximately 28 km west of Hopetown in the Northern Cape Province. The Basic Assessment Report (BAR) and EMPr process for Environmental Authorisation for the proposed diamond prospecting is conducted in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA). A Cultural Heritage Impact Assessment (HIA) was requested by Milnex CC on behalf of the client to evaluate the potential impact of the proposed diamond prospecting activities. Reference number for the project: NC30/5/1/1/2/13048PR.

2. Objectives

The general objective of the cultural heritage survey is to record and document cultural heritage remains consisting of both tangible and intangible archaeological and historical artefacts, structures (including graves), settlements and oral traditions of cultural significance.

As such the terms of reference of this survey are as follows:

- Identify and provide a detailed description of all artefacts, assemblages, settlements and structures of an archaeological or historical nature (cultural heritage sites) located on the study area,
- Estimate the level of significance/importance of these remains in terms of their archaeological, historical, scientific, social, religious, aesthetic and tourism value,
- Assess any impact on the archaeological and historical remains within the area emanating from the development activities, and
- Propose recommendations to mitigate heritage resources where complete or partial conservation may not be possible and thereby limit or prevent any further impact.

3. Description of Physical Environment of Study Area

The heritage survey focussed on areas situated approximately 28 km west of Hopetown, south of Kimberley.

Farm Name(s) and Portions	<ul style="list-style-type: none"> • Farm Deelfontein 237 RD <ul style="list-style-type: none"> ○ Portion 3
Size of Survey Area	2291.7235 hectares
Magisterial District	Pixley Ka Seme District Municipality Thembelihle Local Municipality
1:50 000 Map Sheet	2923BD
1:250 000 Map Sheet	2922
Central Coordinates of the Development	23.88583°E 29.46888°S

Table 1: Physical Environment

The survey area falls patricianly within the Savanna Biome, particularly the Eastern Kalahari Bushveld Bioregion and more specifically the Kimberley Thornveld (SVk 4). This vegetation type occurs mostly in the Kimberley, Hartswater, Bloemhof and Hoopstad Districts as well as

substantial parts of the Warrenton, Christiana, Taung, Boshof and to some extent the Barkly West Districts. Also includes pediment areas in the Herbert and Jacobsdal Districts. The central section of the survey footprint falls within the Savanna Biome, particularly the Eastern Kalahari Bushveld Bioregion and more specifically the Vaalbos Rocky Shrubland (SVk 5) This vegetation type occurs in the Northern Cape and Free State Provinces and also to some extent along solitary hills and scattered ridges east of the confluence of the Orange and Vaal Rivers, mainly in the Kimberley and Herbert Districts and west of a line bounded by the western Free State towns of Luckhoff, Petrusburg, Dealesville, Bultfontein and Hertzogville. The western section of the survey area falls patricianly within the Nama-Karoo Biome, particularly the Upper Karoo Bioregion and more specifically the Northern Upper Karoo (Nku3). This vegetation type occurs mostly in the Northern Cape and Free State Provinces and further in the northern regions of the Upper Karoo plateau from Prieska, Vosburg and Carnarvon in the west to Philipstown, Petrusville and Petrusburg in the east. Bordered in the north by Niekerkshoop, Douglas and Petrusburg and in the south by Carnarvon, Pampoenpoort and De Aar. A few patches occur in Griqualand West (Mucina & Rutherford 2006).

The survey footprint is characterised by open and flat plains, slightly undulating plains and some hills. Infrastructure consists of the several gravel roads that provide access to the area, as well as power lines, fences, and extensive agricultural fields (both used and fallow). The eastern border of the farm is indicated by the Orange River. Note that the area has been mined along the rocky outcrops near the Orange River.

The climate of the region near Hopetown has summer and autumn rainfall and very dry winters. Rainfall ranges from about 300 mm in the southwest to about 500 mm in the northeast. Frost occurs frequently in winter. Mean monthly maximum and minimum temperatures for Kimberley 37.5°C and -4.1°C for January and July, respectively.

Current Zoning	Agricultural (Cultivation) Sheep grazing (pastoralism)
Economic activities	Farming and mining
Soil and basic geology	Shales of the Volksrust Formation and to a lesser extent the Prince Albert Formation (both of the Ecca Group) as well as Dwyka Group diamictites form the underlying geology. Jurassic Karoo Dolerite sills and sheets support this vegetation complex in places. Wide stretches of land are covered by superficial deposits including calcretes of the Kalahari Group. Soils are variable from shallow to deep, red-yellow, apedal, freely drained soils to very shallow Glenrosa and Mispah forms. Mainly Ae, Ag and Fc land types. A highly fragmented area on Ecca and Dwyka Group sediments and Karoo dolerites as well as on Ventersdorp Supergroup lavas (Allanridge Formation). Extensive dolerite sills which form ridges, and plateaus and slopes of koppies and small escarpments mark the erosion terraces. These dolerite sills cover alternating layers of mudstone and sandstone of sedimentary origin. Prominent soil forms are the stony Mispah and gravel-rich Glenrosa forms derived from Jurassic dolerite, calcrete-rich soils cover the lowlands (Kimberley and Plooyburg forms) (Mucina & Rutherford 2006).
Prior activities	Livestock farming and agriculture Mining

Socio Economic Environment	The population has grown from 15 705 in 2011 to 16 230 in 2016, which represents a population growth of 0.75% per annum.
Evaluation of Impact	An evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits NHRA (Act No. 25 of 1999, Section 38(3d)): Positive

Table 2: Socio-economic environment

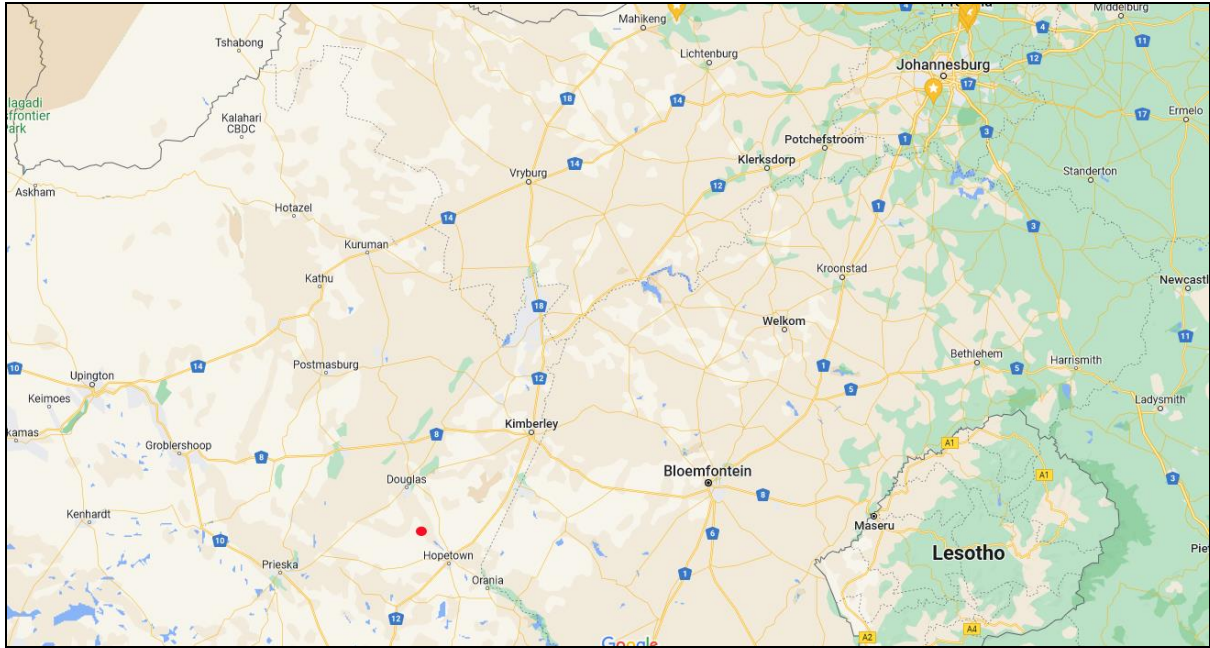


Figure 1: Regional context of the survey footprint located north west of Hopetown (indicated by the red area)

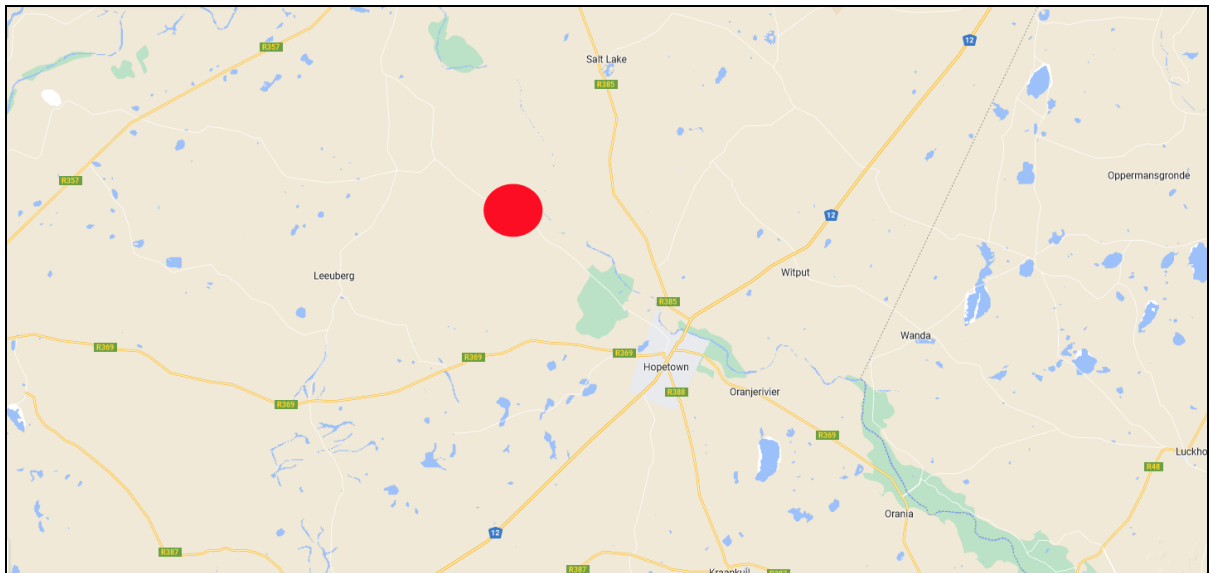


Figure 2: Local context of the survey area located north west of Hopetown (indicated by the red area)

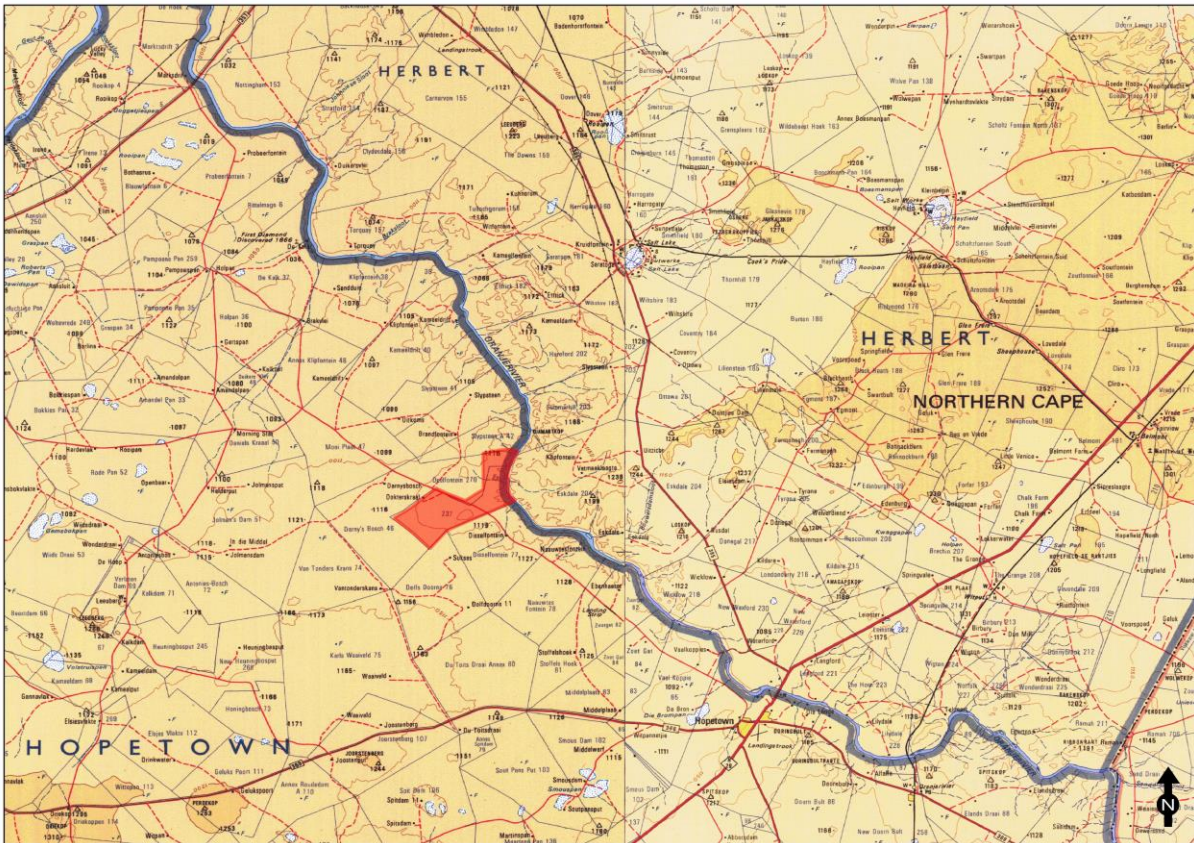


Figure 3: Local context of the survey footprint (1:250 000 Map 2724)

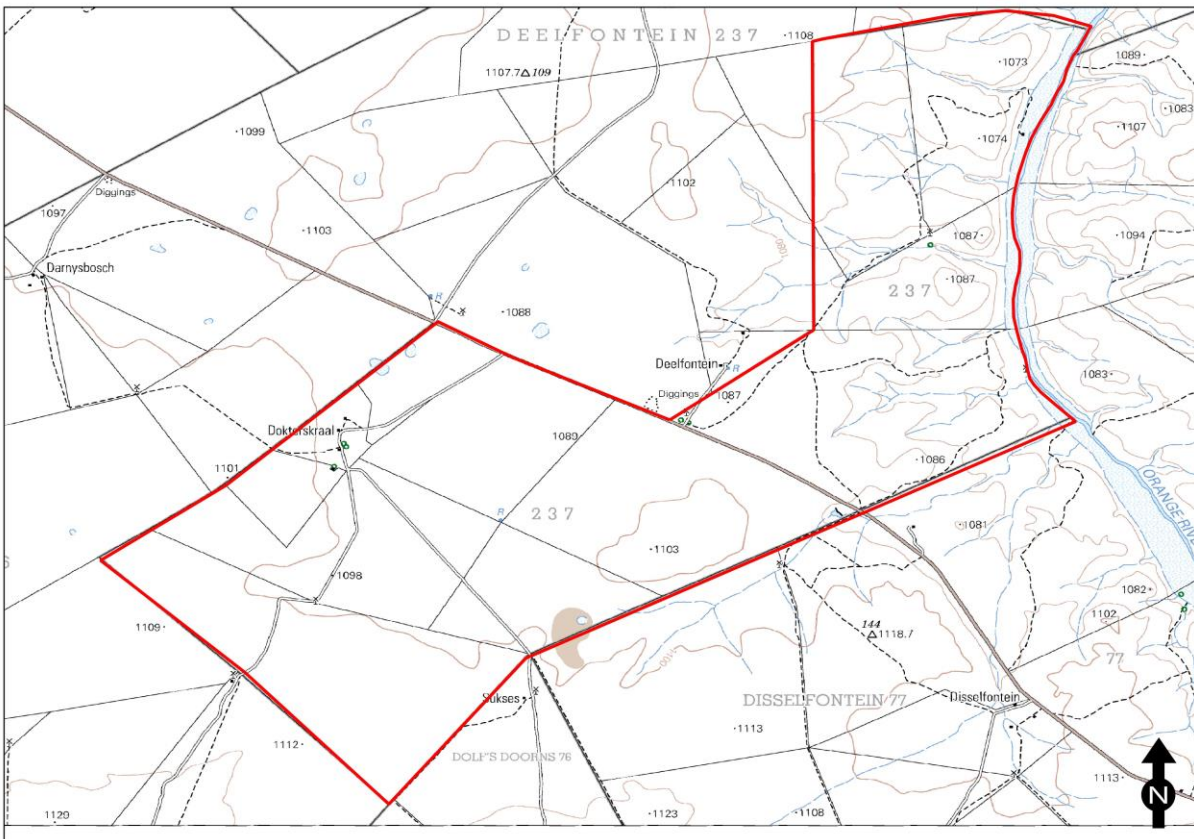


Figure 4: The survey area as indicated on the 1:50 000 topographic map 2923BD (2005)



Figure 5: Regional view of the survey area as indicated on Google Earth Pro (2022)



Figure 6: Detail of survey area indicating location near the Orange River (Google Earth Pro: 2022)



Figure 7: General view of the survey footprint with the rocky outcrops along the Orange River



Figure 8: General view of the survey footprint with the rocky outcrops along the Orange River



Figure 9: General view of the survey footprint with the rocky outcrops along the Orange River

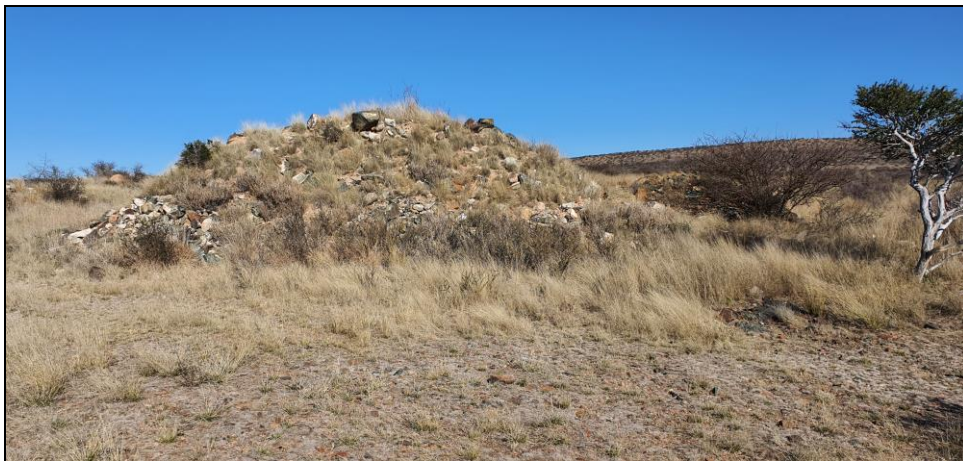


Figure 10: General view of the existing mining activities in the eastern section of the survey footprint



Figure 11: General view of the existing mining activities in the eastern section of the survey footprint



Figure 12: General view of the existing infrastructure within the survey footprint

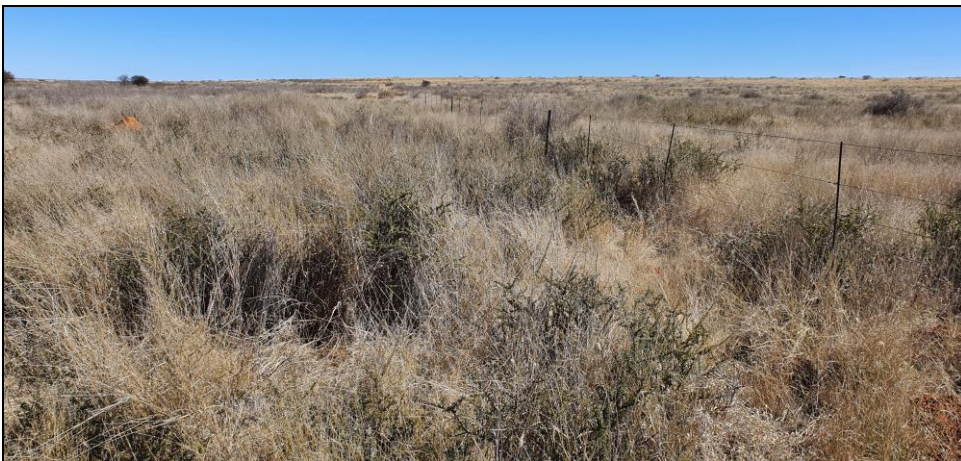


Figure 13: General view of the central section of the survey footprint



Figure 14: General view of the eastern section of the survey footprint



Figure 15: General view of the eastern section of the survey footprint

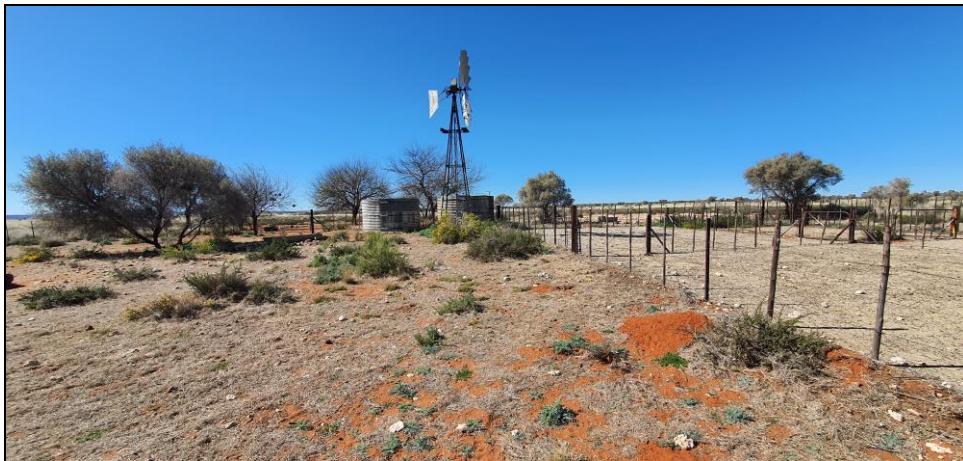


Figure 16: General view of the existing infrastructure within the survey footprint



Figure 17: General view central section of the survey footprint



Figure 18: General view of the eastern section of the survey footprint



Figure 19: General view of the western section of the survey footprint

4. Proposed Project Description

The proposed prospecting of Diamonds Alluvial (DA), Diamonds General (D) and Diamonds (DIA) will entail the following activities:

Pitting: Pits shall be dug, locked, sampled and backfilled. To dig the pits, the applicant shall make use of the systems of the appointed geologist.

The applicant shall at the end of the pitting process have locked the pits with the following information:

- A description of the soil and rock types from ground level to the base of the pits;
- Record of rock head depth and refusal depth, a list of where the samples will be taken, a record of where ground water seepage will be recorded;
- A general note of the geologist and conditions in the vicinity of the test pit.

Calculations:

It is planned that 50 pits will be dug (it may be less depending on the results) at an extent of 3m (length) x 2m (breadth) x 4m (depth).

- $(50 \text{ pits} / 24 \text{ months}) \times 12 \text{ months} = 25 \text{ pits dug per year}$
- $25 \text{ pits} \times (3\text{m} \times 2\text{m}) / 10\,000 = 0.015 \text{ Ha disturbed per year}$
- $50 \text{ pits} \times (3\text{m} \times 2\text{m}) / 10\,000 = 0.03 \text{ Ha disturbed}$

Drilling:

It is estimated that 200 boreholes shall be drilled by the appointed contractor. Percussion drilling methods will be used to drill boreholes at varying depths ranging from 90-150m with hole diameters of at least 150mm. The drilling programme shall be done in accordance with procedures and protocols drawn up by the appointed geologist. Drilling shall be carried out by using a Volvo drilling machine. The drill will be under constant observation to determine the depth estimates of the lithological contacts. Each sample shall be logged based upon macroscopic examination of the drill cuttings.

The holes will be drilled on a 100 m by 100 m grid on the target areas identified during phase 1 and phase 2.

Calculations

According to the PWP the diameter of the borehole will be 150mm and 200 boreholes will be drilled. The disturbance of each borehole was calculated at 2m x 2m.

- $2\text{m} \times 2\text{m} = 4\text{m}^2$ (From mm to m)
- $4\text{m}^2 \times 200 \text{ boreholes} = 800\text{m}^2$
- $800\text{m}^2 / 10\,000 = 0.08\text{ha}$
- $0.08\text{ha} / 2 \text{ years} = 0.04\text{ha}$

5. Legal Framework

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE APPLIED
The Constitution of the Republic of South Africa (Act No. 108 of 1996)	
The National Environmental Management Act (Act No. 107 of 1998)	Section 24 Section 28
The National Water Act (Act No. 36 of 1998)	Section 21 (a)(b)
Regulation 2, Appendix 2 of Governmental Notice Regulation (GNR) 982	Appendix 2 (a-l)
Air Quality Act (Act No. 39 of 2004)	Section 21
National Forests Act, Act of 84 of 1998	Chap 3 (Part 1), Section 12(1), Section 15(1)
The National Heritage Resources Act (Act No. 25 of 1999)	Section 38, 34, 35, 36
Conservation of Agricultural Resources Act (Act No. 85 of 1983)	
Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)	
The National Water Act (Act No. 36 of 1998);	Section 2
Mine Health and Safety Act (Act No. 29 of 1996) (MHSA)	

Biodiversity Act (Act 10 of 2004)	
National Infrastructure Plan	

Table 3: Legal framework

NAME OF ACTIVITY (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc E.g. for mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (GNR 324, GNR 325 or GNR 326)
<p>Prospecting near watercourse</p> <p>Drilling It is estimated that 200 boreholes shall be drilled by the appointed contractor. Percussion drilling methods will be used to drill boreholes at varying depths ranging from 90-150m with hole diameters of at least 150mm.</p> <p>Pitting 50 pits: 3m (length) x 2m (breadth) x 4m (depth).</p> <p>Listing Notice 1: GNR 327, Activity 19: The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from: i) a watercourse;</p>	Extent of the proposed portions are 2291.7235 Ha Concurrent backfilling will take place in order to rehabilitate.	X	Listing Notice 1, (GNR327), Activity 19

<p>Prospecting Right without bulk sampling:</p> <p>Drilling It is estimated that 200 boreholes shall be drilled by the appointed contractor. Percussion drilling methods will be used to drill boreholes at varying depths ranging from 90-150m with hole diameters of at least 150mm.</p> <p>Pitting 50 pits: 3m (length) x 2m (breath) x 4m (depth).</p> <p>Listing Notice 1: GNR 327, Activity 20: “Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including— (a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource[,] ; or [including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)] (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing</p>	<p>Extent of the proposed portions are 2291.7235 Ha Concurrent backfilling will take place in order to rehabilitate.</p>	<p>X</p>	<p>Listing Notice 1 (GNR 327), Activity 20</p>
<p>Clearance of indigenous vegetation:</p> <p>Drilling It is estimated that 200 boreholes shall be drilled by the appointed contractor. Percussion drilling methods will be used to drill boreholes at varying depths ranging from 90-150m with hole diameters of at least 150mm.</p> <p>Pitting 50 pits: 3m (length) x 2m (breath) x 4m (depth).</p> <p>Listing Notice 1: GNR 327, Activity 27: "The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation."</p>	<p>Extent of the proposed portions are 2291.7235 Ha Concurrent backfilling will take place in order to rehabilitate.</p>	<p>X</p>	<p>Listing Notice 1 (GNR 327), Activity 27</p>

<p>Clearance of indigenous vegetation:</p> <p>Drilling It is estimated that 200 boreholes shall be drilled by the appointed contractor. Percussion drilling methods will be used to drill boreholes at varying depths ranging from 90-150m with hole diameters of at least 150mm.</p> <p>Pitting 50 pits: 3m (length) x 2m (breadth) x 4m (depth).</p> <p>Listing Notice 3: GNR 324, Activity 12: "The clearance of an area of 300 square metres or more of indigenous vegetation. (g) Northern Cape (ii) Within critical biodiversity areas identified in bioregional plans;"</p>	<p>Extent of the proposed portions are 2291.7235 Ha Concurrent backfilling will take place in order to rehabilitate.</p>	<p>X</p>	<p>GNR. 324, Listing Notice 3, Activity 12</p>
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Table 4: Listing notices

- Section 38 of the NHRA (Act No. 25 of 1999) stipulates that the following activities trigger a heritage survey:

Development criteria in terms of Section 38(1a-e) of the NHRA (Act No. 25 of 1999)	Yes/No
Construction of road, wall, powerline, pipeline, canal or other linear form of development or barrier exceeding 300m in length	No
Construction of bridge or similar structure exceeding 50m in length	No
Development exceeding 5000 m ² in extent	Yes
Development involving three or more existing erven or subdivisions	No
Development involving three or more erven or divisions that have been consolidated within past five years	No
Rezoning of site exceeding 10 000 m ²	No
Any other development category, public open space, squares, parks, recreation grounds	No

Table 5: Activities that trigger Section 38 of the NHRA

- Field rating system as recommended by SAHRA:

Field Rating	Grade	Significance	Recommended Mitigation
National Significance	Grade I	High significance	Conservation by SAHRA, national site nomination, mention any relevant international ranking. No alteration
Provincial Significance	Grade II	High significance	Conservation by provincial heritage authority, provincial site nomination. No alteration whatsoever without permit
Local Significance	Grade III-A	High significance	Conservation by local authority, no alteration whatsoever without permit from provincial heritage authority. Mitigation as part of development process not
Local Significance	Grade III-B	High significance	Conservation by local authority, no external alteration without permit from provincial heritage authority. Could
Generally Protected A	Grade IV-A	High/medium significance	Conservation by local authority. Site should be mitigated before destruction. Destruction permit required from
Generally Protected B	Grade IV-B	Medium significance	Conservation by local authority. Site should be recorded before destruction. Destruction permit required from provincial heritage authority.
Generally Protected C	Grade IV-C	Low significance	Conservation by local authority. Site has been sufficiently recorded in the Phase 1 HIA. It requires no further recording before destruction. Destruction permit

Table 6: Field rating system to determine site significance

- Heritage resources have lasting value in their own right and provide evidence of the origins of South African society and they are valuable, finite, non-renewable and irreplaceable.
- All archaeological remains, features, structures and artefacts older than 100 years and historic structures older than 60 years are protected by the relevant legislation, in this case the **National Heritage Resources Act (NHRA) (Act No. 25 of 1999, Section 34 & 35)**. The Act makes an archaeological impact assessment as part of an EIA and EMPR mandatory (see **Section 38**). No archaeological artefact, assemblage or settlement (site) may be moved or destroyed without the necessary approval from the **South African Heritage Resources Agency (SAHRA)**. Full cognisance is taken of this Act in making recommendations in this report.
- Cognisance will also be taken of the Mineral and Petroleum Resources Development Act (Act No 28 of 2002) and the National Environmental Management Act (Act No 107 of 1998) when making any recommendations.
- Human remains older than 60 years are protected by the NHRA, with reference to Section 36. Human remains that are less than 60 years old are protected by the Regulations Relating to the Management of Human Remains (GNR 363 of 22 May 2013) made in terms of the National Health Act No. 61 of 2003 as well as local Ordinances and regulations.
- With reference to the evaluation of sites, the certainty of prediction is definite, unless stated otherwise.
- The guidelines as provided by the NHRA (Act No. 25 of 1999) in Section 3, with special reference to subsection 3, and the Australian ICOMOS (International Council on Monuments and Sites) Charter (also known as the Burra Charter) are used when determining the cultural significance or other special value of archaeological or historical sites.
- A copy of this report will be submitted on SAHRIS as stipulated by the National Heritage Resources Act (NHRA) (Act No. 25 of 1999), Section 38 (especially subsection 4) and the relevant Provincial Heritage Resources Authority (PHRA).
- Note that the final decision for the approval of permits, or the removal or destruction of sites, structures and artefacts identified in this report, rests with the SAHRA (or relevant PHRA).

6. Study Approach/Methodology

Geographical information (ESRI shapefiles) on the proposed prospecting areas was supplied by Milnex 189 CC. The most up-to-date Google Earth images and topographic maps were used to indicate the survey area. Topographic maps were sources from the Surveyor General. Please note that all maps are orientated with north facing upwards (unless stated otherwise).

The strategy during this survey was to survey all the farms that form part of the application. The intension was therefore to conduct a detailed pedestrian (foot) and predictive survey of the survey footprint.

Please note that the owner of the farm was present during the survey and due to extensive knowledge of the heritage sites, assisted in the location of known heritage sites.

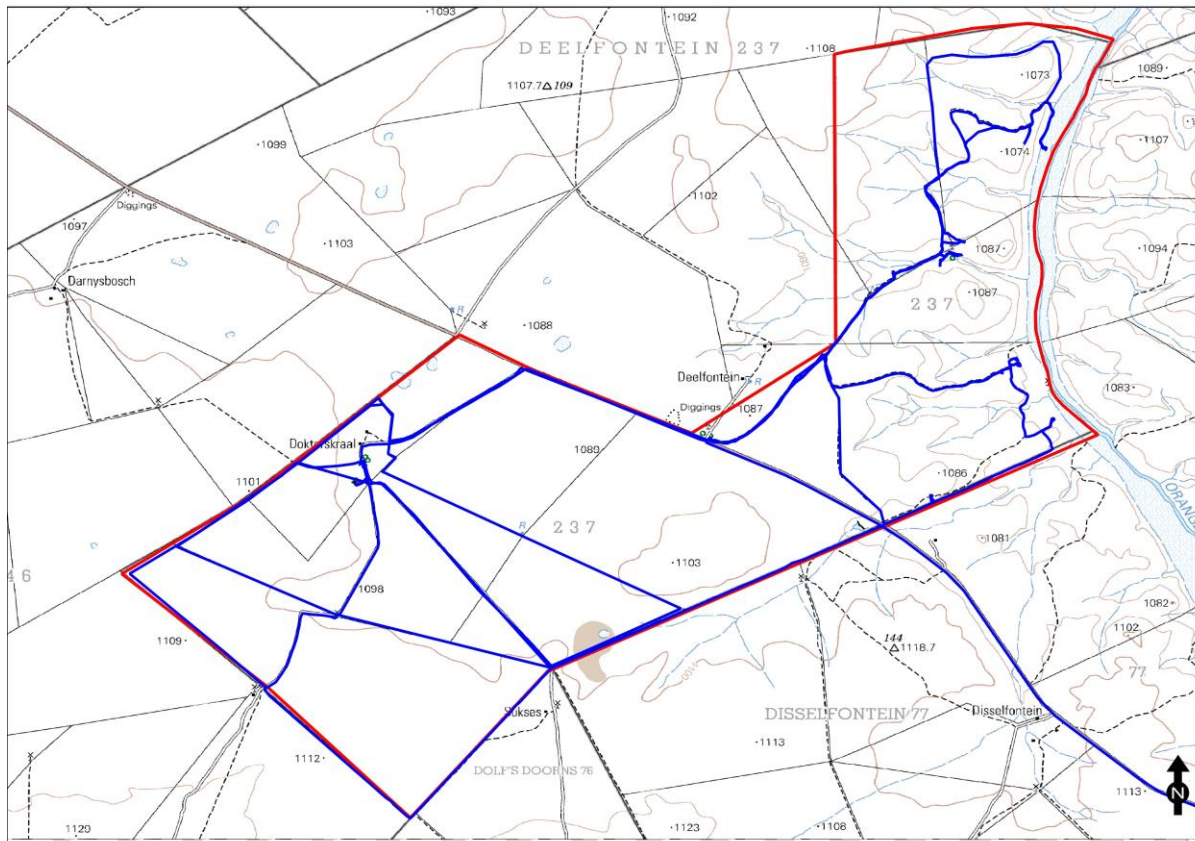


Figure 20: Recorded survey tracks for the project

6.1 Review of existing information/data

Additional information on the cultural heritage of the area was sourced from the following records:

- National Mapping Project by SAHRA (which lists heritage impact assessment reports submitted for South Africa);
- Environmental Potential Atlas (ENPAT);
- Online SAHRIS database;
- National Automated Archival Information retrieval System (NAAIRS);
- Maps and information documents supplied by the client; and
- Several heritage surveys have been conducted in the vicinity of the survey area (published and unpublished) material on the area (Dreyer 2005)

Several heritage impact assessments have been completed in the general vicinity of the survey area, also note that one survey also included the eastern portion of the current survey (see Van Ryneveld 2013a and 2013b).

The SAHRIS database listed the following surveys conducted in the area:

- Beaumont, P.B. 2005. Heritage Study for an EMP Covering a Portion of the Remainder of Kransfontein 19, Northern Cape Province.

- Beaumont, P.B. 2007. Phase 1 Heritage Impact Assessment Report on the Farm Riets Drift 18, on the South Bank of the Orange River Between Douglas and Prieska, Karoo District Municipality, Northern Cape Province.
- Dreyer, C. 2005. Archaeological and Cultural Heritage Investigation of the Proposed Wigton – Osborne Eskom Power Line Route, near Hopetown, Northern Cape.
- Dreyer, C. 2007. First Phase Archaeological and Cultural Heritage Assessment of the Proposed Borrow Pit Sites and R385 Road Upgrading Between Douglas and Campbell, Northern Cape.
- Dreyer, C. 2008. Archaeological and Cultural Heritage Assessment of the Proposed MTN Mast at the Farm Elandsdraai 88, near Orange River Station, Hopetown District, Northern Cape.
- Dreyer, C. 2008. First Phase Archaeological and Cultural Heritage Assessment of the Proposed Diamond Prospecting Developments at the Farm Kameeldrift 40, Douglas, Northern Cape.
- Morris, D. 1997. Archaeological Impact Assessment for Gypsum Industries in Respect of Proposed Mining at Kraankuil on the Farms Zeerust and Springbokspoor.
- Morris, D. 2003. Archaeological Survey of the Farm Koodoosberg No.141, Northern Cape.
- Morris, D. 2005a. Archaeological Impact Assessment at Abrahamoos Fontein near Plooyburg, Northern Cape.
- Morris, D. 2005b. Archaeological Impact Assessment at Taaibosch Fontein near Plooyburg, Northern Cape.
- Morris, D. 2008. Report on a Phase 1 Archaeological Impact Assessment of the Proposed Prospecting on Uitkyk 106, Locks Verdiet 105 and Brakpan 107, West of Kimberley, Northern Cape.
- Van Schalkwyk, J.A. 2008. Heritage Impact Survey Report for the Development of Visitor Facilities in the Mokala National Park, Northern Cape Province.
- Van Ryneveld, K. 2004. Cultural Resources Management Impact Assessment: (Portions of) Ettrick 182, Hopetown District, Northern Cape, South Africa.
- Van Ryneveld, K. 2005a. Cultural Resources Management Impact Assessment: (Portions of) Leewpoort 161, Kimberley District, Northern Cape, South Africa.
- Van Ryneveld, K. 2005b. Cultural Heritage Impact Assessment: Erf 1, Douglas, Herbert.
- Van Ryneveld, K. 2005c. Cultural Heritage Site Inspection Report for the Purpose of a Prospecting Right EMP- (Portion of) De Kalk 37, Herbert District, Northern Cape, South Africa.
- Van Ryneveld, K. 2005d. Cultural Resources Management Impact Assessment Portions of Paardeberg 154, Kimberley.
- Van Ryneveld, K. 2005e. Cultural Resources Management Impact Assessment: Portion 1 of Roodepan 146, Kimberley District, Northern Cape, South Africa.
- Van Ryneveld, K. 2007a. Phase 1 Archaeological Impact Assessment Portions of Erf 1, Douglas, Herbert District, Northern Cape, South Africa.
- Van Ryneveld, K. 2007b. Phase 1 Archaeological Impact Assessment: A 1.1ha Mining Development, Portion of Erf 1, Douglas, Northern Cape, South Africa.
- Van Ryneveld, K. 2007c. Portion of Erf 314, Douglas, Herbert District, Northern Cape, South Africa.
- Van Ryneveld, K. 2008. Phase 1 Archaeological Impact Assessment: Diamond Mining, Portions of Erven 1 & 341, Douglas, Northern Cape, South Africa.

More recent heritage surveys in the region include:

- Kaplan; J. 2012. Archaeological Impact Assessment. The Proposed Disselfontein Keren Energy Solar Plant near Hopetown, Northern Cape Province.
- Morris, D. 2011a. Screening Phase Heritage Assessment of the Proposed PV Solar Park near Douglas, Northern Cape.
- Morris, D. 2011b. Archaeological Impact Assessment Phase 1: Gannahoek N12 Quarry near Hopetown, Northern Cape.
- Morris, D. Undated. Heritage Impact of the Proposed Douglas Solar Energy Project. Northern Cape. (Not an Original Report Name).
- Opperman, H. 2012. First Phase Archaeological and Cultural Heritage Assessment of the Proposed Residential Development of Portions 14 and 3 of the Farm Vluytjeskraal 149, District: Hopetown, Province: Northern Cape.
- Pelser, A. J. 2011. A Report on a Phase 1 Heritage Impact Assessment for Proposed Mining on the Farm Koedoeskloof in the Hay District, Northern Cape.
- Pelser, A. J. 2012. A Report on a Heritage Impact Assessment (HIA) For a Proposed Photovoltaic Solar Power Generation Plant on Klein Swartz Bast 188, Kenhardt District, Northern Cape.
- Pelser, A. J. and Van Vollenhoven, A. C. 2011. A Report on a Heritage Impact Assessment for the Upgrade of Transnets Glosam Siding for PMG'S Bishop Mine (Loading Bay) on Portion 2 and the Remainder of Gloucester 674 near Postmasburg, Tsantsabane Local Municipality, Northern Cape.
- Webley, L. & Orton, J. 2012. Heritage Impact Assessment Proposed Construction of the Graspan Photovoltaic Power Facility, Pixley Ka Seme District Municipality, Northern Cape Province.
- Van Ryneveld, K. 2013a. Phase 1 Archaeological Impact Assessment: The South Hydroelectric Power Site, Orange River, Thembilihle Local Municipality, Northern Cape, South Africa.
- Van Ryneveld, K. 2013b. Phase 1 Archaeological Impact Assessment: The North Hydroelectric Power Site, Orange River, Siyancuma Local Municipality, Northern Cape, South Africa

Also note that over 26 heritage sites are also listed on the McGregor Museum's database for the region.

The various surveys and reports consulted it seems the Stone Age record seems by far the most dominant in the region. On the farm Disselfontein Kaplan (2012) recorded a number of ESA bifaces and 2 handaxes and Pelser (2012) reported on additional ESA evidence from Klein Swartz Bast. The MSA record seems to dominate, often in association with LSA assemblages. MSA deposits were reported on by Kaplan (2012), Pelser (2011), Pelser & Van Vollenhoven (2011), Opperman (2012), Van Ryneveld (2005) and Webley & Orton (2012), while MSA and LSA mixed assemblages were reported on by Morris (2011), Pelser (2011, 2012) and Webley & Orton (2012). A rich local record on Rock Art engravings exists for the region, especially on the rocky outcrop along the Orange River. Recordings have been made by by Morris (2011) at the Gannahoek quarry near Hopetown.

Colonial Period records reflect both the farming and the mining history of the area: Opperman (2012) recorded a historical farmhouse (2012). Pelser & Van Vollenhoven (2011) reported on additional Colonial Period structures, while Webley & Orton (2012) reported on a number of features and historical dump material that may well reflect, at least in part, early Colonial mining activities and associated development in the region. Colonial Period graves

were reported on by Pelsler (2011), Opperman (2012) and Becker (2013). The history of Hopetown is intrinsically tied with the 1865 discovery of the 1st diamond in South Africa, the 23.25 carat 'Eureka' on the farm De Kalk. There is little doubt that diamonds literally created Hopetown, and when the boom ended the town declined into insignificance and almost weathered to oblivion. The town lies on the edge of the Great Karoo on an arid slope leading town to the Orange River and it is believed to have been named by the great explorer Colonel Robert Gordon, in honour of William Prince of Orange. Hopetown came into being in 1850 when Sir Harry Smith extended the northern frontier of the Cape to the mighty Orange and settlers started claiming land by 1854. Hopetown saw some action during the Anglo Boer War, at the skirmish at Houtkraal and a concentration camp is situated on the farm Doornbult. The Old Wagon route and the 1st bridge across the Orange, dating to 1871, carried traffic to the diamond fields and a blockhouse can still be seen standing on the banks of the Orange River (www.heritage.org.za/karoo/hope/htm).

According to the Surveyor General's database the farm Deelfontein 237 RD was originally surveyed in 1963 (also see Addendum 3). However, it seems that the current farm known as Deelkraal 237 RD consisted of various other farms during the late 1890s to 1900s. It seems that Brandfontein, Docter's Kraal and Dornys Bosch were consolidated to form one large farm.

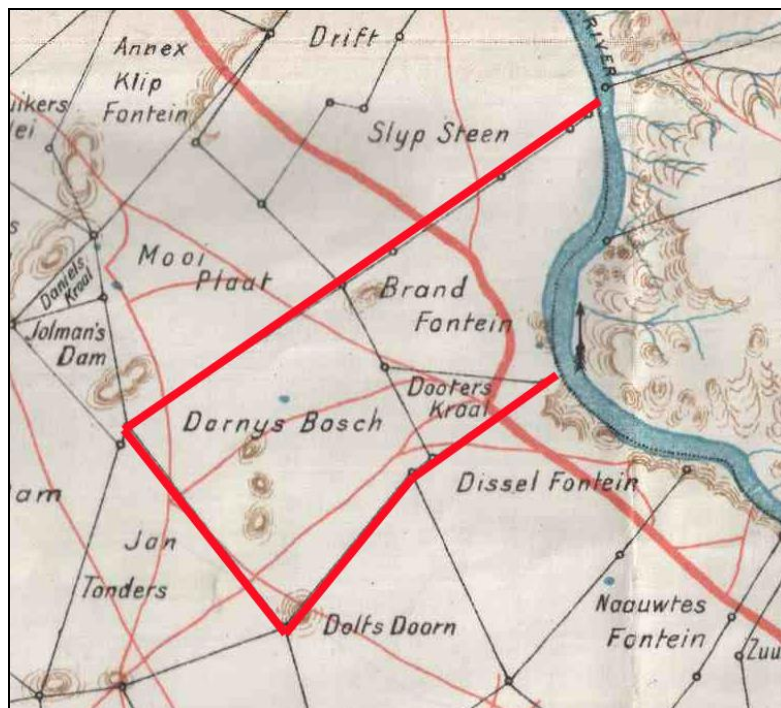


Figure 21: Field Intelligence map of Hopetown in 1900

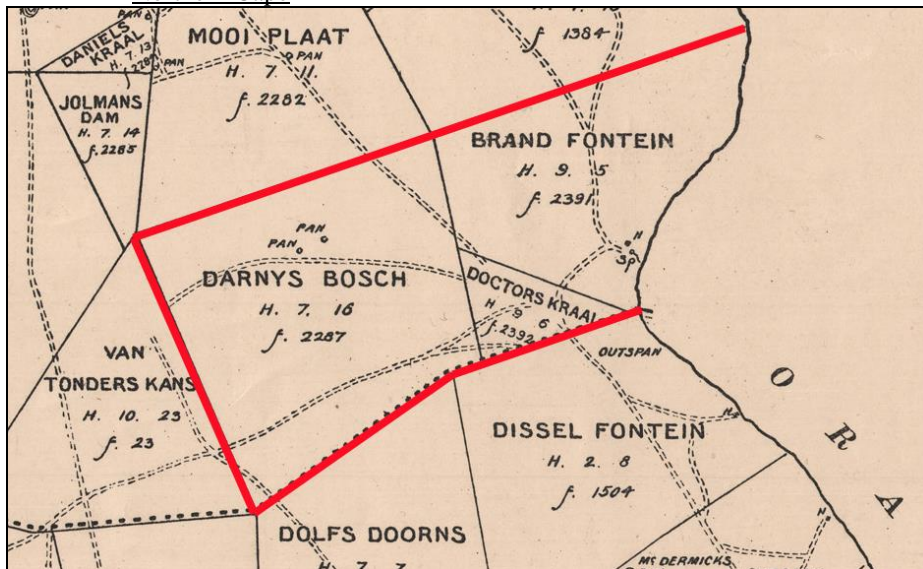


Figure 22: The farm indicated on the Division of Hoe Town of 1902

Note that no declared National Heritage Sites have been recorded in the Bloemhof region. According to the SAHRIS database no heritage sites are recorded near the survey footprint, although a number of historical buildings are indicated in Bloemhof and further to the east. Please note that the Lonmin Platinum sites indicated on the Map are incorrect.

Historical maps of the late 19th and early 20th centuries clearly indicate extensive agricultural fields, diamond mining and even a salt works plant on the Salt Lake (see Figure 4). Moreover, a cluster of historical structures (Sites 1 and 2) situated on the southern extent of the farm is possibly associated with the extensive salt works that was taking place at the pan (see Figure 24). These structures were probably used as accommodation for workers as well as for processing and packaging of the salt product.

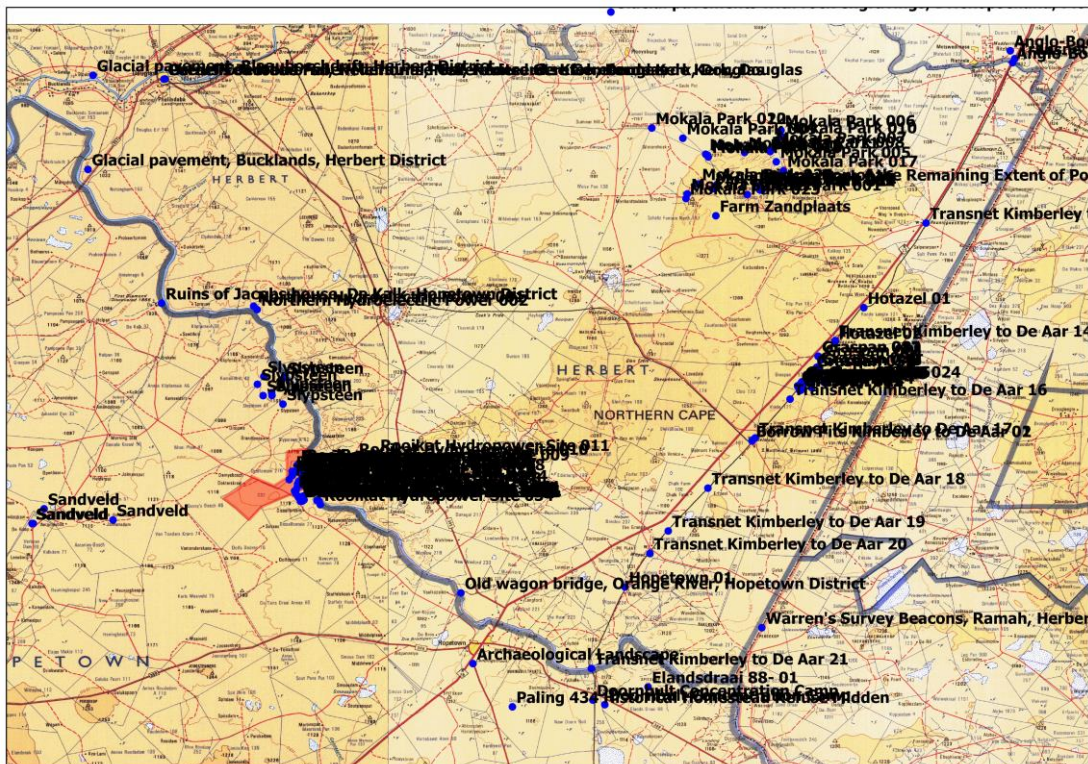


Figure 23: Recorded sites near the survey footprint (SAHRIS database as at July 2022)

The following declared Provincial Heritage sites are listed in the vicinity of the survey footprint.

SAHRA No	Site Name	Place	Coordinates
9/2/043/0004	Ruins of Jacobs house (pre-1880), De Kalk, Hopetown District	Hopetown	S29°16'50"; E23°46'20"
9/2/043/0006	Old wagon bridge, Orange River (built during Anglo Boer war), Hopetown District	Hopetown	S29°34'10"; E24°04'20"

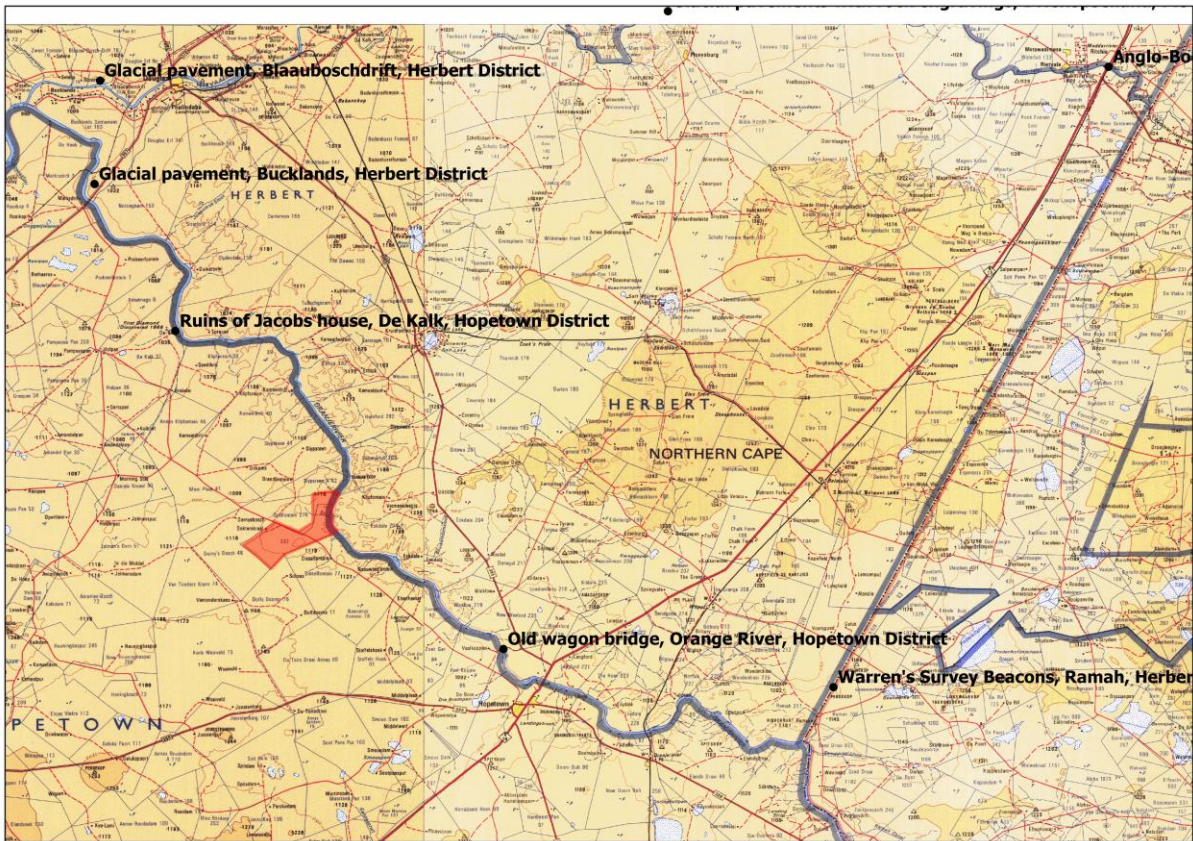


Figure 24: Declared Provincial Heritage sites near the survey footprint

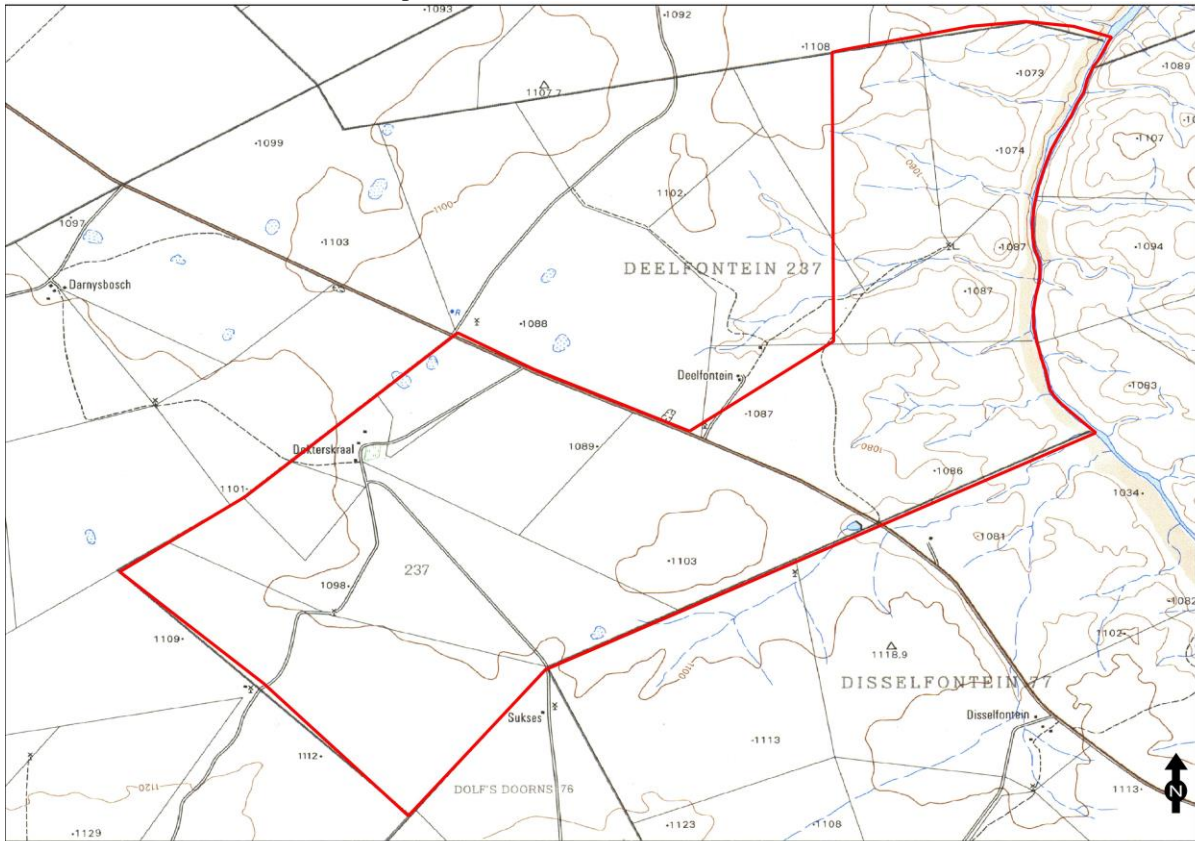


Figure 25: The survey area as indicated on the 1:50 000 topographic map 2923BD (1988)

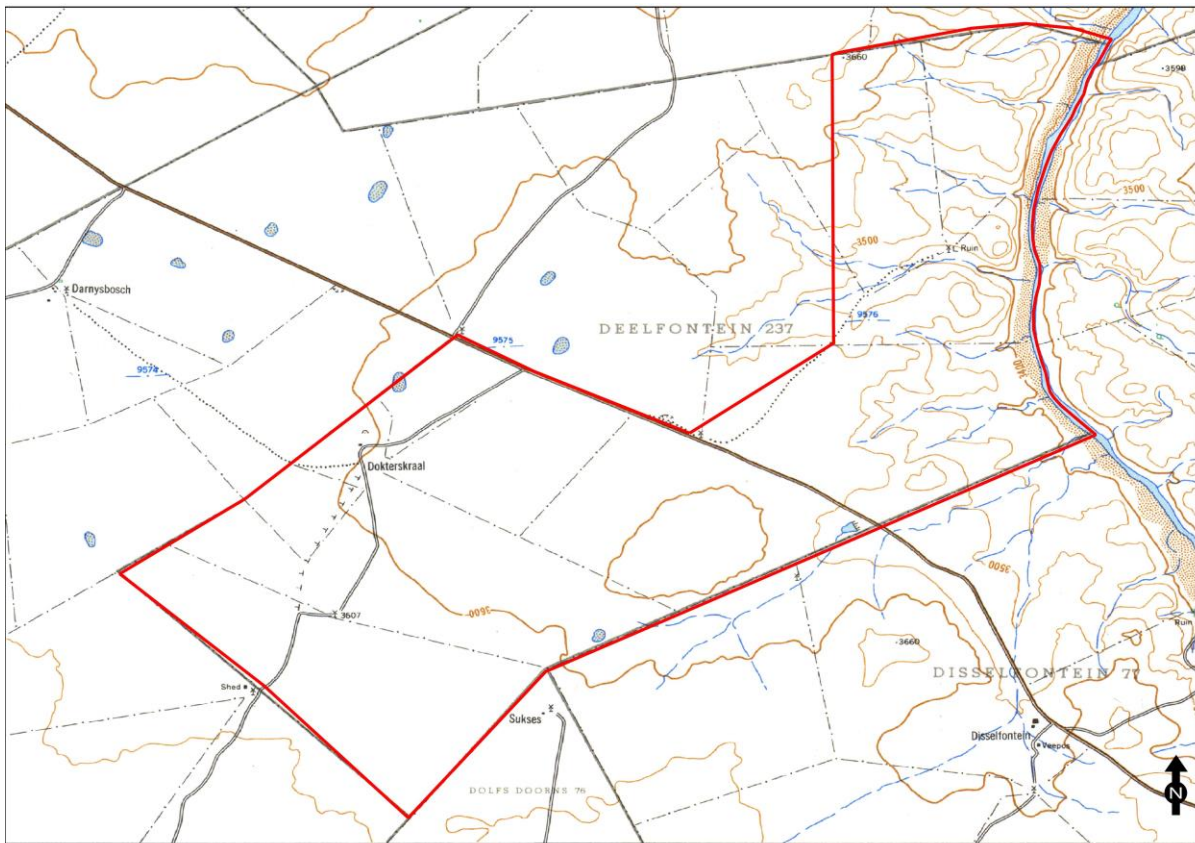


Figure 26: The survey area as indicated on the 1:50 000 topographic map 2923BD (1964)

6.2 Palaeontological sensitivity

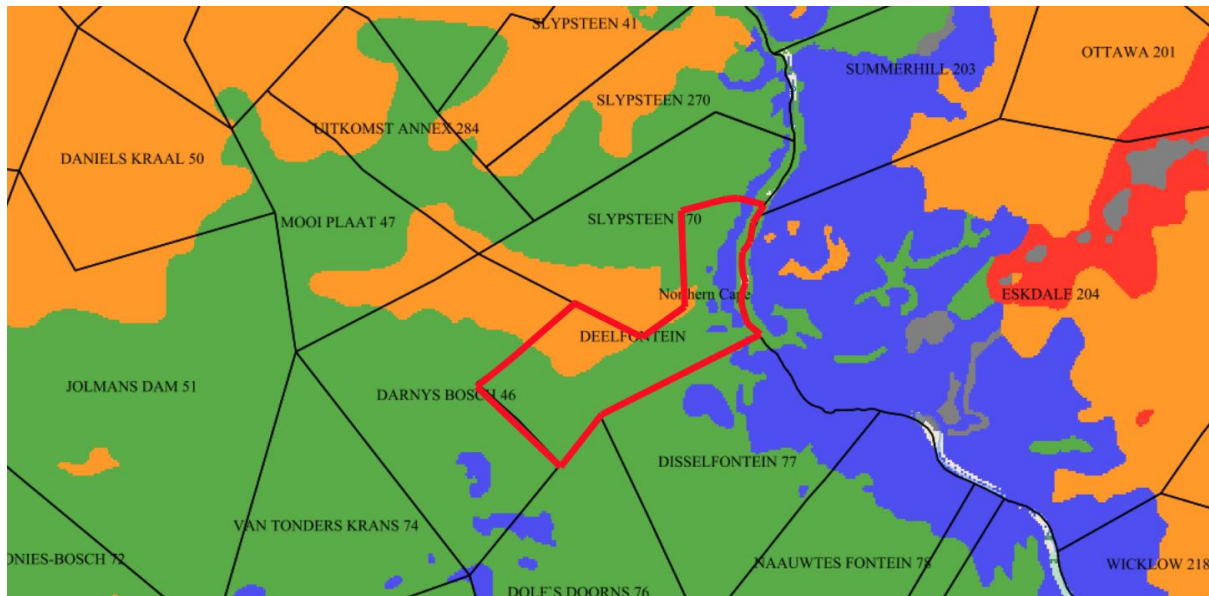


Figure 27: Palaeontological sensitivity zones as indicated for Deelfontein 237 RD (SAHRIS 2022)

Colour	Sensitivity	Required Action
RED	VERY HIGH	Field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	Desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	Desktop study is required
BLUE	LOW	No palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	No palaeontological studies are required
WHITE/CLEAR	UNKNOWN	Will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

The palaeontological sensitivity map was extracted from the SAHRIS database and indicates an orange (high), green (moderate) and blue (low) sensitivity for the farm Deelfontein 237 RD. As a result a desktop palaeontological study will be required for the respective survey footprints.

6.3 Site visits

The field survey was conducted on 17 August 2022.

6.4 Social interaction and current inhabitants

The farm owner has been living in the area for the last few decades assisted with the survey. He had extensive knowledge of the various heritage sites located on the farm.

6.5 Public Consultation and Stakeholder Engagement

The Public Participation Process (PPP) must follow Regulation 41 of NEMA EIA Regulations; thus, the process needs to be transparent. However, due to the Protection of Personal Information Act (POPI Act) which commenced on 01 July 2021, Stakeholders,

Landowners, surrounding landowners and registered I&AP' addresses, contact details and comments will not be included in any draft report to be circulated. All this information will form part of the final report to be submitted to the Competent Authority only.

The public participation process is underway with written notices, advertisements, availability of report and scheduled meeting with I&APs.

6.6 Assumptions, restrictions, gaps and limitations

No severe restrictions were encountered during the field survey.

6.7 Methodology for assessment of potential impacts

All impacts identified during the EIA stage of the study will be classified in terms of their significance. Issues were assessed in terms of the following criteria:

- The **nature**, a description of what causes the effect, what will be affected and how it will be affected;
- The **physical extent**, wherein it is indicated whether:
 - 1 - the impact will be limited to the site;
 - 2 - the impact will be limited to the local area;
 - 3 - the impact will be limited to the region;
 - 4 - the impact will be national; or
 - 5 - the impact will be international.
- The **duration**, wherein it is indicated whether the lifetime of the impact will be:
 - 1 - of a very short duration (0–1 years);
 - 2 - of a short duration (2-5 years);
 - 3 - of a medium-term (5–15 years);
 - 4 - of a long term (> 15 years); or
 - 5 - permanent.
- The **magnitude** of impact, quantified on a scale from 0-10, where a score is assigned:
 - 0 - small and will have no effect;
 - 2 - minor and will not result in an impact;
 - 4 - low and will cause a slight impact;
 - 6 - moderate and will result in processes continuing but in a modified way;
 - 8 - high, (processes are altered to the extent that they temporarily cease); or
 - 10 - very high and results in complete destruction of patterns and permanent cessation of processes;
- The **probability** of occurrence, which describes the likelihood of the impact actually occurring and is estimated on a scale where:
 - 1 - very improbable (probably will not happen);
 - 2 - improbable (some possibility, but low likelihood);
 - 3 - probable (distinct possibility);
 - 4 - highly probable (most likely); or
 - 5 - definite (impact will occur regardless of any prevention measures);
- The **significance**, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high;
- The **status**, which is described as either positive, negative or neutral;
 - The degree to which the impact can be reversed;
 - The degree to which the impact may cause irreplaceable loss of resources; and
 - The degree to which the impact can be mitigated.

The significance is determined by combining the criteria in the following formula:

$S = (E+D+M) \times P$; where:

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

Points	Significance Weighting	Discussion
< 30 points	Low	Where this impact would not have a direct influence on the decision to develop in the area.
31-60 point	Medium	Where the impact could influence the decision to develop in the area unless it is effectively mitigated.
> 60 points	High	Where the impact must have an influence on the decision process to develop in the area.

7. The Cultural Heritage Sites

7.1. Isolated occurrences

Isolated occurrences are artefacts or small features recorded on the surface with no contextual information. No other associated material culture (in the form of structures or deposits) was noted that might provide any further context. This can be the result of various impacts and environmental factors such as erosion and modern developments. By contrast archaeological sites are often complex sites with evidence of archaeological deposit and various interrelated features such as complex deposits, stone walls and middens. However, these isolated occurrences are seen as remains of erstwhile complex or larger sites and they therefore provide a broad indication of possible types of sites or structures that might be expected to occur or have occurred in the survey footprint. Throughout the survey area several isolated occurrences were recorded usually associated with the Middle Stone Age (MSA) and Later Stone Age (LSA). These surface finds were recorded near rocky outcrops along the Orange River basin. As such a general A°/m² index for the survey footprint is 0 – 5 artefacts per m² which is low. However, a survey that was conducted by Van Ryneveld (2013a) listed various MSA and LSA as part of her survey, which were probably rated at a higher density.



Figure 28: A selection of Middle Stone Age (MSA) formal tools recorded on the surface

7.2 Heritage sites

A total of nine sites were recorded during the survey which include one graveyard (Site 6) and six historical farmhouse complexes and other historical structures (Sites 1, 3, 4, 5, 7 and 8) and two large rock art sites (Sites 2 and 9). The historical farmhouses and other associated structures mostly date to the late 1800s to early 1900s and are associated with early farming activities. Please note that the Doctor's Kraal complex is associated with a veterinary service that was provided probably from the 1890s. Although most sites correlate or overlap note that the survey conducted by Van Ryneveld (2013a) recorded a total of 27 sites.

No Iron Age settlements, structures, features, assemblages or artefacts were recorded during the survey.

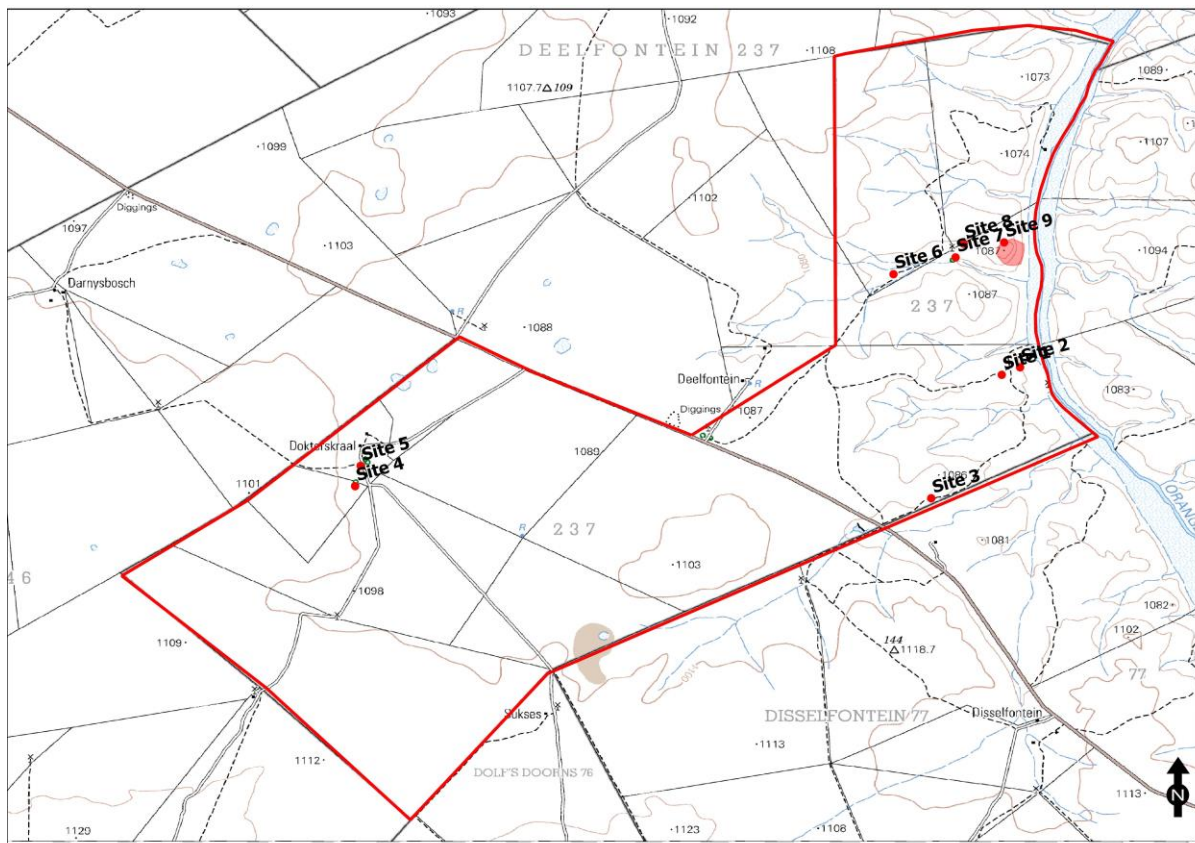


Figure 29: Location of the various recorded heritage sites (the current survey)

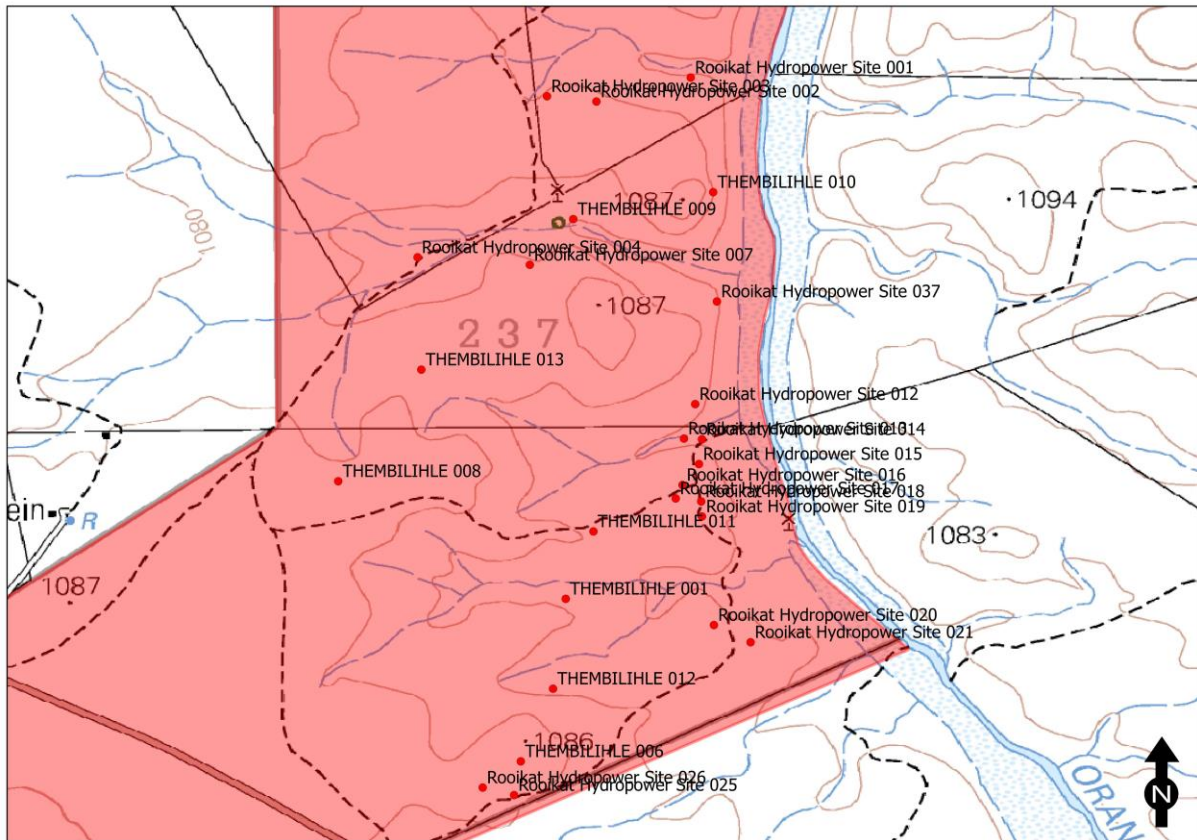


Figure 30: Location of the various recorded heritage sites (Van Ryneveld 2013a)

8. Locations and Evaluation of Sites

Site No	Coordinates	Site Type	Field Rating of Significance	Impact	Proposed Mitigation
1	29.458193°S 23.912786°E	Historical livestock enclosures	Generally protected C: Low significance	High	<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase
2	29.457519°S 23.914426°E	Rock Art (engravings)	Generally protected A: High significance	High	<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase
3	29.469229°S 23.906471°E	Historical livestock enclosures	Generally protected C: Low significance	High	<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase
4	29.468153°S 23.854902°E	Historical livestock enclosure	Generally protected B: Medium significance	High	<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase
5	29.466334°S 23.855395°E	Historical farmhouse complex	Generally protected B: Medium significance	High	<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase
6	29.449192°E 23.903092°E	Graveyard	Generally protected A: High significance	High	<ul style="list-style-type: none"> Fenced off and gate installed Maintain a buffer zone of 50 metres during prospecting phase
7	29.447688°S 23.908647°E	Historical livestock enclosures (with spring)	Generally protected C: Low significance	High	<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase
8	29.446466°S 23.909378°E	Historical farm house complex with enclosures	Generally protected C: Low significance	High	<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase
9	29.446350°S 23.912996°E	Rock art (engravings)	Generally protected A: High significance	High	<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase

Table 7: Location and evaluation of sites

No	Site Code	Site Name	Findings	Y	X
69040	THEM001	THEMBILIHLE 001	Artefacts	-29.461861	23.908639
89004	ROOIK020	Rooikat Hydropower Site 020	Stone walling	-29.462833	23.914139
89021	ROOIK021	Rooikat Hydropower Site 021	Stone walling	-29.463472	23.9155
89025	ROOIK026	Rooikat Hydropower Site 026	Stone walling	-29.468861	23.905556
89024	ROOIK025	Rooikat Hydropower Site 025	Stone walling	-29.469139	23.906722
69049	THEM006	THEMBILIHLE 006	Artefacts	-29.467889	23.906972
84139	THEM008	THEMBILIHLE 008	Artefacts	-29.4575	23.900194
84140	THEM009	THEMBILIHLE 009	Artefacts	-29.447778	23.908917
84141	THEM010	THEMBILIHLE 010	Artefacts	-29.446778	23.914111
84142	THEM011	THEMBILIHLE 011	Artefacts	-29.459361	23.909667
84143	THEM012	THEMBILIHLE 012	Artefacts	-29.465194	23.908167
84144	THEM013	THEMBILIHLE 013	Artefacts	-29.453361	23.903278
89003	ROOIK019	Rooikat Hydropower Site 019	Rock Art	-29.458806	23.913694
89002	ROOIK018	Rooikat Hydropower Site 018	Stone walling	-29.45825	23.913667
89001	ROOIK017	Rooikat Hydropower Site 017	Stone walling	-29.458139	23.912722
89000	ROOIK016	Rooikat Hydropower Site 016	Stone walling	-29.457639	23.912972
88999	ROOIK015	Rooikat Hydropower Site 015	Rock Art	-29.456861	23.913583
88998	ROOIK014	Rooikat Hydropower Site 014	Settlement	-29.455944	23.913694
88997	ROOIK013	Rooikat Hydropower Site 013	Graves	-29.455917	23.913028
88996	ROOIK012	Rooikat Hydropower Site 012	Settlement	-29.454639	23.913444
89042	ROOIK037	Rooikat Hydropower Site 037	Rock Art	-29.450833	23.91425
88981	ROOIK007	Rooikat Hydropower Site 007	Rock Art	-29.449472	23.907306
88979	ROOIK004	Rooikat Hydropower Site 004	Graves	-29.449194	23.903139
88980	ROOIK005	Rooikat Hydropower Site 005	Structures	-29.446556	23.9085
88977	ROOIK002	Rooikat Hydropower Site 002	Stone walling	-29.443417	23.909778
88978	ROOIK003	Rooikat Hydropower Site 003	Artefacts	-29.443222	23.907944
88976	ROOIK001	Rooikat Hydropower Site 001	Rock Art	-29.442528	23.913278

Table 8: Sites recorded by Van Ryneveld (2013a)

9. Management Measures

Heritage sites are fixed features in the environment, occurring within specific spatial confines. Any impact upon them is permanent and non-reversible. Those resources that cannot be avoided and that are directly impacted by the proposed development can be

excavated/recorded and a management plan can be developed for future action. Those sites that are not impacted on can be written into the management plan, whence they can be avoided or cared for in the future.

9.1 Objectives

- Protection of archaeological, historical and any other site or land considered being of cultural value within the project boundary against vandalism, destruction and theft.
- The preservation and appropriate management of new discoveries in accordance with the NHRA, should these be discovered during construction activities

The following shall apply:

- Known sites should be clearly marked in order that they can be avoided during construction activities.
- The contractors and workers should be notified that archaeological sites might be exposed during the construction activities.
- Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible;
- All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken;
- Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and
- Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the NHRA (Act No. 25 of 1999), Section 51. (1).

9.2 Control

In order to achieve this, the following should be in place:

- A person or entity, e.g. the Environmental Control Officer, should be tasked to take responsibility for the heritage sites and should be held accountable for any damage.
- Known sites should be located and isolated, e.g. by fencing them off. All construction workers should be informed that these are no-go areas, unless accompanied by the individual or persons representing the Environmental Control Officer as identified above.
- In areas where the vegetation is threatening the heritage sites, e.g. growing trees pushing walls over, it should be removed, but only after permission for the methods proposed has been granted by SAHRA. A heritage official should be part of the team executing these measures.

10. Recommendations and Conclusions

A total of nine sites were recorded during the survey which include one graveyard (Site 6) and six historical farmhouse complexes and other historical structures (Sites 1, 3, 4, 5, 7 and 8) and two large rock art sites (Sites 2 and 9). The historical farmhouses and other associated structures mostly date to the late 1800s to early 1900s and are associated with early farming activities. However, some of the headstones in the graveyard date to early 1800s which indicate a possible earlier occupation window in area. Early maps confirm that by the late 19th century the farms were already well established. Please note that the Doctor's Kraal

complex is associated with a veterinary service that was provided probably from the 1890s. Although most sites correlate or overlap, note that the survey conducted by Van Ryneveld (2013a) recorded a total of 27 sites. This adds to the high density of the distribution of heritage sites on the farm.

In this regard please note the following proposed mitigation measures:

- Take note of the position of the existing heritage sites;
- A buffer zone of 50 metres should be maintained;
- The graveyard should be fenced off with a gate installed; and
- Care should be taken to prevent any indirect impacts on the historical structures.

It is therefore recommended, from a cultural heritage perspective that the proposed prospecting initiatives may proceed, dependent on adherence to the proposed mitigation measures.

Survey: A graveyard (Site 6), six historical farmhouse complexes and other historical structures (Sites 1, 3, 4, 5, 7 and 8) and two large rock art sites (Sites 2 and 9)		
	Without mitigation	With mitigation
Prospecting Phase		
<i>Probability</i>	Definite (5)	Very Improbable (1)
<i>Duration</i>	Permanent (5)	Short term (2)
<i>Extent</i>	Limited to the site (1)	Limited to the site (1)
<i>Magnitude</i>	Very High (10)	Minor (2)
Significance of Impact	80 (High)	5 (Low)
<i>Status (positive or negative)</i>	Negative	Positive
Reversibility	Low	Low
<i>Irreplaceable loss of resources?</i>	Yes	None
<i>Cumulative impacts and indirect impacts</i>	Prospecting phase may cause excessive vibrations.	
<i>Can impacts be mitigated?</i>	Yes, buffer zones (50 metres) should be maintained during prospecting developments	

Table 9: Significance of the impact

No Iron Age settlements, structures, features, assemblages or artefacts were recorded during the survey.

Also, please note:

If the exhumation and reburial of the graveyards are envisaged it will entail social consultation and permit application. Other legislative measures which may be pertinent include the Removal of Graves and Dead Bodies Ordinance (Ordinance No. 7 of 1925), Regulations Relating to the Management of Human Remains (GNR 363 of 22 May 2013) made in terms of the National Health Act No. 61 of 2003, Ordinance on Exhumations (Ordinance No. 12 of 1980) as well as any local and regional provisions, laws and by-laws that may be in place. Note that unmarked graves are by default regarded as older than 60 years and therefore falls under the NHRA (Act No. 25 of 1999, Section 36).

Archaeological deposits usually occur below ground level. Should archaeological artefacts or skeletal material be revealed in the area during development activities, such activities should

be halted, and a university or museum notified in order for an investigation and evaluation of the find(s) to take place (*cf.* NHRA (Act No. 25 of 1999), Section 36 (6)).

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Addendum 1: Archaeological and Historical Sequence

The table provides a general overview of the chronological sequence of the archaeological periods in South Africa.

PERIOD	APPROXIMATE DATES
Earlier Stone Age	more than 2 million years ago to >200 000 years ago
Middle Stone Age	<300 000 years ago to >20 000 years ago
Later Stone Age (Includes hunter-gatherer rock art)	<40 000 years ago up to historical times in certain areas
Early Iron Age	c. AD 200 - c. AD 900
Middle Iron Age	c. AD 900 – c. AD 1300
Late Iron Age (Stonewalled sites)	c. AD 1300 - c. AD 1840 (c. AD 1640 - c. AD 1840)

< = less than; > = greater than

Archaeological Context

Stone Age Sequence

Concentrations of Early Stone Age (ESA) sites are usually present on the flood-plains of perennial rivers and may date to over 2 million years ago. These ESA open sites may contain scatters of stone tools and manufacturing debris and secondly, large concentrated deposits ranging from pebble tool choppers to core tools such as handaxes and cleavers. The earliest hominins who made these stone tools, probably not always actively hunted, instead relying on the opportunistic scavenging of meat from carnivore kill sites.

Middle Stone Age (MSA) sites also occur on flood plains, but are also associated with caves and rock shelters (overhangs). Sites usually consist of large concentrations of knapped stone flakes such as scrapers, points and blades and associated manufacturing debris. Tools may have been hafted but organic materials, such as those used in hafting, seldom preserve. Limited drive-hunting activities are also associated with this period.

Sites dating to the Later Stone Age (LSA) are better preserved in rock shelters, although open sites with scatters of mainly stone tools can occur. Well-protected deposits in shelters allow for stable conditions that result in the preservation of organic materials such as wood, bone, hearths, ostrich eggshell beads and even bedding material. By using San (Bushman) ethnographic data a better understanding of this period is possible. South African rock art is also associated with the LSA.

The following chronological sequence was recently established by prominent Stone Age archaeologists (Lombard et al 2012):

Later Stone Age

- Age Range: recent to 20-40 thousand years ago

- General characteristics: expect variability between assemblages, a wide range of formal tools, particularly scrapers (microlithic and macrolithic), backed artefacts, evidence of hafted stone and bone tools, borers, bored stones, upper and lower grindstones, grooved stones, ostrich eggshell (OES) beads and other ornaments, undecorated/decorated OES fragments, flasks/flask fragments, bone tools (sometimes with decoration), fishing equipment, rock art, and ceramics in the final phase.
 - **Ceramic or Final Later Stone Age**
 - Generally < 2 thousand years ago
 - MIS 1
 - Contemporaneous with, and broadly similar to, final Later Stone Age, but includes ceramics
 - Economy may be associated with hunter-gatherers or herders

Technological characteristics

- Stone tool assemblages are often microlithic
- In some areas they are dominated by long end scrapers and few backed microliths; in others formal tools are absent or rare
- Grindstones are common, ground stone artefacts, stone bowls and boat-shaped grinding grooves may occur
- Includes grit- or grass-tempered pottery
- Ceramics can be coarse, or well-fired and thin-walled; some times with lugs, spouts and conical bases; sometimes with decoration; sometimes shaped as bowls
- Ochre is common
- Ostrich eggshell (OES) is common
- Metal objects, glass beads and glass artefacts also occur
- **Final Later Stone Age**
 - 100 – 4000 years ago
 - MIS 1
 - Hunter-gatherer economy

Technological characteristics

- Much variability can be expected
- Variants include macrolithic (similar to Smithfield [Sampson 1974]) and/or microlithic (similar to Wilton) assemblages
- Assemblages are mostly informal (Smithfield)
- Often characterised by large untrimmed flakes (Smithfield)
- Sometimes microlithic with scrapers, blades and bladelets, backed tools and adzes (Wilton-like)
- Worked bone is common
- OES is common
- Ochre is common
- Iron objects are rare
- Ceramics are absent
- **Wilton**
 - 4000 – 8000 years ago
 - MIS 1

- At some sites continues into the final Later Stone Age as regional variants (e.g. Wilton Large Rock Shelter and Cave James)

Technological characteristics

- Fully developed microlithic tradition with numerous formal tools
 - Highly standardised backed microliths and small convex scrapers (for definition of standardisation see Eerkens & Bettinger 2001)
 - OES is common
 - Ochre is common
 - Bone, shell and wooden artefacts occur
- **Oakhurst**
 - 7000 – 12 000 years ago
 - MIS 1
 - Includes Albany, Lockshoek and Kuruman as regional variants

Technological characteristics

- Flake based industry
 - Characterised by round, end, and D-shaped scrapers and adzes
 - Wide range of polished bone tools
 - Few or no microliths
- **Robberg**
 - 12 000 to 18 000 years ago
 - MIS 2

Technological characteristics

- Characterised by systematic bladelet (<26mm) production and the occurrence of outils ecaillés or scaled pieces
 - Significant numbers of unretouched bladelets and bladelet cores
 - Few formal tools
 - Some sites have significant macrolithic elements
- **Early Late Stone Age**
 - 18 000 – 40 000 years ago
 - MIS 2-3
 - Informal designation
 - Also known as transitional MSA-LSA
 - Overlapping in time with final Middle Stone Age

Technological Characteristics

- Characterised by unstandardised, often microlithic, pieces and includes the bipolar technique
- Described at some sites, but not always clear whether assemblages represent a real archaeological phase or a mixture of LSA/MSA artefacts

Middle Stone Age

- Age Range: 20 000 – 30 000 years ago

- General characteristics: Levallois or prepared core techniques (for definitions see Van Peer 1992; Boeda 1995; Pleurdeau 2005) occur in which triangular flakes with convergent dorsal scars, often with faceted striking platforms, are produced. Discoidal systems (for definition see Inizan et al. 1999) and intentional blade production from volumetric cores (for definition see Pleurdeau 2005) also occur; formal tools may include unifacially and bifacially retouched points, backed artefacts, scrapers, and denticulates (for definition see Bisson 2000); evidence of hafted tools; occasionally includes marine shell beads, bone points, engraved ochre nodules, engraved OES fragments, engraved bone fragments, and grindstones.
- In the sequence below we highlight differences or characteristics that may be used to refine interpretations depending on context.
- **Final Middle Stone Age**
 - 20 000 – 40 000 years ago
 - MIS 3
 - Informal designation partly based on the Sibudu sequence

Technological characteristics

- Characterised by high regional variability that may include, e.g. bifacial tools, bifacially retouched points, hollow-based points
- Triangular flake and blade industries (similar to Strathalan and Melikane)
- Small bifacial and unifacial points (similar to Sibudu and Rose Cottage Cave)
- Sibudu point characteristics: short, stout, lighter in mass compared to points from the Sibudu technocomplex, but heavier than those from the Still Bay
- Can be microlithic
- Can include bipolar technology
- Could include backed geometric shapes such as segments, as well as side scrapers

Sibudu

- 45 000 – 58 000 years ago
- MIS 3
- Previously published as informal late Middle Stone Age and post-Howieson's Poort at Sibudu
- Formerly known post-Howieson's Poort, MSA 3 generally, and MSA III at Klasies River

Technological characteristics

- Most points are produced using Levallois technique
- Most formal retouch aimed at producing unifacial points
- Sibudu unifacial point (type fossil) characteristics: faceted platform; shape is somewhat elongated with a mean length of 43.9 mm), a mean breadth of 26.8 mm and mean thickness of 8.8 mm (L/B ratio 1.7); their mean mass is 11.8 g (Mohapi, 2012)
- Some plain butts
- Rare bifacially retouched points
- Some side scrapers are present
- Backed pieces are rare
- **Howieson's Poort**
 - 58 000 – 66 000 years ago
 - MIS 3-4

Technological characteristics

- Characterised by blade technology
- Includes small (<4 cm) backed tools, e.g. segments, scrapers, trapezes and backed blades
- Some denticulate blades
- Pointed forms are rare or absent
- **Still Bay**
 - 70 000 – 77 000 years ago
 - MIS 4-5a

Technological characteristics

- Characterised by thin (<10 mm), bifacially worked foliate or lanceolate points
- Semi-circular or wide-angled pointed butts
- Could include blades and finely serrated points (Lombard et al. 2010)
- **Pre-Still Bay**
 - 72 000 – 96 000 years ago
 - MIS 4-5

Technological characteristics

- Characteristics currently being determined / studied
- **Mossel Bay**
 - 77 000 to —105 000 years ago
 - MIS 5a-4
 - Also known as MSA II at Klasies River or MSA 2b generally

Technological characteristics

- Characterised by recurrent unipolar Levallois point and blade reduction
- Products have straight profiles; percussion bulbs are prominent and often splintered or ring-cracked
- Formal retouch is infrequent and restricted to sharpening the tip or shaping the butt
- **Klasies River**
 - 105 000 to —130 000 years ago
 - MIS 5d-5e
 - Also referred to as MSA I at Klasies River or MSA 2a generally

Technological characteristics

- Recurrent blade and convergent flake production
- End products are elongated and relatively thin, often with curved profiles
- Platforms are often small with diffused bulbs
- Low frequencies of retouch
- Denticulate pieces
- **Early Middle Stone Age**
 - Suggested age MIS 6 to MIS 8 (130 000 to —300 000 years ago)
 - Informal designation

Technological characteristics

- This phase needs future clarification regarding the designation of cultural material and sequencing
- Includes discoidal and Levallois flake technologies, blades from volumetric cores and a generalised toolkit
- **Earlier Stone Age**
 - Age range: >200 000 to 2 000 000 years ago
 - General characteristics: early stages include simple flakes struck from cobbles, core and pebble tools; later stages include intentionally shaped handaxes, cleavers and picks; final or transitional stages have tools that are smaller than the preceding stages and include large blades.
 - In the sequence below we highlight differences or characteristics that may be used to refine interpretations depending on context.
- **ESA-MSA transition**
- 200 to —600 thousand years ago
- MIS 7-15

Technological characteristics

- Described at some sites as Fauresmith or Sangoan
- Relationships, descriptions, issues of mixing and ages yet to be clarified
- Fauresmith assemblages have large blades, points, Levallois technology, and the remaining ESA components have small bifaces
- The Sangoan contains small bifaces (<100 mm), picks, heavy and light-duty denticulated and notched scrapers
- The Sangoan is less well described than the Fauresmith
- **Acheulean**
 - 300 thousand to —1.5 million years ago
 - MIS 8-50

Technological characteristics

- Bifacially worked handaxes and cleavers, large flakes > 10 cm
- Some flakes with deliberate retouch, sometimes classified as scrapers
- Gives impression of being deliberately shaped, but could indicate result of knapping strategy
- Sometimes shows core preparation
- Generally found in disturbed open-air locations
- **Oldowan**
 - 1.5 to >2 million years ago
 - MIS 50-75

Technological characteristics

- Cobble, core or flake tools with little retouch and no flaking to predetermined patterns
- Hammerstones, manuports, cores
- Polished bone fragments/tools

Iron Age Sequence

In the northern regions of South Africa at least three settlement phases have been distinguished for early prehistoric agropastoralist settlements during the **Early Iron Age** (EIA). Diagnostic pottery assemblages can be used to infer group identities and to trace movements across the landscape. The first phase of the Early Iron Age, known as **Happy Rest** (named after the site where the ceramics were first identified), is representative of the Western Stream of migrations, and dates to AD 400 - AD 600. The second phase of **Diamant** is dated to AD 600 - AD 900 and was first recognized at the eponymous site of Diamant in the western Waterberg. The third phase, characterised by herringbone-decorated pottery of the **Eiland** tradition, is regarded as the final expression of the Early Iron Age (EIA) and occurs over large parts of the North West Province, Northern Province, Gauteng and Mpumalanga. This phase has been dated to about AD 900 - AD 1200. These sites are usually located on low-lying spurs close to water.



The Late Iron Age (LIA) settlements are characterised by stone-walled enclosures situated on defensive hilltops c. AD 1640 - AD 1830). This occupation phase has been linked to the arrival of ancestral Northern Sotho, Tswana and Ndebele (Nguni-speakers) in the northern regions of South Africa with associated sites dating between the sixteenth and seventeenth centuries AD. The terminal LIA is represented by late 18th/early 19th century settlements with multichrome Moloko pottery commonly attributed to the Sotho-Tswana. These settlements can in many instances be correlated with oral traditions on population movements during which African farming communities sought refuge in mountainous regions during the processes of disruption in the northern interior of South Africa, resulting from the so-called difaqane (or mfecane).

Addendum 2: Description of the Recorded Sites

A system for grading the significance of heritage sites was established by the NHRA (Act No. 25 of 1999) and further developed by the South African Heritage Resources Agency (SAHRA 2007) and has been approved by ASAPA for use in southern Africa and was utilised during this assessment.

Site 1

A. GENERAL SITE DESCRIPTION				
Site type	Historical livestock enclosures			
Site Period	Late 19 th to early 20 th century			
Physical description	The site comprises two stone-walled livestock enclosures both of which are circular in construction with an opening facing north. The walls are partly dilapidated but fairly stable. No middens were recorded at the site.			
Integrity of deposits or structures	Unstable			
Site extent	Diameter: 4 metres Height: 0.7 metres			
B. SITE EVALUATION				
B1. HERITAGE VALUE			Yes	No
Historic Value				
It has importance to the community or pattern of South Africa's history or precolonial history.				X
It has strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.				X
It has significance relating to the history of slavery in South Africa.				X
Aesthetic Value				
It has importance in exhibiting particular aesthetic characteristics valued by a particular community or cultural group.				X
Scientific Value				
It has potential to yield information that will contribute to an understanding of South Africa's natural and cultural heritage.				X
It has importance in demonstrating a high degree of creative or technical achievement at a particular period.				X
It has importance to the wider understanding of the temporal change of cultural landscapes, settlement patterns and human occupation.				X
Social Value				
It has strong or special association with a particular community or cultural group for social, cultural or spiritual reasons (sense of place).				X
Tourism Value				
It has significance through its contribution towards the promotion of a local sociocultural identity and can be developed as tourist destination.				X
Rarity Value				
It possesses unique, uncommon, rare or endangered aspects of South Africa's natural or cultural heritage.				X
Representative Value				
It is importance in demonstrating the principle characteristics of a particular class of South Africa's natural or cultural places or objects.			X	
B2. REGIONAL CONTEXT				
Other similar sites in the regional landscape.			X	
C. SPHERE OF SIGNIFICANCE		High	Medium	Low
International				X
National				X
Provincial				X
Local				X
Specific community				X
D. FIELD REGISTER RATING				

National/Grade 1 [should be registered, retained]	
Provincial/Grade 2 [should be registered, retained]	
Local/Grade 3A [should be registered, mitigation not advised]	
Local/Grade 3B [High significance; mitigation, partly retained]	
Generally Protected A [High/Medium significance, mitigation]	
Generally protected B [Medium significance, to be recorded]	
Generally Protected C [Low significance, no further action]	X
E. GENERAL STATEMENT OF SITE SIGNIFICANCE	
Low	X
Medium	
High	
F. RATING OF POTENTIAL IMPACT OF DEVELOPMENT	
None	X
Peripheral	
Destruction	
Uncertain	
G. RECOMMENDED MITIGATION	
<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase 	
H. APPLICABLE LEGISLATION AND LEGAL REQUIREMENTS	
<ul style="list-style-type: none"> National Heritage Resources Act (Act No. 25 of 1999, Sections 34) 	
I. PHOTOGRAPHS	
	
<p>Figure 31: The stone-walled livestock enclosure</p>	
	
<p>Figure 32: The stone-walled livestock enclosure</p>	

Site 2

A. GENERAL SITE DESCRIPTION				
Site type	Rock Art (Engravings)			
Site Period	Later Stone Age			
Physical description	The site comprises a cluster of rock engravings situated along a rocky outcrop adjacent to the Orange River. Images include rhinoceros, hippopotamus, eland, various antelope and geometric designs.			
Integrity of deposits or structures	Stable			
Site extent	Approximately 100 m x 130 m			
B. SITE EVALUATION				
B1. HERITAGE VALUE			Yes	No
Historic Value				
It has importance to the community or pattern of South Africa's history or precolonial history.			X	
It has strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.				X
It has significance relating to the history of slavery in South Africa.				X
Aesthetic Value				
It has importance in exhibiting particular aesthetic characteristics valued by a particular community or cultural group.			X	
Scientific Value				
It has potential to yield information that will contribute to an understanding of South Africa's natural and cultural heritage.			X	
It has importance in demonstrating a high degree of creative or technical achievement at a particular period.			X	
It has importance to the wider understanding of the temporal change of cultural landscapes, settlement patterns and human occupation.			X	
Social Value				
It has strong or special association with a particular community or cultural group for social, cultural or spiritual reasons (sense of place).			X	
Tourism Value				
It has significance through its contribution towards the promotion of a local sociocultural identity and can be developed as tourist destination.			X	
Rarity Value				
It possesses unique, uncommon, rare or endangered aspects of South Africa's natural or cultural heritage.				X
Representative Value				
It is importance in demonstrating the principle characteristics of a particular class of South Africa's natural or cultural places or objects.			X	
B2. REGIONAL CONTEXT				
Other similar sites in the regional landscape.			X	
C. SPHERE OF SIGNIFICANCE		High	Medium	Low
International			X	
National		X		
Provincial		X		
Local		X		
Specific community		X		
D. FIELD REGISTER RATING				
National/Grade 1 [should be registered, retained]				
Provincial/Grade 2 [should be registered, retained]				
Local/Grade 3A [should be registered, mitigation not advised]				
Local/Grade 3B [High significance; mitigation, partly retained]				
Generally Protected A [High/Medium significance, mitigation]				X
Generally protected B [Medium significance, to be recorded]				
Generally Protected C [Low significance, no further action]				
E. GENERAL STATEMENT OF SITE SIGNIFICANCE				
Low				
Medium				

High	X
F. RATING OF POTENTIAL IMPACT OF DEVELOPMENT	
None	
Peripheral	
Destruction	
Uncertain	X
G. RECOMMENDED MITIGATION	
<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase 	
H. APPLICABLE LEGISLATION AND LEGAL REQUIREMENTS	
<ul style="list-style-type: none"> National Heritage Resources Act (Act No. 25 of 1999, Section 35) 	

I. PHOTOGRAPHS



Figure 33: General view of geometric designs (engravings)



Figure 34: General view of a hippopotamus (engravings)



Figure 35: General view of a eland (engravings)

Site 3

A. GENERAL SITE DESCRIPTION					
Site type	Historical livestock enclosure				
Site Period	Late 19 th to early 20 th centuries				
Physical description	The site comprises a large stone-walled livestock enclosure with an attached smaller (calve) kraal. This this type of structure is colloquially known as a 'skropkraal' used by early livestock farmers as they moved on the landscape between winter and summer feeding. The main kraal is square in layout. A few pieces of ceramic and metal were recorded at the site.				
Integrity of deposits or structures	Stable				
Site extent	Main kraal: 18 metres in diameter Small kraal: 8 metres in length Height: 1 metre				
B. SITE EVALUATION					
B1. HERITAGE VALUE			Yes	No	
Historic Value					
It has importance to the community or pattern of South Africa's history or precolonial history.				X	
It has strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.				X	
It has significance relating to the history of slavery in South Africa.				X	
Aesthetic Value					
It has importance in exhibiting particular aesthetic characteristics valued by a particular community or cultural group.				X	
Scientific Value					
It has potential to yield information that will contribute to an understanding of South Africa's natural and cultural heritage.				X	
It has importance in demonstrating a high degree of creative or technical achievement at a particular period.				X	
It has importance to the wider understanding of the temporal change of cultural landscapes, settlement patterns and human occupation.				X	
Social Value					
It has strong or special association with a particular community or cultural group for social, cultural or spiritual reasons (sense of place).				X	
Tourism Value					
It has significance through its contribution towards the promotion of a local sociocultural identity and can be developed as tourist destination.				X	
Rarity Value					
It possesses unique, uncommon, rare or endangered aspects of South Africa's natural or cultural heritage.				X	
Representative Value					
It is importance in demonstrating the principle characteristics of a particular class of South Africa's natural or cultural places or objects.				X	
B2. REGIONAL CONTEXT					
Other similar sites in the regional landscape.			X		
C. SPHERE OF SIGNIFICANCE		High	Medium	Low	
International				X	
National				X	
Provincial				X	
Local				X	
Specific community				X	
D. FIELD REGISTER RATING					
National/Grade 1 [should be registered, retained]					
Provincial/Grade 2 [should be registered, retained]					
Local/Grade 3A [should be registered, mitigation not advised]					
Local/Grade 3B [High significance; mitigation, partly retained]					
Generally Protected A [High/Medium significance, mitigation]					

Generally protected B [Medium significance, to be recorded]	
Generally Protected C [Low significance, no further action]	X
E. GENERAL STATEMENT OF SITE SIGNIFICANCE	
Low	X
Medium	
High	
F. RATING OF POTENTIAL IMPACT OF DEVELOPMENT	
None	
Peripheral	
Destruction	
Uncertain	X
G. RECOMMENDED MITIGATION	
<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase 	
H. APPLICABLE LEGISLATION AND LEGAL REQUIREMENTS	
<ul style="list-style-type: none"> National Heritage Resources Act (Act No. 25 of 1999, Section 34) 	

I. PHOTOGRAPHS



Figure 36: General view of the smaller kraal at the livestock enclosure



Figure 37: The two pieces of ceramic and one piece of metal recorded at the site

Site 4

A. GENERAL SITE DESCRIPTION	
Site type	Historical livestock enclosure
Site Period	Late 19 th to early 20 th centuries
Physical description	The site comprises an extensive stone-walled livestock enclosure with subdivisions. The walls have been coated with a ‘white wash’ and sections are strengthened with a type of early cement (quick lime). Note that some sections are unstable and in the process of

	collapsing. According to oral history and historical maps the site is known as ‘Doctor’s Kraal’ and was serviced by a veterinarian with the result that farmers in the region brought their sick animals for treatment. The site is associated with Site 5.			
Integrity of deposits or structures	Unstable sections			
Site extent	Approximately 25 m x 15 m Height: 1.5 metres			
B. SITE EVALUATION				
B1. HERITAGE VALUE			Yes	No
Historic Value				
It has importance to the community or pattern of South Africa’s history or precolonial history.			X	
It has strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.				X
It has significance relating to the history of slavery in South Africa.				X
Aesthetic Value				
It has importance in exhibiting particular aesthetic characteristics valued by a particular community or cultural group.				X
Scientific Value				
It has potential to yield information that will contribute to an understanding of South Africa’s natural and cultural heritage.			X	
It has importance in demonstrating a high degree of creative or technical achievement at a particular period.				X
It has importance to the wider understanding of the temporal change of cultural landscapes, settlement patterns and human occupation.			X	
Social Value				
It has strong or special association with a particular community or cultural group for social, cultural or spiritual reasons (sense of place).			X	
Tourism Value				
It has significance through its contribution towards the promotion of a local sociocultural identity and can be developed as tourist destination.				X
Rarity Value				
It possesses unique, uncommon, rare or endangered aspects of South Africa’s natural or cultural heritage.			X	
Representative Value				
It is importance in demonstrating the principle characteristics of a particular class of South Africa’s natural or cultural places or objects.				X
B2. REGIONAL CONTEXT				
Other similar sites in the regional landscape.			X	
C. SPHERE OF SIGNIFICANCE		High	Medium	Low
International				X
National				X
Provincial			X	
Local			X	
Specific community			X	
D. FIELD REGISTER RATING				
National/Grade 1 [should be registered, retained]				
Provincial/Grade 2 [should be registered, retained]				
Local/Grade 3A [should be registered, mitigation not advised]				
Local/Grade 3B [High significance; mitigation, partly retained]				
Generally Protected A [High/Medium significance, mitigation]				
Generally protected B [Medium significance, to be recorded]				X
Generally Protected C [Low significance, no further action]				
E. GENERAL STATEMENT OF SITE SIGNIFICANCE				
Low				
Medium				X
High				
F. RATING OF POTENTIAL IMPACT OF DEVELOPMENT				
None				
Peripheral				

Destruction	
Uncertain	X
G. RECOMMENDED MITIGATION	
<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase 	
H. APPLICABLE LEGISLATION AND LEGAL REQUIREMENTS	
<ul style="list-style-type: none"> National Heritage Resources Act (Act No. 25 of 1999, Section 34) 	

I. PHOTOGRAPHS



Figure 38: General view of the north facing side of the kraal.



Figure 39: Front section indicatng the unstable section of the walling



Figure 40: An internal view of the main kraal



Figure 41: Aerial view of the main livestock enclosure (Site 4) and farm house complex (Site 5)

Site 5

A. GENERAL SITE DESCRIPTION				
Site type	Historical Farmhouse complex			
Site Period	Late 19 th to early 20 th centuries			
Physical description	The site comprises a multi-room farmhouse with associated outbuildings. The multi-room farmhouse was constructed with bricks and cement with plastered walls. Several changes and additions were made to the main house. The roof was constructed with corrugated iron sheets. A dressed stone shed was recorded to the west of the main house along with several more recent outbuildings. A cooler or cool storage room was also recording standing adjacent to the main house. Several large water reservoirs and dams are also located to the east of the main house.			
Integrity of deposits or structures	The main farmhouse is currently occupied and stable.			
Site extent	Farmhouse: 16 m x 16 m Shed: 23 m x 7 m			
B. SITE EVALUATION				
B1. HERITAGE VALUE			Yes	No
Historic Value				
It has importance to the community or pattern of South Africa's history or precolonial history.			X	X
It has strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.				X
It has significance relating to the history of slavery in South Africa.				X
Aesthetic Value				
It has importance in exhibiting particular aesthetic characteristics valued by a particular community or cultural group.			X	
Scientific Value				
It has potential to yield information that will contribute to an understanding of South Africa's natural and cultural heritage.			X	
It has importance in demonstrating a high degree of creative or technical achievement at a particular period.				X
It has importance to the wider understanding of the temporal change of cultural landscapes, settlement patterns and human occupation.			X	
Social Value				
It has strong or special association with a particular community or cultural group for social, cultural or spiritual reasons (sense of place).			X	
Tourism Value				


It has significance through its contribution towards the promotion of a local sociocultural identity and can be developed as tourist destination.			X
Rarity Value			
It possesses unique, uncommon, rare or endangered aspects of South Africa's natural or cultural heritage.			X
Representative Value			
It is importance in demonstrating the principle characteristics of a particular class of South Africa's natural or cultural places or objects.		X	
B2. REGIONAL CONTEXT			
Other similar sites in the regional landscape.		X	
C. SPHERE OF SIGNIFICANCE			
	High	Medium	Low
International			X
National			X
Provincial		X	
Local		X	
Specific community		X	
D. FIELD REGISTER RATING			
National/Grade 1 [should be registered, retained]			
Provincial/Grade 2 [should be registered, retained]			
Local/Grade 3A [should be registered, mitigation not advised]			
Local/Grade 3B [High significance; mitigation, partly retained]			
Generally Protected A [High/Medium significance, mitigation]			X
Generally protected B [Medium significance, to be recorded]			
Generally Protected C [Low significance, no further action]			
E. GENERAL STATEMENT OF SITE SIGNIFICANCE			
Low			
Medium			X
High			
F. RATING OF POTENTIAL IMPACT OF DEVELOPMENT			
None			
Peripheral			
Destruction			
Uncertain			X
G. RECOMMENDED MITIGATION			
<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase 			
H. APPLICABLE LEGISLATION AND LEGAL REQUIREMENTS			
<ul style="list-style-type: none"> National Heritage Resources Act (Act No. 25 of 1999, Section 34) 			
I. PHOTOGRAPHS			
			
<p>Figure 42: General view of the farmhouse complex</p>			



Figure 43: A general view of the cooler situated adjacent to the main house



Figure 44: A cluster of reservoirs and storage tanks situated near the main house




Figure 45: General view fo the farm shed built with dressed stones and corrugated iron roof



Figure 46: General view of an associated outbuilding at the main farm house complex

Site 6

A. GENERAL SITE DESCRIPTION				
Site type	Graveyard			
Site Period	Early 19 th to early 20 th centuries			
Physical description	The site comprises a graveyard which consists of at least 25 graves. The graves have an east-west orientation with the headstone on the western side. Some of the headstones do have inscriptions but they were hand carved and unclear. Please note that unmarked graves are by default regarded as older than 60 years and are therefore protected by the NHRA (Act No 25 of 1999, Section 36). Some of the dates are as early as 1811			
Integrity of deposits or structures	Stable			
Site extent	Length: 20 metres Width: 10 metres			
B. SITE EVALUATION				
B1. HERITAGE VALUE			Yes	No
Historic Value				
It has importance to the community or pattern of South Africa's history or precolonial history.				X
It has strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.				X
It has significance relating to the history of slavery in South Africa.				X
Aesthetic Value				
It has importance in exhibiting particular aesthetic characteristics valued by a particular community or cultural group.				X
Scientific Value				
It has potential to yield information that will contribute to an understanding of South Africa's natural and cultural heritage.			X	
It has importance in demonstrating a high degree of creative or technical achievement at a particular period.				X
It has importance to the wider understanding of the temporal change of cultural landscapes, settlement patterns and human occupation.			X	
Social Value				
It has strong or special association with a particular community or cultural group for social, cultural or spiritual reasons (sense of place).			X	
Tourism Value				
It has significance through its contribution towards the promotion of a local sociocultural identity and can be developed as tourist destination.				X
Rarity Value				

It possesses unique, uncommon, rare or endangered aspects of South Africa's natural or cultural heritage.			X
Representative Value			
It is importance in demonstrating the principle characteristics of a particular class of South Africa's natural or cultural places or objects.			X
B2. REGIONAL CONTEXT			
Other similar sites in the regional landscape.		X	
C. SPHERE OF SIGNIFICANCE	High	Medium	Low
International			X
National		X	
Provincial	X		
Local	X		
Specific community	X		
D. FIELD REGISTER RATING			
National/Grade 1 [should be registered, retained]			
Provincial/Grade 2 [should be registered, retained]			
Local/Grade 3A [should be registered, mitigation not advised]			
Local/Grade 3B [High significance; mitigation, partly retained]			
Generally Protected A [High/Medium significance, mitigation]			X
Generally protected B [Medium significance, to be recorded]			
Generally Protected C [Low significance, no further action]			
E. GENERAL STATEMENT OF SITE SIGNIFICANCE			
Low			
Medium			
High			X
F. RATING OF POTENTIAL IMPACT OF DEVELOPMENT			
None			
Peripheral			
Destruction			
Uncertain			X
G. RECOMMENDED MITIGATION			
<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase Fenced off and gate installed 			
H. APPLICABLE LEGISLATION AND LEGAL REQUIREMENTS			
<ul style="list-style-type: none"> National Heritage Resources Act (Act No. 25 of 1999, Section 36) Regulations Relating to the Management of Human Remains, in terms of the National Health Act No. 61 of 2003 Removal of Graves and Dead Bodies Ordinance (Ordinance No. 7 of 1925) Ordinance on Exhumations (Ordinance No. 12 of 1980) Local and regional provisions, laws and by-laws 			
I. PHOTOGRAPHS			
			
<p>Figure 47: General view of one of the graves (headstone)</p>			

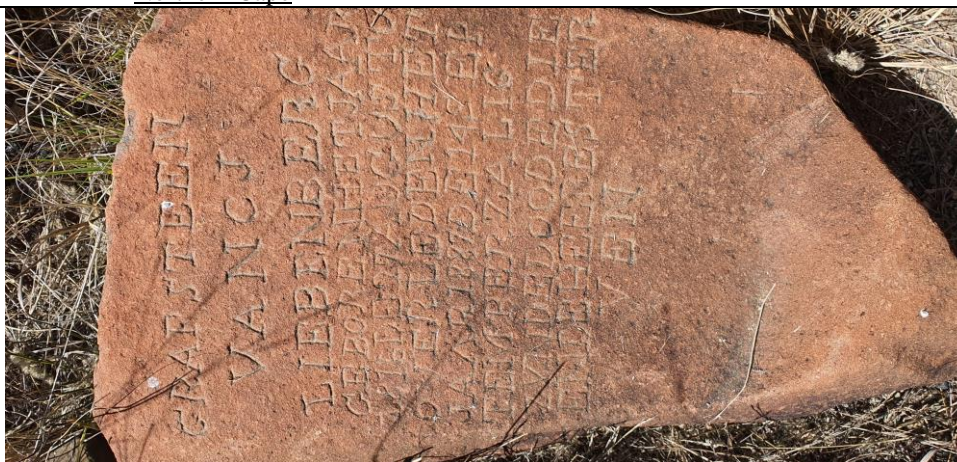


Figure 48: One of the headstone with an inscription

Site 7

A. GENERAL SITE DESCRIPTION				
Site type	Historical Livestock Enclosures			
Site Period	Late 19 th to early 20 th centuries			
Physical description	The site comprises several large livestock enclosures situated in an enclosed shallow valley, with a perennial spring. All the enclosures are constructed of packed stone in a square arrangement. These enclosures were probably used during farming activities by early farmers in the area to pen their livestock overnight. At least eight enclosures were recorded as well as the associated farm house (Site 8).			
Integrity of deposits or structures	Unstable sections			
Site extent	Several various			
B. SITE EVALUATION				
B1. HERITAGE VALUE			Yes	No
Historic Value				
It has importance to the community or pattern of South Africa's history or precolonial history.			X	
It has strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.				X
It has significance relating to the history of slavery in South Africa.				X
Aesthetic Value				
It has importance in exhibiting particular aesthetic characteristics valued by a particular community or cultural group.				X
Scientific Value				
It has potential to yield information that will contribute to an understanding of South Africa's natural and cultural heritage.			X	
It has importance in demonstrating a high degree of creative or technical achievement at a particular period.				X
It has importance to the wider understanding of the temporal change of cultural landscapes, settlement patterns and human occupation.			X	
Social Value				
It has strong or special association with a particular community or cultural group for social, cultural or spiritual reasons (sense of place).			X	
Tourism Value				
It has significance through its contribution towards the promotion of a local sociocultural identity and can be developed as tourist destination.				X
Rarity Value				
It possesses unique, uncommon, rare or endangered aspects of South Africa's natural or cultural heritage.				X
Representative Value				
It is importance in demonstrating the principle characteristics of a particular class of South				X


Africa’s natural or cultural places or objects.					
B2. REGIONAL CONTEXT					
Other similar sites in the regional landscape.				X	
C. SPHERE OF SIGNIFICANCE		High	Medium	Low	
International				X	
National				X	
Provincial				X	
Local				X	
Specific community				X	
D. FIELD REGISTER RATING					
National/Grade 1 [should be registered, retained]					
Provincial/Grade 2 [should be registered, retained]					
Local/Grade 3A [should be registered, mitigation not advised]					
Local/Grade 3B [High significance; mitigation, partly retained]					
Generally Protected A [High/Medium significance, mitigation]					
Generally protected B [Medium significance, to be recorded]					
Generally Protected C [Low significance, no further action]					X
E. GENERAL STATEMENT OF SITE SIGNIFICANCE					
Low					X
Medium					
High					
F. RATING OF POTENTIAL IMPACT OF DEVELOPMENT					
None					
Peripheral					
Destruction					
Uncertain					X
G. RECOMMENDED MITIGATION					
<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase 					
H. APPLICABLE LEGISLATION AND LEGAL REQUIREMENTS					
<ul style="list-style-type: none"> National Heritage Resources Act (Act No. 25 of 1999, Section 34) 					
I. PHOTOGRAPHS					
					
<p>Figure 49: General view of one of the extensive livestock enclosures in the valley</p>					



Figure 50: General view of one of the extensive livestock enclosures in the valley



Figure 51: General view of one of the extensive livestock enclosures in the valley



Figure 52: Aerial view of the small valley indicating the location of the various livestock enclosures

Site 8

A. GENERAL SITE DESCRIPTION

Site type	Historical Farmhouse complex
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Site Period	Later 19 th to early 20 th centuries			
Physical description	The site comprises two-room farmhouse with associated livestock enclosure. The multi-room farmhouse was constructed with dressed stone. Note that all fittings (e.g. doors, windows and roof) have been removed. The house has a square layout with a front door with wooden lintels. No midden was recorded in association with the house. Two small livestock enclosures are located in close proximity to the house.			
Integrity of deposits or structures	The structure is unstable and collapsing			
Site extent	Farmhouse: 10 m x 12 m Wall height 1.5 metres			
B. SITE EVALUATION				
B1. HERITAGE VALUE			Yes	No
Historic Value				
It has importance to the community or pattern of South Africa's history or precolonial history.				X
It has strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.				X
It has significance relating to the history of slavery in South Africa.				X
Aesthetic Value				
It has importance in exhibiting particular aesthetic characteristics valued by a particular community or cultural group.				X
Scientific Value				
It has potential to yield information that will contribute to an understanding of South Africa's natural and cultural heritage.			X	
It has importance in demonstrating a high degree of creative or technical achievement at a particular period.				X
It has importance to the wider understanding of the temporal change of cultural landscapes, settlement patterns and human occupation.			X	
Social Value				
It has strong or special association with a particular community or cultural group for social, cultural or spiritual reasons (sense of place).				X
Tourism Value				
It has significance through its contribution towards the promotion of a local sociocultural identity and can be developed as tourist destination.				X
Rarity Value				
It possesses unique, uncommon, rare or endangered aspects of South Africa's natural or cultural heritage.				X
Representative Value				
It is importance in demonstrating the principle characteristics of a particular class of South Africa's natural or cultural places or objects.				X
B2. REGIONAL CONTEXT				
Other similar sites in the regional landscape.			X	
C. SPHERE OF SIGNIFICANCE				
	High	Medium	Low	
International			X	
National			X	
Provincial			X	
Local			X	
Specific community			X	
D. FIELD REGISTER RATING				
National/Grade 1 [should be registered, retained]				
Provincial/Grade 2 [should be registered, retained]				
Local/Grade 3A [should be registered, mitigation not advised]				
Local/Grade 3B [High significance; mitigation, partly retained]				
Generally Protected A [High/Medium significance, mitigation]				
Generally protected B [Medium significance, to be recorded]				
Generally Protected C [Low significance, no further action]			X	
E. GENERAL STATEMENT OF SITE SIGNIFICANCE				
Low			X	
Medium				
High				
F. RATING OF POTENTIAL IMPACT OF DEVELOPMENT				

None	
Peripheral	
Destruction	
Uncertain	X

G. RECOMMENDED MITIGATION

- Maintain a buffer zone of 50 metres during prospecting phase

H. APPLICABLE LEGISLATION AND LEGAL REQUIREMENTS

- National Heritage Resources Act (Act No. 25 of 1999, Section 34)

I. PHOTOGRAPHS



Figure 53: General view of the farmhouse complex



Figure 54: General view of the rondavel-like structure at this farm complex

Site 9

A. GENERAL SITE DESCRIPTION		
Site type	Rock art (engravings)	
Site Period	Later Stone Age	
Physical description	The site comprises a cluster of rock engravings situated along a rocky outcrop adjacent to the Orange River. Images include rhinoceros, hippopotamus, eland, various antelope and geometric designs.	
Integrity of deposits or structures	Stable	
Site extent	Approximately 200 m x 230 m	
B. SITE EVALUATION		
B1. HERITAGE VALUE	Yes	No

Historic Value			
It has importance to the community or pattern of South Africa's history or precolonial history.			X
It has strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.	X		
It has significance relating to the history of slavery in South Africa.			X
Aesthetic Value			
It has importance in exhibiting particular aesthetic characteristics valued by a particular community or cultural group.	X		
Scientific Value			
It has potential to yield information that will contribute to an understanding of South Africa's natural and cultural heritage.	X		
It has importance in demonstrating a high degree of creative or technical achievement at a particular period.	X		
It has importance to the wider understanding of the temporal change of cultural landscapes, settlement patterns and human occupation.	X		
Social Value			
It has strong or special association with a particular community or cultural group for social, cultural or spiritual reasons (sense of place).			X
Tourism Value			
It has significance through its contribution towards the promotion of a local sociocultural identity and can be developed as tourist destination.	X		
Rarity Value			
It possesses unique, uncommon, rare or endangered aspects of South Africa's natural or cultural heritage.	X		
Representative Value			
It is importance in demonstrating the principle characteristics of a particular class of South Africa's natural or cultural places or objects.	X		
B2. REGIONAL CONTEXT			
Other similar sites in the regional landscape.			X
C. SPHERE OF SIGNIFICANCE			
	High	Medium	Low
International		X	
National	X		
Provincial	X		
Local	X		
Specific community	x		
D. FIELD REGISTER RATING			
National/Grade 1 [should be registered, retained]			
Provincial/Grade 2 [should be registered, retained]			
Local/Grade 3A [should be registered, mitigation not advised]			
Local/Grade 3B [High significance; mitigation, partly retained]			
Generally Protected A [High/Medium significance, mitigation]			X
Generally protected B [Medium significance, to be recorded]			
Generally Protected C [Low significance, no further action]			
E. GENERAL STATEMENT OF SITE SIGNIFICANCE			
Low			
Medium			
High			X
F. RATING OF POTENTIAL IMPACT OF DEVELOPMENT			
None			
Peripheral			
Destruction			
Uncertain			X
G. RECOMMENDED MITIGATION			
<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase 			
H. APPLICABLE LEGISLATION AND LEGAL REQUIREMENTS			
<ul style="list-style-type: none"> National Heritage Resources Act (Act No. 25 of 1999, Section 35) 			

Addendum 3: Surveyor General Farm Diagram

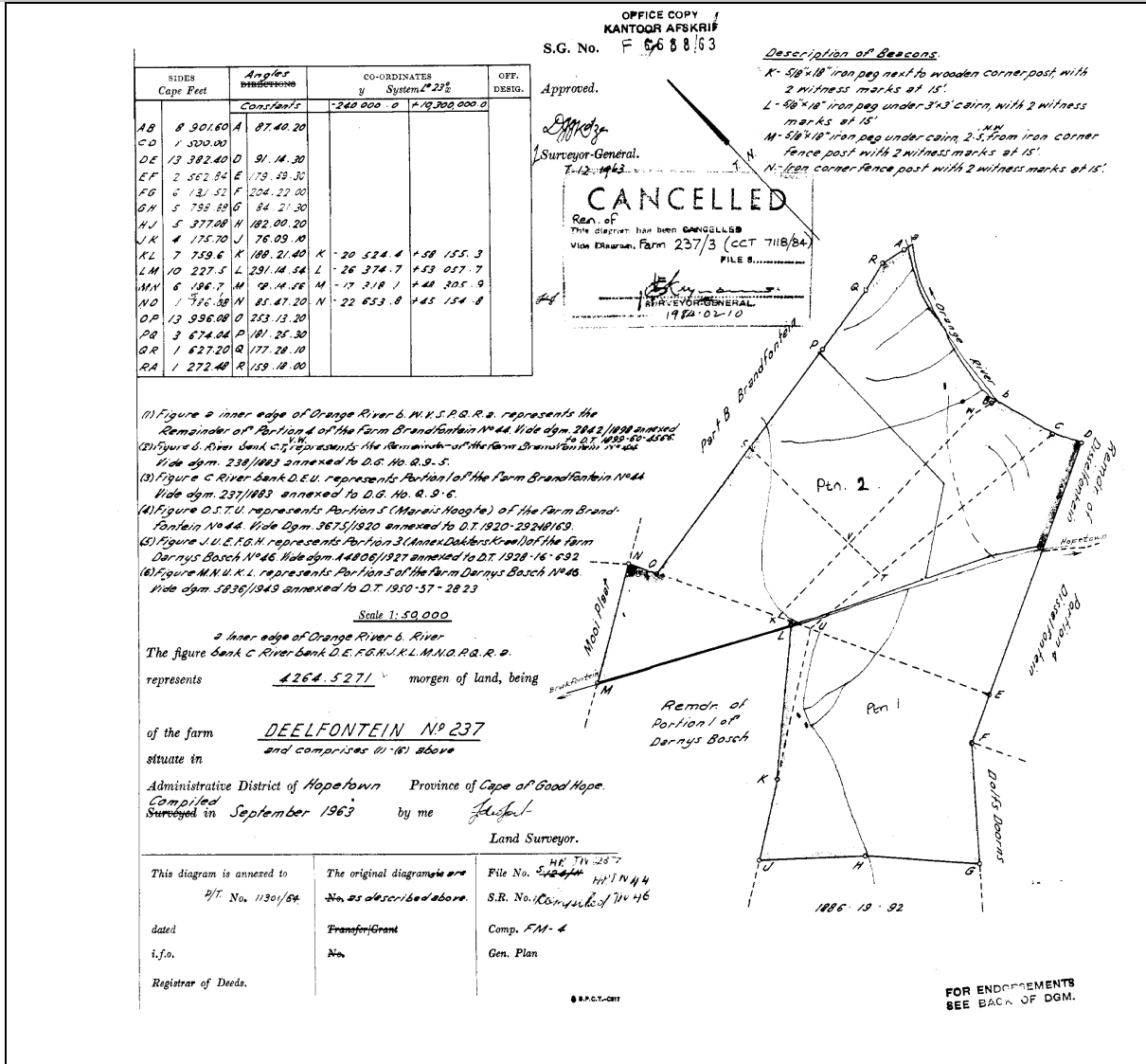


Figure 55: Surveyor General's sketch of the farm Deelfontein 237 RD was surveyed in 1963

Addendum 4: Relocation of Graves

Marked graves younger than 60 years do not fall under the protection of the NHRA (Act No. 25 of 1999) with the result that exhumation, relocation and reburial can be conducted by an undertaker. This will include logistical aspects such as social consultation, purchasing of plots in cemeteries, procurement of coffins, etc. Other legislative measures which may be pertinent include the Removal of Graves and Dead Bodies Ordinance (Ordinance No. 7 of 1925), Regulations Relating to the Management of Human Remains (GNR 363 of 22 May 2013) made in terms of the National Health Act No. 61 of 2003, Ordinance on Exhumations (Ordinance No. 12 of 1980) as well as any local and regional provisions, laws and by-laws that may be in place.

Marked graves older than 60 years are protected by the NHRA (Act No. 25 of 1999) and as a result an archaeologist must be in attendance to assist with the exhumation and documentation of the graves. Note that unmarked graves are by default regarded as older than 60 years and therefore also falls under the NHRA (Act No. 25 of 1999, Section 36).

The relocation of graves entails the following procedure:

- Notices of intent to relocate the graves must be put up at the burial site for a period of 60 days. This should contain contact information where communities and family members can register as interested and affected parties. All information pertaining to the identification of the graves must be documented for the application of a SAHRA permit. All notices must be in at least 3 languages, of which English is one. This is a requirement by law.
- These notices of intention must also be placed in at least two local newspapers and have the same information as above.
- Local radio stations can also be used to try contact family members. This is not required by law, but can be helpful.
- During this time (60 days) a suitable cemetery must be identified near to the development or otherwise one specified by the family of the deceased.
- An open day for family members should be arranged after the period of 60 days so that they can gather to discuss the way forward, and to sort out any problems. The developer needs to take the families requirements into account.
- Once the 60 days have passed and all the information from the family members have been received, a permit can be requested from SAHRA. This is a requirement by law.
- Once the permit has been issued, the graves may be exhumed and relocated.
- All headstones must be relocated with the graves as well as any remains and any additional objects found in the grave.

Information needed for the SAHRA permit application

- The permit application must be done by an archaeologist.
- A map of the area where the graves have been located.
- A survey report of the area prepared by an archaeologist.
- All the information on the families that have identified graves.
- A letter of permission from the landowner granting permission to the developer to exhume and relocate the graves.

- A letter (or proof of purchase of the plots) from the new cemetery confirming that the graves will be reburied there.
- Details of the farm name and number, magisterial district and GPS coordinates of the gravesite.

Graves are generally be classified into four categories. These are:

- Graves younger than 60 years;
- Graves older than 60 years, but younger than 100 years;
- Graves older than 100 years; and
- Graves of victims of conflict or of individuals of royal descent.