

**McGregor Museum
Department of Archaeology**



**Heritage Impact Assessment, Hakskeen
Pan, in the Dawid Kruiper Local
Municipality, Northern Cape, in relation
to tourism and event-related
development:
Final Report (Revised)**

**David Morris
(Order OR-002815: Supplier E4234)
15 December 2016**

**Heritage Impact Assessment, Hakskeen Pan, in the Dawid Kruiper Local Municipality, Northern Cape, in relation to tourism and event-related development:
Final Report (Revised)**

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1. BACKGROUND

The Northern Cape Provincial Government (“NCPG”), having embarked on a strategy to establish and market the Northern Cape Province as an extreme sport destination, currently embraces the Bloodhound Super Sonic Car (SSC) Landspeed Record Project, with the landspeed record attempt to take place on Hakskeen Pan in the Dawid Kruiper (formerly Mier) Local Municipality of the ZF Mgcawu district. It is hoped that the project would help raise the Northern Cape’s profile globally as extreme sports destination. Tourism is considered to be a critical means of having this project leave a lasting legacy to benefit the nearby community of Mier (and villages such as Loubos) within the Dawid Kruiper Municipality. Working relationships vital to the success of the Bloodhound SSC Landspeed Record Attempt span all levels and departments of government in the Northern Cape, with linkages nationally and beyond. In an educational spin-off, the project has been keyed into school curricula in maths and science.

Compliance with environmental and heritage legislation raises the need for a Heritage Impact Assessment (HIA) study to evaluate impacts of proposed development or site alteration on cultural heritage resources and to recommend an overall approach for mitigation and/or conservation of such resources. It would achieve a thorough understanding of the significance of the heritage attributes of Hakskeen Pan near Mier in the Kalahari, in order to assess any impacts on such

cultural and heritage resources, consider mitigation options, and recommend a conservation strategy that best attends to the cultural and heritage resources within the context of the proposed development or site alteration.

The McGregor Museum Archaeology Department was appointed to undertake this Heritage Impact Assessment. A desk top report towards a heritage impact assessment at Hakskeen Pan in Dawid Kruiper Municipality, Northern Cape was compiled in August 2016. The site was visited on 5 December 2016 and again on 14 December 2016. This is a final report characterizing archaeological observations made at the site.

The author of this report is a qualified archaeologist (PhD, University of the Western Cape) accredited as a Principal Investigator by the Association of Southern African Professional Archaeologists. The author has worked as a museum archaeologist in the Northern Cape since 1985. In addition the author has a comprehensive knowledge of the province's history and built environment, and received UCT-accredited training at a workshop on *Architectural and Urban Conservation: researching and assessing local (built) environments* (S. Townsend, UCT). He is also Chairman of the Historical Society of Kimberley and the Northern Cape. His current position includes Extraordinary Professorship in heritage studies and archaeology, School of Humanities, Sol Plaatje University, Kimberley.

The author is independent of the organization commissioning this specialist input, and provides this Specialist Report within the framework of the National Heritage Resources Act (No 25 of 1999).

2. POLICY REGULATORY AND LEGISLATIVE FRAMEWORK

It is noted that all legislation, regulations, policies, acts, frameworks, procedures applicable must be adhered to and in full compliance. These include but are not limited to:

- National Environmental Management Act (NEMA) 1998 (Act 107 of 1998).
- National Industrial Participation Programme(Local Content).
- National Heritage Resources Act 1999 (Act 25 of 1999).
- South African Heritage Resource Agency (SAHRA) policies and practice guidelines.
- SCM Practice Notes and Circulars.
- District Spatial Development Framework
- Land Use Planning Act

The National Heritage Resources Act (No 25 of 1999) (NHRA) provides protection for heritage resources, expected to be principally of an archaeological nature in this instance.

It is an offence to destroy, damage, excavate, alter, or remove from its original position, or collect, any archaeological material or object (defined in the Act), without a permit issued by the S. A. Heritage Resources Agency (SAHRA).

Section 35 of the Act protects all archaeological and palaeontological sites and requires that anyone wishing to disturb a site must have a permit from the relevant heritage resources authority. Section 36 protects human remains older than 60 years. In order for the authority to assess whether approval may be given for any form of disturbance, a specialist report is required. No mining, prospecting or development may take place without heritage assessment and approval.

3. PROJECT PLAN

The following tables and paragraphs summarise the project plan based on Terms of Reference established in May 2016:

3.1 PROJECT STEPS AND METHODOLOGY

<p>The proposed heritage impact assessment, in cooperation with the DEDAT appointed Environmental Management Practitioner (Mr Bernard de Witt), would:</p> <ul style="list-style-type: none"> ▪ Understand the Historic Place – based on desktop and field observations. ▪ Identify Character-Defining Elements. ▪ Evaluate Significance – using significance tables developed for the Northern Cape alongside criteria set out in the National Heritage Resources Act and SAHRA Guidelines (see 3.5 below). ▪ Identify Impacts – and evaluate the significance of each impact as the basis for recommendations (see 3.6 below) ▪ Consult with DEDAT project steering committee to monitor project performance. 	<p>A preliminary report unpacked some of these project steps preparatory to fieldwork at the site. This report is a final assessment report following fieldwork at the site.</p>
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3.2 HERITAGE IMPACT ASSESSMENT REPORTING

<ul style="list-style-type: none"> ▪ Project plan to be provided demonstrating approach to the task. ▪ Milestone-based progress reports for discussion in steering committee meetings. Milestone-based progress reports would include financial reporting ▪ Draft heritage impact assessment report in keeping with professional peer standards and guidelines of the South African Heritage Resources Agency. To be available in Microsoft Word format for comment purposes. ▪ Final heritage impact assessment report hard copy/ies and PDF format. 	<p>Submitted May 2016.</p> <p>Progress report (August 2016)</p> <p>Draft report. <i>(This report)</i></p> <p>Final report.</p>
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3.2.1 Milestone progress report: financial reporting

As per budget (Appendix 3), the financial outlay represented by work to date is as follows:

Hakskeen Pan

Archaeological & Heritage Impact Assessment (excl Palaeontology)

Travel	1140*	km @	4.1	per km	R 4 674.00
Professional fee travel time	12	hours @	660	per hr	R 7 920.00
Professional fee survey & research	8	hours @	660	per hr	R 5 280.00
Field / Lab Assistant (x1 field)	20	hours @	14.7	per hr	R 294.00
Report - Desk-top Scoping	2	hours @	660	per hr	R 1 320.00
Report on field survey	10	hours @	660	per hr	R 6 600.00
				pers/nights	
Accommodation (x 2 personnel)	4	@	650	per night	R 2 600.00
S&T Museum staff (x2 personnel)	6	pers/days	353	per day	R 2 118.00
Consumables (boxes, bags, labels, etc)					R 0.00
Subtotal					R 30 806.00
Museum equipment use +5%					R 1 540.30
Museum admin +5%					R 1 617.32
TOTAL					R 33 963.62

*Actual travel distance = 1403 km

3.3 INTRODUCTION TO DEVELOPMENT SITE

3.3.1 Location plan

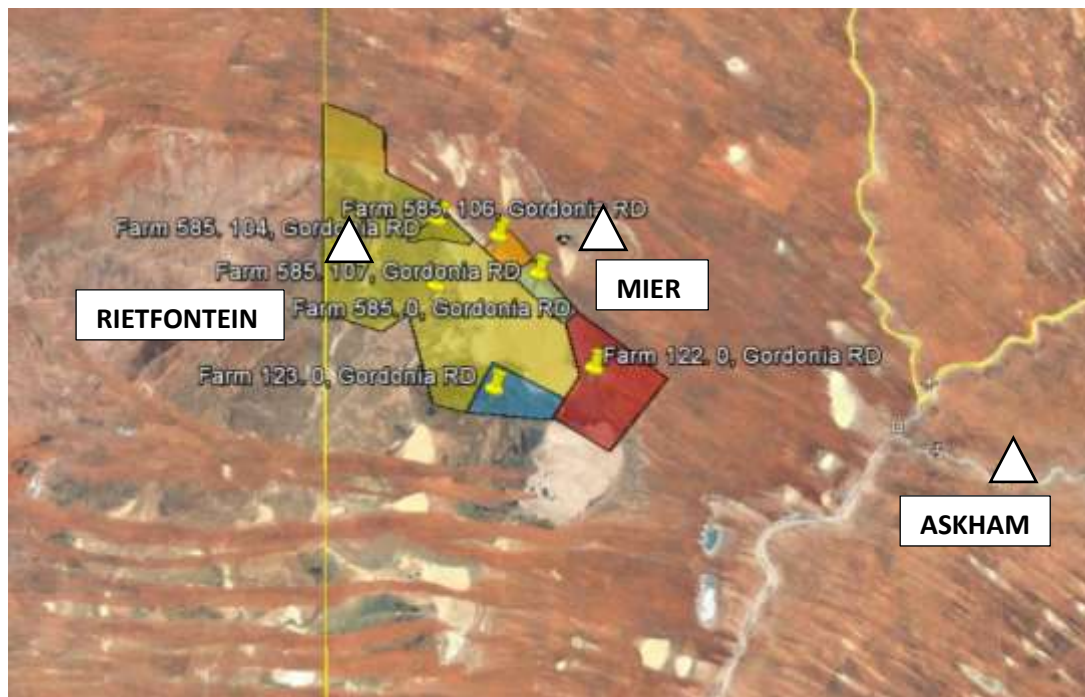


Figure 1. Location of the farms converging on Hakskeen Pan relative to the towns of Mier, Rietfontein and Askham. Also indicated are the Namibian border (vertical yellow stripe) and Botswana border (yellow line curving along the Nossob and Molopo Rivers to the east).

3.3.2 Description of the site identifying significant features, buildings, landscape and vistas.

Hakskeenpan is a mud and salt pan situated between the Towns of Mier and Rietfontein in the Kalahari Desert in the Northern Cape Province, South Africa. It is one of the largest isolated or closed pans ((depressions) in the South African Kalahari, with an area of approximately 140 km², at an elevation of about 800 m above sea level. A number of farms converge across or around the edges of the pan, while the R31 main road from Mier to Rietfontein crosses the northern-most section of it. An older road had traversed the pan a little south of the new road. There are no major buildings or other features, except an MTN mast beside the tarred road at the north-western side of the pan, an existing 'Speed Week Camp', and Speed Week Track and other infrastructure at the eastern side of the pan. A farm worker's dwelling is situated next to the old road as it descends into the pan at the north eastern part of the pan. The pan as a whole and its sides make for significant vistas (Fig. 2).



Figure 2. View from the dunes at the east in a south westerly direction

3.3.3 Cultural heritage resource(s)

contained within the development site identifying significant features, buildings, landscape, vistas and including any heritage recognition of the property with existing heritage descriptions as available.

No heritage features or buildings were recognised prior to this study. It was predicted that some Stone Age traces were likely to occur, especially in the dune environments surrounding the pan.

3.3.4 Context

including adjacent heritage properties and their recognition, and any yet unidentified potential cultural heritage resource(s).

No nearby heritage features or buildings or properties were recognised prior to this study. As noted, Stone Age traces were anticipated to occur. Both Middle and Later Stone Age sites have been documented in the Witdraai/Molopo Lodge area west of Askham (Smith 1985).

3.3.5 Present owner contact information.

Farm 585, Remainder. Owner: This is municipal property

Portion 107 of Farm 585. Owner: Snyders

Remainder of Windhoek 122. Owner: Fourie Trust

3.3.6 Introduction to Development Site

The construction of infrastructure for the speed events held/to be held on Hakskeen Pan has commenced.

The majority of the infrastructure is to be on the eastern side, at the existing MTN containers (Speedweek/Landside camp/Media Centre). In addition there are to be a technical camp at the MTN tower next to the R31, as well as proposed sites for the fuel depot.

The infrastructure includes the following (see Figure 3):

- a 20km long, 500m wide track that has been constructed, including a 300m wide safety buffer on either side of the track. Construction here consists of the following:
 - 317 workers cleared by hand an area of 20km x 1,1km of all surface stones and pebbles.
 - Rehabilitation of the pan in the form of removing an existing causeway which was previously the main road between Mier and Rietfontein. This road which was 1m high was removed and the pan restored to its original surface and level.
 - Material removed from the road was placed back in the borrow pits created many years ago when this road was first built.
 - In certain areas it was necessary to remove stones which protruded above the surface but which extended to below the surface of the pan. These cases only represent a total estimated area of 500m x 300m when combined; thus only 0,68% of the total amount of stones removed were unearthed by machines, the remainder having been removed by hand.
 - The only place where grading has and will take place is to repair manmade indentations and elevations in the form of old tracks created by locals or in the case of the elevated causeway which was removed.
- Temporary structures (mostly shipping containers) placed on the edge of the pan for various functions such as control, storage, hospitality, showers and toilets etc.) located at the landside/Speedweek camp.

- A 110kVa diesel generator, with a 3500l diesel tank and bund, also housed within a portable shipping container on site.
- Two telecommunications masts placed at the landside camp and next to the R31
- 6 x 10 000l jo-jo tanks have been constructed for the storage of water on site.
- Water is sourced from local borehole near the site, via a 16m long, 40mm diameter pipeline.
- There is also a 110kVa diesel generator, with a 3500l diesel tank and bund, also housed within a portable shipping container on site.
- A 44000l sewerage septic/holding tank has also been constructed at the landside/Speedweek camp for the temporary storage of all effluent (to be disposed of by road to the Mier Sewerage Works).
- No new roads constructed for the activities, and only existing tracks on the pan used.



Figure 3. Infrastructure as summarised in paragraph 3.3.6

3.4 BASELINE STUDY

Observations summarised as the Baseline Study are derived from desktop and field work phases of the assessment.

3.4.1 Background: archaeological resources in the region

While much of the surrounding region has yet to be examined from an archaeological viewpoint, certain insights exist from a limited number of prior research and impact assessment observations.

Broadly speaking, the archaeological record of this region reflects the long span of human history from Earlier Stone Age times (more than 1.5 to some 0.3 million years ago), through the Middle Stone Age (about 300 000 – 40 000 years ago), to the Later Stone Age (up to the protocolonial era). The last 2000 years was a period of increasing social complexity to the east, with the appearance there of farming (herding and agriculture), and of ceramic and metallurgical (Iron Age) technologies alongside an older continuing trajectory of hunting and gathering and stone tool based technologies (Morris & Beaumont 2004). In these drier western tracts it is probable that hunting and gathering persisted as a nearly exclusive pursuit into the early colonial era, though with pastoralism being practised to some extent in neighbouring areas. In the absence of rock outcrops, no rock art sites are known.

Earlier Stone Age sites have been documented to the south of here in areas strewn with Dwyka tillite, which provided ample raw material. John Masson (2006) has reported such material at Eenzaamheid Pan (Morris 2006). But a comparable setting at Goeboegoeboe Pan, which lacks, however, the Dwyka element, has comparatively very sparse Stone Age material. Dune crests and slopes, where deflation exposes older surfaces, are known frequently to bear traces of Later Stone Age sites, noted previously by the author at Norokei Pan, Groot Wit Pan, Middelputs on the Molopo (Morris 2006), and adjacent to the Molopo Lodge site at Wit Draai, for example, at 27°10.986' S 20°24.392' E. Sites have also been noted, again mainly on dunes, by A.B. Smith in the Rietfontein area as well as at Twee Rivieren and within the Kgalagadi Transfrontier Park (Smith 1985:296-299).

Engelbrecht (2013) found low density scatters of Earlier, Middle and Later Stone Age artefacts during an impact assessment for a housing development in Rietfontein, while Van Pletzen-Vos and Rust (2013a) have documented diffuse scatters of Later Stone Age tools and ostrich eggshell fragments near Rooipan and Witpan north east of the town. Large clusters of Middle Stone Age flakes and cores are recorded in the vicinities of Loubos and Noenieput (Van Pletzen-Vos and Rust 2013b, 2013c).

A human burial recently retrieved from the Upington Museum, where it had been on display until the mid-1990s, was apparently exposed by wind erosion somewhere in this environment, near Rietfontein, to the west.

Historical events of significance in the area include the actions against Jakob Marenga in 1907 (who was killed at Eenzaamheid Pan to the south), but no tangible traces of this history have been found in the landscape (Masson 2006).

3.4.2 Note on assumptions and limitations

When assessing archaeological resources in this environment, surface indications may be regarded as providing a fair estimate of the nature and range of material present in situations where deflation has occurred, e.g. in the creation of pans. At the edges of pans older surfaces may be exposed by wind or water erosion. By contrast, dunes skirting pans represent processes of sedimentation, and archaeological traces typically might occur below surface except in instances of localised deflation or erosion. It follows that in situations where archaeological resources may have been buried there is potential that some significant features

may be encountered unexpectedly during development, for example a burial or a cache of ostrich eggshell flasks. The report would therefore provide protocols to follow in the event of this occurring.

3.4.3 Observations made at the site

3.4.3.1 On the pan floor

Piles of stone that was cleared from the track were inspected for any indication of heritage traces that may have existed on the pan floor. Much of this material was found to be rock that is sedimentary and not in any way archaeological in nature. A second component consists of small quartzite and other pebbles, many of them rounded, possibly derived from Dwyka tillite known to occur in the wider landscape. A very few of these latter had been flaked or consisted of flakes, constituting an extremely ephemeral archaeological trace on the pan floor. Their very small number indicates a near to zero impact on archaeological traces by any of the proposed developments on the pan surface itself including in the vicinity of the MNT tower and the proposed fuel depots. While traversing the pan not a single such artefact was found *in situ*.

Two such piles were documented at 26°46'39.9" 20°12'18.2" (Figs 4-6) and at 26°50'13.1" 20°13'22.4" (Fig 7)



Figure 4. Pile of rock recovered from the Pan floor situated adjacent to the old road / causeway traversing the northern end of the pan.



Figures 5 (above) & 6 (below). View of a heap containing generally smaller non-sedimentary rocks (i.e. suitable for flaking). A minute component of these stone showed signs of flaking (below)





Figure 7. A further heap of stone material piled up from clearance of one of the rocky parts of the Pan floor. No artefacts were found here at all.

3.4.3.2 In dunes adjacent to the pan.

Two specific areas were examined in some detail. The first was adjacent to the old road that descends into the pan from the east, based on oral testimony from old inhabitants contacted by Mr Ricardo Botha of Loubos, concerning an alleged “Bushman grave”. The second was the ‘Landside’/‘Speedweek’ Camp area with media centre/ ablutions area established in a locale overlooking the pan from the east, where camp facilities include braai areas, powerpoints, water tanks, ablutions, canteen, etc.

3.4.3.2.1 Grave.

An unmarked grave, elliptical in shape and capped by flat stones, was recorded at 26°46′00.6″ 20°13′50.0″ (Fig 8). This was thought by local farm workers to be a “Bushman Grave”. The presence of head and foot stones indicates that it is not of precolonial context but rather reflects Christian influence. It is impossible from the form of the grave and its situation to say anything about the identity of the buried individual. It may be significant that it is situated not far from the old road crossing the pan. The stones used for packing onto the cairn are derived from exposed rock beds a few hundred metres south of the grave. Isolated pieces of ostrich eggshell were noted but could not be linked with the grave (see similar observations below).



Figure 8. Grave on side of dune near old road.



Figure 9. GPS Location of grave.

3.4.3.2.2 Dunes in the vicinity of 'Landside'/'Speedweek' facilities.

The dunes in the area around and adjacent to the 'Landside'/'Speedweek' facilities, namely braai/camping area with powerpoints, water tanks, generator, etc, were

examined closely, since this is where the majority of the infrastructure is to be constructed. A number of isolated finds were located that indicate the presence of Stone Age occupation at various times in the past. None of these appeared to constitute a specific site that was readily definable spatially, but rather a palimpsest of repeated perhaps ephemeral inhabitations of uses of the dunes. It is conceivable that further material or higher densities occur below the surface. In this respect it was notable that exposed artefacts occur on relatively deflated surfaces as opposed to those over which active dunes are in formation.

Table 3.4.1 Stone Age artefacts found on the ‘Landside’/‘Speedweek’ site dunes (see Figures 17a & b):

Observation	Co-ordinates	Observation	Figure
HSP-Landside Dune 1	26°46'46.4" 20°14'38.3"	Large quartzite flake	10
2	26°46'47.2" 20°14'38.3"	Handaxe	11
3	26°46'47.5" 20°14'38.5"	Core	12
4	26°46'50.7" 20°14'40.6"	Later Stone Age flake	
5	26°46'51.3" 20°14'40.9"	Large flake scraper	13
6	26°46'51.6" 20°14'40.9"	Later Stone Age flake	
7	26°46'51.6" 20°14'40.8"	Large ?Lockshoek/Oakhurst flake/scraper	14
8	26°46'47.8" 20°14'37.0"	Cluster of ostrich eggshell pieces over area of about 5x5 m (possibly remains of a single eggshell flask)	



Figures 10 & 11. Flaked quartzite and handaxe.



Figures 12 & 13. Chert core and large quartzite scraper



Figure 14. Large quartzite scraper



Figures 15 (above) & 16 (below). Landscape setting showing dunes on the east side of the pan adjacent to the 'Landside'/'Speedweek' infrastructure development





Figure 17a. 'Landside'/'Speedweek' secondary infrastructure area showing location of clusters of isolated Stone Age traces (with GPS plots 15b, below).



Figure 17b. 'Landside'/'Speedweek' secondary infrastructure area showing GPS plots for individual Stone Age artefacts as tabulated in Table 3.4.1.

3.4.3.3 Fuel Depot Options A and B

Fuel Depot Option A & Technical Camp Option A:

The area indicated for Fuel Depot Option A and Technical Camp Option A is situated on the pan surface on the west side of the pan alongside the old Rietfontein road. This area was traversed on foot, revealing between zero and an extremely low number of flake stone pieces, very widely scattered. This observation is consistent with observations made above for the pan floor in general.

This once again represents an extremely ephemeral archaeological trace on the pan floor where the proposed possible development would constitute a near to zero impact on archaeological traces.

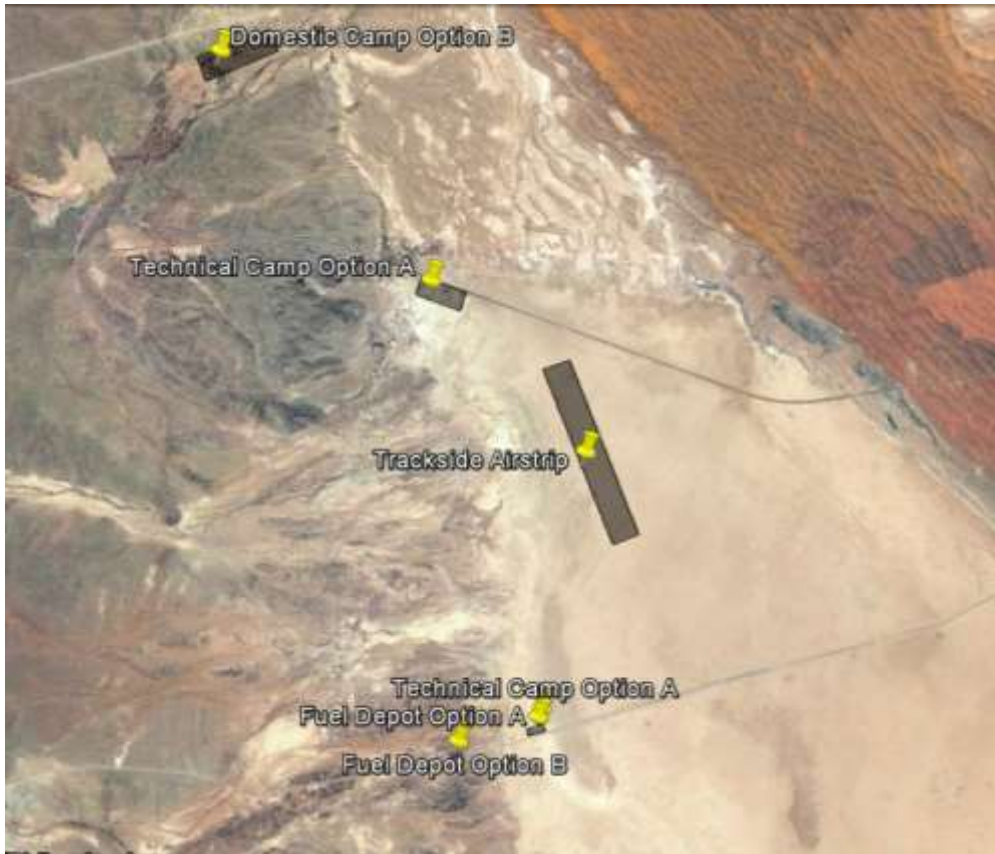


Figure 18. Map of north western end of Hakskeen Pan indicating the Fuel Depot Options, Technical Camp Options, Trackside Airstrip and Domestic Camp Option at Loubos.



Figure 19. Pan floor at Fuel Depot Option A.



Figure 20. Weathered Middle Stone Age blade 26°47'29.4" 20°09'39.9"

Fuel Depot Option B:

The proposed site of Fuel Depot Option B (see Fig 18) is upslope, i.e. westwards, from Option A, also alongside and just north of the old Rietfontein road. It is on the gently sloping ground rising westwards from the pan and on a surface strewn with Dwyka tillite-derived cobbles and, and amongst them, much flaked Stone Age material.



Figure 21. Stony surface at Fuel Depot Option B which includes many flaked stone artefacts, mainly Middle Stone Age.



Figure 22 a & b Stone artefacts including classic Middle Stone pieces at Fuel Depot option B.

Although this locale is rich in stone tools, these are probably a lag deposit, i.e. not in primary context, and hence lacking in archaeological integrity: no stratigraphy; no organic preservation; limited opportunities of characterising the material in any meaningful way. Almost all spreads of Dwyka tillite in the region display similar artefactual content, and this was found to be the case at Loubos as well (see below).

3.4.3.4 Technical Camp Option B and Trackside Airstrip

These areas of potential development are both situated on the pan floor at the north western end of the pan, south of the new (tarred) R31 between Mier and Rietfontein (see Fig. 18). These locales have the same characteristics of other pan floor settings described above, with zero or near zero archaeological traces. There would be no heritage impact by any infrastructure development in these areas.



Figure 23 (above) and Figure 24 (below) show pan surfaces around the MTN tower at the north western end of the pan, scheduled as possible Technical Camp Option A at the north western end of the pan: no artefacts were noted here at all.



3.4.3.5 Domestic Camp Option B

This Option B is situated just to the south of the existing village of Loubos (Fig. 18) which is about 4 km (as the crow flies) north west of the north-western corner of Hakskeen Pan. Much of the area is today infested with mesquite (*Prosopis*): if development of the camp would include clearance of infestations of alien vegetation this could represent a useful contribution to the ecological health of the area. The terrain is mantled by silt below which, and exposed in some parts of the area, there is a Dwyka-strewn surface similar to that noted at Fuel Depot Option B. Once again in these exposed areas there are cobbles of stone and, amongst them, much flaked material, principally Middle Stone Age but possibly containing some Acheulean (Earlier Stone Age) as well. As at Fuel Depot Option B, the archaeological component lacks stratigraphy and contextual features that would make it meaningful.

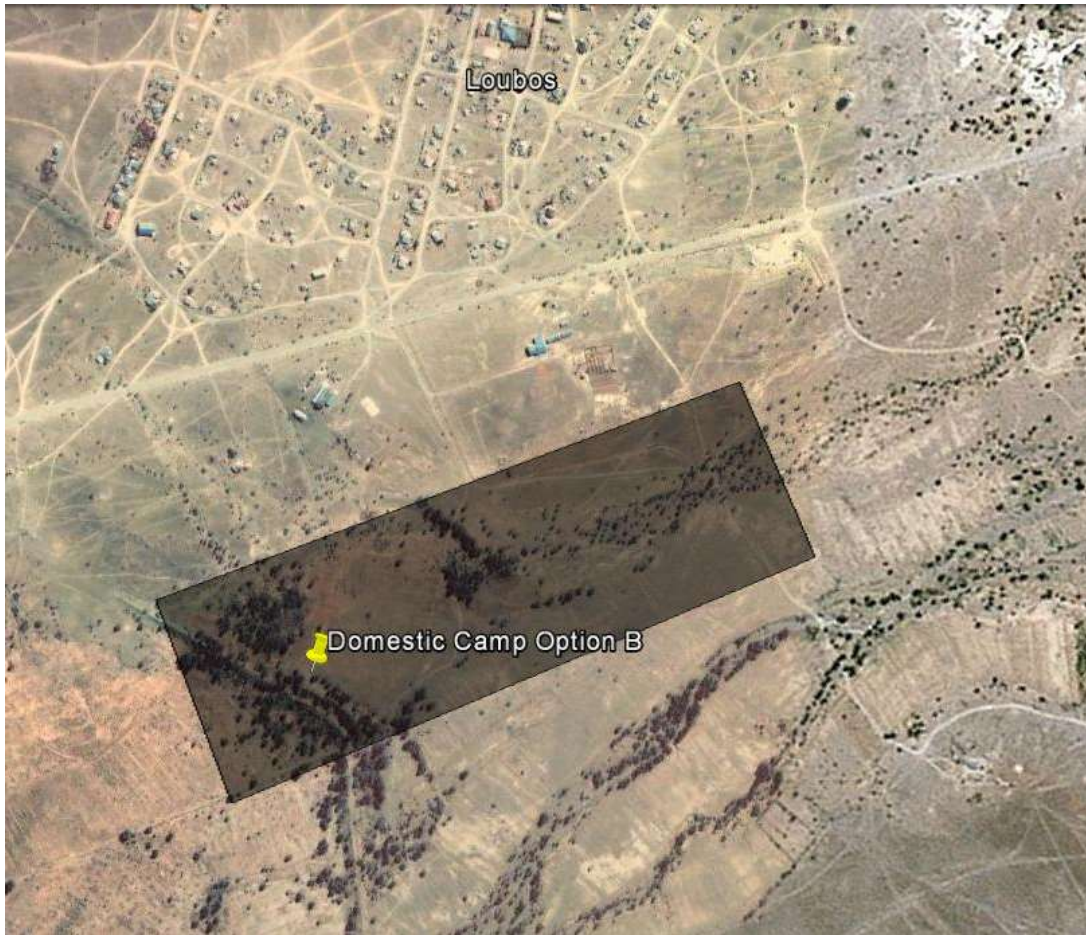


Figure 25. Google Earth image showing proposed potential location of Domestic Camp Option B south of Loubos.



Figure 26. Silt and stony ground south of Loubos: possible Domestic Camp Option B.



Figure 27. Exposures of tillite-strewn surfaces south of Loubos.



Figure 28. Stone artefacts made on quartzite derived from the Dwyka tillite.

3.5 STATEMENT OF SIGNIFICANCE

This section provides a statement of significance identifying the cultural and heritage value and heritage attributes of the identified cultural and heritage resources. This statement is informed by available current research and analysis of the site as well as pre-existing/background heritage data (3.4 above).

3.5.1 Assessing significance

The following criteria are used for determining archaeological significance based on baseline study fieldwork observations. In addition to guidelines provided by the National Heritage Resources Act, a set of criteria based on Deacon and Whitelaw 1997 for assessing archaeological significance has been developed for Northern Cape settings (Morris 2000a).

Estimating site potential

Table 1 is a classification of landforms and visible archaeological traces for estimating the potential for archaeological sites (after J. Deacon and National Monuments Council). Type 3 sites tend to be those with higher archaeological potential. There are notable exceptions, such as the renowned rock art site Driekopseiland, near Kimberley, which is on landform L1 Type 1. Generally, moreover, the older a site the poorer the preservation. Estimation of potential, in the light of such variables, thus requires some interpretation.

Assessing site value by attribute

The second matrix (Table 2) is adapted from Whitelaw (1997), who developed an approach for selecting sites meriting heritage recognition status in KwaZulu-Natal. It is a means of judging a site's archaeological value by ranking the relative strengths of a range of attributes. While aspects of this matrix remain qualitative, attribute assessment is a good indicator of the general archaeological significance of a site, with Type 3 attributes being those of highest significance.

Table 3.5.1. Classification of landforms and visible archaeological traces for estimating the potential for archaeological sites (after J. Deacon, National Monuments Council).

Class	Landform	Type 1	Type 2	Type 3
L1	Rocky surface	Bedrock exposed	Some soil patches	Sandy/grassy patches
L2	Ploughed land	Far from water	In floodplain	On old river terrace
L3	Sandy ground, inland	Far from water	In floodplain or near feature such as hill	On old river terrace
L4	Sandy ground, Coastal	>1 km from sea	Inland of dune cordon	Near rocky shore
L5	Water-logged deposit	Heavily vegetated	Running water	Sedimentary basin
L6	Developed urban	Heavily built-up with no known record of early settlement	Known early settlement, but buildings have basements	Buildings without extensive basements over known historical sites
L7	Lime/dolomite	>5 myrs	<5000 yrs	Between 5000 yrs and 5 myrs
L8	Rock shelter	Rocky floor	Sloping floor or small area	Flat floor, high ceiling
Class	Archaeo-logical traces	Type 1	Type 2	Type 3

Class	Landform	Type 1	Type 2	Type 3
A1	Area previously excavated	Little deposit remaining	More than half deposit remaining	High profile site
A2	Shell or bones visible	Dispersed scatter	Deposit <0.5 m thick	Deposit >0.5 m thick; shell and bone dense
A3	Stone artefacts or stone walling or other feature visible	Dispersed scatter	Deposit <0.5 m thick	Deposit >0.5 m thick

Table 3.5.2. Site attributes and value assessment (adapted from Whitelaw 1997)

Class	Attribute	Type 1	Type 2	Type 3
1	Length of sequence/context	No sequence Poor context Dispersed distribution	Limited sequence	Long sequence Favourable context High density of arte/ecofacts
2	Presence of exceptional items (incl regional rarity)	Absent	Present	Major element
3	Organic preservation	Absent	Present	Major element
4	Potential for future archaeological investigation	Low	Medium	High
5	Potential for public display	Low	Medium	High
6	Aesthetic appeal	Low	Medium	High
7	Potential for implementation of a long-term management plan	Low	Medium	High

In all cases, in terms of the above estimate of potential and attributes noted during fieldwork, the archaeological potential falls within landscape form L3 Type 2 (hence prediction of possible occurrence in the scoping phase) while attributes for archaeological traces found are mostly (with the exception of the grave) Class A3 Type 1 (low potential). Site attributes and value assessment for all the occurrences (except the grave) are Type 1 for Classes 1-6 and Type 2 (medium potential for implementing management plan) for Class 7. The very small numbers of isolated artefacts noted (they seem also to be widely distributed through time, from Earlier Stone Age [>500 000 years old] to Later Stone Age [perhaps up to the 19th century]) suggests that they have low local significance (to be graded 3C in terms of the National Heritage Resources Act).

The grave is of high sensitivity and should be subject to a detailed management plan if there is a chance that development may encroach into the area where it is situated.

3.6 IMPACT OF DEVELOPMENT OR SITE ALTERATION

- Assessment identifying any impact the proposed developments or site alteration may have on the cultural heritage resource(s) associated with Hakskeen Pan including:

- 3.6.1 Destruction of any, or part of any, significant heritage attributes or features.

On the Pan floor, no negative impacts on heritage traces expected.

In the 'landside'/'speedweek camp' area there is potential for destruction of some artefacts. Impacts to be managed.

The grave should be a no-go area for development. Graves (including unmarked graves and burials) have a high local significance and are protected under Section 36 of the NHRA.

- 3.6.2 Alteration that is not sympathetic, or is incompatible, with the historic fabric and appearance of Hakskeen Pan or where the change in use negates the pan's cultural heritage value.

Alteration should be carried out sensitively in respect of visual impacts and physical landscape transformation. Existing modification (clearing of test track, dismantling of road/causeway and filling of old borrow pits) has been in line with this principle.

- 3.6.3 Isolation of a heritage attribute from its surrounding environment, context or a significant relationship.

Not applicable except if in terms of mitigation and removal of artefacts to a museum context.

- 3.6.4 Land disturbances such as a change in grade that alters soils, and drainage patterns that adversely affect a cultural heritage resource, including archaeological resources.

See 3.6.2 above.

- 3.6.5 Reference to any other cultural and heritage impact that may occur as a result of the intended developments and events to take place at Hakskeen Pan including social and community impact.

Not applicable.

- 3.6.6 Possible cumulative impacts.

3.6.7 Defining impact of development or site alteration

The following standard impact assessment criteria and quantitative scoring indices are used in this study to characterise the significance of direct, indirect and cumulative impacts:

- The **nature**, which shall include a description of what causes the effect, what will be affected, and how it will be affected.

- The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional:
 - local extending only as far as the development site area – assigned a score of 1;
 - limited to the site and its immediate surroundings (up to 10 km) – assigned a score of 2;
 - will have an impact on the region – assigned a score of 3;
 - will have an impact on a national scale – assigned a score of 4; or
 - will have an impact across international borders – assigned a score of 5.

- The **duration**, wherein it will be indicated whether:
 - the lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
 - the lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
 - medium-term (5–15 years) – assigned a score of 3;
 - long term (> 15 years) - assigned a score of 4; or
 - permanent - assigned a score of 5.

- The **magnitude**, quantified on a scale from 0-10, where a score is assigned:
 - 0 is small and will have no effect on the environment;
 - 2 is minor and will not result in an impact on processes;
 - 4 is low and will cause a slight impact on processes;
 - 6 is moderate and will result in processes continuing but in a modified way;
 - 8 is high (processes are altered to the extent that they temporarily cease); and
 - 10 is very high and results in complete destruction of patterns and permanent cessation of processes.

- The **probability of occurrence**, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale, and a score assigned:
 - Assigned a score of 1–5, where 1 is very improbable (probably will not happen);
 - Assigned a score of 2 is improbable (some possibility, but low likelihood);
 - Assigned a score of 3 is probable (distinct possibility);

- Assigned a score of 4 is highly probable (most likely); and
- Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).
- the **significance**, which shall be determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high.
- the **status**, which will be described as either positive, negative or neutral.
 - the degree to which the impact can be reversed.
 - the degree to which the impact may cause irreplaceable loss of resources.
 - the *degree* to which the impact can be *mitigated*.

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

S = (E+D+M) P; where

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The **significance weightings** for each potential impact are as follows:

- < 30 points: Low (i.e. where this impact would not have a direct influence on the decision to develop in the area),
- 30-60 points: Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- > 60 points: High (i.e. where the impact must have an influence on the decision process to develop in the area).

Table 3.6.7.1 Impact table template for summarising the significance of possible impacts at the proposed development: All pan and pan-side localities

Nature

Acts or activities resulting in disturbance of surfaces and/or sub-surfaces containing artefacts (causes) resulting in the destruction, damage, excavation, alteration, removal or

collection from its original position (consequences), of any archaeological material or object (what affected).		
	Without mitigation	With mitigation
Extent	1	1
Duration	5	5
Magnitude	4	2
Probability	2	1
Significance	20	8
Status (positive or negative)	Negative	Neutral
Reversibility	No	No
Irreplaceable loss of resources?	Yes	Reduced
Can impacts be mitigated?	Yes	
Mitigation: Manage development in the dune area and salvage Stone Age material which could be used in a tourist information panel.		
Cumulative Impacts: Expansion of the development with time would lead to cumulative impacts, which should be managed in a heritage management plan component of the environmental management plan.		

Table 3.6.7.2 Impact table template for summarising the significance of possible impacts at the proposed development: Grave site.

Nature		
Acts or activities resulting in disturbance of surfaces and/or sub-surfaces containing artefacts (causes) resulting in the destruction, damage, excavation, alteration, removal or collection from its original position (consequences), of any archaeological material or object (what affected).		
	Without mitigation	With mitigation
Extent	2	NO GO AREA
Duration	5	
Magnitude	10	
Probability	2	
Significance	34	NO GO AREA
Status (positive or negative)	Negative	Negative
Reversibility	No	No
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	NO GO AREA	NO GO AREA
Mitigation: Impacting the grave to be avoided. No go area.		

Cumulative Impacts: Environmental Management Plan to red flag this as a no go area

3.7 ALTERNATIVES AND MITIGATION STRATEGIES

The above evaluation of the significance of impacts indicates that in all pan and pan-side settings, with the exception of the grave site, the significance of impact is likely to be low. The grave site is of high sensitivity and it is recommended that it be a no-go area. A mitigation strategy for all other areas, especially with respect to secondary facilities (i.e. subsidiary infrastructure such as accommodation, workshops, media centre, eateries, roads, car parks etc), is recommended to be in the form of a heritage management plan as part of the EMP (3.8 below).

3.8 HERITAGE MANAGEMENT PLAN

A strategy for best possible protection and enhancement of cultural and heritage value and heritage attributes at Hakskeen Pan should include but not be limited to: mitigation and conservation measures with implementation and monitoring plan. Such a heritage management plan is best incorporated in the following terms as part of the project EMP.

Table 3.8.1 Heritage management plan measures for inclusion in EMP

OBJECTIVE: Archaeological or other heritage materials occurring in the path of any surface or sub-surface disturbances associated with any aspect of the development may be subject to destruction, damage, excavation, alteration, or removal. The objective is to manage and minimise any negative impacts.

Project component/s	Any surface or sub-surface disturbance associated with the project and any future extension of the development may impact archaeological resources.
Potential Impact	The potential impact if this objective is not met is that wider areas or extended linear developments may result in further destruction, damage, excavation, alteration, removal or collection of heritage objects from their current context in the area.
Activity/risk source	Activities which could impact on achieving this objective include deviation from the development plan.
Mitigation: Target/Objective	An environmental management plan that takes cognizance of heritage resources during construction and in the event of any future expansion of infrastructure.

Mitigation: Action/control	Responsibility	Timeframe
Provision for on-going heritage monitoring in a project environmental management plan which also provides guidelines on what to do in the event of any major heritage feature being encountered during any phase of development or operation.	Environmental management provider with on-going monitoring.	Environmental management plan to be in place before commencement of development.
Avoid impact on the grave site identified in this study.		

Performance Indicator	Inclusion of further heritage impact consideration in any future expansion or infrastructural elements. Immediate reporting to relevant heritage authorities of any heritage feature discovered during development or operational life of the project.
Monitoring	Officials from relevant heritage authorities (National and Provincial) to be permitted to inspect the project/operation at any time in relation to the heritage component of the management plan.

3.9 REFERENCES

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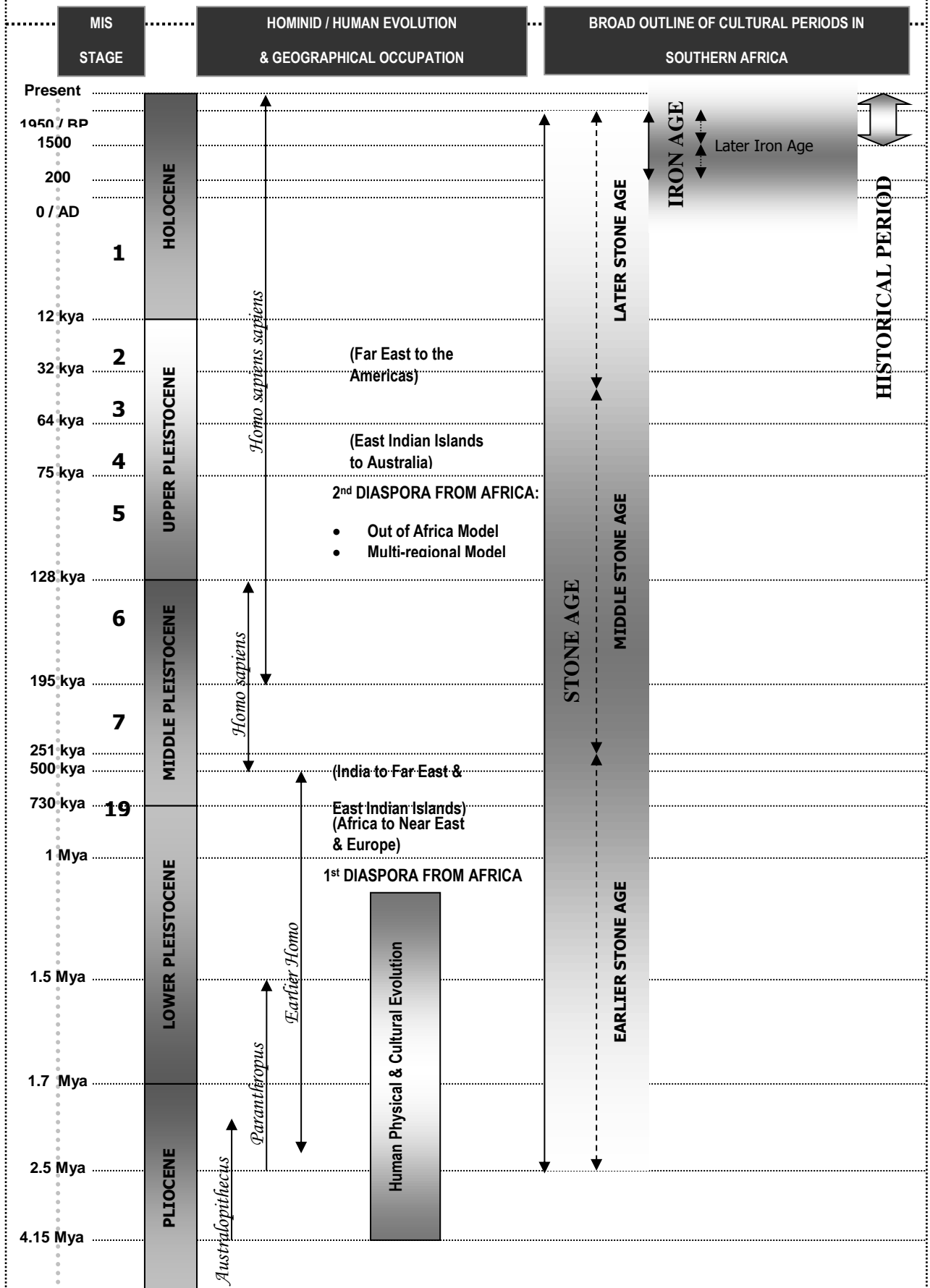
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2.10 LIST OF APPENDICES

1. Schematic Chart on Human Physical and Cultural Evolution in Africa (Developed by K. van Ryneveld, McGregor Museum)
2. Relevant extracts from the National Heritage Resources Act
3. Project Budget

Schematic Human Physical and Cultural Evolution in Africa



APPENDIX 2

National Heritage Resources Act (No 25 of 1999) Extracts

DEFINITIONS

Section 2

In this Act, unless the context requires otherwise:

- ii. “*Archaeological*” means –
 - a) material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures;
 - b) rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10 m of such representation;
 - c) wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the Republic, ... and any cargo, debris, or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation.
- viii. “*Development*” means any physical intervention, excavation or action, other than those caused by natural forces, which may in the opinion of a heritage authority in any way result in a change to the nature, appearance or physical nature of a place, or influence its stability and future well-being, including –
 - a) construction, alteration, demolition, removal or change of use of a place or structure at a place;
 - b) carrying out any works on or over or under a place;
 - c) subdivision or consolidation of land comprising, a place, including the structures or airspace of a place;
 - d) constructing or putting up for display signs or hoardings;
 - e) any change to the natural or existing condition or topography of land; and
 - f) any removal or destruction of trees, or removal of vegetation or topsoil;
- xiii. “*Grave*” means a place of interment and includes the contents, headstone or other marker of such a place, and any other structure on or associated with such place;
- xxi. “*Living heritage*” means the intangible aspects of inherited culture, and may include –
 - a) cultural tradition;
 - b) oral history;
 - c) performance;
 - d) ritual;
 - e) popular memory;
 - f) skills and techniques;
 - g) indigenous knowledge systems; and
 - h) the holistic approach to nature, society and social relationships.
- xxxi. “*Palaeontological*” means any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace;
- xli. “*Site*” means any area of land, including land covered by water, and including any structures or objects thereon;
- xliv. “*Structure*” means any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith;

NATIONAL ESTATE

Section 3

- 1) For the purposes of this Act, those heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations must be considered part of the national estate and fall within the sphere of operations of heritage resources authorities.
- 2) Without limiting the generality of subsection 1), the national estate may include –
 - a) places, buildings, structures and equipment of cultural significance;
 - b) places to which oral traditions are attached or which are associated with living heritage;
 - c) historical settlements and townscapes;
 - d) landscapes and natural features of cultural significance;
 - e) geological sites of scientific or cultural importance
 - f) archaeological and palaeontological sites;
 - g) graves and burial grounds, including –
 - i. ancestral graves;
 - ii. royal graves and graves of traditional leaders;
 - iii. graves of victims of conflict
 - iv. graves of individuals designated by the Minister by notice in the Gazette;

- v. historical graves and cemeteries; and
 - vi. other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No 65 of 1983)
- h) sites of significance relating to the history of slavery in South Africa;
- i) movable objects, including –
- i. objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
 - ii. objects to which oral traditions are attached or which are associated with living heritage;
 - iii. ethnographic art and objects;
 - iv. military objects;
 - v. objects of decorative or fine art;
 - vi. objects of scientific or technological interest; and
 - vii. books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1 xiv) of the National Archives of South Africa Act, 1996 (Act No 43 of 1996).

STRUCTURES

Section 34

- 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.

ARCHAEOLOGY, PALAEOLOGY AND METEORITES

Section 35

- 3) Any person who discovers archaeological or palaeontological objects or material or a meteorite in the course of development or agricultural activity must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority.
- 4) 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 assists in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.
- 5) When the responsible heritage resources authority has reasonable cause to believe that any activity or development which will destroy, damage or alter any archaeological or palaeontological site is under way, and where no application for a permit has been submitted and no heritage resources management procedure in terms of section 38 has been followed, it may –
- a) serve on the owner or occupier of the site or on the person undertaking such development an order for the development to cease immediately for such period as is specified in the order;
 - b) carry out an investigation for the purpose of obtaining information on whether or not an archaeological or palaeontological site exists and whether mitigation is necessary;
 - c) if mitigation is deemed by the heritage resources authority to be necessary, assist the person on whom the order has been served under paragraph a) to apply for a permit as required in subsection 4); and
 - d) recover the costs of such investigation from the owner or occupier of the land on which it is believed an archaeological or palaeontological site is located or from the person proposing to undertake the development if no application for a permit is received within two weeks of the order being served.
- 6) The responsible heritage resources authority may, after consultation with the owner of the land on which an archaeological or palaeontological site or meteorite is situated, serve a notice on the owner or any other controlling authority, to prevent activities within a specified distance from such site or meteorite.

BURIAL GROUNDS AND GRAVES

Section 36

- 3) No person may, without a permit issued by SAHRA or a provincial heritage resources authority –
- a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;
 - b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or

- c) bring onto or use at a burial ground or grave referred to in paragraph a) or b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.
- 4) SAHRA or a provincial heritage resources authority may not issue a permit for the destruction of any burial ground or grave referred to in subsection 3a) unless it is satisfied that the applicant has made satisfactory arrangements for the exhumation and re-interment of the contents of such graves, at the cost of the applicant and in accordance with any regulations made by the responsible heritage resources authority.
- 5) SAHRA or a provincial heritage resources authority may not issue a permit for any activity under subsection 3b) unless it is satisfied that the applicant has, in accordance with regulations made by the responsible heritage resources authority –
 - a) made a concerted effort to contact and consult communities and individuals who by tradition have an interest in such grave or burial ground; and
 - b) reached agreements with such communities and individuals regarding the future of such grave or burial ground.
- 6) Subject to the provision of any other law, any person who in the course of development or any other activity discovers the location of a grave, the existence of which was previously unknown, must immediately cease such activity and report the discovery to the responsible heritage resources authority which must, in co-operation with the South African Police Service and in accordance with regulations of the responsible heritage resources authority –
 - a) carry out an investigation for the purpose of obtaining information on whether or not such grave is protected in terms of this Act or is of significance to any community; and
 - b) if such grave is protected or is of significance, assist any person who or community which is a direct descendant to make arrangements for the exhumation and re-interment of the contents of such grave or, in the absence of such person or community, make any such arrangements as it deems fit.

HERITAGE RESOURCES MANAGEMENT

Section 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 300 m 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 m² in extent; or
 - ii. involving three or more existing erven or subdivisions thereof; or
 - iii. involving three or more erven or subdivisions thereof which have been consolidated within the past five years; or
 - iv. the costs which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
 - d) the rezoning of a site exceeding 10 000 m² in extent; or
 - e) any other category of development provided for in 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.
- 2) The responsible heritage resources authority must, within 14 days of receipt of a notification in terms of subsection 1) –
 - a) if there is reason to believe that heritage resources will be affected by such development, notify the person who intends to undertake the development to submit an impact assessment report. Such report must be compiled at the cost of the person proposing the development, by a person or persons approved by the responsible heritage resources authority with relevant qualifications and experience and professional standing in heritage resources management; or
 - b) notify the person concerned that this section does not apply.
- 3) The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection 2a) ...
- 4) The report must be considered timeously by the responsible heritage resources authority which must, after consultation with the person proposing the development decide –
 - a) whether or not the development may proceed;
 - b) any limitations or conditions to be applied to the development;
 - c) what general protections in terms of this Act apply, and what formal protections may be applied, to such heritage resources;
 - d) whether compensatory action is required in respect of any heritage resources damaged or destroyed as a result of the development; and
 - e) whether the appointment of specialists is required as a condition of approval of the proposal.

APPOINTMENT AND POWERS OF HERITAGE INSPECTORS

Section 50

- 7) Subject to the provision of any other law, a heritage inspector or any other person authorised by a heritage resources authority in writing, may at all reasonable times enter upon any land or premises for the purpose of inspecting any heritage resource protected in terms of the provisions of this Act, or any other property in respect of which the heritage resources authority is exercising its functions and powers in terms of this Act, and may take photographs, make measurements and sketches and use any other means of recording information necessary for the purposes of this Act.
- 8) A heritage inspector may at any time inspect work being done under a permit issued in terms of this Act and may for that purpose at all reasonable times enter any place protected in terms of this Act.
- 9) Where a heritage inspector has reasonable grounds to suspect that an offence in terms of this Act has been, is being, or is about to be committed, the heritage inspector may with such assistance as he or she thinks necessary –
 - a) enter and search any place, premises, vehicle, vessel or craft, and for that purpose stop and detain any vehicle, vessel or craft, in or on which the heritage inspector believes, on reasonable grounds, there is evidence related to that offence;
 - b) confiscate and detain any heritage resource or evidence concerned with the commission of the offence pending any further order from the responsible heritage resources authority; and
 - c) take such action as is reasonably necessary to prevent the commission of an offence in terms of this Act.

A heritage inspector may, if there is reason to believe that any work is being done or any action is being taken in contravention of this Act or the conditions of a permit issued in terms of this Act, order the immediate cessation of such work or action pending any further order from the responsible heritage resources authority.

APPENDIX 3: BUDGET

Hakskeen Pan

Archaeological & Heritage Impact Assessment (excl Palaeontology)

Travel	1140	km @	4.1	per km	R 4 674.00
Professional fee travel time	12	hours @	660	per hr	R 7 920.00
Professional fee survey & research	8	hours @	660	per hr	R 5 280.00
Field / Lab Assistant (x1 field)	20	hours @	14.7	per hr	R 294.00
Report - Desk-top Scoping	2	hours @	660	per hr	R 1 320.00
Report on field survey	10	hours @	660	per hr	R 6 600.00
Accommodation (x 2 personnel)	4	@	650	per night	R 2 600.00
S&T Museum staff (x2 personnel)	6	pers/days	353	per day	R 2 118.00
Consumables (boxes, bags, labels, etc)					R 0.00
Subtotal					R 30 806.00
Museum equipment use +5%					R 1 540.30
Museum admin +5%					R 1 617.32
TOTAL					R 33 963.62