HERITAGE IMPACT ASSESSMENT

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

FOR THE PROPOSED VAN ZYL SILLIMANITE MINING PERMIT ON THE FARM WORTEL, AGGENEYS AREA, NORTHERN CAPE PROVINCE

Client:

Greenmined Environmental (Pty) Ltd

Client info:

Yolandie Coetzee

HCAC - Heritage Consultants
Private Bag X 1049
Suite 34
Modimolle
0510
Tel: 082 373 8491
Fax: 086 691 6461
E-Mail: jaco.heritage@gmail.com

Report Author:
Mr. J. van der Walt
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REPORT OUTLINE

Appendix 6 of GNR 326 EIA Regulations (7 April 2017) as amended 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 GNR 326 EIA Regulations (7 April 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 1, 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
(I) 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 (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	Section 10.2
(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 EIAr
(q) Any other information requested by the competent authority	Section 10

Executive Summary

HCAC was appointed to conduct a Heritage Impact Assessment of the proposed mining permit and related infrastructural activities on Portion 1 of the farm Wortel 42. The farm Wortel 42 is situated approximately 6 km north of Aggeneys 74,7km west of Pofadder and 148km east of Springbok, Northern Cape Province. The commodity of interest is Sillimanite (SI). The study area of 5 hectares was assessed both on desktop level and by a field survey. The field survey was conducted as a non-intrusive pedestrian survey to cover the extent of the impact areas.

The study area is disturbed from a heritage perspective by dumping of topsoil, clearing and levelling as well as previous mining trenches that would have impacted on surface indicators of heritage resources. The lack of significant heritage resources in the study area was confirmed during the survey, and no heritage features or sites of significance were identified. The proposed mining area is located on a steep slope of Witberg Mountain of mica-sillimanite schists which do not seem to have been conducive to the formation of rock shelters, and no rock art or archaeological sites of significance were recorded. The survey also did not reveal any historical farm steads, colonial-era stone-walling (dwellings or kraals), graves or other sites of significance. Human impact (apart from the existing mining and dumps) is limited to isolated farming infrastructure like farm fences, wind pumps and tracks. In terms of the paleontological component, the general study area is indicated as of low or unknown significance on the SAHRA paleontological sensitivity map. As some areas are of unknown paleontological significance an independent assessment is being undertaken for the project, although studies in the area indicated that the area is not paleontologically significant (Pether 2012; Rossouw 2013).

The cultural landscape consisting of mining and farming activities is generally modern without significant cultural landscape elements of concern and impacts are deemed to be of low significance.

The impact of the proposed project on heritage resources is considered to be low, and it is recommended that the proposed project can commence on the condition that the following recommendations are implemented and based on approval from SAHRA:

- Implementation of a chance finds procedure.

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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	28/10/2019

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.

TABLE OF CONTENTS

Contents

LIST OF FIGURES

LIST OF TABLES

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:

HCAC has been contracted by Greenmined Environmental (Pty) Ltd to conduct a heritage impact assessment of the proposed Van Zyl Sillimanite Mining Permit **i**n the Northern Cape Province (Figure 1 – 3).

The study aims to assess the impact of the proposed project on non-renewable heritage resources and to submit appropriate recommendations about 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, no heritage features or sites of significance were recorded. General site conditions and features on sites were recorded using photographs, GPS locations, and site descriptions. Possible impacts were identified, and mitigation measures are proposed in the following report. SAHRA as the commenting authority under section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) requires all documents, compiled in support of this application to be submitted to SAHRA.

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 towers.

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 property	5 hectares on Portion 1 of the farm Wortel 42. The farm Wortel measures approximately 11490ha.
Magisterial District	Khai Ma Local Municipality, Namakwa District Municipality
1: 50 000 map sheet number	2918BB
Central co-ordinate of the study area	-29.090474° 18.819444°

Table 3: Infrastructure and project activities

Type of development	Mining Right
Project size	5 hectares
Project Components	The mining activities will consist of the following: • Stripping and stockpiling of topsoil; • Blasting; • Excavating; • Crushing; • Stockpiling and transporting; • Sloping and landscaping upon closure of the site; and • Replacing the topsoil and vegetation the disturbed area. The mining site will contain the following: • Drilling equipment; • Excavating equipment; • Earth moving equipment; • Crushing and screening plants • Access Roads; • Site office (Container); • Security gate; • Site vehicles; • Parking area for visitors and site vehicles; • Washbay; • Bunded diesel (20 000l tank) and oil storage facilities; • Weighbridge; and • Ablution facilities (Container with septic tank).

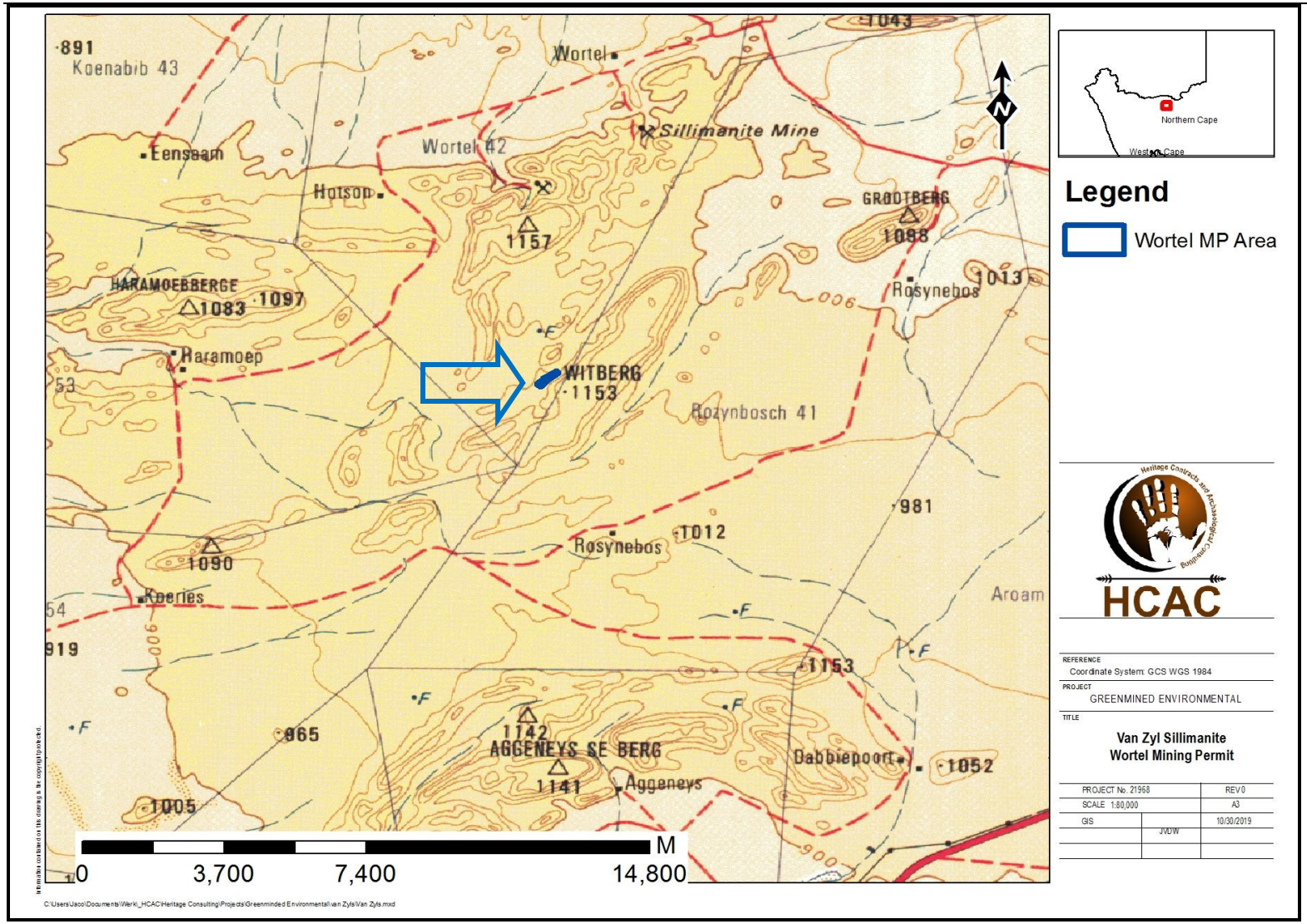

Figure 1. Provincial locality map (1: 250 000 topographical map).

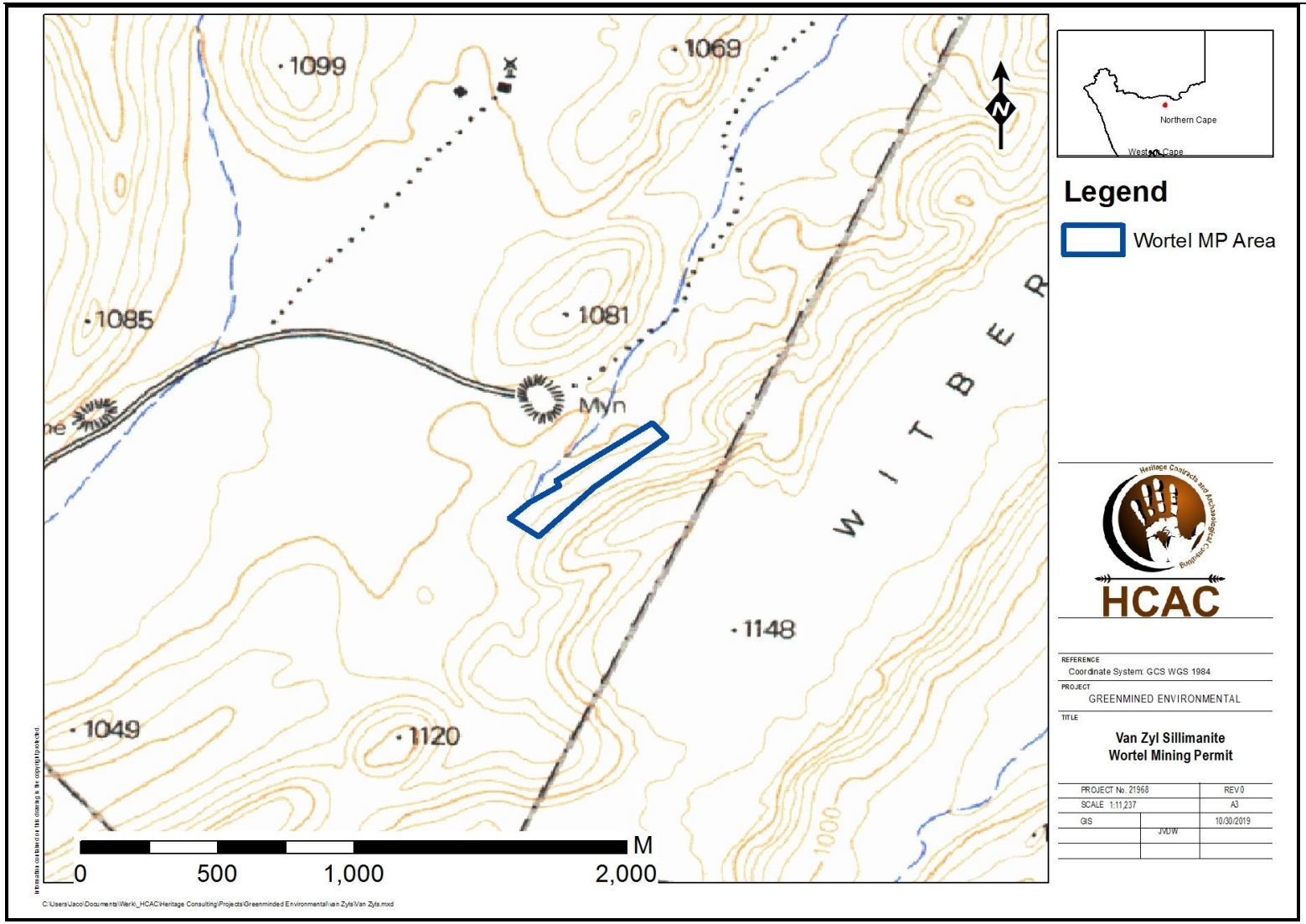

Figure 2: Regional locality map (1:50 000 topographical map).

Figure 3. Satellite image indicating the proposed mining area where the extent of the existing mining is clearly vicible (Google Earth 2019).

2 Legislative Requirements

The HIA 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 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 three years of 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 include (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 a 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) applies 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 fieldwork 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 development process; it involves stakeholders interested in, or affected by the proposed development. Stakeholders are provided with an opportunity to raise issues of concern (for 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. The process involved:

- Placement of advertisements and site notices
- Stakeholder notification (through the dissemination of information and meeting invitations);
- Stakeholder meetings were undertaken with I&APs;
- Authority Consultation
- The compilation of a 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	22 October 2019
Season	Spring –The topsoil and vegetation of the study area have been extensively disturbed/modified by previous mining activities with excavations and roads characterising the study area. Steep slopes hampered accessibility, however the impact areas has been sufficiently covered to understand the heritage context of the study area (Figure 4).

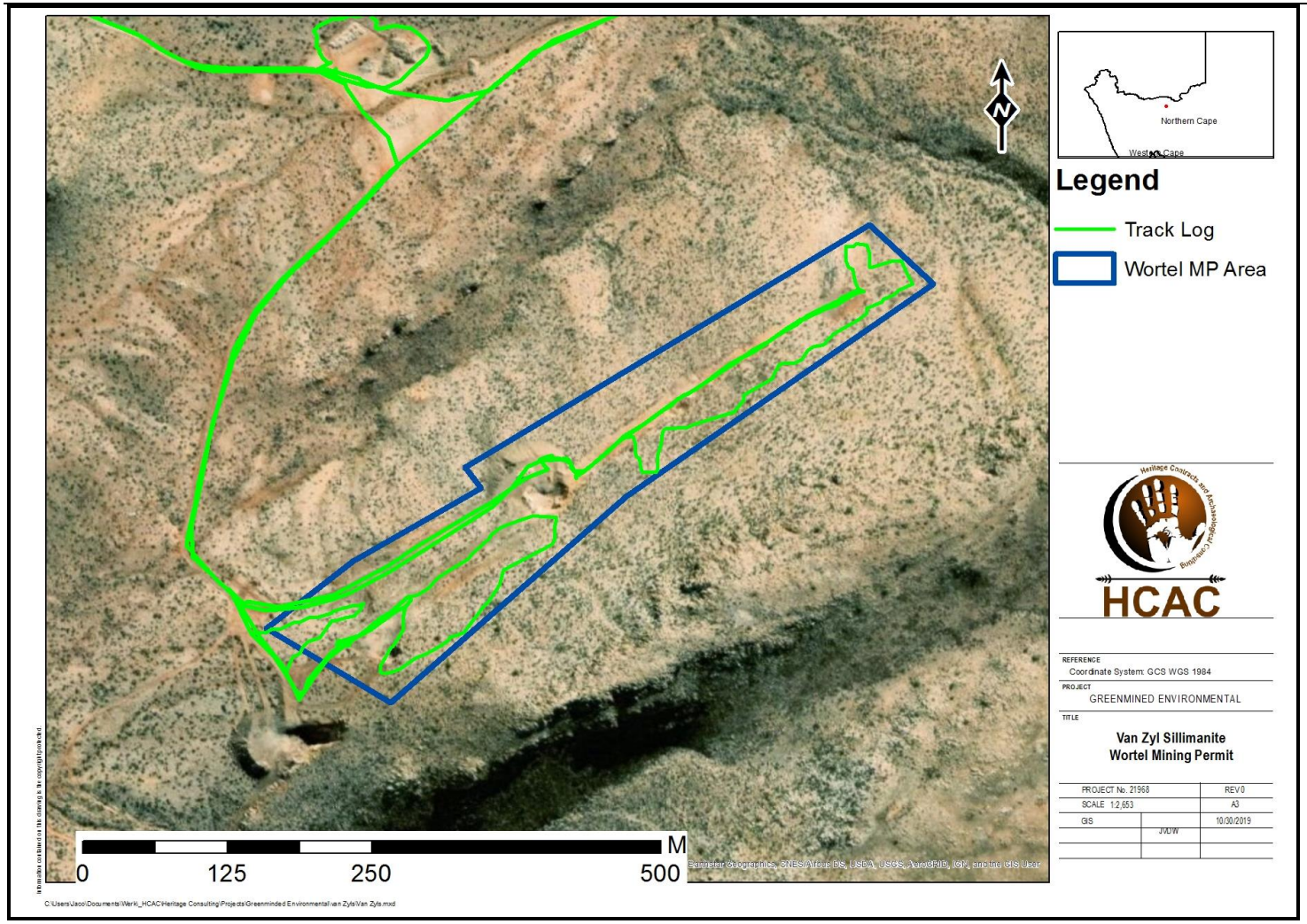

Figure 4: Track logs of the survey in green.

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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. Also, 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 was 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. Also the possible occurrence of 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 dealt with the footprint area of the proposed development and consisted of non-intrusive surface surveys. 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 Environment

According Census 2011, the Khâi-Ma Municipality has a total population of 12 465 people, of which 75,1% are coloured, 17,6% are black African, and 6,0% are white. Other groups make up 0,4% of the population.

Of those aged 20 years and older, 46,3% have some secondary schooling, 17,5% have some primary schooling, 18,1 % completed Grade 12/matric, 5 8% have some higher education, 8,4% completed some primary schooling and 3,9% of this municipality have no schooling.

Of the 5904 economically active people (employed and unemployed but looking for work), 22,1% are unemployed. 322 are classified as discouraged work-seekers.
Of the youth (aged 15 – 34), 2 511 are employed, 776 are unemployed, 192 are classified as discouraged work-seekers, and 1 109 are not economically active.

5 Description of the Physical Environment:

The proposed mining area is located on Portion 1 of the farm Wortel 42, approximately 74,7km west of Pofadder and 148km east of Springbok. The study area is situated within a Desert Biome, and the vegetation consists of Eastern Gariep Plains and Eastern Gariep Rocky vegetation types (Mucina and Rutherford 2006). The area is generally composed of hills marked by stockpiles, excavations and roads from previous Sillimanite mining activities (Figure 9). The bedrock geology tends to be of Schist and Gneiss which does not seem to have been conducive to the formation of rock shelters. Vegetation in the area is low, but the previous mining activities hampered visibility.

Figure 5. General site conditions.

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 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. **Literature / Background Study:**

7.1. Literature Review

Few studies are on record near the study area. Cultural Resource Management reports conducted in the wider area consulted for this study is listed below:

Author	Year	Project	Findings
Webley, L.	2012	Desktop Heritage Impact Assessment: Proposed 1.5 Ha Extension of Gravel Mine, Portion 2 Of the Farm Aroams 57, Near Aggeneys, Northern Cape Province	No sites
Pether J.	2012	Note in Support of Exemption from Desktop Palaeontological Impact Assessment Environmental Management Plan for The Proposed Extension of Existing Raumix Aggregates (Pty) Ltd. Quarry Near Aggeneys, Northern Cape Portion of Portion 2 Of the Farm Aroams 57, Namaqualand	No Sites
Rossouw, L.	2013	Phase 1 Heritage Impact Assessment for proposed prospecting drilling on Portion 2 of Rozynbosch No.41 and Remaining Extent & Portion 1 of Wortel No. 42, Namaqualand District, NC Province	No sites
Orton, J.	2015	Heritage Impact Assessment for The Proposed Cultivation Of New Lands At Klein Pella, Namakwaland Magisterial District, Western Cape	No sites
Van Ryneveld, K.	2017	Koa Valley Prospecting Right Application (without Bulk Sampling), Portions of the Farms Haramoep 53, Oonab-Noord 609, Amam 46 and Nooisabes 51, near Springbok / Aggeneys, Namakwa District Municipality, Northern Cape	MSA and LSA Lithic scatters as well as a Farmstead.
Morris, D	2017	Amendment of the Final Heritage Impact Assessment for the proposed AGGENEIS – PAULPUTS 400kV Transmission Powerline and Substations Upgrade, Northern Cape	Stone age sites (artefacts and grinding hollows) as well as historical structures.
Van der Walt, J & Orton, J.	2019	Heritage Impact Assessment Lime Sales Mining Right Application, Aroams, Northern Cape.	No sites but isolated artefacts were noted.

7.1.1. Genealogical Society and Google Earth Monuments

No cemeteries or graves are indicated in the study area.

7.2. General History of the area

The background of the Aggeneys area has been summarised as follows by Orton in Van der Walt and Orton (2019).

7.2.1. The Stone Age

Archaeological sites in the area around Aggeneys tend to be focused on three types of landscape features:

1. Places where water can be obtained – generally after rain storms. These include pans and low, flat bedrock outcrops that have hollows and crevices that trap water;
2. The bases of rocky hills and outcrops. These areas frequently reveal low stone-walled structures, either at the base of the hills or, less frequently, on the rocky hills; and
3. On and along sand dunes.

Beaumont *et al.* (1995) have noted that there is a low-density background scatter of artefacts throughout Bushmanland. In the Aggeneys area, however, this scatter tends to be quite ephemeral. Other surveys in the region support this distribution of archaeological materials (Halkett 2010; Morris 2011a, 2011b, 2013; Orton 2015, 2016; Webley & Halkett 2012). Within the Gamsberg inselberg, scatters of Early Stone Age (ESA) artefacts have also been recorded in open, often eroding areas (Morris 2010; Orton 2014).

Morris (2010) located bedrock exposures with fissures in them that trap water after rain and sites were reported from the area to the south of Aggeneys (Morris 2013). The rocks bear grinding hollows with associated scatters of stone artefacts, pottery and ostrich eggshell located around them. To the west of Aggeneys, Orton (2016) found a very large bedrock outcrop with a pool of water collected at a low point and many grinding grooves and artefact scatters around it. Pans tend to be rare in the Aggeneys area, but Orton (in prep.) did locate a small LSA scatter alongside a pan to the south of Aggeneys.

Just east of Aggeneys, Webley and Halkett (2012) examined an area to the north of the N14 and recorded many isolated artefacts, and a few occurrences of light quartz and quartzite artefact scatters. Orton (2015) worked in the same area and located an isolated heavily used, grooved double-sided lower grindstone. Morris's (2011b) nearby survey found much sand cover and only a small number of isolated quartz artefacts.

Morris (2011b) notes the presence of a rock painting on a boulder at Aggeneys. The painting is a finger painting likely associated with the Khoekhoen. Similar art is found on granite outcrops throughout Namaqualand but in very low densities (Orton 2013). A small finger-painted image also lies within the Gamsberg Inselberg (Morris 2010; Orton 2014). Neither of these sites has any associated archaeological deposits, but a small rock shelter high on Gamsberg has been excavated and found to contain a deposit some 30 cm deep (Orton 2014). Sites with deep deposits are incredibly rare in Bushmanland, and sadly excavations at this site were never completed, and the deposit has not been dated.

7.2.2. Historical Information

The northern Bushmanland was colonised quite late with most farms only surveyed and granted in the very late 19th or even early 20th centuries. As a result, very few historical structures and features exist on the landscape. The majority of buildings date to the early-mid-20th century and tend to be of low or no heritage significance. A number of surveys in the Bushmanland area have recorded possible isolated graves represented by unusual rocks (either isolated standing rocks or unnatural clusters). Two examples occur alongside a rocky koppie to the southeast of Aggeneys (Orton, in prep.), while others were seen to the west of Aggeneys (Orton 2016). These could be related to early '*trekboers'* passing through the area. Because they lived a very nomadic lifestyle, the physical traces of these early European stock farmers are extremely ephemeral. The ruins of small stone structures that are occasionally found alongside rock outcrops in Bushmanland are likely to represent huts and small livestock enclosures built either by 19th century '*trekboers*' or by early 20th century shepherds. They may have been covered with sticks and skins or by tarpaulins.

Some of the place names in the region reflect the living heritage of the Khoekhoen. Gamsberg (also Ghaamsberg), for example, derives from the Khoekhoen word meaning 'grassy spring' (Raper n.d.). There are unconfirmed historical reports that a massacre of Bushmen may have occurred in a kloof of the Gamsberg (Robinson 1978) but surveys have failed to yield any evidence of this. Morris (2013) seems confident of this event, however, and suggests that the kloof at the south-eastern edge of the inselberg was the location where the killing occurred.

7.2.3. Cultural Landscape

Historical land use and the cultural landscape are linked since the cultural landscape shaped to some extent by the history of the area. Although the farm seems to have been fallow in recent years, some sort of agricultural activity no doubt took place and is evident by fences and watering holes. This is largely related to small stock but has not left much trace. The major historic aspect that left the most visible remains on the landscape is the previous Sillimanite mining activities. Historical maps show several mining areas on the farm Wortel to have been present in 1961 (Figure 6). No structures or farm werfs are in close proximity to the study area.

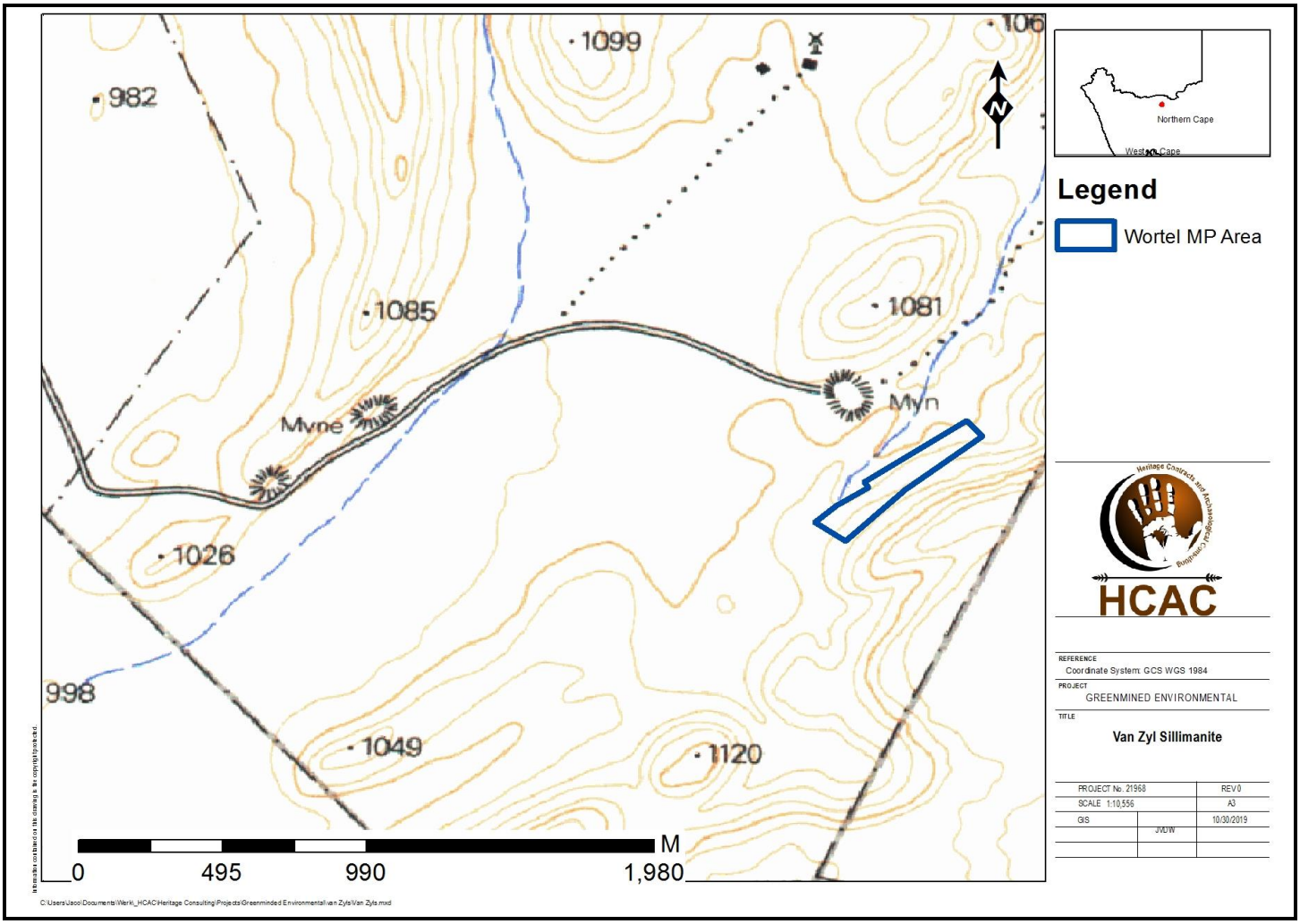


Figure 6. Extract of the 1961 Topographic map of the farm Wortel indicating mining areas close to the study area.

8. Findings of the Survey

It is important to note that only the proposed mining area was surveyed, as indicated in Figure 1 -4 and not the entire farm. Existing roads will be used, and no additional impact is foreseen from this aspect and is therefore not a listed activity. The study area has been impacted on by existing mining and the dumping of topsoil, clearing and levelling as well as previous mining trenches characterise the study area (Figure 7 - 9). All of these activities would have impacted on surface indicators of heritage resources if these ever existed in the study area. The likelihood of heritage resources ever occurring in the study area is doubtful as the site is marked by steep slopes of the Witberg Mountain (Figure 10). These slopes of mica-sillimanite schists do not seem to have been conducive to the formation of rock shelters, and no rock art or archaeological sites of significance were recorded.

The survey also did not reveal any historical farm steads, colonial era stone-walling (dwellings or kraals), graves or other sites of significance. Human impact (apart from the existing mining and dumps) is limited to isolated farming infrastructure like farm fences, wind pumps and tracks.

In terms of the paleontological component, the general study area is indicated as of low or unknown significance (Figure 11), and an independent assessment is being conducted for this aspect. Rossouw (2013) conducted a study on another portion of the farm Wortel and found that "*Bedrock underlying the study area is not considered to be palaeontologically significant, because of the metavolcanic-metasedimentary nature of the strata. No evidence was found of large vertebrate fossil remains within the Quaternary surface deposits covering the terrain'* (Figure 12). Pether (2012) concurred with the results of this study in an application for exemption for a study to the east of Aggeneys.

Figure 7. Existing mining activities.

Figure 8. Previous excavations.

Figure 9. Cleared areas by previous mining.

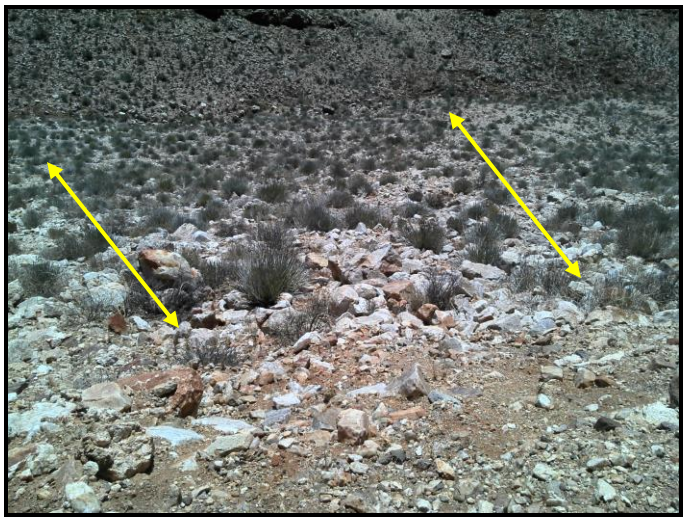
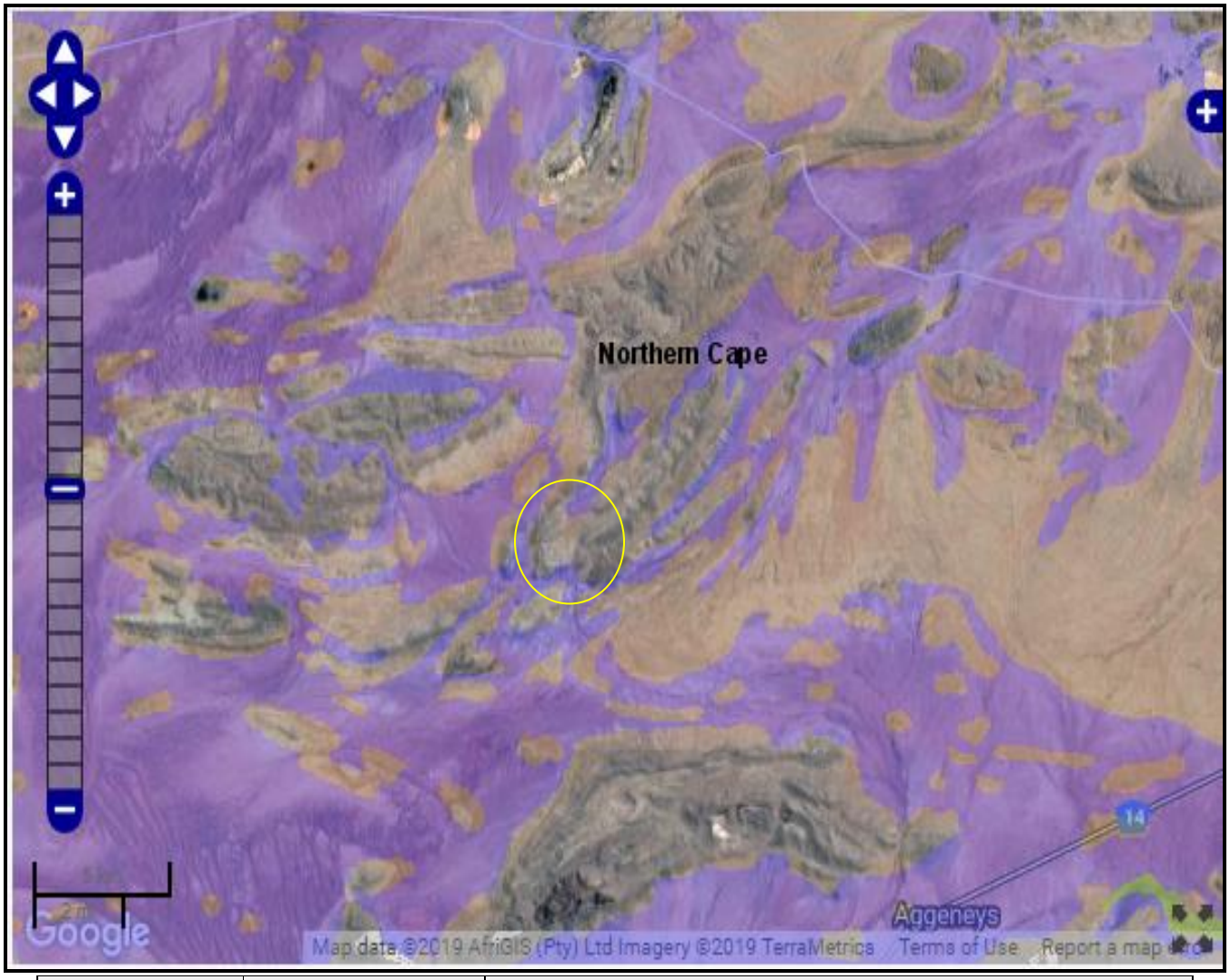


Figure 10. Steep slopes characterising the study area.



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.

Figure 11. Palaeontological sensitivity of the study area, as indicated on SAHRIS.

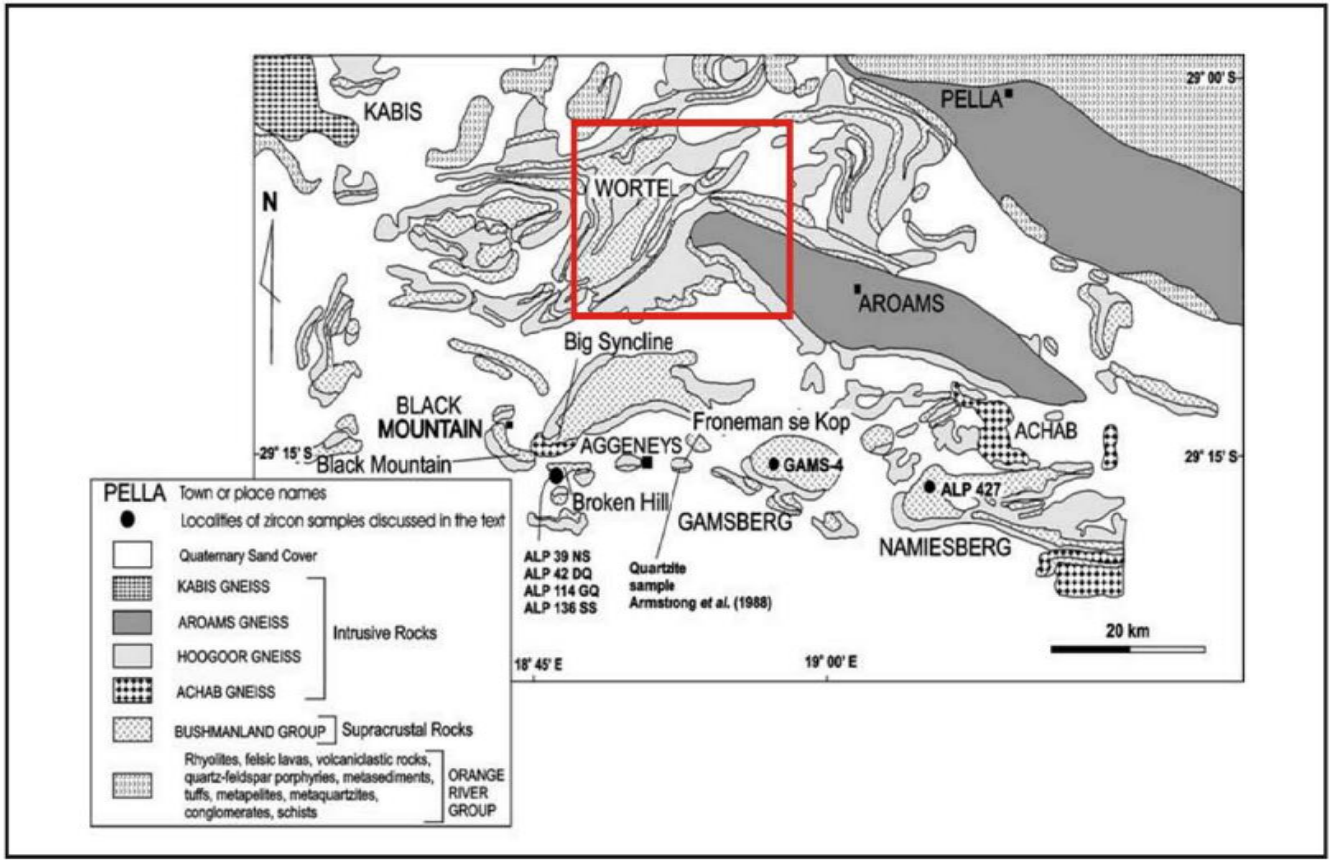


Figure 12. Simplified geological map of the greater study area showing the inselbergs and the distribution of the various granitic gneisses and the Bushmanlandgroup Supracrustal succession (From Bailie *et al* 2007 in Rossouw 2013)

9. Potential Impact

The chances of impacting unknown archaeological sites of significance in the study area is considered to be negligible. Any direct impacts that did occur would be during the construction phase only and would be of low to medium significance. Cumulative impacts occur from the combination of effects of various impacts on heritage resources. The importance of identifying and assessing cumulative impacts is that the whole is greater than the sum of its parts. Due to the fact that the area has been previously disturbed by mining activities the possibility of unearthing subsurface heritage resources is small.

9.1. Pre-Construction phase:

It is assumed that this phase will entail clearance and groundworks. Impacts (if heritage resources are present) include destruction or partial destruction of non-renewable heritage resources.

9.2. Construction Phase

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

9.3. Operation Phase:

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

Nature: During the construction 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 as well as graves (if present).		
	Without mitigation	**With mitigation (Preservation/ excavation of site)**
Extent	Local (3)	Local (3)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low (2)	Low (2)
Probability	Not probable (2)	Not probable (2)
Significance	**20 (Low)**	**20 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	No resources were recorded	No resources were recorded.
Can impacts be mitigated?	Yes, a chance find procedure should be implemented.	Yes
Mitigation: A chance find procedure must be incorporated for the project within the EMPR.		
Cumulative impacts: The impact areas have already been transformed by mining activities and the project will not cause a whole scale change to the environment.		
Residual Impacts: Although surface sites can be avoided or mitigated, there is a small chance that completely buried sites would still be impacted but this cannot be quantified.		

10. Conclusion and recommendation

The larger geographical area (Bushmanland) in which the current study area is located is marked by a low-density background scatter of lithics (Beaumont *et al*. 1995). In the Aggeneys area, however, this scatter tends to be quite ephemeral (e.g., Halkett 2010; Morris 2011a, 2011b, 2013; Orton 2015, 2016; Webley & Halkett 2012, Van der Walt & Orton 2019). Field assessments closer to the current area of investigation yielded no sites of significance (e.g., Rossouw 2013 & Orton 2015) and the cultural heritage of the study area interpreted within this context.

The study area (measuring approximately 5 hectares), have been impacted on by dumping of topsoil, clearing and levelling as well as previous mining trenches. All of these activities would have impacted on surface indicators of heritage resources if these ever existed in the study area. The likelihood of heritage resources ever occurring in the study area is doubtful as the site is marked by steep slopes of the Witberg Mountain of mica-sillimanite schists, that do not seem to be conducive to the formation of rock shelters that could contain rock art or archaeological material.

The lack of significant heritage resources in the area was confirmed during the survey, and no heritage features or sites of significance were identified within the areas assessed. The survey also did not reveal any historical farm steads, colonial-era stone-walling (dwellings or kraals), graves or other sites of significance. Human impact (apart from the existing mining and dumps) is limited to isolated farming infrastructure like farm fences, wind pumps and tracks relating to the cultural landscape. In terms of the paleontological component, the general study area is indicated as of low or unknown significance on the SAHRA paleontological sensitivity map. As some areas are of unknown paleontological significance an independent assessment is being undertaken for the project, although studies in the area indicated that the area is not paleontologically significant (Pether 2012; Rossouw 2013).

The cultural landscape (marked by mining and farming activities) is generally modern without significant cultural landscape elements of concern and impacts are deemed to be of low significance. The impact of the proposed project on heritage resources is considered to be low, and it is recommended that the proposed project can commence on the condition that the following recommendations are implemented and based on approval from SAHRA

- Implementation of a chance finds procedure as outlined below.

10.1. Chance Find Procedure

The possibility of the occurrence of subsurface finds or previously unknown sites 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 for the project. 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.

11. If during the pre-construction phase, 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 heritage site, 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.
12. 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.
13. 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.

10.2. Reasoned Opinion

The impact of the proposed project on heritage resources is considered low and no further pre-construction mitigation in terms of archaeological resources is required based on approval from SAHRA. Furthermore, the socio-economic benefits associated with the project also outweigh the possible impacts of the development on heritage resource if the correct mitigation measures (i.e. chance find procedure) are included in the EMPr.

10.3. Potential risk

Potential risks to the proposed project are the occurrence of unknown and unmarked graves. Thee possibility exists that the study area could contain graves of which surface indicators have been destroyed and subsurface material could be uncovered during earthworks. These risks can be mitigated to an acceptable level with the implementation of a chance find procedure as outlined in Section 10.1.

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Appendix A - Curriculum Vitae of Specialist

Jaco van der Walt
Archaeologist

jaco.heritage@gmail.com
+27 82 373 8491
+27 86 691 6461

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
   E-mail:Alex.Schoeman@wits.ac.za