HERITAGE WALK-DOWN FOR

THE PROPOSED ELAND SOLAR PV FACILITY NEAR WELKOM, FREE STATE PROVINCE

(Required as a condition of authorisation).

Type of development:

PV Facility

Client:

Savannah Environmental (Pty) Ltd

Client info:

Lisa Opperman

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:
2014
Report date:
February 2020

Project Name	**Eland PV Facility**
Report Title	Heritage walk-down for the Eland PV Facility, near Welkom, Free State
Authority Reference Number	14/12/16/3/3/1/1471
Report Status	Draft report
Applicant Name	**Eland Photovoltaic (Pty) Ltd**

INDEMNITY AND CONDITIONS RELATING TO THIS REPORT

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 reserves 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 HCAC exercises due care and diligence in rendering services and preparing documents, HCAC accepts no liability, and the client, by receiving this document, indemnifies HCAC against all actions, claims, demands, losses, liabilities, costs, damages and expenses arising from or in connection with services rendered, directly or indirectly by HCAC and by the use of the information contained in this document.

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.

COPYRIGHT

The client, on acceptance of any submission by HCAC and on condition that the client pays to HCAC the full price for the work as agreed, shall be entitled to use for its own benefit:

- The results of the project;
- The technology described in any report; and
- Recommendations delivered to the client.

Should the applicant wish to utilise any part of, or the entire report, for a project other than the subject project, permission must be obtained from HCAC to do so. This will ensure validation of the suitability and relevance of this report on an alternative project.

EXECUTIVE SUMMARY

An Archaeological Impact Assessment (Van der Walt 2015) was conducted for the proposed Eland PV development. The project was subsequently authorised and HCAC was appointed by Savannah Environmental (Pty) Ltd to conduct a Heritage Walk Down of the final layout of the PV Facility that has minor changes from the 2015 layout in fulfilment of the conditions of the EMPr.

The 2015 assessment recorded no sites of heritage significance within the current impact areas, although stone cairns were recorded well away from the current study area (Van der Walt 2015 a and b). The lack of heritage resources in the study area concurs with similar finds in the surrounding area [Dreyer (2004), Dreyer (2008), Coetzee (2008) and Van der Walt (2013)].

The general study area has been impacted on by the construction of powerlines, roads, cultivation and gold mining activities that would have impacted on surface indicators of heritage sites if any occurred in the study area. The lack of significant heritage resources in the PV footprint was confirmed by a walkthrough of the proposed project components and no heritage features or sites of significance were identified. The palaeontological component is addressed separately (Lavin and Bamford 2020) that concluded that it is very unlikely that the proposed additional infrastructure in the area will impact on any significant palaeontological material.

Due to the apparent lack of significant heritage resources in the study area, the impact of the proposed project on heritage resources is considered to be low and it is recommended that the proposed project can commence on the condition that the following recommendations are implemented as part of the EMPR and based on approval from SAHRA:

- Implementation of a chance find procedure.

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)

Contents

Figures

1. INTRODUCTION

HCAC was appointed by Savannah Environmental to conduct a Heritage Walk Down for the Eland PV Facility near Welkom in the Free State Province (Figure 1 – 3). This is in fulfilment of the one of the requirements of one of the EMPr, which states that a pre-construction walk-through of the development footprint must be undertaken prior to finalisation of the EMPr. The aim of the study is to survey the proposed development footprint to identify cultural heritage sites, especially in areas not previously covered due to lay out changes (Van der Walt 2015) and to 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, review of the AIA for the Eland PV Facility; Phase 2, the physical surveying of the area on foot and by vehicle; Phase 3, reporting the outcome of the study.

General site conditions and features on site were recorded by means of photographs, GPS locations, and site descriptions.

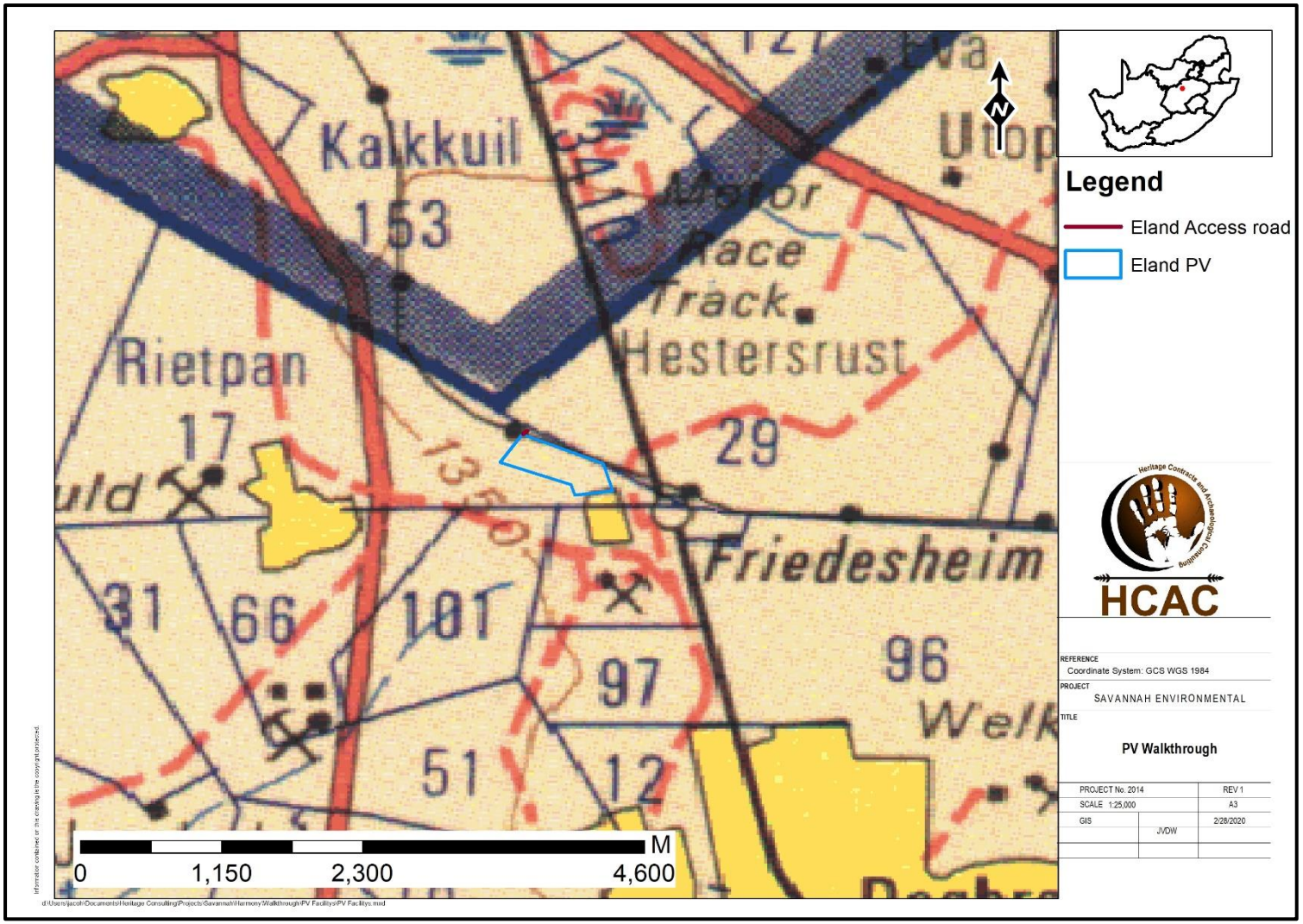

Figure 1**:** Regional setting (Extract from the 1:250 000 topographical map).

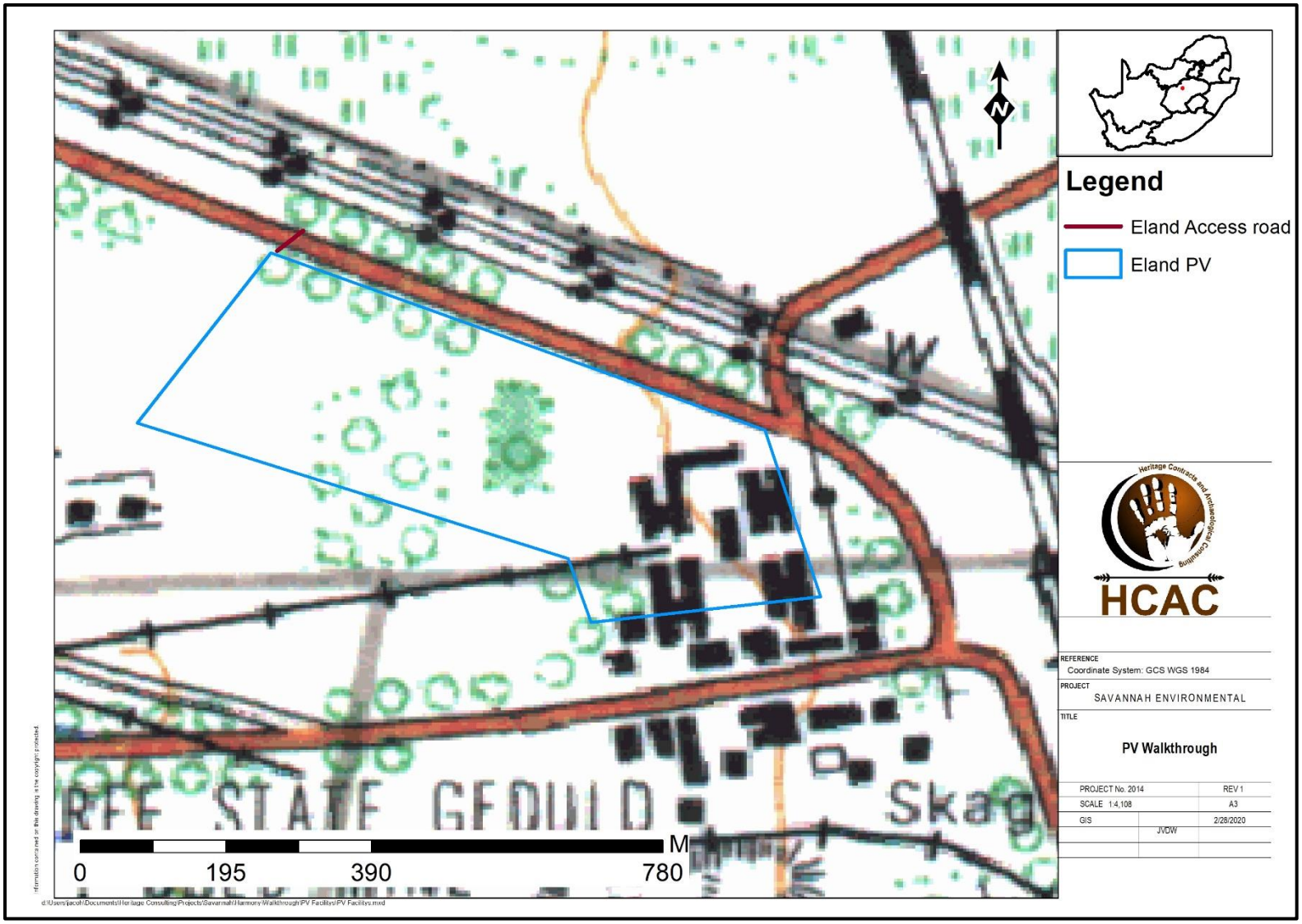

Figure 2. Local setting (Extract from the 1: 50 000 topographical map).

2. PROJECT DESCRIPTION

The study area falls within the bioregion described by Mucina *et al* (2006) as the Dry Highveld Grassland Bioregion with the vegetation described as Vaal-Vet Sandy Grassland within a Grassland Biome. Land use in the general area is characterized by mining and agriculture. The study area is characterised by deep sandy to loamy soils with no major landscape features like pans, rivers or hills.

The Eland study area is situated 350m west of the Friedesheim train station and in close proximity to an active mining area directly south of the proposed study area. 90 % of the Eland study site is covered in a layer of building rubble or the remains of modern buildings that were destroyed fairly recently (Last google earth images are from 2003). The western most corner of this area is free of building rubble but is also fairly flat with high visibility.

2.1. Terms of reference

This Heritage Walk Down report was compiled by HCAC for the proposed development and construction of the Eland PV Facility based on the requirements of the NHRA (no 25 of 1999) and the National Environmental Management Act (NEMA) (no 107 of 1998).

The process consisted of three phases:

- Phase 1, review of the existing AIA for the project;
- Phase 2, the physical surveying of the area on foot and by vehicle;
- Phase 3, reporting the outcome of the study.

2.2. Scope and purpose of the report

The report is intended to report on any heritage resources that might occur within the final footprint of the proposed PV Facility and make recommendations for any mitigation measures that may need to be implemented prior to construction.

2.3. Specialist Qualifications

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, Tanzania and Guinea. Through this he has a sound understanding of the IFC Performance Standard requirements, with specific reference to Performance Standard 8 – Cultural Heritage.

2.4. Physical surveying

An intensive foot-survey that covered the study area was conducted (Figure 3). A non-intrusive pedestrian survey was conducted during the week of 30 January by a professional archaeologist. Identified sites are plotted on 1:50 000 maps and their GPS co-ordinates documented. In addition, digital photographs were used to document the area.

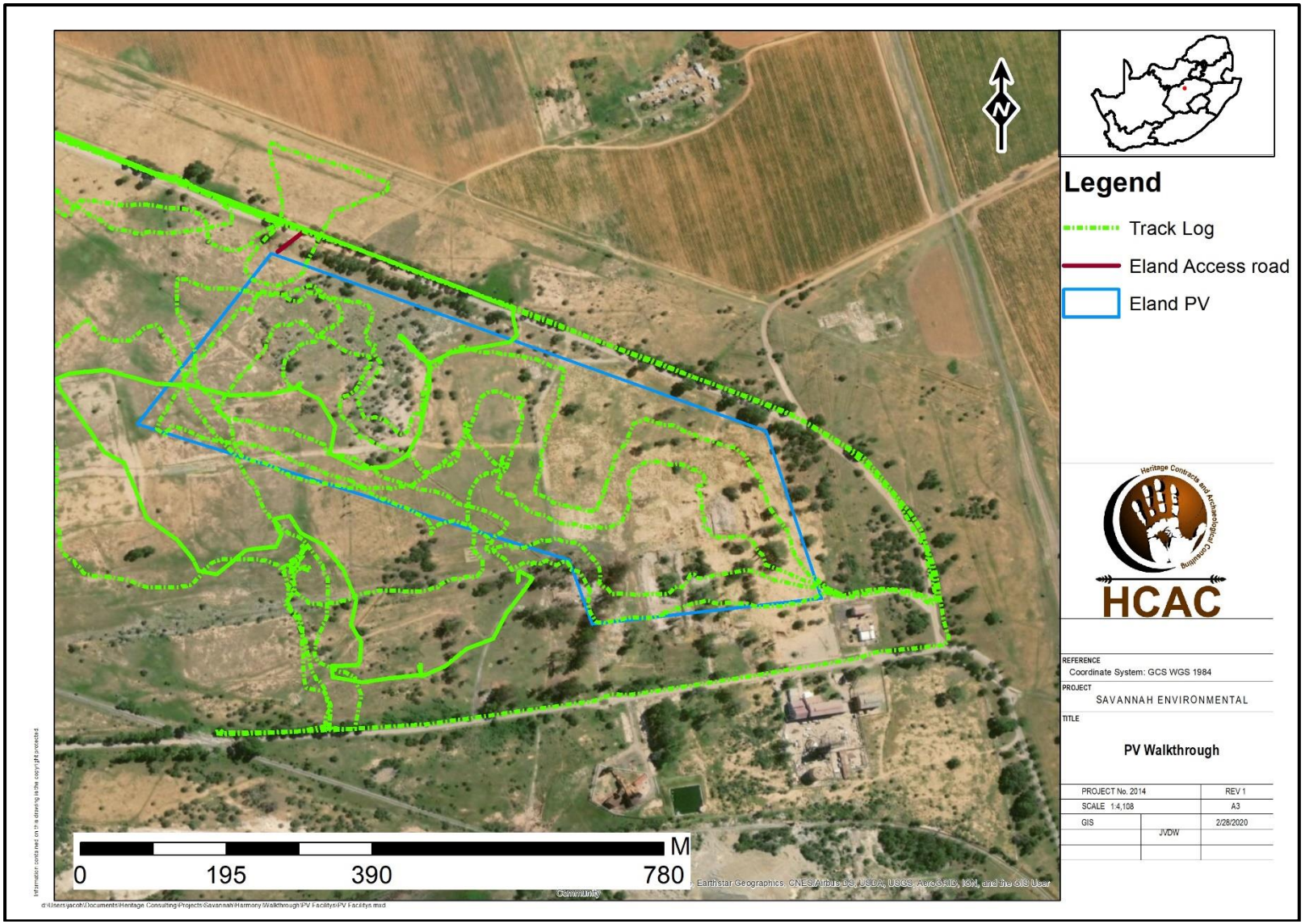

Figure 3. Track logs of the survey.

3. HERITAGE LEGISLATION

The identification, evaluation and assessment of any cultural heritage site, artefact or find in the South African context is required and governed by the following legislation:

i. National Environmental Management Act (NEMA), Act 107 of 1998
ii. National Heritage Resources Act (NHRA), Act 25 of 1999
iii. Mineral and Petroleum Resources Development Act (MPRDA), Act 28 of 2002

The following sections in each Act refer directly to the identification, evaluation and assessment of cultural heritage resources.

i. National Environmental Management Act (NEMA) Act 107 of 1998:
    a. Basic Environmental Assessment (BEA) – Section (23) (2)(d);
    b. Environmental Scoping Report (ESR) – Section (29) (1)(d);
    c. Environmental Impact Assessment (EIA) – Section (32) (2)(d); and
    d. Environmental Management Plan (EMP) – Section (34) (b).
ii. National Heritage Resources Act (NHRA) Act 25 of 1999:
    a. Protection of Heritage Resources – Sections 34 to 36; and
    b. Heritage Resources Management – Section 38.
iii. Mineral and Petroleum Resources Development Act (MPRDA) Act 28 of 2002.

3.1. 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; and
- 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 criterion, 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

3.2. Impact Assessment Methodology

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

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

The **significance** is calculated by combining the criteria in the following formula:
S=(E+D+M) P
S = Significance weighting
E = Extent
D = Duration
M = Magnitude
P = Probability

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

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

4. PROJECT HISTORY

This section of the report relates to the brief desktop study and establishes what is already known about heritage resources in the vicinity of the study area. What was found during the field survey may then be compared with what is already known in order to gain an improved understanding of the significance of newly reported resources.

An AIA (Van der Walt 2015) was conducted for the Eland PV Facility and recorded no sites of heritage significance within the current impact areas, although stone cairns were recorded well away from the current study area (Van der Walt 2015 a and b). The lack of heritage resources in concurs with similar finds in the surrounding area [Dreyer (2004), Dreyer (2008), Coetzee (2008) and Van der Walt (2013)]. An assessment for the electrical infrastructure within the area also recorded no heritage features (Van der Walt 2020).

4.1. Stone Age

South Africa has a long and complex Stone Age sequence of more than 2 million years. The broad sequence includes the Later Stone Age, the Middle Stone Age and the Earlier Stone Age. Each of these phases 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. The Bushmen were the earliest inhabitants of the Northern Free State. These people were foragers, as well as hunters, and roamed the area for hundreds of years. Bantu-speaking tribes later moved into the area and the combined stress of white and black migration led to the expulsion of the San from this area over time (Coplan 2008: 118, 130-131).

∗ Middle Stone Age; associated with Homo sapiens and archaic modern humans. 30-300 thousand years ago. Isolated MSA artefacts especially around pans can be expected but it is not anticipated that these finds will have conservation value.

∗ Earlier Stone Age; associated with early Homo groups such as Homo habilis and Homo erectus. 400 000-> 2 million years ago. No known ESA sites occur in the area.

4.2. 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.

No sites dating to the Early or Middle Iron Age have been recorded or are expected for the study area. Late Iron Age sites in the larger area are mainly associated with two ceramic traditions. The first, the Thabeng ceramic *facies* (Maggs 1976, Mason 1986) belongs to the Moloko branch of the Urewe tradition. The second *facies* is known as Makgwareng (Dreyer 1992 and Maggs 1976), and belongs to the Blackburn Branch of the Urewe tradition.

4.3. Anglo-Boer War

The northern Free State is located within the area where some of the main operations of the Boer General, Christiaan De Wet, took place between 1899 and May 1900 when the war ended. De Wet, among the other Boer generals, realized that they could not win the war by

conventional means, and spread out into small hit-and-run groups that inflicted serious casualties on the British armies. This is known as Guerrilla warfare. According to the source of De Bruin, the railway station of Henneman was occupied by British troops on 11 May 1900.

4.4. Cultural Landscape

The area was historically mined and used as a recreation area. Parts of the impact area was also cultivated (Figure 4 -7)

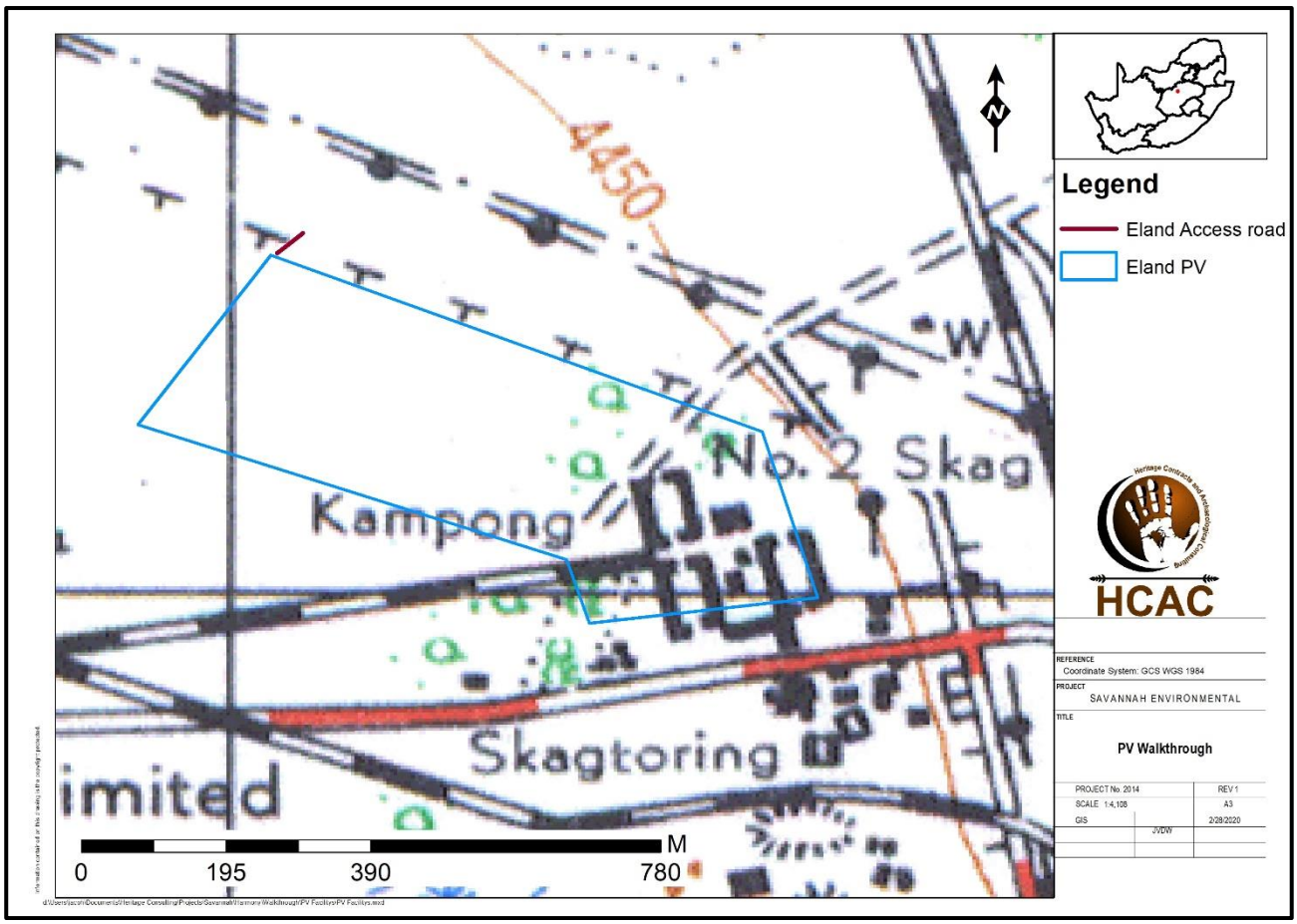

Figure 4. 1952 Topographical map of the study area indicating mining infrastructure within the study area.

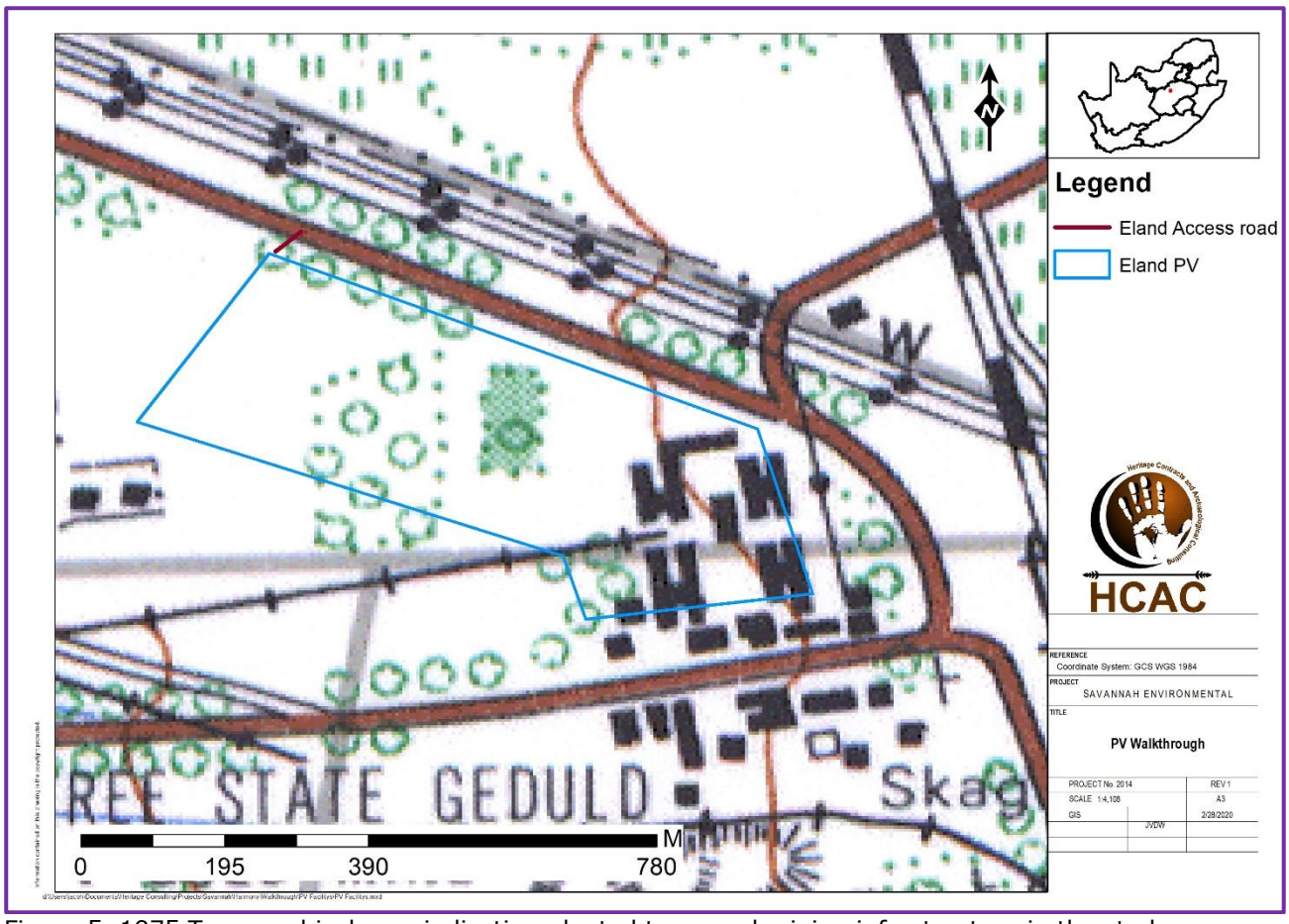

Figure 5. 1975 Topographical map indicating planted trees and mining infrastructure in the study area.

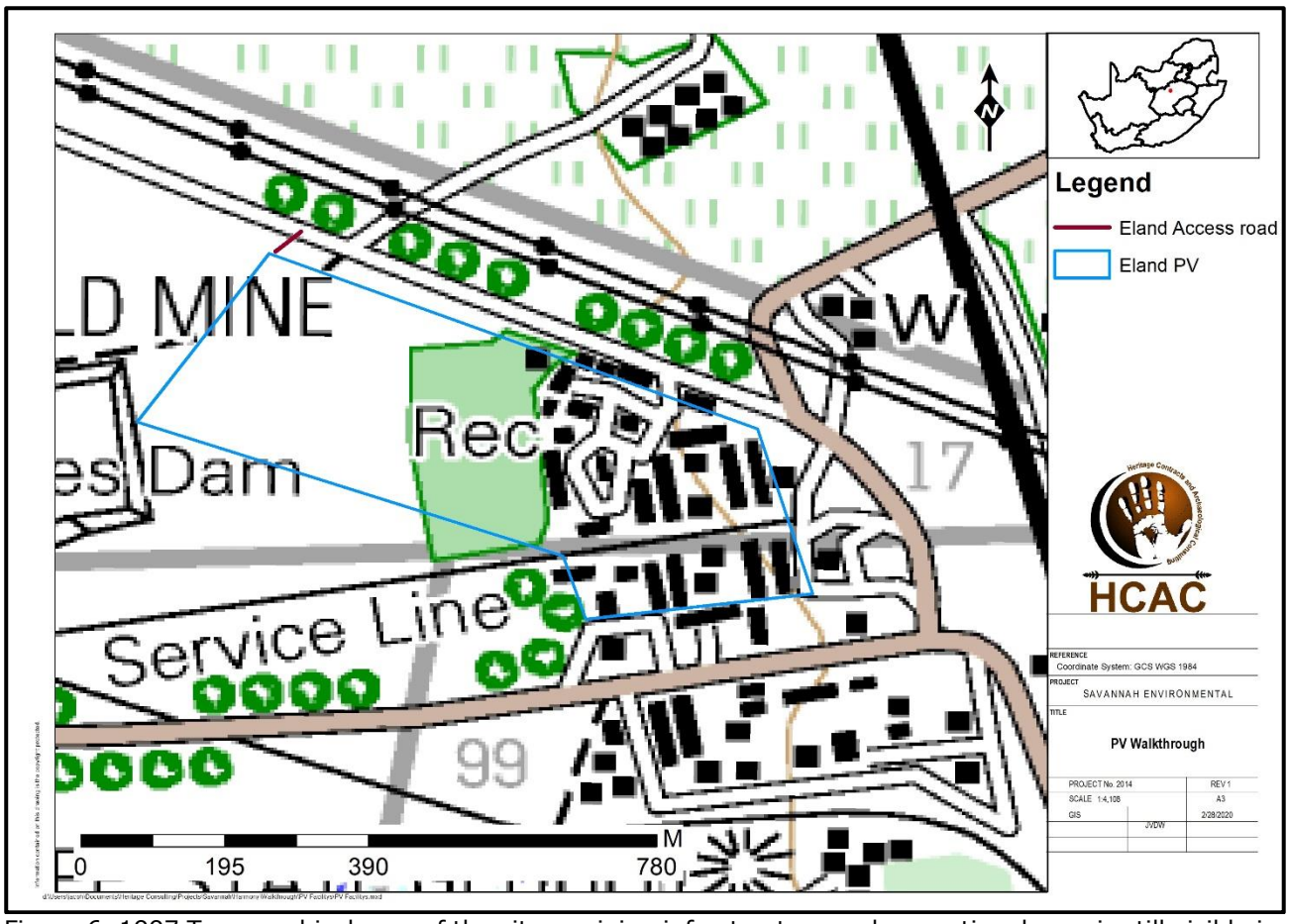

Figure 6. 1997 Topographical map of the site – mining infrastructure and recreational area is still visible in the study area.

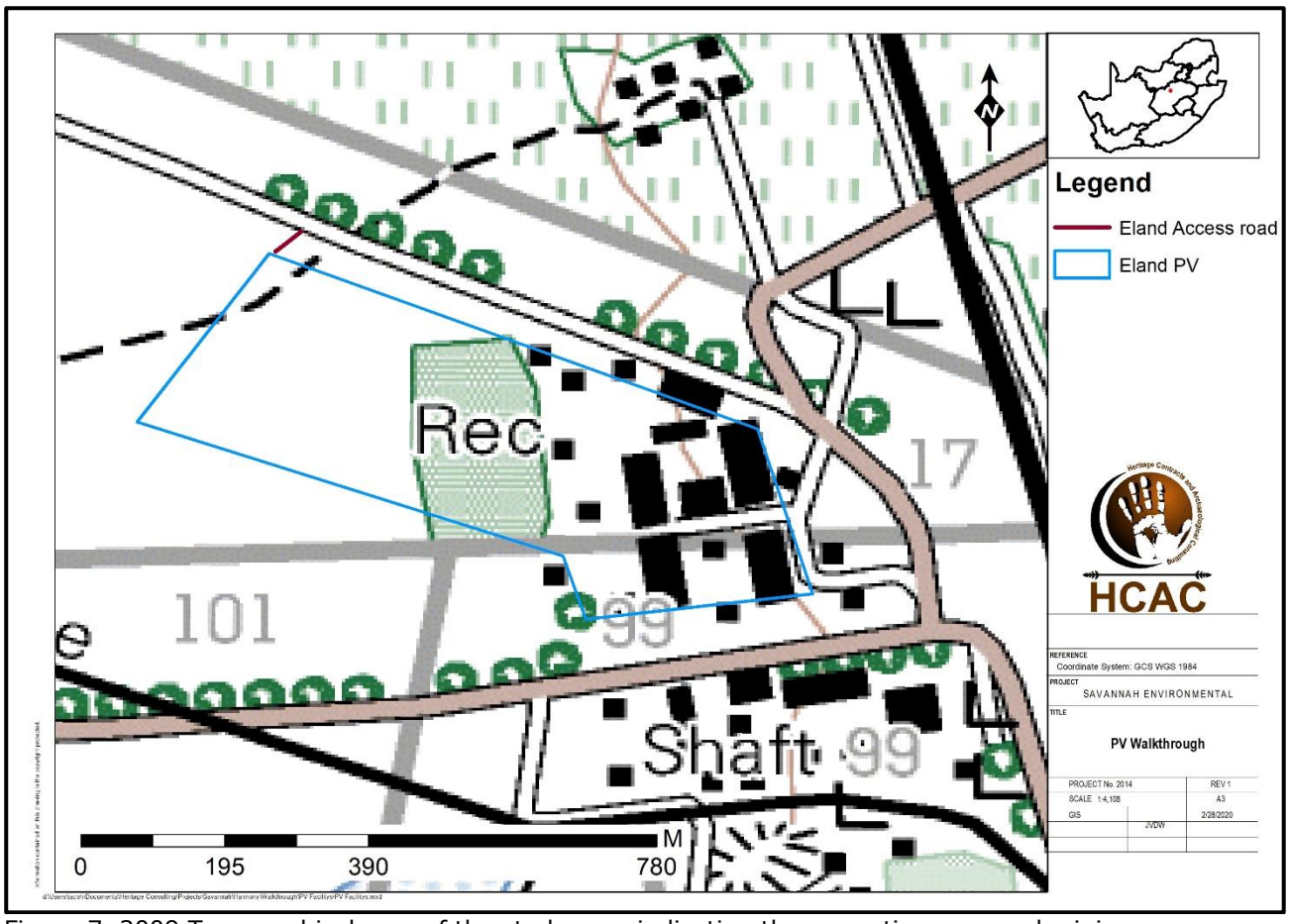

Figure 7. 2009 Topographical map of the study area indicating the recreation area and mining infrastructure in the study area.

5. FINDINGS OF THE WALK DOWN SURVEY

The Eland study area is situated 350m west of the Friedesheim train station and in close proximity to an active mining area directly south of the study area. The study area is characterised by grass cover and large parts is covered in a layer of building rubble or the demolished remains of modern buildings (Figure 8 – 11) relating to accommodation and recreational facilities of the Geduld Gold mine dating from the 1990's. The remains are of no heritage significance not older than 60 years and are not protected by the NHRA. The features are concentrated around coordinates 27°55'35.72"S and 26°42'32.18"E. These features were destroyed fairly recently (last Google earth images are from 2003 – Figure 12). Google Imagery indicate that in the subsequent years, the structures were destroyed and no further developments are visible (Figure 12 - 14). The western most corner of this area is free of building rubble but is also fairly flat with high visibility.

No heritage sites or artefacts of significance were recorded. The lack of Stone Age material can be attributed to the local geology that consists mostly of quaternary sands with no raw material suitable for knapping, and the study area is located outside of the known distribution of Iron Age Sites in this part of the Free State. In terms of the paleontological component of Section 35, an independent study was conducted by Prof Marion Bamford (2015) for the authorised Eland Facility. The study concluded that the authorised PV facilities occur within layers of the Permian Volksrust Formation, the potentially fossiliferous coals of which are of poor quality and lie too deep to be affected by the proposed development.

Figure 8. General Site conditions

Figure 9. General Site conditions

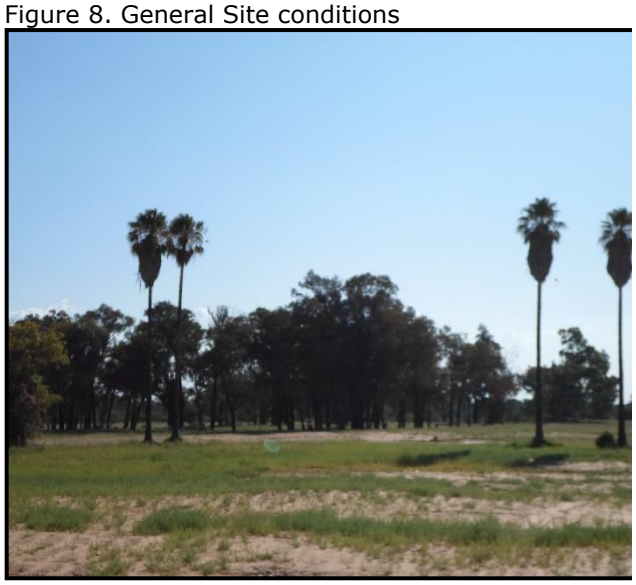

Figure 10. General Site conditions

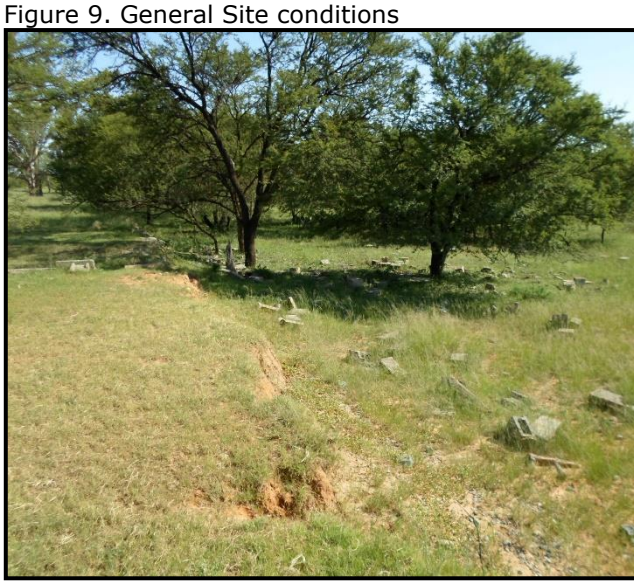

Figure 11. General Site conditions

Figure 12. 2003 Google image of the study area – structures are indicated.

Figure 13. 2010 Google image of the study area.

Figure 14. 2017 Google image of the study area.

6. ASSUMPTIONS AND LIMITATIONS

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. Similarly, 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 and consists of non-intrusive surface surveys. This study did not assess the impact on palaeontology, 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.

7. IMPACT ASSESSMENT

7.1. Potential Impact

The chance of impacting on unknown archaeological sites in the study area is considered to be negligible. Any direct impacts that did occur would be during the construction phase only and would be of low significance. Cumulative impacts occur from the combination of effects of various impacts on heritage resources. The importance of identifying and assessing cumulative impacts is that the whole is greater than the sum of its parts. In the case of the development, it will, with the recommended mitigation measures and management actions, not impact any heritage resources directly. However, this and other projects in the area could have an indirect impact on the larger heritage landscape but is also considered to be low.

7.1.1. Pre-Construction phase:

It is assumed that the pre-construction phase involves 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.

7.1.2. Construction Phase

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

7.1.3. Operation Phase:

No impact is envisaged during this phase.

Table 1.Impact Assessment table.

Nature: During the construction phase, activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological material or objects.		
	Without mitigation	**With mitigation (Preservation/ excavation of site)**
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low (2)	Low (2)
Probability	Not probable (2)	Not probable (2)
Significance	**16 (Low)**	**16 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	No resources were recorded	No resources were recorded.
Can impacts be mitigated?	Yes, a chance find procedure should be implemented.	Yes
Mitigation: A Chance Find Procedure should be implemented for the project should any stratified deposits be exposed during the construction process.		

8. CONCLUSION AND RECOMMENDATIONS

Heritage assessments for the Eland facility recorded no sites of heritage significance within the current impact areas, although stone cairns were recorded well away from the current study area (Van der Walt 2015 a and b). The lack of heritage resources in these areas concurs with similar finds in the surrounding area [Dreyer (2004), Dreyer (2008), Coetzee (2008) and Van der Walt (2013)]. The current study did note the presence of modern building rubble that is of no heritage significance. Although indicated on historical maps dating to 1952, there is no evidence of standing historical structures on the greater site. This was verified by a walk through as well as Google imagery indicating that the structures were destroyed prior to 2017.

In order to ensure the preservation of heritage resources, the following measures should be included in the EMPr.

Table 2. EMPr Mitigation measures

OBJECTIVE: Ensure the preservation of heritage resources

Project component/s	PV Facility.		
Potential Impact	Unintentional damage to heritage resources		
Activity/risk source	Clearing and Construction activities		
Mitigation: Target/Objective	Preservation of heritage resources		
Mitigation: Action/control		**Responsibility**	**Timeframe**
Chance find procedure		EO	Pre-construction and Construction phase
Performance Indicator	Preservation of subsurface heritage resources by implementing a chance find procedure.		
Monitoring	During the construction phase by the ECO.		

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

- Implementation of a chance find procedure as outlined below.

8.1. Chance Find Procedure

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

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

- 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.

8.2. Reasoned Opinion

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

8.3. Potential risk

Potential risks to the proposed project are the occurrence of unknown and unmarked graves. The possibility exists that the study area could contain graves of which surface indicators have been destroyed and subsurface material could be uncovered during earth works. These risks can be mitigated to an acceptable level with monitoring and the implementation of a chance find procedure as outlined in Section 8.1.

9. REFERENCES

Anon. 1991. Myndorp in Noord-Kaap ontwikkel vir volkstaters. *Die Burger*, 16 November 1991, p. 2.

Beaumont, P.B., Smith, A.B. & Vogel, J.C. 1995. Before the Einiqua: the archaeology of the frontier zone. In: Smith, A.B. (ed.) Einiqualand: studies of the Orange River frontier: 236-264. Cape Town: University of Cape Town Press.

Beaumont, P.B. & Morris, D. 1990. Guide to archaeological sites in the Northern Cape. Kimberley: McGregor Museum

Breton, G., Schlebusch, C. M., Lombard, M., Sjödin, P., Soodyall, H. & Jakobsson, M. (2014). Lactase persistence alleles reveal partial East African ancestry of southern African Khoe pastoralists. *Current Biology*, *24*(8), 852–858.

Du Preez, S. J. 1977. *Peace attempts during the Anglo Boer War until March 1901.* Magister Artium thesis in History. Pretoria: University of Pretoria.

Gaigher, S. 2012. HIA Proposed Establishment of Several Electricity Distribution Lines within the Northern Cape Province

Halkett, D & Orton, J. 2011. Heritage Impact assessment proposed Olyven Kolk Solar Plant. Unpublished report.

Hocking, A. 1983. *Kaias and cocopans: the story of mining in South Africa's Northern Cape*. Johannesburg: Hollards Publishers.

Kaplan, J. 2011. Archaeological Impact Assessment The Proposed Solar Cape 100 Mw Photovoltaic Energy Generation Facility Near Kenhardt Northern Cape Province. Unpublished report.

Lombard, M. 2011. Background to the Stone Age of the Kakamas/Keimoes area for CRM purposes. Unpublished report.

Lombard, M. 2012. Phase 2 Mitigation Of An Open-Air Stone Age Site To Be Impacted On By The Aries Solar Energy Plant On Portion 1 Of The Farm Klein Zwart Bast 188 Kenhardt District, Northern Cape. Unpublished report.

Lombard, M., Wadley, L., Deacon, J., Wurz, S., Parsons, I., Mohapi, M., Swart, J. & Mitchell, P. (2012). South African and Lesotho Stone Age sequence updated (I). *South African Archaeological Bulletin*, *67*(195), 123–144.

Magoma, M. 2014. Phase 1 Archaeological Impact Assessment Report For The Proposed Construction Of Transnet 5km 50kv Power Line From Eskom Aries Substation To The Proposed New Transnet Aries Traction Feeder Substation Within The Jurisdiction Of Kai! Garib Local Municipality Of Zf Mgcawu District, Northern Cape Province. Unpublished report.

Marais, J. J. 1977. *De Aar, Stad in wording 1902-1977*. De Aar: Feeskomitee.

Morris, D. 1994. An ostrich eggshell cache from the Vaalbos National Park, Northern Cape,South Africa. Southern African Field Archaeology 3: 55-58.

Morris, A.G. 1995a. The Einiqua: an analysis of the Kakamas skeletons. In: Smith, A.B. (ed.) Einiqualand: Studies of the Orange River Frontier: 110-164. Cape Town: UCT Press.

Morris, D. 2004. Archaeological Resources at Geel Vloer, Bushmanland. A Phase 1 Archaeological Impact Assessment

Mucina, L. & Rutherford, M.C. 2006. The Vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute. Pretoria.

National Heritage Resources Act NHRA of 1999 (Act 25 of 1999)

Ndlovu, N & Magoma, M. 2013. Phase 1 Archaeological Impact Assessment Specialist Study Report For The Proposed Development Of Prospecting Rights Of Zink On Portion 5, Of The Farm Karabee 50, Portions 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 13, 14, 16, 17 And Remaining Extent Of The Farm Prieska Poorts 51 In The Magisterial District Of Prieska, Within The Siyathemba Local Municipality Of Northern Cape. Unpublished report.

Parsons, I. 2000. Later Stone Age open-air sites on Bloubos, Northern Cape. Southern African Field Archaeology 9: 55-67.

Parsons, I. 2003. Lithic expressions of Later Stone Age lifeways in the Northern Cape. South African Archaeological Bulletin 58: 33-37.

Parsons, I. 2004. Stone circles in the Bloubos landscape, Northern Cape. Southern African Humanities 16: 59-69.

Parsons, I. 2007. Hunter-gatherers or herders? Reconsidering the Swartkop and Doornfontein Industries, Northern Cape Province, South Africa. Before Farming 2007/4: Article 3.
Parsons, I. 2008. Five Later Stone Age artefact assemblages from the interior Northern CapeProvince. South African Archaeological Bulletin 63: 51-60.
Pelser, A.J. 2011. A Report on an Archaeological Impact Assessment (AIA) for the proposed Solar Energy Plant on Klein Zwart Bast 188, Kenhardt District, Northern Cape. Unpublished Report Archaetnos AE1104. January 2011. For Robert de Jong & Associates
Pelser, A. 2012. Final Report On The Archaeological Phase 2 Mitigation Of An Open-Air Stone Age Site To Be Impacted On By The Aries Solar Energy Plant On Portion 1 Of The Farm Klein Zwart Bast 188 Kenhardt District, Northern Cape
Ross, R. 2002. *A concise history of South Africa*. Cambridge: Cambridge University Press.
SAHRA Report Mapping Project Version 1.0, 2009
Smith, A.B. 1995. Archaeological observations along the Orange River and its hinterland. In:Smith, A.B. (ed.) Einiqualand: studies of the Orange River frontier: 236-264.Rondebosch: UCT Press.
Van Deventer, P. 2017. Palaeontology Of The Brypaal Site. Unpublished report.
Van Ryneveld, K. 2008 LoR for Exemption from Phase 1 Heritage Impact Assessment Salt River Resources Prospecting Program, Kenhardt
Wagenaar, E. J. C. 1984. A Forgotten frontier zone: settlements and reactions in the Stormberg area between 1820-60. Pretoria: Government Printer, 1984.
Webley, L & Halkett, D. 2012. Heritage Impact Assessment: Proposed Kenhardt Photo-Voltaic Solar Power Plant On Remainder Of The Farm Klein Zwart Bast 188, Northern Cape Province. Unpublished report.

APPENDIX 1 – Curriculum Vitae

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