Heritage Impact Assessment (including Palaeontological Desktop Assessment) for a Mine Prospecting Application on the Farm Kannikwa 156 and Farm Kannikwa Vlakte 157 near Port Nolloth in Richtersveld Local Municipality, Northern Cape

Prepared by

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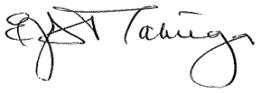
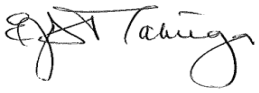
FIELD WORK & REPORT	E. Matenga		21 March 2022

DECLARATION OF INDEPENDENCE

AHSA Pty Ltd is an independent consultancy: I hereby declare that I have no interest, be it business, financial, personal or other vested interest in the undertaking of the proposed activity, other than remuneration for work performed in terms the National Heritage Resources Act (No 25 of 1999).



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EXECUTIVE SUMMARY

1. This heritage specialist report has been prepared in support of a prospecting right application on the Farms Kannikwa 157 and Kannikwa Vlakte 157 situated near Port Nolloth in the Ritchtersveld Local Municipality, Northern Cape.

2. An exploration permit is sought for diamonds expected to be found in gravel deposits on the farms.
3. The impact assessment is in fulfilment of Section 38(8) of the National Heritage Resources Act (No 25/1999) which requires screening for the possible occurrence of heritage resources that may be affected by the proposed activities. This procedure allows appropriate measures to be taken as mitigation.
4. The following is a summary of the findings of this study.

5. *The Stone Age*

The Namaqualand Karoo plains were occupied by hunters and foragers and later semi-nomadic herders who subsisted on stone tool technologies. Scatters of stone tools were encountered on the ridges on the Farm Kannikwa 156. The observations comprised mainly quartz flake waste with a few formal tools.

6. *Burial grounds*

No burial grounds were reported on the farm.

7. *Footprint of the old railway line from Port Nolloth to Steinkopf*

The landowner of Kannikwa 156 treasures a footprint of the old railway line from Port Nolloth to Steinkopf, of which a well preserved section bisects the farm. It is a remnant earth embankment on which rusted railway track fastening system components such as rusted dog spikes are occasionally seen. Sites KAN01, KAN02 and KAN04 represent a western section of the track. Recognising the historical importance of the old track the landowner motivated for the exclusion of the old railway line footprint from the prospecting right. It is further recommended in this report that a servitude of 50 m be reserved on either side of the track. An old settlement on the farm connected with the railway line must also be protected by the reservation of a buffer of 50 m radius.

8. Inventory of heritage sites

SITE NO	LATITUDE	LONGITUDE	PERIOD	DESCRIPTION	RANKING	MITIGATION
KAN01	29°15'26.20"S	16°59'39.50"E	19th Century	Railway embankment or rail track foundation. A rusted iron dog spike or cut track spike used to fasten railway track to wooden sleepers	Local 3A	To be protected
KAN02	29°15'29.70"S	16°59'21.30"E	19th/20th centuries	Found on a railway embankment or rail track foundation. Rail track fastening system components, possibly large spikes. Rusted. Other rusted parts undiagnostic.	Local 3A	To be protected
KAN03	29°15'12.67"S	16°58'59.69"E	19th /20th century	Remains of a settlement, a stopover on the side of the railway supplied water and other essentials for the rail service	Local 3A	To be protected
KAN04	29°15'34.70"S	17° 0'10.80"E	19th/20th century	Found on a railway embankment or rail track foundation. Rail track fastening system components – dog spikes.	Local 3A	To be protected
KAN05	29°15'50.60"S	17° 1'10.30"E	Recent past	A cluster of boulders form a small hill and shallow rock shelter facing north. Recent graffiti – alphabets but not quite legible.	Local 3C	No action required
KAN06	29°15'47.10"S	17° 1'18.50"E	MSA/LSA	Quartzite boulders on the summit of a ridge, quartz flakes of which some may possibly have been used as scrapers.	Local 3C	No action required
KAN07	29°15'16.90"S	17° 0'47.10"E	20th Century	A watering site for animals situated on the western foot of a ridge. An old disused windmill and broken concrete reservoir. Windblown sand in the area.	Local 3C	No action required
KAN08	29°15'14.50"S	17° 0'36.70"E	MSA/LSA	A sand quarry excavated in the recent past exposed quartz lithics. 2 blades and 4 flakes	Local 3C	No action required

KAN09	29°16'21.30"S	17° 1'4.40"E	MSA/LSA	On the summit of a ridge, a large field of quartz waste. A few diagnostic tools found – in the photograph 2 blades, 1 scraper, 2 flakes	Local 3C	No action required
KAN10	29°16'20.00"S	17° 0'57.60"E	MSA/LSA	On the western foot of a ridge. Three quartz lithics representing scrapers	Local 3C	No action required

9. Ranking of Findings

The ranking system is adapted from Guidelines for involving Heritage Specialists in EIA processes by Winter S and & N. Baumann (2005: 19)

GRADE	RANKING	SIGNIFICANCE	NO OF SITES
1	National	Of high intrinsic, associational and contextual heritage value within a national, provincial and local context, i.e. formally declared or potential Grade 1, 2 or 3A heritage resources	0
2	Provincial	Of high intrinsic, associational and contextual heritage value within a national, provincial and local context, i.e. formally declared or potential Grade 2 heritage resources	0
3A	Local	Of high intrinsic, associational and contextual heritage value within a national, provincial and local context, i.e. formally declared or potential Grade 3A heritage resources	4[1]
3B	Local	Of moderate to high intrinsic, associational and contextual value within a local context, i.e. potential Grade 3B heritage resources	0
3C	Local	Of medium to low intrinsic, associational or contextual heritage value within a national, provincial and local context, i.e. potential Grade 3C heritage resources	6
		TOTAL	**10**

10. Conclusion and recommendations

The old railway track will be preserved. A 50 m wide servitude will be reserved on either side of the old track. An old settlement on the farm connected with the railway line must also be protected by the reservation of a buffer of 50 m radius. The prospecting application can be approved with a condition that the old railway track and settlement are protected.

The study is mindful that some important discoveries may occur during the prospecting and mining phases. If this happens operations should be halted, and the provincial heritage resources authority or SAHRA notified in order for an investigation and evaluation of the finds to take place.

[1] Three sites represent features/finds recorded along the old railway track. The fourth site is an old settlement.

BREVIATIONS

CPF	Chance Finds Procedure
EIA	Environmental Impact Assessment
HIA	Heritage Impact Assessment
LSA	Late Stone Age
LIA	Later Iron Age
PHRA	Provincial Heritage Resources Authority
MSA	Middle Stone Age
NEMA	National Environmental Management Act.
NHRA	National Heritage Resources Act
SAHRA	South African Heritage Resources Agency
WHS	World Heritage Site
OUV	Outstanding Universal Value

1. INTRODUCTION

This heritage impact assessment report has been prepared on behalf of Thunderflex (Pty Ltd) in support of a mine prospecting application on the Farms Kannikwa 156 and Farm Kannikwa Vlakte 157 near Port Nolloth in the Richtersveld Local Municipality, Northern Cape. The target mineral is diamonds expected to be present in the gravels on the farms in some places covered by superficial desert sands. Physical activities associated with prospecting will result in the damage or destruction of heritage resources on the surface and below if they occur in the footprint of the exploration. The impact assessment is undertaken in terms of Section 38(8) of the National Heritage Resources Act (No 25/1999) and this procedure allows appropriate measures to be taken as mitigation.

2. DESCRIPTION OF THE RECEIVING ENVIRONMENT

The two portions of the farm Kannikwa (157 and 157) are situated 16 km east of Port Nolloth on the eastern margins of the Namaqualand coastal plain . The two farms are adjoining sharing a common east-west boundary. The R382 Road from Port Nolloth trending east to Steinkopf bisects the area with a larger portion of Kannikwa 156 lying north of the road and a larger portion of Kannikwa Vlakte 157 lying south of the road. (Figures 1-2). The land surface is flat to rolling terrain with the higher ground formed by quartzite ridges and lowland areas covered with a sand overburden. On the western margin of both farms pale sand dunes transition into red sand dunes. From a vegetation perspective the area falls within the Richtersveld ecosystem, host to one of the world's richest variety of desert succulents and other species which form an extensive carpet of flowers, an amazing spectacle at the beginning of spring when they flower (Figure 3 -6).

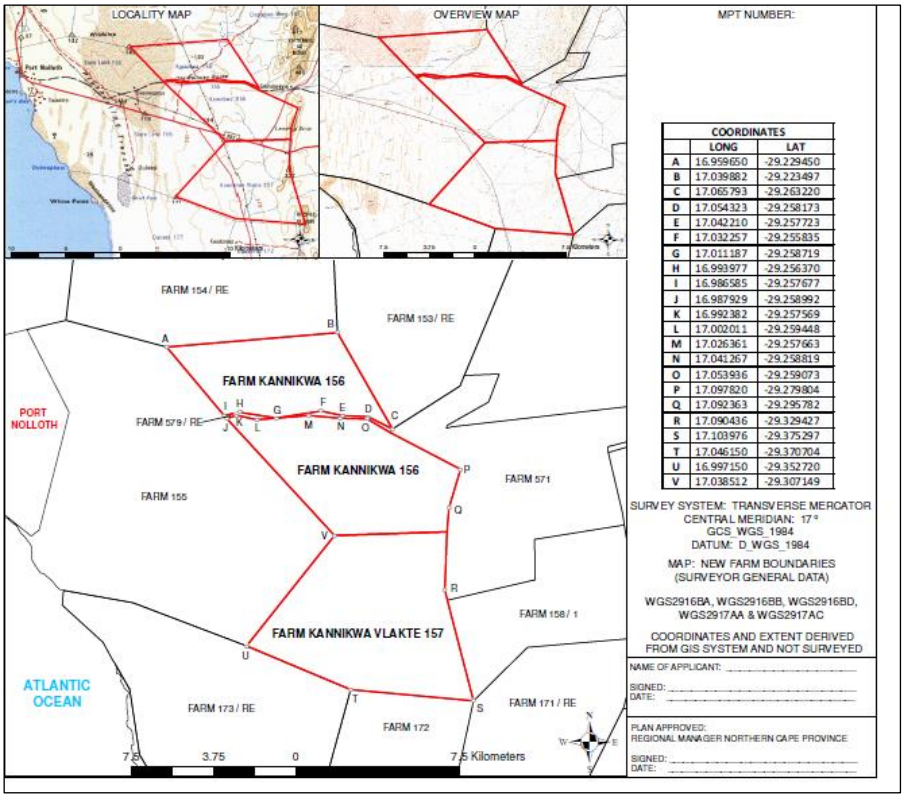

Figure 1: A standard map shows the location of the farms Kannikwa 156 and Kannikwa Vlakte 157 near Port Nolloth

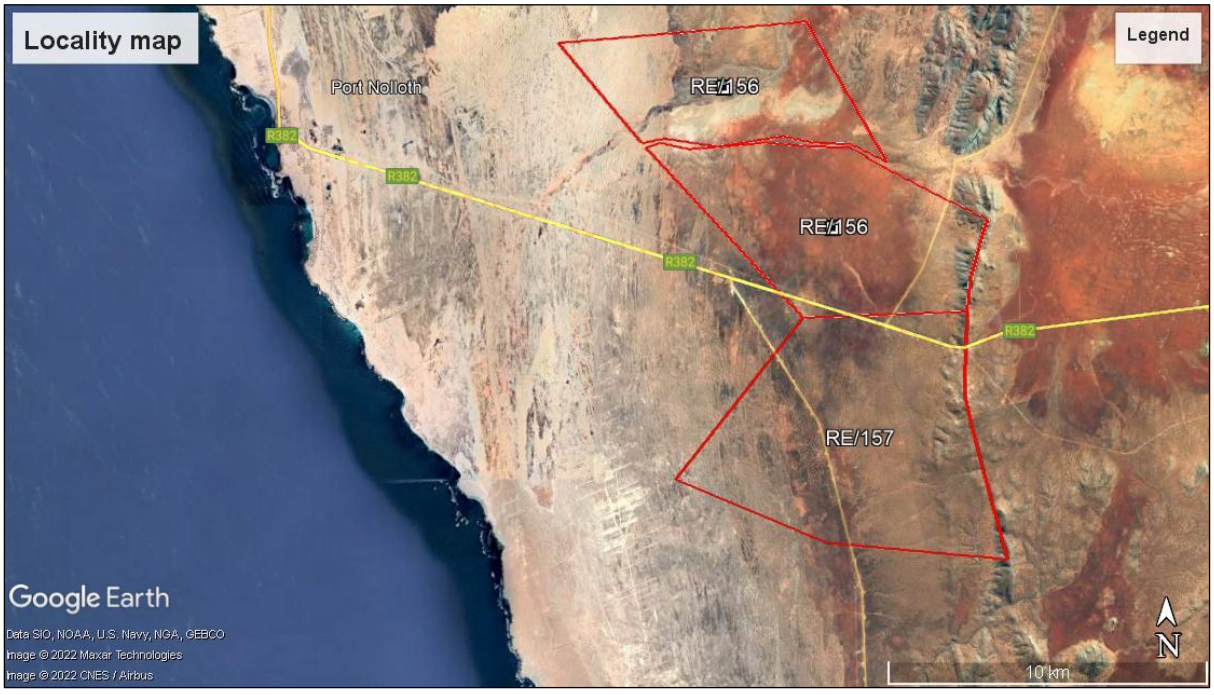

Figure 2: Google Earth map shows the farms Kannikwa 156 and Kannikwa Vlakte 157 situated west of Port Nolloth

Figure 3: A view facing northeast from Kannikwa 156 shows a remnant railway embankment

Figure 4. On Kannikwa 157, windblown desert sand in the foreground and a ridge in the background

Figure 5: A north-western portion of the farm Kannikwa 156 with pale sand cover

Figure 6: Kannikwa Vlakte 157, view of the extensive treeless plain

3. LEGAL FRAMEWORK

This heritage impact assessment fulfils a responsibility placed on developers to protect heritage resources where they are likely to be affected by a proposed development. This obligation is legislated with Sections 34, 35, 36 and 38 of the National Heritage Resources Act (No 25 of 1999) forming the legal framework in which this HIA report has been prepared.

3.1. Section 38 of National Heritage Resources Act on Heritage Impact Assessments

Section 38 of the NHRA states the nature and scale of development which triggers a HIA:

38. *(1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as—*

(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;

(b) the construction of a bridge or similar structure exceeding 50 m in length;

(c) any development or other activity which will change the character of a site—

(i) exceeding 5 000 m^2 in extent[2]; or

(ii) involving three or more existing erven or subdivisions thereof; or

(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or

(iv) the costs of which will exceed a sum set in terms of regulations by

SAHRA or a provincial heritage resources authority;

(d) the re-zoning of a site exceeding 10 000 m^2 in extent; or

(e) any other category of development provided for in the regulations by SAHRA or a provincial heritage resources authority,

must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

3.2. Definition of heritage (National Estate)

Section 3 lists a wide range of cultural phenomena which could be defined as heritage, or the *National Estate* (3(2)). Section 3(3) outlines criteria upon which heritage value is ascribed. This Section is useful as a field checklist for the identification of heritage resources.

[2] Areal extent of the proposed development triggers the HIA.

3.3. Protection of buildings and structures older than 60 years

Section 34 provides automatic protection for buildings and structures more than 60 years old until it can be proven that they do not have heritage value:

(1) No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.

3.4. Protection of archaeological sites

Section 35 (4) of the NHRA prohibits the destruction of archaeological, palaeontological and meteorite sites:

No person may, without a permit issued by the responsible heritage resources authority—
(a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
(b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;
(c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or
(d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.

3.5. Graves and burial grounds

Section 36 of the NHRA provides for the protection of certain graves and burial grounds. Graves are generally classified under the following categories:

- 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
- Graves of individuals of royal descent
- Graves that have been specified as important by the Ministers of Arts and Culture.

Further to the legal prescripts, we are mindful of the fact that graves and burial grounds are held sacred whether they are protected by the law or not.

3.6. The National Environmental Management Act (No 107 of 1998)

This Act states that a survey and evaluation of cultural resources must be done in areas where development projects that will affect the environment will be undertaken. The impact of the development on these resources should be determined and proposals for the mitigation thereof are made. Environmental management is a much broader undertaking to cater for cultural and social needs of people. Any disturbance of landscapes and sites that constitute the nation's cultural heritage should be avoided as far as possible and where this is not possible the disturbance should be minimized and remedied.

3.7. The Burra Charter on Conservation of Places of Cultural Significance

Generic principles and standards for the protection of heritage resources in South Africa are drawn from international charters and conventions. In particular South Africa has adopted the **ICOMOS Australia Charter for the Conservation of Places of Cultural Significance (the Burra Charter 1999)** as a benchmark for best practice in heritage management.

4. APPROACH AND METHODOLOGY

4.1. Literature study

The farms Kannikwa 156 & 157 lie on the margins of the Namaqualand Coastline, which refers to the Atlantic coast from Alexander Bay in the north to Lambert's Bay in the south. The second important point of reference and a subject of keen interest to researchers is proximity of the Richtersveld Botanical and Cultural Landscape which was inscribed on the list of World Heritage sites in 2006,

It is important to mention from the outset that the development will not impact the World Heritage Cultural Landscape since its southern boundary on the village of Eksteenfontein is 50 km to the north of Kannikwa, and the Kleinduin & Augrabies Nature Reserve which borders Kannikwa 156 to the north is part of a formalised buffering mechanism for the Richtersveld World Heritage Site (Figures 7-8). Much has been written about the transhumant economy of Nama herders whose communal land forms part of the World Heritage property (Townsend 2014, p5, EcoAfrica 2019). The tangible and intangible dimensions of this vibrant culture nurtured by the semiarid environment are unique elements which have been considered for the recognition of the Ritchtersveld as a cultural landscape of outstanding universal value (OUV). It needs to be stated that the mine prospecting will be on private land and as such the mining activities will not directly impact the Nama.

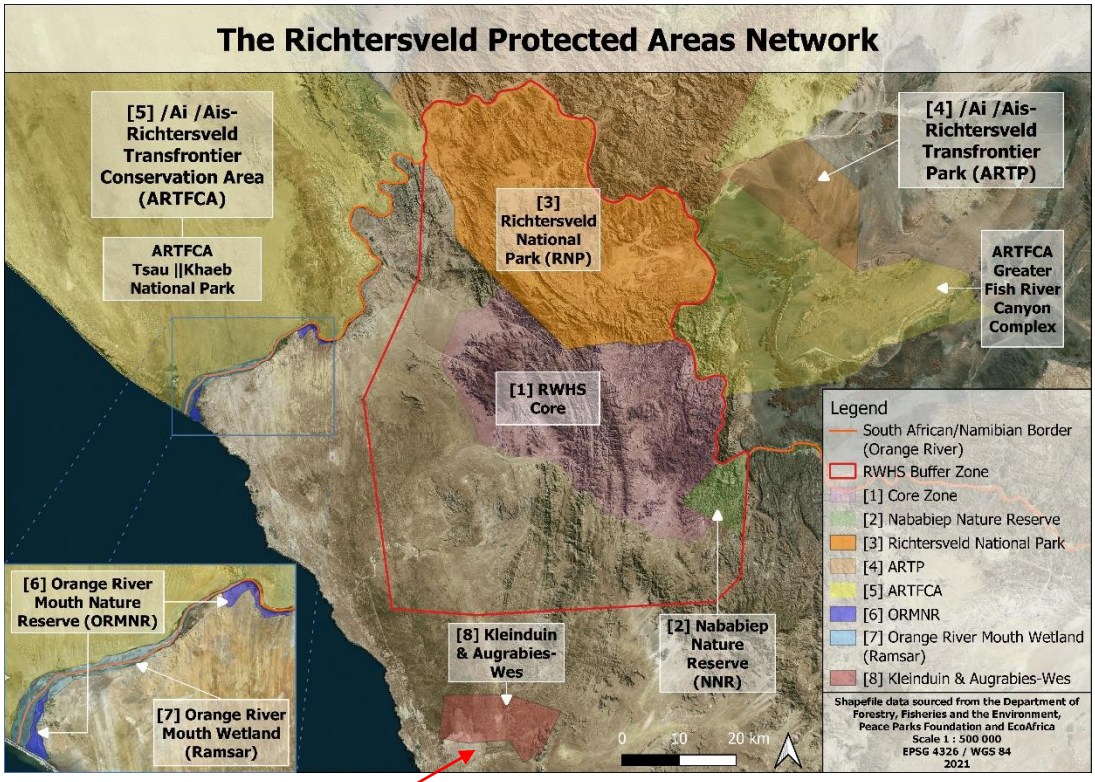

Figure 7: Location of the farm Kannikwa 156 in relationship to Kleinduin & Augrabies Wes Nature Reserve which is part of the buffering mechanism for the Richtersveld Cultural and Botanical Landscape (World Heritage)

Figure 8: Google Earth map shows the location of the farms Kannikwa 156 & 157 in relationship to Kleinduin & Augrabies Wes Nature Reserve which is part of the buffering mechanism for the Richtersveld Cultural and Botanical Landscape (World Heritage)

Although the study area is 11 km inland from the Namaqualand coastline, it is worth mentioning that it is extremely rich in archaeological sites and is well researched. Stone Age people exploited marine shell fish and left behind shell middens and shell scatters along the coastline. Terrestrial animal bones and ostrich eggshells along with cultural materials like stone artefacts, pottery and ostrich eggshell beads have also been encountered. A large number of shell scatters and middens have been seen along the bank of the Orange River stretching more than 2 km inland from its mouth (Smuts et al 2019, p74).

Kaplan, J. 2011. *Archaeological Impact Assessment proposed Port Nolloth Oxidation Ponds and Sewer Pipeline, Northern Cape.* The study area was on the eastern outskirts of Port Nolloth c 8 km west of Kannikwa 157. A few small superficial scatters of marine shellfish and some isolated stone flakes found (page 1).

Dewar, G & J Orton 2013. Subsistence, Settlement and Material Culture on the Central Namaqualand Coastline in Eds. Jerardino A, A Malan & D. *The Archaeology of the West Coast of South Africa*. The authors present the general character of the Stone Age sequence on the central Namaqualand coastline in the region of Port Nolloth.

EcoAfrica, 2006. The Richtersveld Cultural and Botanical Landscape. Application for Inclusion on the World Heritage List. The document was motivation for inscription of the Richtersveld Landscape for listing as heritage of Outstanding Universal Value. It went onto be listed and is a sensitive conservation area on account of its unique desert ecosystem and the living culture therein. The study area is located 50 km south of the Richtersveld and outside the buffer zone.

Matenga, E. 2021. *Phase I Heritage Impact Assessment including Palaeontological Desktop Assessment for a Mining Right Application on a Portion of the Remaining Extent of the Farm Groot Derm 10 and Portion 3 (Beauvallon) of the Farm Groot Derm 10) near Alexander Bay in the Ritchtersveld Local Municipality, Northern Cape*. The study area is located on the banks of the Orange area 40 km north of Kannikwa 156. Scatters of stone tools were encountered on the ridges and saddles south of the Orange River floodplain. The observations comprised mainly flake waste with a few formal tools. It is possible that some artefacts are buried under the windblown desert sand. Stone Age communities were likely to have been active along the floodplain attracted by the perennial water in the Orange River.

4.2. Ground survey

A ground survey was undertaken on 3 and 4 March 2021. The western parts of both farms are covered by a sand overburden which formed dunes in a few places. In the sandy area, little of the stone age material ubiquitous in the region was expected to be found on the surface as it would have been buried under the shifting sand. The field vehicle had to keep on the prepared tracks and avoid places with deep sand deposits. Walking surveys targeted the quartzite ridges where Stone Age material was expected to be found .

5. ARCHAEOLOGICAL AND HISTORICAL CONTEXT

5.1. Cultural Sequence Summary

The cultural sequence in South Africa is summarised by way of a Table in order to provide a theoretical framework for the identification of features / structures and objects of archaeological, historical and cultural interest.

Table 1: Cultural sequence summary[3]

PERIOD	EPOCH	ASSOCIATED CULTURAL GROUPS	TYPICAL MATERIAL EXPRESSIONS
Early Stone Age 2.5m – 250 000 YCE	Pleistocene	Early Hominids: *Australopithecines* *Homo habilis* *Homo erectus*	Typically large stone tools such as hand axes, choppers and cleavers.
Middle Stone Age 250 000 – 25 000 YCE	Pleistocene	First *Homo sapiens* species	Typically smaller stone tools such as scrapers, blades and points.
Late Stone Age 20 000 BC – present	Pleistocene / Holocene	*Homo sapiens* including San people	Typically small to minute stone tools such as arrow heads, points and bladelets.
Early Iron Age / Early Farmer Period c300 – 900 AD (or earlier)	Holocene	Iron Age Farmers	Typically distinct ceramics, bead ware, iron objects, grinding stones.

[3] Adapted from Exigo Consultancy. 2015. Frances Baard District Municipality: Proposed Nkandla Extension 2 Township Establishment, Erf 258 Nkandla, Hartswater, Northern Cape Province. Archaeological Impact Assessment.

Later Iron Age 900ADff	Holocene	Iron Age Farmers, emergence of complex state systems	Typically distinct ceramics, evidence of long distance trade and contacts
(ii) Mapungubwe (K2)	1350AD		Metals including gold, long distance exchanges
(ii) Historical period	Tswana / Sotho, Nguni people	Iron Age Farmers	Stone walls Mfecance / Difaqane
(iii) Colonial period	19th Century	European settlers / farmers / missionaries/ industrialisation	Buildings, Missions, Mines, metals, glass, ceramics

5.2. From the Stone Age to the Present

Since the Early Stone Age tens of thousands of years ago the Karoo plains of Namaqualand have imposed harsh constraints on human settlement. But evidence abounds that people indeed lived in the Karoo demonstrating that in fact they had to a large extent overcome these constraints, chiefly the scarcity of water.

Occupation of the Karoo extends back to the Early Stone Age (ESA; 2.0 mya to 200 kya) with over 50 open sites identified in Namaqualand coastal region. Isolated ESA artefacts, usually handaxes, occur, but quarry sites with thousands of artefacts are found along the marine terraces in the north where outcrops of relatively coarse-grained silcrete occur (Dewar & Orton 2013: 110).

Middle Stone Age (MSA; 200 to 40kya) sites are more frequent with more than 90 open sites recorded on the shoreline and up to a distance of 6 km inland (Dewar & Orton 2013: 110).

Today the Richtersveld plains is home one of the last living examples of transhumant and semi-nomadic animal husbandry practised by the Nama. Over the last two thousand years nomadic and semi-nomadic Khoikhoi people, like the Great and Little Namaqua, made sustainable use of the land as sheep and goat herders, gradually displacing or assimilating the San population. Over this period, traditional management of the grazing and water ensured that they remained in balance with their environment as a result of which they could survive. Today the Nama are the last of the Khoi people that still demonstrate a degree of cultural continuity. They still practice the traditional pattern of alternate summer and winter grazing, the underlying principle being that one had to let the ground rest to prevent overgrazing. Some still live in the unique and highly practical |*haru oms* (matjieshuise).

The |*haru oms* are constructed using reed mats and light canes/rods, materials that occur only in this region. The design makes it possible to disassemble the huts quickly, transport them and erect them again, an essential part of the mobile lifestyle of the Nama. The knowledge and skills needed to build the |*haru oms* have virtually died out outside of the Richtersveld. This important cultural characteristic of the semi-nomadism of the Nama is described as intangible. This includes legends and myths about the mountains, sink holes, fountains and the !Gariep (Orange) River. Other more tangible elements of the Richtersveld that could be seen as part of the pattern of transhumance and the cultural history of the area are the ancient graves, old herding posts (kraals), footpaths and wells. Collectively these can be seen as representative of a cultural landscape that is at least two thousand years old; older even if one considered the gatherer-hunter period.

The Khoisan are resilient communities who adapted to the marginal Karoo environment for thousands of years before the modern age of hydro-engineering. While the Khoisan managed to make the Karoo home for thousands of years, if leading a nomadic existence, the Iron Age farmers failed to do so considering the great risk to crop farming. It is not surprising that the Iron Age farmers confined themselves to the high rainfall belt along the east coast of South Africa. For thousands of years the environment, climate and seasons determined where and how people could live and survive. One had to live sustainably within the strictures of the environment, an ability which the Nama have retained up to today. They still migrate with their matjieshuise, livestock and families from the winter grazing on the mountains to the summer grazing in the low lying areas on a seasonal basis.

During the succeeding centuries of colonialism and, ultimately, apartheid, the Nama and other groups were placed under tremendous economic, social and cultural pressure. Poverty, the call of the cities, the impact of new architectures, new economic opportunities created by the mining industry, and general modernisation, have placed pressure on the ongoing use of |*haru oms* and the survival of traditional pastoralism (EcoAfrica 2019).

The owner of Kannikwa 156 has a good grasp of local history of the arrival of Europeans and colonial occupation at the beginning of the 19th century. When the WWI broke out in 1914, South Africa joined the war on the side of Britain and sent a commando called the Witwatersrand Rifles to protect the railway line from Port Nolloth to Steinkopf against a possible attack from the Germans launched from their colony South-West Africa (now Namibia) . An “archaeological” footprint of the railway line is well preserved on the farm Kannikwa 156 and is treasured.

The history of the Bondelswarts straddles the two neighbouring countries, Namibia and South Africa. They were indigenous Khoi-San people occupying Southern Namibia and the Northern Cape in South Africa. On the Namibian side the Bondelswarts fought a protracted war of resistance against the Germans from 1903 to 1906, but were defeated. Jacobus Cristiaan and Abraham Morris were leading figures amongst the Bondelswarts during the conflict in which they employed guerrilla tactics. After the war they fled across the Orange River into the Northern Cape, where they stayed until after WWI. [18]

The German colonial administration had imposed a dog tax which was unpopular and stoked resentment. When South West Africa was ceded to South Africa in 1915, the Bondelswarts expected the new administration to abolish the restrictions of the German treaty, but nothing changed. The new administration also refused to acknowledge the tribal leadership of Jacobus Cristiaan when he returned in 1919.

In 1922, fear of an indigenous uprising amongst the white farmers of the region created an atmosphere of paranoia. Bondelswarts south of the Orange River crossed north in the wake of Cristiaan's return. Their return sparked fears of unrest and the relationship between the Bondelswarts and the police, as well as the Bondelswarts and the white farmers, deteriorated. The tension reached breaking point with the return of Abraham Morris in April 1922.

On 5 May 1922, Sgt Van Niekerk and Native Constable Gert Kraai were ordered to arrest Morris on these charges. The situation escalated into a standoff. Hofmeyer issued an ultimatum for the surrender of all arms and ammunition. The Bondelswarts rejected the ultimatum and over the period from 22 to 25 May 1922, various farms were raided for horses, supplies, rifles and ammunition. Under the command of the Administrator General G.R. Hofmeyer, the South African government planned a ground and air attack against the Bondelswarts and defeated them. Precautions were also put in place to prevent the Bondelswarts south of the Orange River to join their brethren north of the river.[4]

The above is an outline of the archaeological and historical context of the study area.

[4] Fokkens, A M, 2012. The Suppression of Internal Unrest in South West Africa (Namibia) 1921–1933. *Scientia Militaria vol 40, no 3, 2012, pp.109-146. doi: 10.5787/40-3-1030*

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6. FINDINGS OF THE HERITAGE SURVEY

6.1. The Stone Age

The Namaqualand Karoo plains were occupied by hunters and foragers and later semi-nomadic herders who subsisted on stone tool technologies. Scatters of stone tools were encountered on ridges on the Farm Kannikwa 156 (Table 2, see also Catalogue of Heritage Sites in Section 8). The observations comprised mainly quartz flake waste with a few formal tools. It is possible that some artefacts are buried under the windblown desert sand as attested by the presence of tools in a sand quarry on Kannikwa 156 (Site KAN08).

6.2. Burial grounds

No burial grounds were reported on the farm.

6.3. Footprint of the old railway line from Port Nolloth to Steinkopf

The landowner of Kannikwa 156 treasures the footprint of an old railway line from Port Nolloth to Steinkopf which bisects the farm. It is a remnant earth embankment on which rusted railway track fastening system components such as rusted dog spikes are occasionally seen. Sites KAN01, KAN02 and KAN04 represent a western section of the track. Recognising the historical importance of the old track, the landowner motivated for its exclusion from the prospecting right (see Figures 9-10). It is recommended in this report that a servitude of 50 m be reserved on either side of the track. An old settlement associated with the railway service must also be protected by the reservation of a buffer of 50 m radius (Figure 11).

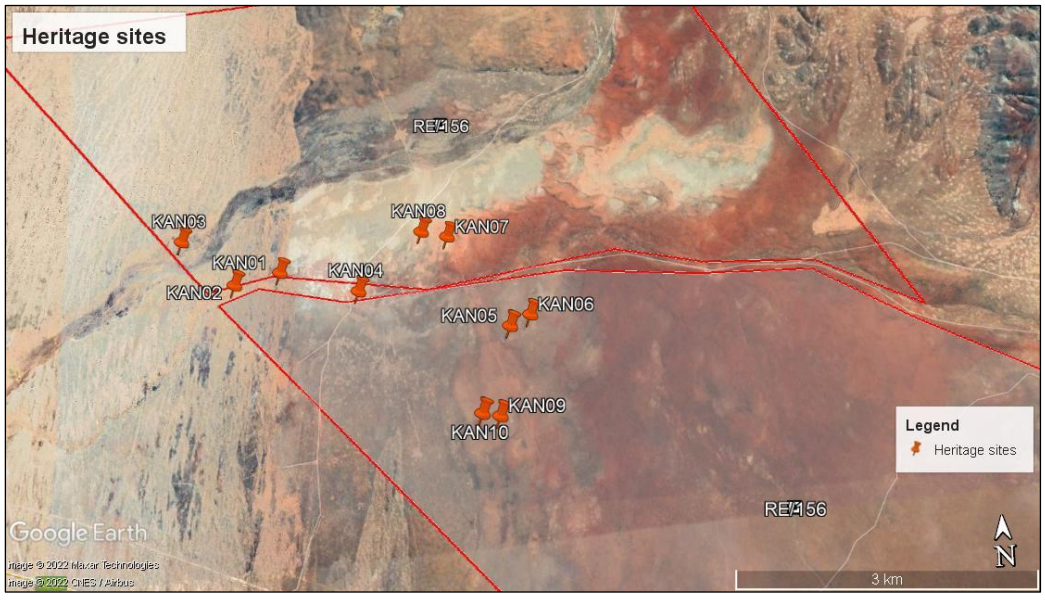


Figure 9: Google Earth map shows the location of heritage sites and corridor left in the prospecting right for the protection of the old railway track. Sites KAN01, KAN02 and KAN04 represent a western section of the track

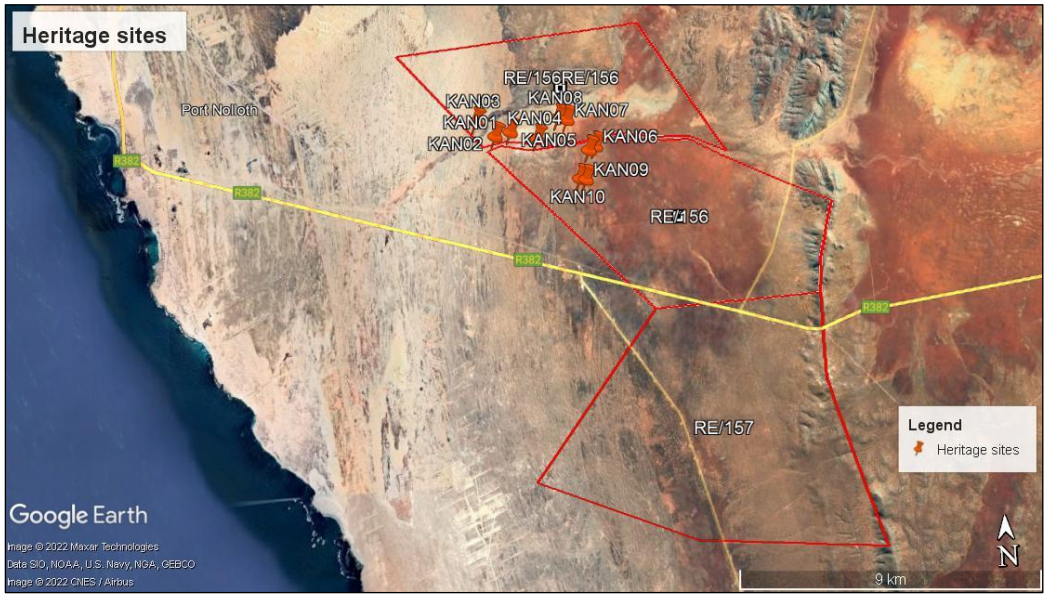


Figure 10: Overview of the location of heritage sites. No heritage sites were found on the farm Kannikwa Vlakte 157

Figure 11: Old settlement associated with the old railway track with a 50 m radius reservation

Table 2. Inventory of heritage sites

SITE NO	LATITUDE	LONGITUDE	PERIOD	DESCRIPTION	RANKING	MITIGATION
KAN01	29°15'26.20"S	16°59'39.50"E	19th Century	Railway embankment or rail track foundation. A rusted iron dog spike or cut track spike used to fasten railway track to wooden sleepers	Local 3A	To be protected
KAN02	29°15'29.70"S	16°59'21.30"E	19th/20th centuries	Found on a railway embankment or rail track foundation. Rail track fastening system components, possibly large spikes. Rusted. Other rusted parts undiagnostic.	Local 3A	To be protected
KAN03	29°15'12.67"S	16°58'59.69"E	19th /20th century	Remains of a settlement, a stopover on the side of the railway supplied water and other essentials for the rail service	Local 3A	To be protected
KAN04	29°15'34.70"S	17° 0'10.80"E	19th/20th century	Found on a railway embankment or rail track foundation. Rail track fastening system components – dog spikes.	Local 3A	To be protected
KAN05	29°15'50.60"S	17° 1'10.30"E	Recent past	A cluster of boulders form a small hill and shallow rock shelter facing north. Recent graffiti – alphabets but not quite legible.	Local 3C	No action required
KAN06	29°15'47.10"S	17° 1'18.50"E	MSA/LSA	Quartzite boulders on the summit of a ridge, quartz flakes of which some may possibly have been used as scrapers.	Local 3C	No action required
KAN07	29°15'16.90"S	17° 0'47.10"E	20th Century	A watering site for animals situated on the western foot of a ridge. An old disused windmill and broken concrete reservoir. Windblown sand in the area.	Local 3C	No action required
KAN08	29°15'14.50"S	17° 0'36.70"E	MSA/LSA	A sand quarry excavated in the recent past exposed quartz lithics. 2 blades and 4 flakes	Local 3C	No action required

KAN09	29°16'21.30"S	17° 1'4.40"E	MSA/LSA	On the summit of a ridge, a large field of quartz waste. A few diagnostic tools found – in the photograph 2 blades, 1 scraper, 2 flakes	Local 3C	No action required
KAN10	29°16'20.00"S	17° 0'57.60"E	MSA/LSA	On the western foot of a ridge. Three quartz lithics representing scrapers	Local 3C	No action required

6.4. Ranking of Findings

The ranking system has been adapted from Guidelines for involving Heritage Specialists in EIA processes by Winter S and & N. Baumann (2005: 19)

GRADE	RANKING	SIGNIFICANCE	NO OF SITES
1	National	Of high intrinsic, associational and contextual heritage value within a national, provincial and local context, i.e. formally declared or potential Grade 1, 2 or 3A heritage resources	0
2	Provincial	Of high intrinsic, associational and contextual heritage value within a national, provincial and local context, i.e. formally declared or potential Grade 2 heritage resources	0
3A	Local	Of high intrinsic, associational and contextual heritage value within a national, provincial and local context, i.e. formally declared or potential Grade 3A heritage resources	4[5]
3B	Local	Of moderate to high intrinsic, associational and contextual value within a local context, i.e. potential Grade 3B heritage resources	0
3C	Local	Of medium to low intrinsic, associational or contextual heritage value within a national, provincial and local context, i.e. potential Grade 3C heritage resources	6
		TOTAL	**10**

6.5. Assessment of Impacts using the Heritage Impact Assessment Statutory Framework

Section 38 of the NHRA

Section 38 (Subsection 3) of the National Heritage Resources Act also provides a schedule of tasks to be undertaken in an HIA process:

Section 38(3) The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection (2)(a): Provided that the following must be included:

(a) The identification and mapping of all heritage resources in the area affected

Heritage resources were recorded in 10 places (see Table 2 above).

(b) An assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6(2) or prescribed under section 7

There are no Grade I or Grade II sites.

[5] Three sites represent features/finds recorded along the old railway track. The fourth site is an old settlement.

(c) An assessment of the impact of the development on such heritage resources

The old railway track will be preserved. It was left out of the prospecting right. A 50 m wide servitude will be reserved on either side of the old track. A servitude of 50m radius must also be reserved around the old settlement.

(i) An evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development

Mining in the Northern Cape is contributing significantly to the growth of the South African economy. It can provide stimulus for rapid socio-economic development in the Northern Cape Province in particular and the country as a whole. As mining is labour intensive and can contribute immensely to alleviate the current high levels of unemployment. General improvement in the quality of livelihoods in local communities and the country at large is expected.

(e) The results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources

Stakeholder consultations were conducted within the scope of the broader environmental impact assessment. No objections were raised concerning the impact of the mining on heritage resources. Precautions have been taken to protect the old railway track following the motivation of the landowners.

(f) If heritage resources will be adversely affected by the proposed development, the consideration of alternatives

An Environmental Control Officer will be trained to curate chance heritage finds.

(g) Plans for mitigation of any adverse effects during and after the completion of the proposed development.

In the event of discovery of heritage resources deemed of significance during exploration or mining, the Provincial Heritage Resources Authority or SAHRA will be informed immediately and an archaeologist or heritage expert called to attend.

6.6. Risk Assessment of the findings

EVALUATION CRITERIA	RISK ASSESSMENT
Description of potential impact	Negative impacts range from partial to total destruction of surface and under-surface movable/immovable relics.
Nature of Impact	Negative impacts can both be direct or indirect.
Legal Requirements	Sections 34, 35, 36, 38 of National Heritage Resources Act No. 25 (1999).
Stage/Phase	Prospecting for minerals (test pits, drilling); Mining Phase.
Extent of Impact	Ground clearing and open cast mining can result in damage and destruction of archaeological resources above and below the surface not seen during the survey.
Duration of Impact	Any accidental destruction of surface or subsurface relics is not reversible, but can be mitigated.
Intensity	Uncertain.
Probability of occurrence	Medium.
Confidence of assessment	High.
Level of significance of impacts before mitigation	Medium.
Mitigation measures	If archaeological or other heritage relics deemed of high significance are found during the exploration phase, heritage authorities will be advised immediately and a heritage specialist will be called to attend.
Level of significance of impacts after mitigation	Low.
Cumulative Impacts	None.
Comments or Discussion	None.

7. CONCLUSION AND RECOMMENDATIONS

The old railway track will be preserved as it was left out of the prospecting right. A 50 m wide servitude will be reserved on either side of the old track. The prospecting application can be approved with a condition that the old railway track and settlement is protected.

The study is mindful that some important discoveries may occur during the prospecting and mining phases. If this happens operations should be halted, and the provincial heritage resources authority or SAHRA notified in order for an investigation and evaluation of the finds to take place.

8. CATALOGUE OF HERITAGE SITES

SITE NO	COORDINATES		PERIOD
KAN01	29°15'26.20"S	16°59'39.50"E	19th Century

DESCRIPTION: Railway embankment or rail track foundation. A rusted iron dog spike or cut track spike used to fasten railway track to wooden sleepers.	
HERITAGE SIGNIFICANCE	Early rail transport engineering.
MITIGATION	The rail embankment will be protected.

SITE NO	COORDINATES		PERIOD
KAN02	29°15'29.70"S	16°59'21.30"E	19th/20th century

DESCRIPTION: Found on a railway embankment or rail track foundation. Rail track fastening system components, possibly large spikes. Rusted. Other rusted parts undiagnostic.

HERITAGE SIGNIFICANCE	Early rail transport engineering.
MITIGATION	The rail embankment will be protected.

SITE NO	COORDINATES		PERIOD
KAN03	29°15'12.67"S	16°58'59.69"E	19th /20th century

DESCRIPTION: Remains of a settlement, a stopover on the side of the railway supplied water and other essentials for the rail service.

HERITAGE SIGNIFICANCE	Associated with early development of rail transport
MITIGATION	The site will be protected

SITE NO	COORDINATES		PERIOD
KAN04	29°15'34.70"S	17° 0'10.80"E	19th/20th century

DESCRIPTION: Found on a railway embankment or rail track foundation. Rail track fastening system components – dog spikes.	
HERITAGE SIGNIFICANCE	Early rail transport engineering.
MITIGATION	The rail embankment will be protected.

SITE NO	COORDINATES		PERIOD
KAN05	29°15'50.60"S	17° 1'10.30"E	Recent past

DESCRIPTION: A cluster of boulders form a small hill and shallow rock shelter facing north. Recent graffiti – alphabets but not quite legible.	
HERITAGE SIGNIFICANCE	Modern art
MITIGATION	No further action required.

SITE NO	COORDINATES		PERIOD
KAN06	29°15'47.10"S	17° 1'18.50"E	MSA/LSA

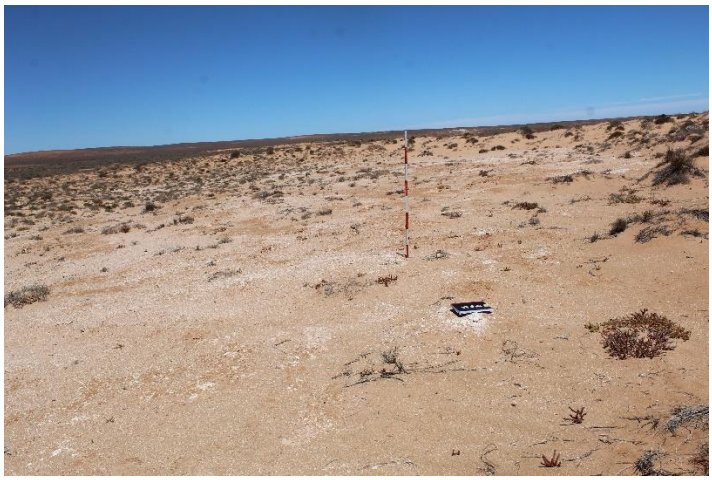
DESCRIPTION: Quartzite boulders on the summit of a ridge, quartz flakes of which some may possibly have been used as scrapers.

HERITAGE SIGNIFICANCE	Evidence of hunter-gatherer activities during the MSA/LSA
MITIGATION	No further action required.

SITE NO	COORDINATES		PERIOD
KAN07	29°15'16.90"S	17° 0'47.10"E	20th Century

DESCRIPTION: A watering site for animals situated on the western foot of a ridge. An old disused windmill and broken concrete reservoir. Windblown sand in the area.	
HERITAGE SIGNIFICANCE	Associated with modern farming
MITIGATION	No further action required.

SITE NO	COORDINATES		PERIOD
KAN08	29°15'14.50"S	17° 0'36.70"E	MSA/LSA



DESCRIPTION: A sand quarry excavated in the recent past exposed quartz lithics. 2 blades and 4 flakes.	
HERITAGE SIGNIFICANCE	Evidence of hunter-gatherer activities during the MSA/LSA
MITIGATION	No further action required.

SITE NO	COORDINATES		PERIOD
KAN09	29°16'21.30"S	17° 1'4.40"E	MSA/LSA

DESCRIPTION: On the summit of a ridge, a large field of quartz waste. A few diagnostic tools found – in the photograph 2 blades, 1 scraper, 2 flakes.	
HERITAGE SIGNIFICANCE	Evidence of hunter-gatherer activities during the MSA/LSA
MITIGATION	No further action required.

SITE NO	COORDINATES		PERIOD
KAN10	29°16'20.00"S	17° 0'57.60"E	MSA/LSA

DESCRIPTION: On the western foot of a ridge. Three quartz lithics representing scrapers.	
HERITAGE SIGNIFICANCE	Evidence of hunter-gatherer activities during the MSA/LSA
MITIGATION	No further action required.

9. GLOSSARY

Archaeological material: remains older than 100 years, resulting from human activities left as evidence of their presence, which are in the form of structure, artefacts, food remains and other traces such as rock paintings or engravings, burials, fireplaces etc.

Artefact: Any movable object that has been used modified or manufactured by humans.

Catalogue: An inventory or register of artefacts and / or sites.

Conservation: All the processes of looking after a site or place including maintenance, preservation, restoration, reconstruction and adaptation.

Cultural Heritage Resources: refers to physical cultural properties such as archaeological sites, palaeontological sites, historic and prehistoric places, buildings, structures and material remains, cultural sites such as places of rituals, burial sites or graves and their associated materials, geological or natural features of cultural importance or scientific significance. These include intangible resources such as religious practices, ritual ceremonies, oral histories, memories, indigenous knowledge.

Cultural landscape: a stretch of land that reflects "the combined works of nature and man" and demonstrates "the evolution of human society and settlement over time, under the influence of the physical constraints and / or opportunities presented by their natural environment and of successive social, economic and cultural forces, both internal and external".[6]

Cultural Resources Management (CRM): the conservation of cultural heritage resources, management and sustainable utilization for present and future generations.

Cultural Significance: is the aesthetic, historical, scientific and social value for past, present and future generations.

Early Iron Age: refers to cultural remains dating to the first millennium AD associated with the introduction of metallurgy and agriculture.

Early Stone Age: a long and broad period of stone tool cultures with chronology ranging from around 3 million years ago up to the transition to the Middle Stone Age around 250 000 years ago.

Excavation: a method in which archaeological materials are extracted from the ground, which involves systematic recovery of archaeological remains and their context by removing soil and any other material covering them.

Historic material: means remains resulting from human activities, which are younger than 100 years and no longer in use; that include artefacts, human remains and artificial features and structures.

Historical: means belonging to the past, but often specifically the more recent past, and often used to refer to the period beginning with the appearance of written texts.

[6] This definition is taken from current terminology as listed on the World Heritage Convention website, URL: http://whc.unesco.org/en/culturallandscape/#1 accessed 17 March 2016.

Intangible heritage: something of cultural value that is not primarily expressed in material form e.g. rituals, knowledge systems, oral traditions or memories, transmitted between people and within communities.

***In situ* material:** means material culture and surrounding deposits in their original location and context, for instance archaeological remains that have not been disturbed.

Later Iron Age: The period from the beginning of the 2nd millennium AD marked by the emergence of complex state society and long-distance trade contacts.

Late Stone Age: The period from ± 30 000 years ago up until the introduction of metals and farming technology around 2000 years ago, but overlapping with the Iron Age in many areas up until the historical period.

Middle Stone Age: a period of stone tool cultures with complex chronologies marked by a shift towards lighter, more mobile toolkit, following the Early Stone Age and preceding the Late Stone Age; the transition from the Early Stone Age was a long process rather than a specific event, and the Middle Stone Age is considered to have begun around 250 000 years ago, seeing the emergence of anatomically modern humans from about 150 000 years ago, and lasting until around 30 000 years ago.

Monuments: architectural works, buildings, sites, sculpture, elements, structures, inscriptions or cave dwellings of an archaeological nature, which are outstanding from the point of view of history, art and science.

Place: means site, area, building or other work, group of buildings or other works, together with pertinent contents, surroundings and historical and archaeological deposits.

Preservation: means the protecting and maintaining of the fabric of a place in its existing state and retarding deterioration or change, and may include stabilization where necessary.

Rock Art: various patterned practices of placing markings on rock surfaces, ranging in Southern Africa from engravings to finger paintings to brush-painted imagery.

Sherds: ceramic fragments.

Significance grading: Grading of sites or artefacts according to their historical, cultural or scientific value.

Site: a spatial cluster of artefacts, structures, organic and environmental remains, as residues of past human activity.

Site Recording Template: a standard document format for site recording.

10. REFERENCES

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ANNEXURE I: MAPS OF THE TRACKLOG

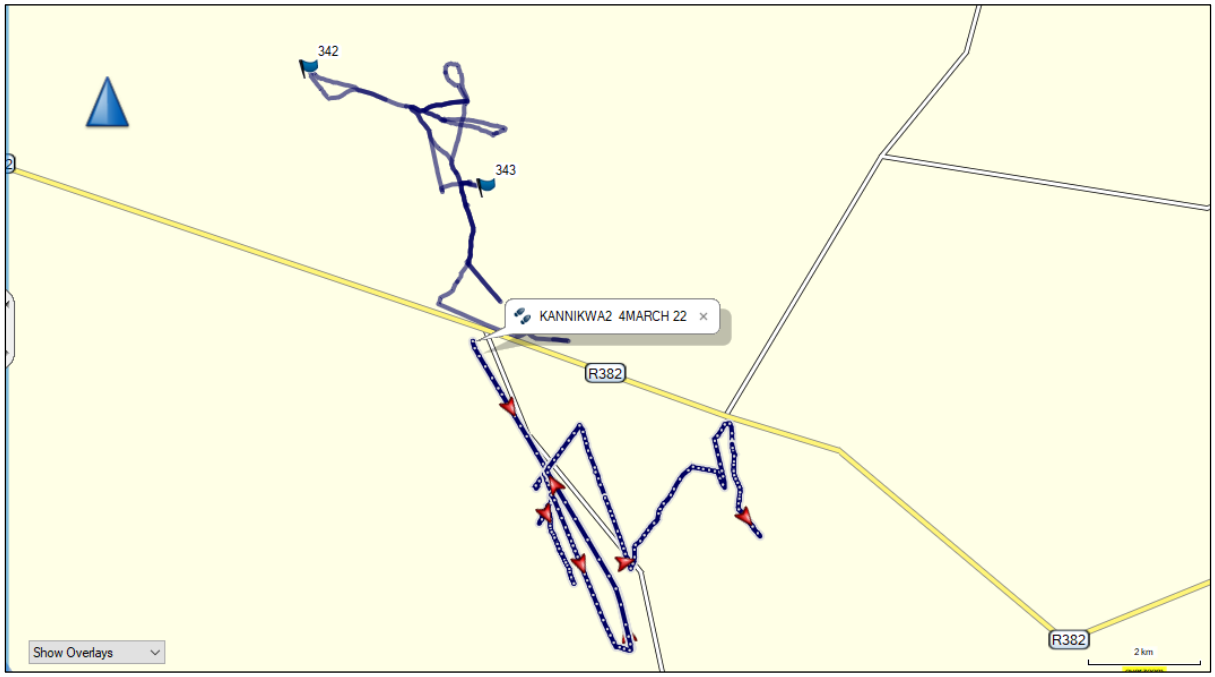

Figure i: Overview of the track log

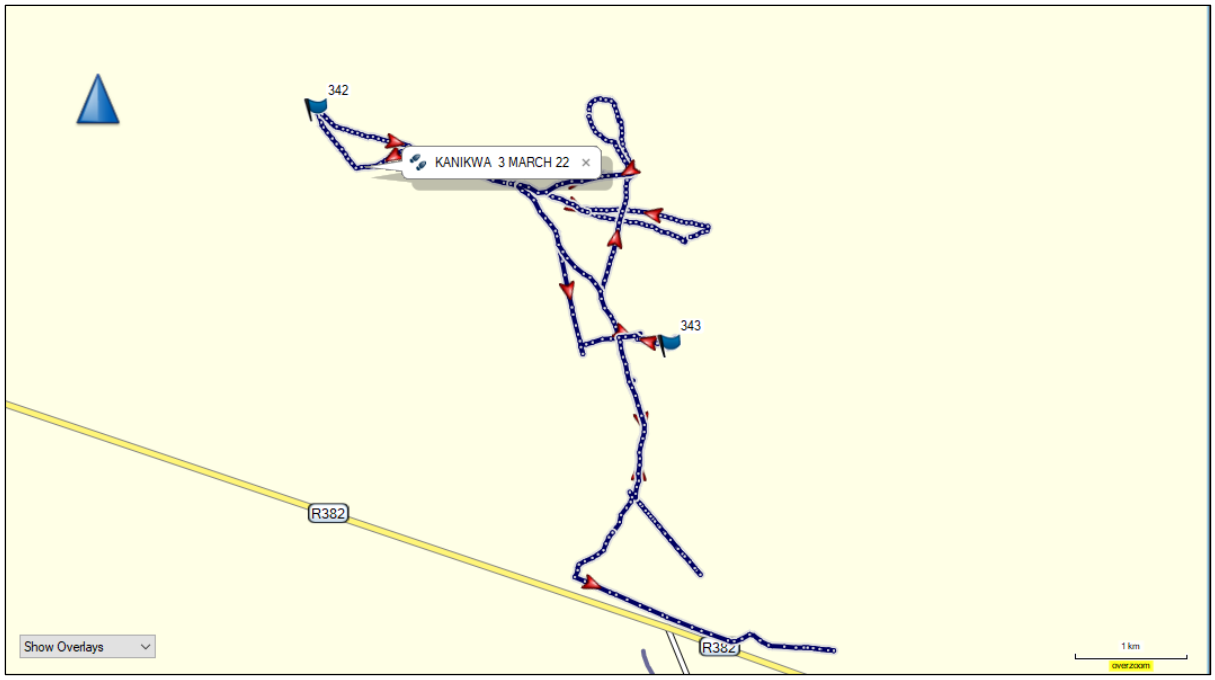

Figure ii: Track long map shows survey on the Farm Kannikwa 156

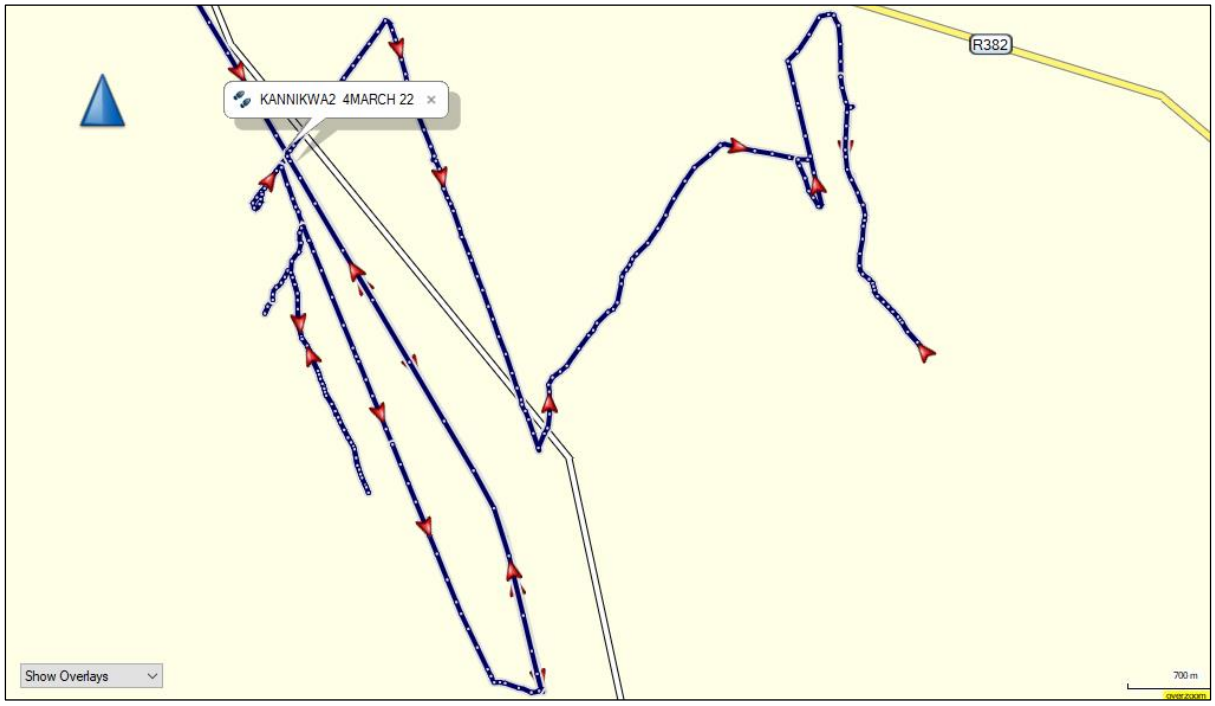

Figure iii: Track log map shows survey tracks on the Farm Kannikwa Vlakte 157