

# HERITAGE IMPACT ASSESSMENT FOR PROPOSED POWER LINES NEAR HOTAZEL, KURUMAN MAGISTERIAL DISTRICT, NORTHERN CAPE

Required under Section 38 (8) of the National Heritage Resources Act (No. 25 of 1999).

*Report for:*

**AURECON SOUTH AFRICA (PTY) LTD**  
P.O. Box 509, George, 6530  
Tel: 044 805 5432  
Email: Patrick.Killick@aurecongroup.com

*On behalf of:*

**HOTAZEL SOLAR FARM 1 (PTY) LTD**  
**SUBSIDIARY OF JUWI RENEWABLE ENERGIES (PTY) LTD**



**Dr Jayson Orton**  
**ASHA Consulting (Pty) Ltd**  
6A Scarborough Road, Muizenberg, 7945  
Tel: (021) 788 8425 | 083 272 3225  
Email: jayson@asha-consulting.co.za

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## EXECUTIVE SUMMARY

ASHA Consulting (Pty) Ltd was appointed by Aurecon South Africa (Pty) Ltd to conduct an assessment of the potential impacts to heritage resources that might occur through the proposed construction of a power line to link the proposed Hotazel Solar Park to the national electricity grid. The study area is centred on S27°14'22.9" E22°58'6.6". Three alternatives have been proposed for assessment and are described below. The farm portions potentially implicated by the various alternatives are Annex Langdon 278/remainder, Hotazel 280/remainder, Devon 277/remainder, York 279/11 and Olive Pan 282/remainder.

The study area is relatively flat and covered in sand, although calcrete is exposed along the banks of the Ga-Mogara River which is crossed by one of the Alternatives. Bush and trees occur widely but in general did not hamper the survey. Some very dense patches along the western power line corridor were impenetrable but this was not a limitation for the assessment. The R31 and R380 roads, a railway and numerous other power lines cross the study area, while a number of manganese mines are operational in the general vicinity.

A desktop assessment was carried out and the site was physically surveyed for heritage resources. Heritage resources were found to be scarce in the broader landscape and, when present, tend to be isolated and of very low cultural significance. A scatter of stone artefacts was observed along the banks of the Ga-Mogara River but these are attributable to background scatter and are not dense enough to be significant. The landscape is also a heritage resource but is deemed to be of low significance because the dominant cultural contribution is from the mining industry and associated activities which date to the mid-twentieth century. No palaeontological material was seen on the site, although a small chance of finding such remains during deep excavations (>1 m) is noted.

There do not appear to be any significant heritage resources within the study area and impacts to heritage are likely to be of very low significance. Because heritage resources occur so infrequently in the wider region, cumulative impacts are of no concern.

Because of the very limited potential for impacts to heritage resources, it is recommended that the power line project be authorised with any of the three alternatives. The following condition should be included in the authorisation:

- If any archaeological material, palaeontological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist or palaeontologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

## Glossary

**Background scatter:** Artefacts whose spatial position is conditioned more by natural forces than by human agency

**Early Stone Age:** Period of the Stone Age extending approximately between 2 million and 200 000 years ago.

**Holocene:** The geological period spanning the last approximately 10 000 to -12 000 years.

**Hominid:** a group consisting of all modern and extinct great apes (i.e. gorillas, chimpanzees, orangutans and humans) and their ancestors.

**Later Stone Age:** Period of the Stone Age extending over the last approximately 20 000 years.

**Middle Stone Age:** Period of the Stone Age extending approximately between 200 000 and 20 000 years ago.

**Pleistocene:** The geological period beginning approximately 2.5 million years ago and preceding the Holocene.

## Abbreviations

**APHP:** Association of Professional Heritage Practitioners

**ASAPA:** Association of Southern African Professional Archaeologists

**CRM:** Cultural Resources Management

**DEA:** Department of Environmental Affairs

**ECO:** Environmental Control Officer

**EIA:** Environmental Impact Assessment

**ESA:** Early Stone Age

**GPS:** global positioning system

**HIA:** Heritage Impact Assessment

**LMS:** London Missionary Society

**LSA:** Later Stone Age

**MSA:** Middle Stone Age

**NEMA:** National Environmental Management Act (No. 107 of 1998)

**NHRA:** National Heritage Resources Act (No. 25) of 1999

**SAHRA:** South African Heritage Resources Agency

**SAHRIS:** South African Heritage Resources Information System

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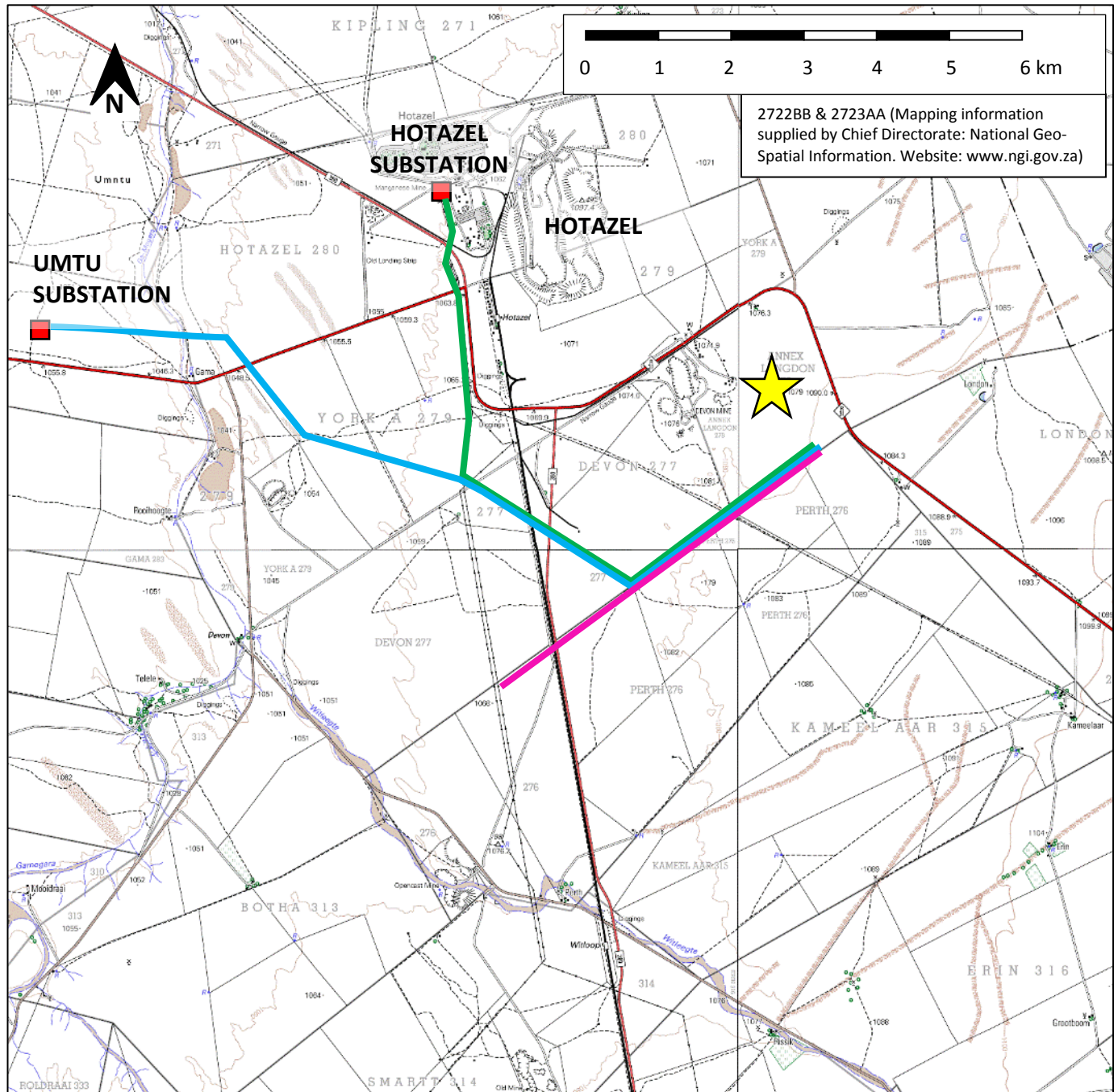
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# 1. INTRODUCTION

ASHA Consulting (Pty) Ltd was appointed by Aurecon South Africa (Pty) Ltd to conduct an assessment of the potential impacts to heritage resources that might occur through the proposed construction of a power line to link the proposed Hotazel Solar Park to the national electricity grid. The study area is centred on S27°14'22.9" E22°58'6.6". Three alternatives have been proposed for assessment and are described below. The farm portions potentially implicated by the various alternatives are Annex Langdon 278/rem, Hotazel 280/rem, Devon 277/rem, York 279/11 and Olive Pan 282/rem.



**Figure 1:** Map showing the location of the site to the south of Hotazel. The green line indicates Alternative C1 running to the Hotazel Substation, the turquoise line is Alternative C2 running to the Umtu Substation, while the pink line is Alternative C3 involving a Loop-In Loop-Out line on an existing Eskom power line. The yellow star indicates the position of the proposed PV facility which has been assessed under a separate process.

## 1.1. Project description

Three alternatives are being considered for assessment as follows and are mapped in Figures 1 and 2:

### 1.1.1. Transmission line C1: Hotazel substation

- A 200m wide corridor  $\leq 11$ km, of a double circuit 132kV power lines will be constructed
- Servitude width 35m
- $\leq 110$  monopole pylons
- $\leq 12$ km long and 4m wide service track

### 1.1.2. Transmission line C2: Umtu substation

- A 200m wide corridor  $\leq 14$ km double circuit 132kV power lines will be constructed
- Servitude width 35m
- $\leq 140$  monopole pylons
- $\leq 15$ km long and 4m service track

### 1.1.3. Transmission Line C3: LILO connection (please see footnote)

- A 200m wide corridor in which two rows of parallel pylons  $\leq 5.5$ km long, of a double circuit 132kV power lines will be constructed (not less than 21m or greater than 42m apart). The lines will tie into the existing 132kV Eskom line located to the west of the site.
- Servitude width 35m per line.
- $\leq 60$  monopole pylons (i.e.  $\leq 120$  pylons in total)
- $\leq 6$ km long and 4m service track per line

### 1.1.4. Alternative C4: NO GO

- No transmission lines would be constructed. Assuming the Hotazel solar plant is authorised, 200MWac power generated by the facility would not be available to the national grid. No environmental or social impacts, positive or negative, would arise.



**Figure 2:** Aerial view of the study area showing the proposed power line routes. The green line indicates Alternative C1, the turquoise line is Alternative C2, while the pink is Alternative C3. Created in Google Earth using the Bing overlay available from <http://ge-map-overlays.appspot.com/bing-maps/aerial/>.

## 1.2. Aspects of the project relevant to the heritage study

All aspects of the proposed development are relevant since excavations for foundations and/or services may impact on archaeological and/or palaeontological remains, while all above-ground aspects create potential visual (contextual) impacts to the cultural landscape and any significant heritage sites that might be visually sensitive.

### **1.3. Terms of reference**

ASHA Consulting was asked to provide a Heritage Impact Assessment (HIA) for the proposed project. The assessment was to follow the impact assessment methodology provided to all specialists.

It should also be noted, however, that following S.38(3) of the National Heritage Resources Act (No. 25 of 1999), even though certain specialist studies may be specifically requested, all heritage resources should be identified and assessed.

### **1.4. Scope and purpose of the report**

A heritage impact assessment (HIA) is a means of identifying any significant heritage resources before development begins so that these can be managed in such a way as to allow the development to proceed (if appropriate) without undue impacts to the fragile heritage of South Africa. This HIA report aims to fulfil the requirements of the heritage authorities such that a comment can be issued by them for consideration by the National Department of Environmental Affairs (DEA) who will review the Basic Assessment Report (BAR) and grant or refuse authorisation. The HIA report will outline any management and/or mitigation requirements that will need to be complied with from a heritage point of view and that should be included in the conditions of authorisation should this be granted.

### **1.5. The author**

Dr Jayson Orton has an MA (UCT, 2004) and a D.Phil (Oxford, UK, 2013), both in archaeology, and has been conducting Heritage Impact Assessments and archaeological specialist studies in the Western Cape and Northern Cape provinces of South Africa since 2004 (Please see curriculum vitae included as Appendix 1). He has also conducted research on aspects of the Later Stone Age in these provinces and published widely on the topic. He is an accredited heritage practitioner with the Association of Professional Heritage Practitioners (APHP) and also holds archaeological accreditation with the Association of Southern African Professional Archaeologists (ASAPA) CRM section (Member #233) as follows:

- Principal Investigator: Stone Age, Shell Middens & Grave Relocation; and
- Field Director: Colonial Period & Rock Art.

### **1.6. Declaration of independence**

ASHA Consulting (Pty) Ltd and its consultants have no financial or other interest in the proposed development and will derive no benefits other than fair remuneration for consulting services provided.

## **2. HERITAGE LEGISLATION**

The National Heritage Resources Act (NHRA) No. 25 of 1999 protects a variety of heritage resources as follows:

- Section 34: structures older than 60 years;



- Section 35: palaeontological, prehistoric and historical material (including ruins) more than 100 years old;
- Section 36: graves and human remains older than 60 years and located outside of a formal cemetery administered by a local authority; and
- Section 37: public monuments and memorials.

Following Section 2, the definitions applicable to the above protections are as follows:

- Structures: “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”;
- Palaeontological material: “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”;
- Archaeological material: 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 10m 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, as defined respectively in sections 3, 4 and 6 of the Maritime Zones Act, 1994 (Act No. 15 of 1994), 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”; and d) “features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found”;
- 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”; and
- Public monuments and memorials: “all monuments and memorials a) “erected on land belonging to any branch of central, provincial or local government, or on land belonging to any organisation funded by or established in terms of the legislation of such a branch of government”; or b) “which were paid for by public subscription, government funds, or a public-spirited or military organisation, and are on land belonging to any private individual.”

While landscapes with cultural significance do not have a dedicated Section in the NHRA, they are protected under the definition of the National Estate (Section 3). Section 3(2)(c) and (d) list “historical settlements and townscapes” and “landscapes and natural features of cultural significance” as part of the National Estate. Furthermore, Section 3(3) describes the reasons a place or object may have cultural heritage value; some of these speak directly to cultural landscapes.

Section 38 (2a) states that if there is reason to believe that heritage resources will be affected then an impact assessment report must be submitted. This report fulfils that requirement.

Under the National Environmental Management Act (No. 107 of 1998; NEMA), as amended, the project is subject to a BAR. Ngwao-Boswa Ya Kapa Bokoni (Heritage Northern Cape; for built environment and cultural landscapes) and the South African Heritage Resources Agency (SAHRA for archaeology and palaeontology) are required to provide comment on the proposed project in order to facilitate final decision making by the DEA.

### 3. METHODS

### **3.1. Literature survey and information sources**

A survey of available literature was carried out to assess the general heritage context into which the development would be set. This literature included published material, unpublished commercial reports and online material, including reports sourced from the South African Heritage Resources Information System (SAHRIS). The 1:50 000 maps were sourced from the Chief Directorate: National Geo-Spatial Information.

### **3.2. Field survey**

The proposed power line corridors and the PV site (the latter assessed in a separate report) were subjected to a foot survey over three days from 29th June to 1st July 2016. This was in mid-winter, but in such dry areas the season has little influence on the amount of plant cover and hence on visibility of the surface. During the survey the positions of finds were recorded on a hand-held GPS receiver set to the WGS84 datum. Photographs were taken at times in order to capture representative samples of both the affected heritage and the landscape setting of the proposed development.

### **3.3. Specialist studies**

A separate specialist assessment of palaeontological heritage has been carried out and is referenced within the present HIA. The palaeontological report can be found in Appendix 2.

### **3.4. Impact assessment**

For consistency, the impact assessment was conducted through application of a methodology supplied by Aurecon.

### **3.5. Grading**

S.7(1) of the NHRA provides for the grading of heritage resources into those of National (Grade I), Provincial (Grade II) and Local (Grade III) significance. Grading is intended to allow for the identification of the appropriate level of management for any given heritage resource. Grade I and II resources are intended to be managed by the national and provincial heritage resources authorities respectively, while Grade III resources would be managed by the relevant local planning authority. These bodies are responsible for grading, but anyone may make recommendations for grading.

It is intended under S.7(2) that the various provincial authorities formulate a system for the further detailed grading of heritage resources of local significance but this is generally yet to happen. SAHRA (2007) has formulated its own system for use in provinces where it has commenting authority. In this system sites of high local significance are given Grade IIIA (with the implication that site should be preserved in its entirety) and Grade IIIB (with the implication that part of the site could be mitigated and part preserved as appropriate) while sites of lesser significance are referred to as having 'General Protection' and rated with an A (high/medium significance, requires mitigation), B (medium significance, requires recording) or C (low significance, requires no further action).

### **3.6. Consultation**

The NHRA requires consultation as part of an HIA but, since the present study falls within the context of an EIA which includes a public participation process (PPP), no dedicated consultation was undertaken as part of the HIA.

### 3.7. Assumptions and limitations

The field study was carried out at the surface only and hence any completely buried archaeological sites would not be readily located. Similarly, it is not always possible to determine the depth of archaeological material visible at the surface. Part of the study area was within the security fence of a mine and was not available for study in the field. The shared section of the route was realigned further south and Alternative 3 was extended after the field survey – these areas were thus not covered. In some areas, especially along the power line corridor to the west, thick thorn bushes prevented easy access. However, these limitations are highly unlikely to have affected the outcome of the assessment because of the uniform nature of the surface and general lack of heritage resources in the area.

## 4. PHYSICAL ENVIRONMENTAL CONTEXT

### 4.1. Site context

The study area lies to the southwest, south and southeast of the town of Hotazel. It is crossed by the R31 and R380 roads as well as by a railway line servicing the manganese mines of the area (Figures 2 & 3). Two substations occur in the north and west and form the termini of two of the alternatives. A number of power lines also already traverse the area, including those for the railway lines.



**Figure 3:** View towards the south from the road bridge over the railway showing infrastructure already present in the area.

### 4.2. Site description

The general area around Hotazel is relatively flat with the only major landscape feature in the study area being the incision housing the Ga-Mogara River. This crosses Alternative C2 in the far west of the study area. The general environment is sandy with grass, thorn bushes and thorn trees being common. Thorn bushes were noted to be especially common immediately outside the existing power line servitude in the north, no doubt because cleared bushes dropped their seed there. Figures 4 to 8 show a selection of views of the landscape through which the proposed project would run.



**Figure 4:** View of the vicinity of the Hotazel Substation where Alternative C1 terminates.



**Figure 5:** View towards the north alongside the existing power lines followed by Alternative C1.



**Figure 6:** View towards the east along the existing power line followed by Alternative C2.



**Figure 7:** View of the area close to where Alternatives C1 and C2 meet.



**Figure 8:** View towards the southwest and west along the Alternative C2 corridor and across the Ga-Mogara River channel.

## 5. HERITAGE CONTEXT

This section of the report contains the desktop study and establishes what is already known about heritage resources in the vicinity of the study area. What was found during the field survey may then be compared with what is already known in order to gain an improved understanding of the significance of the newly reported resources.

### 5.1. Archaeological aspects

Although a large number of applications have been lodged on SAHRIS for areas surrounding the present study area, very few heritage reports have been compiled. Van Schalkwyk (2010, 2016) examined sites just south of the present study area and just west of Hotazel town and found no cultural resources to be present in either location. Other studies further afield (e.g. Fourie 2013) have found a similar paucity of archaeological material in open, sandy areas. However, along the margins of the Kuruman River stone artefacts have been reported (Hutten & Hutten 2013). These artefacts are low density and appear to be largely from the Middle Stone Age (MSA), although some may be Later Stone Age (LSA). They are likely attributable to background scatter. Early Stone Age (ESA) material seems to be largely absent, despite how common it is at Kathu, 50 km to the south, where extensive research has been carried out (e.g. Chazan et al. 2012; Porat et al. 2010).

De Jongh (2010) reports that Iron Age occupation did not extend into this area. It is thus of no further concern.

### 5.2. Palaeontological aspects

Almond (2016) notes that the site is underlain by sediments of the Kalahari Group. These include the Pleistocene-aged red sands of the Gordonian Formation as well as the underlying calcretes of the Mokolanen Formation. Fossils occur in both but are expected to be sporadic and widespread. Although mammalian bones, teeth and horn cores may occur in these sediments, their distribution is likely to be very sparse.

### 5.3. Historical aspects

De Jongh (2010) notes that Western Sotho communities who originated from Late Iron Age communities to the east occupied the broader area around Kathu when white farmers (trekboers) and missionaries arrived in the early 19th century. Here, as was the case over much of the country, this meeting of people and interests resulted in conflict over land. Lovett (1899) describes the beginnings of Kuruman, started by the London Missionary Society (LMS). In 1815 four missionaries were sent from London to work at a place known as Lattakoo. Although only two arrived there on 11th January 1816, one departed fairly soon. The remaining missionary, Robert Hamilton, was soon joined by James Read on 28th December 1816. Read obtained approval from the local chief, Mothibi of the Batlaping, to start a settlement. In June 1817 Mothibi moved his tribe to a better location along the Kuruman River which was initially known as New Lattakoo but then soon became Kuruman. Robert Moffat, a well-known LMS missionary, reached Lattakoo on 17th May 1821. The mission station was moved from Lattakoo to Kuruman in 1824.

The area was very sparsely populated until the 20th century when the farms of the area were surveyed. The Surveyor General diagrams show that Devon 277 was surveyed in 1914 with Annex Langdon having been a deduction from Devon in 1928.

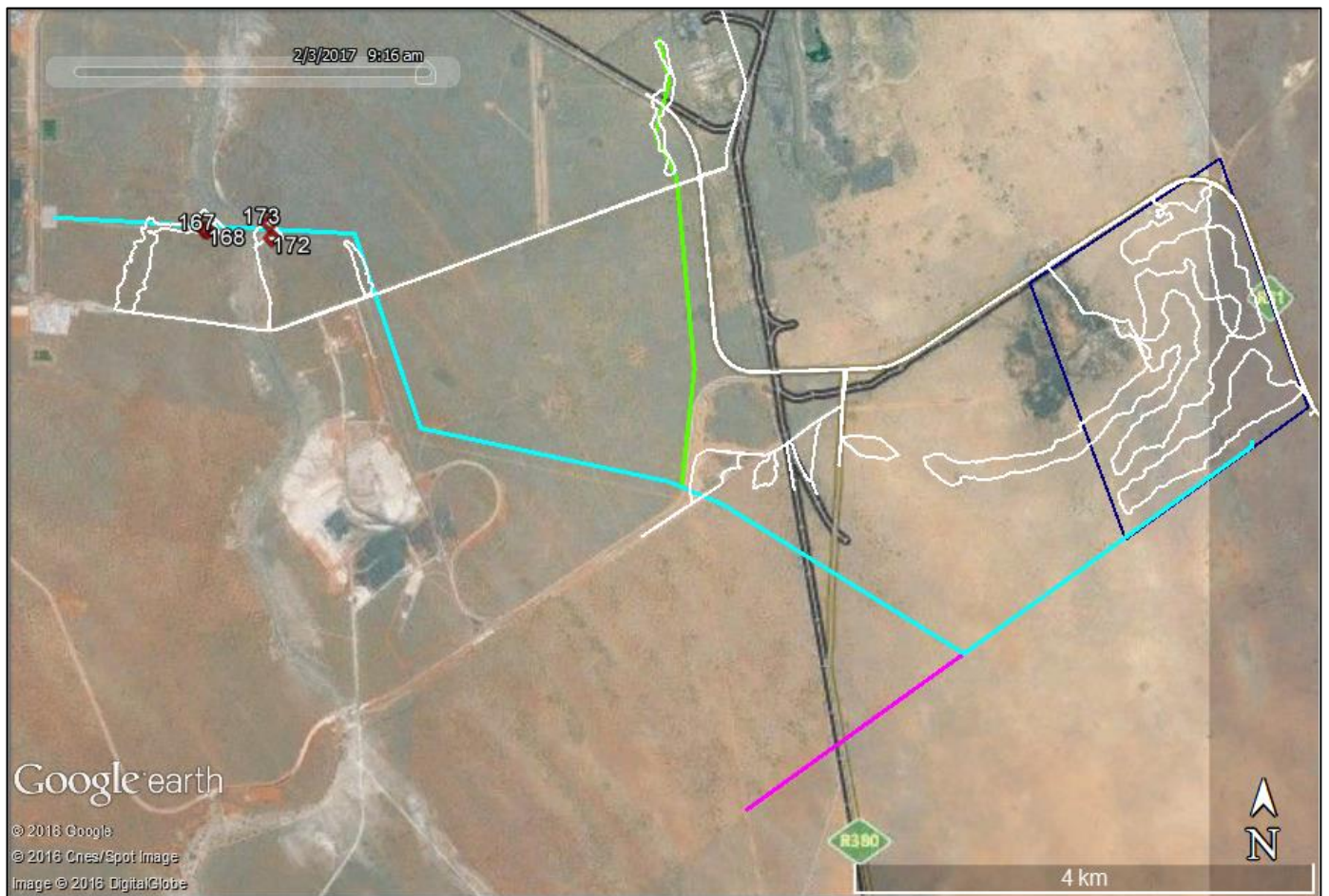
When manganese was discovered in the area during the mid-20th century by Van Rensburg, who was seeking water on the farm Hotazel, the farm was bought by SA Manganese. After testing the ore they set

up a mining operation and small town (initially 30 houses and some offices and stores. An official opening was held in November 1959 (Hocking 1983).

More recently, during the apartheid years in South Africa, the Bophutatswana Territorial Authority was set up in 1961. It became a self-governing state in 1971 and was given independence from South Africa in 1977. In 1994, however, it was reincorporated into South Africa (SAHO 2015).

## 6. FINDINGS OF THE HERITAGE STUDY

This section describes the heritage resources recorded in the study area during the course of the project. Figure 9 shows the walk-paths recorded during the survey and the position of the findings discussed in this section.



**Figure 9:** Aerial view of the study area showing the walk-paths recorded during the survey (white lines) and the positions of finds (numbered symbols). Note that the tracks reflect an earlier layout and that some areas could not be accessed at the time of the survey. Created in Google Earth using the Bing overlay available from <http://ge-map-overlays.appspot.com/bing-maps/aerial>.

### 6.1. Archaeology

Archaeological material in the form of stone artefacts was seen in two places only. These were on the opposite banks of the Ga-Mogara River where the surface sands have been eroded away and the underlying calcrete exposed. On the west bank of the river artefacts were seen at S27° 13' 16.2" E22° 55' 05.4" and S27° 13' 16.4" E22° 55' 06.4", and on the east bank at S27° 13' 18.6" E22° 55' 26.8" and S27° 13' 14.5" E22° 55' 26.1". It seemed clear that the artefacts are naturally located at or close to the interface between the sand and calcrete and have been exposed through the down-cutting of the river

channel. They probably occur extensively along the river channel. The artefacts appear to be from the MSA and were made mostly from quartzite and CCS. At least one quartz artefact was also seen. Figures 10 and 11 show examples of the artefacts found. These are no doubt attributable to the general background scatter that lies buried beneath the sand.



**Figure 10:** Selection of stone artefacts from Waypoint 167 on the western bank of the Ga-Mogara River. They are made from quartzite, quartz and CCS. Scale in cm.



**Figure 11:** Selection of stone artefacts from Waypoint 172 on the eastern bank of the Ga-Mogara River. They are made from quartzite and CCS. Scale in cm.

## 6.2. Palaeontology

The SAHRIS Palaeosensitivity map indicates that the study area is of moderate sensitivity from the point of view of fossil heritage and that at least a desktop study should be conducted (Figure 12). The study produced by Dr John Almond (2016) indicated that the Kalahari Sands and underlying calcretes are not sensitive from a palaeontological point of view because the types of fossils expected to be found are common and widespread within the region. These include invertebrate burrows and root and reed castes.

These sorts of fossils are the only ones recorded by Almond in other nearby areas (see references in Almond 2016).



**Figure 12:** Extract from the SAHRIS Palaeosensitivity map showing the project area (green, turquoise and pink lines) to be of moderate sensitivity (green shading). Source: <http://www.sahra.org.za/sahris/map/palaeo>.

### 6.3. The cultural landscape

The landscape has two primary components. The first and older one is the rural cultural landscape. The cultural aspects of this landscape are not strongly developed, largely because of the very low carrying capacity of the area. The only aspects making a contribution are fences and occasional farm track leading to houses. The second aspect is the more modern mining layer that has been superimposed on the rural landscape. It is of no cultural significance and does not require further discussion.

### 6.4. Statement of significance

Section 38(3)(b) of the NHRA requires an assessment of the significance of all heritage resources. In terms of Section 2(vi), “cultural significance” means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance.

The archaeological resources are deemed to have low cultural significance for their scientific value.

The cultural landscape has low significance for its aesthetic, historical and social value.

### 6.5. Summary of heritage indicators and provisional grading

The archaeological material seen along the Ga-Mogara River is not very significant and can be assigned a provision grading of ‘General Protection C’. There are no palaeontological resources worthy of grading and the landscape does not warrant grading<sup>1</sup>.

<sup>1</sup> Note that the SAHRA grading system has, in any case, only been proposed for use for archaeological resources.  
ASHA Consulting (Pty) Ltd | Reg. no.: 2013/220482/07



## 7. ASSESSMENT OF IMPACTS

### 7.1. Impacts to archaeological resources

Impacts to archaeological heritage would be direct negative impacts and would occur primarily during the construction phase of the project. Operational phase impacts are largely irrelevant since they would involve minor movement or damage to artefacts in the service roads which would have already been substantially disturbed. Archaeological artefacts were only seen in one area – along the banks of the Ga-Mogara River. Although it is likely that more similar artefacts will occur at the interface of sand and the underlying calcrete, the chances of impacting on significant scatters during construction of the power lines is minimal. The assessed significance before mitigation is **very low**. Because the archaeological remains are considered to be of very low cultural significance, no mitigation is suggested. There are no fatal flaws in terms of archaeology. The impacts are assessed in Table 1.

Because of the very limited amount of archaeology in the broader landscape and its generally buried nature, the cumulative impacts are regarded as being of **very low** significance. In the event that mitigation were required at one or other development in the region it is likely that there would be no change to the significance rating.

### 7.2. Impacts to palaeontological resources

Impacts to palaeontological heritage would be direct negative impacts and would occur only during the construction phase of the project. However, no palaeontological material was seen during the site inspection and thus the chances of impacts to these resources occurring are very low. Although such material could be buried beneath the covering sands, the chances of intersecting significant fossils are very low. The assessed significance before mitigation is therefore **very low**. Because palaeontological remains were not seen and the chances of significant resources being present are so low, no mitigation is suggested. There are no fatal flaws in terms of palaeontology. The impacts are assessed in Table 2.

Because of the very limited amount of palaeontology in the broader landscape, the cumulative impacts are regarded as being of **very low** significance. In the event that mitigation were required at one or other development in the region it is likely that there would be no change to the significance rating.

### 7.3. Impacts to the cultural landscape

The landscape is a heritage resource but its cultural aspects are almost exclusively recent and related mostly to the mining industry. As such they have very low cultural significance. Because of the general tree cover in the surrounding area and the degree of modern landscape alteration from mining, the impacts would be localised to the site and its immediate surrounds. In addition, there are already numerous power lines in the area. The significance of potential impacts is rated as being of **very low** significance before mitigation. No practical mitigation measures can be suggested. The impacts are assessed in Table 3.

The general landscape around the study area is already compromised through the presence of several mining facilities and other linear infrastructure including many power lines. It is noted that the other facilities proposed around the Hotazel area are all within reasonably close proximity of mining areas and that their associated power lines would simply be additional to those already present. It is considered that the impacts to the landscape would thus be fairly well concentrated around Hotazel and the various

industrial and mining facilities in the immediate area. The cumulative impacts to the landscape are thus rated as being of **very low** significance. The probability of these impacts is seen as probable because there is doubt over whether all the proposed projects would be constructed.

**Table 1: Impact assessment table for the power lines and service road: archaeology.**

	Hotazel TX line		Umtu TX line		LILO TX line		No Go Alternative	
<b>Short description</b>								
<b>Overview</b>	Negative impacts to archaeology from clearing of the surface and construction of the power lines and service road.		Negative impacts to archaeology from clearing of the surface and construction of the power lines and service road.		Negative impacts to archaeology from clearing of the surface and construction of the power lines and service road.		Retention of the status quo (i.e. livestock grazing / vacant land)	
<b>Assessment</b>								
	<b>Pre-Mitigation</b>	<b>Post Mitigation</b>	<b>Pre-Mitigation</b>	<b>Post Mitigation</b>	<b>Pre-Mitigation</b>	<b>Post Mitigation</b>	<b>Pre-Mitigation</b>	<b>Post Mitigation</b>
<b>Nature</b>	Negative	Negative	Negative	Negative	Negative	Negative	Neutral	Neutral
<b>Duration</b>	Long term	Long term	Long term	Long term	Long term	Long term	Long term	Long term
<b>Extent</b>	Site-specific	Site-specific	Site-specific	Site-specific	Site-specific	Site-specific	Site-specific	Site-specific
<b>Magnitude</b>	Very low	Very low	Very low	Very low	Very low	Very low	Zero	Zero
<b>Probability</b>	Probable	Probable	Probable	Probable	Probable	Probable	Probable	Probable
<b>Confidence</b>	Sure	Sure	Sure	Sure	Sure	Sure	Sure	Sure
<b>Reversibility</b>	Irreversible	Irreversible	Irreversible	Irreversible	Irreversible	Irreversible	Irreversible	Irreversible
<b>Resource irreplaceability</b>	High	High	High	High	High	High	High	High
<b>Mitigatability</b>	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium
<b>Significance</b>	Very low	Very low	Very low	Very low	Very low	Very low	Very low	Very low
<b>Mitigation</b>	<ul style="list-style-type: none"> <li>None required</li> </ul>							
<b>Cumulative Impact assessment</b>	The nature of the archaeological material present in the vicinity suggests that impacts to archaeology are likely to always remain of very low significance, even if a site worthy of mitigation were to be encountered and mitigated in another development.							
<b>Conclusion:</b>	Due only to the shorter length of construction required, the LILO option is preferred. This is followed by the Hotazel Tx line with the Umtu Tx line, which crosses the river where some archaeology was observed, being least preferred.							

**Table 2: Impact assessment table for the power lines and service road: palaeontology.**

	Hotazel TX line		Umtu TX line		LILO TX line		No Go Alternative	
<b>Short description</b>								
<b>Overview</b>	Negative impacts to palaeontology from clearing of the surface and construction of the power lines and service road.		Negative impacts to palaeontology from clearing of the surface and construction of the power lines and service road.		Negative impacts to palaeontology from clearing of the surface and construction of the power lines and service road.		Retention of the status quo (i.e. livestock grazing / vacant land)	
<b>Assessment</b>								
	<b>Pre-Mitigation</b>	<b>Post Mitigation</b>	<b>Pre-Mitigation</b>	<b>Post Mitigation</b>	<b>Pre-Mitigation</b>	<b>Post Mitigation</b>	<b>Pre-Mitigation</b>	<b>Post Mitigation</b>
<b>Nature</b>	Negative	Negative	Negative	Negative	Negative	Negative	Neutral	Neutral
<b>Duration</b>	Long term	Long term	Long term	Long term	Long term	Long term	Long term	Long term
<b>Extent</b>	Site-specific	Site-specific	Site-specific	Site-specific	Site-specific	Site-specific	Site-specific	Site-specific
<b>Magnitude</b>	Very low	Very low	Very low	Very low	Very low	Very low	Zero	Zero
<b>Probability</b>	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
<b>Confidence</b>	Sure	Sure	Sure	Sure	Sure	Sure	Sure	Sure
<b>Reversibility</b>	Irreversible	Irreversible	Irreversible	Irreversible	Irreversible	Irreversible	Irreversible	Irreversible
<b>Resource irreplaceability</b>	Low	Low	Low	Low	Low	Low	Low	Low
<b>Mitigatability</b>	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium
<b>Significance</b>	Very low	Very low	Very low	Very low	Very low	Very low	Very low	Very low
<b>Mitigation</b>	<ul style="list-style-type: none"> <li>None required</li> </ul>							
<b>Cumulative Impact assessment</b>	The nature of the palaeontological material present in the vicinity suggests that impacts to palaeontology are likely to always remain of very low significance, even if fossils worthy of mitigation were to be encountered and mitigated in another development.							
<b>Conclusion:</b>	Due only to the shorter length of construction required, the LILO option is preferred. This is followed by the Hotazel Tx line with the Umtu Tx line, which crosses the river where calcrete outcrops occur, being least preferred.							

**Table 3: Impact assessment table for the power lines and service road: landscape.**

	Hotazel TX line		Umtu TX line		LILO TX line		No Go Alternative	
<b>Short description</b>								
<b>Overview</b>	Negative impacts to the landscape from clearing of the surface and construction of the power lines and service road.		Negative impacts to the landscape from clearing of the surface and construction of the power lines and service road.		Negative impacts to the landscape from clearing of the surface and construction of the power lines and service road.		Retention of the status quo (i.e. livestock grazing / vacant land)	
<b>Assessment</b>								
	<b>Pre-Mitigation</b>	<b>Post Mitigation</b>	<b>Pre-Mitigation</b>	<b>Post Mitigation</b>	<b>Pre-Mitigation</b>	<b>Post Mitigation</b>	<b>Pre-Mitigation</b>	<b>Post Mitigation</b>
<b>Nature</b>	Negative	Negative	Negative	Negative	Negative	Negative	Neutral	Neutral
<b>Duration</b>	Long term	Long term	Long term	Long term	Long term	Long term	Long term	Long term
<b>Extent</b>	Local	Local	Local	Local	Local	Local	Site-specific	Site-specific
<b>Magnitude</b>	Very low	Very low	Very low	Very low	Very low	Very low	Zero	Zero
<b>Probability</b>	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
<b>Confidence</b>	Sure	Sure	Sure	Sure	Sure	Sure	Certain	Certain
<b>Reversibility</b>	Reversible	Reversible	Reversible	Reversible	Reversible	Reversible	Reversible	Reversible
<b>Resource irreplaceability</b>	Low	Low	Low	Low	Low	Low	Low	Low
<b>Mitigatability</b>	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium
<b>Significance</b>	Very low	Very low	Very low	Very low	Very low	Very low	Very low	Very low
<b>Mitigation</b>	<ul style="list-style-type: none"> <li>None required</li> </ul>							
<b>Cumulative Impact assessment</b>	The nature of the archaeological material present in the vicinity suggests that impacts to archaeology are likely to always remain of very low significance, even if a site worthy of mitigation were to be encountered and mitigated in another development.							
<b>Conclusion:</b>	Due only to the shorter length of construction required, the LILO option is preferred. This is followed by the Hotazel Tx line with the Umtu Tx line, which crosses the river (the only prominent landscape feature in the area), being least preferred.							

## **8. INPUT TO THE ENVIRONMENTAL MANAGEMENT PROGRAM**

There are no mitigation measures for this project, but there are some management measures that should be written into the project Environmental Management Program (EMPr). These are discussed here.

It is recommended that the ECO examine all excavations greater than 1 m depth to check for palaeontological material.

Although the chance of finding buried archaeological resources, fossil resources or possibly graves is very low, should any such material be found it should be reported to the project environmental control officer (ECO) who should then report to an archaeologist or palaeontologist as appropriate for assessment and advice on how to proceed. The ECO or heritage practitioner should also report the find to SAHRA.

## **9. EVALUATION OF IMPACTS RELATIVE TO SUSTAINABLE SOCIAL AND ECONOMIC BENEFITS**

Section 38(3)(d) requires an evaluation of the impacts on heritage resources relative to the sustainable social and economic benefits to be derived from the development.

In this instance the heritage significance of the study area is very low which means that the social and economic benefits (provision of jobs and electricity) far outweigh the impacts to heritage resources.

## **10. PUBLIC CONSULTATION**

This HIA forms part of a BAR which will be subjected to the legally required public consultation process. As such, no specific consultation has been undertaken as part of the heritage process.

## **11. CONCLUSIONS**

There are no significant heritage indicators related to this project or its footprint area. No significant impacts are expected, although there is always the remote possibility that buried archaeological material, palaeontological material or isolated graves could be found. Such finds cannot be predicted and do not materially affect the decision to proceed with the project.

## **12. RECOMMENDATIONS**

Because of the very limited potential for impacts to heritage resources, it is recommended that the project be authorised. The following condition should be included in the authorisation:

- If any archaeological material, palaeontological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist or palaeontologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

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## APPENDIX 1 – Curriculum Vitae



*Curriculum Vitae*

**Jayson David John Orton**

ARCHAEOLOGIST AND HERITAGE CONSULTANT

### Contact Details and personal information:

**Address:** 6A Scarborough Road, Muizenberg, 7945  
**Telephone:** (021) 788 8425  
**Cell Phone:** 083 272 3225  
**Email:** jayson@asha-consulting.co.za

**Birth date and place:** 22 June 1976, Cape Town, South Africa  
**Citizenship:** South African  
**ID no:** 760622 522 4085  
**Driver's License:** Code 08  
**Marital Status:** Married to Carol Orton  
**Languages spoken:** English and Afrikaans

### Education:

SA College High School	Matric	1994
University of Cape Town	B.A. (Archaeology, Environmental & Geographical Science)	1997
University of Cape Town	B.A. (Honours) (Archaeology)*	1998
University of Cape Town	M.A. (Archaeology)	2004
University of Oxford	D.Phil. (Archaeology)	2013

\*Frank Schweitzer memorial book prize for an outstanding student and the degree in the First Class.

### Employment History:

Spatial Archaeology Research Unit, UCT	Research assistant	Jan 1996 – Dec 1998
Department of Archaeology, UCT	Field archaeologist	Jan 1998 – Dec 1998
UCT Archaeology Contracts Office	Field archaeologist	Jan 1999 – May 2004
UCT Archaeology Contracts Office	Heritage & archaeological consultant	Jun 2004 – May 2012
School of Archaeology, University of Oxford	Undergraduate Tutor	Oct 2008 – Dec 2008
ACO Associates cc	Associate, Heritage & archaeological consultant	Jan 2011 – Dec 2013
ASHA Consulting (Pty) Ltd	Director, Heritage & archaeological consultant	Jan 2014 –

### Memberships and affiliations:

South African Archaeological Society Council member	2004 –
Assoc. Southern African Professional Archaeologists (ASAPA) member	2006 –
ASAPA Cultural Resources Management Section member	2007 –
UCT Department of Archaeology Research Associate	2013 –
Heritage Western Cape APM Committee member	2013 –
UNISA Department of Archaeology and Anthropology Research Fellow	2014 –
Fish Hoek Valley Historical Association	2014 –



### **Professional Accreditation:**

Association of Southern African Professional Archaeologists (ASAPA) membership number: 233

CRM Section member with the following accreditation:

- Principal Investigator: Coastal shell middens (awarded 2007)
  - Stone Age archaeology (awarded 2007)
  - Grave relocation (awarded 2014)
- Field Director: Rock art (awarded 2007)
  - Colonial period archaeology (awarded 2007)

Association of Professional Heritage Practitioners (APHP)

- Accredited Professional Heritage Practitioner

### **Fieldwork and project experience:**

Extensive fieldwork as both Field Director and Principle Investigator throughout the Western and Northern Cape, and also in the western parts of the Free State and Eastern Cape as follows:

#### Phase 1 surveys and impact assessments:

- Project types
  - Notification of Intent to Develop applications (for Heritage Western Cape)
  - Heritage Impact Assessments (largely in the Environmental Impact Assessment or Basic Assessment context under NEMA and Section 38(8) of the NHRA, but also self-standing assessments under Section 38(1) of the NHRA)
  - Archaeological specialist studies
  - Phase 1 test excavations in historical and prehistoric sites
  - Archaeological research projects
- Development types
  - Mining and borrow pits
  - Roads (new and upgrades)
  - Residential, commercial and industrial development
  - Dams and pipe lines
  - Power lines and substations
  - Renewable energy facilities (wind energy, solar energy and hydro-electric facilities)

#### Phase 2 mitigation and research excavations:

- ESA open sites
  - Duinefontein, Gouda
- MSA rock shelters
  - Fish Hoek, Yzerfontein, Cederberg, Namaqualand
- MSA open sites
  - Swartland, Bushmanland, Namaqualand
- LSA rock shelters
  - Cederberg, Namaqualand, Bushmanland
- LSA open sites (inland)
  - Swartland, Franschhoek, Namaqualand, Bushmanland
- LSA coastal shell middens
  - Melkbosstrand, Yzerfontein, Saldanha Bay, Paternoster, Dwarskersbos, Infanta, Knysna, Namaqualand
- LSA burials
  - Melkbosstrand, Saldanha Bay, Namaqualand, Knysna
- Historical sites
  - Franschhoek (farmstead and well), Waterfront (fort, dump and well), Noordhoek (cottage), variety of small excavations in central Cape Town and surrounding suburbs
- Historic burial grounds
  - Green Point (Prestwich Street), V&A Waterfront (Marina Residential), Paarl

**APPENDIX 2 – Palaeontological desktop study**