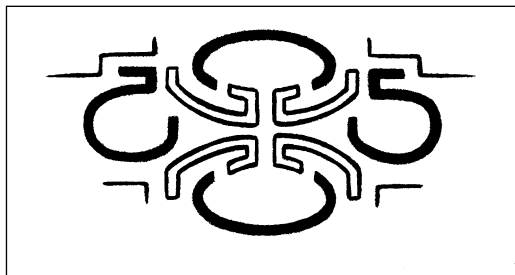


**Desktop Cultural Heritage Assessment:
Proposed Prospecting Application for Diamonds Alluvial, Diamonds
General, Diamonds in Kimberlite and Diamonds near Vioolsdrift,
Namaqualand, Namakwa District Municipality, Nama Khoi Local
Municipality, Northern Cape**

For

<p>Project Applicant Morgenson Mining (Pty) Ltd PO Box 754 Schweizer-Reneke 2780 Cell No: 0832904913 E-mail: js@morgenson.co.za</p>	<p>Environmental Consultant Milnex Environmental Consultants CC PO Box 1086 4 Botha Street Schweizer-Reneke 2780 Tel No: (018) 011 1925 Fax No: (053) 963 2009 e-mail: info@milnex-sa.co.za</p>
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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@unisa.ac.za

Date:	June 2022
Version:	2 (Final Report)

Executive Summary

This report contains a desktop 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 predictive results as requested by Milnex Environmental Consultants CC for the proposed prospecting application for Diamonds Alluvial, Diamonds General, Diamonds in Kimberlite and Diamonds near Vioolsdrift, on Portion 1 of the farm Korridor 21 RD, Namakwa District Municipality, Nama Khoi Local Municipality, Northern Cape

Preliminary indications are that the Northern Cape and more specifically Helskloof Nature Reserve might contain low density Middle Stone Age and Later Stone Age scatters. Surveys and studies in the region confirm the possibility of rock art sites, more specifically engravings. Although no known historical sites were noted in the historical maps and literature there is still the possibility of graves.

Also note that the survey footprint is located within the Buffer Zone of the Richtersveld Cultural and Botanical Landscape which is a declared World Heritage Site. As a result a heritage survey will be mandatory.

It is therefore recommended that a Phase 1 Heritage Assessment be conducted of the proposed areas earmarked for prospecting.

However, please note:

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 Environmental Consultants CC an independent environmental consultant was appointed by Morgenson Mining (Pty) Ltd to undertake a Basic Assessment report (BAR) according to the National Environmental Management Act, 1998 and the National Environmental Management Waste Act, 2008 in respect of Listed Activities that have been triggered by applications in terms of the Mineral and Petroleum Resources Development Act, 2002 (MPRDDA) (as amended). on Portion 1 of the Farm Korridor 21 RD near Vioolsdrift, Namakwa District Municipality, Nama Khoi Local Municipality, Northern Cape. A desktop Cultural Heritage Assessment was requested by Milnex Environmental Consultants CC to predict the potential impact of the proposed prospecting activities on cultural heritage remains.

2. Objectives

The general objective of a desktop cultural heritage survey is to predict the likelihood of cultural heritage remains consisting of both tangible and intangible archaeological and historical artefacts, structures (including graves), settlements and oral traditions of cultural significance, occurring in the area of the proposed development.

3. Description of Physical Environment of Study Area

The report focussed on an area situated east of Eksteenfontein and west of Vioolsdrift with the northern boundary delineated by the Orange River. The survey footprint is protected area and called the Helskloof (Nababiep) Nature Reserve. Also note that the Helskloof Nature Reserve falls within the buffer zone of the Richtersveld Community Conservancy which forms part of the Richtersveld Cultural and Botanical Landscape which is a declared World Heritage Site since 2007 (Government Gazette No. 30043) in accordance with the World Heritage Act (Act No. 49 of 1999).

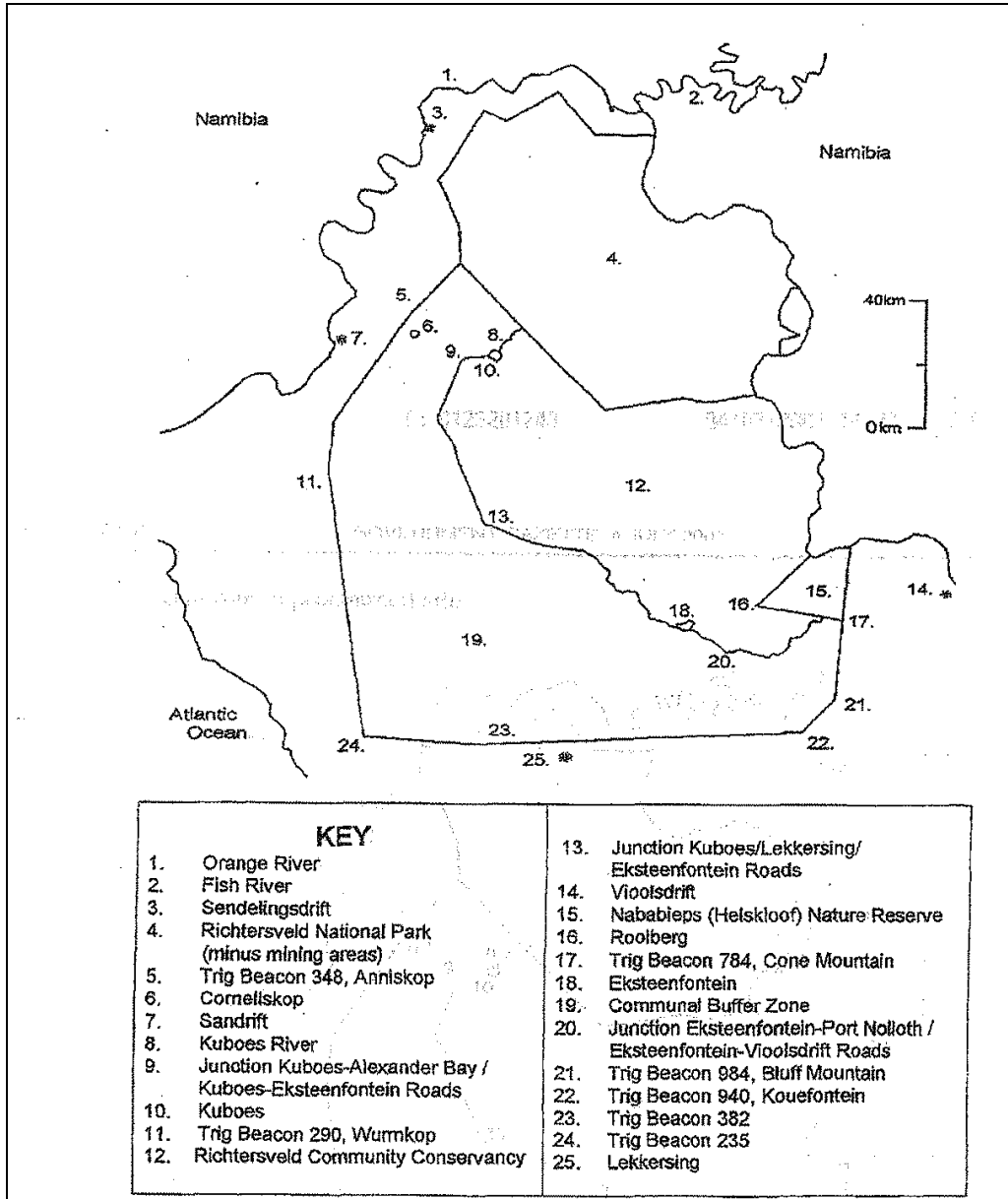


Figure 1: The extent of the Richtersveld Cultural and Botanical Landscape with the survey area indicated as Helskloof Nature Reserve (No. 15)

Farm Name(s) and Portions	Corridor 21 RD • Portion 1
Size of Survey Area	10804.3026 ha
Magisterial District	Namakwa District Municipality Nama Khoi Local Municipality
1:50 000 Map Sheet	2817CB 2817CD
1:250 000 Map Sheet	2816
Central Coordinates of the Development	28.773010°S 17.430820°E

Table 1: Physical Environment

The central parts of the survey area falls within the Desert Biome, particularly the Gariep Desert Bioregion and more specifically the Kahams Mountain Desert (Dg 5). This veld type extends to the area between the Stinkfonteinberge basal apron in the west and the Orange River and Helskloof Canyon in the east, and between the Rosyntjieberge in the north and the Rooiberg in the south. The unit borders on units of the Succulent Karoo Biome to the north, south and west (Mucina & Rutherford 2006).

The survey footprint is characterised as large open desert-type region with catchment areas draining into the Orange River to the north. There is almost no infrastructure with limited access by single track roads.

Vioolsdrift has a short winter season that lasts from about May to July. Almost no rain falls and the weather is hot. The summer season lasts from August to April. It is very hot and there is no rain. Vioolsdrif is officially one of the hottest places in South Africa, on 27 October 2015 a maximum temperature of 47 °C was recorded. The mean annual temperature is 24 °C and temperatures above 30 °C are measured on an average of 220 days (60%) of the year. Daytime maximum temperatures above 43 °C and night time minimums of 27 °C are a regular feature in summer (SAExplorer 2022).

Current Zoning	Nature Reserve
Economic activities	Tourism
Soil and basic geology	The Port Nolloth Group makes up the eastern, external part of the Pan-African Gariep Belt (Port Nolloth Zone) in southern Namibia and western South Africa. It contains two glaciogenic diamictite units, the older Kaigas Formation and the younger Numees Formation, with intercalated and overlying carbonate-dominated units. Available chemostratigraphic information includes O, C and Sr isotope data. Micropalaeontological and geochronological data point to an early Cryogenian age (c. 750 Ma) of the Kaigas Formation and possibly a middle Ediacaran age (c. 580 Ma) for the Numees Formation. The former was deposited in an evolving, but eventually failed, continental rift on the western flank of the Kalahari Craton, probably at low latitude. The Numees Formation is a laterally continuous, up to 600-m-thick glaciomarine deposit for which a passive continental margin setting has been suggested. Alternatively, based on more recent data, the depositional setting might have been a back-arc basin. The eroded remnants of the corresponding arc are present in the Dom Feliciano Belt.
Prior activities	Farming
Socio Economic Environment	The Namakwa District is also the District in the Northern Cape Province with the lowest population in 2016 namely 115488. This is a slight decline from the 2011 census figure of 115 842 and is the least populated district in the Province (and Country, although geographically the largest) with a population comprising 10% of the Provincial total population. With 132 000 people, the Namakwa District Municipality housed 0.2% of South Africa's total population in 2018. Between 2008 and 2018 the population growth averaged 0.93% per annum which is about half than the growth rate of South Africa as a whole (1.57%). Compared to Northern Cape's average annual growth rate (1.66%), the growth rate in Namakwa's population at 0.93% was about half than that of the province. In 2018, Namakwa employed 36 200 people which is 11.15% of the total employment in Northern Cape Province (325 000), 0.23% of total employment in South Africa (16.1 million). Employment within Namakwa increased annually at an average rate of 0.39% from 2008 to 2018 (Namakwa District Municipality (IDP) 2021-2022).

<p>Evaluation of Impact</p>	<p>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</p>
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Table 2: Socio-economic environment

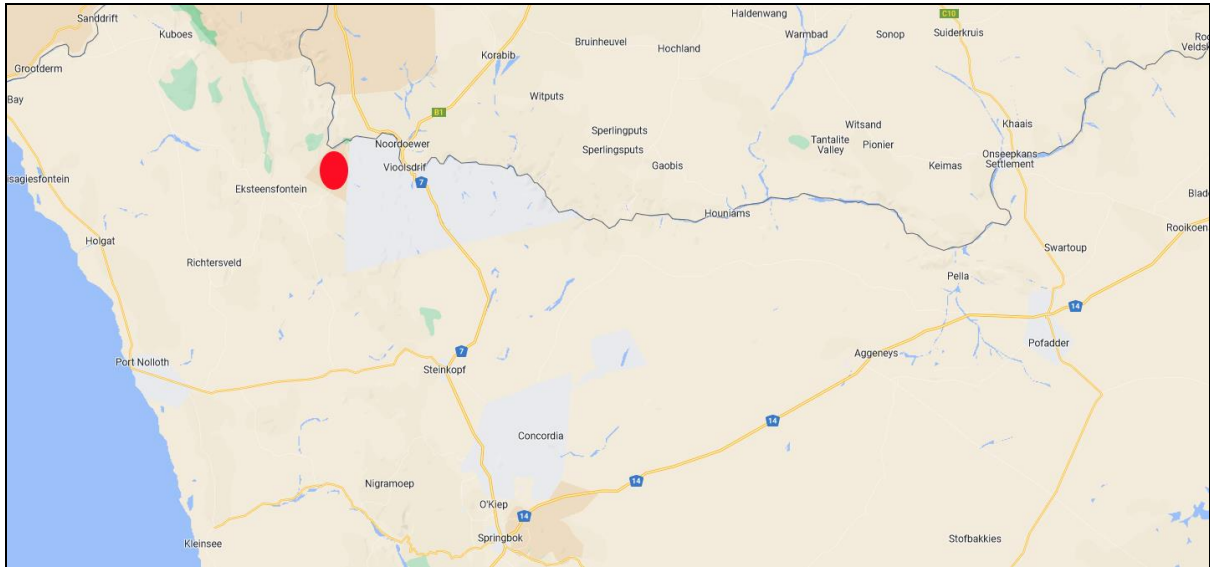


Figure 2: Regional map of the survey area (situated west of Violsdrift) (indicated by the red area)

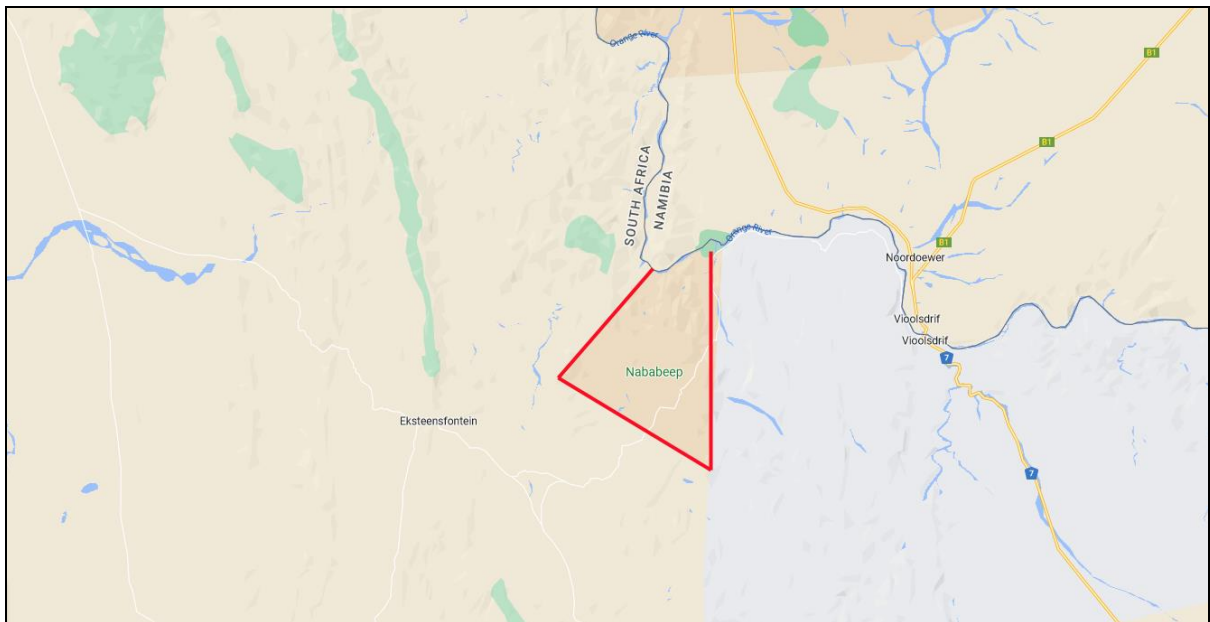


Figure 3: Regional context of the survey footprint located situated west of Violsdrift

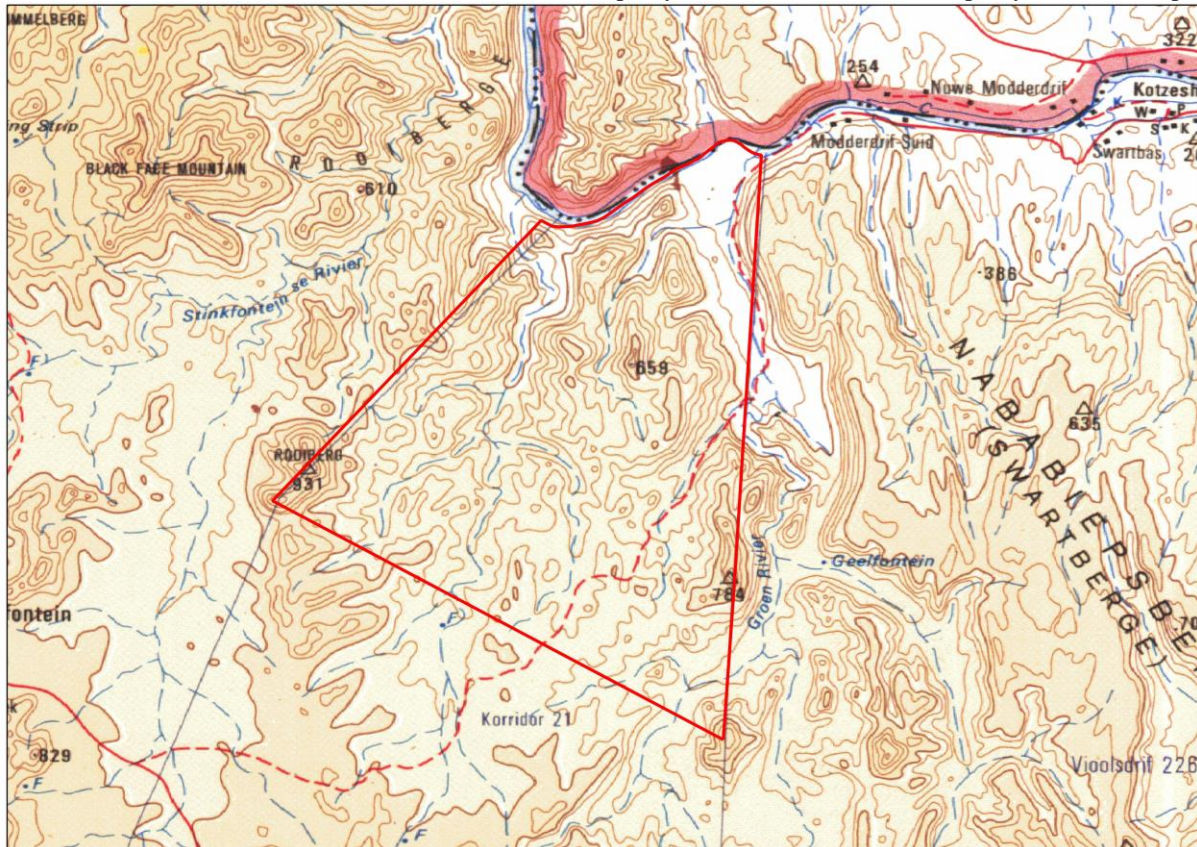


Figure 4: Local context of the survey footprint (1:250 000 Topographical Map 2817)

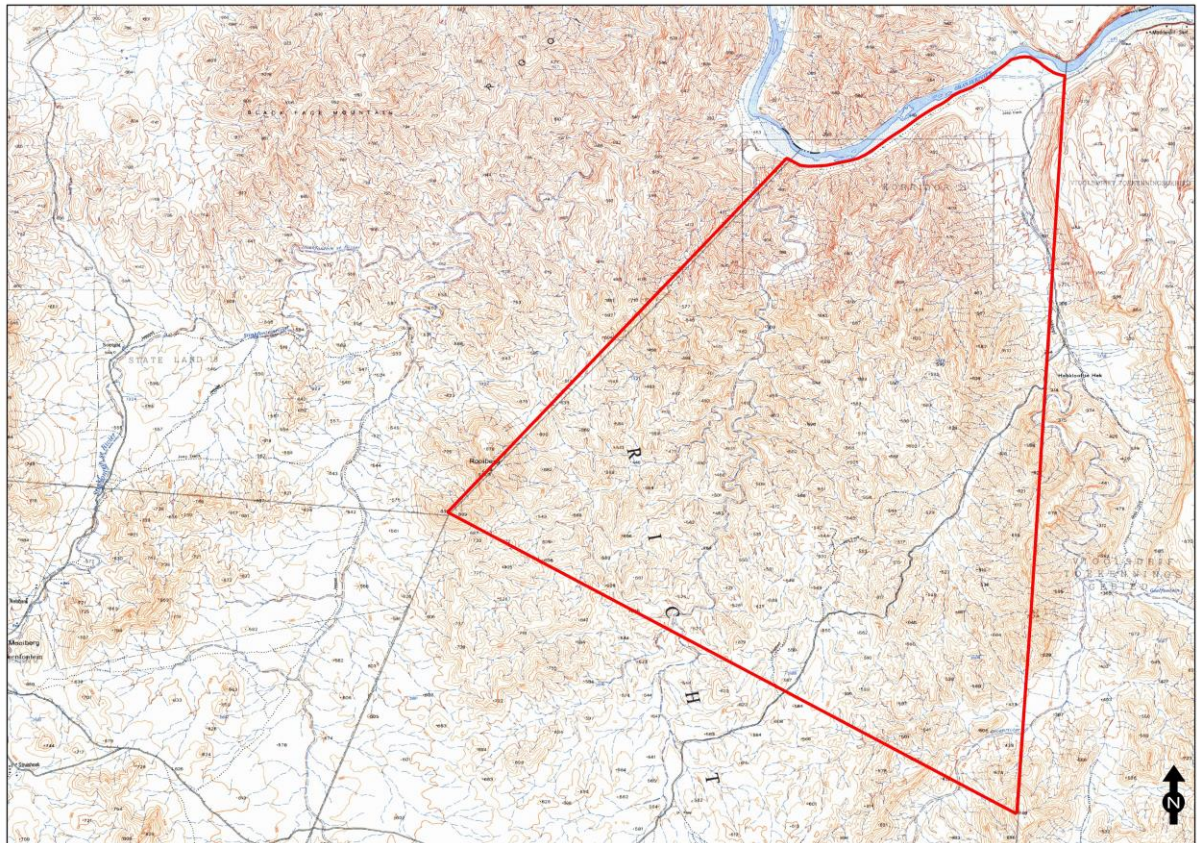


Figure 5: The survey area as indicated on the 1:50 000 topographic map 2817CD and 2817CB (1980)

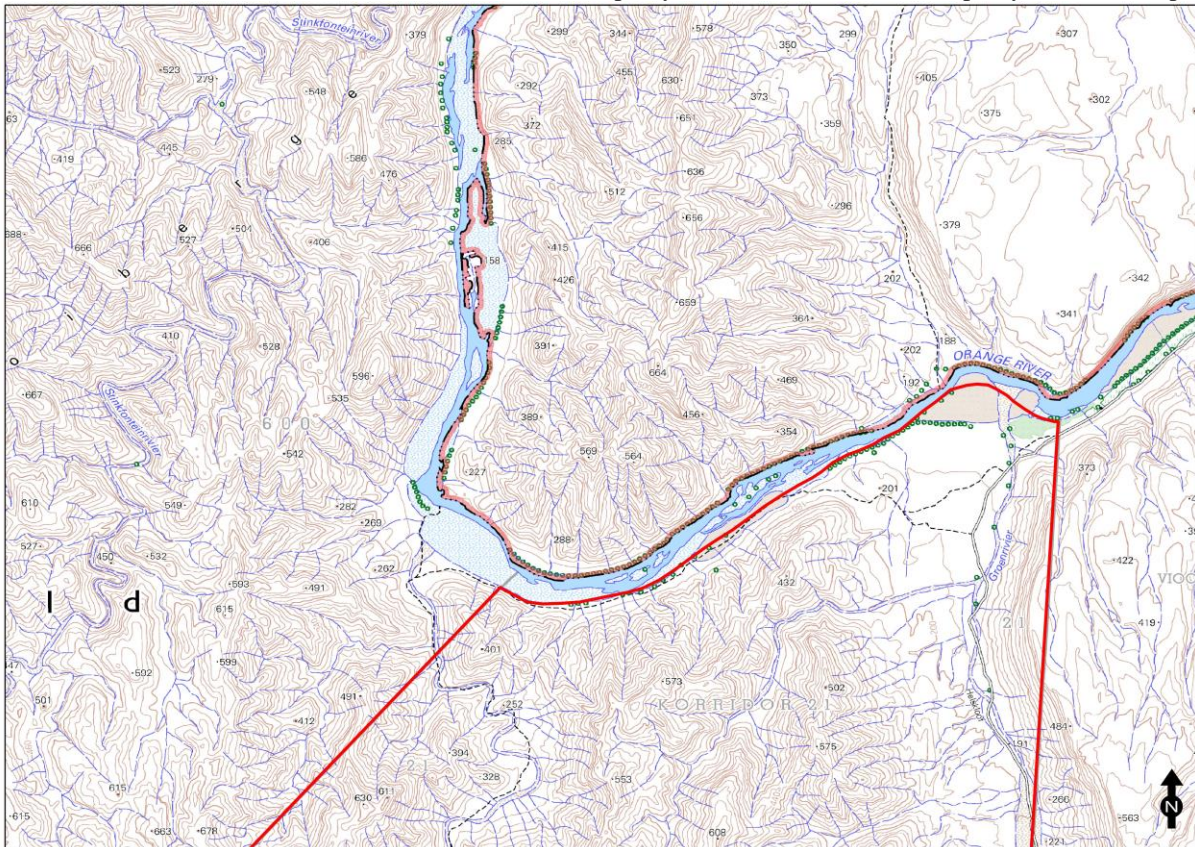


Figure 6: The survey area as indicated on the 1:50 000 topographic map 2817CB (2003)

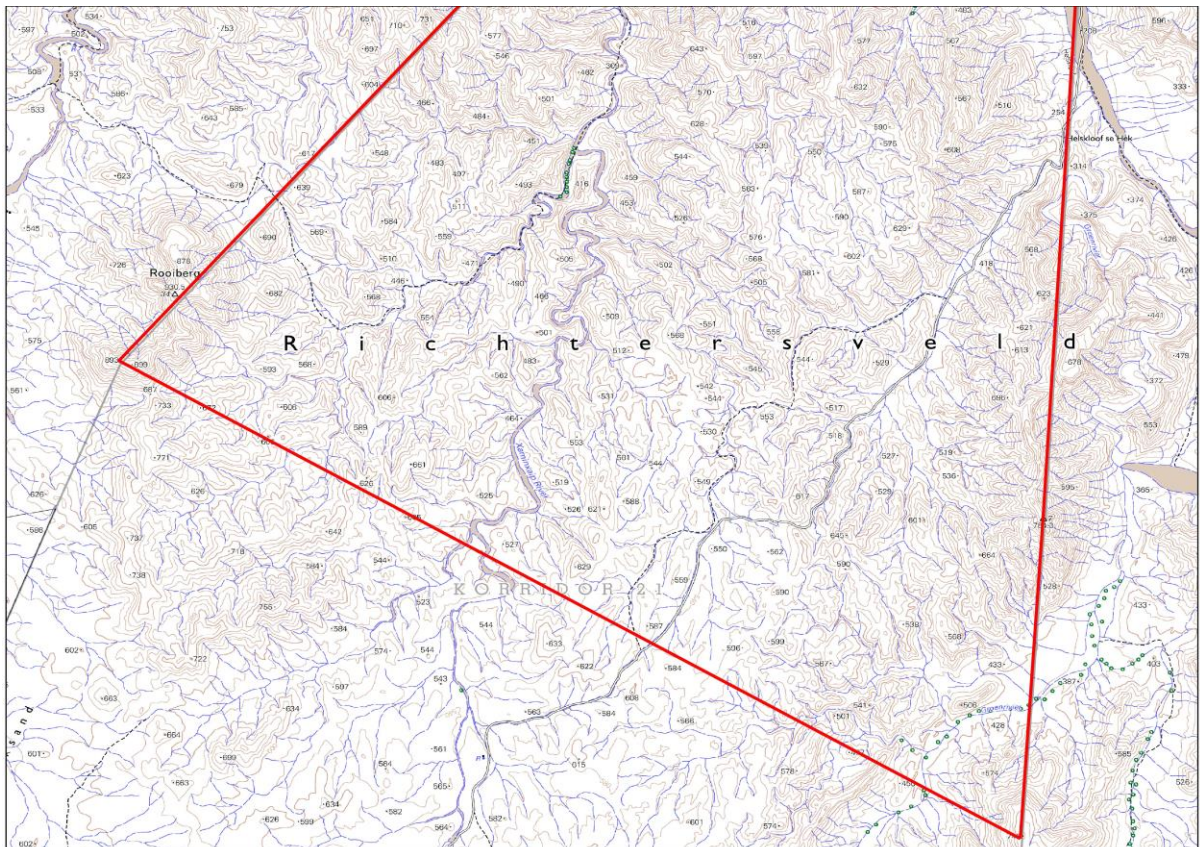


Figure 7: The survey area as indicated on the 1:50 000 topographic map 2817CD (2003)

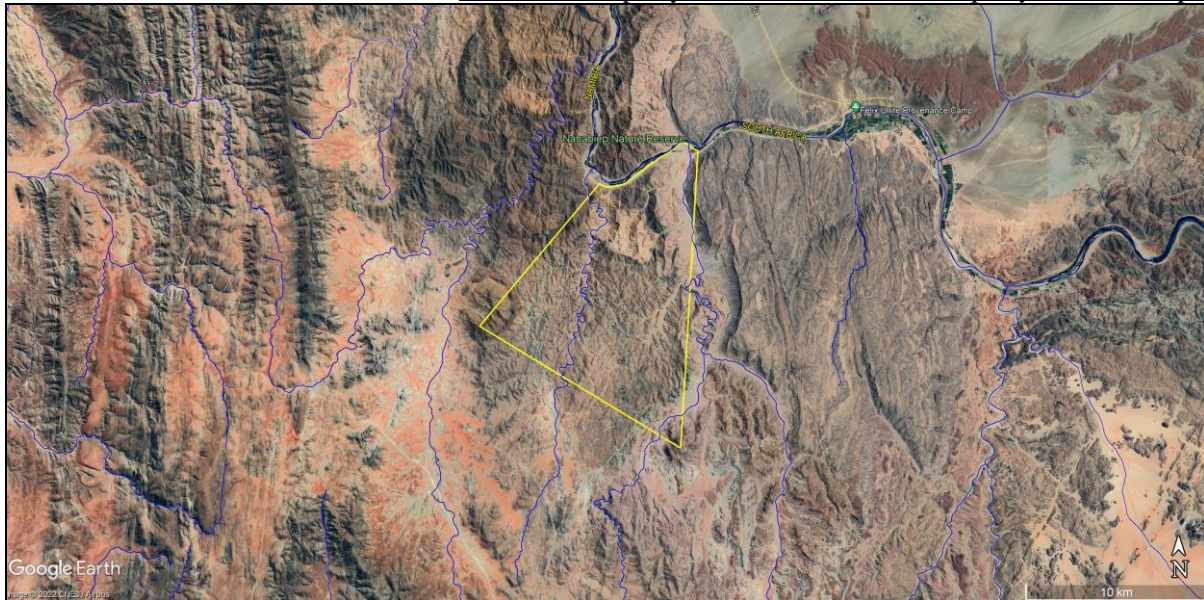


Figure 8: Survey area within local context (Google Earth Pro 2022)

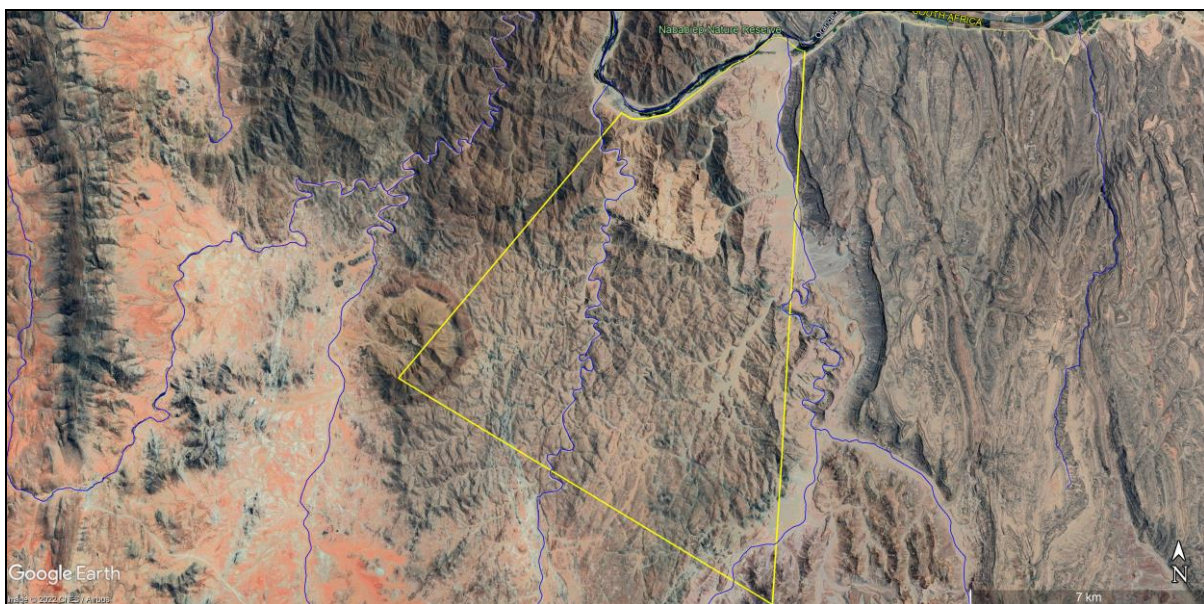


Figure 9: Survey area within local context (Google Earth Pro 2022)

4. Proposed Project Description

Proposed prospecting will consist of the following:

Drilling: 300 boreholes shall be drilled by the appointed contractor. Percussion drilling methods will be used to drill boreholes at varying depths ranging from 90-150 m with borehole diameters of at least 150 mm.

Pitting: 200 pits: 3 m (length) x 2 m (breath) x 4 m (depth). Pits shall be dug, locked, sampled and backfilled.

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
The National Water Act (Act No. 36 of 1998)	

Air Quality Act (Act No. 39 of 2004)	-
National Forests Act, Act of 84 of 1998	-
The National Heritage Resources Act (Act No. 25 of 1999)	Section 38, 34, 35, 36
World Heritage Convention Act (Act No. 49 of 1999)	Various sections
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);	
Mine Health and Safety Act (Act No. 29 of 1996) (MHSA)	
Biodiversity Act (Act 10 of 2004)	
Namakwa District Municipality (IDP) 2021-2022	Various sections

Table 3: Legal framework

<p>Description of the overall activity. (Indicate Mining Right, Mining Permit, Prospecting right, Bulk Sampling, Production Right, Exploration Right, Reconnaissance permit, Technical co-operation permit, Additional listed activity)</p>	<p>1) 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:</p> <p>i) a watercourse;”</p> <p>2) 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—</p> <p>(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)]</p> <p>(b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing;</p> <p>3) 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>4) Listing Notice 3 (GNR 324), Activity 12: “The clearance of an area of 300 square metres or more of indigenous vegetation. (g) Northern Cape: (i) Withing any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; (ii) Within critical biodiversity areas identified in bioregional plans; (iv) On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.</p>
	<p>Prospecting right without bulk sampling for the prospecting of Diamonds Alluvial (DA), Diamonds</p>

	General (D), Diamonds in Kimberlite (DK) and Diamonds (DIA) including associated infrastructure, structure and earthworks. Application of Prospecting right without bulk sampling.
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Table 4: Listed activities

- 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	No
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	Yes
Any other development category, public open space, squares, parks, recreation grounds	Yes

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 whatsoever without permit from SAHRA.
Provincial Significance	Grade II	High significance	Conservation by provincial heritage authority, provincial site nomination. No alteration whatsoever without permit from provincial heritage authority.
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 not process advised.
Local Significance	Grade III-B	High significance	Conservation by local authority, no external alteration without permit from provincial heritage authority. Could be mitigated and (part) retained as heritage register site.
Generally Protected A	Grade IV-A	High/medium significance	Conservation by local authority. Site should be mitigated before destruction. Destruction permit required from provincial heritage authority.
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 required from provincial heritage authority.

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 (KML and shapefiles) on the proposed prospecting activities was supplied by Milnex 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).

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 (Gaigher 2012, Orton 2021, Van Ryneveld 2017).

The Surveyor General's map of the farm Korridor 21 RD indicates that the farm was first surveyed in the 1950s (also see Addendum 2).

The general area near the Orange River has been severely utilised by early communities over the last few millennia and more intensely during the last few centuries. An extensive survey near Upington revealed scatters of Later Stone Age artefacts (Gaigher 2012).

Beaumont *et al.* (1995:240) have stated that “Thousands of square kilometres of Bushmanland are covered by a low density lithic scatter”. Many impact assessments have found this to be true, although it can be stated that the scatter tends to be more noticeable in northern Bushmanland than in the south. The artefacts include material dating to the Early (ESA), Middle (MSA) and Late (LSA) Stone Ages. Beaumont *et al.* (1995:240-1) note a widespread low-density stone artefact scatter of Pleistocene age across areas of Bushmanland to the south where raw materials, mainly quartzite cobbles, were derived from the Dwyka till. Systematic collections of this material made at Olyvenkolk, south west of Kenhardt and Maans Pannen, and east of Gamoep, could be separated out by abrasion state into a fresh component of Middle Stone Age (MSA) with prepared cores, blades and points, and a large aggregate of moderately to heavily weathered Earlier Stone Age (ESA). Beaumont *et al.* (1995:241) have shown that “substantial MSA sites are uncommon in “Bushmanland” and those that have been documented thus far have generally yielded only small samples.

At Jakkelsberg (towards the west) evidence of early pastoralists (herding communities) were recorded by Webley (1997).

A limited number of engraving rock art sites are located in the general area, mostly due to the lack of suitable shelter sites. Most of these sites are located near rocky outcrops with panels of engravings (petroglyphs). The Richtersveld Cultural Landscape is also known for rock art panels along water courses as well as the general vicinity of the Orange River.

Note that engravings have been recorded by tourists in the Helsőort Nature Reserve on social media.

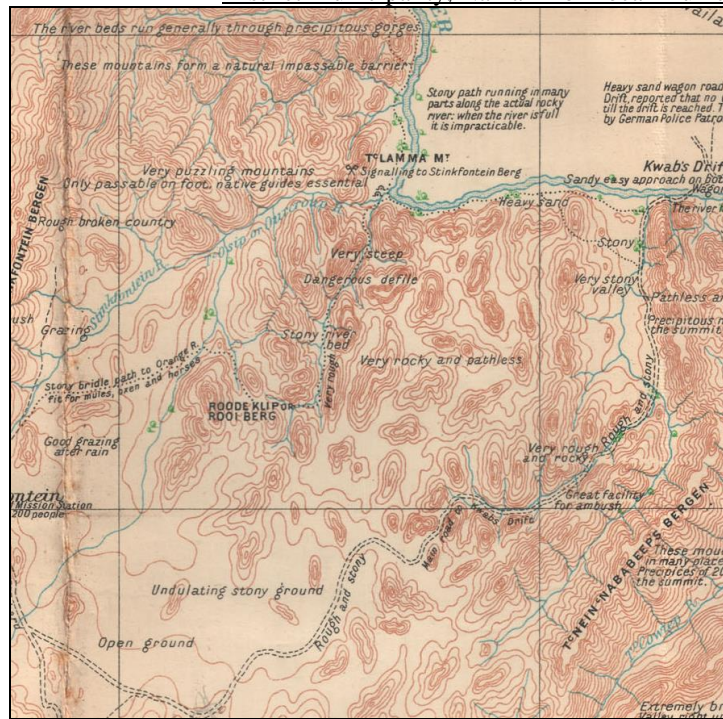


Figure 10: Early War Office maps of the region dating to July 1907

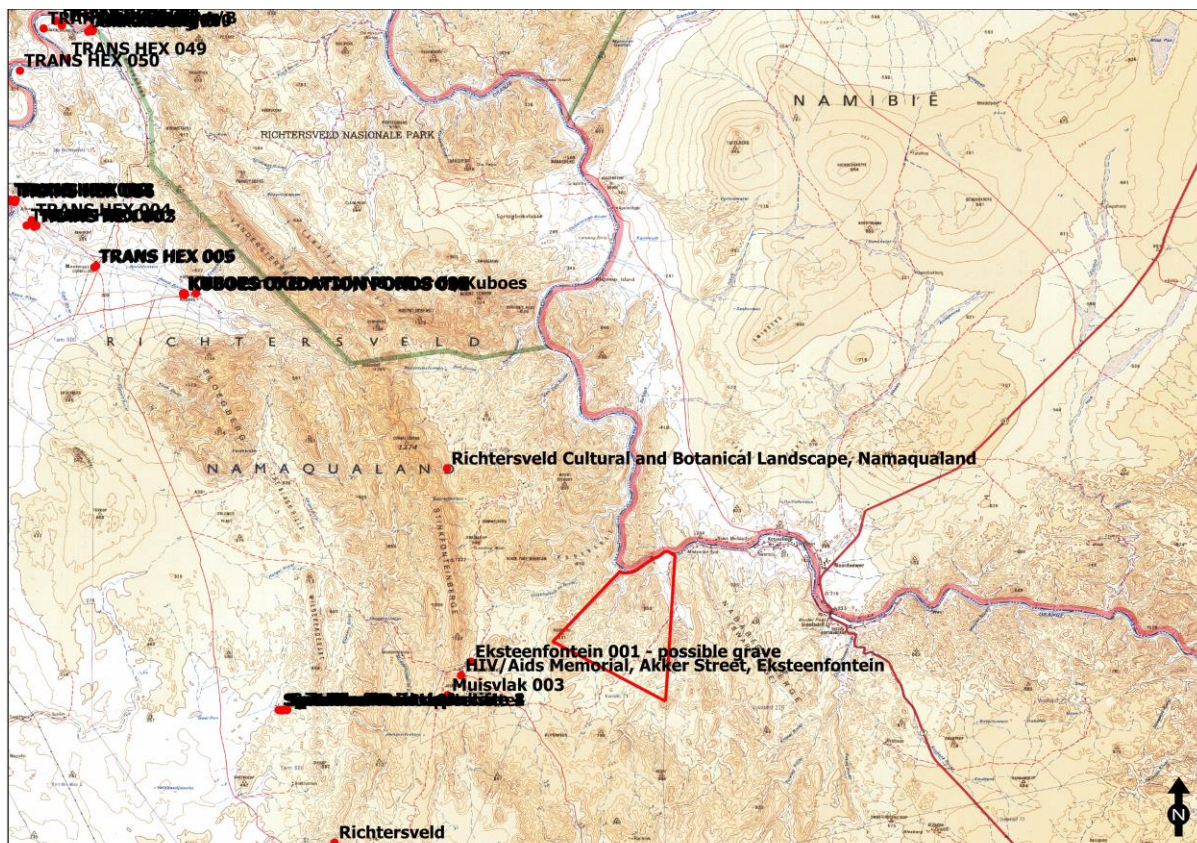


Figure 11: The location of known sites in the region according to the SAHRIS system (2022)

7. Recommendations and Conclusions

Preliminary indications are that the Northern Cape and more specifically Helskloof Nature Reserve might contain low density Middle Stone Age and Later Stone Age scatters. Surveys and studies in the region confirm the possibility of rock art sites, more specifically engravings. Although no known historical sites were noted in the historical maps and literature there is still the possibility of graves.

Also note that the survey footprint is located within the Buffer Zone of the Richtersveld Cultural and Botanical Landscape which is a declared World Heritage Site. As a result a heritage survey will be mandatory.

It is therefore recommended that a Phase 1 Heritage Assessment be conducted of the proposed areas earmarked for prospecting.

Also, please note:

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)).

8. References

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www.saexplorer.co.za (Accessed June 2022)

<https://www.cwgc.org> [Commonwealth War Grace Commission] (Accessed June 2022)

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
 - 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 ecailles 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 occur in which triangular flakes with convergent dorsal scars, often with faceted striking platforms,

are produced. Discoidal systems and intentional blade production from volumetric cores also occur; formal tools may include unifacially and bifacially retouched points, backed artefacts, scrapers, and denticulates; 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
- 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).

Sites that were identified during the survey are archaeological sites dated to the later (stone walled) phase of the Late Iron Age (c. AD 1640 - AD 1830s) also known as the Late Moloko. These sites all conform to a general settlement layout that forms part of a certain worldview. As such, the livestock enclosures are situated in the central area of a settlement. The court (kgotla) is also located in this central area and is associated with men (men are usually also buried here). The surrounding scalloped walling is where the houses are situated and is associated with women. This type of settlement layout is generally known as the Central Cattle Pattern (CCP).

Ethno-historical Context

Vioolsdrift

The name in Afrikaans means 'the ford (shallow river crossing) of the violin'. It is reportedly named after Jan Viool ("John Violin"), who is said to have played the fiddle in these parts in the nineteenth century. Some say he was a Nama man, who used to guide ox-wagons across the ford. An accomplished player, he would fiddle away merrily on the river bank while waiting for wagons to arrive.

Addendum 2: Surveyor General Farm Diagram

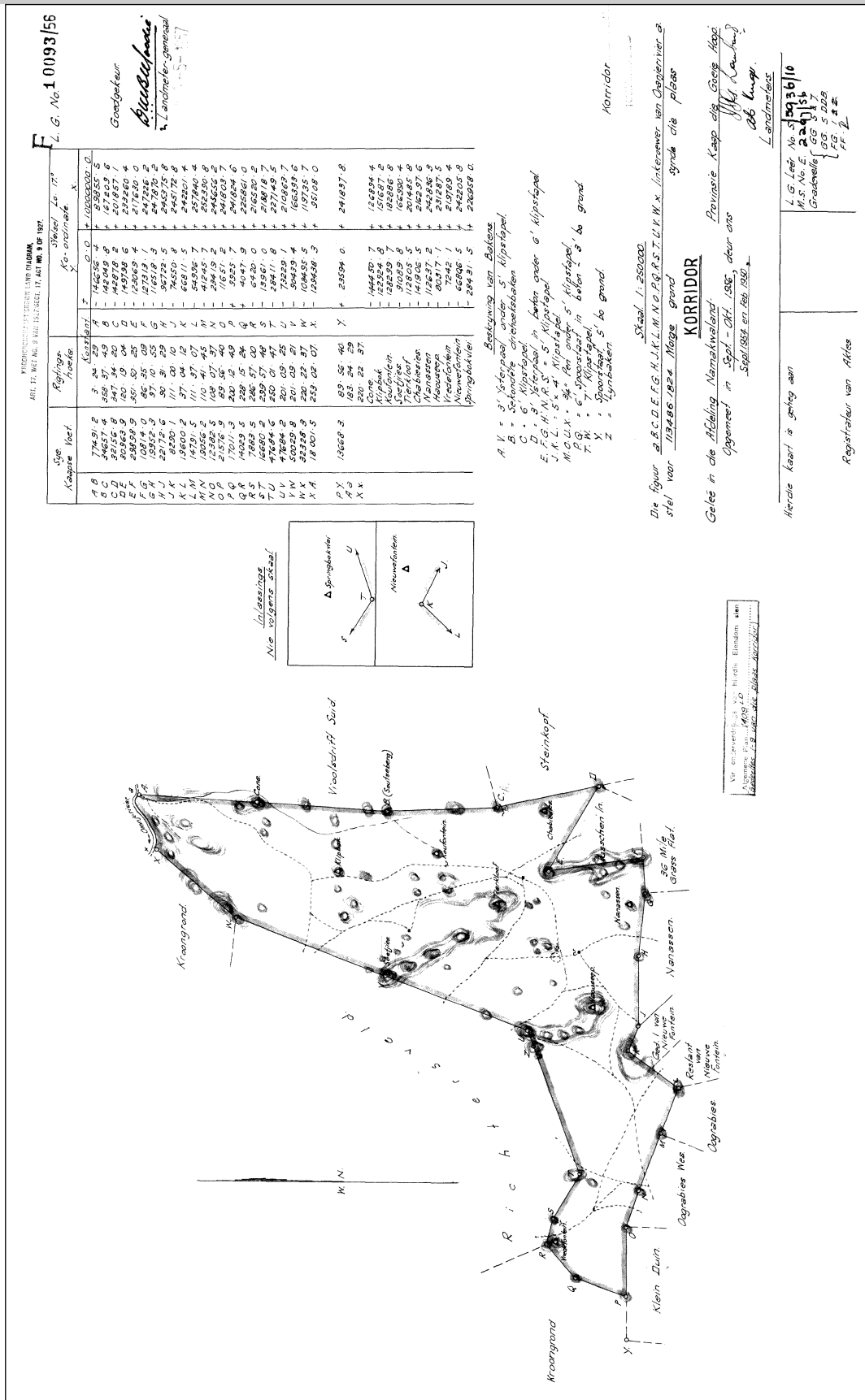


Figure 12: Surveyor General's map of the farm Korridor 21 RD which was first surveyed in the 1950s

Addendum 3: 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.