HERITAGE IMPACT ASSESSMENT

(REQUIRED UNDER SECTION 38(8) OF THE NHRA (No. 25 OF 1999)

For the proposed prospecting on Portion of Portion 2 of the Farm Lanyon Vale 376 Douglas, Bo Karoo Local Municipality, Pixley ka Seme District Municipality, Northern Cape Province

Type of development:

Prospecting Application

Client:

Greenmined Environmental

Client info:

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Project Reference:
HCAC Project number 2170601

Report date:
June 2017

APPROVAL PAGE

Project Name	**Wouterspan Prospecting Application**
Report Title	Heritage Impact Assessment Portion of Portion 2 of the Farm Lanyon Vale 376 Douglas.
Authority Reference Number	Reference number: NC30/5/1/1/2/11892PR.
Report Status	Final Report
Applicant Name	Wouterspan Boerdey Pty Ltd

	Name	Signature	Qualifications and Certifications	Date
Document Compilation	Jaco van der Walt		MA Archaeology ASAPA #159	June 2017
Field Work	Jaco van der Walt		MA Archaeology ASAPA #159	May 2017
Field Work	Marko Hutten		BA Hons Archaeology	May 2017

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Amendments on Document

Date	Report Reference Number	Description of Amendment

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REPORT OUTLINE

Appendix 6 of the GNR 326 EIA Regulations published on 7 April 2017 provides the requirements for specialist reports undertaken as part of the environmental authorisation process. In line with this, Table 1 provides an overview of Appendix 6 together with information on how these requirements have been met.

Table 1. Specialist Report Requirements.

Requirement from Appendix 6 of GN 326 EIA Regulation 2017	Chapter
(a) Details of - (i) the specialist who prepared the report; and (ii) the expertise of that specialist to compile a specialist report including a curriculum vitae	Section a Section 12
(b) Declaration that the specialist is independent in a form as may be specified by the competent authority	*Declaration of Independence*
(c) Indication of the scope of, and the purpose for which, the report was prepared	Section 1
(cA)an indication of the quality and age of base data used for the specialist report	Section 3.4 and 7.1.
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	9
(d) Duration, Date and season of the site investigation and the relevance of the season to the outcome of the assessment	Section 3.4
(e) Description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used	Section 3
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Section 8 and 9
(g) Identification of any areas to be avoided, including buffers	Section 9
(h) Map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers	Section 8
(I) Description of any assumptions made and any uncertainties or gaps in knowledge	Section 3.7
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity **including identified alternatives on the environment** or activities;	Section 9
(k) Mitigation measures for inclusion in the EMPr	Section 9 and 10
(l) Conditions for inclusion in the environmental authorisation	Section 9 and 10
(m) Monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 9 and 10
(n) Reasoned opinion - (i) as to whether the proposed activity, activities or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity or activities; and	Section 10.2

Requirement from Appendix 6 of GN 326 EIA Regulation 2017	Chapter
(ii) if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	
(o) Description of any consultation process that was undertaken during the course of preparing the specialist report	Section 6
(p) A summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Refer to EIA report
(q) Any other information requested by the competent authority	Section 10

Executive Summary

Wouterspan Boerdery Pty Ltd has applied to prospect on Portion of Portion 2 of the Farm Lanyon Vale 376 Douglas, Bo Karoo Local Municipality, Pixley ka Seme District Municipality, Northern Cape Province. HCAC was appointed to conduct a Heritage Impact Assessment of the proposed project to determine the presence of cultural heritage sites and the impact of the proposed prospecting on these non-renewable resources. The study area was assessed both on desktop level and by a field survey.

The southern section of the study area is extensively impacted on by previous small scale mining activities marked by cobble piles and excavated trenches down to heavily calcretized terraces where solution cavities seemed to be targeted by the miners. The proposed prospecting will be focused on spurs consisting of extensive gravel terrace deposits referred to as “Rooikoppies”. These higher lying areas consist of gravels containing Banded Iron Stone (Jaspelite) that was used as raw material during the Stone Age. The area between Douglas and Prieska have been subjected to various Heritage and Archaeological impact assessments (e.g., Beaumont 2005 & 2007, Morris 2005) as part of prospecting and mining right applications and a portion of the current farm under investigation have been assessed previously (Rossouw 2009). Similar to these studies widespread scatters of low density artefacts were recorded possibly dating to the Early Stone Age. In addition to these Stone Age scatters, a cemetery and a single grave site was recorded. Three sites possibly related to earlier mining camps (digger camps) were also recorded in the southern section of the study area with a historical engraving dating to the 1920’s.

With the implementation of the correct mitigation measures the impact of the proposed exploration on heritage resources is considered acceptable and it is recommended that exploration can commence on the condition that the recommendations as made in this report are adhered to and based on approval from SAHRA.

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Declaration of Independence

Specialist Name	Jaco van der Walt
Declaration of Independence	I declare, as a specialist appointed in terms of the National Environmental Management Act (Act No 108 of 1998) and the associated 2014 Environmental Impact Assessment (EIA) Regulations, that I: • I act as the independent specialist in this application; • I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant; • I declare that there are no circumstances that may compromise my objectivity in performing such work; • I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity; • I will comply with the Act, Regulations and all other applicable legislation; • I have no, and will not engage in, conflicting interests in the undertaking of the activity; • I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority; • All the particulars furnished by me in this form are true and correct; and • I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.
Signature	
Date	2/06/2017

a) Expertise of the specialist

Jaco van der Walt has been practising as a CRM archaeologist for 15 years. He obtained an MA degree in Archaeology from the University of the Witwatersrand focussing on the Iron Age in 2012 and is a PhD candidate at the University of Johannesburg focussing on Stone Age Archaeology with specific interest in the Middle Stone Age (MSA) and Later Stone Age (LSA). Jaco is an accredited member of ASAPA (#159) and have conducted more than 500 impact assessments in Limpopo, Mpumalanga, North West, Free State, Gauteng, KZN as well as he Northern and Eastern Cape Provinces in South Africa.

Jaco has worked on various international projects in Zimbabwe, Botswana, Mozambique, Lesotho, DRC Zambia and Tanzania. Through this he has a sound understanding of the IFC Performance Standard requirements, with specific reference to Performance Standard 8 – Cultural Heritage.

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ABBREVIATIONS

AIA: Archaeological Impact Assessment
ASAPA: Association of South African Professional Archaeologists
BGG Burial Ground and Graves
BIA: Basic Impact Assessment
CFPs: Chance Find Procedures
CMP: Conservation Management Plan
CRR: Comments and Response Report
CRM: Cultural Resource Management
DEA: Department of Environmental Affairs
EA: Environmental Authorisation
EAP: Environmental Assessment Practitioner
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EIA Practitioner: Environmental Impact Assessment Practitioner
EMP: Environmental Management Programme
ESA: Early Stone Age
ESIA: Environmental and Social Impact Assessment
GIS Geographical Information System
GPS: Global Positioning System
GRP Grave Relocation Plan
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, 1998 (Act No. 107 of 1998)
NHRA National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NID Notification of Intent to Develop
NoK Next-of-Kin
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 Introduction and Terms of Reference:

Wouterspan Boerdery Pty Ltd has applied to prospect on Portion of Portion 2 of the Farm Lanyon Vale 376 Douglas, Bo Karoo Local Municipality, Pixley ka Seme District Municipality, Northern Cape Province. Heritage Contracts and Archaeological Consulting CC (**HCAC)** has been contracted by Greenmined Environmental to conduct a heritage impact assessment of the proposed impact area. The report forms part of the Environmental Impact Assessment Report (EIA) and Environmental Management Programme Report (EMPR) for the Wouterspan prospecting application.

The aim of the study is to survey the proposed development footprint 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 No 25 of 1999). The report outlines the approach and methodology utilized before and during the survey, which includes: Phase 1, review of relevant literature; Phase 2, the physical surveying of the area on foot and by vehicle; Phase 3, reporting the outcome of the study.

During the survey, several heritage sites and features were identified. 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. SAHRA as a commenting authority under section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) require all environmental documents, complied in support of an Environmental Authorisation application as defined by NEMA EIA Regs section 40 (1) and (2), to be submitted to SAHRA. As such the Environmental Impact Assessment report and its appendices must be submitted to the case as well as the EMPr, once it's completed by the Environmental Assessment Practitioner (EAP).

1.1 Terms of Reference

Field study

Conduct a field study to: (a) locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) record GPS points of sites/areas identified as significant areas; c) determine the levels of significance of the various types of heritage resources affected by the proposed development.

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 the relevant legislation, SAHRA minimum standards 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 No 25 of 1999).

Table 2: Project Description

Size of farm and portions	Portion of Portion 2 of the Farm Lanyon Vale 376 Douglas (Figure 1 – 3). The extent of the farm is 2314 ha, but the area earmarked for exploration is around 900 ha.
Magisterial District	Bo Karoo Local Municipality, Pixley ka Seme District Municipality
1: 50 000 map sheet number	2923 AB
Central co-ordinate of the development	29° 13' 29.5858" S 23° 19' 01.0364" E

Table 3: Infrastructure and project activities

Type of development	Mining prospecting application
Project size	The extent of the farm is 2314 ha, but the area earmarked for exploration is around 900 ha.
Project Components	**The site will consist of the following:** **Construction vehicles:** o Loader WA 320 Komatso o Excavator o 2 x Dump trucks o Bull dozer **Plant:** o Screen 40mm o Screen 5mm o Scrubber o 16 foot rotary pan o Dewatering screen o Flow-sort machine **Infrastructure:** o Mobile site office o Portable ablution facility o 1000L Diesel Bowser o Generator o Disposal Skips

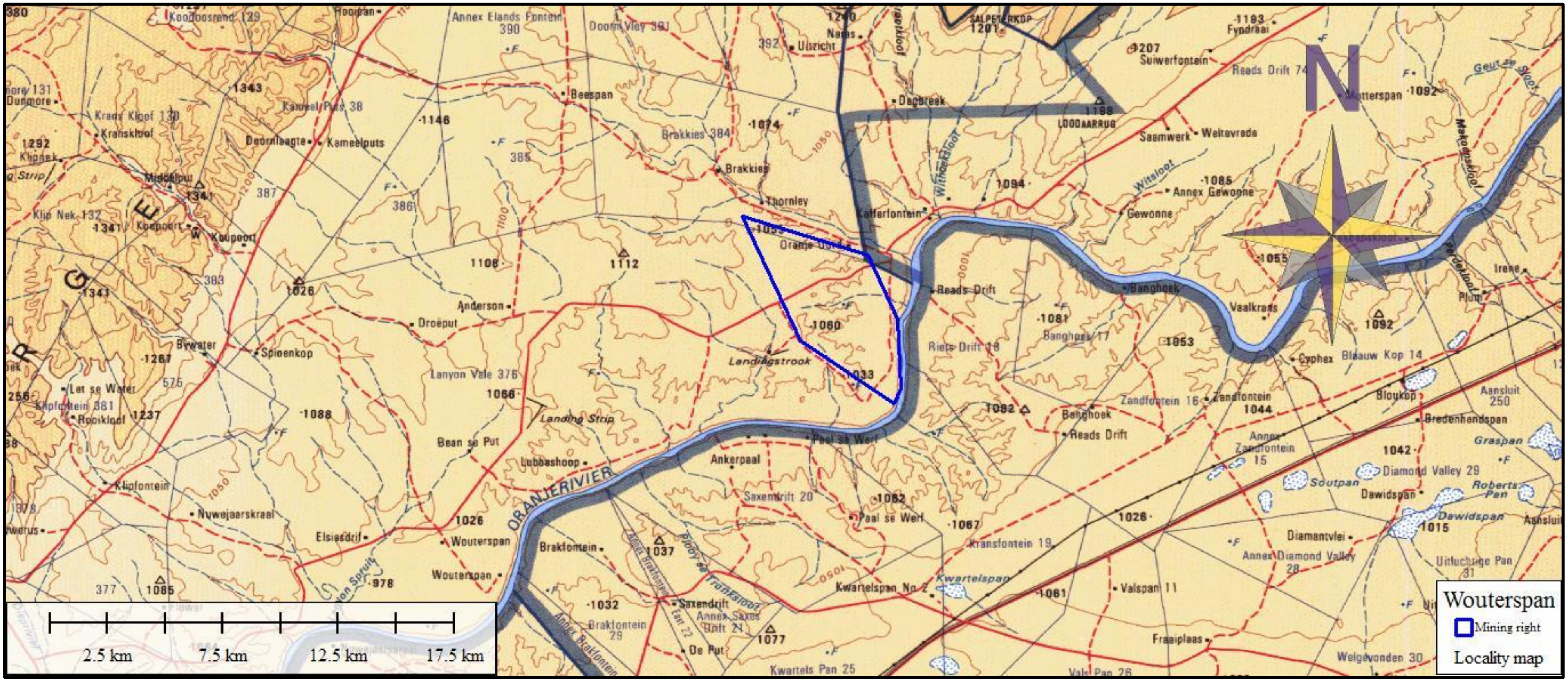


Figure 1. Provincial locality map (1: 250 000 topographical map)

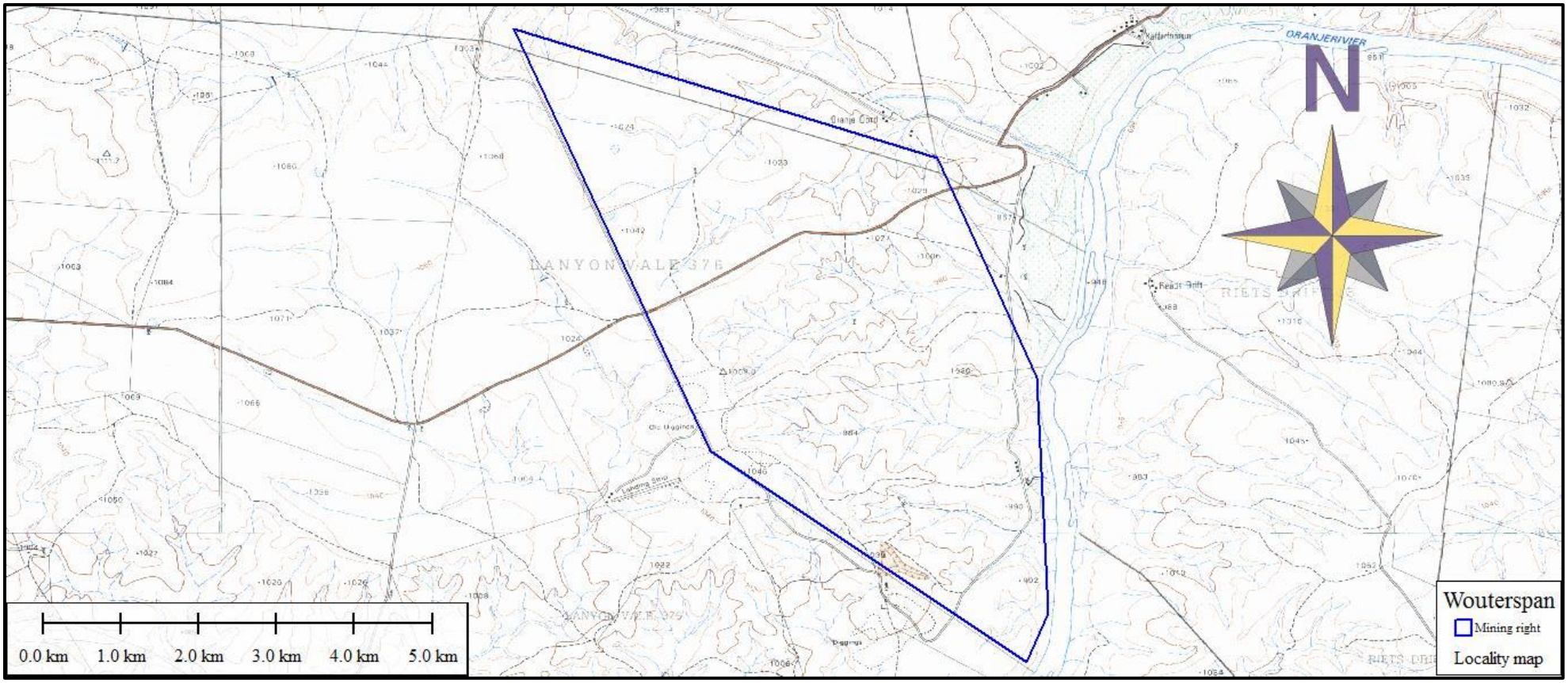


Figure 2: Regional locality map (1:50 000 topographical map).

Figure 3. Satellite image indicating the study area in green (Google Earth 2015).

2 Legislative Requirements

The HIA, as a specialist sub-section of the EIA, is required under the following legislation:

- National Heritage Resources Act (NHRA), Act No. 25 of 1999)
- National Environmental Management Act (NEMA), Act No. 107 of 1998 - Section 23(2)(b)
- Mineral and Petroleum Resources Development Act (MPRDA), Act No. 28 of 2002 - Section 39(3)(b)(iii)

A Phase 1 HIA is a pre-requisite for development in South Africa as prescribed by SAHRA and stipulated by legislation. The overall purpose of 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; and
- Make recommendations for the appropriate heritage management of these impacts.

The HIA should be submitted, as part of the impact assessment report or EMPr, to the PHRA if established in the province or to SAHRA. SAHRA will ultimately be 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 impact assessment report and/or EMPr, 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 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 AIA's are primarily concerned with the location and identification of heritage 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 with SAHRA by the applicant 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 reinternment 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).

3 METHODOLOGY

3.1 Literature Review

A brief survey of available literature was conducted to extract data and information on the area in question to provide general heritage context into which the development would be set. This literature search included published material, unpublished commercial reports and online material, including reports sourced from the South African Heritage Resources Information System (SAHRIS).

3.2 Genealogical Society and Google Earth Monuments

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where sites of heritage significance might be located; these locations were marked and visited during the field work phase. The database of the Genealogical Society was consulted to collect data on any known graves in the area.

3.3 Public Consultation and Stakeholder Engagement:

Stakeholder engagement is a key component of any EIA process, it involves stakeholders interested in, or affected by the proposed development. Stakeholders are provided with an opportunity to raise issues of concern (for the purposes of this report only heritage related issues will be included). The aim of the public consultation process was to capture and address any issues raised by community members and other stakeholders during key stakeholder and public meetings. The process involved:

- Placement of advertisements and site notices
- Stakeholder notification (through the dissemination of information and meeting invitations);
- Stakeholder meetings undertaken with I&APs;
- Authority Consultation
- The compilation of an Environmental Impact Assessment (EIA) Report.
- The compilation of a Comments and Response Report (CRR).

3.4 Site Investigation

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 of sites/areas identified as significant areas; c) determine the levels of significance of the various types of heritage resources recorded in the project area.

Table 4: Site Investigation Details

	Site Investigation
Date	23 – 27 May 2017
Season	Early winter –vegetation in the study area is low with good archaeological visibility. The impact area was sufficiently covered (Figure 4) to adequately record the presence of heritage resources.

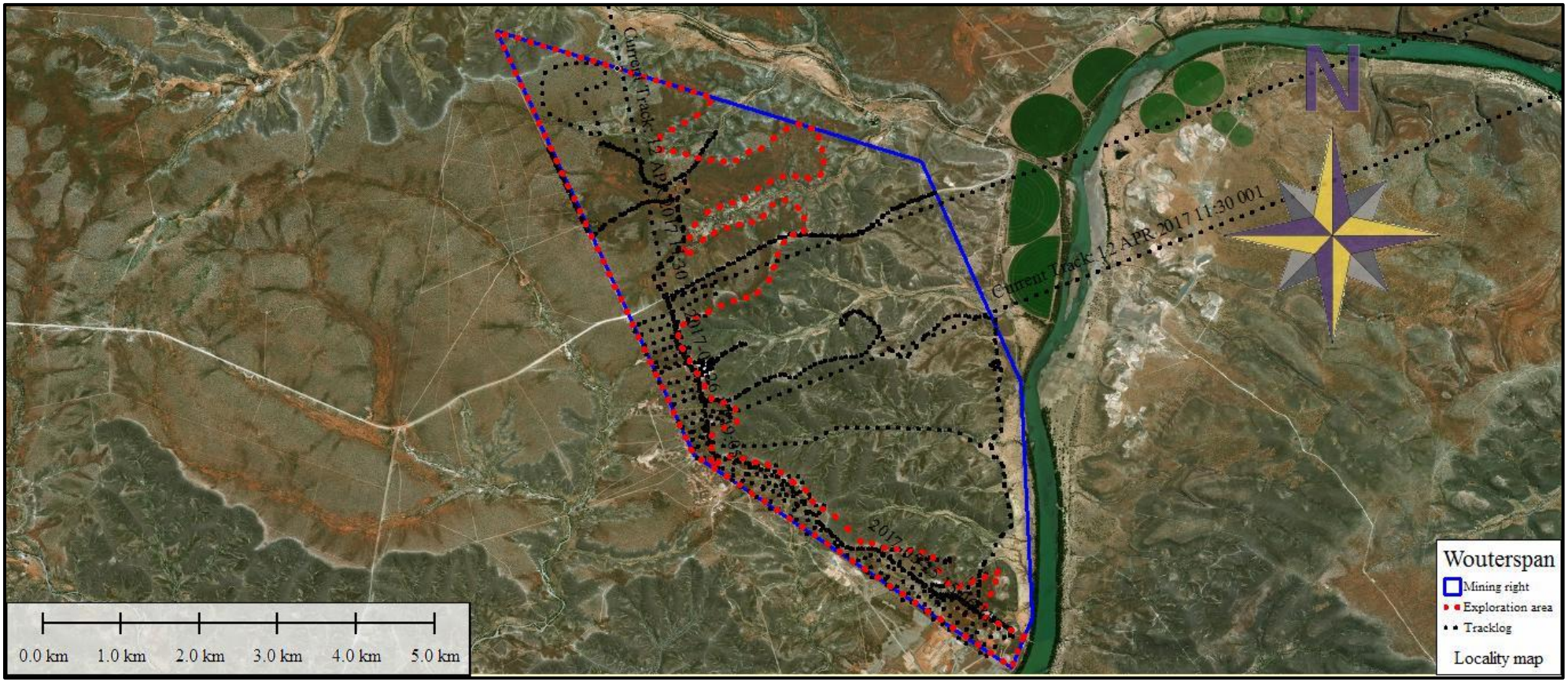


Figure 4: Track logs of the survey in black, the exploration area indicated in red.

3.5 Site Significance and Field Rating

Section 3 of the NHRA 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.

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 project 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 with cognisance of Section 3 of the NHRA:

- 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; and
- Potential to answer present research questions.

In addition to this criteria field ratings 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 10 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

3.6 Impact Assessment Methodology

The criteria below are used to establish the impact rating on sites:

- The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high):
- The **duration**, wherein it will be indicated whether:
  - the lifetime of the impact will be of a very short duration (0-1 years), assigned a score of 1;
  - the lifetime of the impact will be of a short duration (2-5 years), assigned a score of 2;
  - medium-term (5-15 years), assigned a score of 3;
  - long term (> 15 years), assigned a score of 4; or
  - permanent, assigned a score of 5;
- The **magnitude**, quantified on a scale from 0-10 where; 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- The **probability of occurrence**, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1-5 where; 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).

- The **significance**, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high; and
- the **status**, which will be described as either positive, negative or neutral.
- the degree to which the impact can be reversed.
- the degree to which the impact may cause irreplaceable loss of resources.
- the *degree* to which the impact can be mitigated.

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

S=(E+D+M) P

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

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

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

3.7 Limitations and Constraints of the study

The authors acknowledge that the brief literature review is not exhaustive on the literature of the area. Due to the subsurface nature of archaeological artefacts, the possibility exists that some features or artefacts may not have been discovered/recorded during the survey and the possible occurrence of unmarked graves and other cultural material cannot be excluded. Similarly, the depth of the deposit of heritage sites cannot be accurately determined due its subsurface nature. This report only deals with the footprint area of the proposed development and consisted of non-intrusive surface surveys. This study did not assess the impact on medicinal plants and intangible heritage as it is assumed that these components would have been highlighted through the public consultation process if relevant. It is possible that new information could come to light in future, which might change the results of this Impact Assessment.

4 Description of Socio Economic Environmental

The following information was obtained from the 2015 – 2016 Pixley Ka Seme District Municipality Integrated Development Plan:

According to the figure obtained in the census of 2011 the district has a higher unemployment (44.5%) and a lower employment rate (36.1%) than the province. A larger portion (37.8%) of the population is not economically active, although they are of a PEA age (between 15 – 65 years). These persons are either not able to work or chose not to work.

The Wouterspan prospecting and mining project will create employment opportunities as additional workers to be appointed on this prospecting site will be sourced from the local community. Workers will daily be transported to the site. Consumable material and products will be sourced from suitable suppliers where possible within the local community. Diamonds will be sold to Kimberley and Johannesburg.

5 Description of the Physical Environment:

The geology of the Gariep drainage between Douglas and Prieska consists of widespread gravel terrace deposits that occur up to several hundred meters above the present river level. These areas are marked by cobble heaps relating to previous small scale mining activities. The vegetation and landscape is described as flat alluvial terraces supporting complex of riparian thickets (gallery forests) dominated by native Acacia karroo and Diospyros lyciodes, flooded grassland, reed beds and ephemeral herblands populating mainly sand banks within the river and on its banks (BID). The vegetation is described as Northern Upper Karoo (Mucina & Rutherford 2006).

Figure 5. Southern section of the study area

Figure 6. Cobble heaps marking previous mining activities

Figure 7. Eastern section of the study area.

Figure 8. Central section

Figure 9. Cobble heaps marking previous mining activities

Figure 10. North eastern section of the study area

6 Results of Public Consultation and Stakeholder Engagement:

Adjacent landowners and the public at large were informed of the proposed activity as part of the EIA process. Site notices and advertisements notifying interested and affected parties were placed at strategic points and in local newspapers as part of the process.

7 Brief background to the study area:

7.1 Literature Review

The following reports were conducted close to the study area and were consulted for this report toprovide general heritage context into which the development would be set:

Author	Year	Project	Findings
Beaumont, P. B	2005	Heritage Study for an EMP covering a portion of Remainder of Kransfontein 19	Stone tool scatters
Beaumont, P.B	2007	Phase 1 Heritage Impact Assessment Report On The Remainder of Portion 9 (Wouterspan), Portion 14 (Stofdraai) And Portion 16 (A Portion Of Portion 9) Of The Farm Lanyon Vale 376, On The Orange River Downstream Of Douglas, Karoo District Municipality, Northern Cape Province	No sites were identified but a stone age scatter was noted.
Rossouw,L.	2009	Phase 1 Archaeological Impact Assessment of a portion (Elsies Drift) of the farm Lanyonvale No. 376, Hay district, Northern Cape Province	Graves and stone age scatters were recorded.
Morris, D.	2011	Screening Phase Heritage Assessment of the proposed PV solar park near Douglas, Northern Cape	No sites were identified

7.1.1 Genealogical Society and Google Earth Monuments

No known grave sites are indicated in the study area.

7.2 Paleontological background of the area

The following section has been authored by Lloyd Rossouw for a CRM study conducted on Lanyon Vale 376 (2009): "*The Middle and Lower Gariep basin cuts through a series of post-Karoo fluvial remnants. To the west of Prieska the landscape is dissected by the ancient Koa Valley, a Miocene relic with remnants of Cenozoic fluvial deposits that has produced fossil vertebrate bone as well as fossil wood. Southwards, the Koa Valley joins an extensive system of pans fossil where several Palaeogene and Neogene vertebrate fossil remains have been identified. No fossils have been explicitly reported from the terraces between Douglas and Prieska yet, but a variety of fossil fauna have been retrieved from gravel terraces along the Lower Vaal River basin. Here, gravel terraces between 21m and 30m above present river level, contain frequent sandy lenses and have yielded vertebrate fauna such as the extinct proboscidian, Mammuthus subplanifrons that are estimated to be ranging in age from 4.5 to 3.5 million years old. Other fossil remains include extinct suids and more proboscidian taxa, notably Notochoerus cape ns is, and Elephas iolensis"*

7.3 Archaeology of the area

The larger study area has a wealth of pre-colonial archaeological sites (Morris & Beaumont 2004), these sites often occur focused along rivers such as the Orange and the Vaal, on or around koppies, as well as at the verges of pans. Also, notable in the larger study area are rock engravings on dolerite hills (Wilman 1933; Morris 1988). Numerous rock art sites have been recorded with petroglyphs in Middle Orange River Basin especially around Prieska. Rock engravings have been recorded on the farms Wonderdraai, Uitdraai, Sandfontein, Rooilaagte and Niekerkshoop (Rossouw 2009). Colonial era traces occur in association with farming activity as well as historic mining activity. The archaeological record for the greater study area consists of the Stone Age and Iron Age.

7.3.1 Stone Age

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 (Lombard 2011). The three main phases can be divided as follows;

- Later Stone Age; associated with Khoi and San societies and their immediate predecessors. Recently to ~30 thousand years ago.
- Middle Stone Age; associated with Homo sapiens and archaic modern humans. 30-300 thousand years ago.
- Earlier Stone Age; associated with early Homo groups such as Homo habilis and Homo erectus. 400 000-> 2 million years ago.

7.3.2 Iron Age

The Iron Age as a whole represents the spread of Bantu speaking people and includes both the pre-Historic and Historic periods. It can be divided into three distinct periods:

- The Early Iron Age: Most of the first millennium AD.
- The Middle Iron Age: 10th to 13th centuries AD
- The Late Iron Age: 14th century to colonial period.

The Iron Age is characterised by the ability of these early people to manipulate and work Iron ore into implements that assisted them in creating a favourable environment to make a better living.

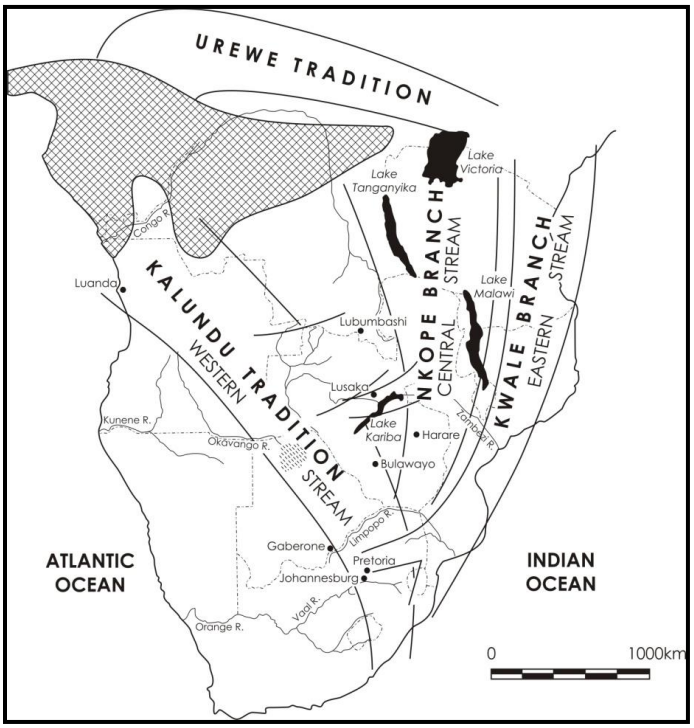


Figure 11: Movement of Bantu speaking farmers (Huffman 2007)

Iron Age expansion in the Northern cape took place southwards past Kuruman into the Ghaap plato and towards Postmasburg and dates to the 1600's (Humphreys, 1976). Definite dates for Tswana presence in the Postmasburg area are around 1805 when Lichtenstein visited the area and noted the mining activities of the Tswana (probably the Thlaping) tribes in the area. The greater study area was marginal in terms of the settlement of Iron Age communities of the Highveld.

7.4 Anglo-Boer War

Although Prieska and Douglas have a rich history relating to the Anglo Boer war no reference to any battlefields or concentration camps were found close to the study area.

7.5 Cultural Landscape

The area has been used for grazing and small scale mining activities in the past and infrastructure relaint to these activities are found across the study area. The areas adjacent to the farm under investigation are currently being mined.

Figure 12. 1957 Aerial photograph of the study area indicating no major developments.

7.6 Douglas

Douglas was founded in 1848 as a mission station on the farm Backhouse by the Reverend Isaac Hughes. In 1867, a group of Europeans from Griquatown signed an agreement giving them the right to establish a town. The town was named after General Sir Robert Percy Douglas, Lieutenant Governor of the Cape Colony (http://www.douglashistory.co.uk/history/Places/douglas_northerncape.htm#.WTAf9mh97IU)

8 Findings of the Survey

The proposed prospecting will be focused on spurs consisting of extensive gravel terrace deposits referred to as “Rooikoppies”. Lower lying fluvial sediments characterised by sandstones, mudstones and shales will not be mined and although these areas were inspected the survey focussed on the areas to be mined (Figure 4).

The southern section of the study area (south of the gravel road) is extensively impacted on by previous small scale mining activities (Figure 19) marked by cobble piles and excavated trenches down to heavily calcretized terraces where solution cavities seemed to be targeted by the miners (Figure 13). Stone Age artefacts in this area are out of context and of low significance.

These mined sites are situated along a ridge which runs along the south-western boundary of the property. The mined areas are concentrated around the highest parts of the property and the biggest concentration of these previously mined areas is situated near the Trig Beacon on the highest point of the property.

The ridge or the geology of the ridge along the south-western boundary of the property is known as “rooikoppie” and it is named after the red rocks (Banded Iron Stone) and gravels found along this ridge. These red rocks and gravels are rumoured to potentially hold diamonds and are the focus of the proposed mining exploration application. The highest parts of the ridge on this side of the property have the highest quantity of these red rocks and gravels. Down the slopes of the ridge and the other lower lying areas the red rocks and gravels disappear and so does the number of previously mined activities.

The previously mined areas consist of small concentrations of diggings or excavations with the processing of the materials around the excavated areas. These diggings measure from 10m x 10m in size and bigger. It consists of the removal of the top layers of rock, gravels and soil until a layer of calcrete was found. The layer of calcrete was cleaned from all gravels and all potholes and voids within this calcrete layer were also cleaned completely. It was believed that diamonds would have fallen into these hollows and potholes.

The removal of the top layers seemed to involve three different processes. The first process was to remove all large lumps of rock and to dump them on a mound. The second process was to sieve the left-over gravels and soil through a contraption with a screen which was known as a “baby”. The screen was rocked up and down as you would rock a baby to sleep. With this action, the finer soils would fall through the screen and the coarser materials will be left out. The coarser materials were dumped on mounds situated close to the location of the “baby”. The fine screened materials were also dumped in close proximity of the operating screens. The third process was most probably to sort and look through the coarser materials and the screened materials in the search for diamonds.

The screens or “babies” were table-like contraptions with a set of legs on the end of an elongated working surface. The legs of these screens were made to stand solid and level on little foundations created for them. These foundations consist of an outline of packed rocks which measure approximately 1m x 1m in size although it differs across the site where they were identified. The screened materials in between these foundations were obviously removed to be sorted in the search for diamonds. Larger and raised foundations for these “babies” were also encountered. This could possibly indicate a larger investment and improved activity as well as better production at the identified mining sites.

Several artefacts, such as a part of the screen, tools, wire and cans were found in and around these diggings.

Figure 13. Solution cavities targeted by miners.

Figure 14. Evidence of previous mining activities.

Figure 15. Stone packed features relating to previous mining activities.

Figure 16. Artefacts used during previous mining activities..

Figure 17. Evidence of previous mine workings

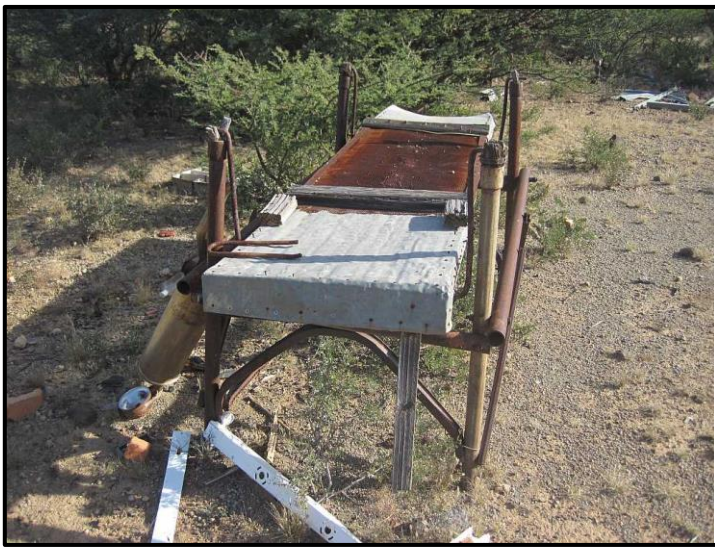


Figure 18. Evidence of mining activities (Baby)

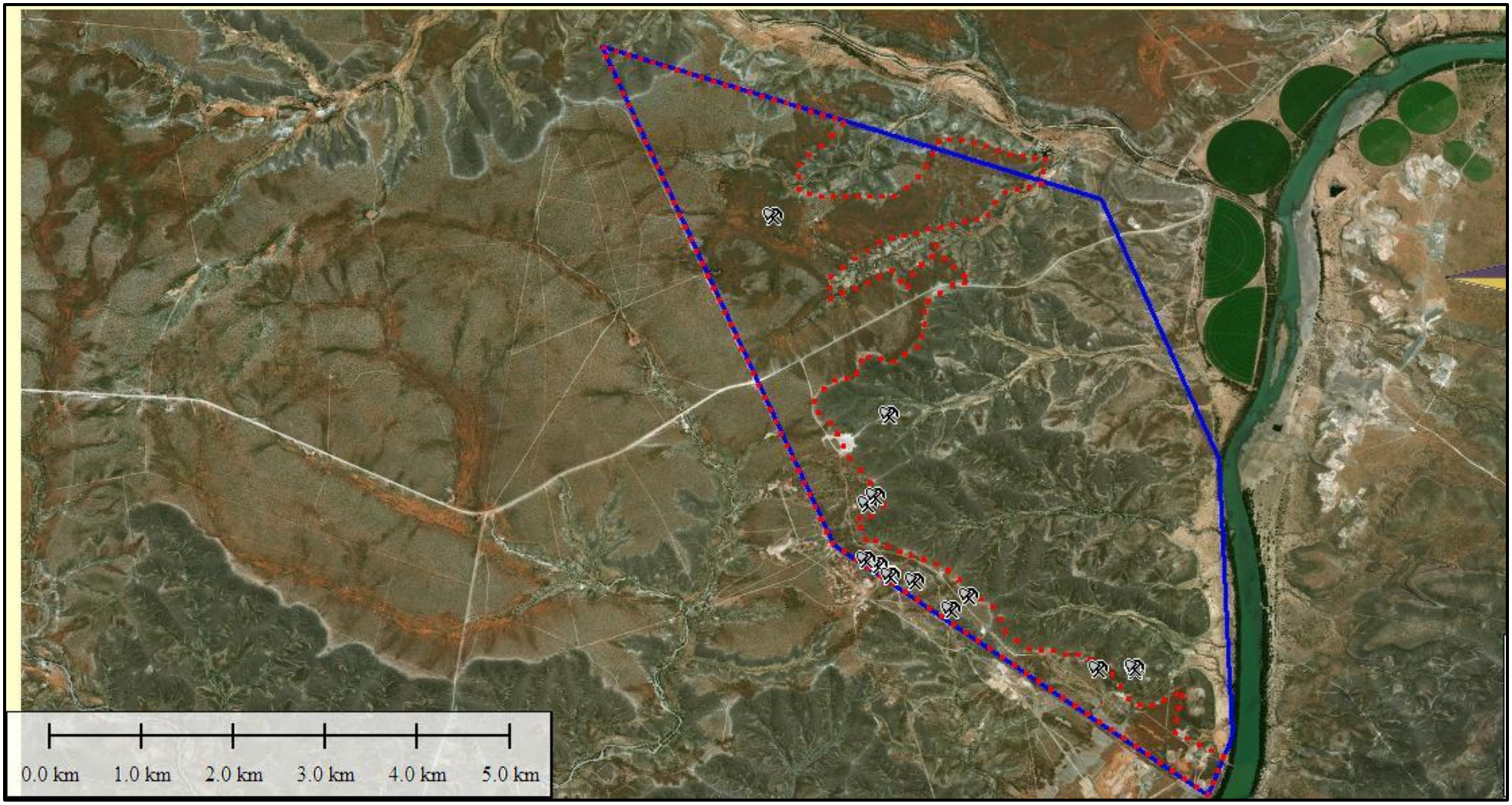


Figure 19. Mining activity in the exploration area (indicated in red). The prospecting area is indicated in blue.

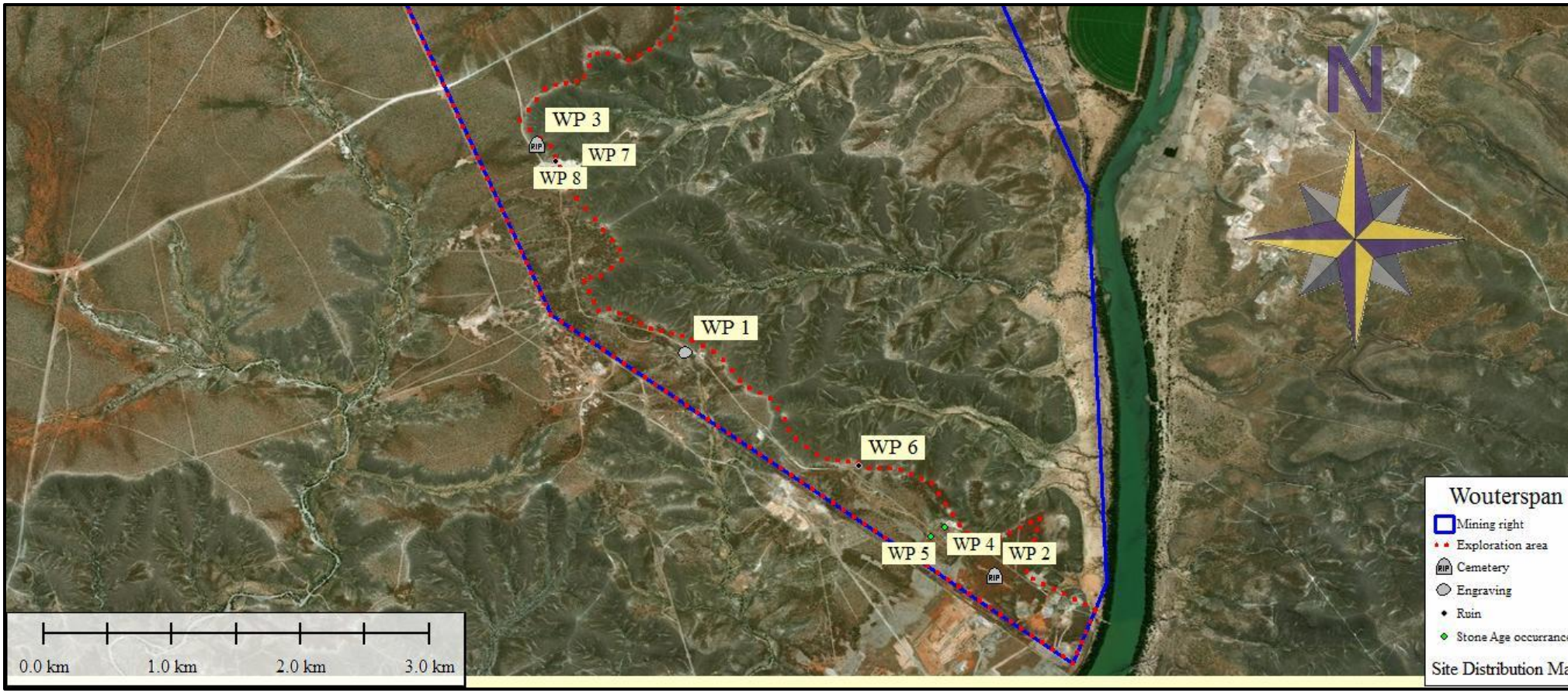


Figure 20. Site distribution map.

9 Description of Identified Heritage Resources (NHRA Section 34 -36):

9.1 Built Environment (Section 34 of the NHRA)

No standing structures older than 60 years occur in the study area although mining trenches of unknown age occur in the southern portion of the study area as well as the remains of ephemeral camps. A single historical engraving was recorded and described under built environment as it probably relates to these previous mining trenches.

Site WP 1 (29º 14' 36.7" S 23º 18' 55.2" E)

Site Description:
A rock with an engraving was identified at this location. This rock is situated underneath a tree (Figure 20) and on the south-western side of the access road to the site. The rock has a large flattish top surface on which the engraving was performed (Figure 21, 22 & 23).

The rock engraving consists of the initials "J J F" in the first line and with the letter "J" and the date 1921(?)/6 in the second line. The last number of the date is not clear.

J J F
J – 1921/6

A piece of a lead sealed Bully Beef (Figure 24) can was picked up north east from the engraving.

Site size: Approximately 2m x 2m.

Figure 21. Site conditions: Site 1

Figure 22.Flat surfaced rock with engravings

Figure 23. Rock engravings

Figure 24. Bully beef can

Figure 25. Engraving

Figure 26. Rock engraving

Site WP 6 (29° 15' 04.9895" S, 23° 19' 38.7265" E)

This is the location of what is assumed to be the location of a diggers / miner's camp. The site is found on top of an area that was previously mined and is right on top of the calcrete with no visible archaeological deposit. An ephemeral linear stone packed foundation is found here with metal artefacts and glass fragments (Figure 27 – 30) scattered over an area of 20 x 20 meter.

Figure 27. Metal artefacts

Figure 28. Metal artefacts scattered on site WP 8.

Figure 29. Ephemeral stone packed features.

Figure 30. Ephemeral stone packed wall.

Site WP 7 (29° 13' 51.3263" S, 23° 18' 28.4112" E)

This is the location of several stone built structures on the edge of a ridge. Cans and fragments of glass is scattered over the site with several diggings 145 meters directly north of it A rectangular structure with an entrance roughly west (measuring 4x4 meter) at least 3 circles or half circles measuring 6 meters in diameter is found here with a stone cairn.

Figure 31: Rectangular dwelling

Figure 32:Circular stone wall

Figure 33: Site viewed from the south west

Figure 34: Site conditions at WP 7

Site WP 8 (29° 13' 48.5581" S, 23° 18' 22.4136" E)

This is the location of the remains of two rectangular stone wall foundations. Several cans etc. are scattered over the site. The foundations measures approximately 5x5 meters.

Figure 35: Site viewed from the south

Figure 36:Ephemeral linear stone wall foundations

9.2 Archaeological resources (Section 35 of the NHRA)

Gravel terraces containing Banded Iron Stone (Jaspelite) occur in the north and western sections of the study area. As a result of the availability of raw material, Stone Age artefacts are found widespread across the study area. These low density widespread occurrences (especially in the southern section where widespread mining activities impacted on these artefacts) are of low heritage significance, similar to findings in the area (Beaumont 2005 & 2007, Rossouw 2009). These artefacts are almost entirely made from Banded Iron Stone (Figure 37 & 38). The artefacts consist mostly of flakes (mostly side struck) with much cortex and irregular cores. A Few flakes do have faceted platforms but few formal tools were noted (apart from WP4 & 5). These finds are tentatively described as representing mostly a grading from Fauresmith into early MSA

Figure 37. Stone tools, north of the gravel road.

Figure 38. Stone tools, south of the gravel road.

Site WP 4

Single bifacial (probably acheulean) artefact within old diggings. The artefact is on the surface without any other material located on the exposed calcrete with no archaeological deposit present. The entire area has been mined and is extensively disturbed. This location does not constitute a site but a find spot and is of no significance. It is however recorded as a site as no other formal tools were noted in the study area.

Site WP5

Here a single artefact was recorded within an area that has been previously mined down to the calcrete. More recently a dirt road has been scraped and the artefact is found within the scraped road and is out of context. The bifacial artifact is tentatively ascribed to the Fauresmith techno complex dating to between 280,000 and 500,000 years ago (Lombard 2011). This location does not constitute a site but a find spot and is of no significance. It is however recorded as a site as no other formal tools were noted in the study area.

Both WP 4 & 5 is of low heritage significance and out of context due to disturbance caused by previous mining activities in the area.

Figure 39. Bifacial artefact from WP 4

Figure 40. Bifacial artefact from WP 5.

9.3 Burial Grounds and Graves (Section 36 of the NHRA)

Site WP 2 (29º 15' 32.9" S 23º 20' 12.9" E)

Site Description:

A single possible grave was identified at this location. This possible grave was identified within an area that has sandy soils and not the predominantly rocky soils and gravels as encountered across the rest of the proposed site. It consists of a mound of soil which was covered with a layer of packed rocks. It measures approximately 2m in length and is orientated from west to east. It is also overgrown with grass and other vegetation. No other graves or features are associated with this possible identified grave.

Site size: Approximately 2m x 3m.

Figure 41. Site viewed from the east

Figure 42. Stone packed cairn

Site WP 3 (29º 13’ 44.6” S 23º 18’ 17.6” E)

Site Description:
An informal cemetery with 36 informal graves was identified at this location. The cemetery is situated on a ridge on the south-western extent of the proposed study area. It is situated on the north-eastern side of the access road to the site and on the northern side of a Trig Beacon.

The graves were placed in six unequal lines and they were all orientated from west to east. Most of the graves have oval shaped mounds of packed rocks, but some graves also have oval shaped outlines of packed rocks which were filled with soil and gravel.

Some of the graves also have rocks placed upright to serve as headstones. And a few graves have bottles placed on them as grave goods.

None of the graves had any inscribed headstones or inscriptions to indicate their identity or age. The graves are not maintained and are overgrown with grass and other vegetation.

Site size: Approximately 30m x 40m.

Figure 43. General site conditions: Site 3

Figure 44. Stone packed grave dressing

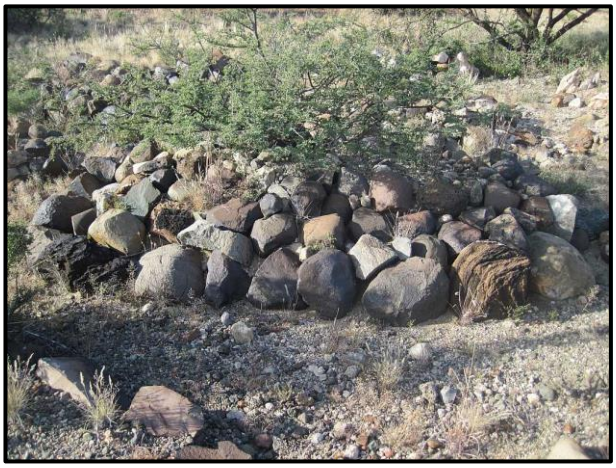


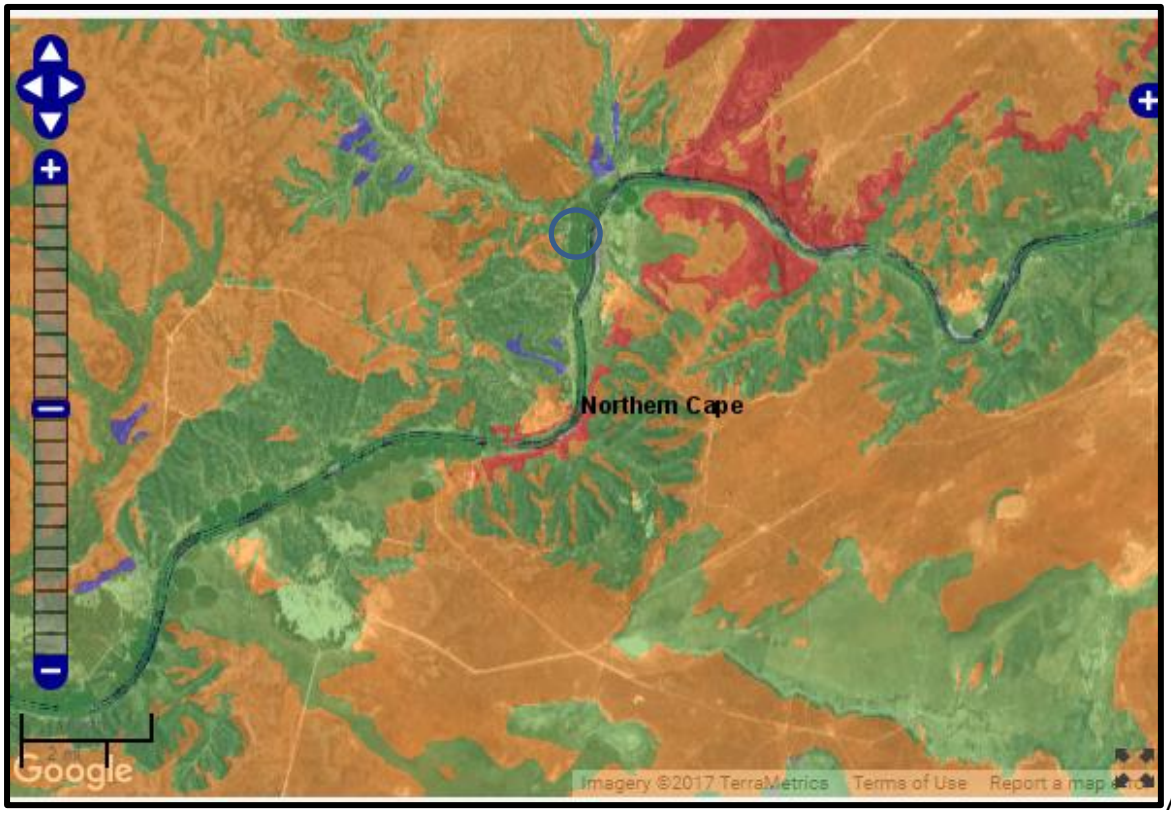
Figure 45. Stone packed grave.

Figure 46. Stone packed graves in cemetery.

9.4 Cultural Landscapes, Intangible and Living Heritage.

Long term impact on the cultural landscape is considered to be negligible as the surrounding area is currently being mined and consist of extensive mining activities in the past. Visual impacts to scenic routes and sense of place are also considered to be low as the site will be rehabilitated immediately.

9.5 Palaeontological Resources



An

Colour	Sensitivity	Required Action
RED	VERY HIGH	Field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	Desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	Desktop study is required
BLUE	LOW	No palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	No palaeontological studies are required
WHITE/CLEAR	UNKNOWN	These areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

No fossils have been explicitly reported from the terraces between Douglas and Prieska yet, but a variety of fossil fauna have been retrieved from gravel terraces along the Lower Vaal River basin. Here, gravel terraces between 21m and 30m above present river level, contain frequent sandy lenses and have yielded vertebrate fauna such as the extinct proboscidian, *Mammuthus subplanifrons* that are estimated to be ranging in age from 4.5 to 3.5 million years old. Other fossil remains include extinct suids and more

proboscidian taxa, notably *Notochoerus cape ns is,* and *Elephas iolensis.* Follow-up investigations by experts should take place occasionally with regard to intact gravel deposits.

9.6 Battlefields and Concentration Camps

There are no battlefields or concentration camp sites close to the study area.

9.7 Potential Impact

The chances of impacting unknown archaeological sites in the study area is considered to be negligible. Any direct impacts that may occur would be during the exploration phase and would be of very low significance. If the project commence into full scale mining impacts are expected to be higher. Cumulative impacts will with the recommended mitigation measures and management actions, not impact heritage resources severely. However, this and other projects in the area could have an indirect impact on the heritage landscape.

9.7.1 Exploration phase:

It is assumed that the exploration phase involves the removal of topsoil and vegetation as well as the establishment of infrastructure needed for the mining phase. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources.

9.7.2 Mining Phase

During this phase, the impacts and effects are similar in nature but more extensive than the exploration phase. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources.

9.7.3 Operation Phase:

No impact is envisaged for the recorded heritage resources during this phase.

9.8 Impact Tables

Built Environment and Archaeological Finds (Section 34 and 35) - Site WP 1, 6,7 and 8

Nature: During the exploration phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological and paleontological material or objects.		
	Without mitigation	**With mitigation (Preservation/ excavation of site)**
Extent	Local (3)	Local (3)
Duration	Permanent (5)	Permanent (5)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Improbable (2)
Significance	**42 (Medium)**	**24 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	Yes
Mitigation: It is recommended that during exploration all identified sites should be avoided and preserved. Site WP 4 & 5 are of no heritage significance as they are no in situ and no further mitigation is required for these sites.		
Cumulative impacts: Other authorised projects (e.g., mining) in the area would have a high cumulative impact on the heritage landscape. The exploration area will be rehabilitated and this will reduce the impact on the surrounding heritage landscape.		
Residual Impacts: If sites are destroyed this results in the depletion of archaeological record of the area.		

Graves and burial sites Section 36 WP Site 2 and 3

Nature: During the exploration phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position human remains.		
	Without mitigation	**With mitigation (Preservation/ excavation of site)**
Extent	Local (3)	Local (3)
Duration	Permanent (5)	Permanent (5)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Improbable (2)
Significance	**42 (Medium)**	**24 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	Yes
Mitigation: It is recommended that during exploration all identified graves should be demarcated and avoided. From a heritage point of view a 25 m buffer is sufficient.		
Residual Impacts: Graves are of high social significance and destruction of these sites can have a negative impact on the community of the area.		

10 Conclusion and recommendations

The southern section of the study area is extensively impacted on by previous small scale mining activities marked by cobble piles and excavated trenches down to heavily calcretized terraces where solution cavities seemed to be targeted by the miners. The proposed prospecting will be focused on spurs consisting of extensive gravel terrace deposits referred to as “Rooikoppies”. These higher lying areas consist of gravels containing Banded Iron Stone (Jaspelite) that was used as raw material during the Stone Age. Heritage and Archaeological impact assessments (e.g., Beumont 2005 & 2007, Morris 2005) in the area as well as a portion of the current farm under investigation (Rossouw 2009) recorded similar scatters and these widespread scatters (possibly dating to the Early Stone Age) were ascribed a low significance rating. In terms of Lower lying fluvial sediments characterised by sandstones, mudstones and shales will not be mined and although these areas were inspected no heritage features of significance were recorded in these areas.

In terms of the archaeological component of Section 35 the area is characterised by widespread low density scatters consisting of mostly flakes and a few blades. Similar scatters in the area have been ascribed to the ESA (Beaumont 2007 & Rossouw 2009). Within the study area bifacial artefacts were noted, tentatively ascribed to the Fauresmith techno complex dating to between 280,000 and 500,000 years ago. These widespread scatters are of low heritage significance as no associated deposit occurs and south of the gravel road the scatters are out of context and no further mitigation is recommended for the exploration phase of the project. If the site will be mined in future, it is recommended that a surface sample of the Stone Age scatter to the north of the gravel road should be collected as these artefacts are not as extensively impacted on as in the south and analysed in order to gain a better understanding of the technology used and to positively ascribed the artefacts to a techno complex.

In terms of the paleontological component in the event that localized fossil material is discovered within the superficial overburden during the exploration phase of the project (i.e. modern-looking but more or less lithified animal bones and teeth), it is recommended that a professional palaeontologist be called in to record and remove the material.

In terms of the built environment of the area (Section 34), no standing structures older than 60 years occur within the study area. Evidence of previous mining activities occurs to the south of the gravel road towards the river. Three possibly miner camps have been identified and it is recommended that these sites should be avoided during exploration with a 20-meter buffer zone. If the sites will be impacted on during mining the sites should be recorded and mapped.

In terms of Section 36 of the Act a possible grave site and an informal cemetery was recorded. Graves are of high social significance and should be avoided during development. From a heritage point of view the graves should be demarcated with a 25-m buffer zone and an access gate for family members. Although it

is possible to relocate graves (adhering to all legal requirements) this must be seen as a last resort. If any graves are located in future they should ideally be preserved *in-situ* or alternatively relocated according to existing legislation. No public monuments are located within or close to the study area. The proposed development will not impact negatively on significant cultural landscapes or viewscapes. During the public participation process conducted for the project no heritage concerns was raised.

In summary, the following recommendations area made:

- If the site will be mined in future, it is recommended that a surface sample of the Stone Age scatter to the North of the gravel road should be collected and analysed in order to gain a better understanding of the technology used and to positively ascribe the artefacts to a techno complex.
- In terms of the paleontological component, in the event that localized fossil material is discovered within the superficial overburden during the construction phase of the project (i.e. modern-looking but more or less lithified animal bones and teeth), it is recommended that a professional palaeontologist should be called in to record and remove the material.
- Three diggers camps (WP 6, 7,8) and an engraving site (WP 1) have been identified and it is recommended that these sites should be avoided during exploration and if the sites will be impacted on during mining the sites should be recorded.
- Graves are of high social significance and should be avoided during development (WP2 and 3). From a heritage point of view the graves should be demarcated with a 25m buffer zone and an access gate for family members. Although it is possible to relocate graves (adhering to all legal requirements) this must be seen as a last resort.
- If any graves are located in future they should ideally be preserved *in-situ* or alternatively relocated according to existing legislation.
- A chance find procedure should be implemented in the EMPR as indicated below:

The possibility of the occurrence of subsurface finds cannot be excluded. Therefore, 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 and therefor chance find procedures should be put in place as part of the EMP for the exploration phase. A short summary of chance find procedures is discussed below.

This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below.

- If during the construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or rock engraving, this person must cease work at the site of

the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.

- It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area.

The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA.

With the implementation of the correct mitigation measure the impact of the proposed exploration on heritage resources is considered acceptable and it is recommended that the proposed exploration can commence on the condition that the recommendations in this report are adhered to and based on approval from SAHRA.

10.1 Reasoned opinion

From a heritage perspective, the impacts of this project can be mitigated to an acceptable level. The following socio-economic benefits as per of the project also outweigh the negative impacts of the development if the correct mitigation measures are employed:

- The Wouterspan prospecting and mining project will create employment opportunities as additional workers to be appointed on this prospecting site will be sourced from the local community.

If during the pre-construction phase or during construction, any archaeological finds are made (e.g. graves, stone tools, and skeletal material), the operations must be stopped, and the archaeologist must be contacted for an assessment of the finds. Due to the subsurface nature of archaeological material and graves the possibility of the occurrence of unmarked or informal graves and subsurface finds cannot be excluded, but can be easily mitigated by preserving the sites *in-situ* within the development.

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12 Appendices:

Curriculum Vitae of Specialist

Jaco van der Walt
Archaeologist

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Education:

Particulars of degrees/diplomas and/or other qualifications:

Name of University or Institution:		University of Pretoria
Degree obtained	**:**	BA Heritage Tourism & Archaeology
Year of graduation	**:**	2001
Name of University or Institution:		University of the Witwatersrand
Degree obtained	**:**	BA Hons Archaeology
Year of graduation	**:**	2002
Name of University or Institution	**:**	University of the Witwatersrand
Degree Obtained	**:**	MA (Archaeology)
Year of Graduation	:	2012
Name of University or Institution	**:**	University of Johannesburg
Degree	**:**	PhD
Year	:	Currently Enrolled

EMPLOYMENT HISTORY:

2011 – Present:	**Owner – HCAC (Heritage Contracts and Archaeological Consulting CC)**.
2007 – 2010 :	**CRM Archaeologist,** Managed the Heritage Contracts Unit at the University of the Witwatersrand.
2005 - 2007:	**CRM Archaeologist**, Director of Matakoma Heritage Consultants
2004:	**Technical Assistant**, Department of Anatomy University of Pretoria
2003:	**Archaeologist**, Mapungubwe World Heritage Site
2001 - 2002:	**CRM Archaeologists,** For R & R Cultural Resource Consultants,

Polokwane

2000: **Museum Assistant**, Fort Klapperkop.

Countries of work experience include:

Republic of South Africa, Botswana, Zimbabwe, Mozambique, Tanzania, The Democratic Republic of the Congo, Lesotho and Zambia.

SELECTED PROJECTS INCLUDE:

Archaeological Impact Assessments (Phase 1)

Heritage Impact Assessment Proposed Discharge Of Treated Mine Water Via The Wonderfontein Spruit Receiving Water Body Specialist as part of team conducting an Archaeological Assessment for the Mmamabula mining project and power supply, Botswana

Archaeological Impact Assessment Mmamethlake Landfill

Archaeological Impact Assessment Libangeni Landfill

Linear Developments

Archaeological Impact Assessment Link Northern Waterline Project At The Suikerbosrand Nature Reserve

Archaeological Impact Assessment Medupi – Spitskop Power Line,

Archaeological Impact Assessment Nelspruit Road Development

Renewable Energy developments

Archaeological Impact Assessment Karoshoek Solar Project

Grave Relocation Projects

Relocation of graves and site monitoring at Chloorkop as well as permit application and liaison with local authorities and social processes with local stakeholders, Gauteng Province.

Relocation of the grave of Rifle Man Maritz as well as permit application and liaison with local authorities and social processes with local stakeholders, Ndumo, Kwa Zulu Natal.

Relocation of the Magolwane graves for the office of the premier, Kwa Zulu Natal

Relocation of the OSuthu Royal Graves office of the premier, Kwa Zulu Natal

Phase 2 Mitigation Projects

Field Director for the Archaeological Mitigation For Booysendal Platinum Mine, Steelpoort, Limpopo Province. Principle investigator Prof. T. Huffman

Monitoring of heritage sites affected by the ARUP Transnet Multipurpose Pipeline under directorship of Gavin Anderson.

Field Director for the Phase 2 mapping of a late Iron Age site located on the farm Kameelbult, Zeerust, North West Province. Under directorship of Prof T. Huffman.

Field Director for the Phase 2 surface sampling of Stone Age sites effected by the Medupi – Spitskop Power Line, Limpopo Province

Heritage management projects

Platreef Mitigation project – mitigation of heritage sites and compilation of conservation management plan.

MEMBERSHIP OF PROFESSIONAL ASSOCIATIONS:

- Association of Southern African Professional Archaeologists. Member number 159

  Accreditation:

  - Field Director Iron Age Archaeology
  - Field Supervisor Colonial Period Archaeology, Stone Age Archaeology and Grave Relocation
- Accredited CRM Archaeologist with SAHRA
- Accredited CRM Archaeologist with AMAFA
- Co-opted council member for the CRM Section of the Association of Southern African Association Professional Archaeologists (2011 – 2012)

PUBLICATIONS AND PRESENTATIONS

- A Culture Historical Interpretation, Aimed at Site Visitors, of the Exposed Eastern Profile of K8 on the Southern terrace at Mapungubwe.
  - J van der Walt, A Meyer, WC Nienaber
  - Poster presented at Faculty day, Faculty of Medicine University of Pretoria 2003
- 'n Reddingsondersoek na Anglo-Boereoorlog-ammunisie, gevind by Ifafi, Noordwes-Provinsie. South-African Journal for Cultural History 16(1) June 2002, with A. van Vollenhoven as co-writer.
- Fieldwork Report: Mapungubwe Stabilization Project.
  - WC Nienaber, M Hutten, S Gaigher, J van der Walt
  - Paper read at the Southern African Association of Archaeologists Biennial Conference 2004
- A War Uncovered: Human Remains from Thabantšho Hill (South Africa), 10 May 1864.
  - M. Steyn, WS Boshoff, WC Nienaber, J van der Walt
  - Paper read at the 12th Congress of the Pan-African Archaeological Association for Prehistory and Related Studies 2005
- Field Report on the mitigation measures conducted on the farm Bokfontein, Brits, North West Province .
  - J van der Walt, P Birkholtz, W. Fourie
  - Paper read at the Southern African Association of Archaeologists Biennial

Conference 2007

- Field report on the mitigation measures employed at Early Farmer sites threatened by development in the Greater Sekhukhune area, Limpopo Province. J van der Walt
    - Paper read at the Southern African Association of Archaeologists Biennial Conference 2008
- Ceramic analysis of an Early Iron Age Site with vitrified dung, Limpopo Province South Africa.
    - J van der Walt. Poster presented at SAFA, Frankfurt Germany 2008
- Bantu Speaker Rock Engravings in the Schoemanskloof Valley, Lydenburg District, Mpumalanga (*In Prep)*
    - J van der Walt and J.P Celliers
- Sterkspruit: Micro-layout of late Iron Age stone walling, Lydenburg, Mpumalanga. W. Fourie and J van der Walt. A Poster presented at the Southern African Association of Archaeologists Biennial Conference 2011
- Detailed mapping of LIA stone-walled settlements' in Lydenburg, Mpumalanga. J van der Walt and J.P Celliers
    - Paper read at the Southern African Association of Archaeologists Biennial Conference 2011
- Bantu-Speaker Rock engravings in the Schoemanskloof Valley, Lydenburg District, Mpumalanga. J.P Celliers and J van der Walt
    - Paper read at the Southern African Association of Archaeologists Biennial Conference 2011
- Pleistocene hominin land use on the western trans-Vaal Highveld ecoregion, South Africa, Jaco van der Walt.
    - J van der Walt. Poster presented at SAFA, Toulouse, France. Biennial Conference 2016

REFERENCES:

1. Prof Marlize Lombard Senior Lecturer, University of Johannesburg, South Africa
   E-mail: mlombard@uj.ac.za
2. Prof TN Huffman Department of Archaeology Tel: (011) 717 6040
   University of the Witwatersrand

3. Alex Schoeman University of the Witwatersrand

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