HERITAGE IMPACT ASSESSMENT

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

FOR THE PROPOSED SOUTH DEEP SOLAR PV PROJECT, WESTONARIA, GAUTENG PROVINCE

Type of development:

Photo Voltaic Facility

Client:

ERM

Client info:

Alan Cochran

E – mail: Alan.Cochran@erm.com

Developer: Enel Green Power

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

Report Author:
Mr. J. van der Walt
Project Reference:
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June 2017

APPROVAL PAGE

Project Name	**South Deep Solar PV**
Report Title	Heritage Impact Assessment South Deep Solar PV
Authority Reference Number	TBC
Report Status	Draft Report
Applicant Name	Enel Green Power

	Name	Signature	Qualifications and Certifications	Date
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Amendments on Document

Date	Report Reference Number	Description of Amendment
2017/08/14	217064	Amendments to Impact assessment, Feature 3 description update.

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REPORT OUTLINE

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

Table 1. Specialist Report Requirements.

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

Executive Summary

Enel Green Power appointed ERM to obtain an Environmental Authorisation from the relevant Environmental Authority for the proposed development of a Solar PV project to be situated at the South Deep Gold Mine, Westonaria, Gauteng Province. The study falls under the jurisdiction of the Rand West City Local Municipality. HCAC was appointed to conduct a Heritage Impact Assessment of the proposed project to determine the presence of cultural heritage sites and the impact of the proposed development on these non-renewable resources. The study area was assessed both on desktop level and by a field survey. The field survey was conducted as a non-intrusive pedestrian survey to cover the extent of the development footprint.

No archaeological sites were recorded during the survey although isolated individual Middle Stone Age lithics were noted. These artefacts are not *in-situ* and are scattered too sparsely to be of any significance apart from noting their presence which has been done in this report. No further mitigation prior to construction is recommended in terms of the archaeological component of Section 35 for the proposed development to proceed.

An independent paleontological study was conducted by Rossouw (2017). He recommended that, as part of a follow-up Phase 1 Palaeontological Impact Assessment, a professional palaeontologist should monitor fresh exposures should large scale excavations into unweathered sedimentary bedrock be conducted during the construction phase of the development.

In terms of the built environment of the area (Section 34), 4 ruins and a kraal were recorded. Based on historical maps from 1943 & 1957 it can be deducted that all of these features are older than 60 years. The features are in very poor condition and some are totally demolished and is of low heritage significance.

Direct impacts to these features would be of low significance. It must however be noted that sites like these might contain unmarked graves and will require the implementation of a chance find procedure during the construction phase.

In terms of Section 36 of the Act a single grave site was recorded and should ideally be demarcated with a 20-meter buffer zone and an access gate for family members. Graves are of high social significance. Based on the current layout preservation is not possible and if the grave has to be relocated this should be done adhering to all legal requirements. If any graves are located in future they should ideally be preserved *in-situ* or alternatively relocated according to existing legislation. No public monuments are located within or close to the study area. The study area is surrounded by mining developments and the proposed development will not impact negatively on significant cultural landscapes or viewscapes. During the public participation process conducted for the project no heritage concerns were raised.

With the correct mitigation measures and management actions in place the impact of the proposed project on heritage resources can be managed to an acceptable level. It is recommended that the proposed project can commence on the condition that the following recommendations together with the site-specific recommendations (Table 2) are implemented as part of the EMPr and based on approval from SAHRA:

- Implementation of a chance find procedure
- It is advised that, as part of a follow-up Phase 1 Palaeontological Impact Assessment, a professional palaeontologist should monitor fresh exposures should large scale excavations into unweathered sedimentary bedrock be conducted during the construction phase of the development.
- Mapping of Features 1 -6 as part of the cultural landscape.
- A destruction permit should be applied for prior to destruction of the historical structures adhering to all legal requirements.
- The grave should be relocated adhering to all legal requirements including permits from the relevant departments for the relocation.

Table 2: Site specific recommendations

Feature Number	Description	Mitigation	Longitude	Latitude
Feature 1	Ruin 3: Rectangular stone foundations	• Mapping of site • Monitoring during construction for unmarked graves	27° 39' 26.1612" E	26° 24' 29.7683" S
Feature 2	Ruin 2 & Large Midden	• Mapping of site • Monitoring during construction for unmarked graves	27° 39' 26.4439" E	26° 24' 22.6731" S
Feature 3	Demolished farm house	No further action needed	27° 39' 28.0333" E	26° 24' 14.4253" S
Feature 4	Cattle Kraal	Mapping of site	27° 39' 30.0666" E	26° 24' 19.6816" S
Feature 5	Ruin 1: Rectangular stone foundations	• Mapping of site • Monitoring during construction for unmarked graves	27° 39' 30.6704" E	26° 24' 16.6627" S
Feature 6	Grave	• Preservation of grave *in situ* with 20-meter buffer zone and access gate • If this is not possible relocation adhering to all legal requirements	27° 39' 23.1526" E	26° 24' 17.0913" S

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Declaration of Independence

Specialist Name	Jaco van der Walt
Declaration of Independence	I declare, as a specialist appointed in terms of the National Environmental Management Act (Act No 108 of 1998) and the associated 2014 Environmental Impact Assessment (EIA) Regulations, that I: • I act as the independent specialist in this application; • I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant; • I declare that there are no circumstances that may compromise my objectivity in performing such work; • I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity; • I will comply with the Act, Regulations and all other applicable legislation; • I have no, and will not engage in, conflicting interests in the undertaking of the activity; • I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority; • All the particulars furnished by me in this form are true and correct; and • I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.
Signature	
Date	13/06/2017

a) Expertise of the specialist

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

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

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ABBREVIATIONS

AIA: Archaeological Impact Assessment
ASAPA: Association of South African Professional Archaeologists
BGG Burial Ground and Graves
BIA: Basic Impact Assessment
CFPs: Chance Find Procedures
CMP: Conservation Management Plan
CRR: Comments and Response Report
CRM: Cultural Resource Management
DEA: Department of Environmental Affairs
EA: Environmental Authorisation
EAP: Environmental Assessment Practitioner
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EIA Practitioner: Environmental Impact Assessment Practitioner
EMP: Environmental Management Programme
ESA: Early Stone Age
ESIA: Environmental and Social Impact Assessment
GIS Geographical Information System
GPS: Global Positioning System
GRP Grave Relocation Plan
HIA: Heritage Impact Assessment
LIA: Late Iron Age
LSA: Late Stone Age
MEC: Member of the Executive Council
MIA: Middle Iron Age
MPRDA: Mineral and Petroleum Resources Development Act
MSA: Middle Stone Age
NEMA National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NID Notification of Intent to Develop
NoK Next-of-Kin
PRHA: Provincial Heritage Resource Agency
SADC: Southern African Development Community
SAHRA: South African Heritage Resources Agency

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

GLOSSARY

Archaeological site (remains of human activity over 100 years old)
Early Stone Age (~ 2.6 million to 250 000 years ago)
Middle Stone Age (~ 250 000 to 40-25 000 years ago)
Later Stone Age (~ 40-25 000, to recently, 100 years ago)
The Iron Age (~ AD 400 to 1840)
Historic (~ AD 1840 to 1950)
Historic building (over 60 years old)

1 Introduction and Terms of Reference:

Heritage Contracts and Archaeological Consulting CC (**HCAC)** has been contracted by ERM to conduct a heritage impact assessment of the proposed infrastructure for the South Deep Solar project. The report forms part of the Basic Assessment Report (BAR) and Environmental Management Programme Report (EMPR) for the project.

The aim of the study is to survey the proposed development footprint to identify cultural heritage sites, document, and assess their importance within local, provincial and national context. It serves to assess the impact of the proposed project on non-renewable heritage resources, and to submit appropriate recommendations with regard to the responsible cultural resources management measures that might be required to assist the developer in managing the discovered heritage resources in a responsible manner. It is also conducted to protect, preserve, and develop such resources within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999). The report outlines the approach and methodology utilized before and during the survey, which includes: Phase 1, review of relevant literature; Phase 2, the physical surveying of the area on foot and by vehicle; Phase 3, reporting the outcome of the study.

During the survey, 6 heritage features were identified. General site conditions and features on sites were recorded by means of photographs, GPS locations, and site descriptions. Possible impacts were identified and mitigation measures are proposed in the following report. SAHRA as a commenting authority under section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) require all environmental documents, complied in support of an Environmental Authorisation application as defined by NEMA EIA Regs section 40 (1) and (2), to be submitted to SAHRA. As such the Basic Assessment report and its appendices must be submitted to the case as well as the EMPr, once it's completed by the Environmental Assessment Practitioner (EAP).

1.1 Terms of Reference

Field study

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

Reporting

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

To assist the developer in managing the discovered heritage resources in a responsible manner, and to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999).

Table 3: Project Description

Size of farm and portions	The project is located at the South Deep Gold Mine, Westonaria on a Portion of the farm Doornpoort 347 IQ (Figure 1 -3)
Magisterial District	Westonaria Local Municipality, West Rand District Municipality, Gauteng Province
1: 50 000 map sheet number	2627 BC
Central co-ordinate of the development	26° 24' 33.9222" S, 27° 39' 14.1372" E

Table 4: Infrastructure and project activities

Type of development	Solar Photovoltaic Facility
Project size	Site 1 97 ha
Project Components	Polycrystalline Photovoltaic Solar (with Trackers) Size: 2 X 20MWAC

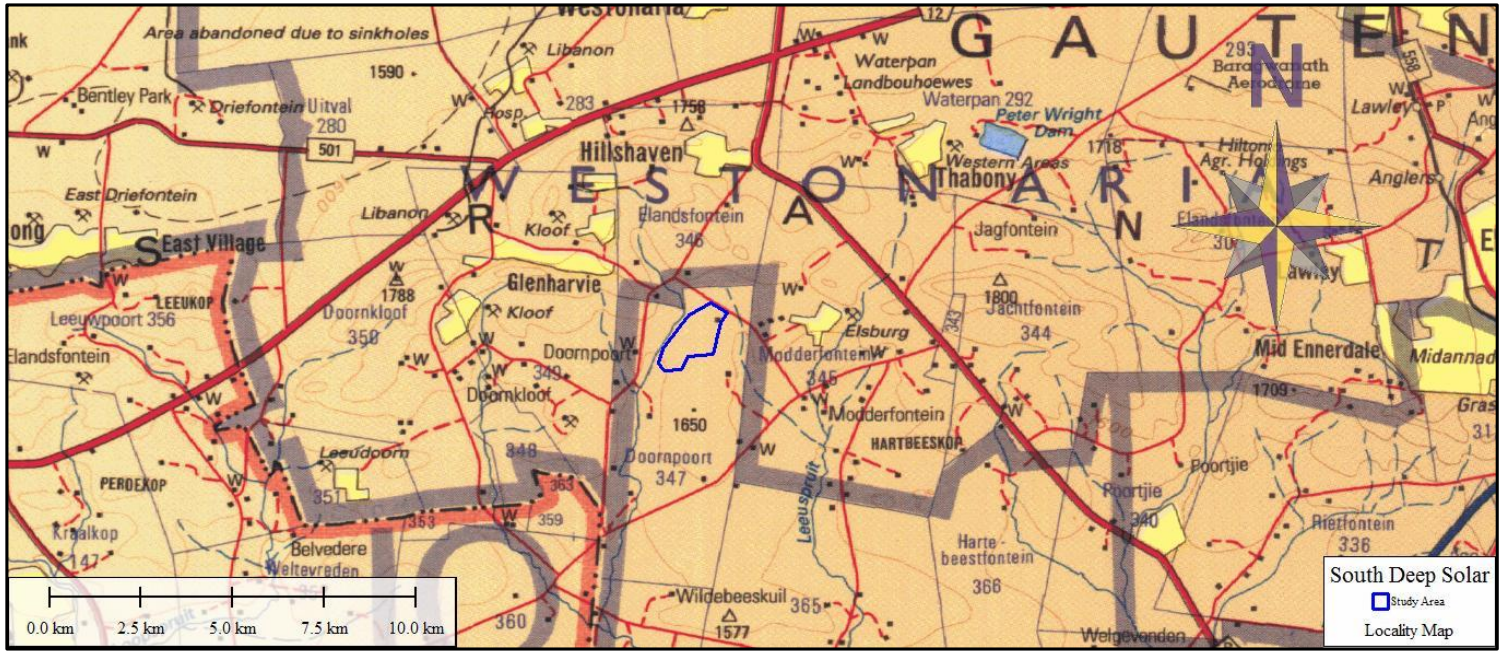

Figure 1. Provincial locality map (1: 250 000 topographical map)

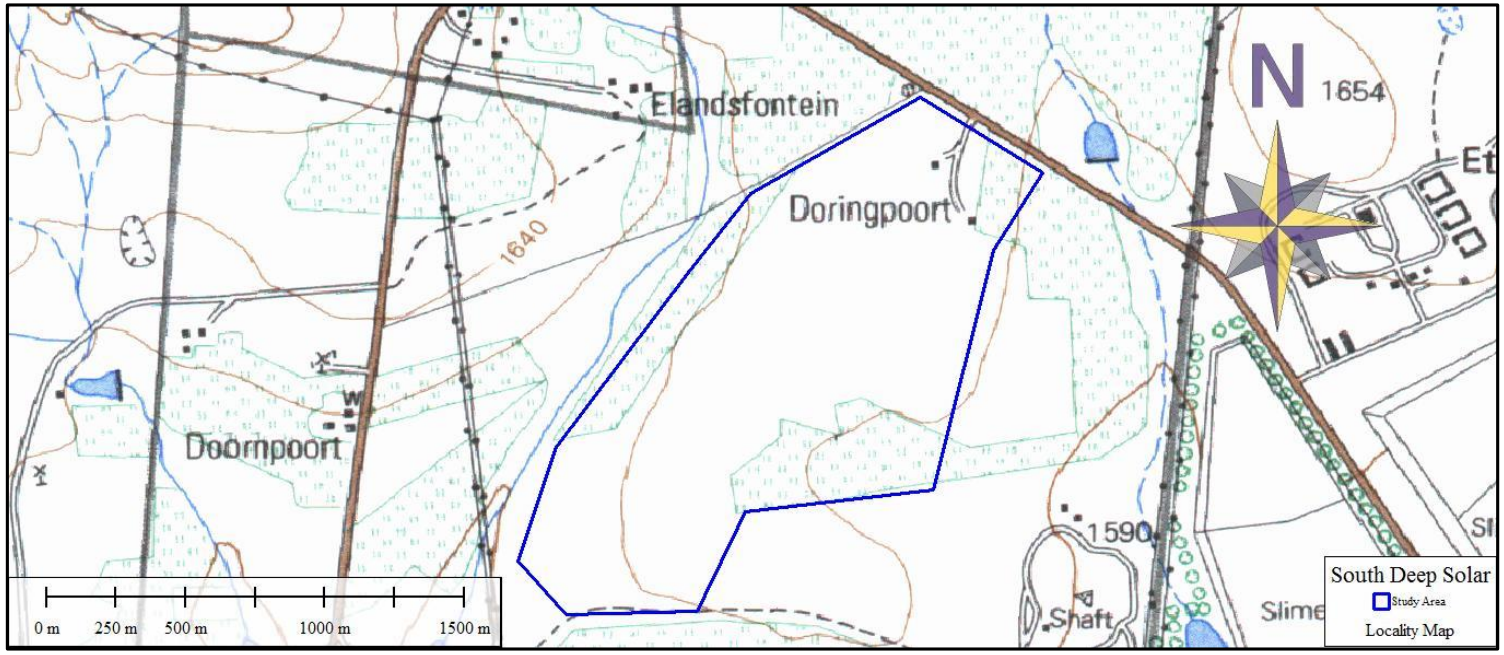

Figure 2: Regional locality map (1:50 000 topographical map).

Figure 3. Satellite image indicating the study area in red (Google Earth 2016).

2 Legislative Requirements

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

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

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

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

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

Minimum accreditation requirements include an Honours degree in archaeology or related discipline and 3 years post-university CRM experience (field supervisor level). Minimum standards for reports, site documentation and descriptions are set by ASAPA in collaboration with SAHRA. ASAPA is based in South Africa, representing professional archaeology in the SADC region. ASAPA is primarily involved in the overseeing of ethical practice and standards regarding the archaeological profession. Membership is based on proposal and secondment by other professional members.

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

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

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

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

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

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

Human remains that are less than 60 years old are protected under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance (Ordinance No. 7 of 1925), as well as the Human Tissues Act (Act 65 of 1983), and are the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the office of the relevant Provincial Premier. This function is usually delegated to the Provincial MEC for Local Government and Planning; or in some cases, the MEC for Housing and Welfare. Authorisation for exhumation and reinternment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to. To handle and transport human remains, the institution conducting the relocation should be authorised under Section 24 of Act 65 of 1983 (Human Tissues Act).

3 METHODOLOGY

3.1 Literature Review

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

3.2 Genealogical Society and Google Earth Monuments

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

3.3 Public Consultation and Stakeholder Engagement:

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

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

3.4 Site Investigation

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

Table 5: Site Investigation Details

	Site Investigation
Date	20 February & 16 May 2017
Season	Late Summer and Early winter –vegetation in the study area is high limiting archaeological visibility. The impact area was however sufficiently covered (Figure 4) to adequately record the presence of heritage resources.

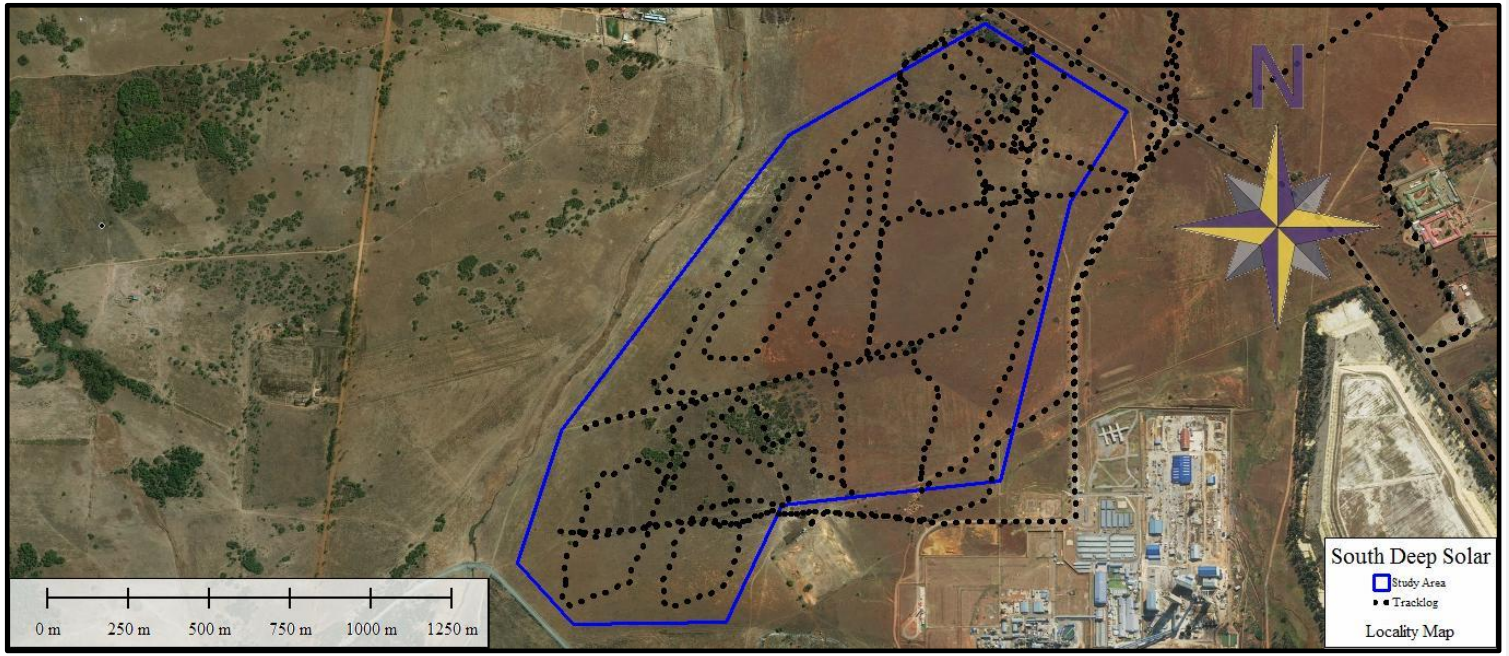

Figure 4: Track logs of the survey in black.

3.5 Site Significance and Field Rating

Section 3 of the NHRA distinguishes nine criteria for places and objects to qualify as 'part of the national estate' if they have cultural significance or other special value. These criteria are:

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

The presence and distribution of heritage resources define a 'heritage landscape'. In this landscape, every site is relevant. In addition, because heritage resources are non-renewable, heritage surveys need to investigate an entire project area, or a representative sample, depending on the nature of the project. In the case of the proposed project the local extent of its impact necessitates a representative sample and only the footprint of the areas demarcated for development were surveyed. In all initial investigations, however, the specialists are responsible only for the identification of resources visible on the surface. This section describes the evaluation criteria used for determining the significance of archaeological and heritage sites. The following criteria were used to establish site significance with cognisance of Section 3 of the NHRA:

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

In addition to this criteria field ratings prescribed by SAHRA (2006), and acknowledged by ASAPA for the SADC region, were used for the purpose of this report. The recommendations for each site should be read in conjunction with section 10 of this report.

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

3.6 Impact Assessment Methodology

The criteria used to establish the impact of the proposed project on sites was provided by ERM and is implemented in Section 8.6.

3.7 Limitations and Constraints of the study

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

4 Description of Socio Economic Environmental

The Rand West City Local Municipality 2016/17- 2020/21 Draft Integrated Development Plan in the Westonaria: Local Economic Development Overview states that:

"*The primary sector that includes agriculture and mining contributes the smallest amount to the provincial economy, although they are strategically important for ensuring food security in the province and uninterrupted business operations. The performance of the secondary sector is mainly driven by manufacturing.*
It is also evident that the WLM is the only one of the four local municipalities which is driven mainly by the mining sector, where the other three are driven by tertiary sectors in different quantities. The manufacturing and agriculture sectors are less prominent in the WLM, and the WLM is also less diversified compared to the other LM's within the WRDM in 2011.
The employment composition in the Westonaria LM is very similar to its GDP-R structure.
The mining and quarrying sector, which contributes almost 76.9% to the GDP-R, provides just fewer than 48% of employment opportunities in the area. At the same time the trade, community and government sector's employment contribution is greater than its contribution towards GDP-R."

5 Description of the Physical Environment:

The study area measures approximately 161 ha in size and is situated to the south of Westonaria and to the south east of Glenharvie. This proposed project is located adjacent and to the east of the existing South Deep Goldmine. It is bordered by a provincial road to the north and the access road to South Deep Gold mine to the east. Open veld is situated on the north west and the south.

Most of the proposed site is relatively flat with high grass cover. Several clusters of *Eucalyptus* trees occur especially in the central portion of the site as well as in the northern portion. The site slopes very slightly south and to the west where an intermittent stream occurs. The proposed site is not fenced off and some parts of the area are used by local residents for grazing, but most of the property is overgrown with grass. A Picnic site, dumping of building rubble and several stone cairns (as a result from clearing of agricultural fields) are found in the southern and south-western portions of the site.

The vegetation and landscape is described by Mucina and Rutherford (*The Vegetation of South Africa, Lesotho and Swaziland*, South African National Biodiversity Institute, Kirstenbosch, August 2006) as Rand Highveld Grassland. According to the 1:1,000,000 Geological Map the local geology consists of Shale, quartzite, conglomerate, breccia, diamictite.

Figure 5: General site conditions

Figure 6: General Site conditions

Figure 7: Abandoned picnic spot

Figure 8: Stone Cairn

6 Results of Public Consultation and Stakeholder Engagement:

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

Commented [A1]: Can you kindly confirm that this is accurate and assist with any comments or questions relating to heritage that were raised during this process in order for us to finalise the report?

7 Literature / Background Study:

7.1 Literature Review

The following CRM reports were conducted in the vicinity of the proposed project and were consulted for this report:

Author	Year	Project	Findings
Du Pisanie, J *et al*	2016	Environmental Impact Assessment for Sibanye Gold Limited's West Rand Tailings Retreatment Project Heritage Impact Assessment	One IA site with low significance; Eight structures with negligible significance; Thirteen werfs with negligible significance; and four burial grounds with very high significance
Huffman, T. et al	1994	Archaeological survey of the East and West Driefontein Mines	Eight sites were identified ranging from MSA to historical sites.
Schoeman, M.H. and Barry, L.	2004	Archaeological Reconnaissance For The Proposed New South Deep Tailings Dam	ESA, MSA and LSA sites were identified as well as a historical site.

7.1.1 Genealogical Society and Google Earth Monuments

No known grave sites are indicated close to the study area.

7.2 General History of the area

7.2.1 Archaeology of the area

7.2.1.1 The Stone Age

South Africa has a long and complex Stone Age sequence of more than 2 million years. The broad sequence includes the Later Stone Age, the Middle Stone Age and the Earlier Stone Age. Each of these phases contain sub-phases or industrial complexes, and within these we can expect regional variation regarding characteristics and time ranges. The three main phases can be divided as follows;

∗ Later Stone Age; associated with Khoi and San societies and their immediate predecessors. Recently to ~30 thousand years ago

∗ Middle Stone Age; associated with Homo sapiens and archaic modern humans. 30-300 thousand years ago.

∗ Earlier Stone Age; associated with early Homo groups such as Homo habilis and Homo erectus. 400 000-> 2 million years ago.

Interestingly closer to Johannesburg, the Melville Koppies is a Middle Stone-Age site. (Bergh 1999: 4). Although there are no well-known Stone Age sites located on or around the study area there is evidence of the use of the larger area by Stone Age communities for example along the Kliprivier where ESA and MSA tools where recorded. For the Later Stone Age, some petroglyphs occur to the south at Redan as well as along the Vaal River (Berg 1999).

7.2.1.2 The Iron Age

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

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

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

This area was important to Iron Age communities, since these people had smelted and worked iron ore at the Melville Koppies site since the year 1060, by approximation. (Bergh 1999: 7, 87). The Melville Koppies site was excavated by Professor Mason from the Department of Archaeology of WITS in the 1980's. Extensive Stone walled sites are also recorded at Klipriviers Berg Nature reserve belonging to the Late Iron Age period. A large body of research is available on this area. These sites (Taylor's Type N, Mason's Class 2 & 5) are now collectively referred to as Klipriviersberg (Huffman 2007). These settlements are complex in that aggregated settlements are common, the outer wall sometimes includes scallops to mark back courtyards, there are more small stock kraals, and straight walls separate households in the residential zone. These sites date to the 18th and 19th centuries and was built by people in the Fokeng cluster.
In this area, the Klipriviersberg walling would have ended at about AD 1823, when Mzilikazi entered the area (Rasmussen 1978). This settlement type may have lasted longer in other areas because of the positive interaction between Fokeng and Mzilikazi.

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7.3 Historical Information

The Difaqane (Sotho), or Mfekane ("the crushing" in Nguni) was a time of bloody upheavals in Natal and on the Highveld, which occurred around the early 1820's until the late 1830's (Bergh 1999: 10). It came about in response to heightened competition for land and trade, and caused population groups like gun-carrying Griquas and Shaka's Zulus to attack other tribes. (Bergh 1999: 14; 116-119) It seems that, in 1827, Mzilikazi's Ndebele started moving through the area where Johannesburg is located today. This group went on raids to various other areas in order to expand their area of influence. (Bergh 1999: 11). During the time of the Difaqane, a northwards migration of white settlers from the Cape was also taking place. Some travellers, missionaries and adventurers had gone on expeditions to the northern areas in South Africa, some already as early as the 1720's.

It was however only by the late 1820's that a mass-movement of Dutch speaking people in the Cape Colony started advancing into the northern areas. This was due to feelings of mounting dissatisfaction caused by economical and other circumstances in the Cape. This movement later became known as the Great Trek. This migration resulted in a massive increase in the extent of that proportion of modern South Africa dominated by people of European descent (Ross 2002: 39). By 1939 to 1940, farm boundaries were drawn up in an area that includes the present-day Johannesburg and Krugersdorp (Bergh 1999: 15).

7.3.1 Anglo-Boer War

An Anglo Boer War battle known as the Battle of Doornkop took place in the area on 29 May 1900. The British were advancing toward Johannesburg led by General John French. De La Rey and his men held the Klipriviersberg Ridge for the first two days but on the third day the Boers were outflanked by French's cavalry to the West, where General Sarel Oosthuizen's commando was forced to withdraw. This opened the road to Johannesburg and the British took the city peacefully on 30 May 1900.

7.3.2 Brief History of Westonaria

Westonaria was proclaimed in 1938 as a result of all the mining activities that took place in this area since 1910 when the first shaft – Pullinger Shaft was sunked. Venterspost town was proclaimed in 1937; Hillshaven, Glenharvie, Waterpan and Libanon were established as mining residential areas. Bekkersdal was established in 1945 and administered under Westonaria Town Council (http://www.westonaria.gov.za).

7.3.3 Brief History of South Deep Mine

The following information was obtained from the Gold Fields website: "*Commercial production of the Western Areas Gold Mine commenced in September 1951. In 1990, Western Areas Gold Mining Company Limited shareholders approved the transfer, cession and assignment of certain land and mineral rights to South Deep Exploration Company Limited in exchange for its shares. Western Areas Gold Mining Company Limited (WAL) and South Deep Exploration Company Limited merged on 1 January 1995. Development of 95 level across to the planned collar position of Twins commenced.*
On 1 April 1999, the Placer Dome/Western Areas (PDWA) joint venture was formed and in February 2000, the name of the mine was changed to South Deep Gold Mine. Sinking of the ventilation shaft was completed to 95 level in 2001 and the main shaft to 110 level in 2002, concurrently a 7,200tpd capacity mill was commissioned. The Twin Shaft Complex was

officially opened on 4 February 2005. Post a prefeasibility study in 2006, the ventilation shaft was deepened to 110 level and was commissioned in 2012
Barrick Gold Corporation acquired a majority interest in Placer Dome Inc. on 20 January 2006 and Gold Fields acquired Barrick's 50% JV interest in the PDWA JV on 1 December 2006. In April 2007 Gold Fields acquired all remaining WAL shares and consequently owned 100% of South Deep Gold Mine at that time.
A new-order mining right was granted to South Deep in 2010, including the area known as Uncle Harry's. During 2011, Newshelf 899 Proprietary Limited (Newshelf) was established, which holds a 100% interest in South Deep Gold Mine. Newshelf is a 90% subsidiary of Gold Fields Limited and the remaining 10% is held by outside shareholders as part of the BBBEE transaction". (www.goldfields.co.za)

7.3.4 Historical overview of the ownership and development of the study area

A number of sources were consulted in the National Archives of South Africa, but unfortunately no information could be found specifically dealing with the portion under investigation. In addition, no information could be found regarding the earliest owners of the farm Doornpoort.

A reference was found referring to the outbreak of an unknown disease among black people on the farm Doornpoort 47 in 1950. No further details could be traced relating to this event. (NASA TAB, KJB: 517 12/2/6)

A number of archival documents could be found dealing with the Elsburg Gold Mining Company Ltd. which was operating a mine on the neighbouring farm Modderfontein since the 1960s. This is presently known as the Twin Shaft South Deep mine. The mine is not very far from the area under investigation, and the following documents can perhaps be consulted in future:

DEPOT SAB
SOURCE BAO
TYPE LEER
VOLUME_NO 4161
SYSTEM 01
REFERENCE C167/3/2218
PART 1
DESCRIPTION DRANK OP MYNE EN BEDRYWE. **ELSBURG GOLD** MINING CO.
STARTING 19661221
ENDING 19731019

DEPOT SAB
SOURCE BAO
TYPE LEER
VOLUME_NO 2689
SYSTEM 01
REFERENCE C31/3/2218
PART 1
DESCRIPTION ENKELKWARTIERE. **ELSBURG GOLD** MINING COMPANY.
STARTING 19670119
ENDING 19681114

DEPOT SAB
SOURCE BAO
TYPE LEER
VOLUME_NO 9739
SYSTEM 01
REFERENCE C29/3/2218
PART 1
DESCRIPTION WERKGEWERSWERFLISENSIE. EMPLOYERS RECRUITING LICENCE. **ELSBURG GOLD** MINING COMPANY LIMITED.
STARTING 19670000
ENDING 19720000

DEPOT SAB
SOURCE BAO
TYPE LEER
VOLUME_NO 4179
SYSTEM 01
REFERENCE C167/4/2218
PART 1
DESCRIPTION DRANK OP MYNE EN BEDRYWE: DRANKSTATE **ELSBURG GOLD** MINING COMPANY LIMITED.
STARTING 19690122
ENDING 19730301
REMARKS A12/2/1/1/3/J8/21.

DEPOT SAB
SOURCE BAO
TYPE LEER
VOLUME_NO 2689
SYSTEM 01
REFERENCE C31/3/2218
PART 1
DESCRIPTION ENKELKWARTIERE. **ELSBURG GOLD** MINING COMPANY.
STARTING 19720626
ENDING 19731004
REMARKS A12/3/9/W27/1.

DEPOT SAB
SOURCE BAO
TYPE LEER
VOLUME_NO 2826
SYSTEM 01
REFERENCE C32/3/2218
PART 1
DESCRIPTION GETROUDE KWARTIERE. **ELSBURG GOLD** MINING COMPOUND LIMITED EVATON.
STARTING 19720000

ENDING 19730000
REMARKS A12/3/9/E22/1.

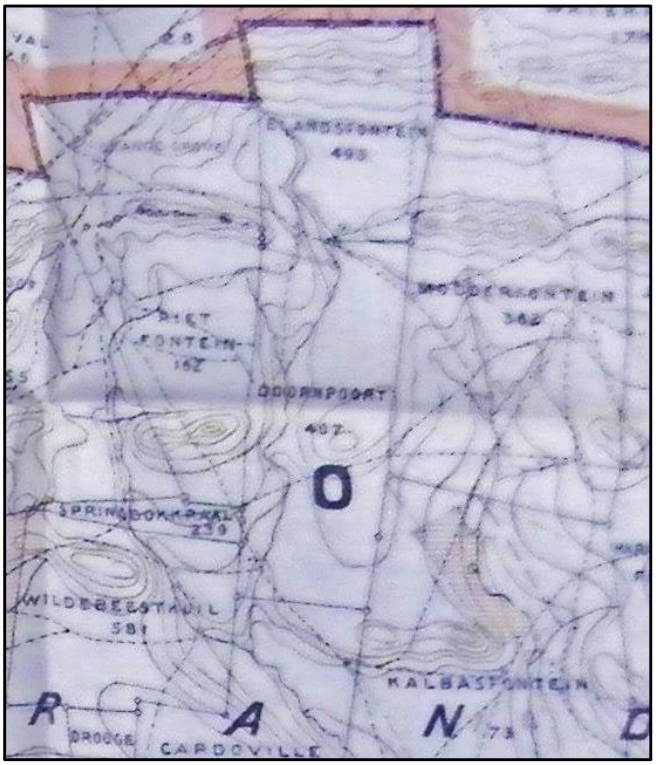
DEPOT SAB
SOURCE BAO
TYPE LEER
VOLUME_NO 3/3753
SYSTEM 01
REFERENCE A12/1/1/1/3/J8/21
PART 1
DESCRIPTION VOORSIENING. INSTANDHOUDING. SWART DIENSTE. DRANK VERSKAFFING AAN MYNE EN BEDRYWE. **ELSBURG GOLD** MINING COMPANY LIMITED. JOHANNESBURG.
STARTING 19740000
ENDING 19740000

DEPOT TAB
SOURCE WLD
TYPE LEER
SYSTEM 01
REFERENCE 2289/1974
PART 1
DESCRIPTION EX PARTE APPLICATION. **ELSBURG GOLD** MINING COMPANY LTD.
STARTING 19740000
ENDING 19740000

7.3.5 Cultural Landscape

Since the mid-1800s up until the present, South Africa has been divided and re-divided into various districts. The district of Potchefstroom was established in 1839, and the land under investigation formed part thereof. This remained the case until 1902, when the property still fell within the jurisdiction of the Potchefstroom district, but also in the ward Gatsrand. As of 1977, the study area formed part of the Westonaria ward within the Witwatersrand district. This remained the case until 1994, when the property became part of the Westonaria ward in the new Gauteng province. (Bergh 1999: 17, 20-27).

Note that, by 1909 the farm under investigation was known as Doornpoort 497. By 1931 the property was known as Doornpoort 2. Before 1950 the name changed to Doornpoort 47. In 1950, the property became known as Doornpoort 347 IQ, as it is still known today.



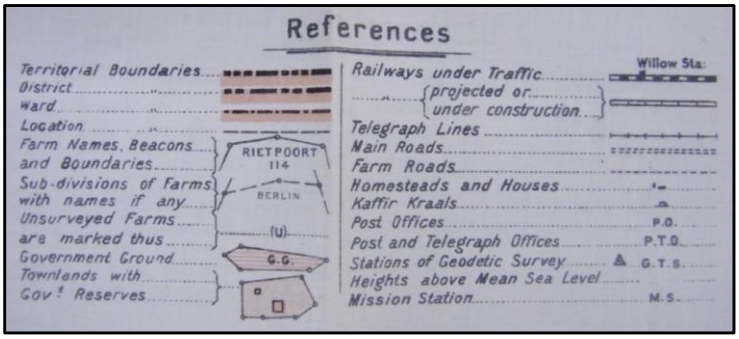


Figure 9. By 1909 the property under investigation would have been located on the farm Doornpoort 497. (Surveyor-General's Office 1909)

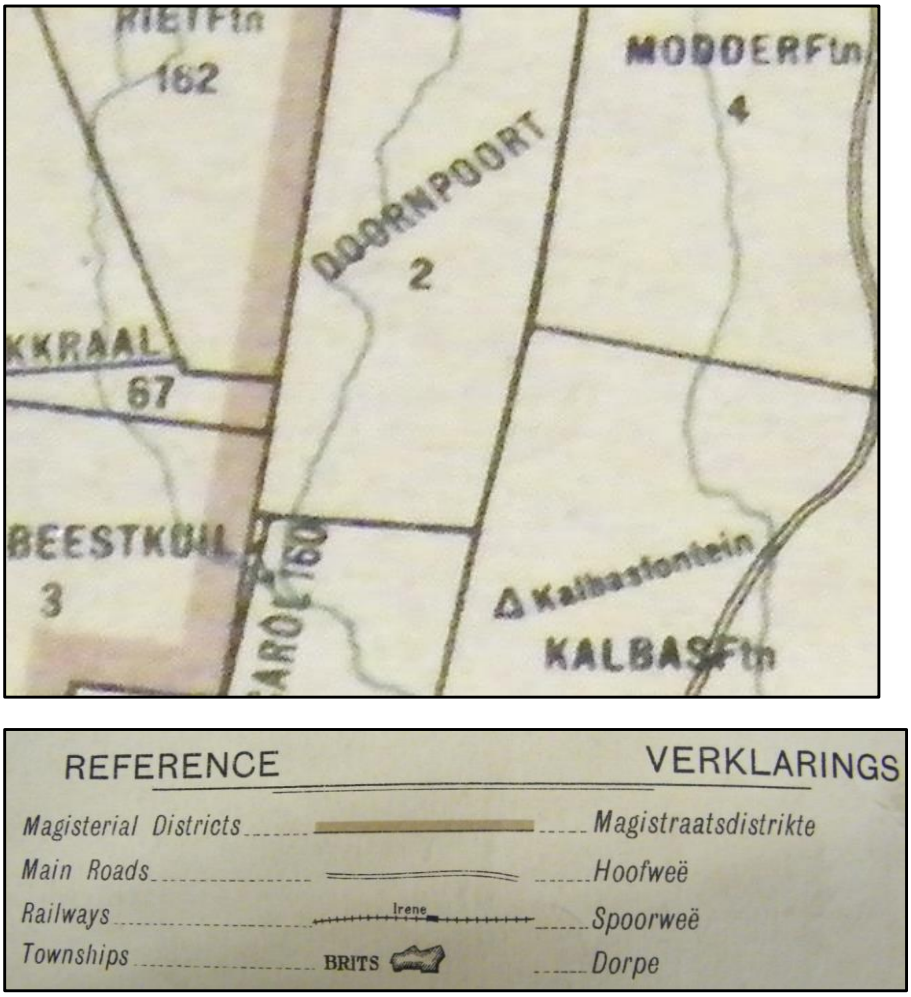


Figure 10. By 1931 the property under investigation would have been located on the farm Doornpoort 2. A stream went through the property. (Surveyor-General's Office 1931)

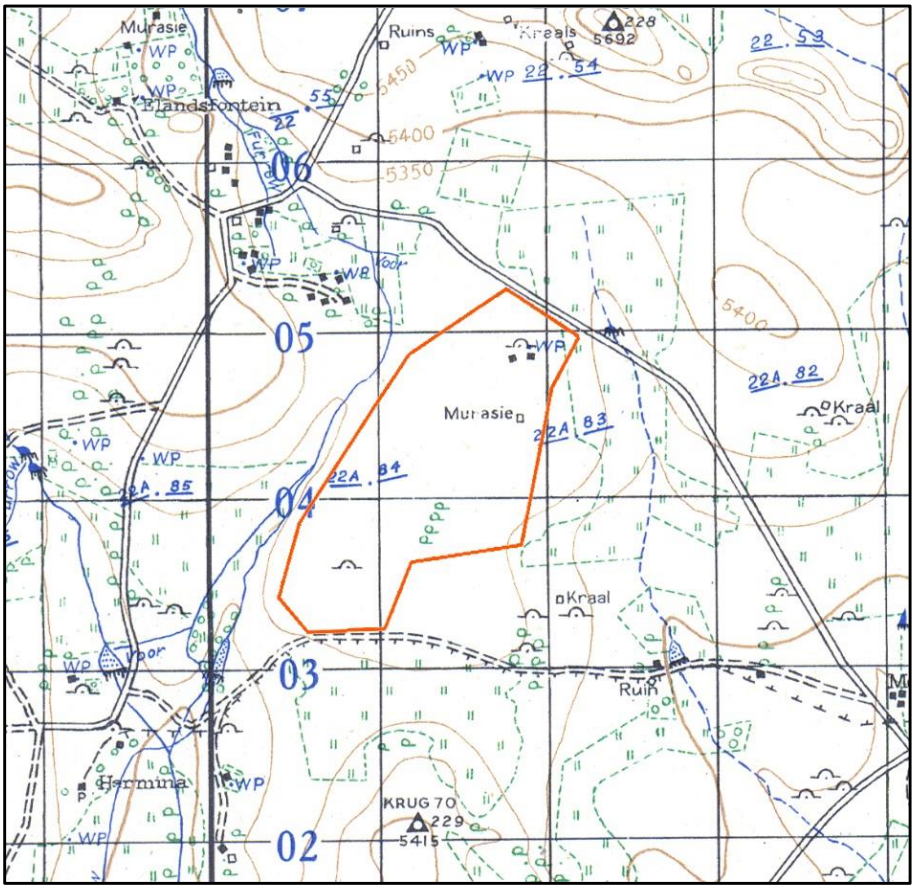


Figure 11. 1943 Topographical map of the study area. The approximate location of the area under investigation is indicated with an orange border. The portion under investigation is located in the most northern part of Doornpoort. A farm road forms the north eastern border of the section under investigation. A track/footpath can be seen near the southern boundary of the property. A hut/kraal and two European buildings can be seen in the northern part of the study area, and a ruin is indicated some distance to the south. Another hut/kraal is visible in the southern part of the property. A stream is visible to the west and cultivated fields can be seen around the study area. (Topographical Map 1943)

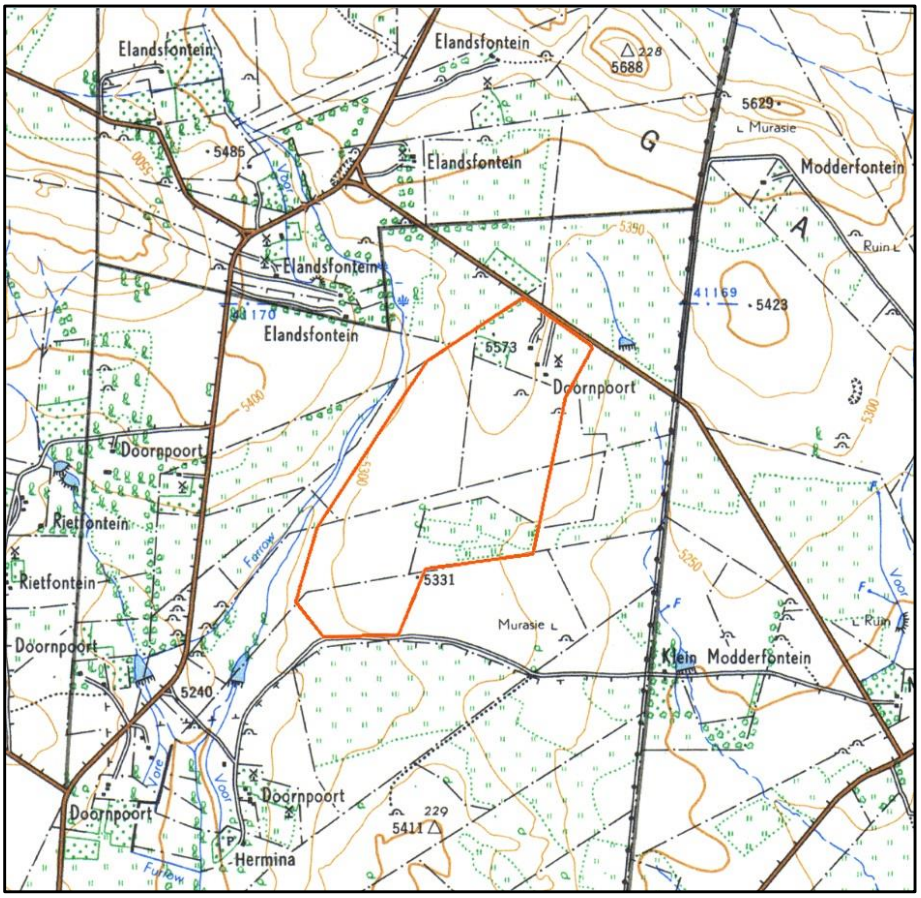


Figure 12. 1957 Topographical map of the study area. The approximate location of the area under investigation is indicated with an orange border. A secondary road forms the north eastern border of the study area, and a farm road forms the southern border. One can see that the farm had been subdivided into a number of portions. There is a small orchard in the northern part of the property, and nearby one can see two farm roads leading from the secondary road, a windmill, three buildings and two huts/kraals. One can see planted fields in the south eastern corner of the study area. It seems that many of the surrounding farms were used for the planting of crops. (Topographical Map 1957)

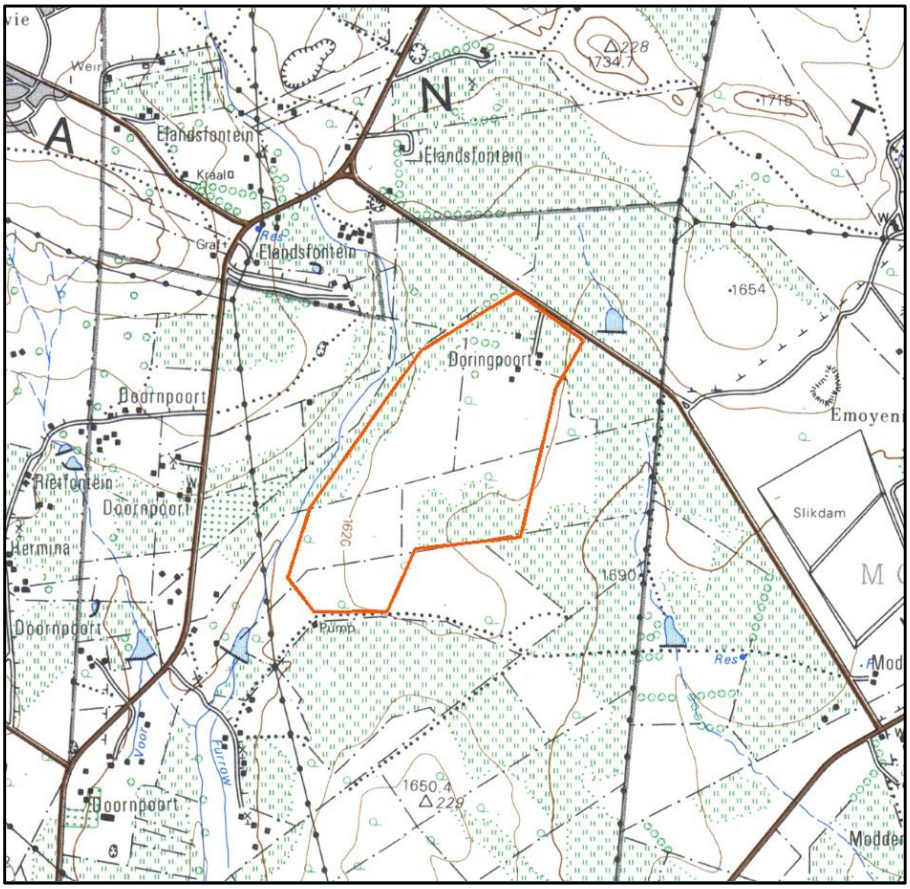


Figure 13. 1976 Topographical map of the study area. The approximate location of the area under investigation is indicated with an orange border. Areas along the western and northern border, as well as in the south eastern corner of the study area were used for cultivating crops. A farm road connects the secondary road bordering on the property in the north east to a development with five buildings. Several planted fields can be seen on farms surrounding the study area. A pump is visible to the south of the property, on the farm road. A power line can be seen to the west of the area under investigation. (Topographical Map 1976)

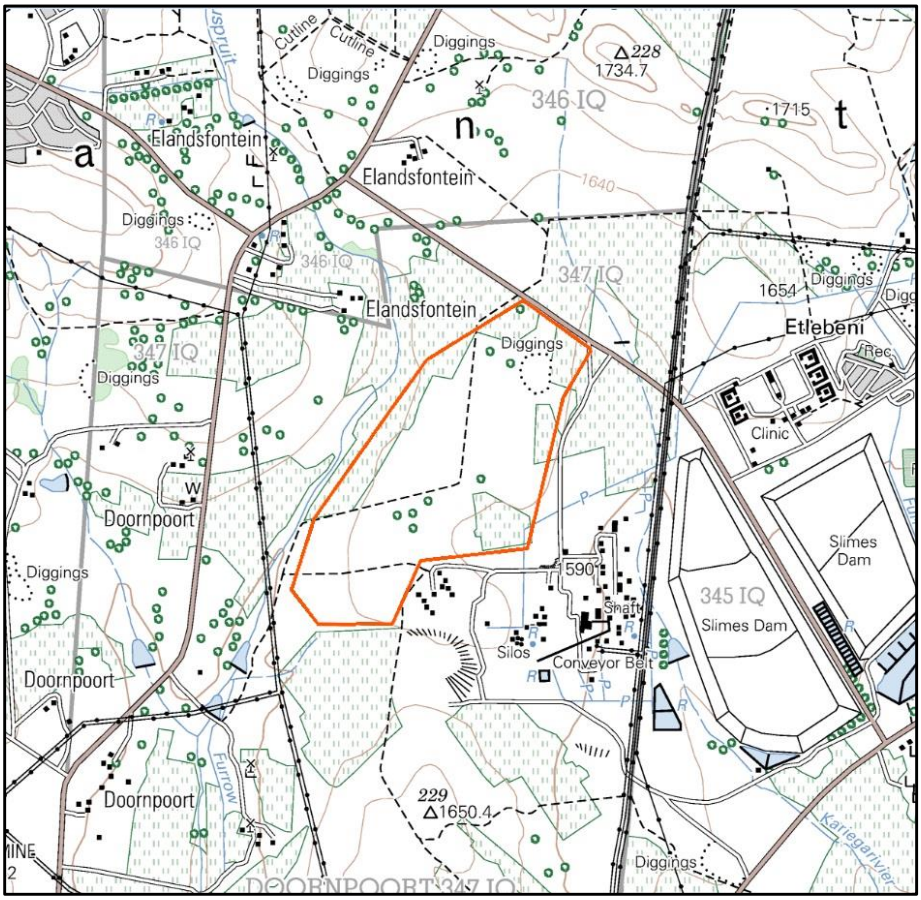


Figure 14. 2007 Topographical map of the study area. The approximate location of the area under investigation is indicated with an orange border. Cultivated fields are visible along the western, northern and eastern borders of the study area. Two tracks/hiking trails went through the property. Where buildings were indicated on the 1976 map, one can see only a diggings site. Etlebeni can be seen to the east of the property. One can see buildings, silos, a shaft, a conveyor belt and other developments in connection with the Twin Shaft South Deep mining development to the south east of the study area. (Topographical Map 2007)

8 Findings of the Survey

It is important to note that only the development footprint of approximately 161 ha was surveyed. During the survey several highly weathered widespread, isolated MSA artefacts was observed scattered over the study area. These artefacts are scattered too sparsely to be of any significance apart from noting their presence.

The following sites were identified:

Feature Number	Description	Longitude	Latitude
Feature 1	Ruin 3	27° 39' 26.1612" E	26° 24' 29.7683" S
Feature 2	Ruin 2 & Large Midden	27° 39' 26.4439" E	26° 24' 22.6731" S
Feature 3	Demolished farm house	27° 39' 28.0333" E	26° 24' 14.4253" S
Feature 4	Cattle Kraal	27° 39' 30.0666" E	26° 24' 19.6816" S
Feature 5	Ruin 1	27° 39' 30.6704" E	26° 24' 16.6627" S
Feature 6	Grave	27° 39' 23.1526" E	26° 24' 17.0913" S

8.1 Built Environment (Section 34 of the NHRA)

Feature 1

This feature consists of ephemeral stone wall foundations (Figure 15) that is entirely overgrown (Figure 16). Most of the walling has been removed but it seems as if the feature was rectangular in shape measuring approximately 8 x 6 meters. No other features or artefacts were noted and the site has been demolished to the extent that it is of low heritage significance. The site is given a Generally Protected C (GP.C) field rating. It must however be kept in mind that sites like these might contain unmarked graves.

Figure 15: Ephemeral stone foundations

Figure 16: Feature 1 viewed from the south

Feature 2

This is the remains of a rectangular stone walled house (Figure 17 & 18). This ruin has an entrance facing east and seems to have consisted of one room only. This ruin is interpreted as farm labourer housing and two large middens (Figure 19 & 20) occur to the east and south of the ruin with various industrial artefacts scattered across the site. These middens measure approximately 6 meters in diameter. This feature is not of architectural or historical importance and is of low heritage significance. The site is given a Generally Protected B (GP.B) field rating. It must however be kept in mind that sites like these might contain unmarked graves.

Figure 17: Feature 2 viewed from the east

Figure 18: Feature 2 viewed from the north

Figure 19: Midden 1

Figure 20: Midden 2

Feature 3.

This is the location where the old farm house used to be. The structure has been entirely demolished and is only marked by building rubble. The site is of no heritage significance. The site is given a Generally Protected C (GP.C) field rating.

Figure 21. General site conditions Feature 3

Figure 22. Building rubble

Feature 4

This is the location of a large cattle kraal constructed from stone (Figure 21). The rectangular kraal measures approximately 27 X 27 meters and the height of the wall is approximately 1.10 meter. The kraal has an entrance on the northern side and the western wall has partly collapsed. A water or feeding trough from cement is located on the inside adjacent to the wall (Figure 22). The site is of low heritage significance. The site is given a Generally Protected B (GP.B) field rating.

Figure 23: Feature 4 viewed from the west

Figure 24: Water trough within Feature 4

Feature 5

This is the location of ephemeral rectangular stone packed foundations. Most of the walling has been removed but the feature seems to have measured 4 X 8 meters. Several other upright standing stones occur in this area forming part of a demolished wall (Figure 23 – 26). It is assumed that Feature 4 and 5 form part of the same site. The site has been demolished to the extent that it is of low heritage significance. The site is given a Generally Protected C (GP.C) field rating. It must however be kept in mind that sites like these might contain unmarked graves.

Figure 25: Upright standing stones at feature 5

Figure 26: : Feature 5 viewed from the south

Figure 27: Linear wall at Feature 5

Figure 28: Linear wall at Feature 5

8.2 Archaeological and palaeontological resources (Section 35 of the NHRA)

No archaeological sites of significance were recorded during the survey. However widely dispersed isolated lithics was recorded. These are made entirely from quartzite and consist of cores and flakes with faceted platforms characteristic of the Middle Stone Age. These artefacts are not *in-situ* and are scattered too sparsely to be of any significance apart from noting their presence which have been done in this report.

The proposed study area is underlain by potentially fossil-bearing, Transvaal Supergroup sedimentary strata (stromatolites) of the early Proterozoic Timeball Hill Formation (Pretoria Group), that are capped by superficial (Quaternary) deposits of low to very low palaeontological sensitivity, the latter being that the impact area is not situated within or near pan, well-developed alluvial or spring deposits. Impact by development on igneous rock mapped near the north-eastern boundary of the site will not affect palaeontological potential remains (Rossouw 2017).

Figure 29:Core with removal visible

Figure 30: Ventral view of large flake

Figure 31: MSA point with dorsal flaking

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

Feature 3

In terms of Section 36 of the Act a single grave was recorded. The grave is that of Elisabeth Gezina Prinsloo, born on the 12th of October 1879 and who passed away on the 30th June 1985. The site is of high social significance and given a field rating of Generally Protected A (GP.A). If any graves are located in future they should ideally be preserved *in-situ* or alternatively relocated according to existing legislation.

Figure 32: Grave viewed from the south

Figure 33: Grave viewed from the north east

Figure 34: Grave of Elisabeth Prinsloo

8.4 Cultural Landscapes, Intangible and Living Heritage.

Long term impact on the cultural landscape is considered to be negligible as the surrounding area consists of an intensely mined area that has already impacted on the cultural landscape of the area that used to consist of a rural/farming landscape. These mining activities also reduces the visual impacts to scenic routes and sense of place.

8.5 Battlefields and Concentration Camps

An Anglo Boer War battle known as the Battle of Doornkop took place in the greater area on 29 May 1900. The British were advancing toward Johannesburg led by General John French. De La Rey and his men held the Klipriviersberg Ridge for the first two days but on the third day the Boers were outflanked by French's cavalry to the West, where General Sarel Oosthuizen's commando was forced to withdraw. This opened the road to Johannesburg and the British took the city peacefully on 30 May 1900.

8.6 Potential Impact

All of the recorded sites will be directly impacted on by the proposed project (Figure 35). In the case of this development, with the recommended mitigation measures and management actions impacts on heritage resources can be mitigated to an acceptable level. However, this and other projects in the area could have an indirect impact on the heritage landscape. The lack of significant heritage resources and the extensive mining activities in the immediate area minimises additional impact on the landscape.

8.6.1 Potential Damage to identified heritage features

8.6.1.1 Project attribute / activity

The pre-construction phase will involve the removal of topsoil and vegetation as well as the establishment of infrastructure needed for the construction phase. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources.

During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological and paleontological material or objects.

8.6.1.2 Embedded controls

A chance find procedure will be implemented for the project.

8.6.1.3 Pre-mitigation impact significance

The loss of cultural heritage structures due to the construction of the solar PV facility will result in a Negligible impact (**Error! Reference source not found.**7).

Table 6 ***Pre-mitigation impact significance rating for loss of cultural heritage structures due to the construction of the solar PV facility***

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	This impact is considered local in extent.
Duration	Permanent	Any impact on non-renewable heritage resources is always permanent and non-reversible.
Scale	130 ha	The impact on heritage resources is restricted to the development footprint of the project where heritage resources occur. This measures less than 10 ha.
Frequency	Permanent	Any impact on non-renewable heritage resources is always permanent and non-reversible.
Likelihood	Definite	Based on the current lay out all of the sites recorded will be destroyed.
Magnitude		
Small		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Low		
The heritage resources are all of a low sensitivity with either a GP.B or GP.C field rating.		
Significance Rating Before Mitigation		
Negligible		

Mitigation measures

- Implementation of a chance find procedure
- Mapping of Features 1 -6 as part of the cultural landscape.
- A destruction permit should be applied for prior to destruction of the structures according to the relevant legislation.
- It is advised that, as part of a follow-up Phase 1 Palaeontological Impact Assessment, a professional palaeontologist should monitor fresh exposures should large scale excavations into unweathered sedimentary bedrock be conducted during the construction phase of the development.

Commented [A2]: Added mitigation measures

Table 7: Site specific mitigation measures

Feature Number	**Description**	**Mitigation**
Feature 1	Ruin 3: Rectangular stone foundations	• Mapping of site • Monitoring during construction for unmarked graves
Feature 2	Ruin 2 & Large Midden	• Mapping of site • Monitoring during construction for unmarked graves
Feature 3	Demolished farm house	No further action needed
Feature 4	Cattle Kraal	Mapping of site
Feature 5	Ruin 1: Rectangular stone foundations	• Mapping of site • Monitoring during construction for unmarked graves

Residual impact significance

The residual impact will remain Negligible; therefore, no further assessments are required.

8.6.2 Damage or destruction of a grave site due to the construction of the solar PV facility

Sensitive receptors

The sensitive receptor is that of the grave of Elisabeth Gezina Prinsloo (12 October 1879 - 30 June 1985). The site is of high social significance and given a field rating of Generally Protected A (GP.A). If any graves are located in future they should ideally be preserved in-situ or alternatively relocated according to existing legislation.

8.6.2.1 Project attribute / activity

The pre-construction phase will involve the removal of topsoil and vegetation as well as the establishment of infrastructure needed for the construction phase. These activities will damage or destroy the grave of Elisabeth Gezina Prinsloo.

8.6.2.2 Embedded controls

The project will undertake a grave relocating in accordance with legislated procedures.

8.6.2.3 Pre-mitigation impact significance

The loss of cultural heritage structures due to the construction of the solar PV facility will result in a Moderate impact (Table 8).

Table 8 ***Pre-mitigation impact significance rating for the damage or destruction of a gravesite due to the construction of the solar PV facility***

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	This impact is considered local in extent.
Duration	Permanent	Any impact on non-renewable heritage resources is always permanent and non-reversible.
Scale	100m^2	The impact on heritage resources is restricted to the site where the grave occurs.
Frequency	Permanent	Any impact on non-renewable heritage resources is always permanent and non-reversible.
Likelihood	Likely	Based on the current layout it is likely that the grave will be impacted upon
Magnitude		
Small		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High		
The site is of high social significance and given a field rating of Generally Protected A (GP.A).		
Significance Rating Before Mitigation		
Moderate		

Mitigation measures

- Preservation of grave *in situ* with 20-meter buffer zone and access gate
- If this is not possible relocation adhering to all legal requirements

Residual impact significance

The residual impact significance will remain Moderate; therefore, no further assessments are required.

8.6.3 ESMP

8.6.3.1 Cultural Heritage Management Plan

Management plan for loss of cultural heritage resources due to construction of the solar PV facility

Potential Impact	Loss of cultural heritage resources due to construction of the solar PV facility
Project Commitment	Implementation of a chance find procedure Respectful and lawful handling of cultural heritage resources.
Key Responsibilities	Implementation of chance find procedure • Site Manager • ECO • All construction staff Implementation of Mitigation Measures • ECO • Heritage Resources Professional
Performance Criteria	Respectful and lawful handling of cultural heritage resources performance assessed through the achievement of the following goals: • Zero grievances logged in the grievance mechanism related to the disturbance or destruction of cultural resources; • Zero incidence of non-compliance in terms of the National Heritage Resources Act, 1999 (Act No.25 of 1999)
Mitigation Measures	A Chance find procedure will be implemented for the project. Sites should be mapped prior to permit application. It is advised that, as part of a follow-up Phase 1 Palaeontological Impact Assessment, a professional palaeontologist should monitor fresh exposures should large scale excavations into unweathered sedimentary bedrock be conducted during the construction phase of the development. In order to proceed with the construction of the solar PV facility the relevant permits should be obtained through SAHRA for the destruction of the heritage resources.
Monitoring	Monitoring • On-going visual assessment of compliance by ECO • Monitoring and management of destruction by suitably qualified and registered heritage resources professional. • Paleontological monitoring of fresh exposures should large scale excavations into unweathered sedimentary bedrock be conducted during the construction phase of the development .

Commented [A3]: Added Mitigation Measures

Potential Impact	Loss of cultural heritage resources due to construction of the solar PV facility
Reporting & Corrective Action	• Records of all monitoring activities will be kept by the ECO and a summary of the results reported to the project management bi-annually. • Corrective actions must be implemented to address audit findings. • On site monitoring and management of the process by a heritage resources professional; • Relevant reports will be submitted by the heritage resources professional to the South African Heritage Resources Agency (SAHRA)
Budget Considerations	Monitoring • Monitoring will be undertaken by the ECO • Monitoring by heritage resources professional: R50 000.00

Management plan for damage or destruction of a grave site due to the construction of the solar PV facility

Potential Impact	Damage or destruction of a grave site due to the construction of the solar PV facility
Project Commitment Key Responsibilities	Respectful and lawful relocation of the grave. <u>Implementation of chance find procedure</u> • Site Manager • ECO • All construction staff <u>Implementation of Mitigation Measures</u> • ECO • Heritage Resources Professional
Performance Criteria	Respectful and lawful relocation of the grave performance assessed through the achievement of the following goals: • Zero grievances logged in the grievance mechanism related to the disturbance or destruction of cultural resources; • Zero incidence of non-compliance in terms of the National Heritage Resources Act, 1999 (Act No.25 of 1999)
Mitigation Measures	In order to proceed with the construction of the solar PV facility the relevant permits should be obtained through SAHRA for the relocation of the grave.
Monitoring	<u>Monitoring</u> • On-going visual assessment of compliance by ECO • Monitoring and management of grave relocation by suitably qualified and registered heritage resources professional.
Reporting & Corrective Action	• Records of all monitoring activities will be kept by the ECO and a summary of the results reported to the project management bi-annually. • Corrective actions must be implemented to address audit findings. • On site monitoring and management of the process by a heritage resources professional; • Relevant reports will be submitted by the heritage resources professional to the South African Heritage Resources Agency (SAHRA)
Budget Considerations	<u>Monitoring</u> • Monitoring will be undertaken by the ECO • Monitoring by heritage resources professional: R50 000.00

Commented [A4]: Should the budget consideration include the grave relocation, mapping of sites and permit applications?

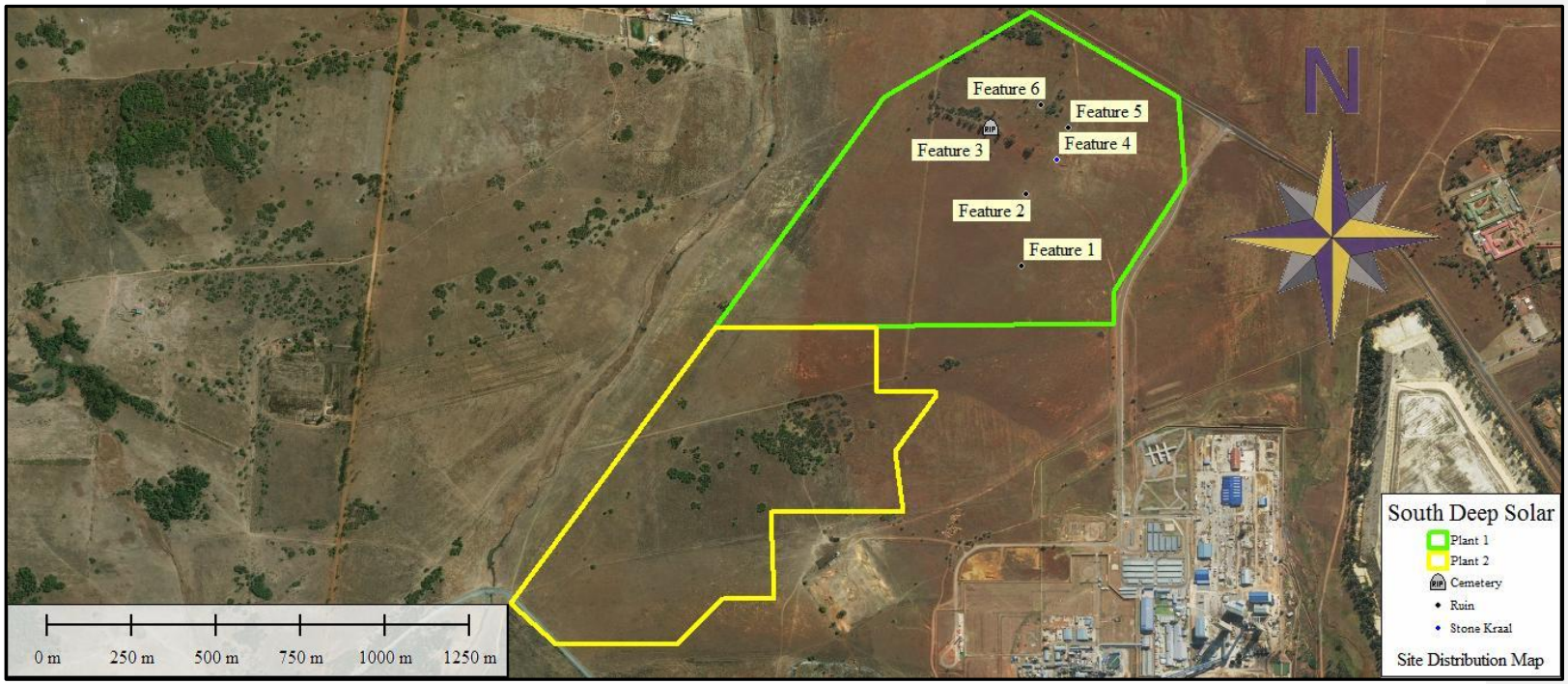


Figure 35. Location of recorded sites within the development footprint

9 Recommendations and conclusion

No archaeological sites were recorded during the survey although isolated individual Middle Stone Age lithics were noted. These artefacts are not *in-situ* and are scattered too sparsely to be of any significance apart from noting their presence which has been done in this report. No further mitigation prior to construction is recommended in terms of the archaeological component of Section 35 for the proposed development to proceed.

An independent paleontological study was conducted by Rossouw (2017). Rossouw concluded: "*The proposed study area is underlain by potentially fossil-bearing, Transvaal Supergroup sedimentary strata (stromatolites) of the early Proterozoic Timeball Hill Formation (Pretoria Group), that are capped by superficial (Quaternary) deposits of low to very low palaeontological sensitivity, the latter being that the impact area is not situated within or near pan, well-developed alluvial or spring deposits. Impact by development on igneous rock mapped near the north-eastern boundary of the site will not affect palaeontological potential remains. As far as palaeontological heritage is concerned, removal of superficial overburden and excavation within the development footprint > 1 m² and exceeding depths of >1 m into unweathered/fresh bedrock will need monitoring by a professional palaeontologist. It is therefore advised that, as part of a follow-up Phase 1 Palaeontological Impact Assessment, a professional palaeontologist should monitor fresh exposures should large scale excavations into unweathered sedimentary bedrock be conducted during the construction phase of the development*." (Rossouw 2017).

In terms of the built environment of the area (Section 34), 4 ruins and a kraal was recorded. Based on historical maps from 1943 & 1957 it can be deducted that all of these features are older than 60 years and would then be protected under the Act. The features are in very poor condition and some are totally demolished and are of low heritage significance. Direct impacts to these features would be of low significance. It must however be noted that sites like these might contain unmarked graves and will require the implementation of a change find procedure during the construction phase. These features should also be mapped as part the cultural landscape and to cross reference any finds that might be exposed during construction activities. A destruction permit should be applied for prior to destruction of the structures.

In terms of Section 36 of the Act a single grave site was recorded and should ideally be demarcated with a 20-meter buffer zone and an access gate for family members. Based on the current layout this is not possible and if the grave has to be relocated this should be done adhering to all legal requirements. If any graves are located in future they should ideally be preserved *in-situ* or alternatively relocated according to existing legislation. No public monuments are located within or close to the study area. The study area is surrounded by mining developments and the proposed development will not impact negatively on significant cultural landscapes or viewscapes. During the public participation process conducted for the project no heritage concerns were raised.

With the correct mitigation measures and management actions in place the impact of the proposed project on heritage resources can be managed to an acceptable level and it is recommended that the proposed project can commence on the condition that the following recommendations and the site-specific recommendation (Table 2 and 9) are implemented as part of the EMPr and based on approval from SAHRA:

- Implementation of a chance find procedure
- It is advised that, as part of a follow-up Phase 1 Palaeontological Impact Assessment, a professional palaeontologist should monitor fresh exposures should large scale excavations into unweathered sedimentary bedrock be conducted during the construction phase of the development.
- Mapping of Features 1 -6 as part of the cultural landscape.
- A destruction permit should be applied for prior to destruction of the historical structures adhering to all legal requirements.
- The grave should be relocated adhering to all legal requirements including permits from the relevant departments for the relocation.

Table 9. Site specific recommendations

Feature Number	Description	Mitigation	Longitude	Latitude
Feature 1	Ruin 3: Rectangular stone foundations	• Mapping of site • Monitoring during construction for unmarked graves	27° 39' 26.1612" E	26° 24' 29.7683" S
Feature 2	Ruin 2 & Large Midden	• Mapping of site • Monitoring during construction for unmarked graves	27° 39' 26.4439" E	26° 24' 22.6731" S
Feature 3	Demolished farm house	No further action needed	27° 39' 28.0333" E	26° 24' 14.4253" S
Feature 4	Cattle Kraal	Mapping of site	27° 39' 30.0666" E	26° 24' 19.6816" S
Feature 5	Ruin 1: Rectangular stone foundations	• Mapping of site • Monitoring during construction for unmarked graves	27° 39' 30.6704" E	26° 24' 16.6627" S
Feature 6	Grave	• Preservation of grave *in situ* with 20 meter buffer zone and access gate • If this is not possible relocation adhering to all legal requirements	27° 39' 23.1526" E	26° 24' 17.0913" S

9.1 Chance Find Procedures

The possibility of the occurrence of subsurface finds cannot be excluded. Therefore, if during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find and therefor chance find procedures should be put in place as part of the EMP. A short summary of chance find procedures is discussed below.

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

- If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area.
- The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA.

10 References

Primary Sources:

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11 Appendices:

Curriculum Vitae of Specialist

Jaco van der Walt
Archaeologist

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

Education:

Particulars of degrees/diplomas and/or other qualifications:

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

EMPLOYMENT HISTORY:

2011 – Present:	**Owner – HCAC (Heritage Contracts and Archaeological Consulting CC)**.
2007 – 2010 :	**CRM Archaeologist,** Managed the Heritage Contracts Unit at the University of the Witwatersrand.
2005 - 2007:	**CRM Archaeologist**, Director of Matakoma Heritage Consultants
2004:	**Technical Assistant**, Department of Anatomy University of Pretoria
2003:	**Archaeologist**, Mapungubwe World Heritage Site
2001 - 2002:	**CRM Archaeologists,** For R & R Cultural Resource Consultants, Polokwane
2000:	**Museum Assistant**, Fort Klapperkop.

Countries of work experience include:

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

SELECTED PROJECTS INCLUDE:

Archaeological Impact Assessments (Phase 1)

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

Archaeological Impact Assessment Mmamethlake Landfill

Archaeological Impact Assessment Libangeni Landfill

Linear Developments

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

Archaeological Impact Assessment Medupi – Spitskop Power Line,

Archaeological Impact Assessment Nelspruit Road Development

Renewable Energy developments

Archaeological Impact Assessment Karoshoek Solar Project

Grave Relocation Projects

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

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

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

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

Phase 2 Mitigation Projects

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

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

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

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

Heritage management projects

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

MEMBERSHIP OF PROFESSIONAL ASSOCIATIONS:

- Association of Southern African Professional Archaeologists. Member number 159

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

PUBLICATIONS AND PRESENTATIONS

- A Culture Historical Interpretation, Aimed at Site Visitors, of the Exposed Eastern Profile of K8 on the Southern terrace at Mapungubwe.
  - J van der Walt, A Meyer, WC Nienaber
  - Poster presented at Faculty day, Faculty of Medicine University of Pretoria 2003
- 'n Reddingsondersoek na Anglo-Boereoorlog-ammunisie, gevind by Ifafi, Noordwes-Provinsie. South-African Journal for Cultural History 16(1) June 2002, with A. van Vollenhoven as co-writer.
- Fieldwork Report: Mapungubwe Stabilization Project.
  - WC Nienaber, M Hutten, S Gaigher, J van der Walt
  - Paper read at the Southern African Association of Archaeologists Biennial Conference 2004
- A War Uncovered: Human Remains from Thabantšho Hill (South Africa), 10 May 1864.
  - M. Steyn, WS Boshoff, WC Nienaber, J van der Walt
  - Paper read at the 12th Congress of the Pan-African Archaeological Association for Prehistory and Related Studies 2005
- Field Report on the mitigation measures conducted on the farm Bokfontein, Brits, North West Province .
  - J van der Walt, P Birkholtz, W. Fourie
  - Paper read at the Southern African Association of Archaeologists Biennial Conference 2007
- Field report on the mitigation measures employed at Early Farmer sites threatened by development in the Greater Sekhukhune area, Limpopo Province. J van der Walt
  - Paper read at the Southern African Association of Archaeologists Biennial Conference 2008
- Ceramic analysis of an Early Iron Age Site with vitrified dung, Limpopo Province South Africa.
  - J van der Walt. Poster presented at SAFA, Frankfurt Germany 2008

- Bantu Speaker Rock Engravings in the Schoemanskloof Valley, Lydenburg District, Mpumalanga (*In Prep)*
    - J van der Walt and J.P Celliers
- Sterkspruit: Micro-layout of late Iron Age stone walling, Lydenburg, Mpumalanga. W. Fourie and J van der Walt. A Poster presented at the Southern African Association of Archaeologists Biennial Conference 2011
- Detailed mapping of LIA stone-walled settlements' in Lydenburg, Mpumalanga. J van der Walt and J.P Celliers
    - Paper read at the Southern African Association of Archaeologists Biennial Conference 2011
- Bantu-Speaker Rock engravings in the Schoemanskloof Valley, Lydenburg District, Mpumalanga. J.P Celliers and J van der Walt
    - Paper read at the Southern African Association of Archaeologists Biennial Conference 2011
- Pleistocene hominin land use on the western trans-Vaal Highveld ecoregion, South Africa, Jaco van der Walt.
    - J van der Walt. Poster presented at SAFA, Toulouse, France. Biennial Conference 2016

REFERENCES:

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