Archaeological Impact Assessment

Archaeological Impact Assessment Report for the Proposed re-use of a hard rock quarry on the Farm Buchuberg 296 in the Hay Magisterial District 24km East of Groblershoop

Prepared For

Site Plan Consulting CC

By

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I, Jaco van der Walt as duly authorised representative of Heritage Contracts and Archaeological Consulting CC, hereby confirm my independence as a specialist and declare that neither I nor the Heritage Contracts and Archaeological Consulting CC have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of which the client was appointed as Environmental Assessment practitioner, other than fair remuneration for work performed on this project.

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EXECUTIVE SUMMARY

Site Plan Consulting CC, on behalf of Group Five Civil Engineering (Pty) Ltd, appointed Heritage Contracts and Archaeological Consulting CC (HCAC) to conduct an Archaeological Impact Assessment for the re-use of an abandoned hard rock quarry (road construction Borrow Pit) on the Farm Buchuberg 296 Remainder, in the Hay Magisterial District 24km East of Groblershoop on the N8 road to Griekwastad. The study forms part of the Basic Assessment for the project.

The site was visited over a period of 1 day and the following observations were made: Isolated MSA artefacts were found scattered in low densities to the north and west of the disused quarry. These were documented as "occurrences' and are of low archaeological significance as these artefacts are not in situ. Furthermore no indications of stratified archaeological deposits were noted resulting that the archaeological material on site has limited scientific value. Mitigation on these occurrences are deemed unnecessary as any further mitigation is unlikely to result in a greater understanding of the material and the various time periods, and as a result we do not believe further archaeological work is necessary.

No buildings exist on the site and no cultural landscape elements were noted. Visual impacts to scenic routes and sense of place are also considered to be low. No further mitigation is recommended for this aspect.

General

Due to the subsurface nature of archaeological material and unmarked graves, the possibility of the occurrence of such finds cannot be excluded. If during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find/s.

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ABBREVIATIONS

AIA: Archaeological Impact Assessment
ASAPA: Association of South African Professional Archaeologists
BIA: Basic Impact Assessment
CRM: Cultural Resource Management
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EIA Practitioner: Environmental Impact Assessment Practitioner
EMP: Environmental Management Plan
ESA: Early Stone Age
GPS: Global Positioning System
HIA: Heritage Impact Assessment
LIA: Late Iron Age
LSA: Late Stone Age
MEC: Member of the Executive Council
MIA: Middle Iron Age
MPRDA: Mineral and Petroleum Resources Development Act
MSA: Middle Stone Age
NEMA: National Environmental Management Act
PRHA: Provincial Heritage Resource Agency
SADC: Southern African Development Community
SAHRA: South African Heritage Resources Agency

**Although EIA refers to both Environmental Impact Assessment and the Early Iron Age both are internationally accepted abbreviations and must be read and interpreted in the context it is used.*

GLOSSARY

Archaeological site (remains of human activity over 100 years old)

Early Stone Age (~ 2.6 million to 250 000 years ago)

Middle Stone Age (~ 250 000 to 40-25 000 years ago)

Later Stone Age (~ 40-25 000, to recently, 100 years ago)

The Iron Age (~ AD 400 to 1840)

Historic (~ AD 1840 to 1950)

Historic building (over 60 years old)

1 BACKGROUND INFORMATION

Heritage Contracts and Archaeological Consulting CC (HCAC) was appointed to conduct an Archaeological Impact Assessment for the proposed re-use of an abandoned hard rock quarry (road construction Borrow Pit) on the Farm Buchuberg 296 Remainder, in the Hay Magisterial District 24km East of Groblershoop on the N8 road to Griekwastad. Material from the old quarry will be used in order to provide road rehabilitation/maintenance materials to the rehabilitation/maintenance of the N8 road between Groblershoop and Griekwastad.

The aim of the study is to identify cultural heritage sites, document, and assess their importance within local, provincial and national context. It serves to assess the impact of the proposed project on non-renewable heritage resources, and to submit appropriate recommendations with regard to the responsible cultural resources management measures that might be required to assist the developer in managing the discovered heritage resources in a responsible manner. It is also conducted to protect, preserve, and develop such resources within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999).

The report outlines the approach and methodology utilized before and during the survey, that includes collection from various sources and consultations; Phase 2, the physical surveying of the study area on foot and by vehicle; Phase 3, reporting the outcome of the study.

During the survey no sites of heritage significance were identified although several occurrences of isolated MSA flakes were noted. These occurrences are not interpreted as sites. General site conditions and features on sites were recorded by means of photographs, GPS locations, and site descriptions. Possible impacts were identified and mitigation measures are proposed in the following report.

This report must also be submitted to the SAHRA for review.

1.1 Terms of Reference

Desktop study

Conduct a brief archaeological desktop study where information on the area is collected to provide a background setting of the archaeology that can be expected in the area.

Field study

Conduct a field study to: a) systematically survey the proposed project area to locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) record GPS points identified as significant areas; c) determine the levels of significance of the various types of heritage resources recorded in the project area.

Reporting

Report on the identification of anticipated and cumulative impacts the operational units of the proposed project activity may have on the identified heritage resources for all 3 phases of the project; i.e., construction, operation and decommissioning phases. Consider alternatives, should any significant sites be impacted adversely by the proposed project. Ensure that all studies and results comply with Heritage legislation and the code of ethics and guidelines of ASAPA.

To assist the developer in managing the discovered heritage resources in a responsible manner, and to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999).

1.2. Archaeological Legislation and Best Practice

Phase 1, an AIA or a HIA is a pre-requisite for development in South Africa as prescribed by SAHRA and stipulated by legislation. The overall purpose of a heritage specialist input is to:

- » Identify any heritage resources, which may be affected;
- » Assess the nature and degree of significance of such resources;
- » Establish heritage informants/constraints to guide the development process through establishing thresholds of impact significance;
- » Assess the negative and positive impact of the development on these resources;
- » Make recommendations for the appropriate heritage management of these impacts.

The AIA or HIA, as a specialist sub-section of the EIA, is required under the National Heritage Resources Act NHRA of 1999 (Act 25 of 1999), Section 23(2)(b) of the NEMA and section s.39(3)(b)(iii) of the MPRDA.

The AIA should be submitted, as part of the EIA, BIA or EMP, to the PHRA if established in the province or to SAHRA. SAHRA will be ultimately responsible for the professional evaluation of Phase 1 AIA reports upon which review comments will be issued. 'Best practice' requires Phase 1 AIA reports and additional development information, as per the EIA, BIA/EMP, to be submitted in duplicate to SAHRA after completion of the study. SAHRA accepts Phase 1 AIA reports authored by professional archaeologists, accredited with ASAPA or with a proven ability to do archaeological work.

Minimum accreditation requirements include an Honours degree in archaeology or related discipline and 3 years post-university CRM experience (field supervisor level).

Minimum standards for reports, site documentation and descriptions are set by ASAPA in collaboration with SAHRA. ASAPA is a legal body, based in South Africa, representing professional archaeology in the SADC region. ASAPA is primarily involved in the overseeing of ethical practice and standards regarding the archaeological profession. Membership is based on proposal and secondment by other professional members.

Phase 1 AIAs are primarily concerned with the location and identification of sites situated within a proposed development area. Identified sites should be assessed according to their significance. Relevant conservation or Phase 2 mitigation recommendations should be made. Recommendations are subject to evaluation by SAHRA.

Conservation or Phase 2 mitigation recommendations, as approved by SAHRA, are to be used as guidelines in the developer's decision making process.

Phase 2 archaeological projects are primarily based on salvage/mitigation excavations preceding development destruction or impact on a site. Phase 2 excavations can only be conducted with a permit, issued by SAHRA to the appointed archaeologist. Permit conditions are prescribed by SAHRA and includes (as minimum requirements) reporting back strategies to SAHRA and deposition of excavated material at an accredited repository.

In the event of a site conservation option being preferred by the developer, a site management plan, prepared by a professional archaeologist and approved by SAHRA, will suffice as minimum requirement.

After mitigation of a site, a destruction permit must be applied for from SAHRA by the client before development may proceed.

Human remains older than 60 years are protected by the National Heritage Resources Act, with reference to Section 36. Graves older than 60 years, but younger than 100 years fall under Section 36 of Act 25 of 1999 (National Heritage Resources Act), as well as the Human Tissues Act (Act 65 of 1983), and are the jurisdiction of SAHRA. The procedure for Consultation Regarding Burial Grounds and Graves (Section 36[5]) of Act 25 of 1999) is applicable to graves older than 60 years that are situated outside a formal cemetery administrated by a local authority. Graves in this age category, located inside a formal cemetery administrated by a local authority, require the same authorisation as set out for graves younger than 60 years, in addition to SAHRA authorisation. If the grave is not situated inside a formal cemetery, but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws, set by the cemetery authority, must be adhered to.

Human remains that are less than 60 years old are protected under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance (Ordinance no. 7 of 1925), as well as the Human Tissues Act (Act 65 of 1983), and are the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the office of the relevant Provincial Premier. This function is usually delegated to the Provincial MEC for Local Government and Planning; or in some cases, the MEC for Housing and Welfare.

Authorisation for exhumation and reinterment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to. To handle and transport human remains, the institution conducting the relocation should be authorised under Section 24 of Act 65 of 1983 (Human Tissues Act).

1.3 Description of Study Area

1.3.1 Location Data

The proposed development is located on the Farm Buchuberg 296, just north of the Orange River. The site is located 100m from the public gravel road that forms the southern boundary of the study area (Figure 1). Access to the site is from the existing old access road to the abandoned quarry. The site is marked by a quartzite ridge which protrudes through the surrounding wind-blown (Aeolian) red sands, forming part of a larger series of Quartzitic ridges running SW-NE. There are no drainage lines within the study area and no major landscape features like pans or buildings. The vegetation is predominantly Bushmanland Arid Grassland vegetation in the Nama-Karoo biome (Mucina & Rutherford 2006) which consists of Karoo scrub and grass and a few isolated *Acacia karoo* trees. Historical imagery on Google earth indicates that the land has been fallow for a number of years.

1.3.2. Location Map

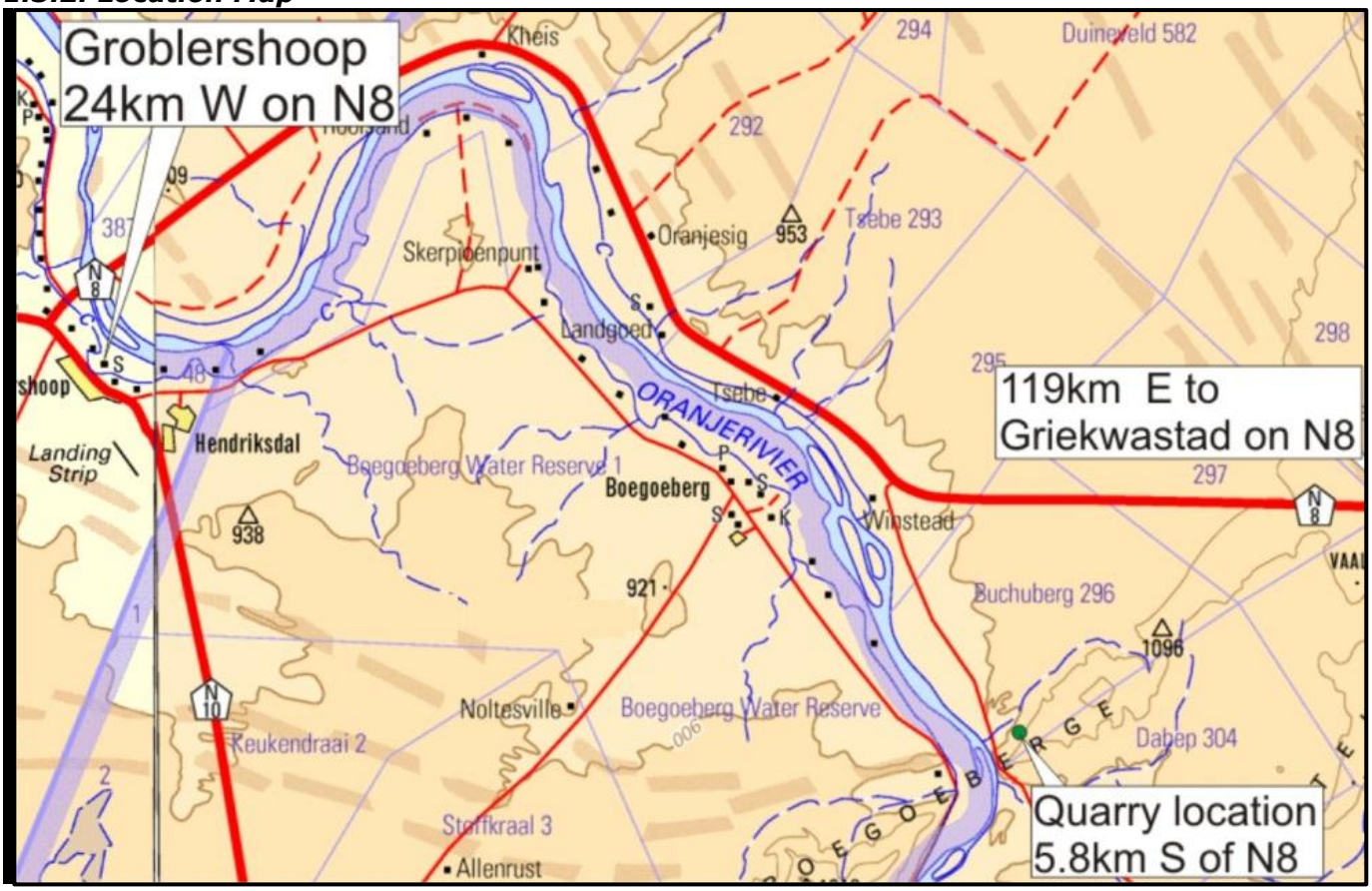

Figure 1: Location map as provided by Site plan.

2. APPROACH AND METHODOLOGY

The aim of the study is to cover archaeological databases to compile a background of the archaeology that can be expected in the study area followed by field verification; this was accomplished by means of the following phases and is reported on in Section 4 of this report.

2.1 Phase 1 - Desktop Study

The first phase comprised a desktop study scanning existing records for archaeological sites. Due to the small size of the proposed development and the fact that it is an existing quarry that would have demolished any surface traces of historical finds no archival work was conducted for this project.

2.1.1 Literature Search

Utilising data for information gathering stored in the archaeological database at Wits and previous CRM reports done in the area. The aim of this is to extract data and information on the area in question.

2.1.2 Information Collection

The SAHRA report mapping project (Version 1.0) was consulted to collect data from previously conducted CRM projects in the region to provide a comprehensive account of the history of the study area.

2.1.3 Consultation

No public consultation was done during the study as this is done as part of the BA.

2.1.4 Google Earth and Mapping Survey

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where sites of heritage significance might be located.

2.1.5 Genealogical Society of South Africa

The database of the Genealogical Society was consulted to collect data on any known graves in the area.

2.2 Phase 2 - Physical Surveying

Due to the nature of cultural remains, the majority of which occurs below surface, a field survey of the study area was conducted over 1 day. The study area was surveyed by means of vehicle and extensive surveys on foot during the week of 10 – 15 December 2012. The survey focused on the 1.5 ha mine plan, but also covered a wider area to accommodate logistical and stock piling area (Figure 2). Track logs of the areas covered were taken (Figure 3).

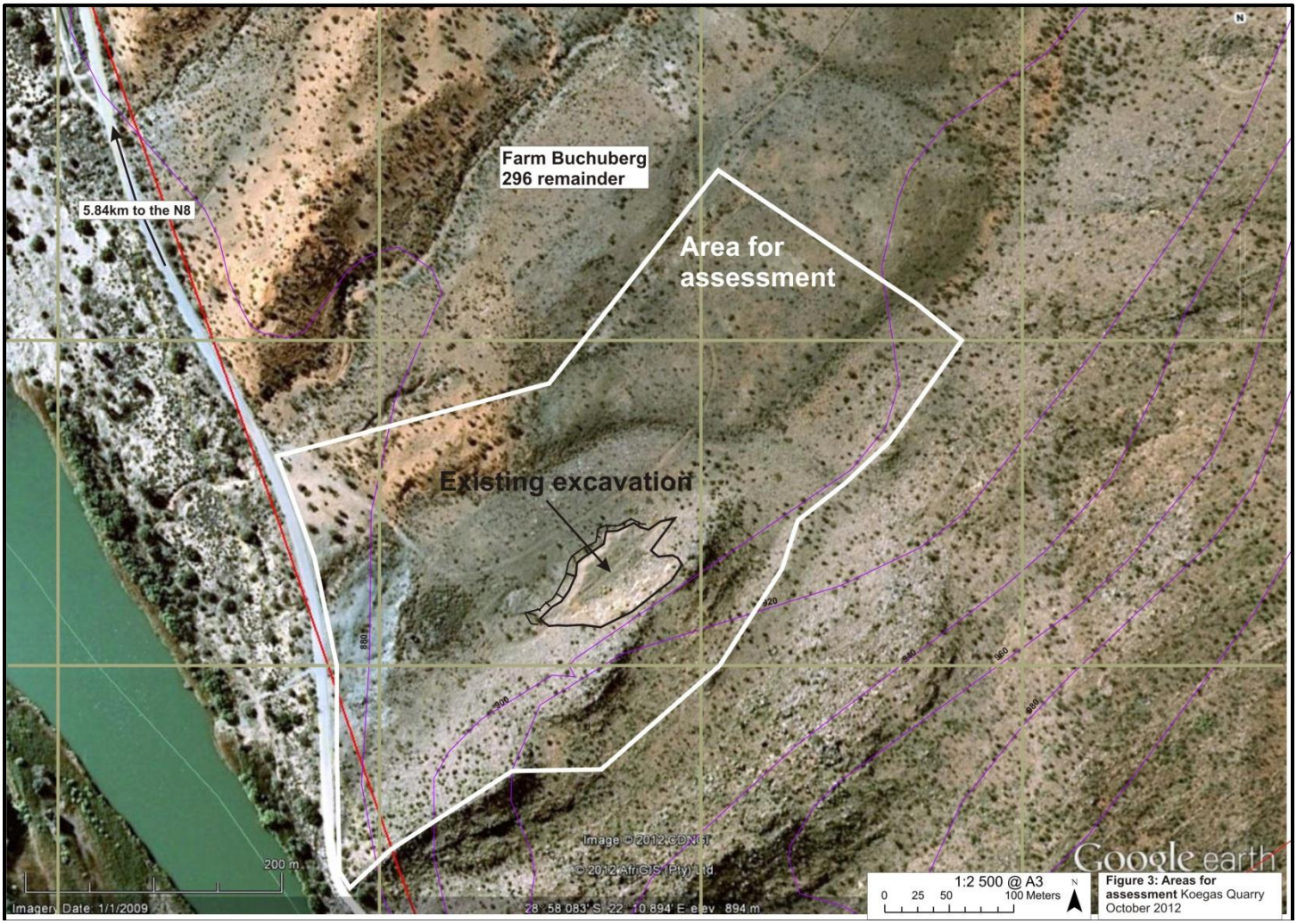

Figure 2: Study area as provided by Site plan.

Figure 3: Track log of study area in black with actual mining footprint in blue

Isolated Stone Age artefacts were recorded scattered throughout the study area. Artefact densities were in general too low to record an artefact ratio (artefacts: m²) and therefor these isolated finds (1 artefact per >10m²) were recorded as occurrences. As per the methodology employed by HCAC artefact scatters higher than 5 artefacts per m² are given site numbers. Individual occurrences were not point plotted within the study area as they are out of context and of low scientific significance.

2.3. Restrictions

Due to the fact that most cultural remains may occur below surface, the possibility exists that some features or artefacts may not have been discovered/ recorded during the survey. Low ground visibility of parts of the study area is due to sand cover and extensive disturbance from previous mining, and the possible occurrence of unmarked graves and other cultural material cannot be excluded. Only the impact area was surveyed as indicated in the location map, and not the entire farm. The study did not include social consulting or a palaeontological assessment. It is assumed that information obtained for the wider region is accurate and applicable to this study.

Although HCAC surveyed the area as thoroughly as possible, it is incumbent upon the developer to stop operations and inform the relevant heritage agency should further cultural remains, such as stone tool scatters, artefacts, bones or fossils, be exposed during the process of development.

3. NATURE OF THE DEVELOPMENT

The following 4 major components and their related activities form part of the proposed development:
i) The excavation which will be developed by hard rock drilling and blasting, with hauling of rock by articulated dump truck to the crushing and screening plant, totalling 1.482ha (Figure 4) (an expansion of the current excavation by 0.996ha).

ii) Crushing and screening plant situated in the eastern extent of the disturbance area to give maximum distance from the adjacent public gravel road
iii) Stockpiling and logistics area of 3.0ha
iv) Logistical facilities, comprising containerised office, stores, work shop and personnel amenities

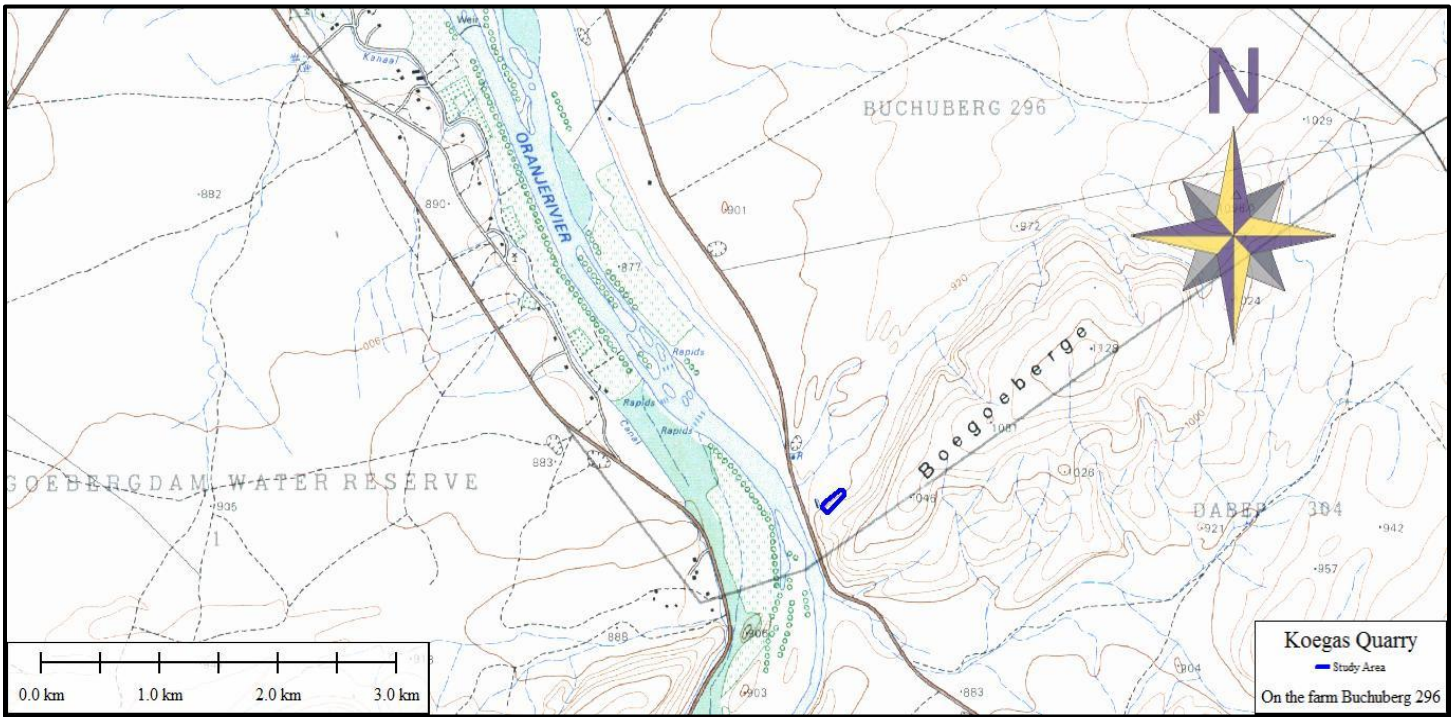

Figure 4: Mining area indicated in blue on the 2822 CC topographic sheet.

4. HISTORICAL AND ARCHAEOLOGICAL BACKGROUND OF THE STUDY AREA

4.1 Databases Consulted

Wits Archaeological Data Bases

No previously recorded sites are on record for the study area at the Wits database (referenced 2009). Due to the short timeline for the project it was not possible to get access to the archaeological database at the McGregor Museum in Kimberly.

SAHRA Report Mapping Project

Two previous heritage studies were conducted close the study area (SAHRA report mapping project V1.0 and SAHRIS accessed December 2012) by K van Ryneveld (2007) and Cobus Dreyer (2006). Van Ryneveld conducted a study to the south west of the study area on the farm Boksputs 118 and Dreyer's study was conducted to the north west on the farm Tampansrus 294/295. Both these studies recorded isolated MSA artefacts scattered over the landscape.

Genealogical Society and Google Earth Monuments

Neither the Genealogical Society nor the monuments database at Google Earth (Google Earth also include some archaeological sites and historical battlefields) have any recorded sites in the study area.

4.2. Background

In order to understand the historical context of a certain area, it is necessary to consider the geographic and climatic nature of the region in question.

Founded in 1936 and named after a former Minister of Agriculture, Groblershoop is currently a farming and administrative centre in the Orange River Valley, east of Upington (www.northerncape.org.za). Groblershoop is in the Siyanda District Municipality in the Northern Cape province of South Africa. It is situated about 10 km east of the Orange River (www.wikipedia.co.za). This historical village is located at the gateway to the Green Kalahari. The historic water turbine driven by solid-oak gears in the Orange River on the farm Winstead build in 1913 is one of the features of the town's heritage landscape. The successful stock farming and wine production in the region is built on hard work and pioneering spirit of early residents. Development in the region was boosted by the construction of the Boegoeberg dam surrounded by red Kalahari dunes, quiver trees and water channels in established in 1929. (www.upington.com).

4.3 Stone Age Background

In 2011 Prof Marlize Lombard compiled a Stone Age sequence for CRM purposes and noted the following:

4.3.1.*Introduction*

South Africa has a long and complex Stone Age sequence of more than 2 million years. The broad sequence includes the Later Stone Age, the Middle Stone Age and the Earlier Stone Age. Each of these phases contains sub-phases or industrial complexes, and within these we can expect regional variation regarding characteristics and time ranges. For Cultural Resources Management (CRM) purposes it is often only expected/ possible to identify the presence of the three main phases. Yet sometimes the recognition of cultural groups, affinities or trends in technology and/or subsistence practices, as represented by the sub-phases or industrial complexes, is achievable. Such finer-grained identifications may help to highlight the importance of some archaeological sites in a specific region. Table 1 provides a brief overview of the Stone Age phases and sub-phases/industrial complexes of South Africa, based on our current knowledge. The information is aimed at assisting the identification of Stone Age occurrences in the field by providing the main associated characteristics, and it provides the broadly associated age estimates. Users of this document should, however, remember that the outlines are broad, and any field interpretations can only be considered preliminary observations until further research is conducted (Lombard 2011).

Archaeological surveys have shown rocky outcrops and hills, drainage lines, riverbanks and confluences to be prime localities for archaeological finds and specifically Stone Age sites, as these areas where utilized for settlement of base camps close to water and hunting ranges. If any of these features occur in the study area Stone Age manifestations can be expected within the development area.

Cultural sequence	~ Associated ages	Associated characteristics
Later Stone Age; associated with Khoi and San societies and their immediate predecessors		
See sub-phases below for more detailed chronology	Recently to ~30 thousand years ago	Include stone tools mostly < 25 mm, bored stones, grinding stones, grooved stones, ostrich eggshell beads, bone tools sometimes with decoration, decorated ostrich eggshell flasks and fishing equipment These are the general characteristics for the Later Stone Age. In the sub-divisions below I highlight differences or characteristics that may be used to

		refine interpretations depending on context.
Broad overview of Later Stone Age sub-phases/industrial complexes		
Hunters-with-livestock/herders (e.g. Mitchell 2002; Lombard & Parsons 2008)	Mostly less than 2 thousand years ago	Regular occurrence of blades and bladelets, but formal stone tools are rare, backed pieces mostly absent, grindstones are common, stone bowls and boat-shaped grinding grooves may occur Sheep, goat, cattle and dog bones along with wild species Pottery is mostly well-fired, thin-walled, sometimes with lugs, spouts and coned bases, sometimes with comb-stamping
Post-Wilton (includes some Smithfield phases) (e.g. Deacon & Deacon 1999; Lombard & Parsons 2008)	~1 hundred - 3 thousand years ago	Mostly macrolithic (stone tools > 20 mm) and informal sometimes with blades and bladelets Characterised by large untrimmed flakes At some sites there are also small backed tools, scrapers and adzes Sometimes includes thick-walled, grass-tempered potsherds
Wilton (includes some Smithfield phases) (e.g. Deacon & Deacon 1999; Wadley 2007)	~4-8 thousand years ago	Microlithic (stone tools < 20 mm) High incidence of backed bladelets and geometric shapes such as segments Include borers, small scrapers, double scrapers, polished bone tools
Oakhurst (includes Albany and Lockshoek) (e.g. Deacon & Deacon 1999; Wadley 2007)	~8-12 thousand years ago	Characterised by round, end and D-shaped scrapers, adzes and a wide range of polished bone tools Few or no microliths
Robberg (Deacon & Deacon 1999; Wadley 2007)	~12-22 thousand years ago	Characterised by few backed tools, few scrapers, significant numbers of unretouched bladelets
Early Later Stone Age	~30-40 thousand years ago	Described at some sites, but as yet unclear whether this represents a real archaeological phase or a mixture of LSA/MSA artefacts
Middle Stone Age; associated with Homo sapiens and archaic modern humans		
See sub-phases	~30-300	Mostly based on prepared core techniques, and the

below for more detailed chronology	thousand years ago	production of triangular flakes with convergent dorsal scars and faceted striking platforms Most pieces are in the region of 40-100 mm Often includes the deliberate manufacture of parallel-sided blades and flake-blades Sometimes produced using the Levallois technique Occasionally includes marine shell beads, bone points, engraved ochre nodules and engraved ostrich eggshell fragments These are the general characteristics for the Middle Stone Age. In the sub-divisions below I highlight differences or characteristics that may be used to refine interpretations depending on context
Broad overview of Middle Stone Age sub-phases/industrial complexes		
Final Middle Stone Age (informal designation partly based on the Sibudu sequence) (Jacobs et al. 2008; Wadley, 2005, 2010)	~30-40 thousand years ago	Could include bifacially retouched, hollow-based points Small bifacial and unifacial points Could include backed geometric shapes such as segments, as well as side scrapers
Late Middle Stone Age (informal designation partly based on the Sibudu sequence) (Jacobs et al. 2008; Wadley 2010)	~45-50 thousand years ago	Most formal retouch aimed at producing unifacial points Sometimes includes bifacially retouched points
Post-Howieson's Poort (also referred to as MSA III at Klasies River or MSA 3 generally) (e.g. Soriano et al. 2007; Jacobs et al. 2008:734)	~47-58 thousand years ago	Most points are produced using Levallois technique, and many are unifacially retouched Some side scrapers are present Backed pieces are rare
Howieson's Poort Industry (e.g. Jacobs et al. 2008:734)	~58-66 thousand years ago	Characterized by blade technology and the presence of small (< 4 cm) backed tools (made on blades), including segments, trapezes and backed blades.
Still Bay Industry (e.g. Jacobs et al. 2008; Lombard et al. 2010; Henshilwood & Dubreuil 2011)	~70-77 thousand years ago	Characterised by thin (< 10 mm), bifacially worked foliate or lanceolate points with either a semicircular or wide-angled pointed butt Could include finely serrated points
Mossel Bay Industry (also referred to as	~85-105 thousand	Characterised by a unipolar Levallois-type point

MSA II at Klasies River or MSA 2b generally) (e.g. Wurz 2010, in press)	years ago	reduction Products have straight profiles, percussion bulbs are prominent and often splintered or ring-cracked Formal retouch is infrequent, restricted to sharpening the tip or shaping the butt
Klasies River sub-stage (also referred to as MSA I at Klasies river or MSA 2a generally) (e.g. Wurz 2010, in press)	~105-115 thousand years ago	Mostly large blades, pointed flakes are elongated and thin, often with curved profiles Platforms are often diffuse and lack clear percussion marks Low frequencies of retouch, few denticulated pieces
MSA 1 (tentative, informal designation) (Volman 1984; Thompson et al. 2010)	Suggested age OIS 6 (~130-195 thousand years ago)	Platforms are mostly plain Very little formal retouch Flakes are mostly short and broad, few have denticulate retouch Rare scraper retouch
Sangoan Sometimes observed between MSA and ESA deposits, some researcher place this phase under the Middle Stone Age, others under the Earlier Stone Age, the designation is thus not yet clear (e.g. Kuman et al. 2005)	> 200 thousand years ago, but few sites in southern Africa have been dated	Contains small bifaces (< 100 mm), picks, heavy- and light-duty denticulated and notched scrapers
Earlier Stone Age; associated with early Homo groups such as Homo habilis and Homo erectus		
Fauresmith (e.g. Porat et al. 2010)	~400-600 thousand years ago	Generally includes small handaxes, long blades and convergent/pointed pieces
Acheulean (e.g. Kuman 2007; Mitchell 2002)	~300 thousand-1.5 million years ago	Bifacially worked handaxes and cleavers, large flakes > 10 cm Some flakes with deliberate retouch, sometimes classified as scrapers Give impression of being deliberately shaped, but could indicate result of knapping strategy

		Sometimes shows core preparation Mostly found in disturbed open-air locations
Oldowan (e.g. Kuman 2007; d'Errico & Backwell 2009; Mitchell 2002)	~1.5 -> 2 million years ago	Cobble, core or flake tools with little retouch and no flaking to predetermined patterns Hammerstones, manuports, cores Polished bone fragments/tools

Table 1. Outline of the Stone Age cultural sequence of South Africa. The information presented here provides a basic, simplified interpretation for the Stone Age sequence. Details may vary from region to region and from site to site. Most of the criteria such as dating, transitional phases, technological phenomena and recursions are currently being researched, so that the information cannot be considered static or final (Lombard 2011).

5. HERITAGE SITE SIGNIFICANCE AND MITIGATION MEASURES

The presence and distribution of heritage resources define a 'heritage landscape'. In this landscape, every site is relevant. In addition, because heritage resources are non-renewable, heritage surveys need to investigate an entire project area, or a representative sample, depending on the nature of the project. In the case of the proposed quarry extension the local extent of its impact necessitates a representative sample and only the footprint of the areas demarcated for development were surveyed. In all initial investigations, however, the specialists are responsible only for the identification of resources visible on the surface.

This section describes the evaluation criteria used for determining the significance of archaeological and heritage sites. The following criteria were used to establish site significance:

- The unique nature of a site;
- The integrity of the archaeological/cultural heritage deposits;
- The wider historic, archaeological and geographic context of the site;
- The location of the site in relation to other similar sites or features;
- The depth of the archaeological deposit (when it can be determined/is known);
- The preservation condition of the sites;
- Potential to answer present research questions.

Furthermore, The National Heritage Resources Act (Act No 25 of 1999, Sec 3) distinguishes nine criteria for places and objects to qualify as 'part of the national estate' if they have cultural significance or other special value. These criteria are:

- Its importance in/to the community, or pattern of South Africa's history;
- Its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
- Its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
- Its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
- Its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- Its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- Its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;

- » Its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa;
- » Sites of significance relating to the history of slavery in South Africa.

5.1. Field Rating of Sites

Site significance classification standards prescribed by SAHRA (2006), and acknowledged by ASAPA for the SADC region, were used for the purpose of this report. The recommendations for each site should be read in conjunction with section 7 of this report.

FIELD RATING	***GRADE***	***SIGNIFICANCE***	***RECOMMENDED MITIGATION***
National Significance (NS)	Grade 1	-	Conservation; national site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; provincial site nomination
Local Significance (LS)	Grade 3A	High significance	Conservation; mitigation not advised
Local Significance (LS)	Grade 3B	High significance	Mitigation (part of site should be retained)
Generally Protected A (GP.A)	-	High/medium significance	Mitigation before destruction
Generally Protected B (GP.B)	-	Medium significance	Recording before destruction
Generally Protected C (GP.C)	-	Low significance	Destruction

6. BASELINE STUDY-DESCRIPTION OF SITES

Isolated Stone Age artefacts were observed scattered to the north and north west of the disused quarry where the Aeolian sands are eroded. The artefacts show a high degree of weathering probably being washed in from their original context and are therefore of little archaeological value. No formal tools were noted and artefacts consist mostly of flakes and blades with no retouch and faceted striking platforms, typologically possibly representative of the MSA. Raw material used consists mostly of quartzite, chalcedony and banded ironstone. As mentioned previously artefact densities were in general too low to record an artefact ratio.

Figure 4. Quartzite ridge that will be mined viewed from the West. Note the previous mining activities in the front.

Figure 5. Study area viewed from the South.

Figure 6. Quartzite ridge in the front which protrudes through the surrounding wind-blown red sands.

Figure 7. MSA artefacts on site made from chalcedony, quartzite and banded ironstone.

6.2.1 Coordinates for occurrences

Site Number	Type Site	Cultural Markers	Co ordinate
Find Spot 1	Stone Age	MSA flake from quartzite	S28 58 03.4 E22 10 55.4
Find Spot 2	Stone Age	MSA blade from banded iron stone	S28 58 02.6 E22 10 51.8
Find Spot 3	Stone Age	MSA flake from quartzite	S28 58 02.8 E22 10 45.6
Find Spot 4	Stone Age	MSA flakes from chalcedony	S28 58 07.6 E22 10 47.0

Isolated artefacts were observed scattered mostly to the west of the study area where Quartzite strongly dominates the MSA component and to a lesser degree banded Iron stone. Artefacts consist mostly of large flakes and blades.

7. CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the study there are no significant archaeological risks associated with the re use of the old abandoned quarry. The existing quarry has already changed the character of the site and would have impacted negatively on any cultural resources on the site. However isolated MSA artefacts are found scattered in low densities to the north and west of the disused quarry. These were documented as "occurrences' and are of low archaeological significance as these artefacts are not in situ. Furthermore no indications of stratified archaeological deposits were noted resulting that the archaeological material on site has limited scientific value. Mitigation on these occurrences are deemed unnecessary as any further mitigation is unlikely to result in a greater understanding of the material and the various time periods, and as a result we do not believe further intervention from an archaeological point of view is necessary.

No buildings exist on the site and no cultural landscape elements were noted. Visual impacts to scenic routes and sense of place are also considered to be low. No further mitigation is recommended for this aspect.

Due to the subsurface nature of archaeological material and unmarked graves the possibility of the occurrence of unmarked or informal graves and subsurface finds cannot be excluded. If during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find.

There were no red flags identified during the AIA and subject to approval from SAHRA there is from an archaeological point of view no reason why the development should not proceed

9. PROJECT TEAM

Jaco van der Walt (BA, BA Hons, MA (Wits)), Project Manager

10. STATEMENT OF COMPETENCY

I (Jaco van der Walt) am a member of ASAPA (no 159), and accredited in the following fields of the CRM Section of the association: Iron Age Archaeology, Colonial Period Archaeology, Stone Age Archaeology and Grave Relocation. This accreditation is also valid for/acknowledged by SAHRA and AMAFA.

Currently, I serve as Council Member for the CRM Section of ASAPA, and have been involved in research and contract work in South Africa, Botswana, Zimbabwe, Mozambique, Tanzania and the DRC; having conducted more than 500 AIAs since 2000.

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