



Booyesdal Mine EMP Amendment
Specialist Archaeology and Heritage Baseline Report
Northam Platinum Limited, South Africa




Issued to: Northam Platinum Limited

Submitted by: HCAC

Date: 13 September 2016



REPORT ISSUE FORM

Client Name	Northam Platinum Limited		
Project Name	Booyssendal Mine EMP Amendment Archaeology and Heritage Baseline Report		
Report Title	Archaeology Heritage Report Booyssendal Mine		
Document Status	Final	Issue No.	2
Issue Date	10 October 2016		
Document Reference		Report Number (please leave blank)	
Author	Jaco van der Walt JP Celliers	 Signature & Date	
Reviewer		Signature & Date	
Project Manager Approval	Amanda Pyper	10 October 2016	





DISCLAIMER

The findings, results, observations, conclusions and recommendations given in this report are based on the author's best scientific and professional knowledge as well as available information. The report is based on survey and assessment techniques which are limited by time and budgetary constraints relevant to the type and level of investigation undertaken and HCAC CC and its staff reserve the right to modify aspects of the report including the recommendations if and when new information becomes available from ongoing research or further work in this field, or pertaining to this investigation.

Although all possible care is taken to identify sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites could be overlooked during the study. Heritage Contracts and Archaeological Consulting CC and its personnel will not be held liable for such oversights or for costs incurred as a result of such oversights.

This report must not be altered or added to without the prior written consent of the author. This also refers to electronic copies of this report which are supplied for the purposes of inclusion as part of other reports, including main reports. Similarly, any recommendations, statements or conclusions drawn from or based on this report must make reference to this report. If these form part of a main report relating to this investigation or report, this report must be included in its entirety as an appendix or separate section to the main report.



EXECUTIVE SUMMARY

Heritage Contracts and Archaeological Consulting CC (HCAC) was appointed to conduct a Phase 1 Archaeological Impact Assessment as required in terms of Section 38 of the National Heritage Resources Act (Act 25 of 1999) for the proposed Booyensdal Mine Expansion project. Booyensdal mine is located in the Eastern limb of the Bushveld Igneous Complex, straddling both the Limpopo and Mpumalanga Provinces, South Africa. The closest towns are Steelpoort and Mashishing (Lydenburg). The Booyensdal Operation currently consists of the Booyensdal North (BN) underground operation and a single portal development at Booyensdal South (BS2). This study includes the expansion of the main Booyensdal South Portal Complex (BS2) with additional infrastructure, development of Booyensdal Central North (BS1) and an underground mine at Booyensdal South (BS3) located on the western flank of the Dwars River Valley to mine the UG₂ and Merensky Reef PGMs is currently in progress. BS3 was previously known as the Fairview Project. The BS1, BS2 and BS3 expansions have identified the need for additional or amendments to infrastructure, processes, and changes to the mining rate, the mine plan and activities.

HCAC examined the proposed development area for sites of archaeological, cultural and historical significance. Some 32 sites were recorded during the 2016 survey. The sites included various Iron Age Sites, Ruins, Cemeteries and graves as well as Stone Cairns and Terracing. In addition a further 17 sites were recorded by previous assessments in the area (e.g., Huffman & Schoeman 2001, 2002a and b, Pistorius 2007).

Every site is relevant to the Heritage Landscape, but none has outstanding significance. Depending on the precise location of development activities, 38 sites will possibly require mitigation. This mitigation, including the avoidance of sites with high significance, complies with both SAHRA and international standards.

ABBREVIATIONS

Abbreviation	Description
AIA	Archaeological Impact Assessment
ASAPA	Association of South African Professional Archaeologists
CA	Competent Authority
CRM	Cultural Resource Management
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPS	Environmental Performance Standards
EIA	Early Iron Age
ESA	Early Stone Age
GN R	General Notice Regulation
GPS	Global Positioning System
HIA	Heritage Impact Assessment
IEM	Integrated Environmental Management
IFC PS	International Finance Corporation Performance Standards on Environmental and Social Sustainability, 2012
IUCN	International Union for Conservation of Nature
I&Aps	Interested and Affected Parties
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, 28 of 2002
MSA	Middle Stone Age
NEMA	National Environmental Management Act, 107 of 1998
NEMBA	National Environmental Management: Biodiversity Act, 10 of 2004
NEMAQA	National Environmental Management: Air Quality Act, 39 of 2004
NEMWA	National Environmental Management: Waste Act, 59 of 2008
NHRA	National Heritage Resources Act, 25 of 1999
NWA	National Water Act, 36 of 1998
OSHA	Occupational Health and Safety Act, 85 of 1993
PHRA	Provincial Heritage Resource Agency
RSA	Republic of South Africa
SADC	Southern African Development Community
SAWIC	South African Waste Information System
SAHRA	South African Heritage Resources Agency
ToR	Terms of Reference

Contents

EXECUTIVE SUMMARY	4
ABBREVIATIONS	5
INTRODUCTION.....	8
1.1. Project Description	8
1.1.1 Location.....	8
1.1.2. Environmental Setting.....	8
1.1.3. Project Description	9
2. LEGAL AND GOVERNANCE FRAMEWORK	11
2.1. South African Heritage Legislation.....	11
2.2 International Agreements, Guidelines and Standards	12
2.2.1 Conventions and agreements	13
2.2.2 International Finance Corporation’s Performance Standards on Environmental and Social Sustainability	13
3. STUDY TEAM	16
4. METHODOLOGY	17
4.1 Literature Review	17
4.2 Field Visit.....	18
4.2.1 Field visit and survey.....	18
4.3 Data Interpretation: Assessment of Significance and Impacts	20
4.3.1. Field Rating of Sites	22
5. BASELINE DESCRIPTION	23
5.1 Palaeontology	23
5.2 Middle Stone Age Finds	23
5.3 Eiland Late Iron Age Finds.....	23
5.4 Additional Sites	23
5.5. Iron Age.....	26
5.5. Ruins (Historical to recent).....	31
5.6. Cemeteries/graves.....	34
5.7. Stone Cairn (Time period unknown)	35
5.8 Engravings	36
6. IMPACT ASSESSMENT	36
6.1. Impact Identification and Assessment	36
6.2. Identified Environmental Impacts.....	37
6.3. Evaluation of Potential Impacts.....	40
6.3.1. Impact Significance Rating Definitions.....	41

6.4. Cumulative Impacts.....	49
7. MANAGEMENT MEASURES	51
8. MONITORING REQUIREMENTS.....	55
9. KNOWLEDGE GAPS.....	55
10. CONCLUSIONS	56
11. REFERENCES.....	58

Figures

Figure 1: Locality map showing infrastructure.	10
Figure 2: Track logs of the areas surveyed in black.	19
Figure 3: Site distribution in the study area.....	25
Figure 4: Ceramics and slag from Feature 350.	30
Figure 5: Communal grinding area at Feature 352.....	30
Figure 6: Stone Walled settlement at Feature 379	30
Figure 7: Stone Walled settlement at Feature 379	30
Figure 8: Rectangular Stone walls at feature 353.....	33
Figure 9: Overgrown stone walls at feature 354	33
Figure 10: Feature 356 viewed from the west.....	33
Figure 11: Feature 375 obscured by vegetation	33
Figure 12: Graves at feature 347	34
Figure 13: Overgrown graves at Feature 374	34
Figure 14: Feature 351.....	35
Figure 15: Feature 375.....	35
Figure 16. Rock engraving	36

Tables

Table 1: IFC Performance Standard 8	13
Table 2: Sites with Coordinates	24

INTRODUCTION

Heritage Contracts and Archaeological Consulting CC (HCAC) was appointed to conduct an Archaeological Impact Assessment for the proposed Booyseendal Mine Expansion project. This report forms part of the EMP & EIA process for the proposed project.

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

The report outlines the approach and methodology utilized before and during the survey, which includes: Phase 1, a scoping study that includes collection from various sources and consultations (Van der Walt 2106); Phase 2, the physical surveying of the study area on foot and by vehicle; Phase 3, reporting the outcome of the study.

General site conditions were recorded by means of photographs, GPS locations, and site descriptions. Possible impacts were identified and mitigation measures are proposed in the following report.

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

1.1. Project Description

1.1.1 Location

The Booyseendal mine is located in the Limpopo and Mpumalanga Provinces of South Africa on the following farms: Buttonshope 51 JT, Booyseendal 43JT, Portions 4, 5, 6 and the remaining extent of the farm Sterkfontein 52JT, portion 5, 6 and 7 of the farm Sterkfontein 749JT as well as sections of the farm De Kafferskraal 53JT. The closest towns are Steelpoort and Mashishing (Lydenburg).

1.1.2. Environmental Setting

The study area forms part of the Dwarsrivier Valley part of the Bushveld Igneous Complex, and can be considered as natural veldt with little impact on it. Impacts present in the area include old farm and exploration roads used for monitoring and exploration purposes as well as impacts from Everest mine (currently under care and maintenance) in the southern portion of the study area. Topographically, the area is mountainous with stretches of more dense vegetation (*Dichrostachys* shrubs) and a number of large hills and valleys. Several streams and tributaries run through the study area that could have been the water source for communities living in the area in antiquity.

1.1.3. Project Description

The main infrastructure expansion will be associated with the new portal complex and associated infrastructure at BS2 (Booysendal Central). This will be developed on the farm Buttonshope 51JT.

Booysendal Central North (BS1) will consist of an emergency escape portal, an access road, vent shaft, powerline and sub-station, all to be located on the farm Booysendal 43JT.

BS3 will be accessed from BS2 via an underground tunnel but will require surface infrastructure in the form of an access road, powerline and vent shafts. This will all be located on the farm Buttonshope 43JT. A total of 450ktpa PGMs will be mined from both the Merensky and UG2 Reefs from these two complexes.

In addition to the above a permanent, hard top two lane access road will be constructed between Booysendal North, past BS1 to BS2 and up to Everest Mine. Various other services will run along the road, including water service pipelines and powerlines from Everest to BS2. A service access road will be constructed between BS2 and BS3. An aerial ropeway for the transportation of ore will run from the farm Buttonshope 51JT to Booysendal North and to Everest. The properties applicable to the Everest side of the development which will be traversed by the above services includes portion 4, 5, 6 and the remaining extent of the farm Sterkfontein 52JT, portion 5, 6 and 7 of the farm Sterkfontein 749JT ,as well as sections of the farm De Kafferskraal 53JT. (Figure 1).

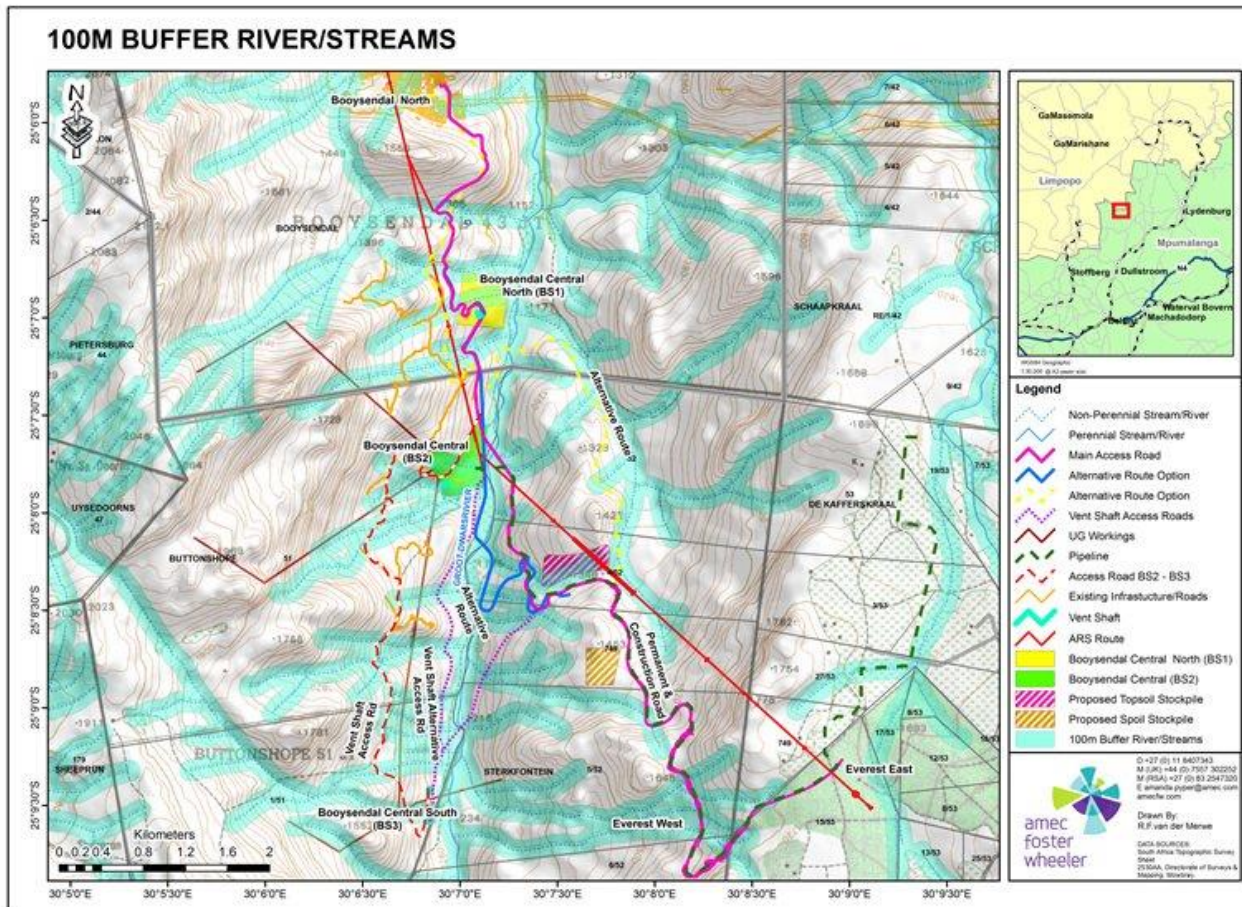


Figure 1: Locality map showing infrastructure.

2. LEGAL AND GOVERNANCE FRAMEWORK

2.1. South African Heritage Legislation

An AIA or a HIA is a pre-requisite for development in South Africa as prescribed by the South African Heritage Resources Agency (SAHRA) and stipulated by legislation. The overall purpose of a heritage specialist input is to:

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

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

The AIA should be submitted, as part of the EIA, Basic Impact Assessment (BIA) or Environmental Management Programme (EMP), to the Provincial Heritage Resources Authority (PHRA) if established in the province or to SAHRA. SAHRA will be ultimately responsible for the professional evaluation of Phase 1 AIA reports upon which review comments will be issued. 'Best practice' requires Phase 1 AIA reports and additional development information, as per the EIA, BIA/EMP, to be submitted in duplicate to SAHRA after completion of the study. SAHRA accepts Phase 1 AIA reports authored by professional archaeologists, accredited with the Association of Southern African Professional Archaeologists (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 Cultural Resource Management (CRM) experience (field supervisor level).

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

Phase 1 AIAs are primarily concerned with the location and identification of 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 in terms of section 35 (4) and section 38 (3) (g). Phase 2 excavations can only be conducted with a permit, issued by SAHRA to the appointed archaeologist. Permit conditions are prescribed by SAHRA and includes (as minimum requirements) reporting back strategies to SAHRA and deposition of excavated material at an accredited repository.

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

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

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

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

Authorisation for exhumation and 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).

2.2 International Agreements, Guidelines and Standards

For purposes of the heritage component for the Booysendal Mine Project, the International Finance Corporation's (IFC) Performance Standard 8 regarding Cultural Heritage is probably the most important guideline. These Standards are part of the Equator Principles established to manage the social and environmental risks (and impacts) of development in its member countries (IFC 2012). The main focus is on the potential impacts associated with project activities during construction, operation, decommissioning and closure. Section 2.2.2 Table 1 outlines performance standards associated with archaeological, heritage and cultural risks related to the project.

2.2.1 Conventions and agreements

An important international agreement regarding the protection of cultural resources is the United Nations Educational, Scientific and Cultural Organization's (UNESCO's) Convention for the Protection of the World's Cultural and Natural Heritage (1972) and its Convention on the Means of Prohibiting and Preventing the Illicit Import, Export or Transfer of Ownership of Cultural Goods (1970). There are no World Heritage sites located close to the project area. The inscribed sites will not have an impact on the current project.

South Africa is also party to the Cotonou Agreement between the European Union and the African, Caribbean and Pacific (ACP) Group of state. In addition to a whole series of development cooperation issues, the Cotonou Agreement also recognizes the social and cultural dimension of cooperation projects and programs based on the following principles:

- Integrating the cultural dimension at all levels of development cooperation;
- Recognizing, preserving and promoting the value of cultural heritage; supporting the development of capacity on this sector; and
- Developing cultural industries and enhancing market access opportunities for cultural goods and services. (Article 27 on Cultural Development).

2.2.2 International Finance Corporation's Performance Standards on Environmental and Social Sustainability

Table 1: IFC Performance Standard 8

PERFORMANCE STANDARD 8: CULTURAL HERITAGE	
Requirement/ Principle	Implications for this Study
<p>Internationally Recognized Practices</p> <p>In addition to complying with relevant national law on the protection of cultural heritage, including national law implementing the host country's obligations under the Convention Concerning the Protection of the World Cultural and Natural Heritage and other relevant international law, the client will protect and support cultural heritage by undertaking internationally recognized practices for the protection, field-based study, and documentation of cultural heritage. If the requirements apply, the client will retain qualified and experienced experts to assist in the Assessment.</p>	<p>In accordance with the IFC Performance Standard 8 Guidelines, a professional archaeologist was appointed for this project to investigate archaeological and heritage sites in the project area.</p> <p>An archaeological site visit was undertaken by Jaco van der Walt and JP Celliers for the identification of significant archaeological and heritage sites, as well as the documentation and assessment of the significant sites identified.</p>
<p>Chance Find Procedure</p> <p>The client is responsible for siting and designing a project to avoid significant damage to cultural</p>	<p>In accordance with Section 8 of the IFC Performance Standard 8 Guidelines, the archaeologist will assess the findings in the project area and; make constructive</p>

<p>heritage. When the proposed location of a project is in areas where cultural heritage is expected to be found, either during construction or operations, the client will implement chance find procedures established through the Social and Environmental Assessment. The client will not disturb any chance finds further until an Assessment by a competent specialist is made and actions consistent with the requirements of this Performance Standard are identified.</p>	<p>recommendations for the management of sites that may be impacted by construction and operational activities. Archaeological and heritage monitoring and management measures (including chance find procedures) will be incorporated as part of the environmental management plan of the project (EMPP), to ensure sites of archaeological and heritage significance are protected during all phases of the project. This is described in detail in Section 11 of this report.</p>
<p>Consultation</p> <p>Where a project may affect cultural heritage, the client will consult with affected communities within the host country who use, or have used within living memory, the cultural heritage for longstanding cultural purposes to identify cultural heritage of importance, and to incorporate into the client's decision-making process the views of the affected communities on such cultural heritage. Consultation will also involve the relevant national or local regulatory agencies that are entrusted with the protection of cultural heritage.</p>	<p>In accordance with Section 6 of the IFC Performance Standard 8, a separate social study was conducted. In cooperation with the social and public consultation process, the EMPP should make provision to ensure that all affected community members are informed and consulted within the appropriate cultural context before any site of archaeological or heritage significance is affected that is related to communities in the area. All work will be done under the necessary permits from the SAHRA.</p>
<p>Removal of Cultural Heritage</p> <p>Most cultural heritage is best protected by preservation in its place, since removal is likely to result in irreparable damage or destruction of the cultural heritage. The client will not remove any cultural heritage, unless the following conditions are met:</p> <ul style="list-style-type: none"> • There are no technically or financially feasible alternatives to removal • The overall benefits of the project outweigh the anticipated cultural heritage loss from removal • Any removal of cultural heritage is conducted by the best available technique 	<p>In accordance with Section 7 of the IFC Performance Standard 8 Guidelines, the following will be considered:</p> <ul style="list-style-type: none"> • There are no technically or financially feasible alternatives to removal; • The overall benefits of the project outweigh the anticipated cultural heritage loss from removal; and/or <p>Any removal of cultural heritage material is conducted adhering to heritage legislation and done by scientific standards.</p>

<p>Critical cultural heritage consists of</p> <p>(i) the internationally recognized heritage of communities who use, or have used within living memory the cultural heritage for long-standing cultural purposes; and</p> <p>(ii) Legally protected cultural heritage areas, including those proposed by host governments for such designation.</p> <p>The client will not significantly alter, damage, or remove any critical cultural heritage. In exceptional circumstances , where a project may significantly damage critical cultural heritage, and its damage or loss may endanger the cultural or economic survival of communities within the host country who use the cultural heritage for long-standing cultural purposes , the client will:</p> <p>(i) meet the requirements of Paragraph 6 above; and</p> <p>(ii) (ii) conduct a good faith negotiation with and document the informed participation of the affected communities and the successful outcome of the negotiation.</p> <p>In addition, any other impacts on critical cultural heritage must be appropriately mitigated with the informed participation of the affected communities.</p>	<p>In accordance with Section 8 and 9 of the IFC Performance Standard 8 Guidelines, the client will not significantly alter, damage, or remove any critical cultural heritage or any sites of international value e.g. World Heritage Sites.</p>
<p>Protected Heritage Areas</p> <p>Legally protected cultural heritage areas are important for the protection and conservation of cultural heritage, and additional measures are needed for any projects that would be permitted under the applicable national laws in these areas. In circumstances where a proposed project is located within a legally protected area or a legally defined buffer zone, the client, in addition to the requirements for critical cultural heritage cited above in Paragraph 9, will meet</p>	<p>In accordance with Section 9 of the IFC Performance Standard 8 Guidelines, the EMPP will make provision to ensure that the proposed project area is not located within a legally protected cultural heritage area or a legally defined cultural heritage buffer zone. As part of the environmental impact study, all relevant national and local environmental and social policies, plans and guidelines should be implemented for all development activities</p>

<p>the following requirements :</p> <ul style="list-style-type: none">• Comply with defined national or local cultural heritage regulations or the protected area management plans• Consult the protected area sponsors and managers, local communities and other key stakeholders on the proposed project• Implement additional programs, as appropriate, to promote and enhance the conservation aims of the protected area	<p>associated with the project.</p>
---	-------------------------------------

3. STUDY TEAM

Archaeologist – Jaco van der Walt

Jaco has been actively involved as a professional archaeologist within the heritage management field in Southern Africa for the past 15 years. Jaco acted as council member for the Association of Southern African Professional Archaeologist (ASAPA Member #159) for SADC countries in the Cultural Resource Management (CRM) portfolio for two years (2011 – 2012). He is well respected in his field and published in peer reviewed journals and presented his findings on various national and international conferences.

Archaeologist – JP Celliers

JP Celliers is a trained Archaeologist and Museum Professional. He holds a Masters Degree from the University of Pretoria with specialisation in Archaeology.

He has been conducting Archaeological Impact Studies and Mitigation in a professional capacity since 2003. He is also a member in good standing of ASAPA (Association of South African Professional Archaeologists)

Archival Specialist – Liesl Bester

Liesl Bester has worked on several historical research projects for foreign and local academics as well as CRM companies and has been actively involved in the heritage management field for the past 9 years.

Liesl specialises in archival document retrieval from various archive repositories in South Africa and she holds an Honours degree from the University of Pretoria specializing in Heritage and Cultural Tourism and History.

4. METHODOLOGY

4.1 Literature Review

A review was conducted utilising data for information gathering from published articles and CRM reports on the archaeology and history of the area. The aim of this is to extract data and information on the area in question, looking at archaeological sites, historical sites and graves of the area.

Information collection

The South African Heritage Resource Information System (SAHRIS) was consulted to further collect data from Cultural Resource Management (CRM) practitioners who undertook work in the area to provide the most comprehensive account of the history of the area where possible. Research was also conducted in the National Archives for more information on the properties affected by the proposed development.

Google Earth and mapping survey

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

Genealogical Society of South Africa

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

For detailed information of the findings please refer to the scoping report (Van der Walt 2016).

In anticipation of other mining activities in the greater study area, archaeologists have completed numerous heritage surveys including Huffman & Schoeman 2001, 2002 a and b; van Schalkwyk 2005; Roodt 2003a, 2003b, 2003c, 2005, 2008a, 2008b; Van der Walt & Fourie 2006; Van der Walt & Celliers 2009; Van der Walt 2009 and Pistorius 2007, 2010 and 2011 for various Environmental Impact Assessment Reports (EIAs) and Environmental Management Programmes (EMPs). These studies provide a good understanding of the archaeology of the area and use of the wider landscape. Since 2002, heritage surveys have recorded more than 240 sites in the greater study area, ranging from the Middle Stone Age to the recent households of farm labourers.

The distribution of the sites on the landscape show different land use patterns. Many agriculturally-orientated societies (making Eiland, Leolo and Marateng pottery) built their villages in the valleys near cultivatable alluvium. Others (probably Ndebele) built terraced-settlements on basal slopes of the valley edge, while farm labourers usually lived in the valleys as well.

During the 19th Century, farmers lived around the edge of high meadows as a measure of protection. A few Middle Iron Age Eiland sites dating to AD 1000 to 1300 (Huffman 2007) were also cited in this plateau environment. Grave sites can be expected anywhere on the landscape. These studies provide a good understanding of the archaeology of the area and use of the wider landscape.

4.2 Field Visit

Due to the nature of cultural remains, the majority of which occurs below surface, a field survey of the proposed development was conducted. The study area was surveyed by means of vehicle and extensive pedestrian surveys during the week of the 2nd – 5th February 2016 the 8th – 12th February and again on the 22nd March 2016.

4.2.1 Field visit and survey

The survey was aimed at covering the proposed development footprint, focussing on specific areas on the landscape that would be more likely to contain archaeological and/or other heritage remains like drainage lines, rocky outcrops as well as slight elevations in the natural topography. These areas were searched more intensively, but many other areas were walked in order to confirm expectations in those areas. Track logs of the areas covered were taken (Figure 2).

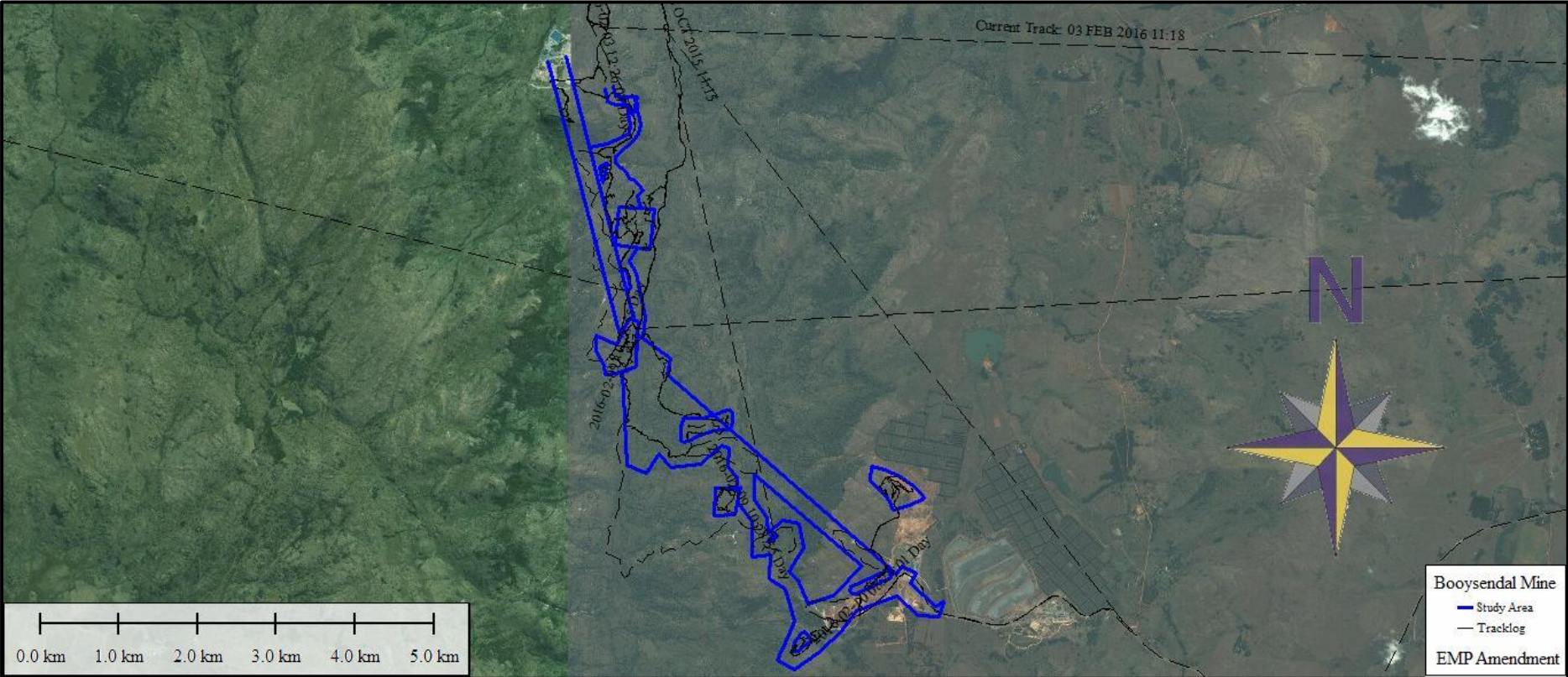


Figure 2:Track logs of the areas surveyed in black.

4.3 Data Interpretation: Assessment of Significance and Impacts

The presence and distribution of heritage resources (including tangible and intangible heritage) define a 'heritage landscape'. (Tangible heritage refers to physical artifacts or structures and Intangible cultural heritage refers to the practices, representations, expressions, knowledge, skills – as well as artifacts and cultural spaces associated therewith that is recognized as cultural heritage).

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:

- 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.

Furthermore, 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; and
- Sites of significance relating to the history of slavery in South Africa.

4.3.1. Field Rating of Sites

Site significance classification standards prescribed by SAHRA (2006), and acknowledged by ASAPA for the SADC region, were used for the purpose of this report. The recommendations for each site should be read in conjunction with section 8 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

Although HCAC surveyed the area as thoroughly as possible, it is incumbent upon the developer to stop operations and inform the relevant heritage agency should further cultural remains, such as graves, stone tool scatters, artefacts, bones or fossils, be exposed during the process of development (refer to the Chance Find Procedure in Section 11)

5. BASELINE DESCRIPTION

A few background comments are necessary to place the individual sites into perspective.

First, there are no visible fossil-bearing strata in the study area. The geology of the study area consists of Precambrian rocks; including rocks of the Rustenburg layered Suite Bushveld Igneous Complex and also the arenaceous, Steenkampsberg Formation of the Transvaal Supergroup. In places these rocks are overlain by Quaternary alluvium deposits.

5.1 Palaeontology

According to the SAHRIS Paleo sensitivity map most of the study area is classified as being of zero palaeontological sensitivity although the developments on the farm De Kafferskraal are in an area marked as of low palaeontological sensitivity. According to SAHRIS no palaeontological studies are required although a protocol for finds is required and is included under section 8 of this report. A previous Paleontological study on the farms Hoogland 38-JT, Sterkfontein 52-JT and Sterkfontein 74-JT concurred with the SAHRIS recommendations (Rubidge 2011).

5.2 Middle Stone Age Finds

Secondly, Middle Stone Age (30-300 thousand years ago) isolated artefacts are found scattered over the landscape. Finds typically include radial cores, triangular points and flakes. These artefacts are scattered too sparsely to be of any significance apart from noting their presence which has been done in this report. These isolated finds were not point plotted apart from Field no 604 that was recorded by Huffman & Schoeman (2002 a).

5.3 Eiland Late Iron Age Finds

Thirdly, most of the decorated pottery found in the study area belongs to a stylistic facies known as *Eiland*. This style dates to between 1550 AD and 1750 AD and was made by Sotho-Tswana people (Huffman 2007: 186-189). These Middle Iron Age Sites do not have any stone walling associated with them and is found close to cultivatable soil. Some stylistic *Marateng* pottery were also recorded presumably in association with Late Iron Age stone walled settlements. *Marateng* pottery dates to between 1650 AD and 1840 AD (Huffman 2007: 207).

5.4 Additional Sites

Some ephemeral stone walls were also recorded. These walls are inconspicuous and not associated with any particular period. They were mostly built on or near rocky outcrops and are in some instances barely visible as they are covered with grass and vegetation. Several ruins occur in the study area marked by rectangular and linear walls, presumably these sites date to the historical to recent occupation of the study area.

A total of 49 sites are on record for the study area (Figure 3). The 2016 survey identified 32 Sites within the study area. In addition to the newly recorded sites a further 17 Sites are on record from previous surveys that covered sections of the study area (Annexure A).

Refer to table 2 for the coordinates for the sites and to section 6 of this report for a short description of the sites.

Table 2: Sites with Coordinates

FIELD NUMBER	TYPE SITE	LONGITUDE	LATITUDE
344	Historical Ruin	30° 06' 55.5553" E	25° 05' 53.9016" S
345	Historical Ruin	30° 07' 01.9849" E	25° 06' 50.1949" S
346	Historical Ruin	30° 07' 05.0483" E	25° 06' 51.8832" S
347	Cemetery	30° 07' 04.3609" E	25° 06' 54.3563" S
350	Iron Age	30° 07' 07.7520" E	25° 06' 57.3659" S
351	Stone Cairn	30° 07' 09.8977" E	25° 06' 57.6288" S
352	Communal Grinding Area	30° 07' 09.7031" E	25° 06' 58.3201" S
353	Historical Ruin	30° 07' 13.6201" E	25° 06' 40.8419" S
354	Historical Ruin	30° 07' 03.7236" E	25° 07' 37.1279" S
355	Historical Ruin	30° 07' 04.7927" E	25° 07' 38.4493" S
356	Historical Ruin	30° 07' 04.1771" E	25° 07' 40.1231" S
357	Historical Ruin	30° 07' 20.0280" E	25° 07' 56.5068" S
358	Terracing	30° 07' 43.1401" E	25° 08' 13.0885" S
359	Stone Cairn	30° 07' 45.6851" E	25° 08' 14.9603" S
360	Terracing	30° 07' 44.4757" E	25° 08' 16.7065" S
362	Historical Ruin	30° 07' 10.3331" E	25° 08' 18.5640" S
363	Possible Graves	30° 07' 10.3835" E	25° 08' 18.1609" S
365	Stone Cairn	30° 07' 43.4497" E	25° 08' 41.3449" S
366	Terracing	30° 07' 48.1513" E	25° 08' 44.3364" S
367	Terracing	30° 08' 05.8560" E	25° 09' 00.1260" S
368	Terracing	30° 08' 04.3404" E	25° 09' 00.7093" S
369	Rock Engraving	30° 07' 19.4088" E	25° 05' 31.7004" S
370	Iron Age	30° 08' 46.8169" E	25° 09' 17.9029" S
372	Linear Stone Wall	30° 08' 50.9171" E	25° 08' 43.1629" S
373	Historical Ruin	30° 08' 51.9901" E	25° 08' 44.2607" S
374	Cemetery	30° 08' 19.0859" E	25° 09' 42.5808" S
375	Stone Cairn	30° 08' 13.5241" E	25° 09' 44.8777" S
376	Linear Stone Wall	30° 08' 19.9969" E	25° 09' 44.1683" S
378	Terracing	30° 06' 39.4199" E	25° 05' 59.6185" S
379	Iron Age	30° 6'39.87"E	25° 6'8.13"S
600	Terracing	30° 07' 10.7868" E	25° 06' 56.5956" S
601	Terracing	30° 07' 11.9820" E	25° 06' 46.8144" S
602	Grave	30° 08' 47.2000" E	25° 09' 01.0000" S
603	Historic Pedi Complex	30° 08' 45.0000" E	25° 09' 01.0000" S
604	MSA	30° 08' 45.0000" E	25° 09' 02.8000" S
605	Stone Kraal 2	30° 08' 31.4000" E	25° 09' 28.2000" S
606	Stone Kraal	30° 08' 34.8000" E	25° 09' 26.0000" S
607	Grave	30° 08' 41" E	25° 09' 30" S
608	Iron Age	30° 07' 26.2000" E	25° 06' 59.3001" S
609	Iron Age	30° 07' 18.6001" E	25° 07' 12.9000" S
610	Iron Age	30° 07' 56.3401" E	25° 08' 53.6399" S
611	Iron Age	30° 07' 45.9600" E	25° 08' 52.6800" S
612	Iron Age	30° 07' 55.2601" E	25° 08' 53.2799" S
612	Iron Age	30° 07' 54.9599" E	25° 08' 52.9199" S
613	Iron Age	30° 07' 50.3401" E	25° 08' 52.1399" S
614	Iron Age	30° 07' 45.3601" E	25° 08' 49.4999" S
615	Iron Age	30° 07' 44.7599" E	25° 08' 48.4200" S
616	Iron Age	30° 07' 43.4401" E	25° 08' 47.8801" S
617	Iron Age	30° 07' 42.4799" E	25° 08' 50.3400" S

5.5. Iron Age

FIELD NUMBER	TYPE SITE	DESCRIPTION	SIGNIFICANCE RATING	MOTIVATION	MITIGATION
350	Iron Age	Possible deflated midden. A little bit of slag and undecorated ceramics. One decorated piece was found with cross hatching motif as decoration.	Low to Medium Significance	Lack of visible archaeological deposit and features.	Test excavation
352	Communal Grinding Area	Large communal grinding area on exposed bedrock with 7 grinding hollows. Possibly associated with the Iron age.	Low to Medium Significance	Possibly associated with Iron Age site.	Surrounding communal grinding area could contain the subsurface remains of an Iron Age site. Mapping and test excavations are recommended.
370	Iron Age	The site is extensively disturbed due to bulldozing activities. Several undecorated ceramics scattered over the area.	Low significance	The site is extensively disturbed and this would have destroyed all surface indicators.	No mitigation required.
379	Iron Age	Extensive Iron Age stone walled settlement in the saddle on top of a hill. Various enclosures with middens and archaeological deposit present. High frequency of undecorated ceramics.	Medium to high significance	Forms part of a Later Iron Age settlement with archaeological material and deposit	It is preferable to preserve the site in situ if this is not possible and if the site is impacted on it is recommended that the site should be excavated, mapped and monitored.
608	Iron Age	Middle Iron Age Eiland villages with burnt daga	Medium significance	As per Pistorius 2007	As per Pistorius the sites should be mapped and that sample excavations of certain structures and features in the complex must be conducted. Remains have to be preserved in a museum
609	Iron Age	Middle Iron Age Eiland villages with burnt daga	Medium significance	As per Pistorius 2007	As per Pistorius the sites should be mapped and that sample excavations of certain structures and features in the complex must be conducted. Remains have to be preserved in a museum
610	Iron Age	Rudimentary Terrace walls against slope of low protrusion.	Medium significance	As per Pistorius 2007	As per Pistorius the sites should be mapped and that sample excavations of certain structures and features in the complex must be conducted. Remains have to be preserved in a

ARCHAEOLOGY AND HERITAGE
BOOYSENDAL MINE EMP AMENDMENT: SPECIALIST REPORT
JULY 2016

					museum
611	Iron Age	Interrupted circular stone wall on low protrusion.	Medium significance	As per Pistorius 2007	As per Pistorius the sites should be mapped and that sample excavations of certain structures and features in the complex must be conducted. Remains have to be preserved in a museum
612	Iron Age	Rudimentary Terrace walls against slope of low protrusion.	Medium significance	As per Pistorius 2007	As per Pistorius the sites should be mapped and that sample excavations of certain structures and features in the complex must be conducted. Remains have to be preserved in a museum
612b	Iron Age	Rudimentary Terrace walls against slope of low protrusion.	Medium significance	As per Pistorius 2007	As per Pistorius the sites should be mapped and that sample excavations of certain structures and features in the complex must be conducted. Remains have to be preserved in a museum
613	Iron Age	Rudimentary Terrace walls against slope of low protrusion.	Medium significance	As per Pistorius 2007	As per Pistorius the sites should be mapped and that sample excavations of certain structures and features in the complex must be conducted. Remains have to be preserved in a museum
614	Iron Age	Stacks of stone on flat surface. Possible boundary walls for homestead.	Medium significance	As per Pistorius 2007	As per Pistorius the sites should be mapped and that sample excavations of certain structures and features in the complex must be conducted. Remains have to be preserved in a

ARCHAEOLOGY AND HERITAGE
BOOYSENDAL MINE EMP AMENDMENT: SPECIALIST REPORT
JULY 2016

					museum
615	Iron Age	Stacks of stone on flat surface. Possible boundary walls for homestead.	Medium significance	As per Pistorius 2007	As per Pistorius the sites should be mapped and that sample excavations of certain structures and features in the complex must be conducted. Remains have to be preserved in a museum
616	Iron Age	Clay with pole impressions.	Medium significance	As per Pistorius 2007	As per Pistorius the sites should be mapped and that sample excavations of certain structures and features in the complex must be conducted. Remains have to be preserved in a museum
617	Iron Age	Interrupted circular stone wall on low protrusion.	Medium significance	As per Pistorius 2007	As per Pistorius the sites should be mapped and that sample excavations of certain structures and features in the complex must be conducted. Remains have to be preserved in a museum

358	Terracing	Possible terrace wall measuring approximately 12 meters in length. Various other ephemeral walls are visible between rock outcrops. The site is overgrown and visibility is poor due to the vegetation.	Low significance	Lack of visible archaeological deposit and features.	
360	Terracing	Ephemeral terrace walls, surrounding a koppie with undecorated ceramics present on site.	Low to Medium Significance	Lack of visible archaeological deposit and features.	Test excavation
366	Terracing	Ephemeral terrace walls. Fragments of daga with pole impressions and undecorated ceramic scatter occur on site.	Low to Medium Significance	Not applicable	Monitoring if the site will be impacted on.

367	Terracing	Ephemeral terrace walls with undecorated ceramics. Sheet erosion is washing ceramics downhill.	Low significance	Not applicable	No mitigation required.
368	Terracing	Ephemeral terrace walls with undecorated ceramics. Sheet erosion is washing ceramics downhill.	Low significance	Not applicable	No mitigation required.
378	Terracing	Terrace walls located at the foot of the mountain. Undecorated ceramics are present on site. Possible agricultural terraces leading up to Iron Age site higher up on the mountain.	Low to Medium Significance	Forms part of a Later Iron Age settlement.	If the site is impacted on it is recommended that the site should be mapped and monitored.
600	Terracing	Various stone packed terrace walls.	Low significance	Lack of visible archaeological deposit and features.	?
601	Terracing	Terrace wall next to erosion gulley or drainage line. Measure 7 meters in a North South direction and is about half a meter high.	Low significance	Terrace wall is probably associated with agricultural activities. No cultural material present.	?



Figure 4: Ceramics and slag from Feature 350.



Figure 5: Communal grinding area at Feature 352



Figure 6: Stone Walled settlement at Feature 379



Figure 7: Stone Walled settlement at Feature 379

5.5. Ruins (Historical to recent)

FIELD NUMBER	TYPE SITE	DESCRIPTION	SIGNIFICANCE RATING	MOTIVATION	MITIGATION
344	Historical Ruin	Site is fenced in by green palisade fence (fenced by mine). The site consists of several circular enclosures and least two rectangular enclosures.	Low to Medium Significance	Communities in the area are possibly connected to the site and the site might contain unmarked graves.	If the site will be impacted on the presence of unmarked graves should be confirmed through community liaison. The site should be mapped and monitored during construction.
345	Historical Ruin	Consists of the foundations of a mud dwelling (circular enclosure) as well as a rectangular foundation of a house with at least three rooms. Additional stone circle built up against natural rocks. Cultural material consists of cans and undecorated pottery, lower grinders and a possible deflated midden.	Low to Medium Significance	Communities in the area are possibly connected to the site and the site might contain unmarked graves.	If the site will be impacted on the presence of unmarked graves should be confirmed through community liaison. The site should be mapped and monitored during construction.
346	Historical Ruin	Consists of the mud and stone foundations of approximately 6 large rectangular features. Cultural material includes lower grinders and undecorated pottery and burnt daga fragments.	Low to Medium Significance	Communities in the area are possibly connected to the site and the site might contain unmarked graves.	If the site will be impacted on the presence of unmarked graves should be confirmed through community liaison. The site should be mapped and monitored during construction.
353	Historical Ruin	Rectangular stone wall structure incorporated into natural rock. Entrance is orientated to the North. Possible filled in entrance to the South. Several ephemeral terraces surround the feature. Cultural material consists of undecorated ceramics. Linear walls are located to the East and West of this feature.	Low to Medium Significance	Communities in the area are possibly connected to the site and the site might contain unmarked graves.	If the site will be impacted on the presence of unmarked graves should be confirmed through community liaison. The site should be mapped and monitored during construction.
354	Historical Ruin	Rectangular stone walled structure measuring 5 x 4 meters.	Low to Medium Significance	Communities in the area are possibly connected to the site and the site might contain unmarked graves.	If the site will be impacted on the presence of unmarked graves should be confirmed through community liaison. The site should be mapped and monitored during construction.
355	Historical Ruin	Linear stone wall, most likely associated with Feature 354. Cultural material consists of fragments of a 3 legged iron cooking pot.	Low to Medium Significance	Communities in the area are possibly connected to the site and the site might contain unmarked graves.	If the site will be impacted on the presence of unmarked graves should be confirmed through community liaison. The site should be mapped and monitored during construction.
356	Historical Ruin	Rectangular stone walled ruin. Entrance orientated east. Could be a goat kraal. Cultural material consists of an old plough.	Low significance	Communities in the area are possibly connected to the site and the site might contain unmarked graves.	If the site will be impacted on the presence of unmarked graves should be confirmed through community liaison. The site should be mapped and monitored during construction.
357	Historical Ruin	Stone walls that form a funnel towards a rectangular stone walled structure (8 x 8 meters). Fragments of undecorated pottery noted. The possibility exists that more structures might be present as the area is highly overgrown.	Low to Medium Significance	Communities in the area are possibly connected to the site and the site might contain unmarked graves.	If the site will be impacted on the presence of unmarked graves should be confirmed through community liaison. The site should be mapped and monitored during construction.

ARCHAEOLOGY AND HERITAGE
BOOYSENDAL MINE EMP AMENDMENT: SPECIALIST REPORT
JULY 2016

362	Historical Ruin	Consists of the mud foundations of a possible residential dwelling. The ruin measures 12 x 8 meters.	Low to Medium Significance	Communities in the area are possibly connected to the site and the site might contain unmarked graves.	If the site will be impacted on the presence of unmarked graves should be confirmed through community liaison. The site should be mapped and monitored during construction.
372	Linear Stone Wall	Linear stone wall probably associated with the exploration road and is approximately 5 meters wide.	Low significance	Not applicable	No mitigation required.
373	Historical Ruin	Rectangular structure with a North facing entrance. Walls are well preserved. Structure measures 18 x 15 meters. Several other foundations of mud dwellings are also visible. Cultural material consists of modern iron and glass artefacts together with undecorated ceramics. The site also includes the remains of two rectangular stone packed kraals measuring 12 x 18 meters (approximately).	Low to Medium Significance	Communities in the area are possibly connected to the site and the site might contain unmarked graves.	If the site will be impacted on the presence of unmarked graves should be confirmed through community liaison. The site should be mapped and monitored during construction.
376	Linear Stone Wall	Long stone packed wall close to exploration road. Measures 12 meters in length. The wall is of unknown purpose and no cultural material is present.	Low significance	Lack of visible archaeological deposit and features.	No mitigation required.
603	Historic Pedi Complex	Substantial Pedi Complex centres on a rock dome. The site is characterised by low stone lapa walls and burnt daga.	Low to Medium Significance	Not applicable	If the site will be impacted on the presence of unmarked graves should be confirmed through community liaison. The site should be mapped and monitored during construction.
605	Stone Kraal 2	Historic stone kraal.	Low significance	Not applicable	If the site will be impacted on the presence of unmarked graves should be confirmed through community liaison. The site should be mapped and monitored during construction.
606	Stone Kraal	Historic stone kraal.	Low significance	Not applicable	If the site will be impacted on the presence of unmarked graves should be confirmed through community liaison. The site should be mapped and monitored during construction.



Figure 8: Rectangular Stone walls at feature 353



Figure 9: Overgrown stone walls at feature 354



Figure 10: Feature 356 viewed from the west



Figure 11: Feature 375 obscured by vegetation

5.6. Cemeteries/graves.

FIELD NUMBER	TYPE SITE	DESCRIPTION	SIGNIFICANCE RATING	MOTIVATION	MITIGATION
347	Cemetery	Three graves with headstones. Oldest visible date is 1962.	High Significance	Graves are of high social significance.	Graves are already fenced and should be preserved in situ.
374	Cemetery	Site is highly overgrown and the number of graves could not be determined. The graves are located within a kraal wall and belong to the Mokala family.	High Significance	Graves are of high social significance.	Preservation in situ.
602	Grave	African grave with headstone. Located next to stone foundations of a rectangular house.	High Significance	Graves are of high social significance.	Preservation in situ.
607	Grave	Single grave	High Significance	Graves are of high social significance.	Preservation in situ



Figure 12: Graves at feature 347



Figure 13: Overgrown graves at Feature 374

5.7. Stone Cairn (Time period unknown)

FIELD NUMBER	TYPE SITE	DESCRIPTION	SIGNIFICANCE RATING	MOTIVATION	MITIGATION
351	Stone Cairn	Rectangular stone dressing orientated north to south. Purpose is unknown but could be a possible grave.	If confirmed as a grave it is of high social significance.	Graves are of high social significance.	Preservation in situ.
359	Stone Cairn	Two stone cairns of unknown purpose. One is rectangular in shape and the other circular. Measuring 1.2 meters in diameter.	If confirmed as graves it is of high social significance.	Graves are of high social significance.	Preservation in situ.
365	Stone Cairn	4 Stone cairns of unknown purpose. Could be linked with initiation. Although unlikely, it could also be possible graves. Measure between 0.5 to 1.5 / 2 meters. Cultural material includes broken lower and upper grinders, pottery - decoration indicate possible Marateng pottery (Pedi). Possible Iron Age site with terracing.	If confirmed as graves it is of high social significance.	Graves are of high social significance.	Test excavation
375	Stone Cairn	Orientated north to south and measures 2.5 x 1.5 m. The cairn is of unknown purpose, but could represent a grave.	If confirmed as a grave it is of high social significance.	Graves are of high social significance.	Preservation in situ.



Figure 14: Feature 351



Figure 15: Feature 375

5.8 Engravings

FIELD NUMBER	TYPE SITE	DESCRIPTION	SIGNIFICANCE RATING	MOTIVATION	MITIGATION
369	Rock Engraving	Rock engravings. Circular motifs. Possibly resembling later Iron Age lay outs.	Medium significance	Not applicable	Preservation in situ.



Figure 16. Rock engraving

6. IMPACT ASSESSMENT

6.1. Impact Identification and Assessment

In terms of the International Finance Corporation Performance Standards the Area of Influence is defined as:

The area likely to be affected by:

- *the project and the client's activities and facilities that are directly owned, operated or managed (including by contractors) and that are a component of the project;*
- *impacts from unplanned but predictable developments caused by the project that may occur later or at a different location;*
- *indirect project impacts on biodiversity or on ecosystem services upon which Affected Communities' livelihoods are dependent;*

- *Associated facilities, which are facilities that are not funded as part of the project and that would not have been constructed or expanded if the project did not exist and without which the project would not be viable.*
- *Cumulative impacts that result from the incremental impact, on areas or resources used or directly impacted by the project, from other existing, planned or reasonably defined developments at the time the risks and impacts identification process is conducted.*

Impacts can be direct, indirect or cumulative and needs to be related to all activities and associated, including direct third party activities.

- **Direct impacts** are caused by the action and occur at the same time and place;
- **Indirect impacts** are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable;
- **Cumulative impact** is the impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions.

6.2. Identified Environmental Impacts

The following sites will not be directly impacted by the proposed development based on the current lay out:

FIELD NUMBER	TYPE SITE	SOURCE	SIGNIFICANCE	CAUSE OF IMPACT
344	Historical Ruin	Van der Walt 2016	Low to Medium Significance	No impact
353	Historical Ruin	Van der Walt 2016	Low to Medium Significance	No impact
369	Rock Engraving	Van der Walt 2016	Medium significance	No impact
602	Grave	Huffman and Schoeman 2002a	High Significance	No impact
603	Historic Pedi Complex	Huffman and Schoeman 2002a	Low to Medium Significance	No impact
604	MSA	Huffman and Schoeman 2002a	Low significance	No impact
608	Iron Age	Huffman and Schoeman 2002 b	Medium significance	No impact
609	Iron Age	Huffman and Schoeman 2002b	Medium significance	No impact
611	Iron Age	Pistorius 2007	Medium significance	No Impact
613	Iron Age	Pistorius 2007	Medium significance	No Impact

The following sites will be impacted on by the proposed development as per the current lay out.

FIELD NUMBER	TYPE SITE	SOURCE	SIGNIFICANCE RATING	MOTIVATION	CAUSE OF IMPACT
345	Historical Ruin	Van der Walt 2016	Low to Medium Significance	Communities in the area are possibly connected to the site and the site might contain unmarked graves.	Inside development footprint
346	Historical Ruin	Van der Walt 2016	Low to Medium Significance	Communities in the area are possibly connected to the site and the site might contain unmarked graves.	Inside development footprint
347	Cemetery	Van der Walt 2016	High Significance	Graves are of high social significance.	Inside development footprint
350	Iron Age	Van der Walt 2016	Low to Medium Significance	Lack of visible archaeological deposit and features.	Inside development footprint
351	Stone Cairn	Van der Walt 2016	If confirmed as a grave it is of high social significance.	Graves are of high social significance.	Inside development footprint
352	Communal Grinding Area	Van der Walt 2016	Low Significance	Possibly associated with Iron Age site.	Inside development footprint
354	Historical Ruin	Van der Walt 2016	Low to Medium Significance	Communities in the area are possibly connected to the site and the site might contain unmarked graves.	Inside development footprint
355	Historical Ruin	Van der Walt 2016	Low to Medium Significance	Communities in the area are possibly connected to the site and the site might contain unmarked graves.	Inside development footprint
356	Historical Ruin	Van der Walt 2016	Low significance	Communities in the area are possibly connected to the site and the site might contain unmarked graves.	Inside development footprint
357	Historical Ruin	Van der Walt 2016	Low to Medium Significance	Communities in the area are possibly connected to the site and the site might contain unmarked graves.	Inside development footprint
358	Terracing	Van der Walt 2016	Low significance	Lack of visible archaeological deposit and features.	Inside development footprint
359	Stone Cairn	Van der Walt 2016	If confirmed as graves it is of high social significance.	Graves are of high social significance.	Inside development footprint
360	Terracing	Van der Walt 2016	Low to Medium Significance	Lack of visible archaeological deposit and features.	Inside development footprint
362	Historical Ruin	Van der Walt 2016	Low to Medium Significance	Communities in the area are possibly connected to the site and the site might contain unmarked graves.	Inside development footprint
363	Possible Graves	Van der Walt 2016	If confirmed as a grave it is of high social significance.	Graves are of high social significance.	Inside development footprint
365	Stone Cairn	Van der Walt 2016	If confirmed as graves it is of high social significance.	Graves are of high social significance.	Inside development footprint
366	Terracing	Van der Walt 2016	Low to Medium Significance	Due to lack of visible archaeological deposit and other features.	Inside development footprint
367	Terracing	Van der Walt 2016	Low significance	Due to lack of visible archaeological deposit and other features.	Inside development footprint

ARCHAEOLOGY AND HERITAGE
BOOYSENDAL MINE EMP AMENDMENT: SPECIALIST REPORT
JULY 2016

368	Terracing	Van der Walt 2016	Low significance	Due to lack of visible archaeological deposit and other features.	Inside development footprint
370	Iron Age	Van der Walt 2016	Low significance	The site is extensively disturbed.	Inside Development footprint
372	Linear Stone Wall	Van der Walt 2016	Low significance	Due to lack of visible archaeological deposit and other features.	Inside Development footprint
373	Historical Ruin	Van der Walt 2016	Low to Medium Significance	Communities in the area are possibly connected to the site and the site might contain unmarked graves.	Inside Development footprint
374	Cemetery	Van der Walt 2016	High Significance	Graves are of high social significance.	Inside development footprint
375	Stone Cairn	Van der Walt 2016	If confirmed as a grave it is of high social significance.	Graves are of high social significance.	Inside development footprint
376	Linear Stone Wall	Van der Walt 2016	Low significance	Lack of visible archaeological deposit and features.	Inside development footprint
378	Terracing	Van der Walt 2016	Low to Medium Significance	Forms part of a Later Iron Age settlement.	Ropecon / Aerial rope way
379	Iron Age	Van der Walt 2016	Medium to high significance	Forms part of a Later Iron Age settlement with archaeological material and deposit	Inside development footprint
600	Terracing	Van der Walt 2016	Low significance	Lack of visible archaeological deposit and features.	Inside development footprint
601	Terracing	Van der Walt 2016	Low significance	Terrace wall is probably associated with agricultural activities. No cultural material present.	Inside development footprint
605	Stone Kraal 2	Huffman and Schoeman 2001	Low significance	As per initial assessment	Inside development footprint
606	Stone Kraal	Huffman and Schoeman 2001	Low significance	As per initial assessment	Inside development footprint
607	Grave	Huffman and Schoeman 2002 a	High Significance	Graves are of high social significance.	Inside development footprint
610	Iron Age	Pistorius 2007	Medium significance	As per initial assessment	Inside development footprint
612	Iron Age	Pistorius 2007	Medium significance	As per initial assessment	Inside development footprint
612	Iron Age	Pistorius 2007	Medium significance	As per initial assessment	Inside development footprint
614	Iron Age	Pistorius 2007	Medium significance	As per initial assessment	Inside Development footprint
615	Iron Age	Pistorius 2007	Medium significance	As per initial assessment	Inside Development footprint
616	Iron Age	Pistorius 2007	Medium significance	As per initial assessment	Inside Development footprint
617	Iron Age	Pistorius 2007	Medium significance	As per initial assessment	Inside development footprint

The impact

In terms of heritage resources the impact of project activities including pre construction work (vegetation clearing etc.) and construction work on heritage resources are always destructive and permanent.

The source of the impact;

During the pre-construction and 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.

The potential consequence of the impact;

The consequence of disturbing or destroying heritage sites is always permanent irreversible damage to the site and a subsequent loss of archaeological data. However if sites are recorded and preserved or mitigated this adds to the record of the area.

The significance of the impact within the wider environment and taking consideration of the vulnerability of the specific receptors

6.3. Evaluation of Potential Impacts

The potential impacts are evaluated using the guidelines provided by Amec Foster and Wheeler (Pty) Ltd. These criteria do not translate easily into heritage impacts as heritage resources are non-renewable and damage is permanent and irreversible.

6.3.1. Impact Significance Rating Definitions

Likelihood, duration, extent, magnitude, sensitivity and significant ratings should be based on the following scoring scheme:

Likelihood:

1 = Unlikely	2 = Possible	3 = Likely	4 = Definite Likelihood
Low to no probability of occurrence with the implementation of management measures	Possible that impact may occur from time to time	Distinct / realistic possibility that impacts will occur if not managed and monitored	Impacts will occur even with the implementation of management measures

Duration:

1 = Temporary	2 = Short Term	3 = Long Term	4 = Permanent
Possible to within a short period of time mitigate / immediate or fairly quick progress with management implementation	Impacts reversible within a short period of time +3 to 5 yrs.	Impacts will only cease after the operational life +/- 50 yrs.	Long term, beyond mine closure or irreplaceable

Extent:

1 = Localised	2 = Site	3 = Area of Influence	4 = Regional/ Provincial/ National
Localised to specific area of activities	Confined to the site	The extent of the impacts will affect the wider area of Influence	Importance of the impact is of regional provincial or national importance

Magnitude (negative):

-1 = Low	-2 = Minor	-3 = Moderate	-4 = High
Deterioration of baseline conditions or functions are negligible Nuisance Will not cause any material change to the value or function of the receptor/s of Emissions will comply	Moderate deterioration, partial loss of habitat / biodiversity/ social functions or resources, Emissions at times exceed legal limits Emissions reach outside project footprint	Reversible although substantial illness, injury, loss of habitat, loss of resources Notable deterioration of functions Impact on biodiversity Causes a change in the value or function of receptor but does not	Mainly irreversible Causes a significant change in the environment affecting the viability, value and function of the receptors Substantial impact and loss of biodiversity Death/ loss of receptors

with legal limits Emissions contained within footprint within limits		fundamentally affect its overall viability Emissions regularly exceed legal limits Emissions will affect the wider region Livelihood of sensitive receptors are impacted	Loss of livelihood Emissions do not comply with regulations Impact on listed species
---	--	--	--

Magnitude (positive):

+1 = Low	+2 = Minor	+3 = Moderate	+4 = High
<p>Slight enhancement of baseline conditions or functions</p> <p>Potential pollution sources are removed Slight positive change to the value or function of the receptor/s</p> <p>Project controls assists in Emissions will comply with legal limits</p> <p>Emissions contained within footprint within limits</p>	<p>Minor enhancement, of habitat / biodiversity/ social functions or resources,</p> <p>Better control of emissions</p> <p>Project assist in management and control of emissions</p>	<p>Substantial improvement in human health habitat, and ecosystem services</p> <p>Notable improvement of functions</p> <p>Moderate improvement of biodiversity</p> <p>Causes a change in the value or function of receptor and improves overall viability</p> <p>Emissions regularly improves</p> <p>Livelihood of sensitive receptors are improved</p>	<p>Significant positive change in the environment viability, value and function Substantial impact and improvement of biodiversity</p> <p>Better protection of receptors</p> <p>Development of livelihood</p> <p>Emissions improve to comply with regulations</p> <p>Protection of listed species</p>

Sensitivity:

1 = Low	2 = Moderate Low	3 = Moderate	4 = High
<p>Areas already subjected to significant degradation</p> <p>Non-designated or locally designated sites/habitats</p> <p>Non-sensitive receptor with regards to the impact type (e.g. noise receptors)</p> <p>No vulnerable</p>	<p>Partially degraded area</p> <p>Sensitive receptors present</p> <p>Small number of vulnerable communities present</p>	<p>Regionally designated sites / habitats</p> <p>Regionally rare or endangered species</p> <p>Moderately sensitive receptor with regard to the impact type</p> <p>Some vulnerable communities present</p>	<p>Nationally or internationally designated sites/habitats</p> <p>Species protected under national or international laws / conventions</p> <p>High sensitivity with regard to the impact type</p> <p>High number of vulnerable</p>

communities			communities present High dependency
-------------	--	--	--

Significance

The significance of the impact is calculated as follow:

Significance = (Likelihood + duration + extent + sensitivity) x magnitude

		Likelihood + duration + extent + sensitivity			
		Low (+ / -) ≤4	Minor (+ / -) 5 – 8	Moderate (+ / -) 9 – 12	High (+ / -) 13 – 16
Magnitude	Low (1)	Not significant	Not significant	Minor	Moderate
	Minor (2)	Not significant	Minor	Minor	Moderate
	Moderate (3)	Minor	Moderate	Moderate	High
	High (4)	Moderate	High	High	High

Impact assessment of Iron Age Features and Terracing

(350, 352,358,360,366,367,368,370,378, 379, 600, 601, 610, 612, 614, 615, 616, 617)

Impact Component	Impact 1	Significance prior to Mitigation	Significance with Mitigation
Activity	Pre-construction activities (Site preparation and clearance) Construction activities		
Risk/ Impact	Vegetation clearance for mine infrastructure can directly impact. Heritage sites by disturbing artefacts or moving artefacts from their original context. Construction and clearing activities can also destroy heritage sites. Impacts on heritage resources are permanent and irreversible due the non-renewable nature of heritage sites.		

Project Phase (during which impact will be applicable) CO = construction, OP = operational, CL = Closure and post-closure	Pre Construction		
Nature of Impact	CO		
Nature of Impact	Negative		
Type of Impact	Direct: Pre Construction and Construction activities will directly lead to impact		
	Define Significance Categories	Significance Prior to Mitigation	Significance With Mitigation
Likelihood/ probability	Definite Likelihood	4	4
Duration	Permanent Impact on heritage resources is permanent and irreversible.	4	4
Extent	Localised Impact will be localised to the project area.	2	1
Receptor Sensitivity	Moderate	3	2
Magnitude	Mainly irreversible The magnitude will depend on the location of infrastructure components. If sites can be demarcated and left as is the impact will be less or recorded and mitigated.	4	3
Impact Significance	High significance as heritage sites are not renewable and losses are permanent and irreversible. With the correct mitigation and monitoring the rating can be decreased to Moderate.	High <u>13</u> 4	Moderate <u>11</u> 2
Mitigating and Monitoring Requirements			
Required Management Measures	Sites should be mapped, test excavated and the results recorded. It is also recommended that the presence of unmarked graves should be confirmed through community liaison. .		
Required Monitoring (if any)	Iron Age Sites should be monitored by a qualified archaeologist during construction.		
Responsibility for implementation	Environmental Officer and Mine Manager		
Impact Finding			
Impact Finding	Impact can be managed through mitigation and monitoring.		

--	--

Impact Assessment on Graves and Cemeteries (Site 347, 363, 374, 607)

Impact Component	Impact	Significance prior to Mitigation	Significance with Mitigation
Activity	Construction activities		
Risk/ Impact	Construction activities can also destroy surface indicators and subsurface remains of graves and at cemeteries. Graves are of high social significance and are protected by the heritage act. Impacts on heritage resources are permanent and irreversible due the non-renewable nature of heritage sites.		
Project Phase (during which impact will be applicable) CO = construction, OP = operational, CL = Closure and post-closure	CO		
Nature of Impact	Negative		
Type of Impact	Direct: Construction activities will directly lead to impact		
	Define Significance Categories	Significance Prior to Mitigation	Significance With Mitigation
Likelihood/ probability	Definite Likelihood	4	4
Duration	Permanent Impact on heritage resources is permanent and irreversible.	4	4
Extent	Localised Impact will be localised to the project area.	2	1
Receptor Sensitivity	High	4	3
Magnitude	Mainly irreversible The magnitude will depend on the location of infrastructure components. If sites can be demarcated and left as is the impact will be less or recorded and mitigated.	4	3
Impact Significance	High significance as heritage sites are not renewable and losses are permanent and irreversible. With the correct mitigation and monitoring the rating can be decreased to Moderate.	High <u>14</u> 4	Moderate <u>12</u> 2

Mitigating and Monitoring Requirements			
Required Management Measures	Graves should ideally be preserved in situ. If this is not possible graves should be relocated as per the required legislation.		
Required Monitoring (if any)	If graves can be preserved the graves should be fenced with an access gate for family members. The graves should be monitored by the ECO quarterly, the site should be maintained, and vegetation should be controlled.		
Responsibility for implementation	Environmental Officer and Mine Manager		
Impact Finding			
Impact Finding	Impact can be managed through mitigation and monitoring.		

Impact Assessment on Ruins (Site 345, 346, 354, 355, 356, 357, 362, 372, 373, 376, 605 and 606)

Impact Component	Impact 1	Significance prior to Mitigation	Significance to With Mitigation
Activity	Pre-construction activities (Site preparation and clearance) Construction activities		
Risk/ Impact	Vegetation clearance for mine infrastructure can directly impact Heritage sites by disturbing artefacts or moving artefacts from their original context. Construction and clearing activities can also destroy heritage sites. Impacts on heritage resources are permanent and irreversible due the non-renewable nature of heritage sites. Sites like these are also known to contain unmarked graves.		
Project Phase (during which impact will be applicable) CO = construction, OP = operational, CL = Closure and post-closure	Pre-Construction		
Nature of Impact	CO Negative		
Type of Impact	Direct: Pre Construction and Construction activities will directly lead to impact		
	Define Significance Categories	Significance Prior to Mitigation	Significance to With Mitigation
Likelihood/ probability	Definite Likelihood	4	4
Duration	Permanent Impact on heritage resources is permanent and irreversible.	4	4

Extent	Localised Impact will be localised to the project area.	2	1
Receptor Sensitivity	Moderate	3	2
Magnitude	Mainly irreversible The magnitude will depend on the location of infrastructure components. If sites can be demarcated and left as is the impact will be less or recorded and mitigated.	4	3
Impact Significance	High significance as heritage sites is not renewable and losses are permanent and irreversible. With the correct mitigation and monitoring the rating can be decreased to Moderate .If the sites contain graves this will increase the significance as graves are of high social significance.	High <u>13</u> 4	Moderate <u>11</u> 2
Mitigating and Monitoring Requirements			
Required Management Measures	Sites that are impacted on should be mapped, test excavated and the results recorded. It is also recommended that the presence of unmarked graves should be confirmed through community liaison. .		
Required Monitoring (if any)	Sites should be monitored by a qualified archaeologist during during construction especially while digging the foundations of infrastructure.		
Responsibility for implementation	Environmental Officer and Mine Manager		
Impact Finding			
Impact Finding	Impact can be managed through mitigation and monitoring. If graves are found in the area these should ideally be preserved in situ. If this is not possible the graves should be relocated following the correct procedures.		

Impact Assessment on Stone Cairns (Site 351, 359, 365, 375)

Impact Component	Impact 1	Significance prior to Mitigation	Significance with Mitigation
Activity	Pre-construction activities (Site preparation and clearance) Construction activities		
Risk/ Impact	Vegetation clearance for mine infrastructure can directly impact Heritage sites by disturbing artefacts or moving artefacts from their original context. Construction and clearing activities can also destroy heritage sites. Impacts on heritage resources are permanent and irreversible due the non-renewable nature of heritage sites. The cairns are of unknown purpose but can be associated with graves.		
Project Phase (during which impact will be applicable) CO = construction, OP = operational, CL = Closure and post-closure Nature of Impact	Pre-Construction CO Negative		
Type of Impact	Direct: Pre Construction and Construction activities will directly lead to impact		
	Define Significance Categories	Significance Prior to Mitigation	Significance With Mitigation
Likelihood/ probability	Definite Likelihood	4	4
Duration	Permanent Impact on heritage resources is permanent and irreversible.	4	4
Extent	Localised Impact will be localised to the project area.	2	1
Receptor Sensitivity	Moderate	3	2
Magnitude	Mainly irreversible The magnitude will depend on the location of infrastructure components. If sites can be demarcated and left as is the impact will be less or recorded and mitigated.	4	3
Impact Significance	High significance as heritage sites is not renewable and losses are permanent and irreversible. With the correct mitigation and monitoring the rating can be decreased to Moderate .If the sites contain graves this will increase the significance as graves are of high social	High <u>13</u> 4	Moderate <u>11</u> 2

	significance.		
Mitigating and Monitoring Requirements			
Required Management Measures		It is recommended that the presence of unmarked graves should be confirmed through community liaison. If the presence of graves cannot be confirmed and the sites will be impacted on the sites will have to be test excavated.	
Required Monitoring (if any)		No monitoring required. .	
Responsibility for implementation		Environmental Officer and Mine Manager	
Impact Finding			
Impact Finding		Impact can be managed through mitigation and monitoring. If graves are found in the area these should ideally be preserved in situ. If this is not possible the graves should be relocated following the correct procedures.	

6.4. Cumulative Impacts

Through CRM studies for developments in the area heritage sites are identified and protected from accidental damage, this can be regarded as a positive impact as it adds to the heritage database of the area.

In terms of the cumulative impact of this and other developments in the Groot Dwarsrivier Valley area, as there are numerous similar projects in the area the impact on the heritage landscape is increased slightly.

Potential cumulative impacts may include the following:

- Increased human presence in the area may further expose or damage heritage resources, especially the looting of archaeological sites for artefacts;
- Informal or smaller infrastructure developments outside the areas covered by the EIS and EMP may impact or expose further heritage resources not currently documented and recorded; and
- Due to the magnitude of the impact area of the project, depletion of the archaeological record is at risk and therefore increasing the importance of managing the recorded heritage resources in a responsible manner.
- Low significant heritage sites are demolished through the development in the area and these sites form part of the larger heritage landscape.

The impact of the project on identified heritage resources will be mitigated.

Action trigger	Development impact
Is the proposed action one of several similar past, present or future actions in the same geographic area?	Yes
Do other activities (whether state or private) in the region have environmental effects similar to those of the proposed action?	Yes
Will the proposed action (in combination with other planned activities) affect any natural resources, cultural resources, socio or economic units, or ecosystems of local, regional or national concern?	There is a secondary impact that can be managed through the correct mitigation.
Have any recent heritage studies of similar actions identified important adverse or beneficial cumulative effects issues?	Data on the heritage resources on the area is being collected through systematic surveys and identified resources are recorded and managed through mitigation.
Has the impact been historically significant, such that the importance of the resource is defined by past loss, gain or investments to restore resources?	No, but the heritage of the communities in the area is being preserved through mitigation.
Does the proposed action involve any of the following? <ul style="list-style-type: none"> » Loss of natural habitats or historic character through residential, commercial and industrial development » Social, economic or cultural effects on marginalised communities resulting from ongoing development 	Currently the area is not inhabited The project and others in the area will have an impact on the cultural landscape, but the social benefits of the project have been classified as beneficial.

7. MANAGEMENT MEASURES

IFC Performance Standards require the development of an Environmental and Social Management System (ESMS) appropriate to the nature and scale of the project and its associated risks and impacts. As part of the ESMS, specific mitigation measures should be identified for each significant aspect of the project. For archaeological and heritage sites, potential mitigation and management measures to be considered include;

- i. *Avoidance*: This option focuses on conservation of cultural heritage sites by avoiding disturbance of these locations where feasible. Depending on the importance of the resource and the economic viability of preservation, site conservation may be the only option available to the developer. A site HMP may be developed to describe management plans and actions.
- ii. *Mitigation and partial conservation*: This option focuses on a combined approach of mitigation and avoidance or conservation. Portions of a site that cannot be avoided may be managed through archaeological study including such actions as shovel test pits, test excavations, detailed documentation and mapping. In areas where avoidance is feasible, conservation efforts should especially consider significant site features.
- iii. *Site mitigation*: The entire site is mitigated through appropriate archaeological study and documentation before destruction.
- iv. *Site destruction*: If a site is of little or no archaeological or cultural heritage significance, it may be destroyed.

Two options can be considered in the mitigation and management of the sites in this report. Option I, which entails the conservation and protection of sites in their original location, is the preferred course. When this is not practically or economically viable for significant sites, Option II & III, archaeological study and test excavations, is recommended. These measures will minimize the negative impacts of the development. To protect the conserved sites further, monitoring will be necessary.

Mitigation measures:

- Booysendal Mine should develop a site specific Heritage Management Plan (HMP) that integrate all the findings of the various surveys in the area and that describes the location of known cultural heritage sites in the mine impact and lease area and actions for managing those sites. This should also include a Heritage Monitoring Plan and annual heritage audit.
- Prior to construction and if impacted on by the final lay out, the following sites are recommended for further study and documenting in anticipation of destruction by mine infrastructure based on the current layout. This will include as a minimum the following;
 - 347, 363, 374, 607 – It is recommended that grave sites should be preserved in situ and if this is not possible the graves should be relocated following the correct procedures as per legislation.
 - 350, 352, 360 - Mapping, test excavations and analysis;
 - 378 - Mapping and monitoring ;

- 379 - It is preferable to preserve the site *in situ* if this is not possible and if the site is impacted on it is recommended that the site should be excavated, mapped and monitored before a destruction permit can be applied for from the SAHRA;
 - 358, 370, 600, 601, 610, 612, 612,614, 615,616, 617 – Monitoring during construction
 - 344, 345, 346, 353, 354, 355, 356, 357, 362, 373 - If the ruins are impacted on the sites must be mapped and through community involvement the presence of unknown graves must be determined. Some of these features might be older than 60 years and could require destruction permits if impacted on. These sites should be monitored during construction.
 - 351, 359, 365, 375 – It is recommended that through social consultation it is established whether the cairns represent graves. If they are confirmed as graves it is recommended that grave sites should be preserved *in situ* and if this is not possible the graves should be relocated following the correct procedures as per legislation.
- Due to the ruggedness and the vastness of the study area more sites can be expected and it is recommended that the final lay out is subjected to a walk through prior to construction.
 - Once the pylon positions of the Aerial Ropeway is confirmed this must be subjected to a walk down.
 - It is recommended that the mine community liaison officer must liaise with community members regarding unknown graves and intangible heritage resources in the area.
 - Cultural training and awareness program: Contractors, subcontractors and employees should be sensitized to the procedures that must be followed in case of a discovery and the potential presence of archaeological resources that may be discovered during land-clearance and mechanical excavation activities.
 - Develop and implement a plan for chance finds or “unforeseen discoveries” procedures of significant archaeological, cultural or historic features revealed during construction and operational activities.
 - Routine monitoring of land-clearing activities should be undertaken by monitors trained to identify archaeological artefacts and sites.
 - Routine review of integrity of cultural heritage sites in the area of the operations.
 - It is recommended that an integrated heritage report be compiled for the entire project with consolidated mitigation measures, as a holistic approach to mitigate cultural resources impacted on by the project is preferable.

Chance Find Procedure

The following procedural guidelines must be considered in the event that previously unknown heritage resources or burial grounds and graves are exposed or found during the life of the project.

Initial Identification and/or Exposure (Chance Find)

If during the construction, operations, or closure phases of this project, any person employed by the mine, one of its subsidiaries, contractors and subcontractors, or service provider, find any artefact of cultural significance, this person must cease work at the site of the find. They must report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.

The initial procedure when such sites are found aim to avoid any further damage. If during the construction, operations or closure phases of this project, any person employed by the mine, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance the following steps and reporting structure must be observed in both instances:

- The person or group (identifier) who identified or exposed the heritage resource or burial ground must cease all activity in the immediate vicinity of the site;
- The identifier must immediately inform the senior on-site Manager of the discovery;
- The senior on-site Manager must make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area and ensure that the site is secured and control access;
- The senior on-site Manager will inform the EO and Health and Safety (HS) officer of the chance find and its immediate impact on mine operations. The EO will then contact the project archaeologist.

- **Chance Find Procedures: Heritage Resources**

In the event that previously unidentified heritage resources are identified and/or exposed during construction or operation of the project, the following steps must be implemented subsequent to those outlined above:

- The project archaeologist must be notified of the discovery;
- The project archaeologist will visit the site for a field based assessment of the finds and appropriate mitigation measures will then be presented to the mine;
- Should the specialist conclude that the find is a heritage resource protected in terms of heritage legislation, the project archaeologist will notify the relevant authorities; and
- Based on the comments received from the authorities, the project archaeologist will provide the mine with a Terms of References Report and relevant associated costs if necessary.

Chance Find Procedures: Burials and Graves

In the event that previously unidentified burial grounds and graves are identified and/or exposed during construction or operation of the project, the following steps must be implemented subsequent to those outlined above:

- The project archaeologist must immediately be notified of the discovery in order to take the required further steps:
 - The local Police and traditional authority should be notified;
 - The project archaeologist will inspect the exposed burial and determine in consultation with the police and traditional authority if any additional graves may exist in the vicinity as well as the temporal context of the remains, i.e.:
 - forensic
 - recent or historical; or
 - archaeological;
- Should the specialist conclude that the find is a heritage resource protected in terms of legislation, the project archaeologist will notify the authorities;

The Chance Find Procedures presented in this document serve as international best practice policy for the accidental discovery of heritage resources and burial grounds and graves. Based on the definitions provided within this document and the proposed lines of communication, Booysendal Mine will be able to mitigate the accidental discovery of heritage resources and burial grounds and graves throughout the various phases of the project.

The project archaeologist will be available to assist with the recommendation of mitigations for the accidental discovery of heritage resources and burial grounds and graves.

8. MONITORING REQUIREMENTS

Ideally, site monitoring should be conducted by an experienced archaeologist or heritage specialist. However, because of human resource limitations and budget constraints, this may not be practical. If heritage specialists are not available, it is recommended that Environmental Officers (EO) or other responsible persons should be trained along the following lines:

- *Induction training:* Responsible staff identified by the developer should attend a short course on heritage management and identification of heritage resources.
- *Site monitoring and watching brief:* As most heritage resources occur below surface, all earth-moving activities need to be routinely monitored in case of accidental discoveries. The greatest potential impacts are the initial soil removal and subsequent earthworks during construction. The EO should monitor all such activities on a daily basis. In the event that any heritage resources are found, the chance finds procedure must be followed as outlined above.

Finally, a heritage specialist should assess any material change to the conceptual layout plan.

Monitoring should take place at the following sites: 378, 379, 358, 370, 600, 601, 610, 612, 612,614, 615,616, 617, 344, 345, 346, 353, 354, 355, 356, 357, 362, 373. Monitoring should take place during construction on a daily basis by the ECO and bi weekly by the project archaeologist. It is recommended that all earthworks are monitored. Graves and cemeteries should also be monitored to ensure preservation and prevent damage.

9. KNOWLEDGE GAPS

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. This report only deals with the footprint area of the proposed development as indicated in the location map. Inaccessibility and vegetation cover hampered the survey.

No community resides in the study area and therefore no one was consulted regarding social and intangible cultural resources that might be present. Reliability of older reports including coordinates cannot be guaranteed as well as whether these sites are still intact.

10. CONCLUSIONS

According to the SAHRIS Paleo Sensitivity map most of the study area is classified as being of zero and low palaeontological sensitivity. According to SAHRIS no palaeontological studies are required although a protocol for finds is required and is included in this report.

Middle Stone Age (30-300 thousand years ago) isolated artefacts are found scattered over the landscape. These artefacts are scattered too sparsely to be of any significance apart from noting their presence which has been done in this report. Decorated pottery found in the study area belongs to a stylistic facies known as *Eiland* that dates to between 1550 AD and 1750 AD (Huffman 2007: 186-189). These Middle Iron Age Sites do not have any stone walling associated with them and is found close to cultivatable soil. As these sites are not easily discernible on the surface more sites dating to this period can be expected.

Some stylistic *Marateng* pottery was also recorded presumably in association with Late Iron Age stone walled settlements. *Marateng* pottery dates to between 1650 AD and 1840 AD (Huffman 2007: 207). Some ephemeral stone walls were also recorded. These walls are inconspicuous and not associated with any particular period. They were mostly built on or near rocky outcrops and are in some instances barely visible as they are covered with grass and vegetation. Several ruins occur in the study area marked by rectangular and linear walls, presumably these sites date to the historical to recent occupation of the study area.

A total of 49 sites are on record for the study area. The current assessment identified 32 Sites within the study area. In addition to the newly recorded sites a further 17 Sites are on record from previous surveys that covered sections of the study area. . Depending on the precise location of development activities, some 38 sites will require mitigation.

Prior to construction and if impacted on by the final lay out, the following sites are recommended for further study and documenting in anticipation of destruction by mine infrastructure based on the current layout. This will include as a minimum the following;

- 347, 363, 374, 607 – It is recommended that grave sites should be preserved in situ and if this is not possible the graves should be relocated following the correct procedures as per legislation.
- 350, 352, 360 - Mapping, test excavations and analysis;
- 378 - Mapping and monitoring ;
- 379 - It is preferable to preserve the site *in situ* if this is not possible and if the site is impacted on it is recommended that the site should be excavated, mapped and monitored before a destruction permit can be applied for from the SAHRA;
- 358, 370, 600, 601, 610, 612, 612,614, 615,616, 617 – Monitoring during construction
- 344, 345, 346, 353, 354, 355, 356, 357, 362, 373 - If the ruins are impacted on the sites must be mapped and through community involvement the presence of unknown graves must be determined. Some of these features might be older than 60 years and could require destruction permits if impacted on. These sites should be monitored during construction.

- 351, 359, 365, 375 – It is recommended that through social consultation it is established whether the cairns represent graves. If they are confirmed as graves it is recommended that grave sites should be preserved *in situ* and if this is not possible the graves should be relocated following the correct procedures as per legislation.

It is recommended that Environmental Officers (EO) or other responsible persons should be trained along the following lines:

- *Induction training:* Responsible staff identified by the developer should attend a short course on heritage management and identification of heritage resources.
- *Site monitoring and watching brief:* As most heritage resources occur below surface, all earth-moving activities need to be routinely monitored in case of accidental discoveries. The greatest potential impacts are the initial soil removal and subsequent earthworks during construction. The EO should monitor all such activities on a daily basis. In the event that any heritage resources are found, the chance finds procedure must be followed as outlined above.

Finally, a heritage specialist should assess any material change to the conceptual layout plan.

Monitoring should take place at the following sites: 378, 379, 358, 370, 600, 601, 610, 612, 612,614, 615,616, 617, 344, 345, 346, 353, 354, 355, 356, 357, 362, 373. Monitoring should take place during construction on a daily basis by the ECO and bi weekly by the project archaeologist. It is recommended that all earthworks are monitored. Graves and cemeteries should also be monitored to ensure preservation and prevent damage.

Reasoned Opinion

The proposed project is acceptable from a heritage point of view, if the above recommendations are adhered to and based on approval from SAHRA, HCAC is of the opinion that the development can continue. If any heritage resources of significance is exposed during the proposed project the South African Heritage Resources Authority (SAHRA) should be notified immediately, all mining activities must be stopped and an archaeologist accredited with the Association for Southern African Professional Archaeologist (ASAPA) should be notify in order to determine appropriate mitigation measures for the discovered finds. This may include obtaining the necessary authorisation (permits) from SAHRA to conduct the mitigation measures

11. REFERENCES

- Acocks, J.P.H. 1975. *Veld Types of South Africa*. Pretoria: Botanical Research Institute.
- Deacon, H.J. & Deacon, J. 1999. *Human Beginnings in South Africa*. David Philip, Cape Town.
- Delius, P. 1983. *The Land belongs to Us: The Pedi polity, the Boers and the British in the Nineteenth Century Transvaal*. Johannesburg: Raven Press.
- Delius, P. & Schoeman, M.H. 2008. Revisiting Bokoni: populating the stone ruins of the Mpumalanga Escarpment. In: Swanepoel, N., Esterhuysen, A. & Bonner, P. (eds) *Five Hundred Years Rediscovered: Southern African Precedents and Prospects*: 135-167. Johannesburg: Witwatersrand University Press.
- Evers, T.M. 1983. Oori or Moloko? The origins of the Sotho-Tswana on the evidence of the Iron Age of the Transvaal, reply to R.J. Mason. *South African Journal of Science* 79: 261-264.
- Huffman, T.N. 1982. Archaeology and ethnohistory of the African Iron Age. *Annual Review of Anthropology* 11: 133-150.
- Huffman, T.N. & Schoeman, M.H. 2001. Archaeological Assessment Of The Proposed Everest South Bulk Sampling Area. Unpublished report
- Huffman, T.N. & Schoeman, M.H. 2002a. Archaeological Reconnaissance Of The Everest South Bulk Sample Area And The Former Headquarters Of The Phetla Chief. Unpublished report.
- Huffman, T.N. & Schoeman, M.H. 2002b. *Archaeological Assessment of the Der Brochen Project, Mpumalanga*. Johannesburg: Archaeological Resources Management.
- Huffman, T.N. 2004/05. Archaeological mitigation for Project Lion. *Southern African Field Archaeology* 13 & 14: 42-48.
- Huffman, T.N. 2007. *Handbook to the Iron Age: The Archaeology of Pre-colonial Farming Societies in Southern Africa*. Pietermaritzburg: University of KwaZulu-Natal Press.
- Huffman, T.N. 2010. Intensive El Nino and the Iron Age of South East Africa. *Journal of Archaeological Science* 37: 2572-2586.
- Huffman, T.N. & Schoeman, M.H. 2011. Lebalelo: Early Iron Age pits near Burgersfort. *South African Archaeological Bulletin*
- Huffman, T.N. & Schoeman, M.H. 2002. *Further Archaeological reconnaissance for the Everest South Project*. Johannesburg: Archaeological Resources Management.
- Hunt, D.R. 1931. An account of the BaPedi. *Bantu Studies* 5: 275-326.
- Kuper, A. 1982. *Wives for Cattle: Bridewealth and Marriage in Southern Africa*. London: Routledge & Kegan Paul.
- Mitchell, P. 2002. *The Archaeology Of Southern Africa*. Cambridge: Cambridge University Press.
- Mönnig, H.O. 1967. *The Pedi*. Pretoria: Van Schaik.
- Ngubane, H. 1977. *Body and Mind in Zulu Medicine*. London: Academic Press.
- Roodt, F. 2003a. *Der Brochen Tailings Dam Farms Helena and St George Mpumalanga Province*. Pietersburg: R & R Cultural Resource Consultants.

- Roodt, F. 2003b. *Der Brochen Project Helena Complex: Trial Mining Phase Mpumalanga Province*. Pietersburg: R & R Cultural Resource Consultants.
- Roodt, F. 2003c. *Der Brochen Project Richmond Complex: Trial Mining Phase Mpumalanga Province*. Pietersburg: R & R Cultural Resource Consultants.
- Roodt, F. 2008a. *Der Brochen Mine Richmond 370KT Limpopo*. Pietersburg: V.H.H.C. Heritage Consultants.
- Roodt, F. 2008b. *Der Brochen Mine Complex Mototolo Road Options Mpumalanga*. Pietersburg: V.H.H.C. Heritage Consultants.
- Schoeman, M.H. 1998a. Excavating Ndzundza Ndebele identity at KwaMaza. *Southern African Field Archaeology* 7(1): 42-52.
- Smith, J., Lee-Thorp, J. & Hall, S. 2007. Climate change and agropastoralist settlement in the Shashe-Limpopo River Basin, southern Africa: AD 880 to 1700. *South African Archaeological Bulletin* 62: 115-125.
- Van der Walt, J. 2009. *Archaeological Impact assessment for the Water Pipe Line and Access Route for the BooySENDAL Platinum Mine, Steelpoort, Mpumalanga Province*. Johannesburg: Wits Enterprise.
- Van der Walt, J. & Celliers, J.P. 2009. *Archaeological impact Assessment for the BooySENDAL Platinum Mine on the Farms BooySENDAL 43JT and Der Brochen 7JT, Steelpoort, Mpumalanga Province*. Johannesburg: Wits Enterprise.
- Van der Walt, J. & Fourie, W. 2006. *Archaeological Impact Assessment for Mining Development on the Farm Mareesburg 8JT, District Steelpoort*. Krugersdorp: Matakoma Heritage consultants.
- Van Schalkwyk, J.A. 2007. Mototolong Early Iron Age site, Sekhukhuneland, Limpopo Province. *National Cultural History Museum Research Journal* 2: 25-36.
- Van Schalkwyk, J.A. 2005. *Heritage Impact Scoping Report for the Proposed Richmond Dam, Lydenburg District, Mpumalanga*. Pretoria: National Culture History Museum.
- Volman, T.P. 1984. Early prehistory of southern Africa. In Klein, R.G. (ed.), *Southern African Prehistory and Paleoenvironments*, pp.169-220. Rotterdam: A.A. Balkema.
- Wadley, L. 1987. *Later Stone Age Hunters and Gatherers of the Southern Transvaal*. (BAR International Series 380).
- Wood, M. 2011. A glass bead sequence for Southern Africa from the 8th to the 16th Century AD. *Journal of African Archaeology* 9: 67-84.

FIELD NUMBER	TYPE SITE	LONGITUDE	LATITUDE	ELEVATION
344	Historical Ruin	30° 06' 55.5553" E	25° 05' 53.9016" S	1316.47937
345	Historical Ruin	30° 07' 01.9849" E	25° 06' 50.1949" S	1262.755249
346	Historical Ruin	30° 07' 05.0483" E	25° 06' 51.8832" S	1247.663086
347	Cemetery	30° 07' 04.3609" E	25° 06' 54.3563" S	1251.647461
350	Iron Age	30° 07' 07.7520" E	25° 06' 57.3659" S	1248.476074
351	Stone Cairn	30° 07' 09.8977" E	25° 06' 57.6288" S	1250.166382
352	Communal Grinding Area	30° 07' 09.7031" E	25° 06' 58.3201" S	1248.75293
353	Historical Ruin	30° 07' 13.6201" E	25° 06' 40.8419" S	1193.850464
354	Historical Ruin	30° 07' 03.7236" E	25° 07' 37.1279" S	1214.71875
355	Historical Ruin	30° 07' 04.7927" E	25° 07' 38.4493" S	1204.736206
356	Historical Ruin	30° 07' 04.1771" E	25° 07' 40.1231" S	1200.843872
357	Historical Ruin	30° 07' 20.0280" E	25° 07' 56.5068" S	1228.896973
358	Terracing	30° 07' 43.1401" E	25° 08' 13.0885" S	1364.937378
359	Stone Cairn	30° 07' 45.6851" E	25° 08' 14.9603" S	1368.218506
360	Terracing	30° 07' 44.4757" E	25° 08' 16.7065" S	1362.147949
362	Historical Ruin	30° 07' 10.3331" E	25° 08' 18.5640" S	1221.214111
363	Possible Graves	30° 07' 10.3835" E	25° 08' 18.1609" S	1218.892334

365	Stone Cairn	30° 07' 43.4497" E	25° 08' 41.3449" S	1454.183228
366	Terracing	30° 07' 48.1513" E	25° 08' 44.3364" S	1434.141235
367	Terracing	30° 08' 05.8560" E	25° 09' 00.1260" S	1514.348999
368	Terracing	30° 08' 04.3404" E	25° 09' 00.7093" S	1508.143555
369	Rock Engraving	30° 07' 19.4088" E	25° 05' 31.7004" S	1155.920776
370	Iron Age	30° 08' 46.8169" E	25° 09' 17.9029" S	1710.073608
372	Linear Stone Wall	30° 08' 50.9171" E	25° 08' 43.1629" S	1727.761108
373	Historical Ruin	30° 08' 51.9901" E	25° 08' 44.2607" S	1720.533569
374	Cemetery	30° 08' 19.0859" E	25° 09' 42.5808" S	1638.158203
375	Stone Cairn	30° 08' 13.5241" E	25° 09' 44.8777" S	1602.400757
376	Linear Stone Wall	30° 08' 19.9969" E	25° 09' 44.1683" S	1634.493896
378	Terracing	30° 06' 39.4199" E	25° 05' 59.6185" S	1388.248413
379	Iron Age	30° 6'39.87"E	25° 6'8.13"S	Not available
600	Terracing	30° 07' 10.7868" E	25° 06' 56.5956" S	1249.872192
601	Terracing	30° 07' 11.9820" E	25° 06' 46.8144" S	1190.991211
602	Grave	30° 08' 47.2000" E	25° 09' 01.0000" S	Not available
603	Historic Pedi Complex	30° 08' 45.0000" E	25° 09' 01.0000" S	Not available
604	MSA	30° 08' 45.0000" E	25° 09' 02.8000" S	Not available
605	Stone Kraal 2	30° 08' 31.4000" E	25° 09' 28.2000" S	Not available
606	Stone Kraal	30° 08' 34.8000" E	25° 09' 26.0000" S	Not available
607	Grave	30° 08' 41" E	25° 09' 30" S	Not available
608	Iron Age	30° 07' 26.2000" E	25° 06' 59.3001" S	Not available
609	Iron Age	30° 07' 18.6001" E	25° 07' 12.9000" S	Not available

610	Iron Age	30° 07' 56.3401" E	25° 08' 53.6399" S	Not available
611	Iron Age	30° 07' 45.9600" E	25° 08' 52.6800" S	Not available
612	Iron Age	30° 07' 55.2601" E	25° 08' 53.2799" S	Not available
612	Iron Age	30° 07' 54.9599" E	25° 08' 52.9199" S	Not available
613	Iron Age	30° 07' 50.3401" E	25° 08' 52.1399" S	Not available
614	Iron Age	30° 07' 45.3601" E	25° 08' 49.4999" S	Not available

615	Iron Age	30° 07' 44.7599" E	25° 08' 48.4200" S	Not available
616	Iron Age	30° 07' 43.4401" E	25° 08' 47.8801" S	Not available
617	Iron Age	30° 07' 42.4799" E	25° 08' 50.3400" S	Not available

SOURCE	DESCRIPTION
Van der Walt 2016	Site is fenced in by green palisade fence (fenced by mine). The site consists of several circular enclosures and at least two rectangular enclosures.
Van der Walt 2016	Consists of the foundations of a mud dwelling (circular enclosure) as well as a rectangular foundation of a house with at least three rooms. Additional stone circle built up against natural rocks. Cultural material consists of cans and undecorated pottery, lower grinders and a possible deflated midden.
Van der Walt 2016	Consists of mud and stone foundations of the ruins of several large rectangular features. Lower grinders and undecorated pottery together with the ruins of approximately 6 houses. Burnt daga fragments.
Van der Walt 2016	Three graves with headstones. Oldest visible date is 1962.
Van der Walt 2016	Possible deflated midden. A little bit of slag and undecorated ceramics. One decorated piece was found with a cross hatching motif as decoration.
Van der Walt 2016	Rectangular stone dressing orientated north to south. Purpose is unknown but could be a possible grave.
Van der Walt 2016	Large communal grinding area on exposed bedrock with 7 grinding hollows. Possibly associated with the Iron age.
Van der Walt 2016	Rectangular stone wall structure incorporated into natural rock. Entrance is orientated to the North. Possible filled in entrance to the South. Several ephemeral terraces surround the feature. Cultural material consists of undecorated ceramics. Linear walls are located to the East and West of this feature.
Van der Walt 2016	Rectangular stone walled structure measuring 5 x 4 meters.
Van der Walt 2016	Linear stone wall, most likely associated with Feature 354. Cultural material consists of fragments of an iron 3 legged cooking pot.
Van der Walt 2016	Rectangular stone walled ruin. Entrance orientated east. Could be a goat kraal. Cultural material consists of a old plough.
Van der Walt 2016	Stone walls that form a funnel towards a rectangular stone walled structure (8 x 8 meters). Fragments of undecorated pottery noted. The possibility exists that more structures might be present as the area is highly overgrown.
Van der Walt 2016	Possible terrace wall measuring approximately 12 meters in length. Various other ephemeral walls are visible between rock outcrops. The site is overgrown and visibility is poor due to the vegetation.
Van der Walt 2016	Two stone cairns of unknown purpose. One is rectangular in shape and the other circular. Measuring 1.2 meters in diameter.
Van der Walt 2016	Ephemeral terrace walls, surrounding a koppie with undecorated ceramics present on site.
Van der Walt 2016	Consists of the mud foundations of a possible residential dwelling. The ruin measures 12 by 8 meters.
Van der Walt 2016	Stone standing upright, possibly a grave marker. Cultural material consists of a 20 c piece dating to 1989. Glass and metal fragments. Several lower grinders.

Van der Walt 2016	4 Stone cairns of unknown purpose. Could be linked with initiation. Although unlikely, it could also be possible graves. Measure between 0.5 to 1.5 / 2 meters. Cultural material includes broken lower and upper grinders, pottery - decoration indicate possible Marateng pottery (Pedi). Possible Iron Age site with terracing.
Van der Walt 2016	Ephemeral terrace walls. Fragments of daga with pole impressions and undecorated ceramic scatter occur on site.
Van der Walt 2016	Ephemeral terrace walls with undecorated ceramics. Sheet erosion is washing ceramics down hill.
Van der Walt 2016	Ephemeral terrace walls with undecorated ceramics. Sheet erosion is washing ceramics down hill.
Van der Walt 2016	Rock engravings. Circular motifs. Possibly resembling later Iron Age lay outs.
Van der Walt 2016	Disturbed area due to bulldozing activities. Several undecorated ceramics scattered over the area. The site is extensively disturbed.
Van der Walt 2016	Linear stone wall, probably associated with the exploration road and is approximately 5 meters wide.
Van der Walt 2016	Rectangular structure with a North facing entrance. Walls are well preserved. Structure measures 18 x 15 meters. Several other foundations of mud dwellings are also visible. Cultural material consists of modern iron and glass artefacts together with undecorated ceramics. the site also includes the remains of two rectangular stone packed kraals measuring 12 x 18 meters (approximately).
Van der Walt 2016	Site is highly overgrown and the number of graves could not be determined. The graves are located within a kraal wall and belongs to the Mokala family.
Van der Walt 2016	Orientated north to south and measures 2.5 x 1.5 m. The cairn is of unknown purpose, but could represent a grave.
Van der Walt 2016	Long stone packed wall close to exploration road. Measures 12 meters in length. The wall is of unknown purpose and no cultural material is present.
Van der Walt 2016	Terrace walls located at the foot of the mountain. Undecorated ceramics are present on site. Possible agricultural terraces leading up to Iron Age site higher up on the mountain.
Van der Walt 2016	Extensive Iron Age stone walled settlement in the saddle on top of a hill. Various enclosures with middens and archaeological deposit present. High frequency of undecorated ceramics.
Van der Walt 2016	Various stone packed terrace walls.
Van der Walt 2016	Terrace wall next to erosion gully or drainage line. Measure 7 meters in a North South direction and is about half a meter high.
Huffman and Schoeman 2002A	African grave with headstone. Located next to stone foundations of a rectangular house.
Huffman and Schoeman 2002A	Substantial Pedi Complex centres around a rock dome. The site is characterised by low stone lapa walls and burnt daga.
Huffman and Schoeman 2002	Middle stone Age scatter.
Huffman and Schoeman 2002	Historic stone kraal.
Huffman and Schoeman 2002	Historic stone kraal.
Huffman and Schoeman 2001	Single grave
Huffman and Schoeman 2002 B	Middle Iron age Eiland villages with burnt daga
Huffman and Schoeman 2002B	Middle Iron age Eiland villages with burnt daga

Pistorius 2007	Rudimentary Terrace walls against slope of low protrusion.
Pistorius 2007	Interrupted circular stone wall on low protrusion.
Pistorius 2007	Rudimentary Terrace walls against slope of low protrusion.
Pistorius 2007	Rudimentary Terrace walls against slope of low protrusion.
Pistorius 2007	Rudimentary Terrace walls against slope of low protrusion.
Pistorius 2007	Stacks of stone on flat surface. Possible boundary walls for homestead.

Pistorius 2007	Stacks of stone on flat surface. Possible boundary walls for homestead.
Pistorius 2007	Clay with pole impression marking.
Pistorius 2007	Interrupted circular stone wall on low protrusion.

SIGNIFICANCE RATING	MOTIVATION	MITIGATION
Low to Medium Significance	Communities in the area are possibly connected to the site and the site might contain unmarked graves.	Community Liaison , Test excavation, Mapping, Monitoring
Low to Medium Significance	Communities in the area are possibly connected to the site and the site might contain unmarked graves.	Community Liaison , Test excavation, Mapping, Monitoring
Low to Medium Significance	Communities in the area are possibly connected to the site and the site might contain unmarked graves.	Community Liaison , Test excavation, Mapping, Monitoring
High Significance	Graves are of high social significance.	Graves are already fenced and should be preserved in situ.
Low to Medium Significance	Lack of visible archaeological deposit and features.	Test excavation
If confirmed as a grave it is of high social significance.	Graves are of high social significance.	Preservation in situ.
Low to Medium Significance	Possibly associated with Iron Age site.	Surrounding communal grinding area could contain the subsurface remains of an Iron Age site. Mapping and test excavations are recommended.
Low to Medium Significance	Communities in the area are possibly connected to the site and the site might contain unmarked graves.	Test excavation, Mapping, Monitoring
Low to Medium Significance	Communities in the area are possibly connected to the site and the site might contain unmarked graves.	Community Liaison , Test excavation, Mapping, Monitoring
Low to Medium Significance	Communities in the area are possibly connected to the site and the site might contain unmarked graves.	Community Liaison , Test excavation, Mapping, Monitoring
Low significance	Communities in the area are possibly connected to the site and the site might contain unmarked graves.	Community Liaison , Test excavation, Mapping, Monitoring
Low to Medium Significance	Communities in the area are possibly connected to the site and the site might contain unmarked graves.	Community Liaison , Test excavation, Mapping, Monitoring
Low significance	Lack of visible archaeological deposit and features.	Monitoring if the site will be impacted on.
If confirmed as graves it is of high social significance.	Graves are of high social significance.	Preservation in situ.
Low to Medium Significance	Lack of visible archaeological deposit and features.	Test excavation
Low to Medium Significance	Communities in the area are possibly connected to the site and the site might contain unmarked graves.	Community Liaison , Test excavation, Mapping, Monitoring
If confirmed as a grave it is of high social significance.	Graves are of high social significance.	Preservation in situ.

If confirmed as graves it is of high so	Graves are of high social significance.	Test excavation
Low to Medium Significance	Iron Age Site	Monitoring if the site will be impacted on.
Low significance	Artefacts are not in situ	No mitigation required.
Low significance	Artefacts are not in situ	No mitigation required.
Medium significance	Not applicable	Preservation in situ.
Low significance	The site is extensively disturbed.	No mitigation required.
Low significance	Not applicable	No mitigation required.
Low to Medium Significance	Communities in the area are possibly connected to the site and the site might contain unmarked graves.	Community Liaison , Test excavation, Mapping, Monitoring
High Significance	Graves are of high social significance.	Preservation in situ.
If confirmed as a grave it is of high so	Graves are of high social significance.	Preservation in situ.
Low significance	Lack of visible archaeological deposit and features.	No mitigation required.
Low to Medium Significance	Forms part of a Later Iron Age settlement.	If the site is impacted on it is recommended that the site should be mapped and monitored.
Medium to high significance	Forms part of a Later Iron Age settlement with archaeological material and deposit	It is preferable to preserve the site in situ if this is not possible and if the site is impacted on it is recommended that the site should be excavated, mapped and monitored.
Low significance	Lack of visible archaeological deposit and features.	No mitigation required.
Low significance	Terrace wall is probably associated with agricultural activities. No cultural material present.	Community Liaison , Test excavation, Mapping, Monitoring
High Significance	Graves are of high social significance.	Preservation in situ.
Low to Medium Significance	As per initial assessment	If the site is impacted on it is recommended that the site should be mapped and monitored.
Low significance	As per initial assessment	No mitigation required.
Low significance	As per initial assessment	Monitoring if the site will be impacted on.
Low significance	As per initial assessment	Monitoring if the site will be impacted on.
High Significance	Graves are of high social significance.	Preservation in situ
Medium significance	As per initial assessment	
Medium significance	As per initial assessment	

Medium significance	As per initial assessment	Sites should be mapped, test excavated and the results recorded. It is also recommended that the presence of unmarked graves should be confirmed through community liaison. .
Medium significance	As per initial assessment	Sites should be mapped, test excavated and the results recorded. It is also recommended that the presence of unmarked graves should be confirmed through community liaison. .
Medium significance	As per initial assessment	Sites should be mapped, test excavated and the results recorded. It is also recommended that the presence of unmarked graves should be confirmed through community liaison. .
Medium significance	As per initial assessment	Sites should be mapped, test excavated and the results recorded. It is also recommended that the presence of unmarked graves should be confirmed through community liaison. .
Medium significance	As per initial assessment	Sites should be mapped, test excavated and the results recorded. It is also recommended that the presence of unmarked graves should be confirmed through community liaison. .
Medium significance	As per initial assessment	Sites should be mapped, test excavated and the results recorded. It is also recommended that the presence of unmarked graves should be confirmed through community liaison. .

Medium significance	As per initial assessment	Sites should be mapped, test excavated and the results recorded. It is also recommended that the presence of unmarked graves should be confirmed through community liaison. .
Medium significance	As per initial assessment	Sites should be mapped, test excavated and the results recorded. It is also recommended that the presence of unmarked graves should be confirmed through community liaison. .
Medium significance	As per initial assessment	Sites should be mapped, test excavated and the results recorded. It is also recommended that the presence of unmarked graves should be confirmed through community liaison. .

Inside development footprint
Inside development footprint
Inside development footprint
Inside development footprint
No impact
Inside Development footprint
Inside Development footprint
Inside Development footprint
Inside development footprint
Inside development footprint
Inside development footprint
Ropecon / Aerial rope way
Inside development footprint
Inside development footprint
No impact
No impact
No impact
Inside development footprint
Inside development footprint
Inside development footprint
No impact
No impact

Inside development footprint
No Impact
Inside development footprint
Inside development footprint
No Impact
Inside Development footprint

Inside Development footprint

Inside Development footprint

Inside development footprint

CV Jaco van der Walt

PERSONAL PARTICULARS:

NAME: Jaco van der Walt
MARITAL STATUS: Married with two dependants
DATE OF BIRTH : 1977-11-04
Work Address 37 Olienhout Street, Modimolle, 0510
E-MAIL: jaco.heritage@gmail.com
MOBILE: +27 82 373 8491
FAX: +27 86 691 6461

SYNOPSIS

Jaco has been actively involved as a professional archaeologist within the heritage management field in southern Africa for the past 15 years. Jaco acted as council member for the Association of Southern African Professional Archaeologists (ASAPA Member #159) in the Cultural Resource Management (CRM) portfolio for two years (2011 – 2012). Jaco was also a Research Associate with the University of Johannesburg from 2011 – 2013. He is well respected in his field and published in peer reviewed journals and presented his findings on various national and international conferences.

ACADEMIC QUALIFICATIONS:

Date of matriculation: 1995
Particulars of degrees/diplomas and/or other qualifications:
Name of University or Institution: University of Pretoria
Degree obtained : BA
Major subjects : Archaeology
Cultural Heritage Tourism
Year of graduation : 2001

Name of University or Institution: University of the Witwatersrand
Degree obtained : BA [Honours]
Major subjects : Archaeology
Year of graduation : 2002

Name of University or Institution : University of the Witwatersrand
Degree Obtained :BA [Masters]
Major subject :Archaeology
Year of Graduation :2012

EMPLOYMENT HISTORY:

2011 – Present: **Owner - 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.

MEMBERSHIP OF PROFESSIONAL ASSOCIATIONS:

- Association of Southern African Professional Archaeologists. Member number 159
- Association of Southern African Professional Archaeologists Cultural Resource Management Section
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)

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

Jean-Pierre Celliers

CURRICULUM
VITAE

Personal Details

Full Names: Jean-Pierre Celliers
Commonly Known as: JP
ID or Passport Number: 750602 522 8080
Date of Birth: 1975-06-02
Race and Gender: White, Male
Nationality: South African & British
Marital Status: Married
Cell phone Number: 082 779 3748
e-mail Address: Kudzala@lantic.net
Theft/Fraud Disclosure: No
Disabilities: None
Residential Address Sterkspruit Estate, 5303, Lydenburg
Postal Address P.O. Box 5209, Lydenburg
Employment Preference: Permanent: Yes Contracting: No

Language Proficiency

Language	Read	Write	Speak	Home Language
Afrikaans	Yes	Yes	Yes	Yes
English	Yes	Yes	Yes	No

Qualifications		
Qualification	Institution	Date Completed
Senior Certificate (Matric with exemption)	Nelspruit High School	1993
BA Archaeology	University of Pretoria	1998
BA (Hons) Archaeology	University of Pretoria	2000
MA Archaeology	University of Pretoria	2009
<p>Mekemeke: A study of the Archaeological sequence and interaction between two Swazi villages of the late 19th and early 20th century</p>		

Career History	
<p>Employer: Extraman Employment Agency London, UK</p> <p>Period: 1994</p> <p>Position: Various</p> <p>Summary of Duties and Responsibilities Did various temporary jobs during a working holiday including construction, cleaning, hard labour, furniture moving.</p>	
<p>Employer: SupaQuick Nelspruit, RSA</p> <p>Period: 2007</p> <p>Position: Wheel Alignment Technician</p> <p>Summary of Duties and Responsibilities Wheel alignment and balancing</p>	
<p>Employer: Lowvelder Newspaper Nelspruit, RSA</p> <p>Period: 2000-2003</p> <p>Position: Journalist</p> <p>Summary of Duties and Responsibilities Crime reporting, Editor of Farmer Supplement, General reporting, Motoring and photography</p>	
<p>Employer: Thaba Chweu Municipality Lydenburg, RSA</p> <p>Period: 2004-2013</p> <p>Position: Museum Curator/ Manager</p> <p>Summary of Duties and Responsibilities Museum Curator/ Manager, Tourism coordinator, GIS coordinator, Game Reserve Manager, Trade Union Chairperson (2008 – 2010)</p>	

References		
Name	Institution/Organisation	Contact Detail
Prof. Innocent Pikirayi	Department Anthropology and Archaeology, University of Pretoria	012 420 4111
Mr. Coen Nienaber	Department of Anatomy, University of Pretoria	012 319 2244
Mr. Brian Moutl	Manager, Lowvelder Newspaper	013 754 1600 082 978 5678
Mr. Fanus van Eck	Deputy Director, Safety and Community Services, Thaba Chweu Municipality	013 235 7300 082 662 2771
Prof. Roger Fisher	Emeritus Prof. Architecture, University of Pretoria	083 602 7736
Mr. Benjamin Moduka	MPHRA (Mpumalanga)	013 766 5196 076 937 5198

Interests and Activities	
History	Fly-Fishing and fly-tying
Archaeology	Hiking
Scuba Diving (Advanced Open Water Diver)	Hunting
Skin Diving	Motorcycling
Reading	

Archaeological Experience	
1998-2000	Archaeological field excursions with University of Pretoria Periodic excavations at Krygkor Shelter, Pretoria. Under mentorship of P.H. Prinsloo
1999-2000	Archaeological site survey program for the Kruger National Park. Located and mapped existing and new archaeological sites within the Skukuza and Lower Sabie area. As fulfilment for the requirements for Honours Degree in Archaeology, University of Pretoria
2000-2004	While working as a journalist covered stories on archaeological research in the Lowveld Several national conferences (ASAPA) attended
2001	Part of Steinaeckers' Horse excavation team in the Letaba area of the Kruger National Park, under directorship of Dr. A van Vollenhoven.
2002	Archaeological site survey project of Mbombela Municipal Area
2003	Part time work on the Mapungubwe Rehabilitation project at Mapungubwe World Heritage Site. Responsible for accession of artefacts.

Archaeological Experience

Also assisted with profile sketches at K8 and JS1

Archaeological Projects and Contributions

2004	Supervisor at Archaeological excavations under directorship of Dr. Anton van Vollenhoven. Excavation of historic Albasini ruins in the Kruger National Park during July 2004
2005	Supervisor at Archaeological excavations under directorship of Dr. Anton van Vollenhoven. Excavation of Steinaecker's Horse ruins in the Kruger National Park during August 2005
2005	Directed excavations at Mekemeke and eKusoleni in Low's Creek as part of my MA research project, April 2005. Title: Mekemeke: An archaeological study of a nineteenth-century Swazi settlement in the Mpumalanga Lowveld.
2006	Delivered a paper at the Biennial Meeting of the Association of Southern African Professional Archaeologists. Title: Mekemeke: An archaeological study of a nineteenth-century Swazi settlement in the Mpumalanga Lowveld
2006	Senior team member of Steinaecker's Horse Historic Archaeological research project in the Kruger National Park
2008	Delivered a paper at the Biennial Meeting of the Association of Southern African Professional Archaeologists. Title: Fort Howard: Remains of an Anglo Boer War (1899-1902) Fortification in Lydenburg, Mpumalanga
2011	Delivered a paper at the Biennial Meeting of the Association of Southern African Professional Archaeologists. Title: Bantu-Speaker Rock Engravings in the Schoemanskloof Valley, Lydenburg District, Mpumalanga
2011	Delivered a paper at the Biennial Meeting of the Association of Southern African Professional Archaeologists. Title: Detailed Mapping of LIA stone-walled settlements in Lydenburg, Mpumalanga

Professional Experience

2004 – List of selected Archaeological surveys include:

Shatale and Lillydale water reticulation projects
Moriah property development
Dwarsloop reticulation project
Juniorsloop reticulation project
The Rest property development project
Welgevonden property development project

2005 – List of selected Archaeological surveys include:

Shandon ridge phases 2-5 property development project, Nelspruit
Schoonspruit property development project, Machadodorp
Bentley property development project, Nelspruit
Sterkspruit property development project, Lydenburg
Beryl property development project, Nelspruit

2006 – List of selected Archaeological surveys include:

Boschrand residential development, Nelspruit
Drum Rock Manor residential development, Nelspruit
Sterkspruit property development, Lydenburg
Mashishing property development, Lydenburg

Projects 2006:

Facilitated the assessment and official grading of the Samora Machel memorial in an effort to have it graded as a historic site of national and international significance in compliance with SAHRA (South African Heritage Resources Agency) regulations and stipulations.

Facilitated the assessment and official grading of the Boomplaas Rock Art site in an effort to have it graded as an archaeological site of national and international significance in compliance with SAHRA regulations and stipulations

2007 – List of selected Archaeological surveys include:

Lydenburg extension 6 residential development
Grave exhumation and relocation project, Rocklands Estate, Nelspruit
Broedershoek residential development
Karino residential development
Blinkwater residential development
Beryl residential development, Nelspruit
Boschrand residential estate, Nelspruit
Rooidraai residential development, Lydenburg

Professional Experience

Projects 2007:

Facilitating mitigation (phase 2) at Lydenburg Extension 6. Fort Howard investigation.

Professional Experience

2008/9 - List of selected Archaeological surveys include:

Scotston residential development, Barberton
Beryl residential development, Nelspruit
St Paul's residential development, Schoemanskloof
Elukwatini residential development, Badplaas
Sterkstroom residential development, Schoemanskloof
Goudmyn mining development. Steelpoort
Twyfelaar mining development, Sekhukune
The Rest residential development, Nelspruit
De Rust residential development, Nelspruit

Projects 2008/2009:

Directed excavations at Lydenburg Extension 6 and Fort Howard
Directed field work during recording of Rock Art in the Schoemanskloof valley, article in prep.
Zwartkoppies Mine: facilitation of the Zwartkoppies Grave Relocation project – social consultation and grave identification/ survey

2009/13 – List of selected Archaeological/ Heritage surveys include:

Strathmore residential development, Malelane
Montrose falls reticulation project, Schagen
Middelpunt diamond prospecting project, Belfast
Heidelberg residential development, White River
Imbabala Coal, Ermelo
Middelburg Townlands residential development, Middelburg
N4 Section 7B widening of national road, Nelspruit
Komatipoort town residential extension survey (2012)
White River Colts Hill residential development survey (2012)
Hazyview residential development survey (2012)
The Fountains farm residential development survey (2012)
Field Monitoring during construction activities at Elephant Point residential development (2012)
Field surveying and management plan for SASOL Synfuels Secunda and Sasolburg sites (2012)
Field surveying for SASOL Synfuels Rustenburg and Bronkhorstspuit sites (2013)
Ermelo Witpunt residential development survey (2013)
Halls PTY Ltd properties residential development survey (2013)

Projects – 2008-2012

Directed archaeological site surveying and planning, Lydenburg extension 6
Directed archaeological excavations, Lydenburg extension 6
Directed Sterkstroom rock engraving documentation and survey

Professional Experience

Social consultation, Tsjibeng grave relocation project

Facilitated Heritage Tourism Training in collaboration with WITS University for local community members

Directed Grading and Listing of Historic buildings and houses in the town of Lydenburg

Member of the Permit Committee for the Mpumalanga Heritage Resources Agency (MHRA) permitting of the Built Environment – Industrial Archaeology

JP Celliers has been the Director of a Heritage Consulting Company, Kudzala Antiquity CC since 2003. He has worked with other consulting companies such as HCAC since 2008.

Archaeological excavation of a small LSA and LIA shelter as part of mitigation measures at Booyesendal Mine, Limpopo Province

Affiliations

A member in good standing of the Association of South African Professional Archaeologists (ASAPA)

A member of the MHRA Permit Committee

Institutional member of SAMA (South African Museums Association)

Documentation

Proof of documentation and identification on request.

For Further Information Please Contact
Jean-Pierre Celliers at:

Tel: 013 235 7300

Cell: 082 779 3748

e-mail: kudzala@lantic.net

◆◆◆◆◆◆◆◆◆◆ **END** ◆◆◆◆◆◆◆◆◆◆