Zibulo North Shaft Project – 132KV Overhead Powerlines

On Farms Leeuwfontein 219, Smithfield 44 and Zondagsfontein 257, Nkangala District Municipality, Mpumalanga Province

Heritage Impact Assessment

Template Number	Document Number	Revision	Date
PGS PJ REP 007 01	729HIA-001	2.0	29/08/2023

PGS HERITAGE

+ 27 (0) 12 332 5305 | +27 (0) 86 675 8077 | contact@pgsheritage.co.za | PO Box 32542, Totiusdal, 0134

Offices in South Africa, Kingdom of Lesotho and Mozambique

Head Office:
906 Bergarend Streets
Waverley, Pretoria,
South Africa

Directors: HS Steyn, PD Birkholtz, W Fourie

REVISION HISTORY

Version	Issue Date	Description of Changes
00	18/08/2023	First draft
01	28/08/2023	Second draft

Declaration of Independence

- I, Jessica Angel, declare that –
- General declaration:
- I act as the independent heritage practitioner 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 heritage impact assessments, 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 will take into account, to the extent possible, the matters listed in section 38 of the NHRA when preparing the application and any report relating to the application;
- 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;
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not
- All the particulars furnished by me in this form are true and correct;
- I will perform all other obligations as expected from a heritage practitioner in terms of the Act and the constitutions of my affiliated professional bodies; and
- I realise that a false declaration is an offence in terms of regulation 71 of the Regulations and is punishable in terms of section 24F of the NEMA.

Disclosure of Vested Interest

- I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Regulations;

HERITAGE CONSULTANT: PGS Heritage (Pty) Ltd

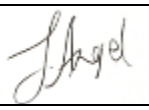
CONTACT PERSON: Jessica Angel – Senior Archaeologist

Tel: +27 (0) 12 332 5305

Email: jessica@pgsheritage.co.za

SIGNATURE: 

ACKNOWLEDGEMENT OF RECEIPT

Report Title	Heritage Impact Assessment - Zibulo North Shaft Project – 132KV Overhead Powerlines		
Control	**Name**	**Signature**	**Designation**
Author	J Angel		PGS Heritage Senior Archaeologist
Reviewer	W Fourie		PGS Heritage Principal Heritage Specialist

CLIENT: **Environmental Impact Management Services (Pty) Ltd**

CONTACT PERSON: **Brian Whitfield**
Email: Brian@eims.co.za

SIGNATURE: _____

The Heritage Impact Assessment Report has been compiled considering the National Environmental Management Act (Act No. 107 of 1998) (NEMA): Appendix 6 of the Environmental Impact Assessment (EIA) Regulations of 2014 (as amended, 2017) requirements for specialist reports as indicated in the table below.

Requirements of Appendix 6 – GN R326 EIA Regulations of 7 April 2017	**Relevant section in report**
1.(1) (a) (i) Details of the specialist who prepared the report	Page ii of Report – Contact details and company
(ii) The expertise of that person to compile a specialist report including a curriculum vita	Section 1.2 – refer to Appendix C
(b) A declaration that the person is independent in a form as may be specified by the competent authority	Page ii of the report
(c) An indication of the scope of, and the purpose for which, the report was prepared	Section 1.1
(cA) An indication of the quality and age of base data used for the specialist report	N/A
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 5
(d) The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment	Section 4.4
(e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used	Appendix A and B
(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 4
(g) An identification of any areas to be avoided, including buffers	Section 4
(h) A 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 4.3
(i) A description of any assumptions made and any uncertainties or gaps in knowledge;	Section 1.3
(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	Section 4
(k) Any mitigation measures for inclusion in the EMPr	Section 6
(l) Any conditions for inclusion in the environmental authorization	Section 6
(m) Any monitoring requirements for inclusion in the EMPr or environmental authorization	Section 6
(n)(i) A reasoned opinion as to whether the proposed activity, activities or portions thereof should be authorised and	Section 6 and 7
(n)(iA) A reasoned opinion regarding the acceptability of the proposed activity or activities; and	
(n)(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 6
(o) A description of any consultation process that was undertaken during the course of carrying out the study	Informal consultation in fieldwork.
(p) A summary and copies if any comments that were received during any consultation process	Not applicable. To date no comments regarding heritage resources that require input from a specialist have been raised.
(q) Any other information requested by the competent authority.	Not applicable.
(2) Where a government notice by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	No protocols or minimum standards for HIAs or PIAs

EXECUTIVE SUMMARY

PGS Heritage (Pty) Ltd was appointed by Environmental Impact Management Services (Pty) Ltd (EIMS) to undertake a Heritage Impact Assessment (HIA) that forms part of the registration progress with the Standard for the Development and Expansion of Power Lines and Substations within identified Geographical for the proposed Zibulo North Shaft Project – 132KV Overhead Powerlines on farms Leeuwfontein 219, Smithfield 44 and Zondagsfontein 257, Nkangala District Municipality, Mpumalanga Province

A further standalone Palaeontological Impact Assessment (PIA) was completed for PGS by Dr Elize Butler of Banzai Environmental.

During the fieldwork a total of **four** heritage features and resources where identified (**Figure 25**). These consist of three burial grounds (**Z001,Z002, Z003**) and one locality with a recent historic structure (**Z004**). See **Figure 24** and the individual site descriptions as contained in **Appendix C**. The field description forms were collected with ArcGIS Survey123 in field software.

Historical Structures
One Building was located which is not conservation worthy.

Archaeological Site
None were located.

Burial grounds and graves
Three burial grounds were located.
Z001 – approximately 14 graves.
Z002 – approximately 6 graves.
Z003 – approximately 45 graves

Palaeontology
The Vryheid Formation (Ecca Group, Karoo Supergroup) and Jurassic dolerite underpin the proposed Powerline Project. According to the South African Heritage Resources Information System (SAHRIS), the Palaeontological Sensitivity of the Vryheid Formation (Ecca Group) is Very High, whereas that of Karoo Dolerite is Zero because it is igneous in origin and thus unfossiliferous (Almond et al, 2013; SAHRIS website).

A site-specific field survey of the development footprint was done both on foot and by car. There were no fossiliferous outcrops found in the area where construction is planned. According to the site investigation and desktop research, fossil heritage of scientific and conservation relevance is rather uncommon in the total development footprint. In contrast, the SAHRIS Palaeosensitivity Map and DFFE Screening Tool assigned a Very High Sensitivity to the development region. A Medium Palaeontological value has been assigned to the PV development construction phase prior to mitigation and a Low value after mitigation. The construction

phase will be the only development phase that will have an influence on Palaeontological Heritage, with no significant impacts projected during the operational or decommissioning stages.

If fossil remains are discovered during any phase of construction, whether on the surface or revealed through excavations, the Environmental Control Officer (ECO) in charge of these activities is required to follow the Chance Find Procedure as contained in the Generic EMPR as it is adequate to mitigate the impact.

Therefore, it is advised that no additional palaeontological heritage studies, fieldwork, or expert mitigation are needed until fossils are found.

Mitigation measures

The Impact Management actions as contained in the Generic EMPr are adequate to mitigate the impact on heritage resources. Mitigation measures are also described in **Table 10** of this report.

Conclusion

It is the combined considered opinion of the heritage specialists that the proposed project will not have a direct impact on the identified heritage resources, rated being of low to high heritage significance.

As the development footprint is not considered sensitive in terms of palaeontological resources, construction of the development may thus be approved in its entirety. It is thus suggested that no additional palaeontological heritage research, ground truthing, or specialised mitigation be undertaken until new found fossils are identified.

With the implementation of recommended mitigation measures the overall impact on heritage resources will be reduced to acceptable levels during the activities of the project.

TABLE OF CONTENT

1 INTRODUCTION 1

1.1 Scope of the Study 1

1.2 Specialist Qualifications 1

1.3 Assumptions and Limitations 2

1.4 Legislative Context 2

1.4.1 Notice 648 of the Government Gazette 45421 2

1.4.2 NEMA – Appendix 6 requirements 3

1.4.3 The National Heritage Resources Act 3

2 TECHNICAL DETAILS OF THE PROJECT 4

2.1 Locality 4

2.1.1 Site Description 4

2.2 Technical Project Description 5

2.2.1 Project description 5

2.2.2 Scope of Work – Electrical Supply 1

2.2.3 Stringing procedure 1

3 ASSESSMENT METHODOLOGY 3

3.1 Methodology for Assessing Heritage Site significance. 3

3.1.1 Site Significance 4

3.2 Methodology used in determining the significance of environmental impacts 6

4 CURRENT STATUS QUO 6

4.1 Site Description 6

4.2 Overview of the study area and surrounding landscape 8

4.2.1 Archival and historical maps 15

4.2.2 Previous heritage impact assessment reports from the study area and surroundings 17

4.2.3 Heritage screening 19

4.2.4 Palaeontological screening 21

4.2.5 Heritage sensitivity 21

4.3 Fieldwork findings 22

4.4 Palaeontology 26

5 IMPACT ASSESSMENT 27

5.1 Details of all alternatives considered. 27

5.1.1 Burial grounds and graves 27

5.1.2 Historical Structures 27

5.1.3 Palaeontology 27

5.2 Impact assessment summary table 28

6 MANAGEMENT RECOMMENDATIONS AND GUIDELINES 31

6.1 Construction and operational phases 31

6.2 Chance finds procedure 31

6.3 Possible finds during construction 32

6.4 Timeframes 32

6.5 Heritage Management Plan for EMPr implementation 33

7 CONCLUSIONS AND RECOMMENDATIONS 34

7.1 Historical Structures 34

7.2 Burial grounds and graves 34

7.3 Palaeontology 34

7.4 Mitigation measures 35

7.5 General 35

8 REFERENCES 36

8.1 Published Sources 36

8.2 Unpublished Sources 37

8.3 Historical Topographic Maps 38

8.4 Internet 39

8.5 Google Earth 39

List of Figures

Figure 1 – Human and Cultural Timeline in Africa xv

Figure 2 - Regional Locality of study area (red polygon) 1

Figure 3 - Line Route Option 1 2

Figure 4 - Line Route Option 2 3

Figure 5 – View of the landscape on the western side of the proposed area near the Zibulo North Offices .. 7

Figure 6 – View of excavations and dumping along the most northern section of the proposed area 7

Figure 7 – General vegetation and infrastructure on the eastern part of the proposed area 7

Figure 8 – View of agricultural fields 7

Figure 9 – View of wetland areas on the eastern side of the proposed area. 7

Figure 10 – View of mining infrastructure on the eastern side of the proposed area 7

Figure 11 – Example of Early Stone Age Later Acheulian handaxes. These handaxes were identified at Blaaubank near Rooiberg. Cropped section of an illustration published in Mason (1962:199). 8

Figure 12 - King Mzilikazi of the Matabele. This depiction was made by Captain Cornwallis Harris in c. 1838 (www.sahistory.org.za). 10

Figure 13 - Historic photograph of the coal mine at Brugspruit (Lang, 1995). 11

Figure 14 – John Howard, the mine manager of the Transvaal and Delagoa Bay Colliery, who was a key figure in Winston Churchill's escape from the Transvaal Republic (Sandys, 1999). 13

Figure 15 – Sir Winston Leonard Spencer Churchill as Prime Minister of the United Kingdom during the Second World War (www.wikipedia.org). 13

Figure 16 – Historic photograph of Witbank taken in 1936 (Delius, 2007:340). 14
Figure 17 – Historic photograph was taken during the late 1940s of an unknown colliery near Witbank (Delius, 2007:159). 15
Figure 18 - Map of the Heidelberg District in 1900, The Imperial Map of South Africa. Encircled in red is the farms near where the town Ogies is located today. 16
Figure 19 – Section of the 1965 First edition 2629AA Map showing the location of a grave at -26.18484S, 29.01914E 17
Figure 20 – One example of the hut locations. 17
Figure 21 – Location of the grave depicted on the first edition maps. The grave was not located. 17
Figure 22 - Screening tool map indicating a high sensitivity rating for archaeology and heritage 20
Figure 23 - Palaeontological Sensitivity generated by the National Environmental Web-Based Screening indicating the Very High Palaeontological Sensitivity of the proposed development, while areas with a Medium Sensitivity also underlies the study area 21
Figure 24 - Fieldwork tracklogs (track in blue, study area in red) 23
Figure 25 - Identified heritage resources within the Zibulu North Powerline development area. 24
Figure 26 - View of the burial ground at Z001 25
Figure 27 – View of the burial ground at Z002 25
Figure 28 - View of the burial ground at Z003 25
Figure 29 – The structure at Z004 25
Figure 30 – Grave dated 1946 at Z003 25
Figure 31 - Updated Geology (Council of Geosciences, Pretoria) indicates that the study area is largely underlain by the Vryheid Formation (Pv, Ecca Group, Karoo Supergroup) with small patches of the Karoo Dolerite Suite (Jd). 26

List of Tables

Table 1: Reporting requirements for GN648 2
Table 2: Rating system for archaeological resources 4
Table 3: Rating system for built environment resources 5
Table 4: Tangible heritage site in the study area. 21
Table 5: Landform type to heritage find matrix 22
Table 6: Impact Table – Burial grounds 29
Table 7: Impact Table - Structures 30
Table 8: Impact Table – Palaeontology 30
Table 9: Lead times for permitting and mobilisation 32
Table 10: Heritage Management Plan for EMPr implementation 33

List of Appendices

A *Environmental Impact Assessment Methodology*

B *Site description forms*

C *Project team CV's*

TERMINOLOGY AND ABBREVIATIONS

Archaeological resources

This includes:

- material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years including artefacts, human and hominid remains and artificial features and structures;
- rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation;
- wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the republic as defined in the Maritimes Zones Act, and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation;
- features, structures and artefacts associated with military history which are older than 75 years and the site on which they are found.

Cultural significance

This means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance

Development

This means any physical intervention, excavation, or action, other than those caused by natural forces, which may in the opinion of the heritage authority in any way result in a change to the nature, appearance or physical nature of a place or influence its stability and future well-being, including:

- construction, alteration, demolition, removal or change in use of a place or a structure at a place;
- carrying out any works on or over or under a place;
- subdivision or consolidation of land comprising a place, including the structures or airspace of a place;
- constructing or putting up for display signs or boards;
- any change to the natural or existing condition or topography of land; and
- any removal or destruction of trees, or removal of vegetation or topsoil

Early Stone Age

The archaeology of the Stone Age between 700 000 and 2 500 000 years ago.

Fossil

Mineralised bones of animals, shellfish, plants and marine animals. A trace fossil is the track or footprint of a fossil animal that is preserved in stone or consolidated sediment.

Heritage

That which is inherited and forms part of the National Estate (historical places, objects, fossils as defined by the National Heritage Resources Act 25 of 1999).

Heritage resources

This means any place or object of cultural significance and can include (but not limited to) as stated under Section 3 of the NHRA,

- places, buildings, structures and equipment of cultural significance;
- places to which oral traditions are attached or which are associated with living heritage;
- historical settlements and townscapes;
- landscapes and natural features of cultural significance;
- geological sites of scientific or cultural importance;
- archaeological and palaeontological sites;
- graves and burial grounds, and
- sites of significance relating to the history of slavery in South Africa;

Holocene

The most recent geological time period which commenced 10 000 years ago.

Late Stone Age

The archaeology of the last 30 000 years associated with fully modern people.

Late Iron Age (Early Farming Communities)

The archaeology of the last 1000 years up to the 1800's, associated with iron-working and farming activities such as herding and agriculture.

Middle Stone Age

The archaeology of the Stone Age between 30 000-300 000 years ago, associated with early modern humans.

Palaeontology

Any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace.

Abbreviations	Description
AIA	Archaeological Impact Assessment
ASAPA	Association of South African Professional Archaeologists
CRM	Cultural Resource Management
ECO	Environmental Control Officer
EIA practitioner	Environmental Impact Assessment Practitioner
EIA	Environmental Impact Assessment
ESA	Early Stone Age
GPS	Global Positioning System
HIA	Heritage Impact Assessment
I&AP	Interested & Affected Party
LSA	Late Stone Age
LIA	Late Iron Age
MSA	Middle Stone Age
MIA	Middle Iron Age
NEMA	National Environmental Management Act
NHRA	National Heritage Resources Act
PHRA-G	Gauteng Provincial Heritage Resources Authority
PHS	Provincial Heritage Site
PSSA	Palaeontological Society of South Africa
SADC	Southern African Development Community
SAHRA	South African Heritage Resources Agency

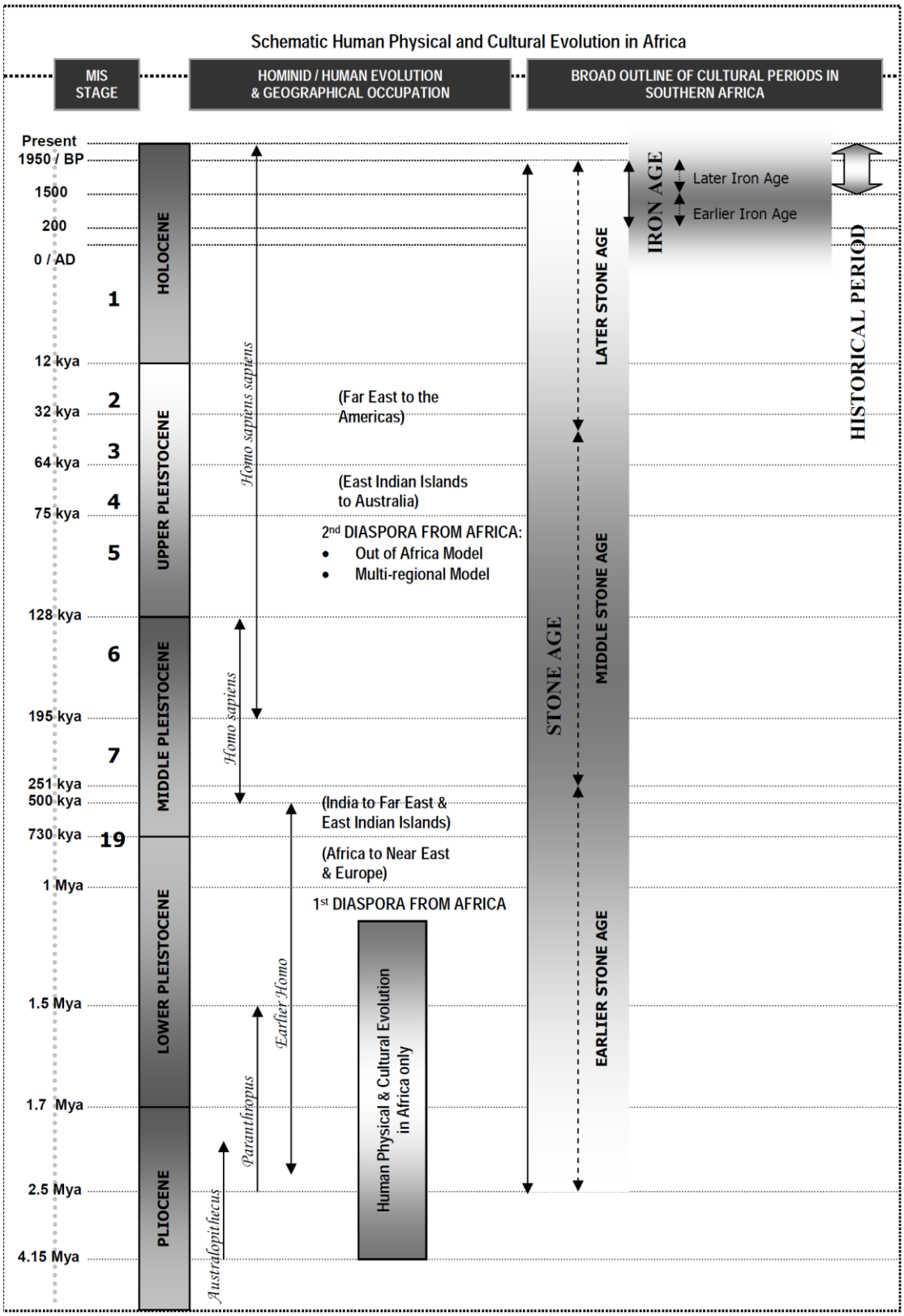


Figure 1 – Human and Cultural Timeline in Africa

1 INTRODUCTION

PGS Heritage (Pty) Ltd (PGS) was appointed by Environmental Impact Management Services (Pty) Ltd (EIMS) to undertake a Heritage Impact Assessment (HIA) that forms part of the registration with the Standard for the Development and Expansion of Power Lines and Substations within identified Geographical Areas for the proposed Zibulo North Shaft Project – 132KV Overhead Powerlines on farms Leeuwfontein 219, Smithfield 44 and Zondagsfontein 257, Nkangala District Municipality, Mpumalanga Province

A further standalone Palaeontological Impact Assessment (PIA) was completed for PGS by Dr Elize Butler of Banzai Environmental.

1.1 Scope of the Study

The aim of the study is to identify heritage sites and finds that may occur in the proposed project area. The HIA informs the BA to assist the developer in managing the discovered heritage resources in a responsible manner, in order to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999) (NHRA).

1.2 Specialist Qualifications

This HIA Report was compiled by PGS.

The staff at PGS has a combined experience of nearly 70 years in the heritage consulting industry. PGS and its staff have extensive experience in managing HIA processes. PGS will only undertake heritage assessment work where they have the relevant expertise and experience to undertake that work competently.

Jessica Angel, the author of this report, is registered as a Professional Archaeologist with the Association of Southern African Professional Archaeologists (ASAPA). She has 10 years of experience in the heritage assessment field and holds a Master’s degree (MSc) in Archaeology from the University of the Witwatersrand.

Wouter Fourie, the Project Coordinator and Archaeologist, is registered with the Association of Southern African Professional Archaeologists (ASAPA) as a Professional Archaeologist and is accredited as a Principal Investigator; he is further an Accredited Professional Heritage Practitioner with the Association of Professional Heritage Practitioners (APHP).

1.3 Assumptions and Limitations

Not detracting in any way from the comprehensiveness of the fieldwork undertaken, it is necessary to realise that the heritage resources located during the fieldwork do not necessarily represent all the possible heritage resources present within the area. Various factors account for this, including the subterranean nature of some archaeological sites and existing vegetation cover. It should be noted most of the study area was accessible for the fieldwork survey.

Fieldwork was also focussed on area that was not previously ploughed or disturbed by farming activity, thus focussing on areas with the highest potential to yield heritage resources.

Therefore, should any heritage features and/or objects be located or observed outside the identified heritage sensitive areas during the construction activities, a heritage specialist must be contacted immediately. Such observed or located heritage features and/or objects may not be disturbed or removed in any way until such time that the heritage specialist has been able to make an assessment as to the significance of the site (or material) in question. This applies to graves and cemeteries as well. If any graves or burial places are located during the development, the procedures and requirements pertaining to graves and burials will apply as set out below.

1.4 Legislative Context

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:

- Notice 648 of the Government Gazette 45421- general requirements for undertaking an initial site sensitivity verification where no specific assessment protocol has been identified.
- National Environmental Management Act (NEMA), Act 107 of 1998 – Appendix 6
- National Heritage Resources Act (NHRA), Act 25 of 1999

1.4.1 Notice 648 of the Government Gazette 45421

Although minimum standards for archaeological (2007) and palaeontological (2012) assessments were published by SAHRA, GN.648 requires sensitivity verification for a site selected on the national web based environmental screening tool for which no specific assessment protocol related to any theme has been identified. The requirements for this Government Notice (GN) are listed in **Table 1** and the applicable section in this report noted.

Table 1: Reporting requirements for GN648

GN 648	Relevant section in report	Where not applicable in this report
2.2 (a) a desktop analysis, using satellite imagery;	section 4.3	
2.2 (b) a preliminary on-site inspection to identify if there are any discrepancies with the current use of land and environmental status quo versus the environmental sensitivity as identified on the national web-based environmental screening tool, such as new developments, infrastructure, indigenous/pristine vegetation, etc.	4.1	-
2.3(a) confirms or disputes the current use of the land and environmental sensitivity as identified by the national web-based environmental screening tool;	section 4.1	-
2.3(b) contains motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity;	section 4.1	-

1.4.2 NEMA – Appendix 6 requirements

The HIA report has been compiled considering the NEMA Appendix 6 requirements for specialist reports as indicated in the table below. For ease of reference, the table below provides cross-references to the report sections where these requirements have been addressed.

1.4.3 The National Heritage Resources Act

- National Heritage Resources Act (NHRA) Act 25 of 1999
    - Protection of Heritage Resources – Sections 34 to 36; and
    - Heritage Resources Management – Section 38

The NHRA is utilised as the basis for the identification, evaluation, and management of heritage resources and in the case of Cultural Resource Management (CRM) those resources specifically impacted on by development as stipulated in Section 38 of the NHRA. This study falls under Section 38(8) and requires comment from the relevant heritage resources authority.

Section 24(2) of the NEMA requires environmental authorisation from the environmental authority for certain activities that have been identified and must undergo an EIA or Basic Assessment (BA) process. Similarly, Section 38 NHRA lists specific development activities that require notice to the heritage resources authority to determine if an HIA process is necessary. Approval from the heritage authority is mandatory before proceeding with the development activities.

To avoid redundancy and facilitate coordination between NEMA and NHRA requirements, Section 38(8) of the NHRA states that if the development activities listed in Section 38(1) require an EIA

under NEMA, a separate HIA and approval from the heritage resources authority are unnecessary. However, the environmental authority must ensure that the heritage resources authority's requirements for HIA are fulfilled and that its comments and recommendations are considered before granting environmental authorisation.

Therefore, if a NEMA EIA is required for the development activities listed under Section 38 of the NHRA, separate HIA and EIA processes may not be followed, and different decisions may not be issued under NHRA and NEMA. The EIA process will be followed, and if the heritage resources authority requires HIA, it must be conducted as one of the EIA specialist studies[1].

The environmental authority must ensure that the heritage resources authority's requirements for the assessment are met. A separate heritage approval may not be issued, but the environmental authority must consider the heritage resources authority's comments and recommendations before granting or refusing environmental authorisation. All applicable documents, including the HIA report, the EIA report and the other supporting studies, will be submitted to SAHRA for Statutory Comment and Feedback, and to the Provincial Heritage Resources Authority (PHRA) for noting.

2 TECHNICAL DETAILS OF THE PROJECT

2.1 Locality

The proposed Zibulo North Shaft entrance is located at 26°8’55.0”S, 28°57’10.32”E, approximately 6.6 km south of Kendal Power Station and approximately 14.5 km Southwest of Ogies, off the N12 national highway in the Nkangala District Municipality, Mpumalanga (**Figure 2**). The source and load substations with reference to the power lines are located at:

- Cologne -26°7'24.26"S, 28°59'46.03"E,
- Modiri SS -26°12'11.37"S, 29° 1'17.01"E and
- Zibulo North Shaft SS - 26° 8'56.88"S, 28°57'22.38"E

2.1.1 Site Description

The application area is situated on the Farms Leeuwfontein 219, Smithfield 44 and Zondagsfontein 257 with a footprint area of approximately 533ha (**Figure 2**)

[1] EIMS appointed PGS to complete the independent HIA process.

2.2 Technical Project Description

2.2.1 Project description

Two proposed line routes are identified.

Option 1 – Preferred Routes - **Figure 3**

Option 2 Alternative Routes - **Figure 4**

.

Figure 2 - Regional Locality of study area (red polygon)

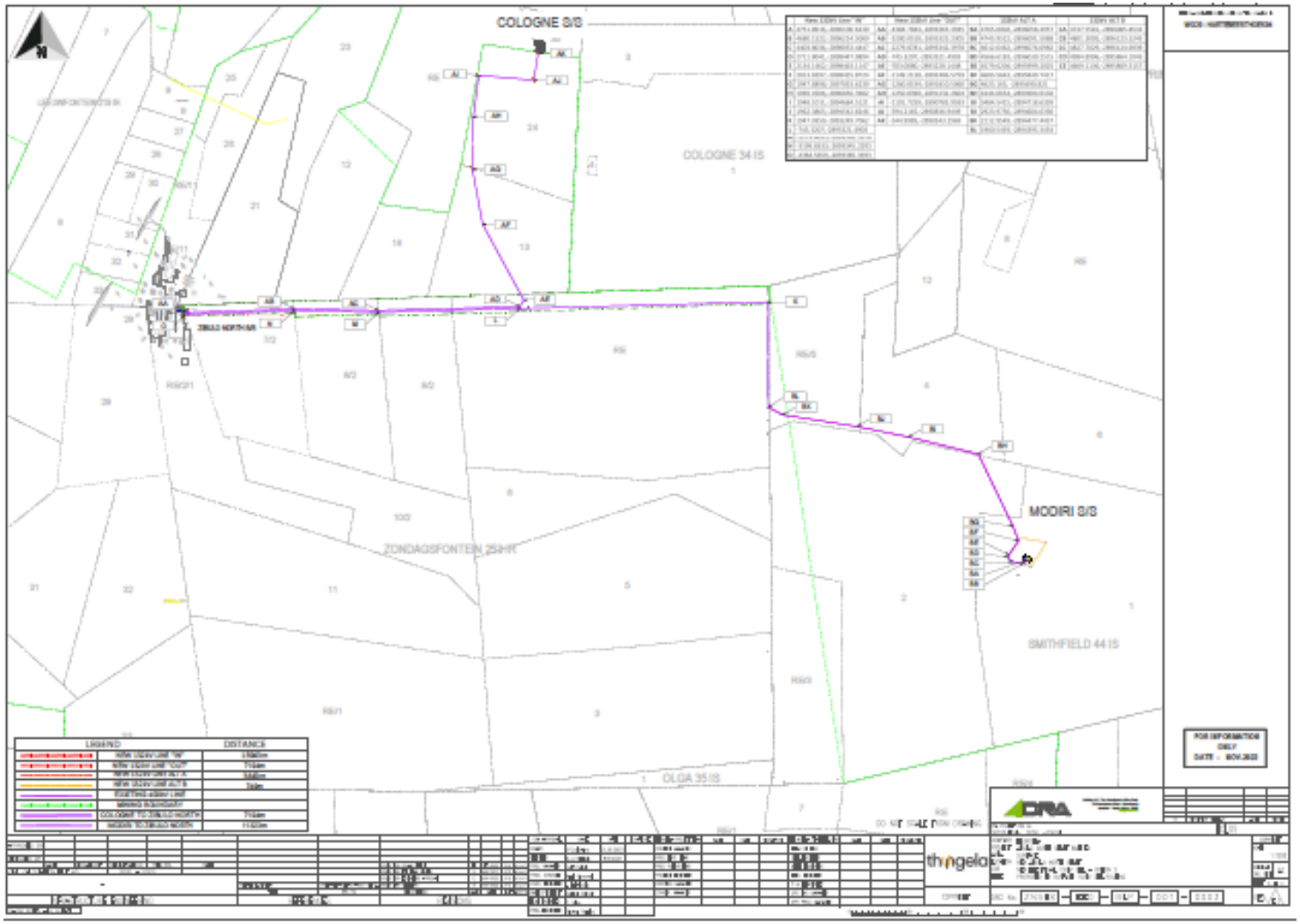


Figure 3 - Line Route Option 1

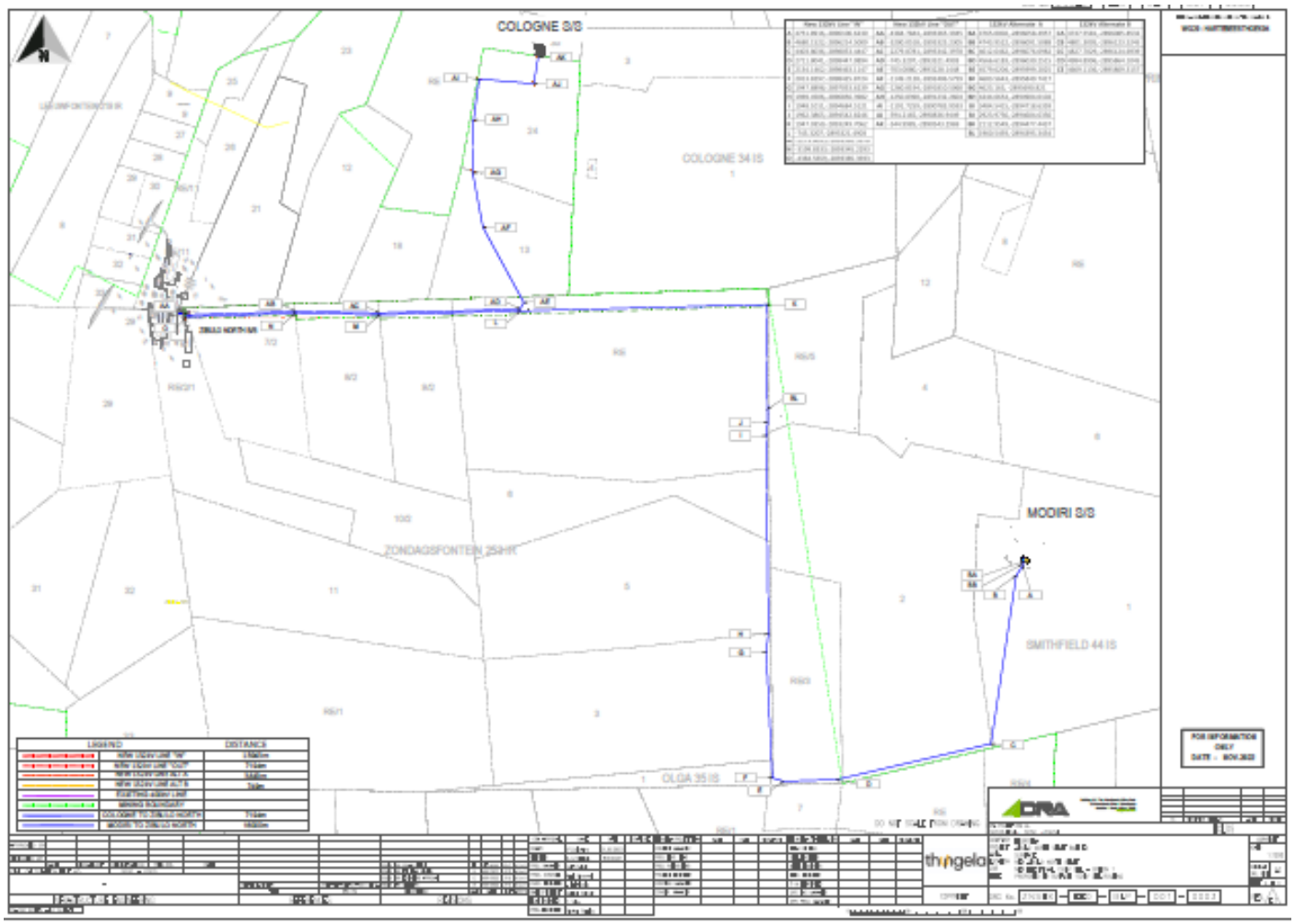


Figure 4 - Line Route Option 2

2.2.2 Scope of Work – Electrical Supply

Zibulo North Shaft requires a 20MVA premium supply for the mining operations by 2025. The following assets will be established for the supply:

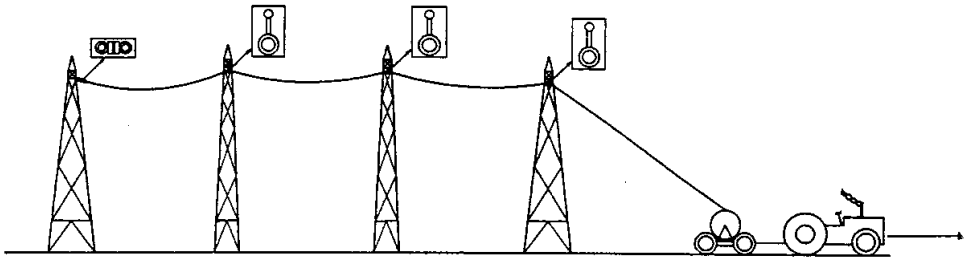
- A new Zibulo North Shaft 132/11kV 2x20MVA Substation for the Zibulo North Shaft Point of Supply (POS). 2x20MVA TRFR's will be installed in phase 1 with an open TRFR bay for the installation of the third TRFR in 2032 should it be required.
- Establish 132kV Feeder Bay at the existing Cologne Substation.
- Build 7km (option 1 & 2) Kingbird 132kV line from Cologne Substation to Zibulo North Shaft Substation.
- Establish 132kV Feeder Bay at the existing Modiri Substation.
- Build 10.5km (option 1) or 15km (option 2) Kingbird 132kV line from Modiri Substation to the Zibulo North Shaft Substation. The route options will be assessed during the course of this environmental application process.

2.2.3 Stringing procedure

Step 1: Running out of the conductor

- Secure swivel onto the strain structure (anchor end).
- Terminate the conductor with the compression dead-end onto the swivel.
- Use a conductor drum carrier to run out the conductor along the line and lock the conductor onto the running blocks. (light pilot wires can be used)
- All unnecessary slack shall be eliminated to prevent conductor friction during tensioning.
- The conductor must never be dragged on the ground, if it is not possible to achieve this, the conductor must be protected with wooden planks form damaging.
- Under no circumstances shall any vehicle be allowed to drive over conductors.

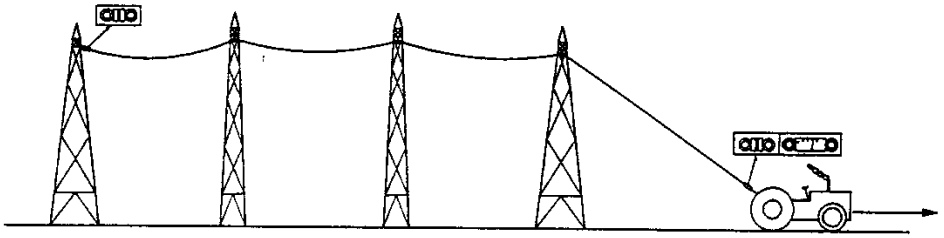
STEP (1)



Step 2: Unwinding of the conductor

- Cut the conductor.
- Install a swivel and dynamometer at the pulling end.
- Tighten conductor slightly and give the conductor time to unwind.

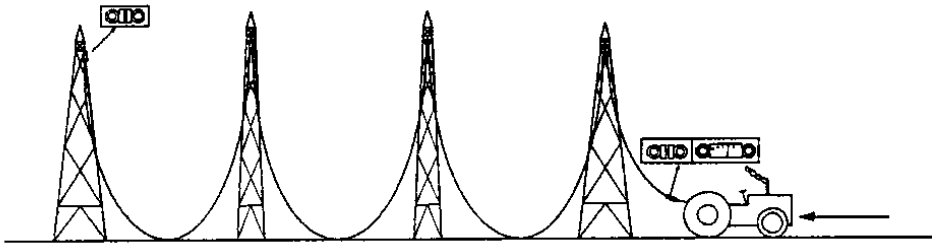
STEP (2)



Step 3: Slacking of conductor

- Conductor to be slacken after it has unwounded.

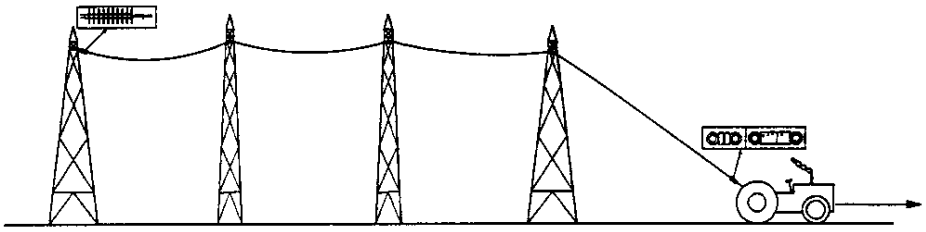
STEP (3)



Step 4: Sagging

- Remove the swivel at the anchor end.
- Install the strain insulator.
- Sag conductor according to the provided Sag and Tension Chart.
- Ensure that conductor has not snagged on any of the running blocks.

STEP (4)



3 ASSESSMENT METHODOLOGY

The section below outlines the assessment methodologies utilised in the study.

3.1 Methodology for Assessing Heritage Site significance.

This HIA report was compiled by PGS for the proposed Zibulo North Shaft Project – 132KV Overhead Powerlines. The applicable maps, tables and figures are included, as stipulated in the NHRA (no 25 of 1999) and the National Environmental Management Act (NEMA) (No. 107 of 1998). The HIA process consists of three steps:

Step I – Literature Review and initial site analysis: The background information to the field survey relies greatly on the Heritage Background Research which was undertaken through archival research and evaluation of satellite imagery and topographical maps of the study area.

Step II – Physical Survey: A physical survey was conducted by a combination of vehicle and pedestrian access through the proposed project area by one qualified heritage specialist and one field assistant (between 24 and 26 July 2023, aimed at locating and documenting sites falling within and adjacent to the proposed development footprint.

Step III – The final step involved the recording and documentation of relevant heritage resources identified in the physical survey, the assessment of these resources in terms of the HIA criteria and report writing, as well as mapping and constructive recommendations.

The significance of heritage sites is based on four main criteria:

- Site integrity (i.e. primary vs. secondary context),
- Amount of deposit, range of features (e.g., stonewalling, stone tools and enclosures),
- Density of scatter (dispersed scatter)
    - Low - <10/50m2
    - Medium - 10-50/50m2
    - High - >50/50m2
- Uniqueness; and
- Potential to answer present research questions.

Impacts on these sites by the development will be evaluated as follows:

3.1.1 Site Significance

Site significance classification standards use is based on the heritage classification of s3 in the NHRA and developed for implementation keeping in mind the grading system approved by SAHRA for archaeological impact assessments. The update classification and rating system as developed by Heritage Western Cape (2016) is implemented in this report.

Site significance classification standards prescribed by the Heritage Western Cape Guideline (2016), were used for the purpose of this report (**Table 2** and **Table 3**).

Table 2: Rating system for archaeological resources

Grading	Description of Resource	Examples of Possible Management Strategies	Heritage Significance
I	Heritage resources with qualities so exceptional that they are of special national significance. Current examples: Langebaanweg (West Coast Fossil Park), Cradle of Humankind	May be declared as a National Heritage Site managed by SAHRA. Specific mitigation and scientific investigation can be permitted in certain circumstances with sufficient motivation.	Highest Significance
II	Heritage resources with special qualities which make them significant, but do not fulfil the criteria for Grade I status. Current examples: Blombos, Paternoster Midden.	May be declared as a Provincial Heritage Site managed by Provincial Heritage Authority. Specific mitigation and scientific investigation can be permitted in certain circumstances with sufficient motivation.	Exceptionally High Significance
III	Heritage resources that contribute to the environmental quality or cultural significance of a larger area and fulfils one of the criteria set out in section 3(3) of the Act but that does not fulfil the criteria for Grade II status. Grade III sites may be formally protected by placement on the Heritage Register.		
IIIA	Such a resource must be an excellent example of its kind or must be sufficiently rare. Current examples: Varschedrift; Peers Cave; Brobartia Road Midden at Bettys Bay	Resource must be retained. Specific mitigation and scientific investigation can be permitted in certain circumstances with sufficient motivation.	High Significance
IIIB	Such a resource might have similar significances to those of a Grade III A resource, but to a lesser degree.	Resource must be retained where possible where not possible it must be fully investigated and/or mitigated.	Medium Significance
IIIC	Such a resource is of contributing significance.	Resource must be satisfactorily studied before impact. If the recording already done (such as in an HIA or permit application) is not sufficient, further recording or even mitigation may be required.	Low Significance
NCW	A resource that, after appropriate investigation, has been determined to not have enough heritage significance to be	No further actions under the NHRA are required. This must be motivated by the applicant or	No research potential or other cultural significance

Grading	Description of Resource	Examples of Possible Management Strategies	Heritage Significance
	retained as part of the National Estate.	the consultant and approved by the authority.	

Table 3: Rating system for built environment resources

Grading	Description of Resource	Examples of Possible Management Strategies	Heritage Significance
I	Heritage resources with qualities so exceptional that they are of special national significance. Current examples: Robben Island	May be declared as a National Heritage Site managed by SAHRA.	Highest Significance
II	Heritage resources with special qualities which make them significant in the context of a province or region, but do not fulfil the criteria for Grade I status. Current examples: St George's Cathedral, Community House	May be declared as a Provincial Heritage Site managed by Provincial Heritage Authority.	Exceptionally High Significance
II	Such a resource contributes to the environmental quality or cultural significance of a larger area and fulfils one of the criteria set out in section 3(3) of the Act but that does not fulfil the criteria for Grade II status. Grade III sites may be formally protected by placement on the Heritage Register.		
IIIA	Such a resource must be an excellent example of its kind or must be sufficiently rare. These are heritage resources which are significant in the context of an area.	This grading is applied to buildings and sites that have sufficient intrinsic significance to be regarded as local heritage resources; and are significant enough to warrant that any alteration, both internal and external, is regulated. Such buildings and sites may be representative, being excellent examples of their kind, or may be rare. In either case, they should receive maximum protection at local level.	High Significance
IIIB	Such a resource might have similar significances to those of a Grade III A resource, but to a lesser degree. These are heritage resources which are significant in the context of a townscape, neighbourhood, settlement or community.	Like Grade IIIA buildings and sites, such buildings and sites may be representative, being excellent examples of their kind, or may be rare, but less so than Grade IIIA examples. They would receive less stringent protection than Grade IIIA buildings and sites at local level.	Medium Significance
IIIC	Such a resource is of contributing significance to the environs These are heritage resources which are significant in the context of a streetscape or direct neighbourhood.	This grading is applied to buildings and/or sites whose significance is contextual, i.e. in large part due to its contribution to the character or significance of the environs.	Low Significance

Grading	Description of Resource	Examples of Possible Management Strategies	Heritage Significance
		These buildings and sites should, as a consequence, only be regulated if the significance of the environs is sufficient to warrant protective measures, regardless of whether the site falls within a Conservation or Heritage Area. Internal alterations should not necessarily be regulated.	
NCW	A resource that, after appropriate investigation, has been determined to not have enough heritage significance to be retained as part of the National Estate.	No further actions under the NHRA are required. This must be motivated by the applicant and approved by the authority. Section 34 can even be lifted by HWC for structures in this category if they are older than 60 years.	No research potential or other cultural significance

3.2 Methodology used in determining the significance of environmental impacts

The methodology used to determine the environmental impact significance was provided by EIMS and is explained in **Appendix B**.

4 CURRENT STATUS QUO

4.1 Site Description

The study area is characterised by primarily level areas south of the N12 between Pretoria and Ogies. The site is located approximately 10km south-west of Ogies.

In terms of vegetation, the study area is located within the Eastern Highveld Grassland vegetation type. This vegetation type is described as "…*Slightly to moderately undulating plains, including some low hills and pan depressions. The vegetation is short dense grassland dominated by the usual highveld grass composition (Aristida, Digitaria, Eragrostis, Themeda, Tristachya etc.) with small, scattered rocky outcrops with wiry, sour grasses and some woody species"* (www.sanbi.org).

In terms of geology and soils, the Eastern Highveld Grassland vegetation type is *"Red to yellow sandy soils of the Ba and Bb land types found on shales and sandstones of the Madzaringwe Formation (Karoo Supergroup).* …," (www.sanbi.org).

Existing surrounding land uses associated with the project area are mostly agricultural farming.

Overall, the accessibility of the project footprint area was fairly good. Several photographs below provide general views of the study area and the landscape within which it is located.

Figure 5 – View of the landscape on the western side of the proposed area near the Zibulo North Offices

Figure 6 – View of excavations and dumping along the most northern section of the proposed area

Figure 7 – General vegetation and infrastructure on the eastern part of the proposed area

Figure 8 – View of agricultural fields

Figure 9 – View of wetland areas on the eastern side of the proposed area.

Figure 10 – View of mining infrastructure on the eastern side of the proposed area

4.2 Overview of the study area and surrounding landscape

DATE	DESCRIPTION
The Study Area and Surroundings during the Stone Age	
The South African Stone Age is the longest archaeologically identified phase identified in human history and lasted for millions of years. Very little is known about the Stone Age archaeology of the study area and its immediate surroundings.	
2.5 million to 250 000 years ago	The Earlier Stone Age is the first and oldest phase identified in South Africa's archaeological history and comprises two technological phases. The earliest of these technological phases is known as Oldowan which is associated with crude flakes and hammerstones and dates to approximately 2 million years ago. The second technological phase in the Earlier Stone Age of Southern Africa is known as the Acheulian and comprises more refined and better-made stone artefacts such as the cleaver and bifacial handaxe. The Acheulian phase dates back to approximately 1.5 million years ago. No information with regard to Early Stone Age sites from the surrounding area could be found. However, it seems possible for such sites to exist here.

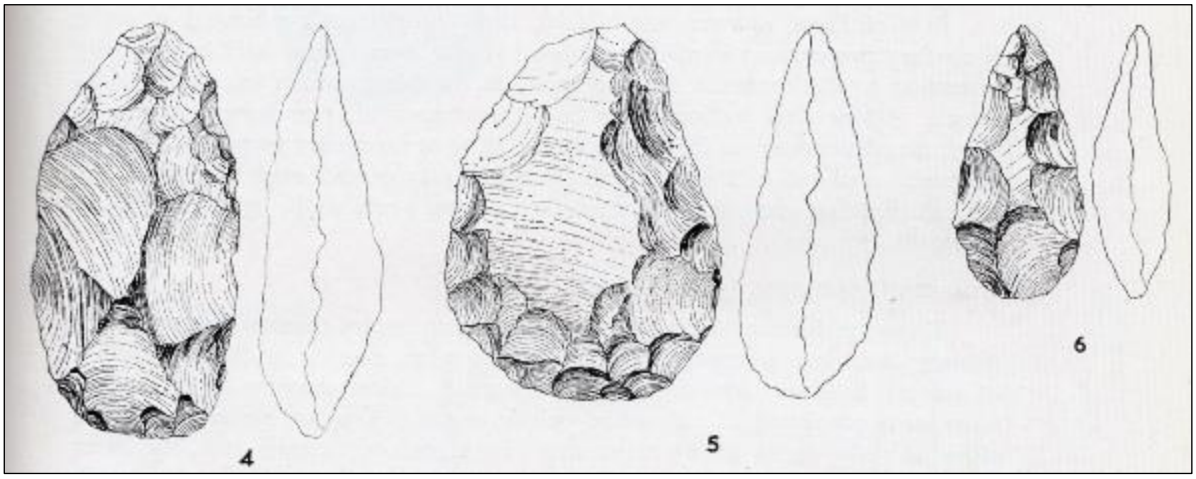



Figure 11 – Example of Early Stone Age Later Acheulian handaxes. These handaxes were identified at Blaaubank near Rooiberg. Cropped section of an illustration published in Mason (1962:199).	
250 000 to 40 000 years ago	The Middle Stone Age (MSA) dates to between 250 000 to 40 000 years BP. MSA dates of around 250 000 BP originate from sites such as Leopards Kopje in Zambia, while the late Pleistocene (125 000 BP) yields a number of important dated sites associated with modern humans (Deacon & Deacon, 1999). The MSA is characterised by flake and blade industries, the first use of grindstones, wood and bone artefacts, personal ornaments, use of red ochre, circular hearths and hunting and gathering lifestyle. Two low-density surface scatters of Middle Stone Age lithics are located 25km north-east of the present study area alternatives. These surface scatters (TAV 3 & TAV 5) were identified on the western bank of the Steenkoolspruit during a heritage impact assessment undertaken in 2001 (CRM Africa & Matakoma, 2001). During the present study no MSA lithics were identified
40 000 years ago to the historic past	The Later Stone Age (LSA) is the third phase identified in South Africa's Stone Age history. This phase in human history is associated with an abundance of very small stone artefacts or microliths. A large number of Later Stone Age materials are found around the general vicinity of the study area. Unfortunately, these are mostly in the form of surface material which has been eroded out of

	dongas and riverbeds. As a result, the primary context of these sites and associated material is often in doubt (Van Schalkwyk, 2001). A natural sandstone shelter containing some Later Stone Age lithics is located 25km north-east of the closest point along the boundaries of the present study area alternatives. This sandstone shelter (TAV 6) was identified during a heritage impact assessment undertaken in 2001 (CRM Africa & Matakoma, 2001).
The Study Area and Surroundings during the Iron Age	
The arrival of early farming communities during the first Millenium heralded in the start of the Iron Age for South Africa. The Iron Age is that period in South Africa's archaeological history associated with pre-colonial farming communities who practised cultivation and pastoralist farming activities, metalworking, cultural customs such as lobola and whose settlement layouts show the tangible representation of the significance of cattle (known as the Central Cattle Pattern) (Huffman, 2007).	
AD 1700 – AD 1840	The Buispoort facies of the Moloko branch of the Urewe Tradition is the first association of the study area's surroundings with the Iron Age. It is most likely dated to between AD 1700 and AD 1840. The key features on the decorated ceramics of this facies include rim notching, broadly incised chevrons and white bands, all with red ochre (Huffman, 2007). Buispoort can be associated with the Western Sotho-Tswana, including the Hurutshe and Kwena, and the settlement layouts of Buispoort sites are known as Molokane-type walling (Huffman, 2007). According to the map published by Huffman (2007:203), the present study area is located on the far eastern edge of the known distribution of Buispoort facies sites and settlements.
AD 1821 – AD 1823	After leaving present-day KwaZulu-Natal the Khumalo Ndebele (more commonly known as the Matabele) of Mzilikazi migrated through the general vicinity of the study area under discussion before reaching the central reaches of the Vaal River in the vicinity of Heidelberg in 1823 (www.mk.org.za). Two different settlement types have been associated with the Khumalo Ndebele. The first of these is known as Type B walling and was found at Nqabeni in the Babanango area of KwaZulu-Natal. These walls stood in the open without any military or defensive considerations and comprised an inner circle of linked cattle enclosures (Huffman, 2007). The second settlement type associated with the Khumalo Ndebele is known as Doornspruit, and comprises a layout which from the air has the appearance of a 'beaded necklace'. This layout comprises long scalloped walls (which mark the back of the residential area) which closely surround a complex core which in turn comprises a number of stone circles. The structures from the centre of the settlement can be interpreted as kitchen areas and enclosures for keeping small stock. It is important to note that the Doornspruit settlement type is associated with the later settlements of the Khumalo Ndebele in areas such as the Magaliesberg Mountains and Marico and represent a settlement under the influence of the Sotho with whom the Khumalo Ndebele intermarried. The Type B settlement is associated with the early Khumalo Ndebele settlements and conforms more to the typical Zulu form of settlement. As the Khumalo Ndebele passed through the general vicinity of the study areas shortly after leaving Kwazulu-Natal, one can assume that their settlements here would have conformed more to the Type B than the Doornspruit type of settlement. It must be stressed however that no published information could be found which indicates the presence of Type B sites in the general vicinity of the study area.

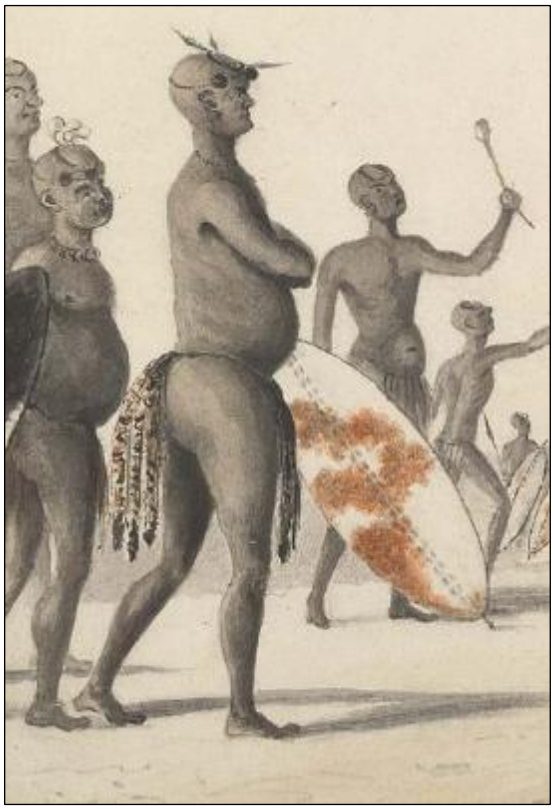


Figure 12 - King Mzilikazi of the Matabele. This depiction was made by Captain Cornwallis Harris in c. 1838 (www.sahistory.org.za).

The Study Area and Surroundings during the Early Historical Period	
The early Historical Period within the study area and surroundings were characterised by the arrival of newcomers to this area. The first arrivals would almost certainly have been travellers, traders, missionaries, hunters and fortune seekers. However, with time, this initial trickle was replaced by a flood of white immigrants during the 1830s, when mass migration of roughly 2 540 Afrikaner families (comprising approximately 12 000 individuals) from the frontier zone of the Cape Colony to the interior of Southern Africa took place. The people who took part in this Great Trek were later to be known as Voortrekkers (Visagie, 2011).	
1836	The first Voortrekker parties crossed over the Vaal River (Bergh, 1999).
1845	Both the district and town of Lydenburg was established in this year (Bergh, 1999). The study area fell within the Lydenburg district at the time.
The 1850s - 1860s	In general terms, this period saw the early establishment of farms by white farmers in the general vicinity of the study area. The archival research undertaken for this study has shown that most of the farms from within the study area were formally inspected by one P.J. Fourie, as representative of the government of the Zuid-Afrikaansche Republiek, during the late 1960s. It seems likely for P.J. Fourie to have been the local *veldkornet* or commandant. The permanent settlement of white farmers in the general vicinity of the study area would have resulted in the proclamation of individual farms and the establishment of permanent farmsteads. Features that can typically be associated with the early farming history of the area include farm dwellings, sheds, rectangular stone kraals and cemeteries. The other sites often associated with these early farms are graves and cemeteries for farmers and farm workers, and their respective families. These sites are often all that remains of the farmsteads of the mid to late nineteenth

	century. This may be due to their age as well as the destruction of farmsteads by the British forces during the South African War in accordance with the so-called 'scorched earth' policy.
1872 – 1894	During this time a number of small coal mining operations were started in the general vicinity of the study area. With no railway line connecting this area with the coal markets further to the west, these early coal mines proved a difficult commercial undertaking. Four coal mines were in existence in the Witbank area by 1889, namely Brugspruit Adit, Maggie's Mine, Steenkoolspruit and Douglas (Falconer, 1990).

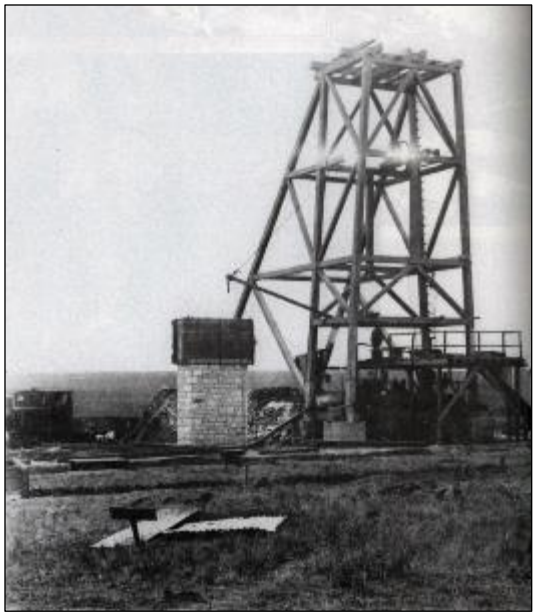


Figure 13 - Historic photograph of the coal mine at Brugspruit (Lang, 1995).

20 October 1894 – 2 November 1894	On this day the railway line between Pretoria and Delagoa Bay (present-day Maputo) was completed, with the last work on the line taking place near Balmoral. However, the symbolic completion of the line's construction took place at Brugspruit Station, where the last rail screw was fastened by President Paul Kruger on 2 November 1894 (De Jong, 1996). Brugspruit (later Clewer) Station was located 26km north-east of the present study area. The completion of the NZASM Eastern Line, as it was known, was very significant for the study area and surroundings. This is due to the fact that the vast deposits of coal known to have existed in this area since the mid 19th century, could now be commercially mined (Bulpin, 1989) and easily transported to the Witwatersrand gold mines and the populated centres of Pretoria and Johannesburg where it was most required. As a result, the completion of the Eastern Line created a massive stimulus not only for the mining of coal but also for the establishment of coal mines. As will be seen below, a number of coal mines were established in the years following on the completion of the Eastern Line.
1895	According to Schalekamp (2006), the Landau Colliery was established in 1895 by the Cassel Coal Company on the farm Klipfontein to supply coal to the gold mines along the Witwatersrand. If this date is correct, it would mean that the Landau Colliery was the earliest coal mine to be established in close proximity to the present study area and in all likelihood also one of the first such collieries to be established in proximity to present-day Emalahleni. However, other sources such as the South African Mining Yearbook of 1911 indicate that the Cassel Coal Company was registered in August 1895 as a

	reconstruct of the Cassel Colliery Company Limited. According to this source, the property of the Cassel Coal Company at the time of its registration was restricted to sections of a farm near Springs. In November 1898 the Cassel Coal Company resolved to acquire the property and assets of Landau's Transvaal Colliery comprising 26 860 acres on the farms Klipfontein, Klippan, Kleinkopje, Wolvekrans and Blaauwkrans. This means that the Cassel Coal Company became involved in properties located within and surrounding the present study area in November 1898.
1896	A coal mine shaft was sunk on the farm Witbank in this year by Samuel Stanfield (Erasmus, 2004). In September 1896, Witbank Colliery Limited was established (South African Mining Yearbook, 1941/1942). The Witbank Colliery was located a short distance north of the present study area, with the farm Witbank adjoining one of the farms located within the study area.
9 April 1897	The Anglo-French (Transvaal) Navigation Coal Estates Limited was registered on 9 April 1897. This company was established to purchase the undertaking of the Anglo-French Collieries Syndicate Limited. Possibly at the time of its establishment and certainly before 1911, the company acquired the coal leasehold rights to the farm Blaauwkrans (South African Mining Yearbook, 1911)
The Study Area and Surroundings during the South African War	
The South African War (also known as the Anglo Boer War) between Great Britain and her allies and the Boer Republics of the Transvaal (known as the *Zuid-Afrikaansche Republiek*) and Free State took place between October 1899 and May 1902. No battles or skirmishes associated with this war are known from within the study area or its direct surroundings, although a number are known from the surrounding landscape. The primary battles from the surrounding landscape include the Battle of Rhenosterkop of 29 November 1900, the Battle of Wilmansrust of 12 June 1901 and the Battle of Bakenlaagte of 30 October 1901 (Van der Westhuizen & Van der Westhuizen, 2000). During the war, the railway line between Pretoria and Delagoa Bay (present-day Maputo) was of immense strategic significance for both sides. As a result, and especially during the guerrilla phase of the war, the Boer forces spent considerable energy in blowing up and derailing trains and also damaging and destroying bridges and culverts. These Boer activities were aimed at suppressing the rapid movement of British troops, ammunition and supplies by rail. In response, the British Army built a series of fortifications and blockhouses along the railway line and also made use of armoured trains.	
13 December 1899 – 21 December 1899	On 13 December 1899 the future Prime Minister of Great Britain, Winston Churchill, escaped from a Prisoner of War Camp in Pretoria. He escaped from the Boer capital in an open coal truck (some sources indicate that Churchill walked) and travelled by rail to Clewer Siding. Near Clewer Siding, Churchill jumped off the train and headed for lights he could see in the distance. These lights turned out to be the Transvaal and Delagoa Bay Colliery, where Churchill knocked on the first house he found. He was fortunate to have knocked on the door of the English mine manager, John Howard, who as a pro-Briton decided to assist Winston Churchill. With the assistance of a small number of pro-British mine employees, Howard hid Churchill for a couple of days in one of the colliery's mineshafts and subsequently for a few more days behind packing cases at the mine office. Early on the morning of 19 December 1899 Winston Churchill was taken to the colliery siding by John Howard and hidden in one of the train wagons carrying a cargo of wool. He safely reached Lourenco Marques (present-day Maputo) on 21 December 1899. After the war, Winston Churchill sent engraved gold watches to everyone at the Transvaal and Delagoa Bay Colliery who assisted in his escape (Sandys, 1999) (Van der Westhuizen & Van der Westhuizen, 2000). The Transvaal and Delagoa Bay Colliery where Winston Churchill was hidden appears to have been located near the boundary between the farms Schoongezicht and Driefontein, some 35 km north-east of the present study area.

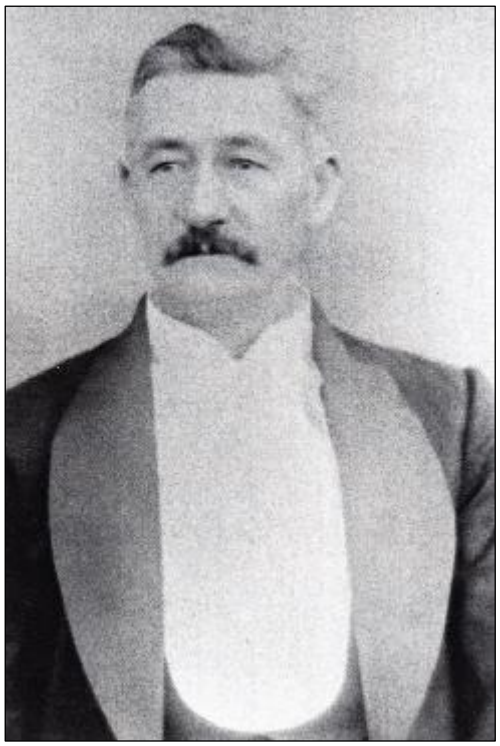


Figure 14 – John Howard, the mine manager of the Transvaal and Delagoa Bay Colliery, who was a key figure in Winston Churchill's escape from the Transvaal Republic (Sandys, 1999).

Figure 15 – Sir Winston Leonard Spencer Churchill as Prime Minister of the United Kingdom during the Second World War (www.wikipedia.org).

7 October 1900	On this day a railway culvert near Brugspruit was destroyed by Boer forces (Aitken, 2000). The blowing up and derailment of trains, as well as the acts of sabotage against the Eastern Line by Boer forces, formed part of their tactics during the guerrilla war to try and suppress the rapid movement of British troops, ammunition and supplies by rail.
Late 1900	One of the closest known skirmishes to the present study area appears to be mentioned in the published war memoir of General Ben Viljoen (1902), which states that a skirmish between his commando and the British forces took place near Witbank Station. This skirmish appears to have taken place during the latter part of 1900.
17 January 1901	A British train was derailed near Brugspruit Station on the morning of 17 January 1901. This was the work of the infamous Irish-born train-wrecker of the Boer forces, namely Captain Jack Hindon (Aitken, 2000).
11 April 1901	On 11 April 1901, a British train was blown up by Boer forces near Witbank (Meijer, 2000).
The Study Area and Surroundings during the Twentieth Century	
The general surroundings of the study area underwent significant changes and development during the twentieth century, including extensive development in the form of coal mining, railway and transportation development as well as the establishment of nearby towns such as Witbank (present-day Emalahleni), Ogies and Kriel.	
1903	The town of Witbank was formally proclaimed (Erasmus, 2004).

Figure 16 – Historic photograph of Witbank taken in 1936 (Delius, 2007:340).

1905	While no details are available, it would appear that the Cassel Coal Company's Landau Colliery started producing coal in 1905. The coal output for this year was 181,071 tons (The Mining Yearbook, 1911). The mine continued to operate during the subsequent years.
1906	The town of Witbank received its first Health Board (Bulpin, 1989).
December 1906	The new railway line from near Johannesburg all the way to Witbank (present-day Emalahleni) was officially opened on 26 December 1906 (www.wikipedia.org). The opening of this line meant that a direct route between the coal mines from the surroundings of Witbank and the markets in the Witwatersrand now became available. The importance of this new railway line for the coal mines from within the study area and its surroundings can *inter alia* be seen in the fact that during its early development, the Anglo-French (Transvaal) Navigation Colliery built a railway siding which connected it with this new railway link between Witbank and Johannesburg (The Mining Yearbook, 1911). The railway line originally built in 1906, passes through Ogies, with the Ogies Station being the closest to the present study area.
December 1906	In December 1906 the Anglo-French (Transvaal) Navigation Colliery produced its first coal output. This followed on the striking of four coal seams during shaft sinking activities (South African Mining Yearbook, 1911). This mine also continued to operate during the subsequent years.
1914	The town of Witbank became a municipality in this year (Bulpin, 1989).
13 April 1921	On 13 April 1921 the South African Coal Estates (Witbank) Limited was established to acquire the assets of the Cassel Coal and Anglo-French

	companies (South African Mining Yearbook, 1941/2). These companies were amalgamated into this newly established company, and as a result of both the Landau and Navigation Collieries now formed part of the South African Coal Estates (Witbank) Limited.
1923 - 1926	Based on the information that is presently available, it would appear that the village of Clewer was established during this period by the South African Coal Estates (Witbank) Limited. The company owned Clewer for some time after its establishment. In a number of inscriptions in these mining yearbooks, Clewer is referred to as '*the garden township'.* See for example the South African Mining Yearbook that was published in 1941/2.
1928	The town of Ogies was established (Erasmus, 2004).
May 1946	The Apex Mines Limited established the Greenside Colliery on the farm Groenfontein, with production commencing here during May 1946 (The Mining Yearbook, 1949). This mine is located 27km north-east of the present study area.

Figure 17 – Historic photograph was taken during the late 1940s of an unknown colliery near Witbank (Delius, 2007:159).

4.2.1 Archival and historical maps

The examination of historical data and cartographic resources represents a critical tool for locating and identifying heritage resources and in determining the historical and cultural context of the study area. Relevant topographic maps and satellite imagery were studied to identify structures, possible burial grounds or archaeological sites in the footprint area.

Since the mid 1800's up until the present, South Africa had been subdivided into various districts. Since 1945, the area where Ogies is located formed part of the Lydenburg district. As of 1872, the farm area was located within the Middelburg district. The Witbank district was however proclaimed

in 1925, and the farms of concern were located in this area. From 1977 the properties fell under the jurisdiction of the Witbank Magisterial Area. This was still the case by 1994 (Bergh,1999: 17, 20-27).

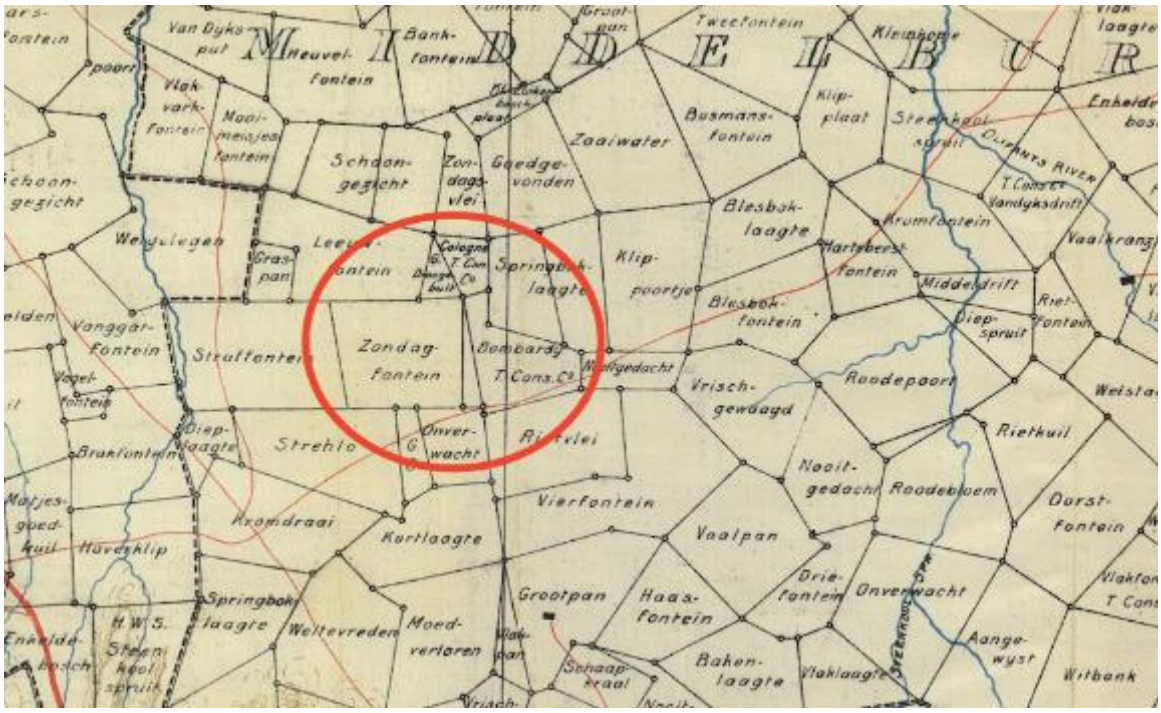


Figure 18 - Map of the Heidelberg District in 1900, The Imperial Map of South Africa. Encircled in red is the farms near where the town Ogies is located today.

Historical topographic maps (1:50 000) for the year 1965, First Edition 2629AA and 2628BB, were available for utilisation in the background study. These maps were assessed to observe the development of the area, as well as the location of possible historical structures and burial grounds. The study area was overlain on the map sheets to identify structures or graves situated within or immediately adjacent to the study area that could possibly be older than 60 years and thus protected under Section 34 and 36 of the NHRA.

The Maps showed five areas of heritage sensitivity. One grave was depicted and four locations of hut features, most likely used for farm labour accommodation. The grave was not located during the survey.

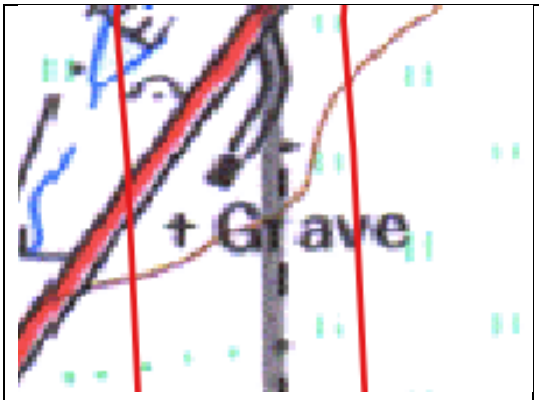


Figure 19 – Section of the 1965 First edition 2629AA Map showing the location of a grave at -26.18484S, 29.01914E

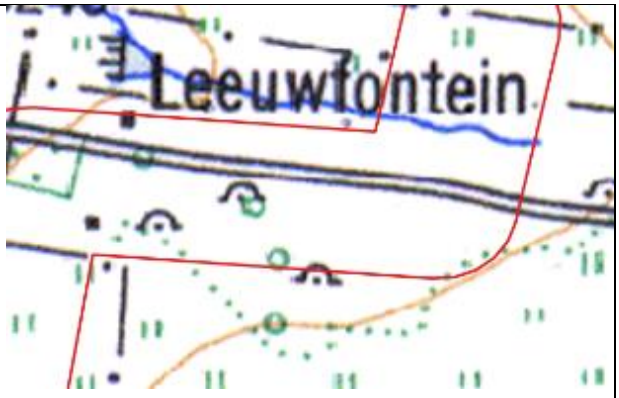


Figure 20 – One example of the hut locations.

Figure 21 – Location of the grave depicted on the first edition maps. The grave was not located.

4.2.2 Previous heritage impact assessment reports from the study area and surroundings

A search of the South African Heritage Resources Information System (SAHRIS) database revealed that several previous archaeological and heritage impact assessments had been undertaken within the surroundings of the study area. In each case, the results of each study are shown in bold. These previous studies are listed below in ascending chronological order:

- BIRKHOLTZ, P & FOURIE, W. 2000. Phase 1 Archaeological Survey of the Impunzi Division of Duiker Mining - Witbank/Ogies area. **Seventeen burial grounds, three Iron Age sites, two Middle Stone Age sites and one Late Stone Age site was recovered.**

- VAN VOLLENHOVEN, A. & PELSER, A. 2010. heritage impact assessment for the expansion of openCape Archaeological Survey CCt coal mining operations, Landau Colliery, on the farm Nooitgedacht 300 JS near Witbank, Mpumalanga. **Besides the grave site, containing about 20 graves, 3 sites dating to the recent historical period were located and recorded.**

- VAN VOLLENHOVEN, A. 2013. A Report On A Cultural Heritage Impact Assessment For A Proposed Prospecting Rights Application On The Farm Elandsfontein 309 Js, Close To Emalahleni, Mpumalanga Province. **During the survey, two sites of cultural heritage, significance was located in the area to be developed, including an old farmhouse and a burial ground.**

- VAN VOLLENHOVEN, A. 2013. A Report on a Cultural Heritage Impact Assessment for the NEMA Application Relating to the Vierfontein Mine, Near Ogies, Mpumalanga Province. **Two burial grounds were located.**

- VAN DER WALT, J. 2013. Archaeological Scoping Report for The Proposed Establishment of The Transalloys Coal-Fired Power Plant Near Witbank, Mpumalanga Province. Portions 25, 26, 33, 34, 35, 36 and 37 of the Farm Elandsfontein 309 JS Portions 20, 24 and 38 of the Farm Schoongezicht 308 JS. **As this was a scoping level study, no fieldwork was undertaken, and no specific heritage resources were identified.**

- VAN VOLLENHOVEN, A & COLLINS, Z. 2014. A Report on a Cultural Heritage Impact Assessment for The Proposed Development At Transalloys On Portions 34 And 35 (Portion Of Portion 34) Of The Farm Elandsfontein 309 JS And Portions 20 And 24 Of The Farm Schoongezicht 308 JS, Close To Emalahleni, Mpumalanga Province. **During the HIA survey one site of cultural heritage significance was identified; this was a large burial ground containing approx. 90 graves.**

- VAN DER WALT, J. 2014. Archaeological Impact Assessment For the proposed Clay and Coal Mining project on a Portion of Portion 2 of the Farm Weltevreden 324 JS, Magisterial District of Witbank. **No heritage sites were located.**

- CELLIERS, J.P. 2015. Phase 1 Archaeological Impact and Heritage Assessment on portions of the farms Kleinzuikerboschplaat 5 IS, Klipfontein 3 IS and Zondagsvlei 9 IS, in respect of the proposed construction of a 88 kV Eskom Powerline, Ogies, Mpumalanga Province. **Three cemeteries and twelve historic structures were located.**

- KUSEL, U. 2016. Phase I Cultural Heritage Resources Impact Assessment For A Temporary Road For A Large Dragline To Be Moved From Kromdraai Coal Mine To Clewer In The Emalahleni District Mpumalanga Province. **Two cemeteries were found along the proposed route of the dragline.**

- DU PISANIE, J. 2017. Heritage Impact Assessment: Environmental Regulatory Processes relating to the amendment of the Environmental Management Programme for its Elandsfontein Operations. Five heritage resources were identified within the site-specific study area. **These were all informal burial grounds, which contained both European and African graves.**

- PISTORIUS, J.C.C. 2018. A Phase I Heritage Impact Assessment Study for The Proposed Project Z Near Ogies In the Mpumalanga Province. **No Heritage sites were located.**

- KITTO, J. 2020. Heritage Impact Assessment Report, For Inclusion In The Environmental Impact Assessment Report For The Proposed Anker Elandsfontein Colliery Project, Witbank, Emalahleni Local Municipality, Mpumalanga Province. **Eight burial grounds and three sites containing structures are present on the property.**

- VAN VOLLENHOVEN, A. 2020. A report on an Archaeological Impact Assessment for the proposed Zibulo north shaft expansion project, close to Ogies, Mpumalanga province. **During the survey 19 burial grounds and 6 historical structures were located.**

- COETZEE, T. 2020. PHASE 1 Archaeological Impact Assessment For The Proposed Lakeside/Leeuwfontein Colliery Expansion near Ogies, Mpumalanga. **Three burial grounds and seven historical structures were located.**

4.2.3 Heritage screening

A heritage screening report was compiled by the Department of Environmental Affairs National Web-based Environmental Screening Tool as required by Regulation 16(1)(v) of the Environmental Impact Assessment Regulations 2014, as amended. According to the heritage screening report, the project area has a High Heritage Sensitivity (**Figure 22**). The fieldwork has confirmed the location of the one Grade 3 site which was presented in the screening report as well as two others.

Therefore, the screening report was lacking with some sites recovered in the area, this is in part due to the low resolution of the available data that the screening data is based on.

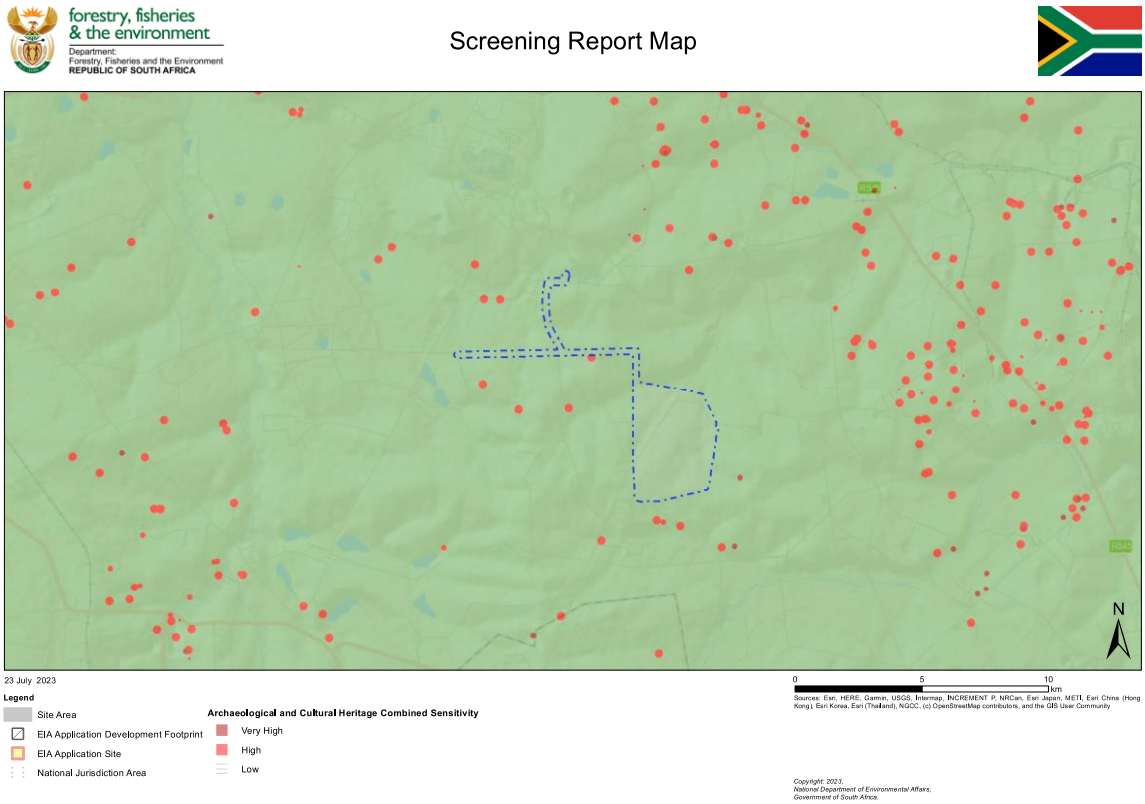


Figure 22 - Screening tool map indicating a high sensitivity rating for archaeology and heritage

4.2.4 Palaeontological screening

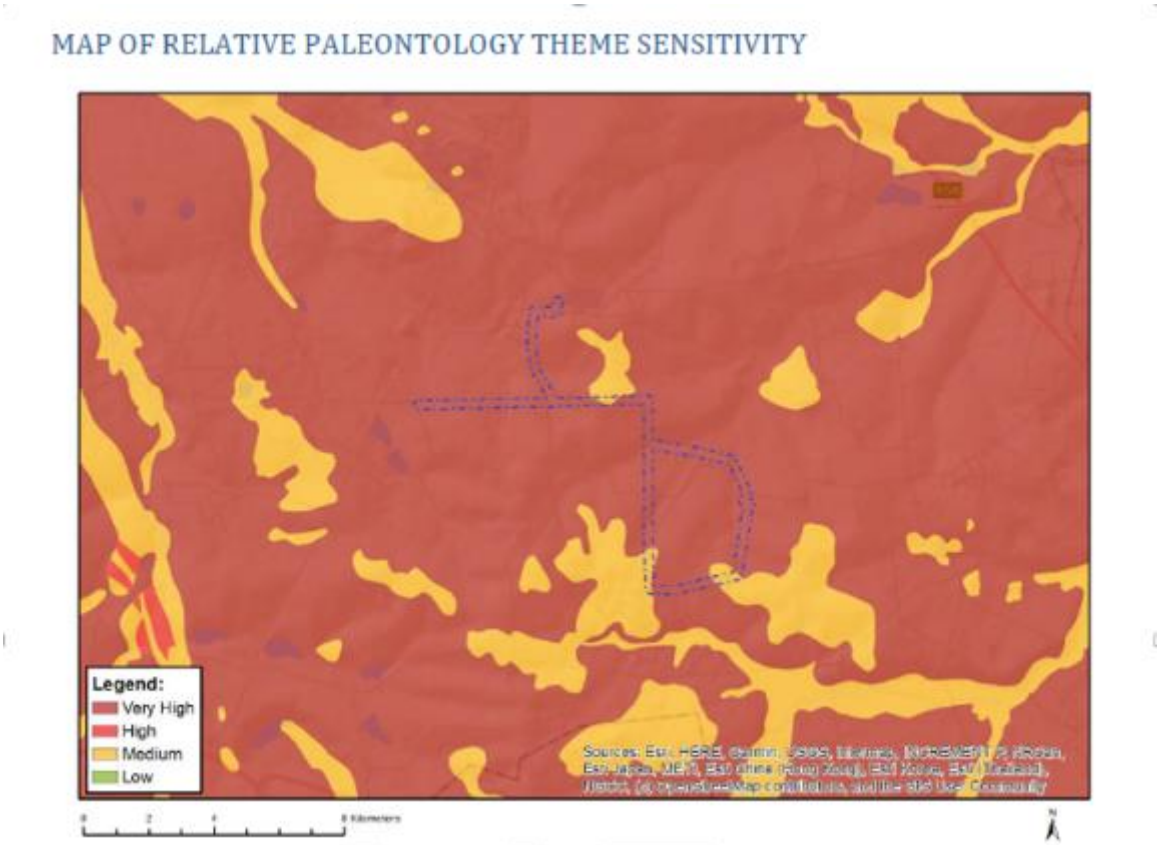


Figure 23 - Palaeontological Sensitivity generated by the National Environmental Web-Based Screening indicating the Very High Palaeontological Sensitivity of the proposed development, while areas with a Medium Sensitivity also underlies the study area

4.2.5 Heritage sensitivity

Analysis of maps and satellite imagery enabled the identification of possible heritage sensitive areas. By superimposition and analysis, it was possible to rate these structures according to age and thus their level of protection under NHRA. **Table 4** lists the possible tangible heritage sites identified in the vicinity of the study area and the relevant legislative protection.

Table 4: Tangible heritage site in the study area.

Name	Description	Legislative protection
Archaeology	Older than 100 years	NHRA Sections 3 and 35
Structures	Possibly older than 60 years	NHRA Sections 3 and 34
Burial grounds	Graves	NHRA Sections 3 and 36 and MP Graves Act

Additionally, evaluation of satellite imagery has indicated the following areas that may be sensitive from a heritage perspective. The analysis of the studies conducted in the area assisted in the development of the following landform type to heritage find matrix (**Table 5**).

Table 5: Landform type to heritage find matrix

LANDFORM TYPE	HERITAGE TYPE
Crest and foot hill	LSA and MSA scatters, LIA settlements
Crest of small hills	Small LSA sites – scatters of stone artefacts, ostrich eggshell, pottery and beads
Water holes/pans/rivers	MSA and LSA sites, LIA settlements
Farmsteads	Historical archaeological material
Ridges and drainage lines	LSA sites, LIA settlements

4.3 Fieldwork findings[2]

The fieldwork was conducted on the 24th – 26th of July 2023 by a field team of PGS heritage. Their movement on site was tracked by GPS and a tracklog map can be seen in **Figure 24**.

During the fieldwork a total of **four** heritage features and resources where identified (**Figure 25**). These consist of three burial grounds (**Z001,Z002, Z003**) and one locality with a recent historic structure (**Z004**). See **Figure 24** and the individual site descriptions as contained in **Appendix C**. The field description forms were collected with ArcGIS Survey123 in field software.

The recent historic structure is younger than 60 years. The structure and remains of structures are not conservation worthy and contain no cultural or scientific value and is consequently graded as not conservation worthy.

Three burial grounds consisting of approximately 14 graves (**Z001**), 6 graves (**Z002**) and 45 graves (**Z003**) were identified. Some of the graves are still identifiable and consist mainly of stone packed or stone lined grave dressings, some have formal granite dressings. An inscribed concrete headstone at **Z003** was also found with an inscription date of 1946. Due to the cultural and religious significance of burial grounds the sites have a high heritage significance and graded as Grade 3A.

[2] *Site in this context refers to a place where a heritage resource is located and not a proclaimed heritage site as contemplated under s27 of the NHRA.*

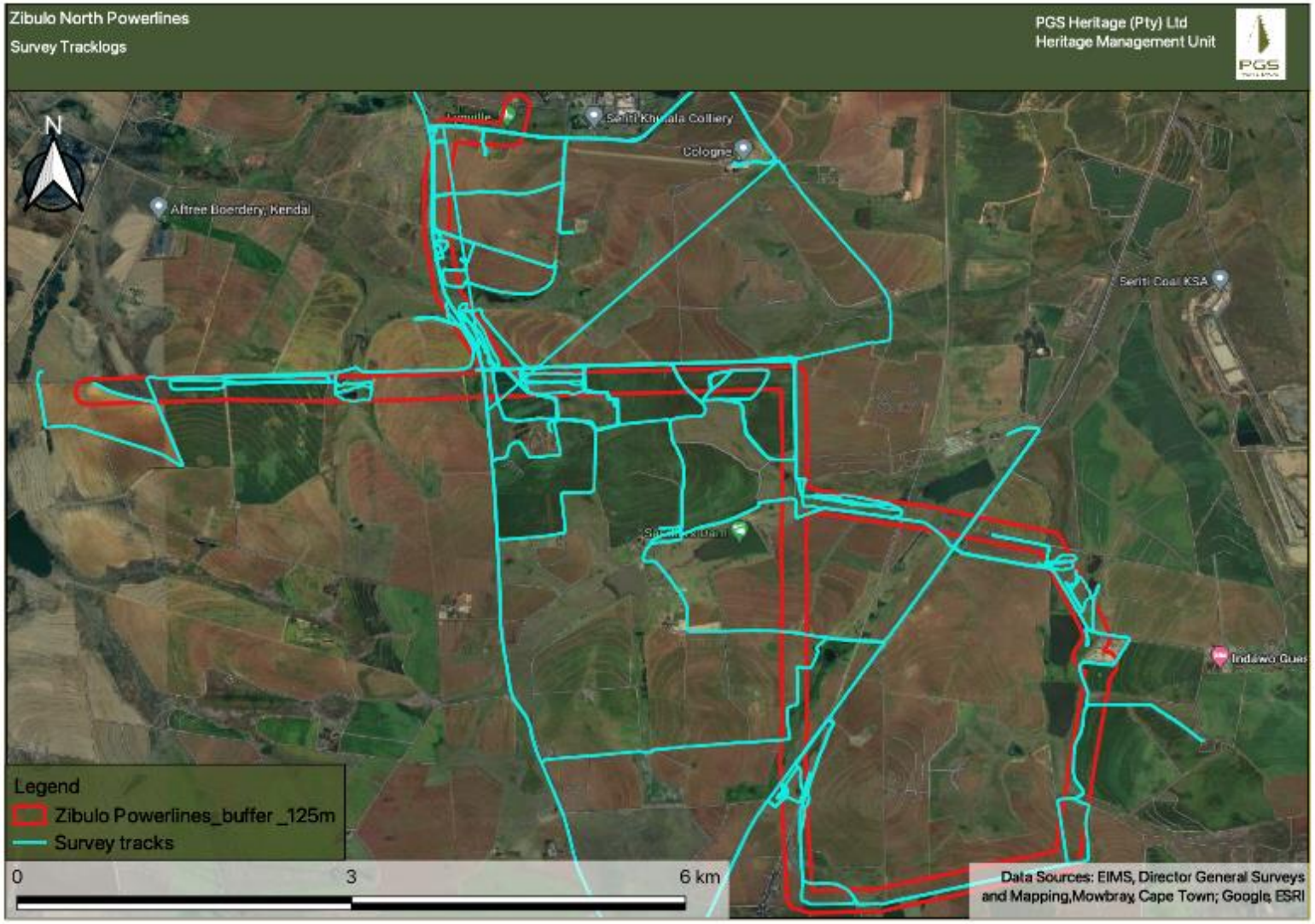


Figure 24 - Fieldwork tracklogs (track in blue, study area in red)

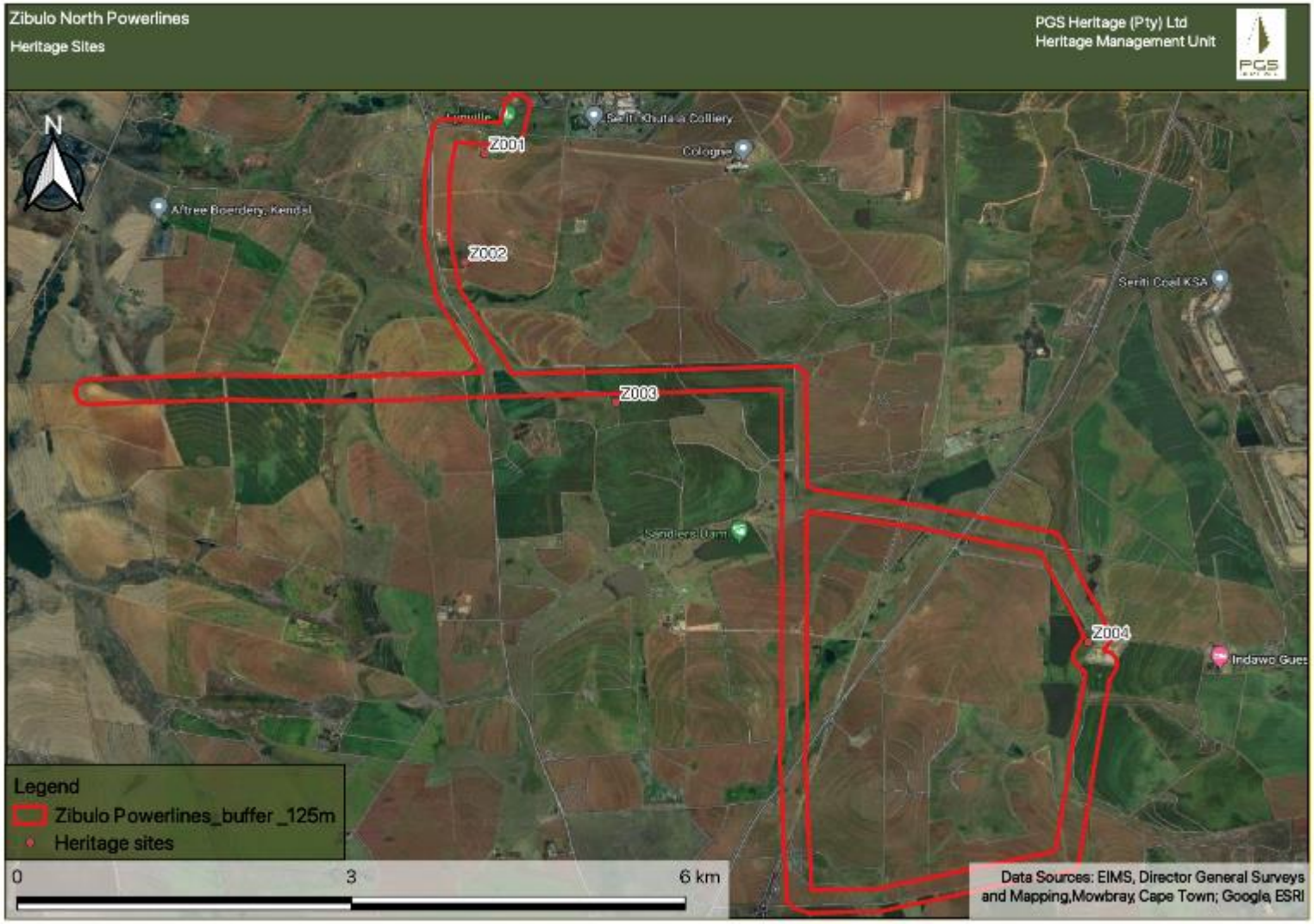


Figure 25 - Identified heritage resources within the Zibulu North Powerline development area.

Figure 26 - View of the burial ground at Z001

Figure 27 – View of the burial ground at Z002

Figure 28 - View of the burial ground at Z003

Figure 29 – The structure at Z004

Figure 30 – Grave dated 1946 at Z003

4.4 Palaeontology

Banzai Environmental was appointed by PGS to conduct the Palaeontological Desktop Assessment (PDA) for the project area. According to this PIA (Butler 2023), the Vryheid Formation (Ecca Group, Karoo Supergroup) and Jurassic dolerite underpin the proposed Powerline Project. According to the South African Heritage Resources Information System (SAHRIS), the Palaeontological Sensitivity of the Vryheid Formation (Ecca Group) is Very High, whereas that of Karoo Dolerite is Zero because it is igneous in origin and thus unfossiliferous (Almond et al, 2013; SAHRIS website).

A site-specific field survey of the development footprint was done both on foot and by car. There were no fossiliferous outcrops found in the area where construction is planned. According to the site investigation and desktop research, fossil heritage of scientific and conservation relevance is rather uncommon in the total development footprint. In contrast, the SAHRIS Palaeosensitivity Map and DFFE Screening Tool assigned a Very High Sensitivity to the development region

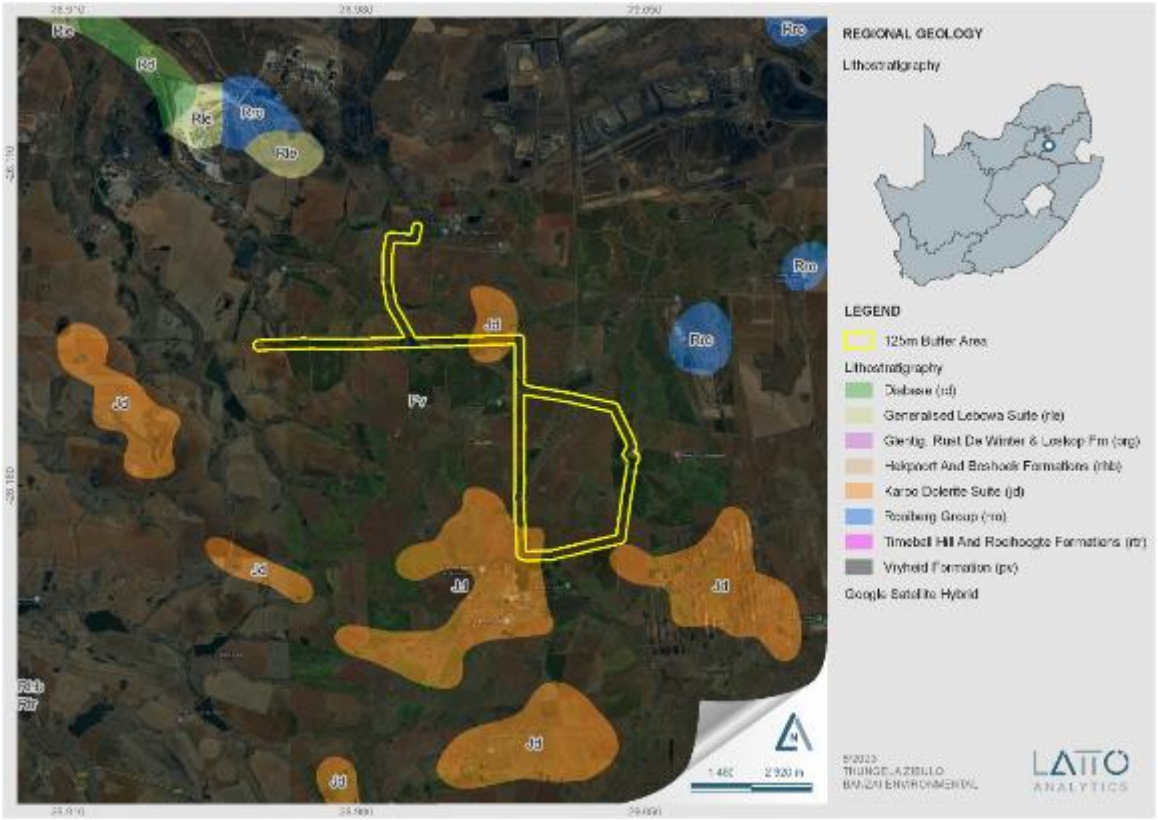


Figure 31 - Updated Geology (Council of Geosciences, Pretoria) indicates that the study area is largely underlain by the Vryheid Formation (Pv, Ecca Group, Karoo Supergroup) with small patches of the Karoo Dolerite Suite (Jd).

5 IMPACT ASSESSMENT

The impact assessment rating is based on the rating scale as contained in **Appendix B**.

The following section provides an analysis of the impact of the proposed project area on heritage resources identified within the Zibulu North Powerline footprint.

5.1 Details of all alternatives considered.

This section describes alternative means of carrying out the operation and the consequences of not proceeding with the proposed project.

Both alternatives of Line route option one and line route option 2 are mostly considered agricultural areas and Heritage is low. The burial grounds are all outside of the proposed areas. Therefore both options are suitable from a heritage perspective.

The “no-go” alternative refers to the option of not going ahead with the proposed project. This will entail maintaining the current status quo with no impact from the project.

5.1.1 Burial grounds and graves

The burial grounds at sites Z001, Z002 and Z003 has a high local heritage significance with 3A heritage grading. The possibility of the burial ground impacted by the proposed powerlines cannot be excluded and the project can potentially have a MODERATE impact without mitigation. Implementation of the recommended management and mitigation measures can reduce the impact rating to LOW.

5.1.2 Historical Structures

The impact on the recent historic structure identified during the fieldwork is calculated as having a LOW significance before and after the implementation of the proposed mitigation measures.

5.1.3 Palaeontology

A Medium Palaeontological value has been assigned to the PV development construction phase prior to mitigation and a Low value after mitigation. The construction phase will be the only development phase that will have an influence on Palaeontological Heritage, with no significant impacts projected during the operational or decommissioning stages.

5.2 Impact assessment summary table

Implementing the impact assessment methodology as supplied by the EIMS. **Table 6** provides a quantitative assessment of the impacts of the proposed powerline options.

The pre-mitigation impact on the identified burial grounds located within the footprint of Route Option 1 and Option 2 is calculated as LOW negative and only focused during the construction of the powerlines. Implementation of the recommended mitigation measures will reduce the impact to LOW positive.

The pre-mitigation impact on the identified structures located within the footprint of Route Option 1 is calculated as LOW negative and only focused during the construction of the powerlines. Implementation of the recommended mitigation measures will reduce the impact to LOW positive.

A Medium Palaeontological value has been assigned to the PV development construction phase prior to mitigation and a Low value after mitigation. The construction phase will be the only development phase that will have an influence on Palaeontological Heritage, with no significant impacts projected during the operational or decommissioning stages.

Table 6: Impact Table – Burial grounds

IMPACT DESCRIPTION				Pre-Mitigation							Post Mitigation									Priority Factor Criteria			
Identifier	Impact	Alternative	Phase	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Priority Factor	Final score
10.1.1	Burial Grounds	Alternative 1	Construction	-1	3	5	5	5	1	-4,5	1	3	5	2	5	1	3,75	High	1	3	1,25	4,6875
10.1.2	Burial Grounds	Alternative 2	Construction	-1	3	5	5	5	1	-4,5	1	3	5	2	5	1	3,75	High	1	3	1,25	4,6875

Table 7: Impact Table - Structures

IMPACT DESCRIPTION				Pre-Mitigation							Post Mitigation								Priority Factor Criteria			
Identifier	Impact	Alternative	Phase	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Priority Factor	Final score
10.1.1	Structures	Alternative 1	Construction	-1	2	5	1	5	1	-3,25	1	2	5	1	5	1	3,25	High	1	1	1,00	3,25

Table 8: Impact Table – Palaeontology

IMPACT DESCRIPTION				Pre-Mitigation							Post Mitigation								Priority Factor Criteria			
Identifier	Impact	Alternative	Phase	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Priority Factor	Final score
	Loss of fossil Heritage	Alternative 1	Construction	-1	1	5	2	5	4	-13	1	1	5	1	5	2	6	High	2	3	1,38	8,25

6 MANAGEMENT RECOMMENDATIONS AND GUIDELINES

The following section must be read in conjunction with **Table 10** of this report.

6.1 Construction and operational phases

The project will encompass a range of activities during the construction phase, including ground clearance, establishment of construction camp areas and small-scale infrastructure development associated with the project.

It is possible that cultural material will be exposed during construction and may be recoverable, keeping in mind delays can be costly during construction, and as such must be minimised. Development surrounding infrastructure and construction of facilities results in significant disturbance, however foundation holes do offer a window into the past and it thus may be possible to rescue some of the data and materials. It is also possible that substantial alterations will be implemented during this phase of the project, and these must be catered for.

Temporary infrastructure developments, such as construction camps and laydown areas, are often changed or added to the project as required. In general, these are low impact developments as they are superficial, resulting in little alteration of the land surface, but still need to be catered for.

During the construction phase, it is important to recognize any significant material being unearthed, making the correct judgment on which actions should be taken. It is recommended that the following chance find procedure should be implemented.

6.2 Chance finds procedure

- A heritage practitioner / archaeologist should be appointed to develop a heritage induction program and conduct training for the ECO as well as team leaders in the identification of heritage resources and artefacts **during the implementation of the EMPr**.
- Should an archaeological site or cultural material be discovered during construction (or operation), the area should be demarcated, and construction activities halted.
- An appropriately qualified heritage practitioner / archaeologist must be called upon in the event that any possible heritage resources or artefacts are identified.
- The qualified heritage practitioner / archaeologist will then need to come out to the site and evaluate the extent and importance of the heritage resources and make the necessary recommendations for mitigating the find and the impact on the heritage resource.
- The contractor therefore should have some sort of contingency plan so that operations could move elsewhere temporarily while the materials and data are recovered.
- Construction can commence as soon as the site has been cleared and signed off by the heritage practitioner / archaeologist.

6.3 Possible finds during construction

The study area occurs within a greater historical and archaeological site as identified during the desktop and fieldwork phase. Soil clearance for infrastructure as well as the proposed reclamation activities, could uncover the following:

- Historical structures and foundations
- unmarked burial grounds and graves
- Archaeological features (Iron Age or Stone Age)

6.4 Timeframes

It must be kept in mind that mitigation and monitoring of heritage resources discovered during construction activity will require permitting for collection or excavation of heritage resources and lead times must be worked into the construction time frames. **Table 9** gives guidelines for lead times on permitting.

Table 9: Lead times for permitting and mobilisation

Action	Responsibility	Timeframe
Preparation for field monitoring and finalisation of contracts	The contractor and service provider	1 month
Application for permits to do necessary mitigation work	Service provider – Archaeologist and SAHRA	3 months
Documentation, excavation and archaeological report on the relevant site	Service provider – Archaeologist	3 months
Handling of chance finds – Graves/Human Remains	Service provider – Archaeologist and SAHRA	2 weeks
Relocation of burial grounds or graves in the way of the development	Service provider – Archaeologist, SAHRA, local government and provincial government	6 months

6.5 Heritage Management Plan for EMPr implementation

Table 10: Heritage Management Plan for EMPr implementation

Area and site no.	Mitigation measures	Phase	Timeframe	The responsible party for implementation	Monitoring Party (frequency)	Target	Performance indicators (monitoring tool)
General project area	Implement a chance to find procedures in case where possible heritage finds are uncovered.	Construction	During construction	Applicant ECO Heritage Specialist	ECO (monthly / as or when required)	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 34-36 and 38 of NHRA	ECO Monthly Checklist/Report
Burial grounds and graves	All burial grounds and graves should be retained and avoided with a **buffer zone of 30m** as per SAHRA guidelines. If this is not possible, the graves could be relocated after completion of a detailed grave relocation process, that includes a thorough stakeholder engagement component, adhering to the requirements of s36 of the NHRA and its regulations as well as the National Health Act and its regulations.	Construction	During Construction	Applicant Environmental Control Officer (ECO) Heritage specialist	Monthly	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	ECO Monthly Checklist/Report
Historical Structures	Z004 requires no further mitigation.						
Palaeontology	Implement a Chance Find Protocol.	Construction	During Construction	Applicant Environmental Control Officer (ECO) Heritage specialist	Monthly	Ensure compliance with relevant legislation and recommendations from NHRA under Section 35 of NHRA	ECO Monthly Checklist/Report

7 CONCLUSIONS AND RECOMMENDATIONS

PGS was appointed by EIMS to undertake a HIA for the proposed Zibulo North Shaft Project – 132KV Overhead Powerlines on Farms Leeuwfontein 219, Smithfield 44 and Zondagsfontein 257, Nkangala District Municipality, Mpumalanga Province

A further standalone Palaeontological Impact Assessment (PIA) was completed for PGS by Dr Elize Butler of Banzai Environmental.

According to the heritage screening report, the project area has a High Heritage Sensitivity. The fieldwork has confirmed the location of the one Grade 3a site which was presented in the screening report as well as two other burial grounds. The HIA identified the burial grounds and one structure which is not conservation worthy, outside of the study area. The burial grounds are rated as having a high heritage significance and will require further mitigation work before the project can continue if these may be impacted upon. The Impact Management Actions as described in the Generic EMPr are adequate and no further mitigation measures will be required.

During the fieldwork a total of **four** heritage features and resources where identified (**Figure 25**). These consist of three burial grounds (**Z001, Z002, Z003**) and one locality with a recent historic structure (**Z004**). See **Figure 24** and the individual site descriptions as contained in **Appendix C**. The field description forms were collected with ArcGIS Survey123 in field software.

7.1 Historical Structures

One Building was located which is not conservation worthy.

7.2 Burial grounds and graves

Three burial grounds were located.
Z001 – approximately 14 graves.
Z002 – approximately 6 graves.
Z003 – approximately 45 graves

7.3 Palaeontology

The Vryheid Formation (Ecca Group, Karoo Supergroup) and Jurassic dolerite underpin the proposed Powerline Project. According to the South African Heritage Resources Information System (SAHRIS), the Palaeontological Sensitivity of the Vryheid Formation (Ecca Group) is Very High, whereas that of Karoo Dolerite is Zero because it is igneous in origin and thus unfossiliferous (Almond et al, 2013; SAHRIS website).

A site-specific field survey of the development footprint was done both on foot and by car. There were no fossiliferous outcrops found in the area where construction is planned. According to the site investigation and desktop research, fossil heritage of scientific and conservation relevance is rather uncommon in the total development footprint. In contrast, the SAHRIS Palaeosensitivity Map and DFFE Screening Tool assigned a Very High Sensitivity to the development region. A Medium Palaeontological value has been assigned to the PV development construction phase prior to mitigation and a Low value after mitigation. The construction phase will be the only development phase that will have an influence on Palaeontological Heritage, with no significant impacts projected during the operational or decommissioning stages.

If fossil remains are discovered during any phase of construction, whether on the surface or revealed through excavations, the Environmental Control Officer (ECO) in charge of these activities is required to follow the Chance Find Procedure as contained in the Generic EMPR as it is adequate to mitigate the impact.

Therefore, it is advised that no additional palaeontological heritage studies, fieldwork, or expert mitigation are needed until fossils are found.

7.4 Mitigation measures

Mitigation measures are described in **Table 10** of this report.

7.5 General

It is the combined considered opinion of the heritage specialists that the proposed project will not have a direct impact on the identified heritage resources, rated being of low to medium heritage significance.

As the development footprint is not considered sensitive in terms of palaeontological resources, construction of the development may thus be approved in its entirety. It is thus suggested that no additional palaeontological heritage research, ground truthing, or specialised mitigation be undertaken until new found fossils are identified.

With the implementation of recommended mitigation measures the overall impact on heritage resources will be reduced to acceptable levels during the activities of the project

8 REFERENCES

8.1 Published Sources

AITKEN, D.W. 2000. Guerrilla Warfare, October 1900 – May 1902: Boer Attacks on the Pretoria-Delagoa Bay Railway Line. *South African Military History Journal* Vol. 11 No. 6.

ALMOND, J., PETHER, J, and GROENEWALD, G. 2013. South African National Fossil Sensitivity Map. SAHRA and Council for Geosciences. Schweitzer *et al*. (1995) pp p288.

BERGH, J.S. 1999. *Geskiedenisatlas van Suid-Afrika: die Vier Noordelike Provinsies*. Van Schaik, Pretoria.

BULPIN, T.V. 1989. *Lost Trails of the Transvaal*. Southern Book Publishers.

DEACON, H.J. & J. DEACON. 1999. *Human Beginnings in South Africa: Uncovering the Secrets of the Stone Age*. David Philip Publishers. Cape Town.

DE JONG, R.C. 1996. "The Iron Road to the Sea": The Pretoria-Maputo Railway, 1895-1995*. Pretoriana. No 108 (pp. 3-16).*

DELIUS, P. ed., 2007. *Mpumalanga: history and heritage*. University of Kwazulu Natal Press.

ERASMUS. B.P.J. 2004. *On Route in South Africa*. Johnathan Ball Publishers.

FALCONER, K.W., 1990. SPOTLIGHT-ON 100 YEARS OF COAL-MINING IN WITBANK. *Journal of the South African Institute of Mining and Metallurgy*, *90*(4), pp.78-78

HUFFMAN, T.N. 2007. *Handbook to the Iron Age: The Archaeology of Pre-Colonial Farming Societies in Southern Africa*. University of KZN Press: South Africa.

LANG, J. 1995. *Power Base: Coal Mining in the Life of South Africa*. Jonathan Ball Publishers, Johannesburg.

MASON, R. 1962. *Prehistory of the Transvaal*. Witwatersrand University Press, Johannesburg.

MEIJER, J.W. n.d. *Generaal Ben Viljoen: 1868 – 1917*. Protea Boekhuis, Pretoria.

SANDYS, C. 1999. *Churchill: Wanted Dead or Alive*. De Capo Press.

SCHALEKAMP, E.E. 2006. *The Financial Viability of Coal Reserves within Previously Mined Areas of the Witbank Coalfield*. Unpublished M.Sc. Dissertation, University of Pretoria, Pretoria.

SOUTH AFRICAN MINING AND ENGINEERING JOURNAL. 1982.

SOUTH AFRICAN MINING YEARBOOK, 1911

SOUTH AFRICAN MINING YEARBOOK. 1941/2. *The South African Mining Journal Syndicate*, Johannesburg.

VAN DER WESTHUIZEN, G. & E. VAN DER WESTHUIZEN 2000. *Guide to the Anglo Boer War in the Eastern Transvaal*. Transo Press, Roodepoort.

VISAGIE, J.C. 2011. *Voortrekkerstamouers: 1835 – 1845*. Protea Boekhuis, Pretoria.

8.2 **Unpublished Sources**

BIRKHOLTZ, P & FOURIE, W. 2000. Phase 1 Archaeological Survey of the Impunzi Division of Duiker Mining - Witbank/Ogies area.

VAN VOLLENHOVEN, A. & PELSER, A. 2010. heritage impact assessment for the expansion of openCape Archaeological Survey CCt coal mining operations, Landau Colliery, on the farm Nooitgedacht 300 JS near Witbank, Mpumalanga.

VAN VOLLENHOVEN, A. 2013. A Report On A Cultural Heritage Impact Assessment For A Proposed Prospecting Rights Application On The Farm Elandsfontein 309 Js, Close To Emalahleni, Mpumalanga Province.

VAN VOLLENHOVEN, A. 2013. A Report on a Cultural Heritage Impact Assessment for the NEMA Application Relating to the Vierfontein Mine, Near Ogies, Mpumalanga Province.

VAN DER WALT, J. 2013. Archaeological Scoping Report for The Proposed Establishment of The Transalloys Coal-Fired Power Plant Near Witbank, Mpumalanga Province. Portions 25, 26, 33, 34, 35, 36 and 37 of the Farm Elandsfontein 309 JS Portions 20, 24 and 38 of the Farm Schoongezicht 308 JS.

VAN VOLLENHOVEN, A & COLLINS, Z. 2014. A Report on a Cultural Heritage Impact Assessment for The Proposed Development At Transalloys On Portions 34 And 35 (Portion Of Portion 34) Of The Farm Elandsfontein 309 JS And Portions 20 And 24 Of The Farm Schoongezicht 308 JS, Close To Emalahleni, Mpumalanga Province.

VAN DER WALT, J. 2014. Archaeological Impact Assessment For the proposed Clay and Coal Mining project on a Portion of Portion 2 of the Farm Weltevreden 324 JS, Magisterial District of Witbank.

CELLIERS, J.P. 2015. Phase 1 Archaeological Impact and Heritage Assessment on portions of the farms Kleinzuikerboschplaat 5 IS, Klipfontein 3 IS and Zondagsvlei 9 IS, in respect of the proposed construction of a 88 kV Eskom Powerline, Ogies, Mpumalanga Province.

KUSEL, U. 2016. Phase I Cultural Heritage Resources Impact Assessment For A Temporary Road For A Large Dragline To Be Moved From Kromdraai Coal Mine To Clewer In The Emalahleni District Mpumalanga Province.

DU PISANIE, J. 2017. Heritage Impact Assessment: Environmental Regulatory Processes relating to the amendment of the Environmental Management Programme for its Elandsfontein Operations. Five heritage resources were identified within the site-specific study area.

PISTORIUS, J.C.C. 2018. A Phase I Heritage Impact Assessment Study for The Proposed Project Z Near Ogies In the Mpumalanga Province.

KITTO, J. 2020. Heritage Impact Assessment Report, For Inclusion In The Environmental Impact Assessment Report For The Proposed Anker Elandsfontein Colliery Project, Witbank, Emalahleni Local Municipality, Mpumalanga Province.

VAN VOLLENHOVEN, A. 2020. A report on an Archaeological Impact Assessment for the proposed Zibulo north shaft expansion project, close to Ogies, Mpumalanga province.

COETZEE, T. 2020. PHASE 1 Archaeological Impact Assessment For The Proposed Lakeside/Leeuwfontein Colliery Expansion near Ogies, Mpumalanga.

8.3 **Historical Topographic Maps**

All the historic topographical maps used in this report were obtained from the Directorate: National Geo-spatial Information of the Department of Rural Development and Land Reform in Cape Town.

8.4 **Internet**

www.angloboerwar.com
www.mk.org.za
www.sahistory.org.za
www.sanbi.org
www.wikipedia.org

8.5 Google Earth

All the aerial depictions and overlays used in this report are from Google Earth.

APPENDIX A

ENVIRONMENTAL IMPACT METHODOLOGY

ENVIRONMENTAL IMPACT MANAGEMENT SERVICES (EIMS): IMPACT ASSESSMENT METHODOLOGY

TITLE:	ENVIRONMENTAL IMPACT ASSESSMENT RATING PROCEDURE	DOC No:	PRO 106	REV:	00	Page 2 of 7

1. **Purpose**

The purpose of this procedure is to guide the undertaking of an impact and risk assessment process, as required under the regulations promulgated under the National Environmental Management Act (Act 107 of 1998 - NEMA).

2. **Scope**

This procedure provides the methodology to be applied to environmental impacts and risks identified during the Environmental Impact Assessment Process. The methodology ensures that consistent impact assessment rating is carried out that is legally compliant and aligned with EIMS's objective of providing a quality service.

3. **References**

GNR. 982 National Environmental Management Act (Act No. 107 of 1998): Environmental Impact Assessment Regulations, 2014 – hereafter referred to as the Regulations.

4. **Additional Guidelines and References**

Guidelines and Reference Docs (not exhaustive – please verify with the applicable competent authority).	
Compulsory Compliance: GNR. 982 National Environmental Management Act (Act No. 107 of 1998 - NEMA): Environmental Impact Assessment Regulations, 2014.	National
Companion Guideline for Implementation: Environmental Management Assessment Regulations, 2010 - GN 805/2012 (NEMA)	National
DEAT (2002) Impact Significance, Integrated Environmental Management, Information Series 5, Department of Environmental Affairs and Tourism (DEAT), Pretoria	National

5. **Definitions and Abbreviations**

Refer to Chapter 1 of the Regulations.

6. **Procedure**

The impact significance rating methodology, as presented herein and utilised for all EIMS Impact Assessment Projects, is guided by the requirements of the NEMA EIA Regulations 2014 (as amended). The broad approach to the significance rating methodology is to determine the environmental risk (ER) by considering the consequence (C) of each impact (comprising Nature, Extent, Duration, Magnitude, and Reversibility) and relate this to the probability/ likelihood (P) of the impact occurring. The ER is determined for the pre- and post-mitigation scenario. In addition, other factors, including cumulative impacts and potential for irreplaceable loss of resources, are used to determine a prioritisation factor (PF) which is applied to the ER to determine the overall significance (S). The impact assessment will be applied to all identified alternatives.

a. **Determination of Environmental Risk**

The significance (S) of an impact is determined by applying a prioritisation factor (PF) to the environmental risk (ER). The environmental risk is dependent on the consequence (C) of the particular impact and the probability (P) of the impact occurring. Consequence is determined through the consideration of the Nature (N), Extent (E), Duration (D), Magnitude (M), and Reversibility (R) applicable to the specific impact.

For the purpose of this methodology the consequence of the impact is represented by:

$$C = \frac{(E + D + M + R) * N}{4}$$

Each individual aspect in the determination of the consequence is represented by a rating scale as defined in Table 1 below.

Table 1: Criteria for Determining Impact Consequence

Aspect	Score	Definition

Nature	- 1	Likely to result in a negative/ detrimental impact
	+1	Likely to result in a positive/ beneficial impact
Extent	1	Activity (i.e. limited to the area applicable to the specific activity)
	2	Site (i.e. within the development property boundary)
	3	Local (i.e. the area within 5 km of the site)
	4	Regional (i.e. extends between 5 and 50 km from the site)
	5	Provincial / National (i.e. extends beyond 50 km from the site)
Duration	1	Immediate (<1 year)
	2	Short term (1-5 years)
	3	Medium term (6-15 years)
	4	Long term (15-65 years, the impact will cease after the operational life span of the project)
	5	Permanent (>65 years, no mitigation measure of natural process will reduce the impact after construction)
Magnitude/ Intensity	1	Minor (where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected)
	2	Low (where the impact affects the environment in such a way that natural, cultural and social functions and processes are slightly affected)
	3	Moderate (where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way, moderate improvement for +ve impacts)
	4	High (where natural, cultural or social functions or processes are altered to the extent that it will temporarily cease, high improvement for +ve impacts)
	5	Very high / don't know (where natural, cultural or social functions or processes are altered to the extent that it will permanently cease, substantial improvement for +ve impacts)
Reversibility	1	Impact is reversible without any time and cost.
	2	Impact is reversible without incurring significant time and cost.
	3	Impact is reversible only by incurring significant time and cost.
	4	Impact is reversible only by incurring prohibitively high time and cost.
	5	Irreversible Impact.

Once the C has been determined, the ER is determined in accordance with the standard risk assessment relationship by multiplying the C and the P. Probability is rated/ scored as per Table 2.

Table 2: Probability Scoring

Probability		
	1	Improbable (the possibility of the impact materialising is very low as a result of design, historic experience, or implementation of adequate corrective actions; <25%),
	2	Low probability (there is a possibility that the impact will occur; >25% and <50%),
	3	Medium probability (the impact may occur; >50% and <75%),
	4	High probability (it is most likely that the impact will occur- > 75% probability), or
	5	Definite (the impact will occur),

The result is a qualitative representation of relative ER associated with the impact. ER is therefore calculated as follows:

$$ER = C \times P$$

Table 3: Determination of Environmental Risk

Consequence						
	5	5	10	15	20	25
	4	4	8	12	16	20
	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5
		1	2	3	4	5
	Probability					

The outcome of the environmental risk assessment will result in a range of scores, ranging from 1 through to 25. These ER scores are then grouped into respective classes as described in Table 4.

Table 4: Environmental Risk Scores

ER Score	Description
<9	Low (i.e. where this impact is unlikely to be a significant environmental risk/ reward).
≥9 ≤17	Medium (i.e. where the impact could have a significant environmental risk/ reward),
>17	High (i.e. where the impact will have a significant environmental risk/ reward).

The impact ER will be determined for each impact without relevant management and mitigation measures (pre-mitigation), as well as post implementation of relevant management and mitigation measures (post-mitigation). This allows for a prediction in the degree to which the impact can be managed/mitigated.

b. Impact Prioritisation

Further to the assessment criteria presented in the section above, it is necessary to assess each potentially significant impact in terms of:

1. Cumulative impacts; and
2. The degree to which the impact may cause irreplaceable loss of resources.

To ensure that these factors are considered, an impact prioritisation factor (PF) will be applied to each impact ER (post-mitigation). This prioritisation factor does not aim to detract from the risk ratings but rather to focus the attention of the

decision-making authority on the higher priority/significance issues and impacts. The PF will be applied to the ER score based on the assumption that relevant suggested management/mitigation impacts are implemented.

Table 5: Criteria for Determining Prioritisation

Cumulative Impact (CI)	Low (1)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.
	Medium (2)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is probable that the impact will result in spatial and temporal cumulative change.
	High (3)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is highly probable/ definite that the impact will result in spatial and temporal cumulative change.
Irreplaceable Loss of Resources (LR)	Low (1)	Where the impact is unlikely to result in irreplaceable loss of resources.
	Medium (2)	Where the impact may result in the irreplaceable loss (cannot be replaced or substituted) of resources but the value (services and/or functions) of these resources is limited.
	High (3)	Where the impact may result in the irreplaceable loss of resources of high value (services and/or functions).

The value for the final impact priority is represented as a single consolidated priority, determined as the sum of each individual criteria represented in Table 5. The impact priority is therefore determined as follows:

$$Priority = CI + LR$$

The result is a priority score which ranges from 2 to 6 and a consequent PF ranging from 1 to 1.5 (Refer to Table 6).

Table 6: Determination of Prioritisation Factor

Priority	Prioritisation Factor
2	1
3	1.125
4	1.25
5	1.375
6	1.5

In order to determine the final impact significance, the PF is multiplied by the ER of the post mitigation scoring. The ultimate aim of the PF is an attempt to increase the post mitigation environmental risk rating by a factor of 0.5, if all the priority attributes are high (i.e. if an impact comes out with a high medium environmental risk after the conventional impact rating, but there is significant cumulative impact potential and significant potential for irreplaceable loss of resources, then the net result would be to upscale the impact to a high significance).

Table 7: Final Environmental Significance Rating

Significance Rating	Description
<-17	High negative (i.e. where the impact must have an influence on the decision process to develop in the area).
≥-17, ≤-9	Medium negative (i.e. where the impact could influence the decision to develop in the area).
>-9, < 0	Low negative (i.e. where this impact would not have a direct influence on the decision to develop in the area).
0	No impact
>0, <9	Low positive (i.e. where this impact would not have a direct influence on the decision to develop in the area).
≥9, ≤17	Medium positive (i.e. where the impact could influence the decision to develop in the area).
>17	High positive (i.e. where the impact must have an influence on the decision process to develop in the area).

The significance ratings and additional considerations applied to each impact will be used to provide a quantitative comparative assessment of the alternatives being considered. In addition, professional expertise and opinion of the specialists and the environmental consultants will be applied to provide a qualitative comparison of the alternatives under consideration. This process will identify the best alternative for the proposed project.

7. Responsibilities

It is the responsibility of each EIMS employee and each external Specialist appointed by EIMS to ensure that this procedure is carried out as described. All the personnel within the organization have the responsibility to report any deviations/changes from the procedures to management. This is to ensure that the necessary changes are documented after approval.

It is the responsibility of the senior/ junior consultant (as applicable) assigned with the task of report compilation to ensure that this methodology/ procedure is strictly applied. It is the responsibility of the assigned Senior Consultant or Quality Reviewer to review and verify that the procedure has been complied with, and such documented at the specified quality check intervals.

8. Records

RECORD	STORAGE LOCATION	STORAGE SYSTEM	RESPONSIBLE PERSON	RETENTION PERIOD
Significance Rating Input Spreadsheet	Project File - /Server/assignments/ Job#/Records	Electronic-Scanned PDF	Project Manager	10 Years

9. Record of Changes, Revisions and Cancellations

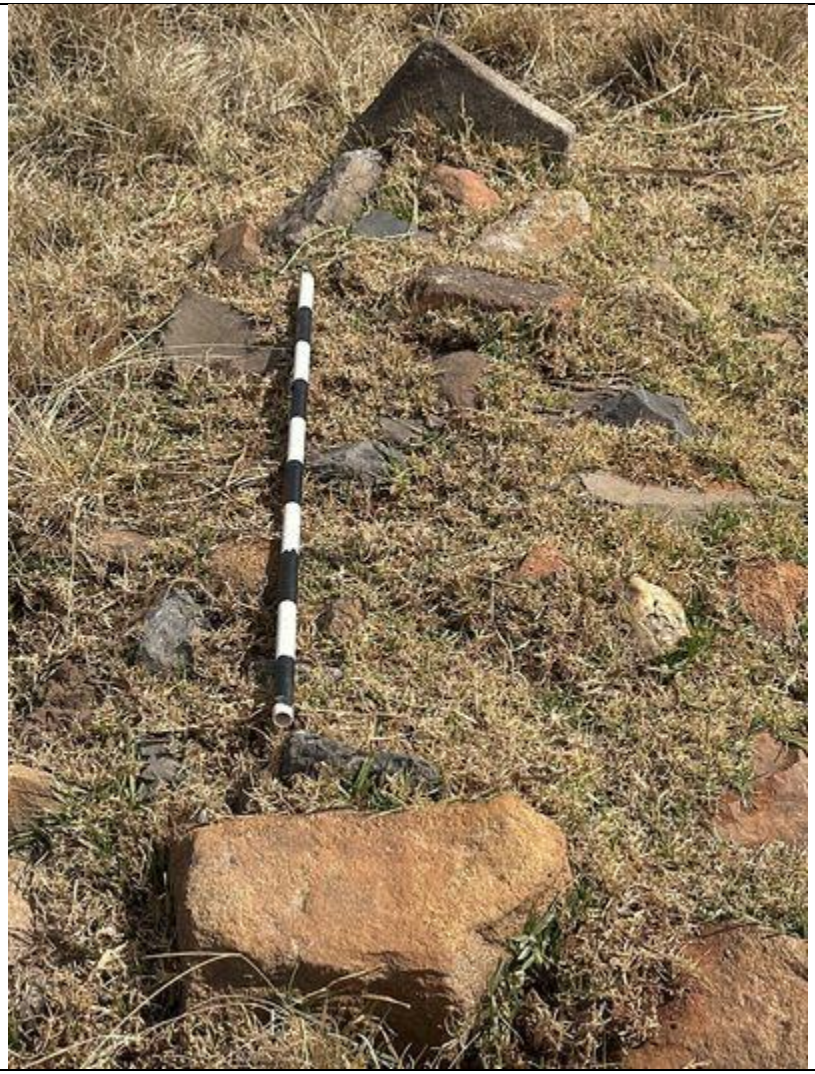
RECORD OF CHANGES, REVISIONS AND CANCELLATIONS		
DATE	NATURE / DETAIL OF CHANGE	REV No.

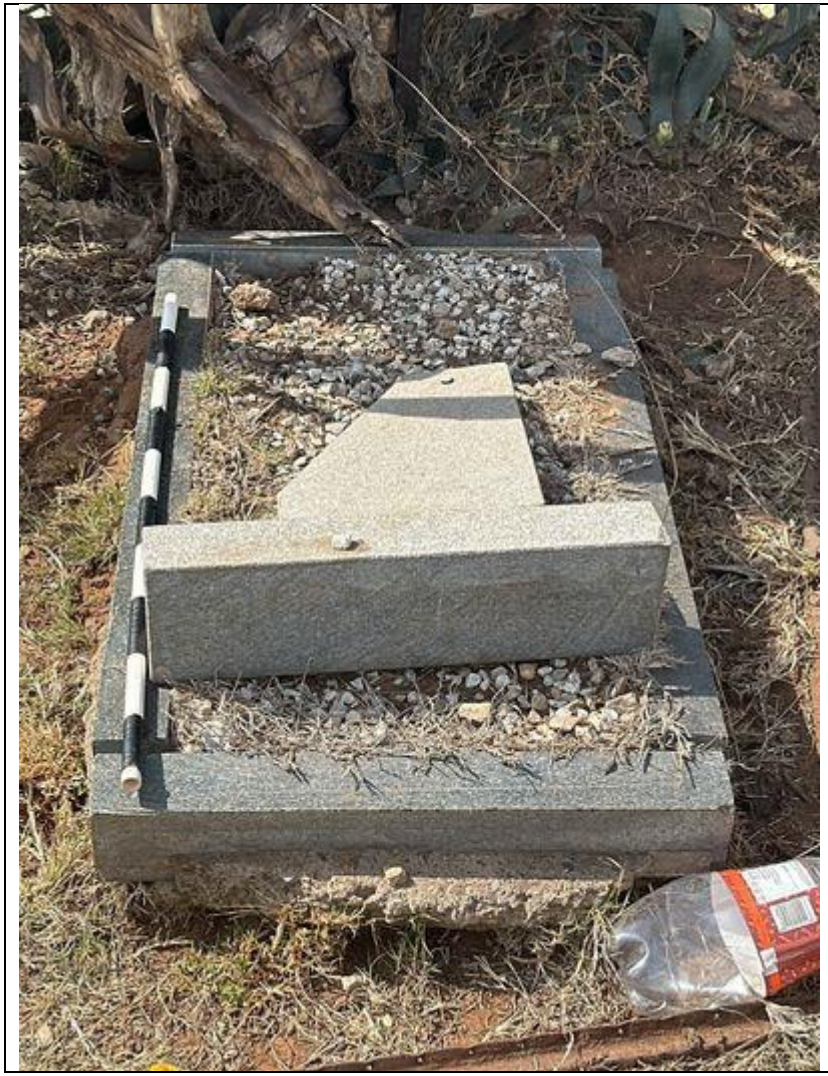
APPENDIX B

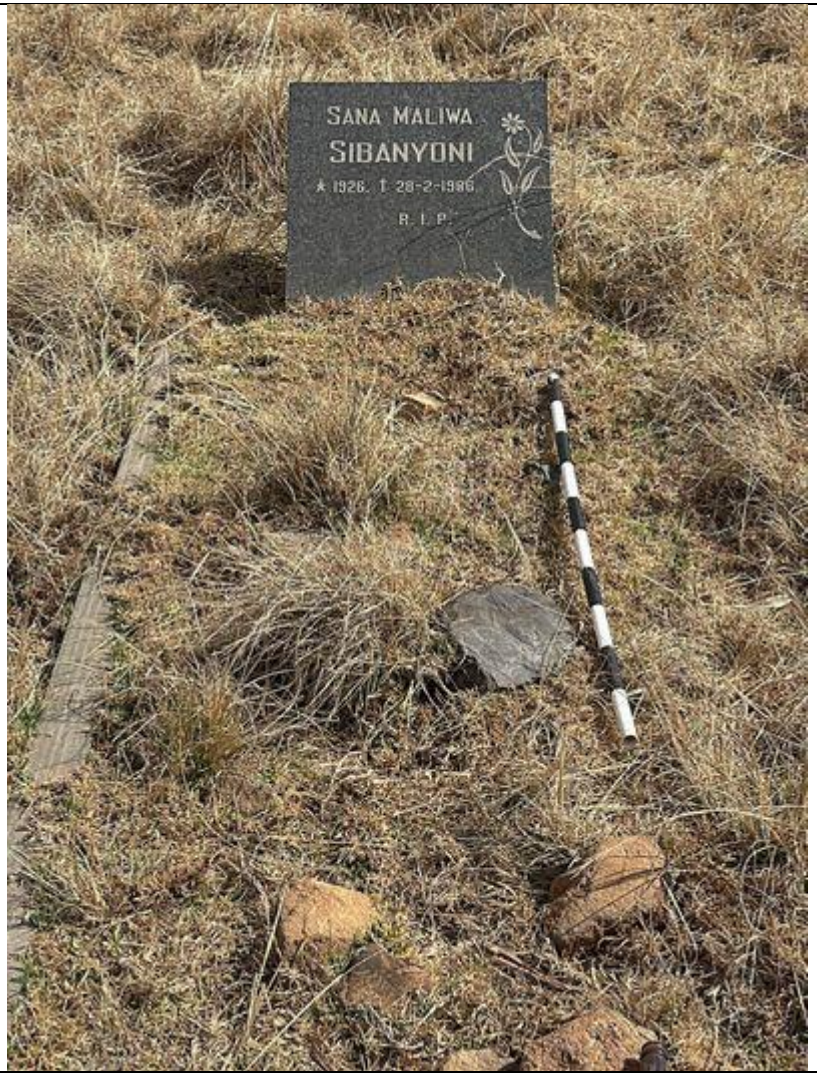
SITE DESCRIPTION FORMS

Site coordinates		
site_nr	**X**	**Y**
Z001	**28.99182**	**-26.12802**
Z002	**28.99005**	**-26.13779**
Z003	**29.00363**	**-26.15037**
Z004	**29.04605**	**-26.17193**

Site Number	Coordinates	Brief Site Description	Significance
Z001	-26.12802 28.99182	14 graves. Located within a small homestead area. Some with markers. Outside of the project boundary.	Grade 3 - A (IIIA), NCW

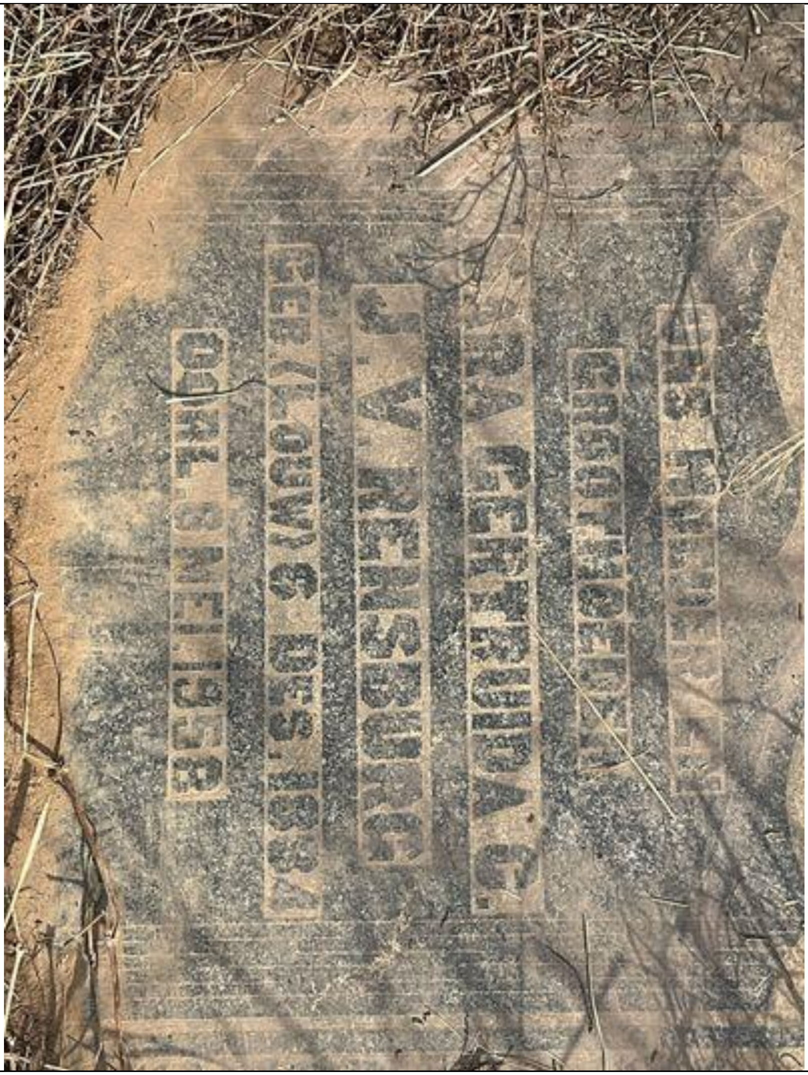




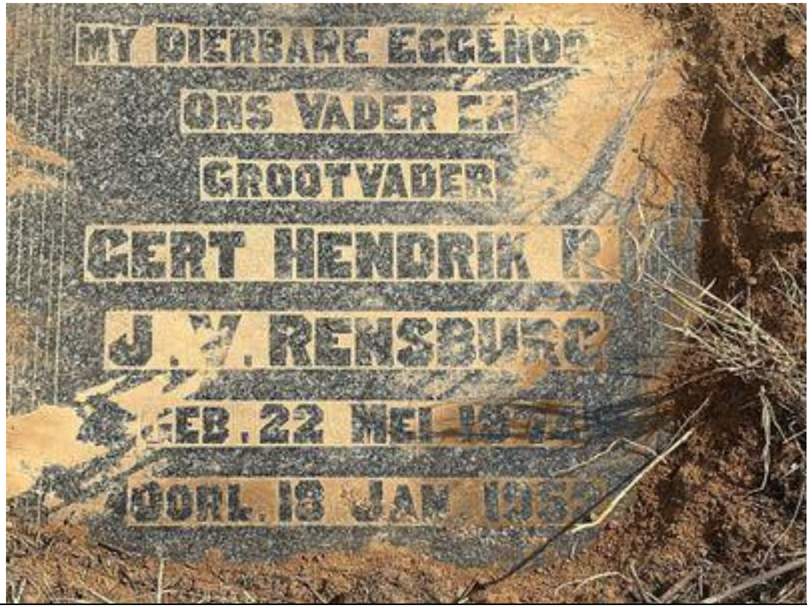

SANA MALIWA
SIBANYONI
* 1926. † 28-2-1986
R. I. P.


MARTHA MBONANI

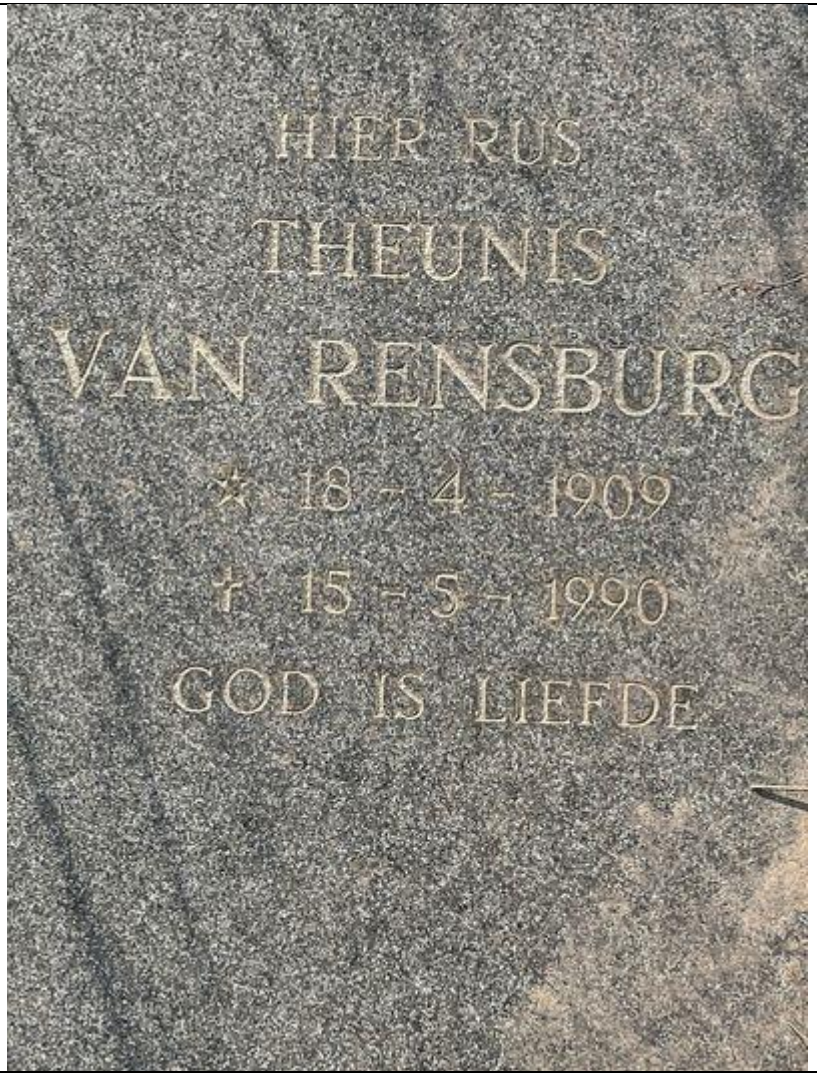
Site Number	Coordinates	Brief Site Description	Significance
Z002	-26.13779 28.99005	Approximately six graves with formal dressings. Very disturbed one appears to be vandalized by being exposed. Some of the grace dressings are collapsed.	Grade 3 - A (IIIA), NCW

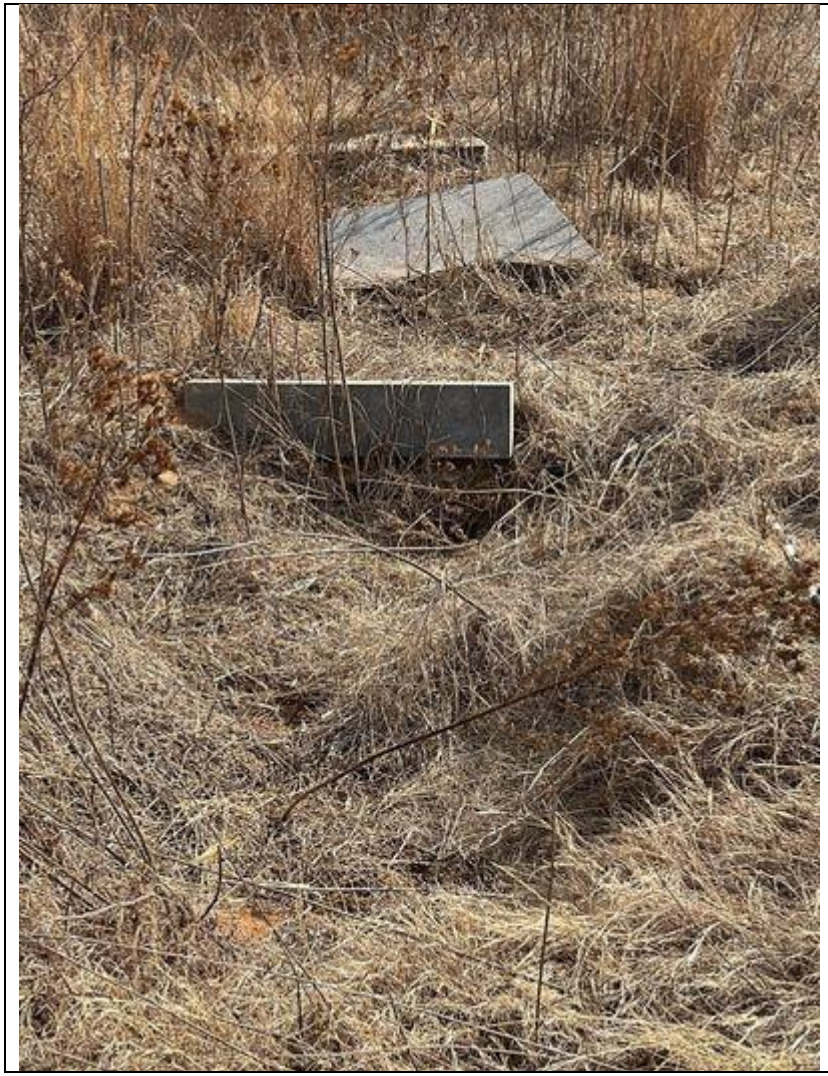


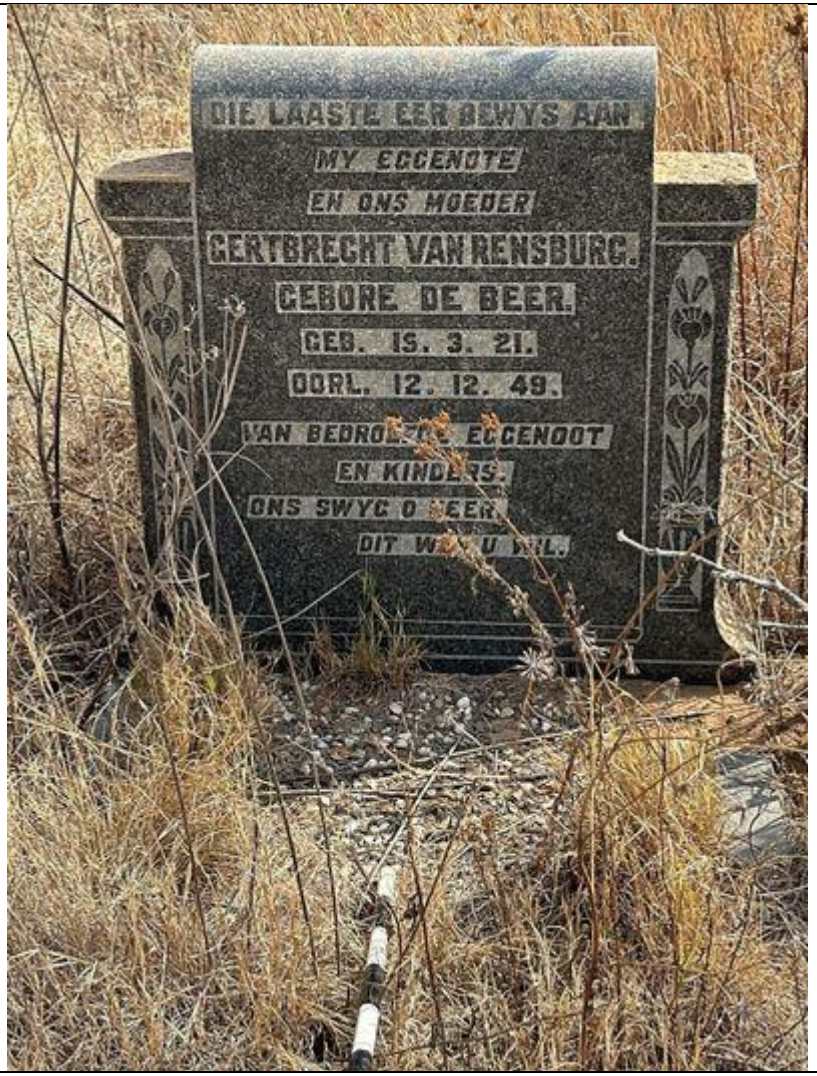
GROOTMOEDER
J. V. RENSBURG
GEB (LOUW) 6 DES 1884



MY DIERBARE EGGENOO
ONS VADER EN
GROOTVADER
GERT HENDRIK
RENSBURG
GEB. 22 MEI
OORL. 18 JAN

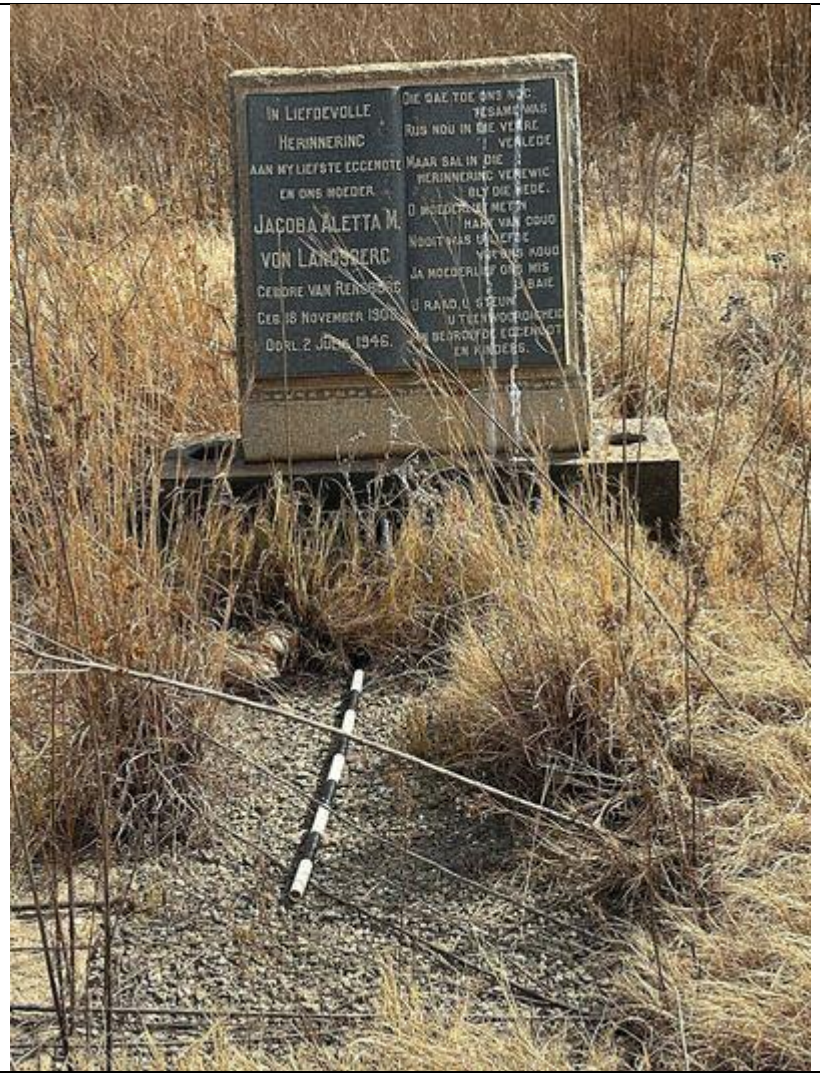

HIER RUS
THEUNIS
VAN RENSBURG
☆ 18 - 4 - 1909
† 15 - 5 - 1990
GOD IS LIEFDE




DIE LAASTE EER BEWYS AAN
MY EGGENOTE
EN ONS MOEDER
GERTBRECHT VAN RENSBURG.
GEBORE DE BEER.
GEB. 15. 3. 21.
OORL. 12. 12. 49.
EGGENOOT
EN KINDERS.


IN TERE HERINNERING
AAN
ONS GELIEFDE PAPPIE
EN OUPA
WILLIAM S.H.P.
VON LANDSBERG
GEB. 6 OKT. 1902
OORL. 17 APRIL 1970
TWEE MOEE OE
SLAAP SAG,
TWEE AFGEMATTE HANDE
IS STIL,
HY WAT SO HARD IN
DIE LEWE
GEWERK HET,
RUS NA GODS WIL.

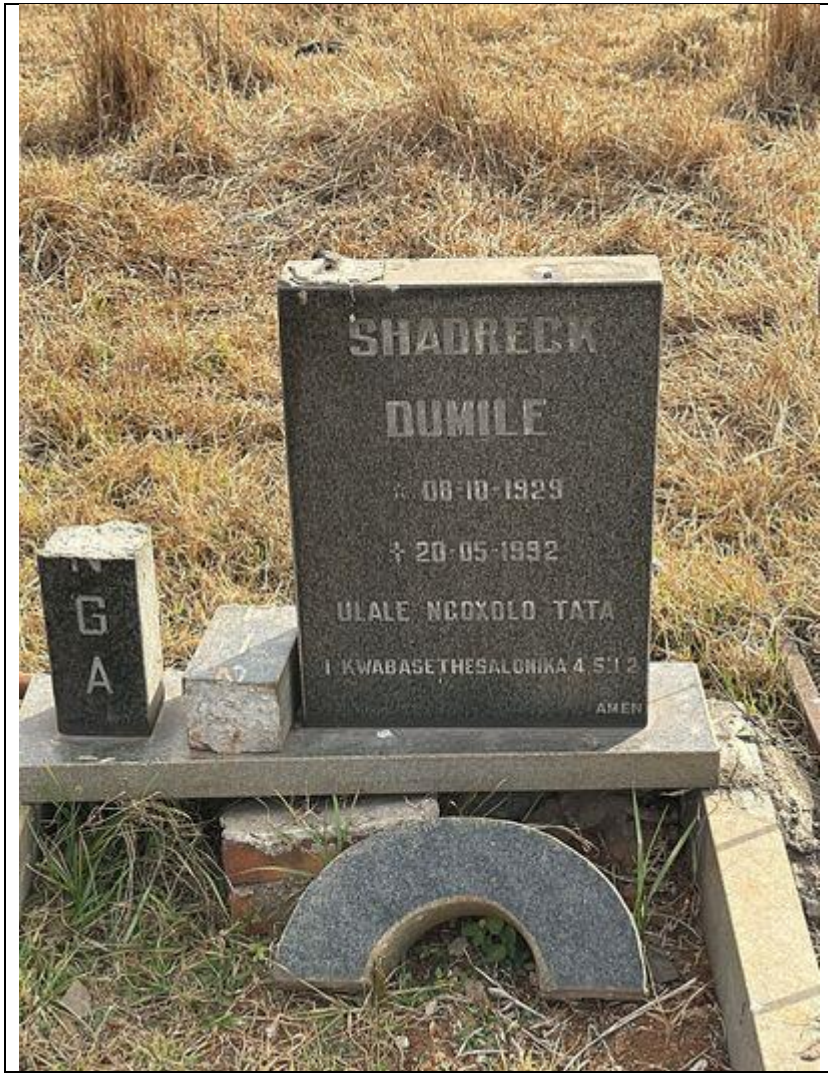

IN TERE HERINNERING
AAN
ONS GELIEFDE PAPPIE
EN OUPA
WILLIAM S.H.P.
VON LANDSBERG
GEB. 6 OKT. 1902
OORL. 17 APRIL 1970
TWEE MOEE OE
SLAAP SAG,
TWEE AFGEMATTE HANDE
IS STIL,
HY WAT SO HARD IN
DIE LEWE
GEWERK HET,
RUS NA GODS WIL.



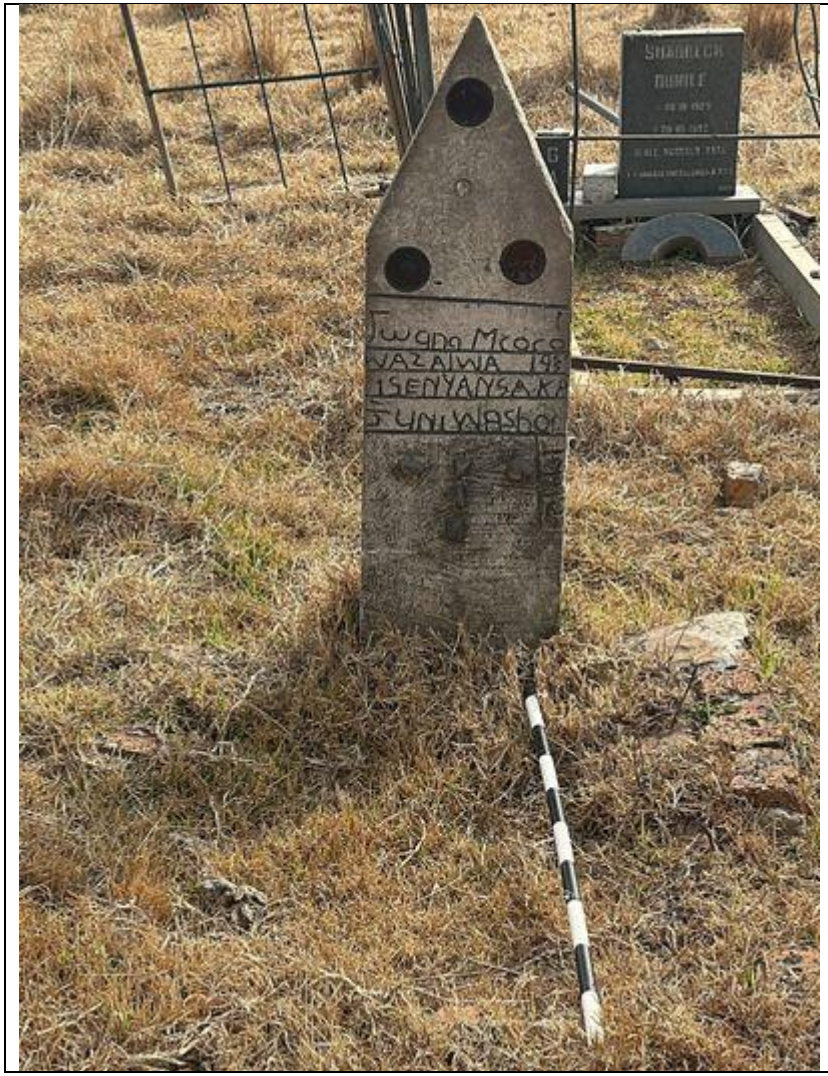
Site Number	Coordinates	Brief Site Description	Significance

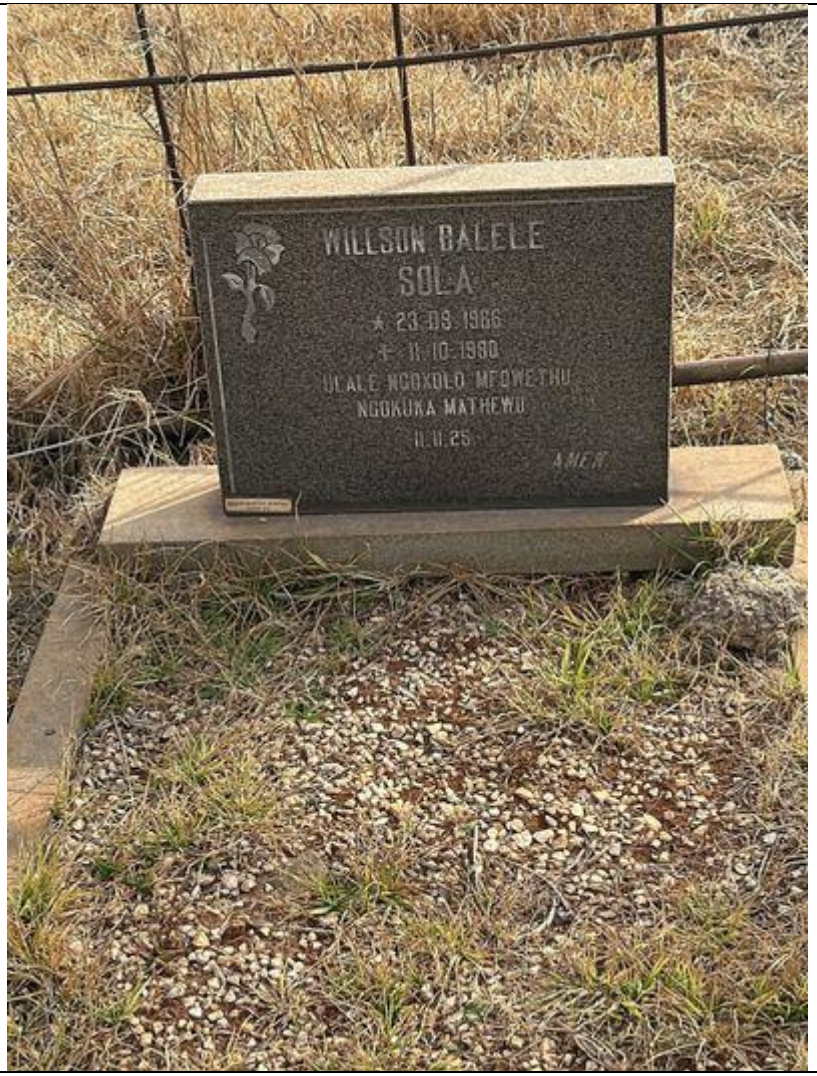
Z003	-26.15037 29.00363	Approximately 45 graves. Small informal cemetery. Many graves are collapsed or damaged. Does not appear to be maintained presently. Some have formal dressings, others just stone packed. Some vandalism appears to have occurred with some dressings. Surrounding fence is damaged.	Grade 3 - A (IIIA)

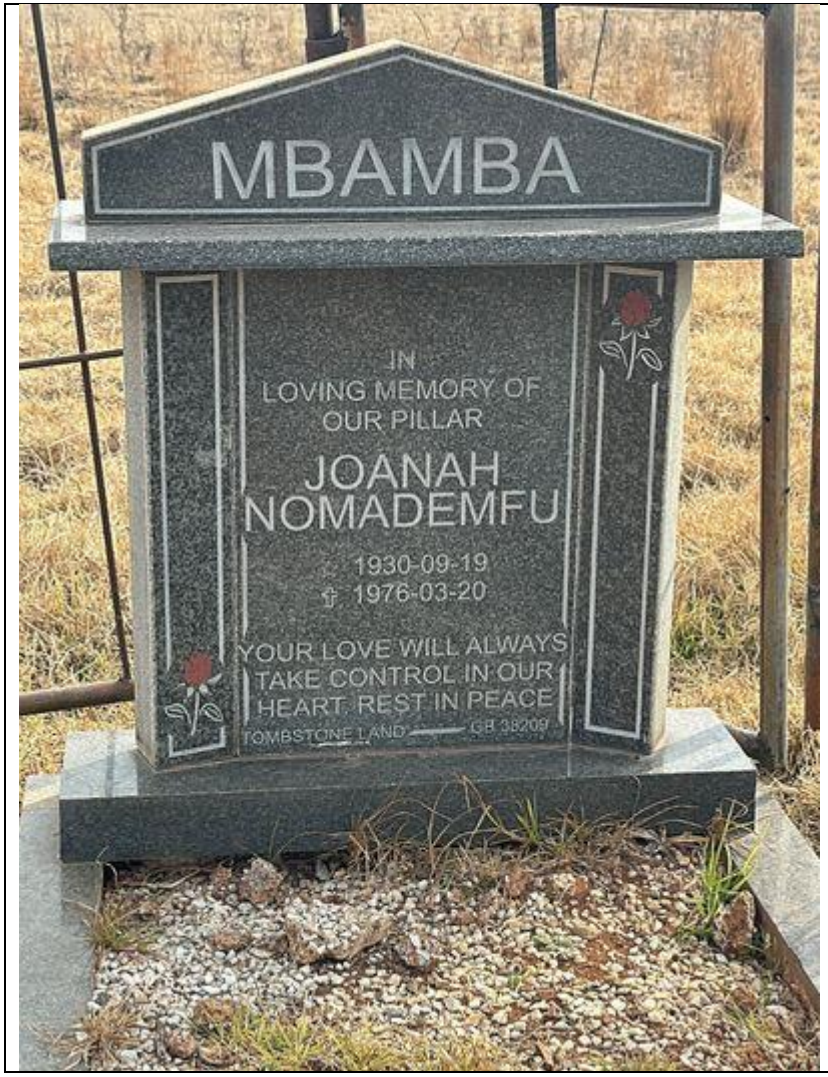

SIMON MASUKU


SHADRECK
DUMILE
08-10-1929
20-05-1992
ULALE NGOXOLO TATA
I KWABASETHESALONIKA 4 5 1 2
AMEN
G
A


SHADRECK
DUMILE




WILLSON BALELE
SOLA
★ 23.09.1986
✝ 11.10.1980
ULALE NGOXOLO MFOWETHU
NGOKUKA MATHEWU
11.11.25
AMEN


MBAMBA
IN
LOVING MEMORY OF
OUR PILLAR
JOANAH
NOMADEMFU
1930-09-19
1976-03-20
YOUR LOVE WILL ALWAYS
TAKE CONTROL IN OUR
HEART. REST IN PEACE
TOMBSTONE LAND
GB 38209

Site Number	Coordinates	Brief Site Description	Significance

Z004	-26.17193 29.04605	Small single building. Agricultural. Wooden window frames, steel door frames. Old chimney. Wooden slats for ceilings. Asbestos corrugated roof.	Grade 3 - C (IIIC)

APPENDIX C

PGS TEAM CVS

PROFESSIONAL CURRICULUM VITAE FOR JESSICA ANGEL

Professional Archaeologist for PGS Heritage

Personal Details

- **Name:** Jessica
- **Surname:** Angel
- **Date of Birth:** 25-12-1983
- **Citizenship:** South African
- **Gender:** Female
- **Marital Status:** Single
- **Languages Spoken**: English and Afrikaans
- **Drivers Licence** Code B – competent 4x4 driver
- **First Aid** (Level 1)
- **Snake Handling and snake bite first aid** (March 2019. African Snakebite Institute – Johan Marias)

Education History

- **2002**: Matriculated from Northcliff High School with the following subjects: English, Afrikaans, Mathematics, Science, Biology and Art.
- **2005**: Completed BA at University of the Witwatersrand with Geography and Archaeology Majors.
- **2006**: Completed BSc Hons (Geography) at the University of the Witwatersrand with the following subjects: Environmental Management, Advanced Geographic Information Systems (GIS), Paleogeomorphology and Globalisation and Agro Food Restructuring.
- **2009 – 2013**: M.Sc Archaeology and Geography, with thesis title: *Mpumalanga Late Iron Age: Incorporating Geographic Information Systems (GIS) and Archaeological Data to Better Understand Spatial and Temporal Distribution of Past Societies.* (Graduated March 2014).

Employment History

- **2015 – current:** Senior Archaeologist – PGS Heritage
- **2012-2013:** Basic internship at PGS. Duties include gaining familiarity with gathering relevant background data, field surveys, exhumations and report writing.
- **2013:** Heritage work at NGT. Background research, report writing and ground surveys.
- **2011**: Research Assistant: GIS work for Prof Karim Sadr. Duties include: Google Earth survey work and digitising. (Sadr, K & Rodier, X. 2012. Google Earth, GIS and stone-walled structures in southern Gauteng, South Africa. *Journal of Archaeological Science* xxx: 1-9)

Experience in the field of archaeology:

2012:

- First Phase Heritage Assessment. Belfast, Mpumalanga
- First Phase Heritage Assessment. Delareyville, Stone Age survey
- Heritage Assessment. Belfast Mpumalanga, Ndebele initiation site.

2013:

- Second Phase Impact Assessment. Pretoria East, Gauteng. Documentation and mapping the layout of an Iron Age site.
- Final Phase Impact Assessment. Grave Exhumation. Chlorkop, Gauteng
- First Phase Heritage Assessment. Belfast, Mpumalanga. Exxaro Paardeplaats Project.
- Grave Exhumation. Mafikeng. University of Pretoria research.
- First Phase Heritage Assessment. Port Nolloth, Namaqualand. Powerline.

2015

- Heritage inventory of the Ekuruleni area for Auracon
- Heritage Impact assessment, Heilbron, Freestate
- Second Phase Heritage Impact assessment. Documentation of an Iron age site, Rustenburg.
- Heritage Impact Assessment. Proposed Mining of the farm Zandvoort 10. Carolina, Mpumalanga. (SAHRIS CaseID:11952)
- Heritage Impact Assessment. The Rand en Dal Ext13 proposed development on Portion 29 of the Farm Paardeplaats117 IQ, Krugersdorp, Gauteng. (SAHRIS CaseID:7176)
- Heritage Impact Assessment. Proposed Jeanette Project. Welkom, Freestate.
- Heritage Impact Assessment. Proposed Sendawo 75MW Solar Photovoltaic (PV) Energy Facility. Vryburg, North West Province. (SAHRIS CaseID:9116)
- Heritage Impact Assessment. Proposed Tlisitseng 75MW Solar Photovoltaic (PV) Energy Facility. Lichtenburg, North West Province. (SAHRIS CaseID:9119)
- Second Phase Heritage Mitigation. Clanwilliam Dam Project. Clanwilliam, Western Cape. Heritage management and mitigation of 90 archaeological and historical sites that are to be impacted by the Raising of the Clanwilliam Dam wall. (Collections manager: three year contract).

2016

- Heritage Impact Assessment. Proposed Ngwedi Loop. Rustenburg, North West Province

- Heritage Impact Assessment. Proposed N2 Bypass. Butterworth, Eastern Cape
- Heritage Impact. Sibanye Gold Proposed PV Plant. Westonaria, Gauteng
- Heritage Impact Assessment. Proposed City Parks Wetlands. Middle Soweto, Gauteng.
- Heritage Impact Assessment. Proposed Newtown Development. Pilgrimsrest, Mpumalanga.
- Heritage Impact Assessment. Proposed development of the Platberg Wind Energy Facility and supporting electrical infrastructure. Victoria West, Northern Cape. (SAHRIS CaseID:9301)
- Heritage Impact Assessment. Proposed Aletta and Eureka Wind Energy Facility (WEF). Copperton, Northern Cape. (SAHRIS CaseID:9810)
- Heritage Impact Assessment. Proposed upgrade of the Newlands Bulk Water Supply Scheme. East London, Eastern Cape.
- Heritage Impact Assessment, Leeuwbosch 44, Leeudoringstad, North West Province. Proposed construction of the 5MW Solar Photovoltic (PV) Power Plant. (SAHRIS CaseID:10407)
- Heritage Impact Assessment, Wildebeestkuil 59, Leeudoringstad, North West Province. Proposed construction of the 5MW Solar Photovoltic (PV) Power Plant.
- Heritage Impact Assessment. Proposed development of four Leeuwberg Wind Farms for the Associated Grid Connection near Loeriesfontein, Northern Cape Province. (SAHRIS CaseID:12081, 12082, 12078, 12077)
- Heritage Fatal Flaw Assessment, for the inclusion in the Environmental Screening Investigation for the Proposed Arnot New Ash Disposal Facility, Mpumalanga.
- Heritage Walk Down and Management Plan. Upgrading of the 66KV Network to a 132KV Network in the Hotazel, Kuruman and Kathu Area, Northern Cape Province. Post Authorisation Walkdown from Mothibistad Substation to Sekgame Switching Station. (SAHRIS CaseID:11967)
- Heritage Screening of Portion 9 of the Farm Grootfontein 394 JR, Tswane, Gauteng.
- Second Phase Heritage Mitigation. Mitigation work required with respect to the heritage find PGS06 on the remainder of the farm number 469, Hay District (Registration division), Tsantsabane Local Municipality, Northern Cape Province, in respect to the ACWA Power Solar reserve, Redstone Solar Thermal Power Plant. (SAHRIS CaseID:10081)
- Second Phase Heritage Mitigation. Clanwilliam Dam Project. Continued from 2015

2017

- Heritage Impact Assessment for the Proposed Lanseria Outfall Sewer, Johannesburg. (SAHRIS CaseID:11397)
- Heritage Study. Proposed opencast Mining on the Farm Kwaggafontein 8 IT, near Carolina, Mpumalanga Province. (SAHRIS CaseID:11952)

- Heritage Impact Assessment for the Proposed K60 Road Development, Rabie Ridge Gauteng.
- Heritage Impact Assessment. Kimberly Ekapa Mining Joint Venture 2.8 Slimes Pipeline Project, Kimberly, Northern Cape Province.
- Heritage Screening and Site Assessment. MTK 39/2015/16 Mintek Derelict and Ownerless Mines Rehabilitation Programme 2016-2019. Msauli Mine, Steelpoort Mine, Penge Mine, Langerdraai Mine and Uitkuik Mine.
- Heritage Impact Assessment. Proposed Phalandwa Extension Mine, Delmas, Mpumalanga.
- Site Assessment and Heritage Screening. Wadeville Extension 51. Township establishment and associated infrastructure development on Portion 273 and the remaining extent of Portion 267 on the Farm Klippoortjie 110 – IR. Ekurhuleni, Gauteng.
- Site assessment and Heritage Scoping. Proposed eMakhazeni Project near Belfast, Mpumalanga. (SAHRIS CaseID:12316)
- Heritage Impact Assessment. Proposed extension of the mining operations at the existing Ilima Colliery (Old Pembani Colliery), Near Carolina, Mpumalanga. (SAHRIS CaseID:12793)
- Heritage Impact Assessment. Proposed Mlonzi Golf Estate and Hotel, near Lusikisiki, Eastern Cape.

- Second Phase Heritage Mitigation. Clanwilliam Dam Project. Continued from 2015

2018

- Heritage Impact Assessment. Proposed Extension of the Mining Operations at the Existing Manungu Colliery, near Delmas, Mpumalanga.
- Heritage Impact Assessment. Proposed Mashishing Housing Development, Lydenburg, Mpumalanga. (SAHRIS CaseID:12999)
- Heritage Impact Assessment. Phase 1B1 Thornhill Housing Development, Port Alfred, Eastern Cape Province.
- Heritage Impact Assessment. Target to Freddies Pipeline, Allanridge, Freestate.
- Heritage Impact Assessment. Proposed Leslie Coal Mine near Leandra, Mpumalanga. (SAHRIS CaseID:12399)

2020

- Coega Zone 10, Coega IDZ, Eastern Cape Province. Colonial Period Phase 2 Mitigation Archaeological Excavation

2018 to 2023

- Presently employed on the Polihali Dam Project in Lesotho as Collections Manager (5 year contract).

The Polihali Dam Project is a 2nd Phase CRM operation in mitigation of total inundation of a range of cultural sites, including extant, historical and Stone Age sites. Nine (9) APC and thirty one (31) LSA sites are earmarked for detailed survey and excavation.

WOUTER FOURIE

Professional Heritage Practitioner

PROFILE

Project Manager and Principal Heritage Specialist holds a post-graduate degree in Archaeology and is registered with the Association of Southern African Professional Archaeologists as a Professional Archaeologist and is accredited as a Principal Investigator; he is further an Accredited Professional Heritage Practitioner with the Association of Professional Heritage Practitioners in South Africa.

My work focuses on heritage management through Heritage Impact Assessments, implementation of recommendations and large-scale heritage mitigation projects. I have worked, completed and implemented heritage projects in South Africa, Botswana, Mozambique, Mauritius, Zambia, Lesotho, and the Democratic Republic of the Congo.

CONTACT

PHONE NUMBER:
+27 82 851 3575
+258 84 774 6768
WEBSITE:
www.pgsheritage.com
EMAIL ADDRESS:
wouter@pgsheritage.com

PGS HERITAGE

EDUCATION

University of Pretoria
1993-1996
BA Degree - Majors in Archaeology, Anthropology and Geography

University of Pretoria
1997
BA Hon Archaeology, with further specialisation in environmental management.

University of Cape Town
2016 – present
MPhil Conservation of the Built Environment

WORK EXPERIENCE

PGS Heritage Group of Companies
(***South Africa, Lesotho, Mozambique, and Portugal***)
Director – Heritage Specialist
2003- present
I am actively involved in the management of the business and focus on marketing and new business for PGS, specifically the broader SADC region. Acting as heritage specialist in multidisciplinary teams

The University of the Witwatersrand - Project Manager – Archaeological Contracts Unit
2007-2008
Responsible for conducting heritage and archaeological impact studies, archaeological excavations and general management of the unit

Matakoma Consultants – Director – Heritage Specialist
2000 – 2008
Heritage specialist and Director responsible for heritage and archaeological impact studies

Randfontein Estate Gold Mine – Environmental Coordinator
Oct 1998- Feb 2000
Coordinating all environmental Rehabilitation work

Department of Minerals and Energy Environmental Officer
Oct 1997– Sept 1998

PROFESSIONAL AFFILIATION

Accredited Professional Heritage Practitioner
Association of Professional Heritage Practitioners
Since 2014

Accredited Professional Archaeologist
Association of Southern African Professional Archaeologists –
Since 2001