

**HERITAGE IMPACT ASSESSMENT:  
PROPOSED PROSPECTING ON PORTIONS 9, 10 & 11  
OF FARM BRAKFORTEIN 133 AND PORTIONS 1 & 23  
OF FARM MELKBOSCHKUIL, NAMAKWALAND  
MAGISTERIAL DISTRICT, NORTHERN CAPE PROVINCE**

Required under Section 38(8) of the National Heritage Resources Act (No. 25 of 1999)  
as part of a Heritage Impact Assessment.

*Report for:*

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*On behalf of:*

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## SUMMARY

ASHA Consulting (Pty) Ltd was appointed by N.J. van Zyl to conduct an assessment of the potential impacts to heritage resources that might occur through proposed prospecting activities on a portion of Portion 9, a portion of Portion 10 and Portion 11 of the farm Brakfontein 133 and a portion of Portion 1 and a portion of Portion 23 of the Farm Melkboschkuil 132 in the Namakwaland Magisterial District. The study area is broken into two larger areas, one adjacent to Okiep and the other at Carolusberg. The approximate centre points of these two areas are at about S29° 35' 10" E17° 53' 10" and S29° 38' 55" E17° 57' 20" respectively.

The project involves various methods, the vast majority of which are of no concern to this study (e.g. desktop research, remote sensing, geological mapping). The only aspect that may cause physical damage to heritage resources is drilling. Each drill hole would require a cleared area of 160 m<sup>2</sup> and drilling would occur through use of a truck-mounted drill rig.

The study area lies within the granite hills of the northernmost Kamiesberg and has been the site of many copper mining ventures since the mid-19<sup>th</sup> century. The mountains have much exposed granite while the valleys tend to be filled with alluvium and generally sparse vegetation. Traces of earlier mining are abundant in the landscape, especially in close proximity to Okiep and Carolusberg.

A survey of those areas already identified for drilling at Carolusberg was carried out and heritage resources were found to be absent. Very nearby, however, is the declared PHS of Simon van der Stel's copper mine. A brief visit was also made to a portion of the study area at Okiep because two further PHSs occur there.

Stone Age resources appear to be very sparse and none were recorded during the survey. Traces of historical use of the landscape other than mining are known to occur widely throughout the local area but were absent from the surveyed areas. These traces relate to use of the landscape during the last two centuries since the establishment of mission stations in the area. Although not intrinsically significant, these resources reflect the living heritage of the area since they are the result of transhumant behaviour. Historical mining traces are the most important aspect of heritage encountered but only occur in specific places on the landscape. These traces include historical excavations, ruins and built structures. There are also many traces of mid-late 20<sup>th</sup> century copper mining and, although part of the region's mining history, these do not constitute heritage resources. Because of the very sparse distribution of heritage resources, it is concluded that impacts to such resources are likely to be minimal. While potential concerns remain in the Okiep study area, there are none at Carolusberg.

It is recommended that SAHRA allow the prospecting project to proceed as planned but subject to the following recommendations:

- Once the Okiep drilling locations are known, a map should be provided to an archaeologist for desktop analysis. If any potentially sensitive areas cannot be avoided then a brief site visit should be carried out to confirm sensitivity and, in consultation with the prospecting geologists, propose alternative nearby drill sites. An opinion should then be expressed in a letter that should be submitted to SAHRA confirming whether or not drilling may proceed;
- Regardless of the above archaeological opinion, all drill sites should be carefully inspected by project staff to ensure that no heritage features are present;

- All historical features at the Okiep West Mine must be avoided with a 30 m buffer respected around the Cornish Beam Pump and Smoke Stack;
- A fossil Chance Finds Procedure must be included in the project EMPr and implemented in the event of any chance finds of fossils, and
- If any archaeological 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. Such heritage is the property of the state and may require excavation and curation in an approved institution.

It is further recommended to Ngwao-Boswa Ya Kapa Bokoni that the structural stability of the Cornish Beam Pump be investigated as soon as possible. It is clear that significant collapse of the wooden components has happened in the last decade and that the PHS is in danger of significant damage should there be further collapse.

## 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 10-12 000 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.

## Abbreviations

**APHP:** Association of Professional Heritage Practitioners

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

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

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

**CRM:** Cultural Resources Management

**SAHRA:** South African Heritage Resources Agency

**DMR:** Department of Mineral Resources

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

**ESA:** Early Stone Age

**GP:** General Protection

**GPS:** global positioning system

**HIA:** Heritage Impact Assessment

**LSA:** Later Stone Age

**MSA:** Middle Stone Age

**NBKB:** Ngwao-Boswa Ya Kapa Bokoni

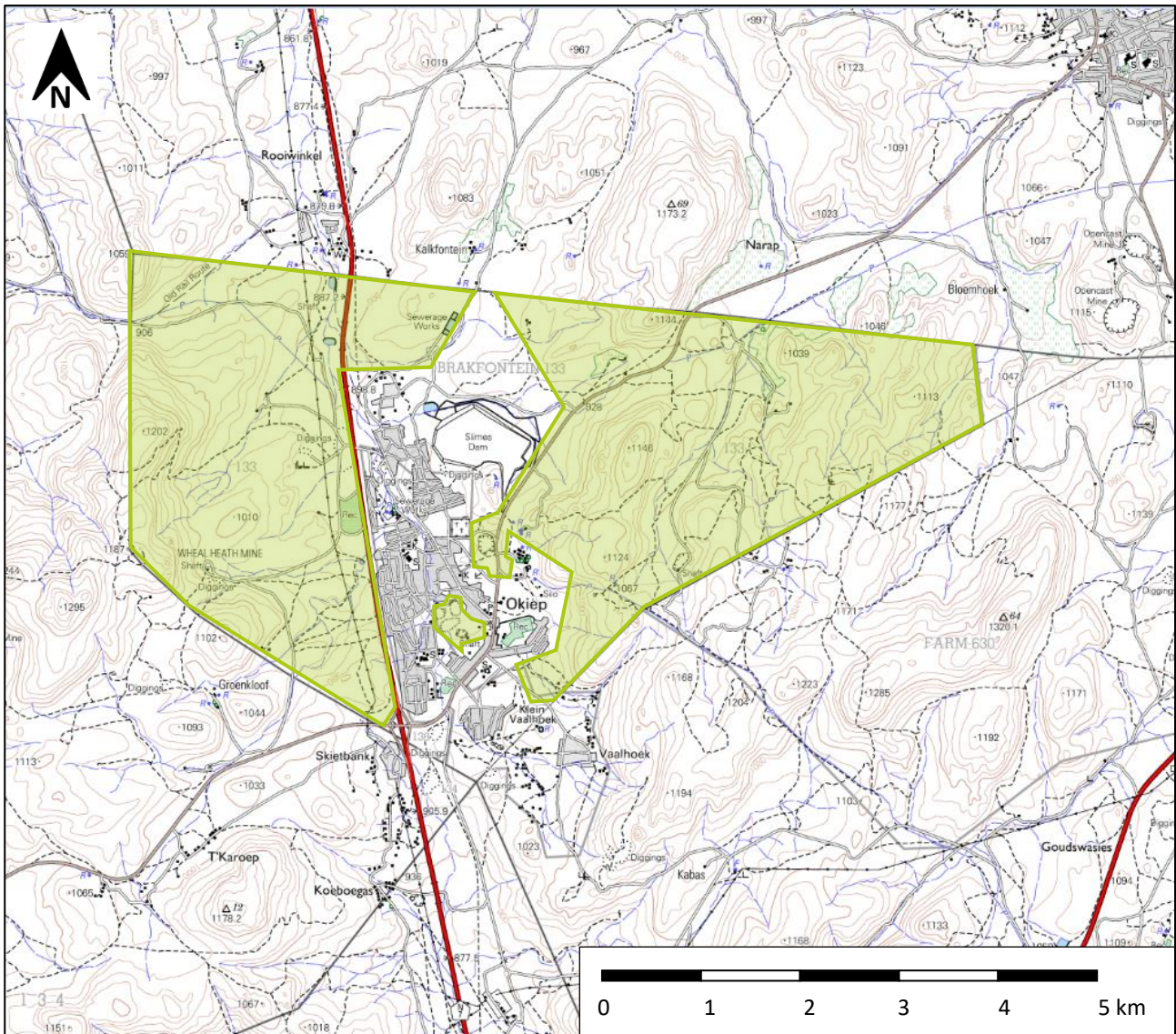
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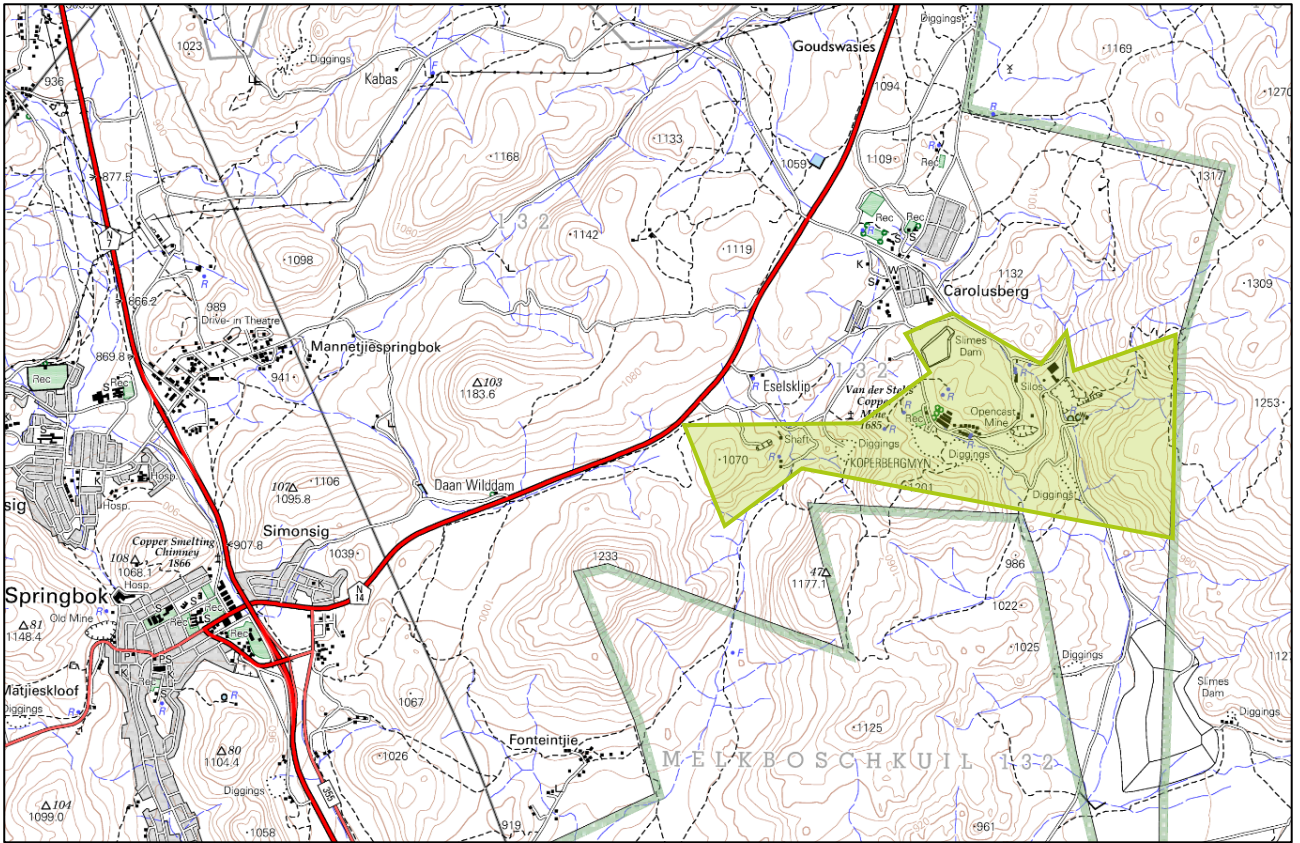
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# 1. INTRODUCTION

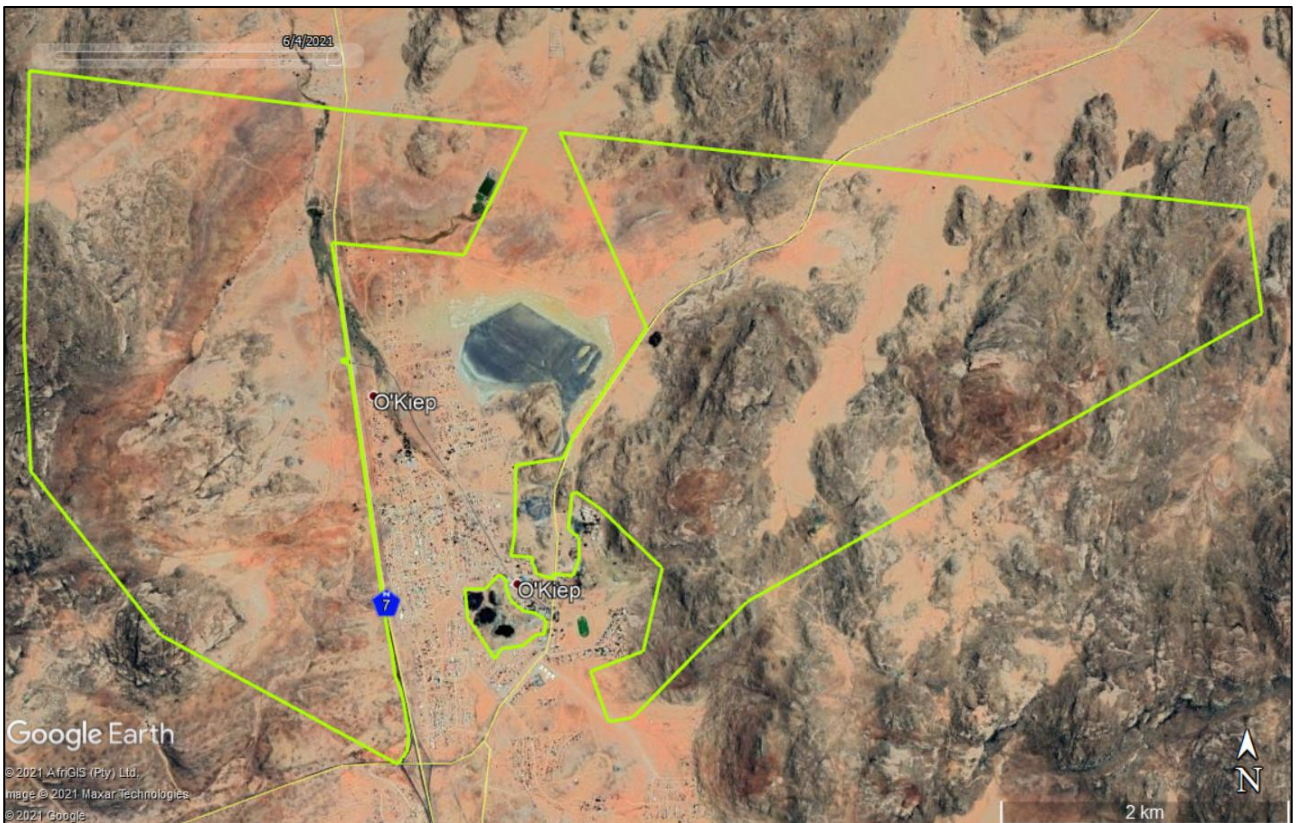
ASHA Consulting (Pty) Ltd was appointed by N.J. van Zyl to conduct an assessment of the potential impacts to heritage resources that might occur through proposed prospecting activities on a portion of Portion 9, a portion of Portion 10 and Portion 11 of the farm Brakfontein 133 and a portion of Portion 1 and a portion of Portion 23 of the Farm Melkboschkuil 132 in the Namakwaland Magisterial District (Figures 1 to 4). The study area is broken into two larger areas, one adjacent to Okiep and the other at Carolusberg. The approximate centre points of these two areas are at about S29° 35' 10" E17° 53' 10" and S29° 38' 55" E17° 57' 20" respectively.



**Figure 1:** Extract from 1:50 000 topographic map 2917DB showing the location of the Okiep study area. Source of basemap: Chief Directorate: National Geo-Spatial Information. Website: [www.ngi.gov.za](http://www.ngi.gov.za).



**Figure 2:** Extract from 1:50 000 topographic map 2917DB showing the location of the Carolusberg study area. Source of basemap: Chief Directorate: National Geo-Spatial Information. Website: [www.ngi.gov.za](http://www.ngi.gov.za).





**Figure 3:** Aerial view of the Okiep study area (green polygons).



**Figure 4:** Aerial view of the Carolusberg study area (green polygon). The shaded areas were indicated for fieldwork.

## 1.1. The proposed project

### 1.1.1. Project description

The prospecting work will occur in three phases as follows:

#### Phase 1

Desktop work, aerial surveys, surface geological mapping, geochemical surveys, underground sampling, geophysical surveys and data compilation. It should be noted that the locations of the drilling sites are as yet unknown and will only be determined based on the early research undertaken at the start of Phase 1.

#### Phase 2

Drilling with a truck-mounted drilling rig (Figure 3) and metallurgical sampling.

#### Phase 3

Pre-feasibility report, resource statement and Application for Mining Right.

A small, temporary laydown and storage area will be required at each drill site but no other infrastructure, accommodation, etc will be developed as part of this prospecting project and no processing plant or other related services will need to be developed. Each drill site would require

about 160 m<sup>2</sup> of surface disturbance. Existing roads and tracks will be used as far as possible but from time to time the drilling rig will need to cross undisturbed ground to reach drill sites. All damaged areas will be rehabilitated after drilling.



**Figure 5:** Example of the type of drilling rig to be used. Source: Basic Assessment Report Figure 4.

#### 1.1.2. Identification of alternatives

There are no alternatives for this project. The project location, technology and layouts are all suited to the prospecting as proposed and no feasible alternatives exist. As such, this assessment proceeds on the basis of a preferred alternative and the No-Go alternative only.

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

The only aspect of concern to this study is the drilling stage. Other samples will be too small to be of concern and will not result in significant impacts. However, the drilling will require bringing a drilling rig onto the site and this could result in damage to heritage resources, especially archaeological resources that are not readily identifiable by lay people.

### 1.2. Terms of reference

ASHA Consulting was asked to compile a heritage impact assessment (HIA) that assessed all relevant heritage resources and made recommendations to minimise impacts to such resources during implementation of the project. Because physical intervention sites for drilling cannot be identified until after the project has commenced, the work was to be done largely from the desktop. However, certain areas at Carolusberg were identified for field survey since preliminary work has already determined that these will be the initial target areas for drilling.

### **1.3. 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 Department of Mineral Resources and Energy (DMRE) who will review the Basic Assessment (BA) 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.

### **1.4. 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 South Africa (primarily in the Western Cape and Northern Cape provinces) 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; Member #43) 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.

### **1.5. 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. LEGISLATIVE CONTEXT**

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

The NHRA protects a variety of heritage resources as follows:

- Section 34: structures older than 60 years;
- Section 35: prehistoric and historical material (including ruins) more than 100 years old as well as military remains more than 75 years old, palaeontological material and meteorites;
- 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.”

Section 3(3) describes the types of cultural significance that a place or object might have in order to be considered part of the national estate. These are as follows:

- a) its importance in the community, or pattern of South Africa’s history;
- b) its possession of uncommon, rare or endangered aspects of South Africa’s natural or cultural heritage;
- c) its potential to yield information that will contribute to an understanding of South Africa’s natural or cultural heritage;
- d) its importance in demonstrating the principal characteristics of a particular class of South Africa’s natural or cultural places or objects;
- e) its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- f) its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- g) its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- h) its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and
- i) sites of significance relating to the history of slavery in South Africa.

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, some of the points in Section 3(3) speak directly to cultural landscapes.

Section 38(8) of the NHRA states that if an impact assessment is required under any legislation other than the NHRA then it must include a heritage component that satisfies the requirements of S.38(3). Furthermore, the comments of the relevant heritage authority must be sought and considered by the consenting authority prior to the issuing of a decision. Under the National Environmental Management Act (No. 107 of 1998; NEMA), as amended, the project is subject to an BA. The present report provides the heritage component. 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 DMRE.

### 3. METHODS

#### 3.1. Literature survey and information sources

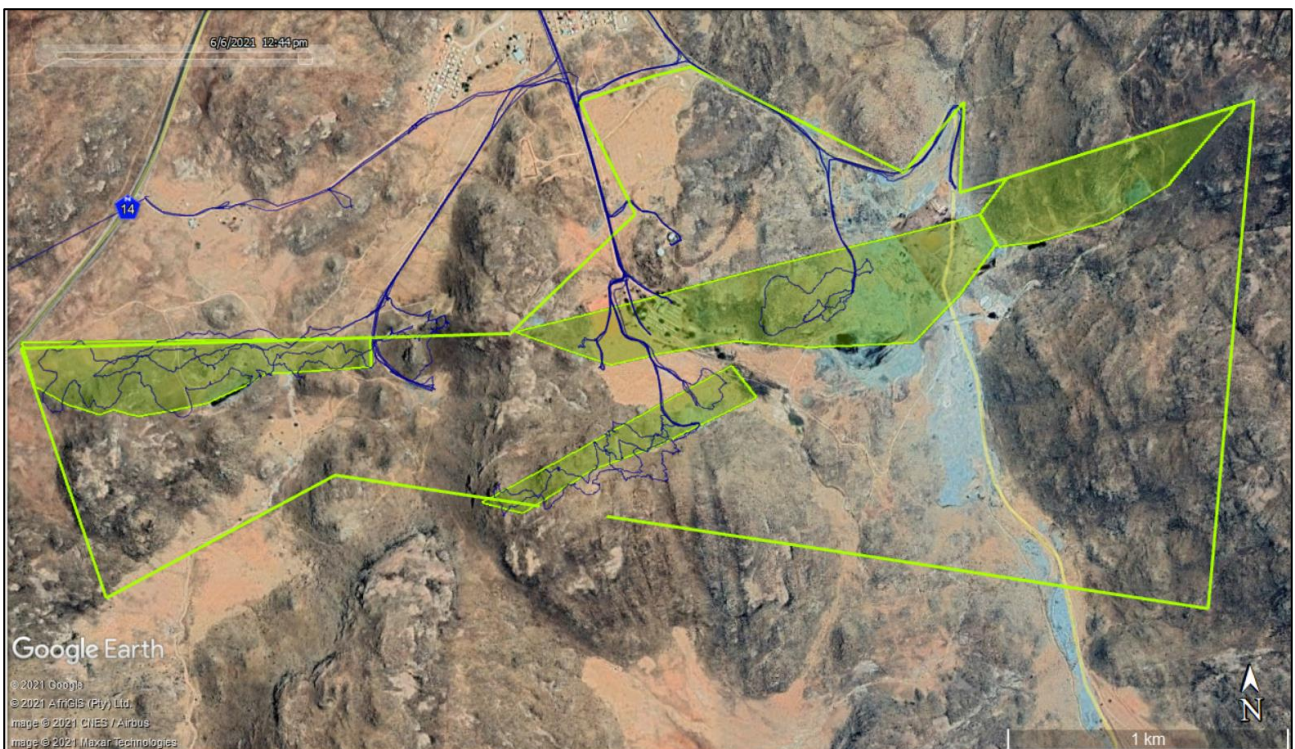
A survey of available literature was carried out to assess the general heritage context into which the development would be set. The information sources used in this report are presented in Table 1. Data were also collected via a field survey.

**Table 1:** Information sources used in this assessment.

Data / Information	Source	Date	Type	Description
Maps	Chief Directorate: National Geo-Spatial Information	Various	Spatial	Historical and current 1:50 000 topographic maps of the study area and immediate surrounds
Aerial photographs	Chief Directorate: National Geo-Spatial Information	Various	Spatial	Historical aerial photography of the study area and immediate surrounds
Aerial photographs	Google Earth	Various	Spatial	Recent and historical aerial photography of the study area and immediate surrounds
Cadastral data	Chief Directorate: National Geo-Spatial Information	Various	Survey diagrams	Historical and current survey diagrams, property survey and registration dates
Background data	South African Heritage Resources Information System (SAHRIS)	Various	Reports	Previous impact assessments for any developments in the vicinity of the study area
Palaeontological sensitivity	South African Heritage Resources Information System (SAHRIS)	Current	Spatial	Map showing palaeontological sensitivity and required actions based on the sensitivity.
Background data	Books, journals, websites	Various	Books, journals, websites	Historical and current literature describing the study area and any relevant aspects of cultural heritage.

### 3.2. Field survey

The areas indicated for archaeological survey in The Carolusberg section of the study area were examined on 4<sup>th</sup> June 2021. A brief visit was also made to the small central section of the Okiep study area because of the known heritage resources that occur there. This was during winter but, in this dry area, the season makes no meaningful difference to vegetation covering and hence the ground visibility for the archaeological survey. Other heritage resources are not affected by seasonality. During the survey the positions of finds and survey tracks were recorded on a hand-held Global Positioning System (GPS) receiver set to the WGS84 datum (Figures 6 & 7). Photographs were taken at times in order to capture representative samples of both the affected heritage and the landscape setting of the proposed development.



**Figure 6:** Aerial view of the Carolusberg study area showing survey tracks (blue lines).

It should be noted that amount of time between the dates of the field inspection and final report do not materially affect the outcome of the report.

### 3.3. 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<sup>1</sup> 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 the 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' (GP) and rated as GP A (high/medium significance, requires mitigation), GP B (medium significance, requires recording) or GP C (low significance, requires no further action).



**Figure 7:** Aerial view of the central section of the Okiep study area showing survey tracks (blue lines).

### 3.4. 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. The easternmost part of the study area could not be examined due to an active aggregate quarry operating at the foot of the slope (security would not allow access to the area). Given that this particular area is a very steep slope running up to the top of a mountain and that such environments are known to be devoid of archaeology (aside from mining traces), this is not considered to have limited the outcomes of the study.

## 4. PHYSICAL ENVIRONMENTAL CONTEXT

### 4.1. Site context

The study area is split broadly into two sections. One lies around Okiep with sections east and west of the town. A small area within the town has also been identified as part of the study area. The second section is in the vicinity of Carolusberg, some 5 km east of Springbok. At Okiep the

<sup>1</sup> The system is intended for use on archaeological and palaeontological sites only.

westernmost section partially straddles the N7 with the rest of its eastern boundary following that road. The eastern part of the northern section extends into the town of Okiep but excludes all buildings. The small central part encloses a historical mining area. Much of the study area is a natural environment, although traces of mining are visible on aerial photography in several areas in and around the study area (the region in general is well known for its copper mines). Occasional small farmsteads are evident in and around the study area.

#### 4.2. Site description

The site lies in the far north of the Kamiesberg Mountains of Namaqualand. The mountains are granite and are characterised by plenty of exposed rock with occasional large bare domes surrounded by tumbled blocks occurring in places. Between the hills the land tends to form relatively flat fine gravel/sandy plains. The area in which fieldwork was conducted was found to have been heavily disturbed by previous mining activities. Figures 8 to 13 illustrate the Carolusberg study area where the survey was carried out. Figures 14 and 15 show parts of the Okiep study area.



**Figure 8:** View towards the east from the top of the mountain in the far western part of the Carolusberg study area.





**Figure 9:** View towards the west from the southern part of the Carolusberg study area and looking across towards the western part.



**Figure 10:** View towards the east through the southern part of the Carolusberg study area.



**Figure 11:** View towards the northeast through the southern part of the Carolusberg study area and looking towards the central and eastern parts in the background.



**Figure 12:** View towards the west across the central part of the Carolusberg study area showing the southern part of the abandoned mine complex.



**Figure 13:** View towards the east across the eastern part of the Carolusberg study area. The entire valley bottom is taken up by an aggregate quarry.



**Figure 14:** View towards the southwest through north-eastern part of the Okiep study area. Okiep town is behind the tallest mountain to the right.



*Figure 15: View towards the southwest through the western part of the Okiep study area.*

## 5. FINDINGS OF THE HERITAGE STUDY

This section describes the heritage resources recorded in the study area during the course of the project.

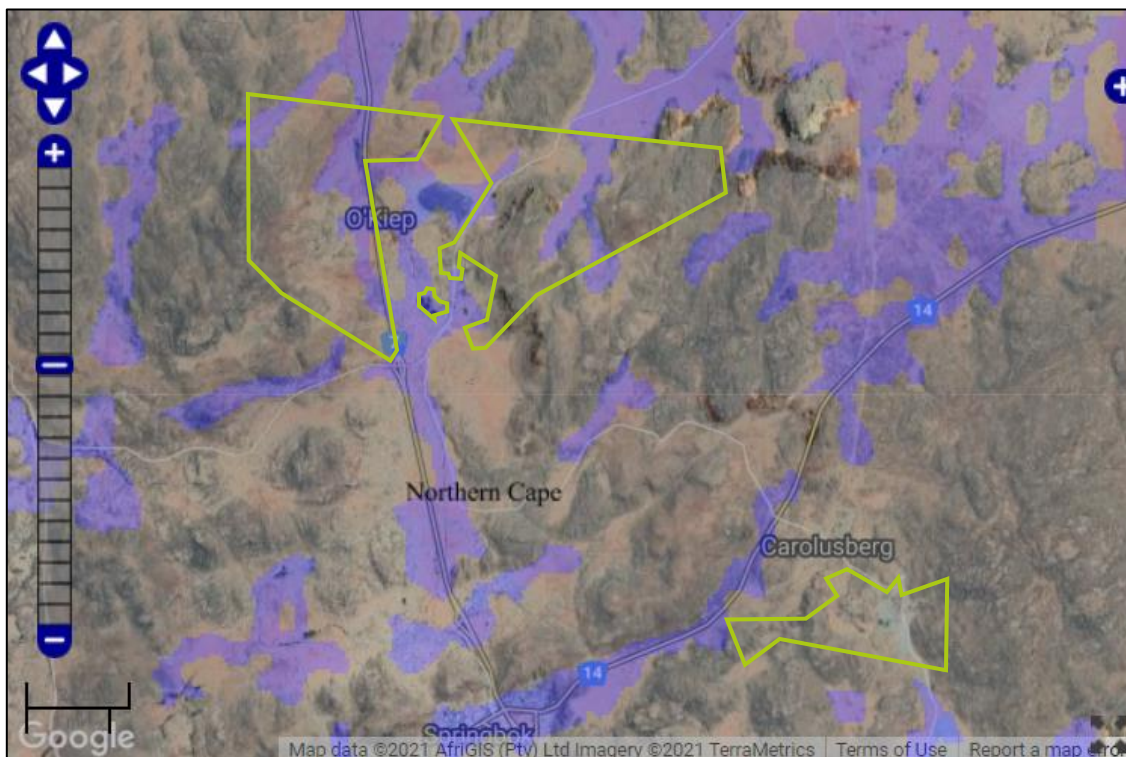
### 5.1. Palaeontology

The SAHRIS Palaeosensitivity map shows the study area to be of largely zero palaeontological sensitivity (Figure 16). This is because it is underlain by “granites and gneisses of the Namaqua Metamorphic Province that are between one and two billion years old and do not contain fossils” (Almond & Pether 2009). However, valley fills (e.g. Figure 17) in between the granite hills can contain rare fossils and these zones are rated as being of low palaeontological sensitivity (Figure 16). Dr John Almond (2019:3) has recently considered these valley fills and plains deposits for a project at Concordia and had the following to say:

The overall palaeontological sensitivity of the sandy to gravelly, and locally calcretised, Late Caenozoic superficial deposits in the Namaqualand region is generally low. The predominantly porous, sandy superficial deposits in the study area, including the alluvial and aeolian sands and gravels, are unlikely to contain substantial fossil remains (De Beer et al., 2002, Almond & Pether 2008, Almond in Macey et al. 2008). Fossil land snails have been recorded from yellowish to reddish terrestrial sands and overlying calcretes in the Springbok sheet area (Marais et al., 2001, p70). Among the limited range of other fossils that might be encountered within Late Caenozoic surface sediments in the study area are calcretized rhizoliths (root casts), termitaria and other burrows, freshwater molluscs, ostrich egg shells, sparse bones, teeth and horn cores of mammals, and tortoise remains. Finer-grained river, stream and pan sediments might contain fossils of fish, frogs, molluscs, crustaceans (crabs, ostracods, phyllo pods such as conchostracans) as well as microfossils such as diatoms, palynomorphs and macroplant remains (e.g. wood, peats). Such fossil remains are likely to occur only sporadically.

Bamford (2018:8) has recently considered an area at NababEEP and stated that “quaternary alluvial sands do not preserve fossils because of their friable and transported nature.” Although the two

authors provide variable comments, it is clear that the sensitivity of these sand and fine gravel deposits is low with a very minimal chance of locating any fossils.



**Figure 16:** Extract from the SAHRIS Palaeosensitivity map showing the study area to be of low (blue shading) and zero (grey shading) palaeontological sensitivity.



**Figure 17:** An example of a valley fill deposit showing layers of gravel and sand. The exposure in this view is 2.8 m high.

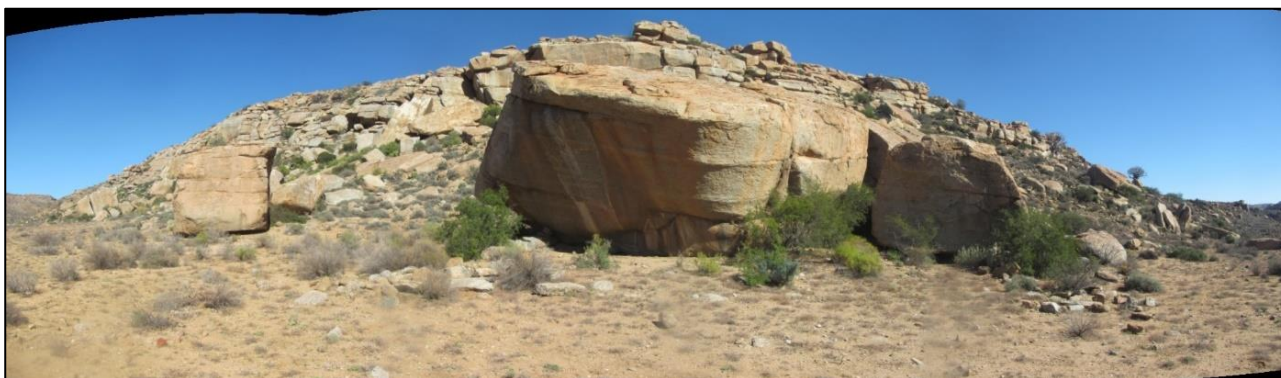
## 5.2. Archaeology

### 5.2.1. Desktop study

Archaeological research in Namaqualand has been focussed on the coast (Dewar 2007; Orton 2012), the Kamiesberg mountains (Webley 1992) and the Richtersveld, especially along the Orange River (Orton & Halkett 2010; Robertshaw 1978; Webley 1992). Archaeological occurrences in some areas have been rich and varied (Morris 2018) and range from the ESA to the LSA, the latter being more common. While some chronological frameworks have been developed for certain areas, as Kaplan (2016) points out, there have been no academic studies in the Springbok area. There have, however, been a number of CRM studies which form the basis of the review below.

Isolated artefacts or very low density background scatters from the Early (ESA), Middle (MSA) and Late Stone Ages (LSA) have been reported from various areas (e.g. Kaplan 2016; Morris 2018; Smith 2013). They tend to occur on the sandy sediments of the valleys and plains and not on the rocky hills which are largely devoid of Stone Age archaeological traces. LSA sites and occurrences are the most predominant significant pre-colonial heritage resources noted in surveys in the area. They are nevertheless sparsely distributed and tend to be concentrated on water sources and where some possibilities of shelter occur. Pans, springs, rock shelters and in the lee of koppies are likely locations.

Kaplan (2010a) surveyed an area between Okiep and Carolusberg noting some adiaagnostic quartzite flakes and a rock shelter with faded rock art and some artefacts. The rock art site has been revisited by the present author with many more details being recorded. The site lies beneath the overhanging east face of a large boulder at the foot of a granite hill (Figure 18). The wall of the boulder has several geometric finger paintings on it (Figures 19 & 20) and a low stone wall has been constructed around the floor of the shelter. Some of the rocks have been used as lower grindstones and there is an extensive assemblage of stone artefacts and other materials, including a few historical items, both within and outside of the walling (Orton, own data). This site lies immediately outside the northeast corner of the eastern Okiep study area. Rock art is rare in Namaqualand and the next nearest site on record lies more than 25 km to the southwest of Springbok. It was recorded by Rudner and Rudner (1968) but no precise location was given.



**Figure 18:** A site with geometric rock art, stone walling and many artefacts.



**Figure 19:** Geometric rock art. Scale in cm.



**Figure 20:** Geometric rock art. Scale in cm.

Historic accounts refer to the Little Namaqua Khoekhoen, a pastoralist group who were spread out across the Namaqualand landscape in the 19<sup>th</sup> century but who seem to have been concentrated in the Kamiesberg and along the Orange River. Research into pastoralist archaeology has recorded evidence for early sheep and cattle bones from the Namaqualand coastal areas. If any significant pastoralist sites are identified around Okiep and Nababeep, this would provide the potential to contribute to our understanding of the origins and spread of the Khoekhoen into southern Africa. The geometric rock art site reported above, may be one such site, since geometric art has been linked by several authors to the Khoekhoen (Eastwood & Smith 2005; Smith & Ouzman; Van Rijssen 1994).

Historical mining traces (industrial archaeology) will be dealt with under Section 5.4.

#### 5.2.2. Site visit

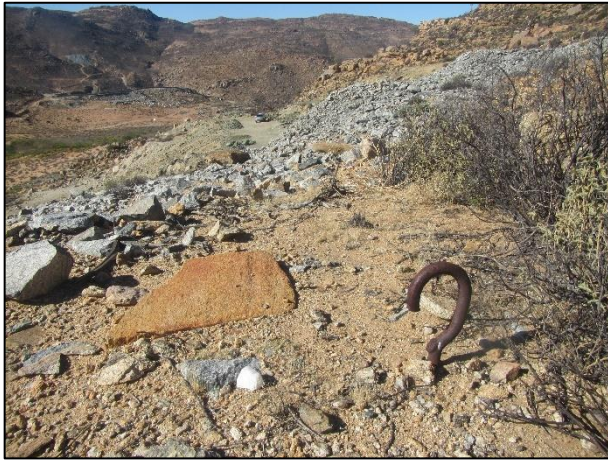
No precolonial archaeological materials were seen during the survey. The only anthropogenic remains found were related to historic mining activities and almost all of this is likely to have been during the 20<sup>th</sup> century. Aside from the very obvious mining traces (excavations and rock dumps; Figures 21 & 22), other traces included drill cores and iron ring bolts, some of which were associated with modern (mid-20<sup>th</sup> century) foundations (Figures 23 & 24). Other modern foundations in the mountains also clearly relate to 20<sup>th</sup> century mining activities (Figure 25). The only feature not obviously related to the mining was a stone-walled enclosure under a boulder and containing only a cold drink or beer tin (waypoint 517; Figure 26). The walling was very casually made by piling stones on top of one another and, although partially collapsed, there was no obvious entrance.



**Figure 21:** Deep excavation following a copper ore body at Carolusberg.



**Figure 22:** Rock dumps (the grey patches) at Carolusberg.



**Figure 23:** Iron hook protruding from the ground at Carolusberg.



**Figure 24:** Iron loops in a cement foundation at Carolusberg.



**Figure 25:** Cement and stone foundation slab in the Carolusberg study area.



**Figure 26:** Stone walling under a boulder in the Carolusberg study area (waypoint 517).



### **5.3. Graves**

Isolated graves and informal cemeteries have been reported from a few areas around Springbok, Okiep and Concordia (Kaplan 2010; Orton 2018, 2019; Smith 2013).

No graves were seen anywhere in the area surveyed for this project. While none are expected to occur in the hills, it is very likely that isolated graves – either unmarked precolonial graves or else minimally marked historical graves – could be present in the valley areas. The Okiep Cemetery occurs immediately outside the edge of the study area. It is assumed to be a municipal cemetery, in which case it would not be considered a heritage resource.

### **5.4. Historical aspects and the Built environment**

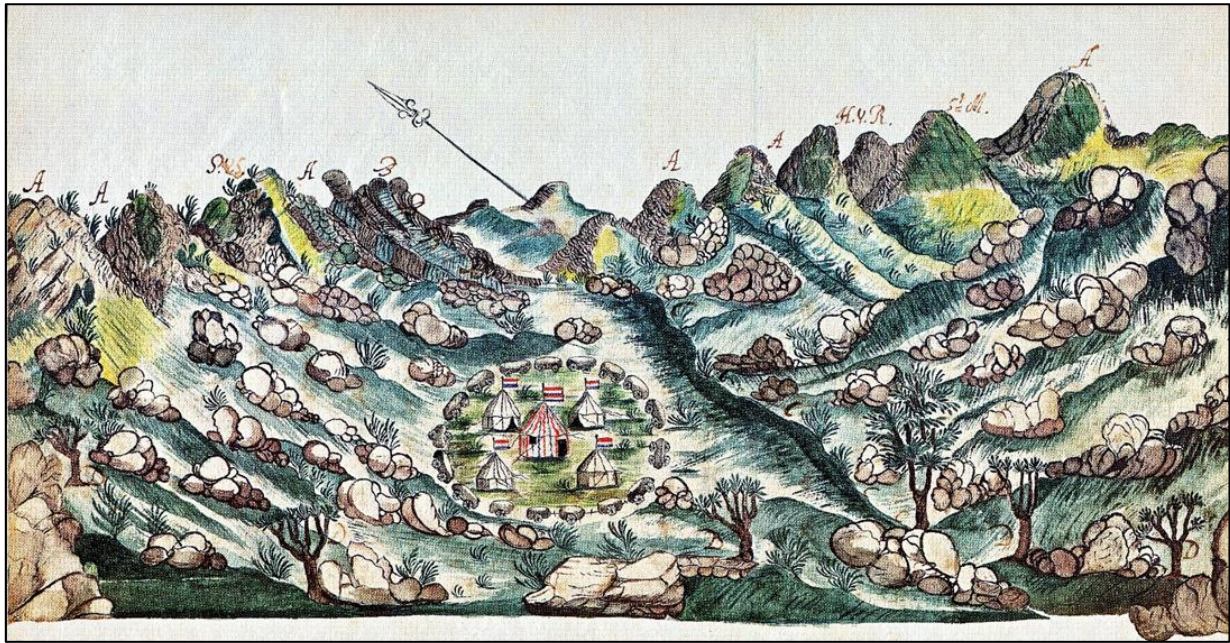
#### **5.4.1. Desktop study**

#### **COPPER MINING**

Given that the present project deals with prospecting for copper, the history of early copper mining in the region is highly relevant. In 1682, some Namaqua Khoekhoen visited the Fort of Good Hope with some pieces of copper that the Commander, Simon van der Stel, thought to be of good quality and he presumed that it was abundant in their country although it appeared that they did not know how to refine it.

According to the Codex Witsenni (a copy of the expedition diary kept in the South African Library), Van der Stel, and the VOC Commissioner, Hendrik van Rhee de with a party of men set out in 1685 in search of the copper mines which were said to exist to the far north, in the country of the Namaqua.

In October 1685 the expedition reached the Copper Mountains. Figure 27 shows a drawing of their camp made at the time and Figure 28 shows a photograph of a similar view. There they remained for 15 days, digging for ore and surveying the surrounding area. Despite the optimism of the foreman miner regarding the quality and quantity of the ore, the samples sent to the Netherlands for assay were found to be low-grade. This, together with the distance from the Cape, the difficulty of transporting the ore to the coast, and the difficulty of processing it locally due to a lack of fuel and water, resulted in the venture being abandoned.



**Figure 27:** Simon van der Stel's campsite in the Koperberge (1685) from the Codex Witsenni (Wilson et al. 2002: 23).



**Figure 28:** View of Van der Stel's koperberge today with his mine ringed.

The illustration in Figure 27 has the following notes attached:

- *A.A.A. This is the Copper Mountains discovered by the Hon Commander Simon van der Stel on the 21 October 1685, and personally inspected for a good ten miles, and consisting mostly of a lode and vein, which rises from out of the ground up to the top of the mountain, and is at least from 8 to 9 feet, but in parts from 2 to 3 roods, broad. It is wholly of one colour and found to be covered with verdigris.*
- *H.V.R<sup>2</sup>. A mountain found to consist entirely of copper ore from top to bottom, therefore excavated there a good 18 feet deep and progressively richer mineral appeared;*

<sup>2</sup> The initials H.V.R, St. M and S.V.S. refer to individuals on the expedition. The sounding now known as Simon van der Stel's mine is in the peak marked as H.V.R in the drawing. It has inscriptions, ostensibly by Van der Stel's miners, carved into the rock on the outside of the entrance to the shaft and within it.

- *St.M.A. A mountain half of ore, but which was believed to be as rich internally as that of H.V.R., and to be one and the same lode or vein, therefore worked to 4 feet deep, and found to be of very good mineral*
- *S.V.S. A mountain with a large plateau which the abovementioned lode cuts through fully to 2 to 2 ½ roods in width; it was worked to a depth of 2 feet, and the ore considered to be as good as the aforementioned.*
- *B.B.B. The lode or copper vein which, as mentioned, was followed for a good 10 miles, and whose end is unknown*
- *C.C.C. A spring or constant-flowing brook, both banks overgrown with the same kind of reed as is found in the Fatherland*
- *D.D.D. Aloe-trees.*

According to the accounts at least 3 shafts were sunk. Only the one with the inscriptions at the entrance of the mine was declared a National Monument (now a PHS) on 24/04/1959 (Gazette Number: 6208). The locations of the other two mines remain unknown.

From here, the expedition travelled north. Figure 29 shows another drawing from the expedition. This image from the Codex Witsenii, referred to as Folio 5, captioned in the Van der Stel account of 1685 as follows (Wilson et al. 2002:24):

*“E.E.E.E. A plain situated about three miles north-ward of the Copper Mountains, in the middle of which was found a flat horizontal rock, from the pores or holes of which Verdigris bubbles out, as it were, and appears<sup>3</sup>”.*

The editors suggest that this is the original 19<sup>th</sup> century mine at Okiep (i.e. the West Okiep Mine). Cairncross (2004) describes the Okiep Mine as: “a mineralized outcrop of an intrusive body of the Koperberg Suite”. The ore body is said to have outcropped at only one place, a knoll about 6 metres across. This became known as the West Okiep orebody and this is where most of the early mining from 1856 onwards took place. The first records of mining at Okiep date to 1856, when a shaft with “a splendid show of copper” was described.

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<sup>3</sup> The editors comment: This is probably the place marked on the map as Tweede Cooper Bergen, the second Copper Mountains. On the basis of the topographic information given in the Journal, a report by the Geological Surveyor to the Cape (Andrew Wyley in 1857), and the observations of the editors, it is “concluded that the place illustrated is the site of the present O’okiep. This is the only site in the vicinity in which a vertical mine was sunk”.



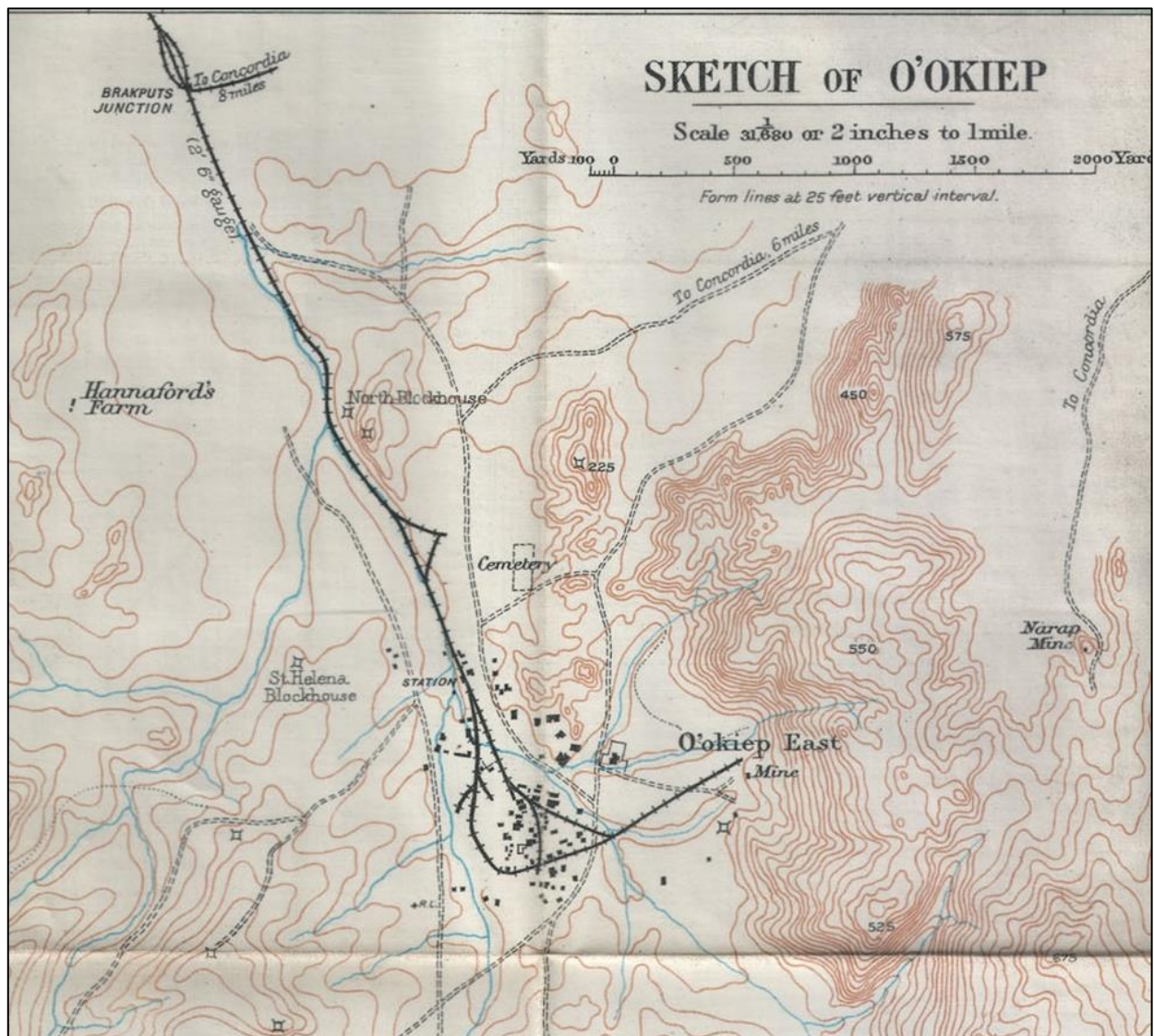
**Figure 29:** Another drawing from the Van der Stel expedition of 1685 and thought to be of the Okiep area.

The first 19<sup>th</sup> century mining company to be registered was *South African Mining Company* formed by Thomas Fannin in 1846 but it did not find viable deposits in the Richtersveld and Fannin sold out his interest in 1847, but not before the Colonial Government had annexed the land between the Buffalo River and Orange River in December 1847. By 1854, between 200 and 300 mining leases had been issued by the Government for the copper mines but it was Phillips and King who had the rights to Brakfontein, Melkboschkuil and Lelyke Pad (Nababeep). They had bought Brakfontein 133 (on which Okiep lies) from Jan Cloete in 1850 and Melkboschkuil 132 (on which Springbok lies) from Jacobus Cloete in 1852. By 1855 the bubble had burst but the mines of Phillips and King remained profitable. Phillips and King sold their company and assets to the *Cape of Good Hope Copper Mining Company Ltd* in 1862.

By 1856, the mine shaft at Okiep was about 3 yards deep. By the 1860s it became one of the most important mines of the *Cape of Good Hope Copper Mining Company* and by 1875 the mine was already 420 feet (c. 127 m) deep. By 1870, it was described as one of the richest copper mines in the world (Smalberger 1975:105). By 1888 the developing town had 2000 inhabitants, and a number of buildings, including churches had been constructed.

By 1873, when the mine was 116 metres deep, large quantities of water were encountered. After the lower levels of the mine had flooded due to the water, a new Cornish pump was installed. By 1882, the mine was 208 metres deep and the pump was not able to remove all the water. "A second 50-inch Cornish pump, designed by John Hocking and built by Harveys of Hayle, was obtained and this is the only complete Cornish pump remaining in the Southern Hemisphere" (Cairncross 2004).

Figure 30 shows an early 20<sup>th</sup> century map of Okiep. The West Mine is not labelled but the Okiep East Mine and Narap Mine further to the east are shown. The map shows the approximate distribution of the buildings in the centre of Okiep, as well as the different branch lines of the railway line. One branch leads up to the Okiep East Mine on the western slopes of the nearby hill.



**Figure 30:** Detailed map of Okiep, dating to 1907, showing the position of the mine, the blockhouses around town, the cemetery and the railway line and station (1:250 000 map “Cape Reconnaissance: Port Nolloth & O’Okiep” War Office July 1907).

A description of Okiep, written in 1952, mentions “the old stack built before 1880”, the old Railway Station, the Acid Plant, the Power Station next to the Mill and the headgear of the mine, the Club and “partially surrounded by the dump material is the old Wesley Chapel built in 1877” (Okiep Copper Company 1952).

In 2009, the Namaqualand Copper Mining Landscape was placed on the UNESCO Tentative List as a World Heritage listing (<http://whc.unesco.org/en/tentativelists/5460/>). The property names which were included under the tentative listing included:

- Okiep
- Concordia
- Nababeep
- Port Nolloth
- Carolusberg
- Springbok

The description read as follows:

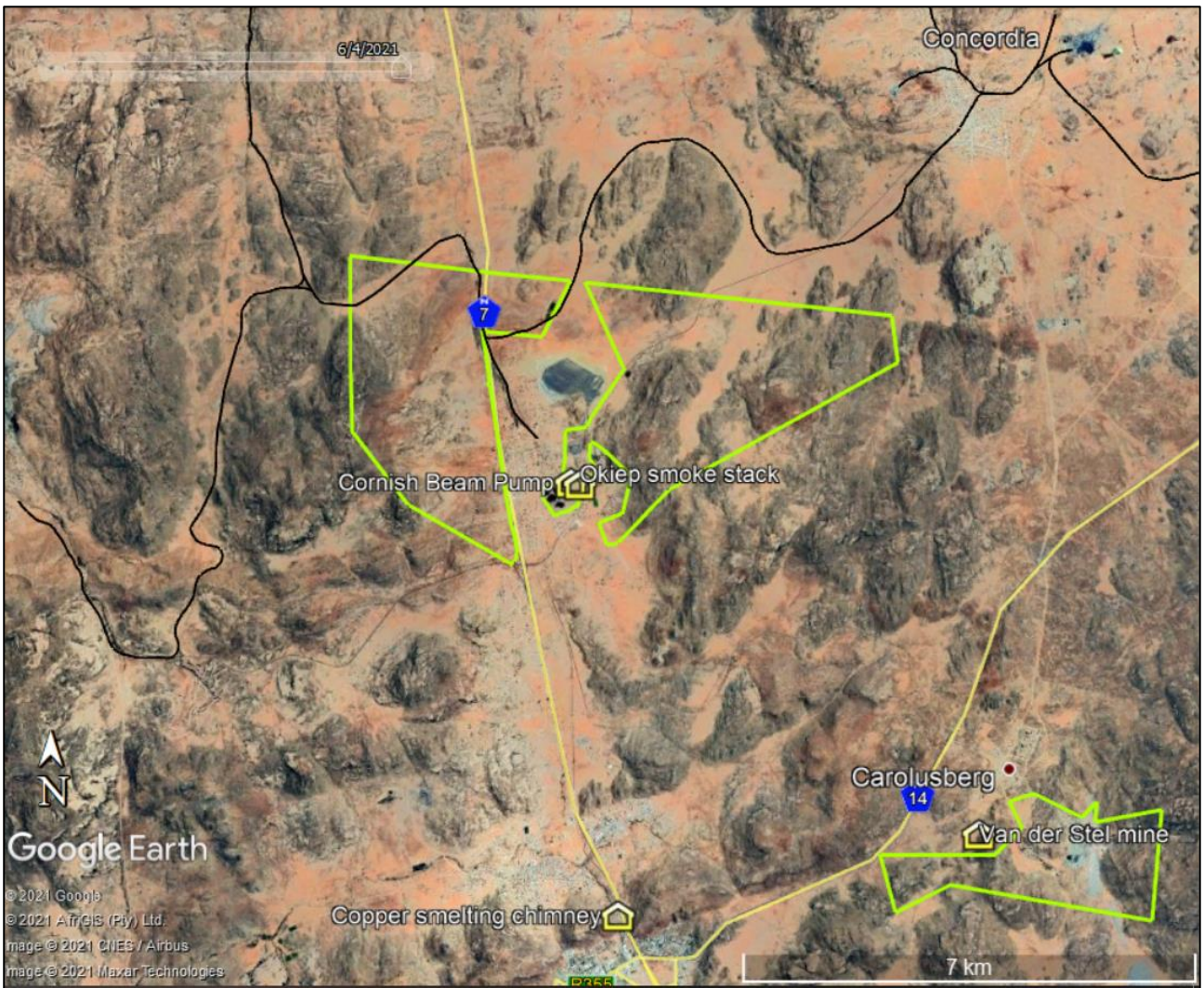
“The Namaqualand copper mines and their associated infrastructure and cultural landscape reflect the beginnings of the mining industry in South Africa in all the myriad ways in which that industry influenced and continues to influence society through the movement and housing of people, the development of transport and other infrastructure and industries and in the development of technological and scientific endeavour. It also reflects the very close links between the development of the Southern African mining industry and mining technology pioneered in Britain, particularly in the counties of Cornwall and Devon, and the landscapes and social structures that went with them”.

However, formal proclamation of the Namaqualand Copper Mining Landscape (NCML) did not take place and in 2015, the NCML was removed from the World Heritage Listing.

### PROVINCIAL HERITAGE SITES

There are four Provincial Heritage Sites (PHSs) in the area, all related to copper mining (Figure 31 to 34). These all relate to historic copper mining and are as follows:

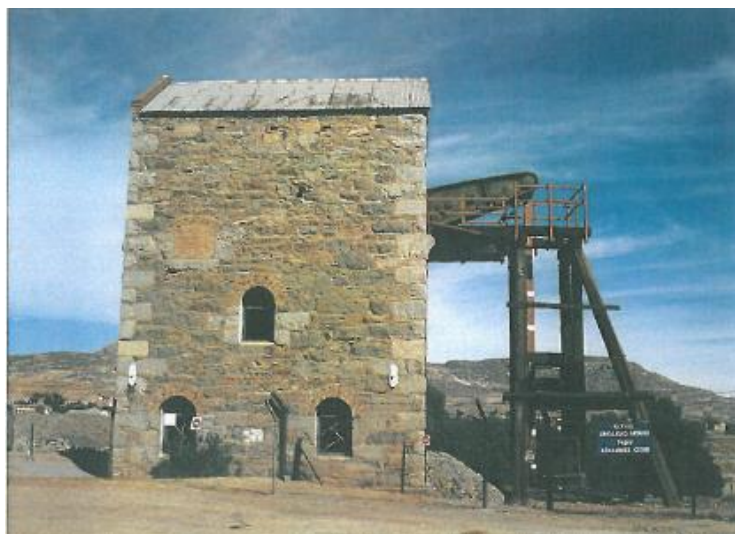
- The copper smelting chimney at Springbok;
- The smoke stack at Okiep;
- The Cornish Beam pump at Okiep; and
- Simon van der Stel’s original 17<sup>th</sup> century mine at Carolusberg.



**Figure 31:** Aerial view of the study area showing the locations of the four local PHSs (yellow house symbols). Two of them are within the study area at Okiep. The layout of the historic copper railway is also shown (black lines).

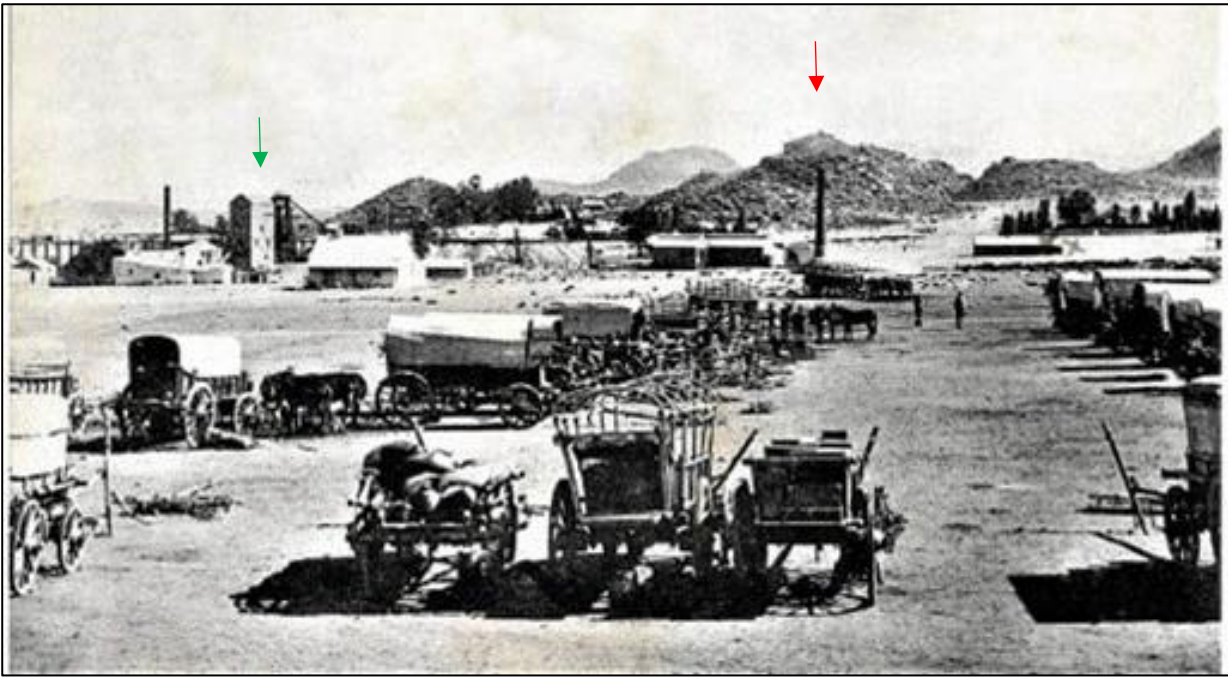


**Figure 32:** Provincial heritage sites related to copper mining in the region. Top left: smelting furnace at Springbok. Top right: Smoke stack with Cornish Beam Pump in the background at Okiep. Bottom: Simon van der Stel mine with mining symbol (scale in cm).



**Figure 33:** The Cornish beam pump at Okiep prior to the partial collapse of the wooden structure on the right (Cairncross 2004: 306).





**Figure 34:** Late 19<sup>th</sup> century view of Okiep, with the transport waggons in the foreground. The Smoke Stack (red arrow) and Cornish Beam Pump (green arrow) are visible in the background. Source: Namaqualand - Geology & Archaeology.

#### COPPER RAILWAY LINE

Initially the copper ore was transported by ox wagon to Hondeklip Bay for shipment to Swansea. In 1862 the Cape of Good Hope Copper Mining Company appointed a Cornishman, Richard Thomas Hall, to engineer a 150 km-long (91 miles) narrow-gauge railway from the mines around Okiep to Port Nolloth. Hall studied the terrain carefully and decided on the narrow gauge as it was best suited to carrying mineral ore (Burke 1995). Once the train reached the highest point, it could run down by gravitation to Okiep and the terminal of the line. Hall designed the line to follow the shortest route, with the minimum of cut and fill and the most gradual of gradients. The line had a curving and undulating character and Hall had a realistic view of drainage structures, believing it was cheaper to replace a length of track than to build substantial bridges. With respect to culverts, he had a “repair-if-washed-away” principle. Culverts and embankments were built of packed stone with no mortar (Ross 1998).

The first line was a tramway for animal-drawn traffic and was constructed on the 30-inch gauge with light rails. According to Burke (1995: 206), Hall used iron rails for each section. The tramway was a big success. The line was completed in stages, reaching Okiep in 1876. Up to 1876 the entire line was operated by animal drawn (mules) traffic. One of the major drawbacks of steam locomotives was the shortage of water. The light rail construction, however, did not favour the use of steam and for many years the line remained a tramway. The light rails were replaced with steel rails in order to replace the animal drawn tram with a steam service, with engines sourced at the Kitson Works in Yorkshire. However, the mountain section remained mule-operated until the arrival of a specially built mountain engine in 1890. Steam traction was finally extended to Okiep in 1893. Concordia was linked with the Okiep line at the Brakputs junction in 1889.

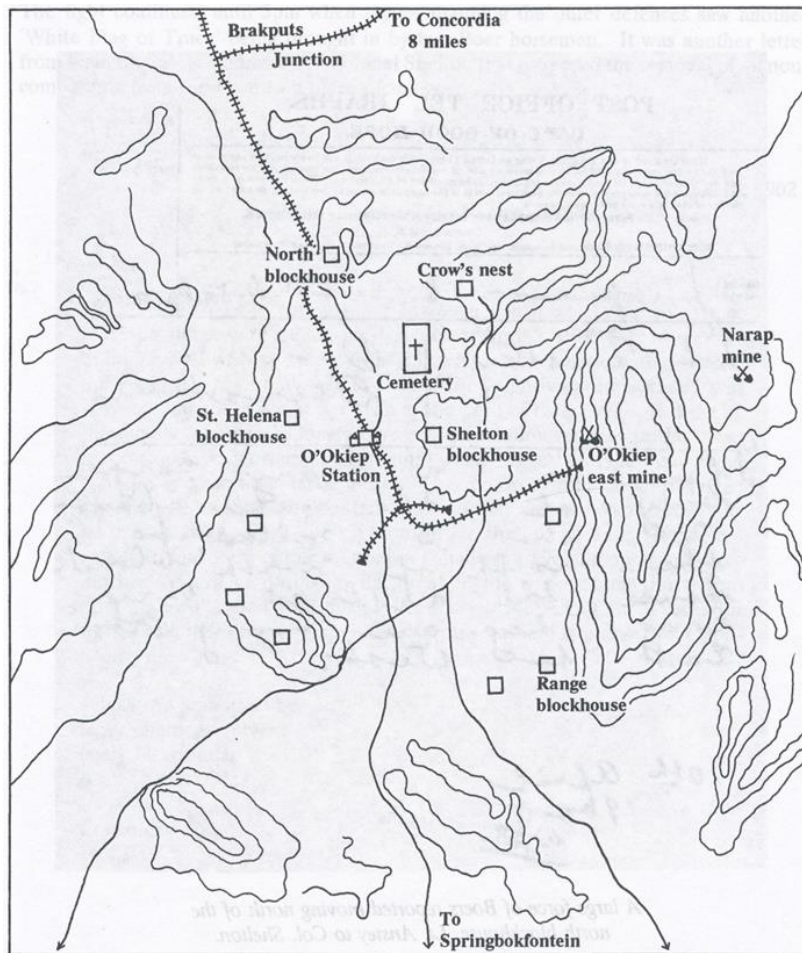
The eight-mile branch line from Garracoup Junction (on the main line) to NababEEP was constructed in 1899 (Hodge 1908; Ross 1998). Figure 31 shows the railway lines in the general area, while Figure 30 shows the detail in Okiep.

Although the main railway line between Port Nolloth and Okiep survived until 1945 when its new owners sold most of the line as scrap, the section between NababEEP and Okiep via Garracoup Junction remained in service until the construction and permanent surfacing of the NababEEP to Okiep road in 1950, when this section was decommissioned, and the rails uplifted.

The railway is considered “a feat of Victorian engineering” (Mining Heritage Trust of Ireland 2012: 8). Although the railway tracks and sleepers have been removed, the position of the line is still indicated by a raised earthen packed ridge. Various stone bridges and culverts are still present in the vicinity of the mines.

### ANGLO-BOER WAR

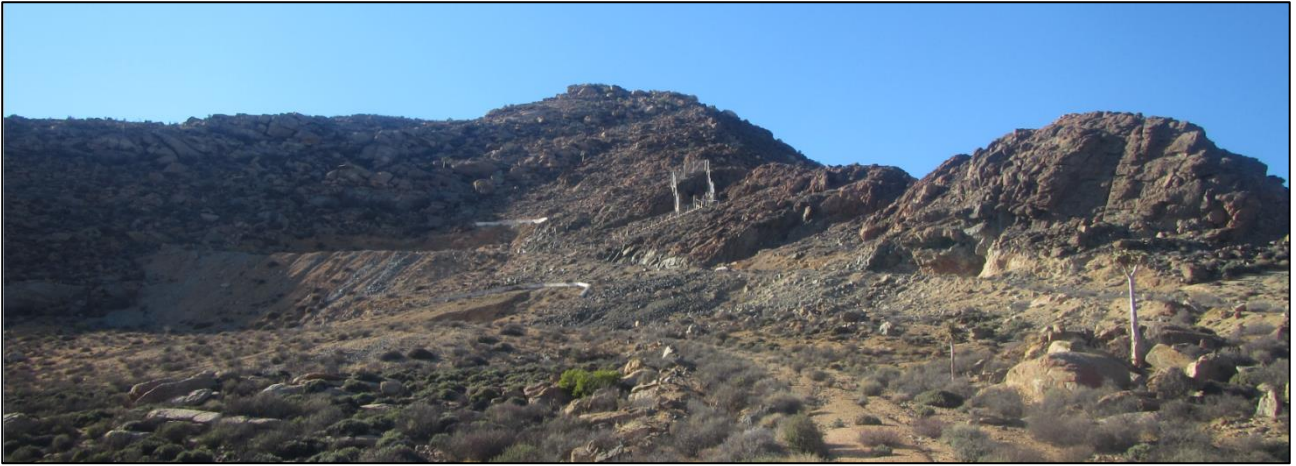
In 1901 Colonel Shelton was appointed by the Governor of the Cape to be the Commander of British forces in Namaqualand during the Anglo Boer War. He was instructed to protect the important Copper Mining Towns of Okiep, Concordia and NababEEP from Boer incursions under General Smuts (Burke 1995). He based his headquarters in Okiep and he fortified the town with thirteen blockhouses (Figure 35), most of which are probably no longer in existence. As Smuts closed in on Shelton’s forces at Okiep, he cut the telegraphic communications lines, so that Shelton’s only means of communicating with the outside world was the railway line to Port Nolloth. Shelton began preparing the town for a siege by Boer forces. One of his greatest fears was that the Boers would cut the railway lines as the trains provided Okiep with its water. Okiep was besieged for about a month from April to May 1902. While Okiep remained in a state of siege, British reinforcements had arrived by sea at Port Nolloth on 12 April. They proceeded slowly up the railway line to Okiep, re-taking the blockhouses along the route. On 26 April Smuts had to leave his men to attend the peace talks at Vereeniging leaving General Maritz in charge of the Boer forces. The relief of Okiep occurred on 4 May 1902.



**Figure 35:** The locations of the blockhouses around Okiep. Source: Burke (1995:135).

#### 5.4.2. Site visit

The Simon van der Stel Mine was visited during the survey (Figures 36 & 37). It lies immediately outside the northern edge of the Carolusberg study area and is enclosed by a steel palisade fence. The fence has been vandalised and the site is in a generally unkempt state. Much graffiti occurs in the mining excavation (Figure 38), some of which is old; dates of 1684 (obviously not really that old as it is fresh-looking and pre-dates the mine), 1857, 1919 and 1955 could be discerned. It was also evident that someone had deliberately scratched out some historical graffiti (Figure 39). The surroundings of the site have been compromised by 20<sup>th</sup> century mining. A number of other small excavations into the same copper-bearing ridge were seen nearby (Figures 40 & 41). Van der Stel's team made three excavations in the area (Cairncross 2004) and it is unknown which, if any, of these relate to this early mining. It is also possible that some of his excavations have been reworked since the mid-19<sup>th</sup> century. There was no evidence of anything historical (e.g. artefacts or graffiti) at any of these places.



**Figure 36:** Looking towards the southeast at the Simon van der Stel mine (PHS; enclosed by steel fence in mid-picture) and showing its current context (waypoint 1902).



**Figure 37:** View into the excavation at the Simon van der Stel Mine.



**Figure 38:** Graffiti in the Simon van der Stel Mine.



**Figure 39:** Vandalised historical graffiti. Scale in cm.



**Figure 40:** *Small excavations into a cliff close to the Van der Stel Mine.*



**Figure 41:** *Small excavations into a cliff close to the Van der Stel Mine.*

No other heritage resources were found within the surveyed areas at Carolusberg. There were plenty of traces of 20<sup>th</sup> century mining in the form of occasional stone and cement foundations and many iron rings (and one hook) that were fastened into the rock. A few fragments of cables suggests that these rings were used as part of pulley systems for moving materials up and down the mountain from the various places where small mines had been made.

The central section of the Okiep study area was also briefly visited to record some of the historical mining remnants there. Importantly, there are two PHSs there and it is noted that in the past the whole precinct was proposed for PHS declaration, although this never happened. Figure 42 shows the locations of the various features recorded and they are described in Table 2. Figures 43 to 46 show the current state of the Cornish Beam Pump. It is clear from comparison with Figure 33 that the site has become degraded through vandalism, the installation of insensitive protective measures and the partial collapse of the wooden structure. The latter is of particular concern because of the irreparable damage that might result should the heavy wooden beams tear away from the rest of the structure. It appears as though there has been some sort of underground collapse which has resulted in some of the upright components dropping lower. This in turn is placing great strain on the joints and will, in time, lead to failure of the structure. This degradation needs to be arrested as soon as possible in order to save the heritage resource. The photograph provided by Mining Heritage Trust of Ireland from April 2012 shows that the collapse has happened since that time.



**Figure 42:** Map of sites recorded at Okiep (numbered diamond symbols). The two PHSs are also shown.

**Table 2:** List of heritage resources recorded at Okiep. Grades are indicated but it should be borne in mind that the entire precinct as a whole can be considered Grade II.

Waypoint	Co-ordinate	Description	Grade
1896	S29 35 52.8 E17 52 53.8	A small stone foundation topped by a concrete slab. It lies adjacent to the Cornish Beam Pump (Figure 47).	IIIB
1897	S29 35 53.1 E17 52 52.6	A stone foundation (Figure 48).	IIIB
1899	S29 35 55.3 E17 52 50.9	A large stone-built ruined structure that clearly relates to the 19 <sup>th</sup> century mining and was built by the Cornish stonemasons. A section of brickwork is also present. Although the ruin is in very bad condition, some features are still present (Figure 49).	IIIA
1900	S29 35 56.2 E17 52 53.3	A pile of bricks and cement that are assumed to be from a structure that was on this spot. No in situ materials were seen so the positioning of the building cannot be determined (Figure 50).	GPA
1901	S29 35 55.1 E17 52 57.5	A stone and cement ruined structure assumed to relate to the processing of copper ore. It is still in reasonable condition (Figure 51).	IIIA



**Figure 43:** View of the east face of the Cornish Beam Pump with its collapsing wooden scaffold.



**Figure 44:** View of the southwest corner of the Cornish Beam Pump.



**Figure 45:** View of the northwest corner of the Cornish Beam Pump.



**Figure 46:** View of the Cornish Beam Pump wooden scaffold showing the partial collapse of the structure.



**Figure 47:** A stone foundation with concrete slab on top (waypoint 1896).



**Figure 48:** A stone foundation (waypoint 1897).



**Figure 49:** A stone ruin (waypoint 1899).



**Figure 50:** A brick and cement foundation (waypoint 1900).



**Figure 51:** A stone ruin (waypoint 1901).



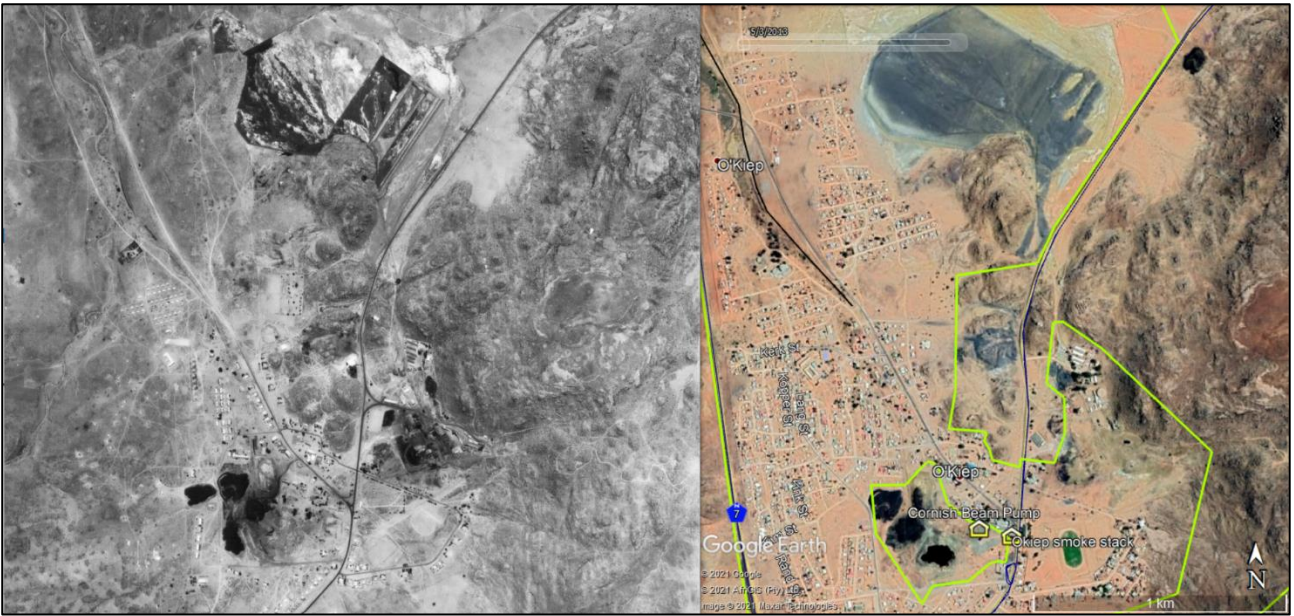
## 5.5. Cultural landscapes and scenic routes

There are three aspects of concern in terms of cultural landscapes. The first aspect of the cultural landscape is the archaeological one. It is expected that the area will contain many archaeological and more recent (i.e. <100 years old) features related to the historical occupation of the area by local herders and their ancestors. Such finds were demonstrated by Orton's (2019) recent survey of areas around Concordia. Morris and Henderson (2018) also documented such features in the Nababoop mining area they assessed. Although many of these features are less than 100 years of age and thus not legally archaeological, they all tell a similar story that extends back to the early 19<sup>th</sup> century when, owing to the influence of the missionaries, the Namakwa started to settle for longer periods close to the mission stations. They started to grow crops and to build stone structures and the landscape became far more marked by their presence than had been the case during precolonial times when the Namakwa were fully transhumant and left only very ephemeral traces of their passing. This cultural landscape is tied directly to living heritage which is addressed in Section 5.6.

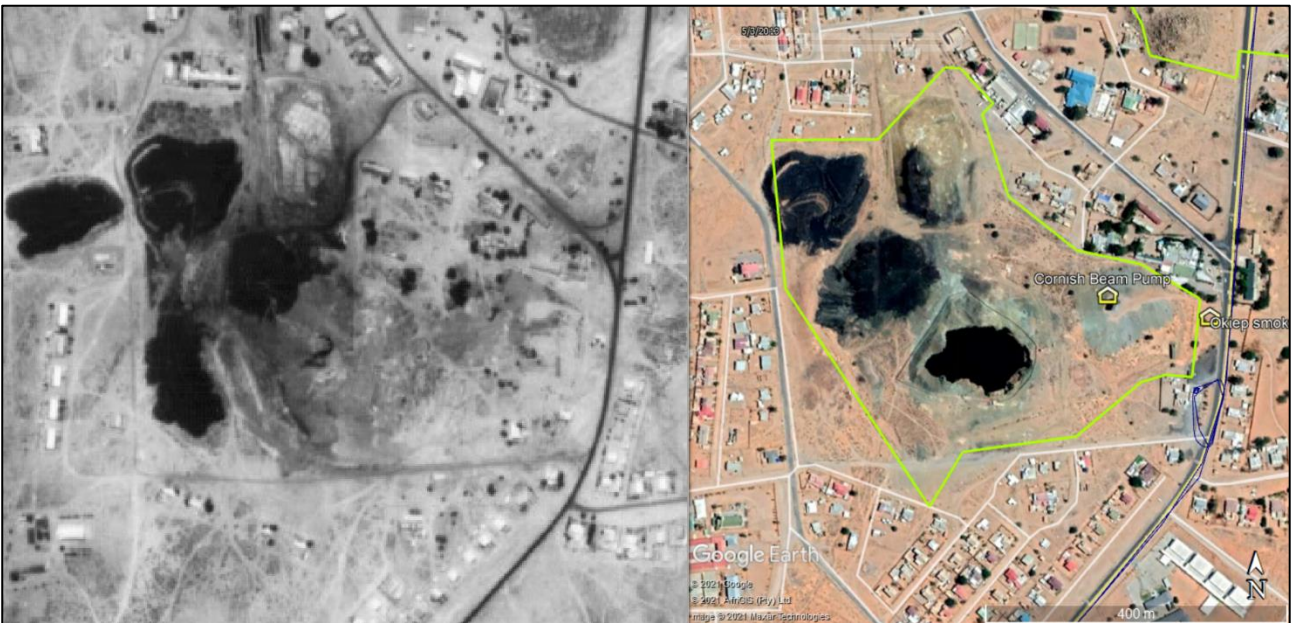
The second aspect is the mining landscape. At the scale of individual mines this landscape can appear 'messy' and a detraction from the natural beauty of the region. This is because of the unsightly mine dumps present around the mines. The large mine dumps around Okiep town are an obvious example. However, some mine dumps and some of the associated structures where these occur are all part of another historical landscape related to early copper mining in the area. This early copper mining landscape was for a number of years on the tentative list for declaration as a World Heritage Site. The declaration was never carried through, but four separate PHSs related to this copper mining landscape do exist in the wider area as noted above. Also an important part of this landscape is the historic copper railway which is represented only by its supporting berm and various related built features (see Section 5.4).

Proposed for PHS declaration, but never carried through, is the well-known Blue Mine in Springbok which was the first commercial copper mine in South Africa. It was opened in 1852 by Philips and King, a company based in Cape Town (Cairncross 2004).

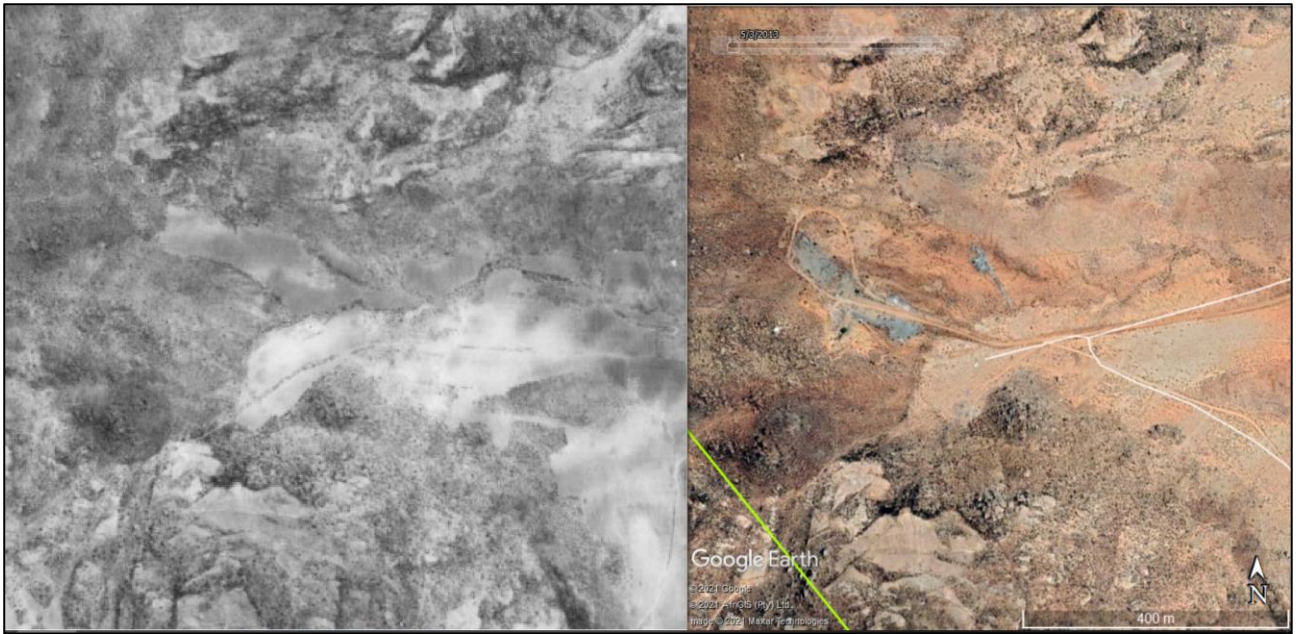
The degree to which this copper mining landscape has changed over time can be established (to some degree) through an examination of aerial photography. The earliest series available for the area dates to 1958. Figure 52 shows comparative 1958 and modern images of Okiep and the associated mining area. While it is clear that the town has grown over the last 60 years, the mine-related features actually cover a very similar area but there are some changes evident, most notably the new excavation in the small central part of the study area where the two PHSs lie (Figure 5053). Figures 54 to 58 show a series of aerial views of different parts of the study area. Although mining activity was ongoing in the wider area 60 years ago, the overall degree of landscape scarring was far less due to the smaller number of mining areas opened. It is clear that much mining has occurred in the last 60 years and that the mining landscape has undergone much transformation. Some of the modern activity has left almost no trace. Figure 59 shows the distribution of drilling locations. Only one of these very small drill holes (c. 40 mm diameter) was seen, but a few drill core fragments were noted in places.



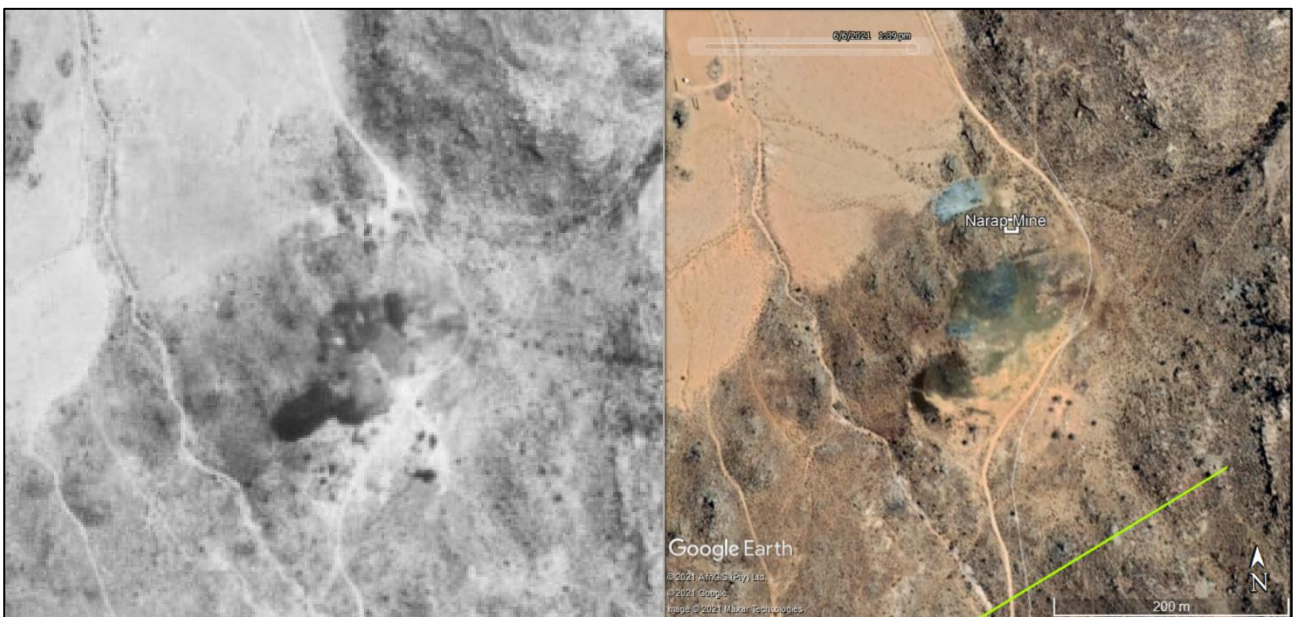
**Figure 52:** 1958 (408\_010\_08392) and modern aerial views of the vicinity around the Okiep area.



**Figure 53:** 1958 (408\_010\_08392) and modern aerial views of the central part of the Okiep study area. The large excavation was not yet present. The mine dump northwest of the Wesleyan Church (red roof on western edge of modern view) has been removed since 1958.



**Figure 54:** 1958 (408\_010\_08390) and modern aerial views of a small section in the western part of the Okiep study area. This is the Wheal Heath Mine.



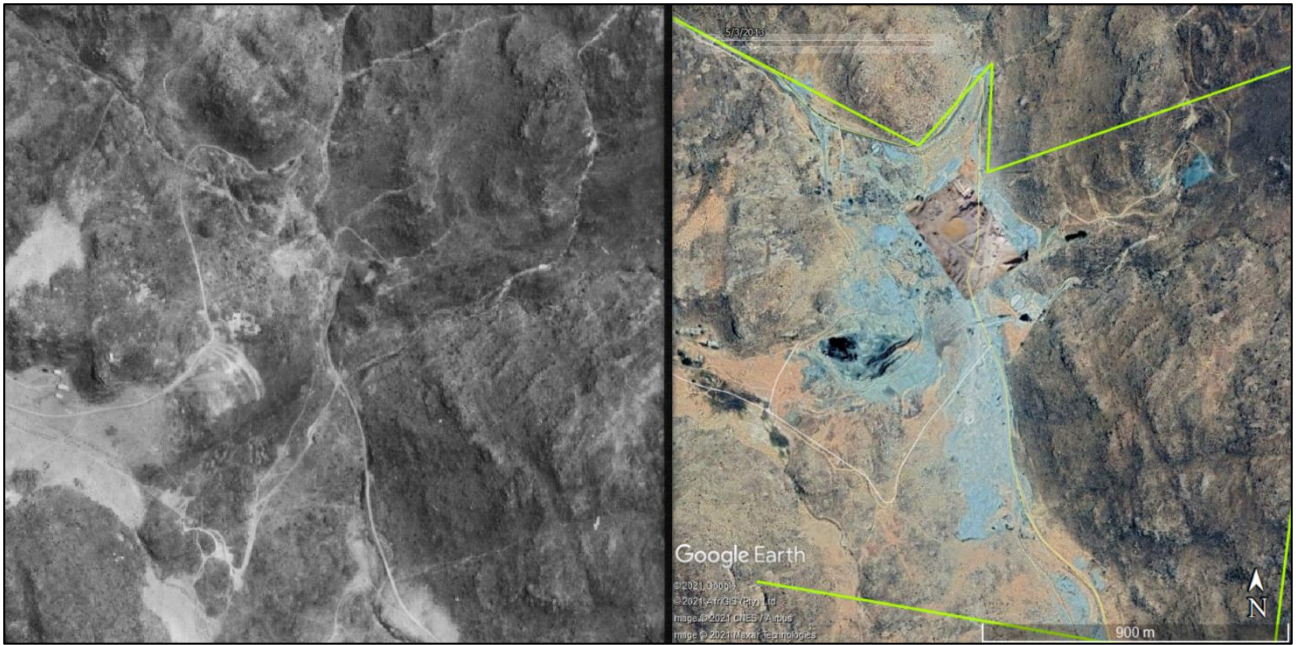
**Figure 55:** 1958 (408\_010\_08392) and modern aerial views of a small section in the eastern part of the Okiep study area. This is the historic Narap Mine.



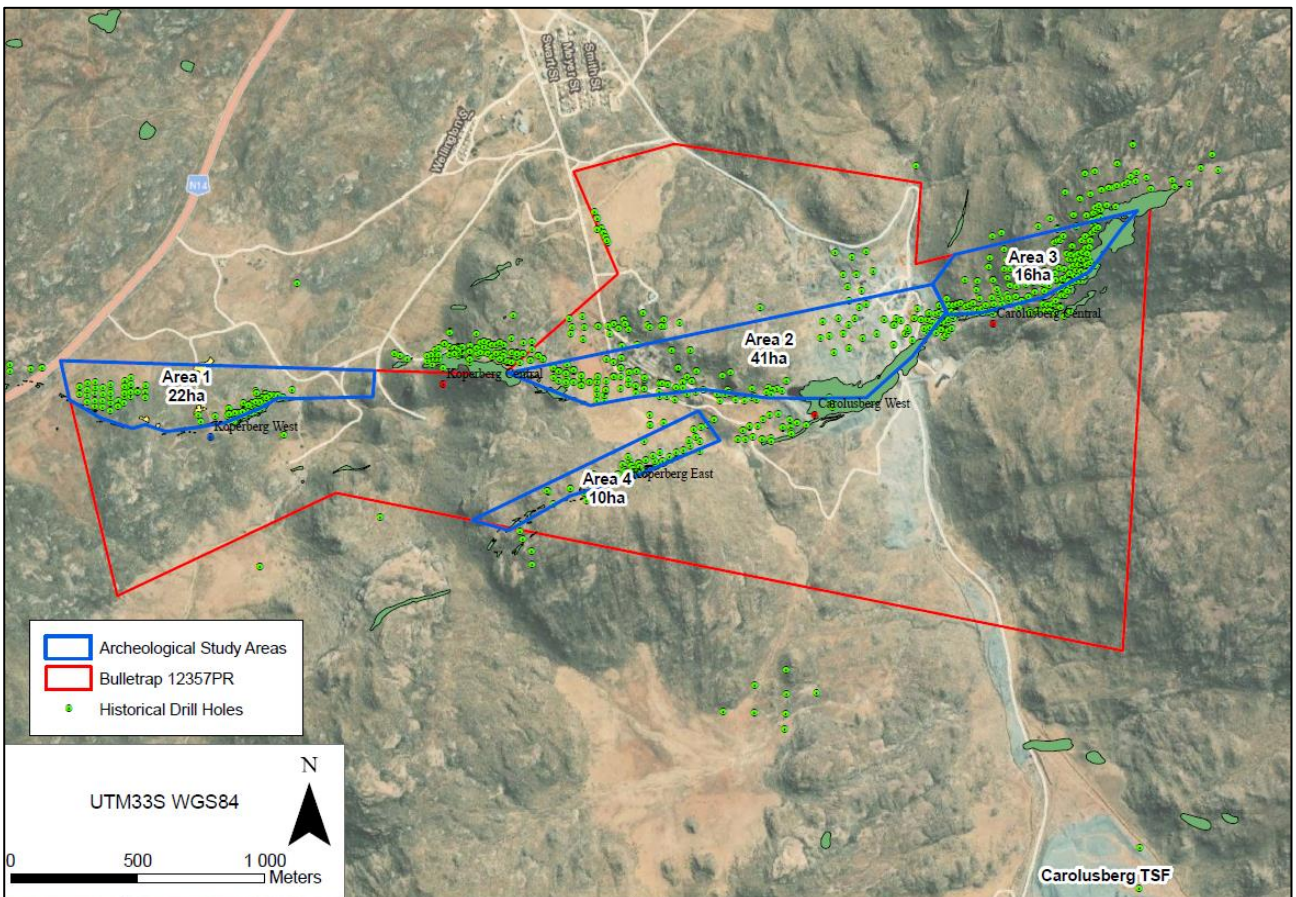
**Figure 56:** 1958 (408\_011\_08350) and modern aerial views of the vicinity around the Van der Stel Mine in the western part of the Carolusberg study area.



**Figure 57:** 1958 (408\_011\_08350) and modern aerial views of the vicinity around the main Carolusberg Mine Complex.



**Figure 58:** 1958 (408\_011\_08350) and modern aerial views of the eastern part of the Carolusberg study area.



**Figure 59:** Map showing past drill sites in the Carolusberg study area.

The third component of the cultural landscape is the natural landscape that has scenic beauty and, during flower season, great tourism value to the surrounding area. Namaqualand is very well-known

for its natural beauty and in this regard the N7 is seen as an important scenic route. Springbok and Okiep, both of which lie along the N7, are major destinations during the flower season. People also travel the minor roads of the region in search of spring flowers. The dry plains and rocky mountains with their granite domes create a primeval landscape with considerable aesthetic qualities.

## **5.6. Living heritage**

There is a direct historical link between the small stock farmers in the Steinkopf, Concordia and Richtersveld Communal Lands and the Namaqua Khoekhoen who were encountered by early travellers in the 17th century. Many of the residents of the Concordia, Steinkopf and Richtersveld Communal Reserves are descended from these Nama-speaking pastoralists who at one time practised a transhumant lifestyle across most of Namaqualand. The Trekboer encroachment into the region from the mid-18th century resulted in the Namaqua losing access to their traditional grazing lands and they eventually gravitated towards the mission stations that were established at Leliefontein, Steinkopf, Komaggas, Concordia and the in Richtersveld during the 19th century. Residents were granted a “Ticket of Occupation” in the mid-19th century and the Mission Stations and Communal Reserves Act of 1909 placed the communal land under government control.

The mission stations provided a form of social support for the Namaqua, but the establishment of schools and churches in the reserves meant that the inhabitants started practicing a more limited transhumant cycle using the villages as one permanent point in their seasonal cycle. Steinkopf residents were still practicing a limited form of transhumance in 1986 (Webley 2009) but many of the old stockposts have now become semi-permanent settlements.

Stockpost locations are typically situated next to a rocky hill or koppie, where the rock provides some shelter from the elements. Stockposts often have one or more kraals nowadays often enclosed by wire fences, whereas in the past they were constructed of stone. In the past the inhabitants would stay in Matjies houses made of a lathe framework covered in rush mats, an architectural tradition that dates back to at least the 17th century and was first documented in the illustrations of early travellers to the Cape. However, these have now been supplanted with corrugated iron houses. Food is often cooked in a separate shelter near the Matjieshuis, known as a “kookskerm”. Other associated elements at the stockpost may include an outside oven made of stone and clay, and a threshing floor (“trapvloer”) for threshing of wheat. There is a great deal of similarity between stockposts found in Steinkopf, Concordia and the Richtersveld. They are a tangible example of a rapidly disappearing pastoralist way of life in the communal lands of Namaqualand and a very good example of “living heritage” as defined in the NHRA. The continuation of traditional practices, for example the outdoor cooking shelters sometimes seen outside houses and the rock and earth ovens, shows that, although life has changed considerably for the local populations, their living heritage remains alive in the area.

Many features related to this living heritage, such as kraals, house floors, threshing floors and other related features have been recorded in the general area, though these are most frequently located in surveys closer to the historical mission stations (Gaigher 2012; Kaplan 2010; Orton 2018, 2019; Smith 2013).

## 5.7. Statement of significance and provisional grading

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 reasons that a place may have cultural significance are outlined in Section 3(3) of the NHRA (see Section 2 above).

Although Stone Age archaeological traces are very rare in this landscape and more recent historical archaeological resources are considered to have medium cultural significance for their historical and social values, the archaeological remains of 19<sup>th</sup> century mining are far more common and are deemed to have high cultural significance for their architectural, historical, scientific, social and technological values. Although the proposed declaration as a World Heritage Site has fallen through, there are mining-related PHSs in the area and Grade II is certainly applicable to the industrial archaeological mining landscape as a whole. The vast majority of other archaeological resources likely to occur in the area would probably have low significance and are generally considered to be GPC.

Most buildings in the general area are not heritage resources as they are too young. However, a few older structures do occur, particularly in Okiep town. Two of these are declared PHSs and are the only structures falling within the Okiep study area. They are thus Grade II. At Carolusberg all the structures within the study area are 20<sup>th</sup> century and likely all post-date the mid-20<sup>th</sup> century opening of the mines. None are considered significant.

Although none were found, graves could still be present within the study area and are deemed to have high cultural significance for their social value and would be graded IIIA.

The cultural landscapes of the area are considered to be of high significance. The archaeological landscape has historical, scientific, social and spiritual significance, the mining landscape is considered to have historical, scientific, social and technological significance, and the natural landscape has aesthetic and scientific significance.

## 6. ASSESSMENT OF IMPACTS

Impacts to fossils, archaeological resources and built heritage are possible and are assessed here. Due to the nature of the proposed drilling, no impacts to the wider cultural landscape are expected since the landscape will remain as before with no perceivable changes. Despite the very high cultural significance of the landscape, this aspect is thus of no further concern and is not assessed here.

### 6.1. Impacts to palaeontological resources

Direct impacts to fossils could occur during the operation phase of any drilling that takes place. However, the chances of intersecting fossils are considered to be extremely small and this aspect if heritage is of no further concern. The significance both before and after mitigation is considered to be **low negative** (Table 3). No specific mitigation measures are required but a Chance Finds Procedure should be included in the Environmental Management Program (EMPr) so that in the event that a fossil is found workers will know what to do. A Chance Finds Procedure is appended to

this report. Because the chances of impacting fossils are so low, the cumulative impacts are also considered to be of low significance. There are no fatal flaws in terms of palaeontology.

**Table 3: Assessment of palaeontological impacts.**

Potential impacts on palaeontological resources	
Nature and status of impact:	Direct, Negative
Extent and duration of impact:	Local, Permanent
Intensity	Low
Probability of occurrence:	Improbable
Degree to which the impact can be reversed:	Low
Degree to which the impact may cause irreplaceable loss of resources:	Low
Cumulative impact prior to mitigation:	Low
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low
Degree to which the impact can be mitigated:	Low
Proposed mitigation:	Application of a chance finds procedure
Cumulative impact post mitigation:	Low
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low

## 6.2. Impacts to archaeological and built heritage resources

Direct impacts to archaeological and built heritage resources could occur during the operation phase of any drilling that takes place. However, archaeological resources are generally rare on the landscape. The only exception to this is in Okiep where an industrial archaeological landscape occurs accompanied by the only two built heritage resources that occur within the study area. Although unlikely, there could also be isolated buildings still associated with some of the more remote historical mines in the area. Nevertheless, the nature of the proposed prospecting is such that significant impacts to the heritage resources there are not expected to occur. The impact significance before and after mitigation is thus rated as **low negative** (Table 4). The only mitigation measures that can be applied are to ensure that all historical features are avoided during drilling and a buffer of at least 30 m is maintained around the two built heritage resources a Okiep. Advice should be sought from an archaeologist once the Okiep drill sites are known in order to assist with this. Note that at Carolusberg no further heritage input is required because the relevant areas have already been considered in this report. Because such prospecting does not typically impact on heritage, the cumulative impacts are similarly of low significance. There are no fatal flaws in terms of archaeology.

**Table 4: Assessment of archaeological and built heritage impacts.**

Potential impacts on archaeological resources	
Nature and status of impact:	Direct, Negative
Extent and duration of impact:	Local, Permanent
Intensity	Low
Probability of occurrence:	Improbable
Degree to which the impact can be reversed:	Low
Degree to which the impact may cause irreplaceable loss of resources:	Low
Cumulative impact prior to mitigation:	Low



Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low
Degree to which the impact can be mitigated:	High
Proposed mitigation:	Avoid any historical features, 30 m buffer around PHSs, seek specialist archaeological advice
Cumulative impact post mitigation:	Low
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low

### 6.3. The No-Go alternative

Implementation of the No-Go alternative would mean that the status quo is retained and no impacts would occur. It should be noted that the no-go alternative would be detrimental to future mining in the area and would thus potentially reduce the inflow of investment into the local economy. Mining could also be a way of protecting, upgrading and promoting mining heritage. The No-Go option could, therefore, not be the best option for heritage resources.

### 6.4. Existing impacts to heritage resources

With one exception, there are currently no obvious threats to heritage resources on the site aside from the natural degradation, weathering and erosion that will affect fossils, rock art and archaeological materials. The exception is at Okiep where the following impacts are noted:

- Vandalism of the industrial archaeological landscape has resulted in degradation of the ruins;
- Widespread littering has resulted in the environment becoming unpleasant to visit; and
- Subsurface subsidence/collapse has resulted in part of the wooden structure of the Cornish Beam Pump sagging and it is in danger of tearing away and causing extensive damage to the PHS.

### 6.5. Cumulative impacts

Due to the nature of the proposed prospecting, cumulative impacts are not expected to be of any concern for this project. They are considered to be of low significance.

### 6.6. Levels of acceptable change

Any impact to an archaeological or palaeontological resource, a heritage building or a grave is deemed unacceptable until such time as the resource has been inspected and studied further if necessary. Impacts to the landscape are difficult to quantify but in general a development that visually dominates the landscape from many vantage points is undesirable. Because of the nature of the proposed development, such an impact is not envisaged.

## 7. INPUT TO THE ENVIRONMENTAL MANAGEMENT PROGRAM

The only points for inclusion in the EMPr are as follows:

- Once the Okiep drilling sites are determined, a map should be sent to an archaeologist to consider from the desktop and advise whether any potentially significant areas are to be impacted and whether any survey or avoidance should be effected;

- All historical features at the Okiep West Mine must be avoided with a 30 m buffer respected around the Cornish Beam Pump and Smoke Stack;
- Project staff must carefully inspect each proposed drilling site for any signs of historical materials or fossils before work starts. If anything of possible concern is seen then it should simply be avoided; and
- In the event that any fossils are uncovered during prospecting, the attached fossil chance Finds Procedure should be applied.

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

Section 38(3)(d) of the NHRA requires an evaluation of the impacts on heritage resources relative to the sustainable social and economic benefits to be derived from the development. There presently is a need for copper to support the renewable energy industry and without prospecting for new ore it will not be possible to establish new mining ventures. This would be a negative socio-economic impact both in terms of the ultimate provision of clean energy to South Africa and in terms of reducing the chances of economic investment into the area. Prospecting is, in the long term, thus beneficial to the local economy.

## **9. CONCLUSIONS**

This report has found that palaeontological and Stone Age resources are rare on the landscape and are of little to no concern. More recent archaeological remains relate to the use of the landscape after the advent of mission stations in the area and, although not of high significance in and of themselves, such traces are also related to living heritage in the area which is significant. Of greater significance is the historical mining landscape which is comprised of industrial archaeological features and some buildings and which has been poorly protected. At Okiep specifically, two built heritage resources in the study area are declared PHSs.

In the words of the Mining Heritage Trust of Ireland, who visited the Copper Mining Landscape in Namaqualand in 2012 prior to its withdrawal from the UNESCO Tentative World Heritage Listing: “The Namaqualand mining landscape is superlative, but it has fallen victim to unsympathetic environmental remediation and has not escaped the attention of recyclers who have stripped everything of mercantile value from mines. If this area wishes to achieve World Heritage status, it will need to demonstrate valorisation of the widely dispersed elements of its extant heritage and how these are to be managed, conserved and protected in the future”. In the event, formal proclamation of the Namaqualand Copper Mining Landscape (NCML) did not take place and in 2015, the NCML was removed from the World Heritage Listing. In the absence of formal proclamation, it is suggested that the NCML tentatively enjoys at least a Grade II or IIIA significance.

The nature of the proposed prospecting and very small number of surface heritage traces means that impacts to significant resources are highly unlikely to occur. For precautionary reasons, a

desktop evaluation of the drill sites will help to further reduce the chances of any impacts and allow for a site inspection if necessary.

Aside from the historical structures (PHSs) at Okiep where no work should take place within 30 m of the structures, no specific buffers are required anywhere, but this is subject to re-evaluation once the Okiep drilling locations are known.

### **9.1. Reasoned opinion of the specialist**

Given the very limited chances of any heritage impacts occurring, it is the opinion of the heritage specialist that the proposed prospecting project may proceed.

## **10. RECOMMENDATIONS**

It is recommended that SAHRA allow the prospecting project to proceed as planned, but subject to the following recommendations:

- Once the Okiep drilling locations are known, a map should be provided to an archaeologist for desktop analysis. If any potentially sensitive areas cannot be avoided then a brief site visit should be carried out to confirm sensitivity and, in consultation with the prospecting geologists, propose alternative nearby drill sites. An opinion should then be expressed in a letter that should be submitted to SAHRA confirming whether or not drilling may proceed;
- Regardless of the above archaeological opinion, all drill sites should be carefully inspected by project staff to ensure that no heritage features are present;
- All historical features at the Okiep West Mine must be avoided with a 30 m buffer respected around the Cornish Beam Pump and Smoke Stack;
- A fossil Chance Finds Procedure must be included in the project EMPr and implemented in the event of any chance finds of fossils, and
- If any archaeological 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. Such heritage is the property of the state and may require excavation and curation in an approved institution.

It is further recommended to Ngwao-Boswa Ya Kapa Bokoni that the structural stability of the Cornish Beam Pump be investigated as soon as possible. It is clear that significant collapse of the wooden components has happened in the last decade and that the PHS is in danger of significant damage should there be further collapse.

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# APPENDIX 1 – Curriculum Vitae



*Curriculum Vitae*

**Jayson David John Orton**

ARCHAEOLOGIST AND HERITAGE CONSULTANT

## Contact Details and personal information:

**Address:** 23 Dover Road, Muizenberg, 7945  
**Telephone:** (021) 788 1025  
**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 –

## 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) membership number: 43

- Accredited Professional Heritage Practitioner

### ➤ **Memberships and affiliations:**

South African Archaeological Society Council member	2004 – 2016
Assoc. Southern African Professional Archaeologists (ASAPA) member	2006 –
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 –
Kalk Bay Historical Association	2016 –
Association of Professional Heritage Practitioners member	2016 –

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

Extensive fieldwork and experience 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:

#### Feasibility studies:

- Heritage feasibility studies examining all aspects of heritage from the desktop

#### Phase 1 surveys and impact assessments:

- Project types
  - Notification of Intent to Develop applications (for Heritage Western Cape)
  - Desktop-based Letter of Exemption (for the South African Heritage Resources Agency)
  - 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 archaeological 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, Namaqualand
- 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

### **Awards:**

Western Cape Government Cultural Affairs Awards 2015/2016: Best Heritage Project.



## APPENDIX 2 – Fossil Finds Procedure

This procedure was developed by Dr John Almond for an adjacent project and has been adapted to the present one.

<b>APPENDIX: CHANCE FOSSIL FINDS PROCEDURE: Copper prospecting on portions of Farms 133 and 134, Okiep and Carolusberg, Northern Cape</b>	
<b>Province &amp; region:</b>	NORTHERN CAPE: Nama Khoi Municipality, Namakwa District Municipality
<b>Responsible Heritage Resources Agency</b>	SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Phone: +27 (0)21 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za).
<b>Rock unit(s)</b>	Late Caenozoic alluvium, calcretes along water courses and calcrete hardpans
<b>Potential fossils</b>	Bones, teeth and horn cores of mammals, freshwater molluscs, calcretised termitaria and other trace fossils
<b>ECO protocol</b>	1. Once alerted to fossil occurrence(s): alert site foreman, stop work in area immediately ( <i>N.B.</i> safety first!), safeguard site with security tape / fence / sand bags if necessary.
	2. Record key data while fossil remains are still <i>in situ</i> : <ul style="list-style-type: none"> <li>• Accurate geographic location – describe and mark on site map / 1: 50 000 map / satellite image / aerial photo</li> <li>• Context – describe position of fossils within stratigraphy (rock layering), depth below surface</li> <li>• Photograph fossil(s) <i>in situ</i> with scale, from different angles, including images showing context (<i>e.g.</i> rock layering)</li> </ul>
	3. If feasible to leave fossils <i>in situ</i> : <ul style="list-style-type: none"> <li>• Alert Heritage Resources Agency and project palaeontologist (if any) who will advise on any necessary mitigation</li> <li>• Ensure fossil site remains safeguarded until clearance is given by the Heritage Resources Agency for work to resume</li> </ul>
	3. If <i>not</i> feasible to leave fossils <i>in situ</i> (emergency procedure only): <ul style="list-style-type: none"> <li>• <i>Carefully</i> remove fossils, as far as possible still enclosed within the original sedimentary matrix (<i>e.g.</i> entire block of fossiliferous rock)</li> <li>• Photograph fossils against a plain, level background, with scale</li> <li>• Carefully wrap fossils in several layers of newspaper / tissue paper / plastic bags</li> <li>• Safeguard fossils together with locality and collection data (including collector and date) in a box in a safe place for examination by a palaeontologist</li> <li>• Alert Heritage Resources Agency and project palaeontologist (if any) who will advise on any necessary mitigation</li> </ul>
	4. If required by Heritage Resources Agency, ensure that a suitably-qualified specialist palaeontologist is appointed as soon as possible by the developer.
	5. Implement any further mitigation measures proposed by the palaeontologist and Heritage Resources Agency
<b>Specialist palaeontologist</b>	Record, describe and judiciously sample fossil remains together with relevant contextual data (stratigraphy / sedimentology / taphonomy). Ensure that fossils are curated in an approved repository ( <i>e.g.</i> museum / university / Council for Geoscience collection) together with full collection data. Submit Palaeontological Mitigation report to Heritage Resources Agency. Adhere to best international practice for palaeontological fieldwork and Heritage Resources Agency minimum standards.