

HERITAGE IMPACT ASSESSMENT

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

FOR THE PROPOSED HENDRINA SOUTH GRID INFRASTRUCTURE, MPUMALANGA
PROVINCE.

Type of development:

Renewable Energy Grid Connection

Client:

Cabanga Environmental

Developer:

ENERTRAG South Africa (Pty) Ltd



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Authority Reference Number	14/12/16/3/3/2/2129
Report Status	Final report
Applicant Name	ENERTRAG South Africa (Pty) Ltd

Responsibility	Name	Qualifications and Certifications	Date
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Palaeontological Assessment	Prof Marion Bamford	PhD Paleo Botany	March 2022

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Amendments on Document

Date	Report Reference Number	Description of Amendment
23 May 2022	2041	Technical revisions

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REPORT OUTLINE

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

Table 1. Specialist Report Requirements.

Requirement from Appendix 6 of GN 326 EIA Regulation 2017	Chapter
(a) Details of - (i) the specialist who prepared the report; and (ii) the expertise of that specialist to compile a specialist report including a curriculum vitae	Section a
(b) Declaration that the specialist is independent in a form as may be specified by the competent authority	<i>Declaration of Independence</i>
(c) Indication of the scope of, and the purpose for which, the report was prepared	Section 1
(cA) an indication of the quality and age of base data used for the specialist report	Section 3.4
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 9
(d) Duration, Date and season of the site investigation and the relevance of the season to the outcome of the assessment	Section 3.4
(e) Description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used	Section 3
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of site plan identifying site alternatives;	Section 8 and 9
(g) Identification of any areas to be avoided, including buffers	Section 8 and 9
(h) Map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers	Section 8
(I) Description of any assumptions made and any uncertainties or gaps in knowledge	Section 3.7
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity including identified alternatives on the environment or activities;	Section 1.3
(k) Mitigation measures for inclusion in the EMPr	Section 10.1
(l) Conditions for inclusion in the environmental authorisation	Section 10. 1.
(m) Monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 10. 5.
(n) Reasoned opinion - (i) as to whether the proposed activity, activities or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity or activities; and (ii) if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	Section 10.3
(o) Description of any consultation process that was undertaken during the course of preparing the specialist report	Section 5
(p) A summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Refer to EIA report
(q) Any other information requested by the competent authority	No other information is requested at this time

Executive Summary

Cabanga Environmental was appointed by ENERTRAG South Africa (Pty) Ltd (ENERTRAG, or Developer hereafter) to undertake an Environmental Impact Assessment (EIA) process for the proposed Hendrina South Grid Infrastructure over various Portions of the Farms Broodsnyersplaats 251S, Bultfontein 1871S, Dunbar1891S, Geluk 261S, Komati Power Station 561S and Wilmansrust 471S. Mpumalanga Province. The proposed project involves the construction and operation of electricity distribution infrastructure, to connect the proposed Hendrina South Wind Energy Facility (WEF) to the substation at the Komati Power Station. Beyond Heritage was appointed to conduct a Heritage Impact Assessment (HIA) for the project and the study area was assessed through a desktop assessment and by a high-level non-intrusive pedestrian field survey. Key findings of the assessment include:


- The Project area is characterised by extensive cultivated fields and is considered to be of low archaeological potential;
- This was confirmed during the field survey and no archaeological sites of significance were noted and finds were limited to ruins and graves;
- The Grid components and two powerline alternatives (Option A & B) were assessed. Both will directly impact burial sites (095 & 096);
- This assessment recorded the range of heritage resources expected in the Project area however more sites could be recorded during the pre-construction walkthrough;
- According to the SAHRA Paleontological sensitivity map the study area is of very high paleontological significance (Figure 8.2) and an independent study was conducted for this aspect. Bamford (2022) concluded that it is extremely unlikely that any fossils would be preserved in the loose soils and sands of the Quaternary. There is a very small chance that fossils may occur in the shales and siltstones of the early Permian Vryheid Formation, but only more than 5m below the surface, therefore, a Fossil Chance Find Protocol should be added to the EMPr.

The impact on heritage resources can be mitigated to an acceptable level provided that the recommendations in this report are adhered to, based on the South African Heritage Resource Authority (SAHRA) 's approval.

Recommendations:

- Implementation of the ENERTRAG Chance Find Procedure for the project (Appendix A);
- Avoidance of burial sites (095 & 096) with a 30 meter buffer;
- Pre-construction heritage walkdown of final pylon positions.

Declaration of Independence

Specialist Name	Jaco van der Walt
Declaration of Independence	<p>I declare, as a specialist appointed in terms of the National Environmental Management Act (Act No 107 of 1998) and the associated 2014 Environmental Impact Assessment (EIA) Regulations (as amended), that I:</p> <ul style="list-style-type: none"> • I act as an independent specialist in this application; • I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant; • I declare that there are no circumstances that may compromise my objectivity in performing such work; • I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity; • I will comply with the Act, Regulations and all other applicable legislation; • I have no, and will not engage in, conflicting interests in the undertaking of the activity; • I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority; • All the particulars furnished by me in this form are true and correct; and • I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.
Signature	
Date	08/04/2022

a) Expertise of the specialist

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

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

TABLE OF CONTENTS

REPORT OUTLINE	4
EXECUTIVE SUMMARY	5
DECLARATION OF INDEPENDENCE	6
A) EXPERTISE OF THE SPECIALIST.....	6
ABBREVIATIONS	9
GLOSSARY	9
1 INTRODUCTION AND TERMS OF REFERENCE:	10
1.1 TERMS OF REFERENCE.....	10
1.2 PROJECT DESCRIPTION	11
1.3 ALTERNATIVES	11
2 LEGISLATIVE REQUIREMENTS	16
3 METHODOLOGY	17
3.1 LITERATURE REVIEW.....	17
3.2 GENEALOGICAL SOCIETY AND GOOGLE EARTH MONUMENTS.....	17
3.3 PUBLIC CONSULTATION AND STAKEHOLDER ENGAGEMENT:.....	17
3.4 SITE INVESTIGATION.....	18
3.5 SITE SIGNIFICANCE AND FIELD RATING.....	20
3.6 IMPACT ASSESSMENT METHODOLOGY.....	22
3.7 LIMITATIONS AND CONSTRAINTS OF THE STUDY	23
4 DESCRIPTION OF SOCIO-ECONOMIC ENVIRONMENT	23
5 RESULTS OF PUBLIC CONSULTATION AND STAKEHOLDER ENGAGEMENT:	23
6 LITERATURE / BACKGROUND STUDY:	24
6.1 LITERATURE REVIEW (SAHRIS)	24
6.2 ARCHAEOLOGICAL BACKGROUND.....	24
7 DESCRIPTION OF THE PHYSICAL ENVIRONMENT	26
8 FINDINGS OF THE SURVEY	28
8.1 HERITAGE RESOURCES.....	28
8.2 CULTURAL LANDSCAPE.....	30
8.3 PALEONTOLOGICAL HERITAGE	30
9 POTENTIAL IMPACT	31
10 CONCLUSION AND RECOMMENDATIONS	35

10.1	RECOMMENDATIONS FOR CONDITION OF AUTHORISATION.....	35
10.2	CHANCE FIND PROCEDURES	ERROR! BOOKMARK NOT DEFINED.
10.3	REASONED OPINION	36
10.4	POTENTIAL RISK	36
10.5	MONITORING REQUIREMENTS	37
10.6	MANAGEMENT MEASURES FOR INCLUSION IN THE EMPR	39
10.7	KNOWLEDGE GAPS	ERROR! BOOKMARK NOT DEFINED.
11	REFERENCES.....	41

LIST OF FIGURES

FIGURE 1.1. REGIONAL SETTING OF THE PROJECT (1: 250 000 TOPOGRAPHICAL MAP).....	13
FIGURE 1.2. LOCAL SETTING OF THE PROJECT (1: 50 000 TOPOGRAPHICAL MAP). NOTE THE EXTENSIVE CULTIVATION IN THE PROJECT AREA.	14
FIGURE 1.3. AERIAL IMAGE OF THE PROPOSED LAYOUT.	15
FIGURE 7.1. AREAS USED FOR GRAZING AND CULTIVATION.	27
FIGURE 7.2. PLOUGHED FIELDS IN THE PROJECT AREA.	27
FIGURE 7.3. EXISTING POWERLINE IN CULTIVATED AREA.....	27
FIGURE 7.4. GENERAL SITE CONDITIONS UNDER EXISTING POWERLINE.	27
FIGURE 8.1. SITE DISTRIBUTION IN RELATION TO THE PROPOSED LAYOUT.....	28
FIGURE 8.2. PALEONTOLOGICAL SENSITIVITY OF THE APPROXIMATE STUDY AREA (YELLOW POLYGON) AS INDICATED ON THE SAHRA PALAEOLOGICAL SENSITIVITY MAP.	30

LIST OF TABLES

TABLE 1. SPECIALIST REPORT REQUIREMENTS.....	4
TABLE 2: PROJECT DESCRIPTION	11
TABLE 3: INFRASTRUCTURE AND PROJECT ACTIVITIES	11
TABLE 4: SITE INVESTIGATION DETAILS	18
TABLE 5: HERITAGE SIGNIFICANCE AND FIELD RATINGS.....	21
TABLE 6. STUDIES CONDUCTED IN THE GREATER AREA.....	24
TABLE 7. IMPACT ASSESSMENT FOR THE PROJECT.....	34
TABLE 8. MONITORING REQUIREMENTS FOR THE PROJECT.....	37
TABLE 9. HERITAGE MANAGEMENT PLAN FOR EMPR IMPLEMENTATION	39

ABBREVIATIONS

ASAPA: Association of South African Professional Archaeologists
BGG Burial Ground and Graves
CFPs: Chance Find Procedures
CMP: Conservation Management Plan
CRR: Comments and Response Report
CRM: Cultural Resource Management
DFFE: Department of Fisheries, Forestry and Environment,
EA: Environmental Authorisation
EAP: Environmental Assessment Practitioner
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EAP: Environmental Assessment Practitioner
EO: Environmental Officer
EPC: Engineering Procurement and Construction
EMPr: Environmental Management Programme
ESA: Early Stone Age
ESIA: Environmental and Social Impact Assessment
GIS Geographical Information System
GPS: Global Positioning System
GRP Grave Relocation Plan
HIA: Heritage Impact Assessment
LIA: Late Iron Age
LSA: Late Stone Age
MEC: Member of the Executive Council
MIA: Middle Iron Age
MPRDA: Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
MSA: Middle Stone Age
NEMA National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NID Notification of Intent to Develop
NoK Next-of-Kin
PRHA: Provincial Heritage Resource Agency
SADC: Southern African Development Community
SAHRA: South African Heritage Resources Agency

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

GLOSSARY

Archaeological site (remains of human activity over 100 years old)

Early Stone Age (~ 2.6 million to 250 000 years ago)

Middle Stone Age (~ 250 000 to 40-25 000 years ago)

Later Stone Age (~ 40-25 000, to recently, 100 years ago)

The Iron Age (~ AD 400 to 1840)

Historic (~ AD 1840 to 1950)

Historic building (over 60 years old)

1 Introduction and Terms of Reference:

Beyond Heritage was appointed to conduct a Heritage Impact Assessment (HIA) for the proposed construction of the Hendrina South Grid Infrastructure over various Portions of the Farms Broodsnyersplaats 25IS, Bultfontein 187IS, Dunbar189IS, Geluk 26IS, Komati Power Station 56IS and Wilmansrust 47IS. The Project is within the Steve Tshwete Local Municipality (Nkangala District Municipality) in Mpumalanga (Figure 1.1 to 1.3). The report forms part of the Environmental Impact Assessment (EIA) and Environmental Management Programme (EMPr) for the development.

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

During the survey, burial sites were recorded. General site conditions and features on sites were recorded by means of photographs, GPS locations and site descriptions. Possible impacts were identified and mitigation measures are proposed in this report. SAHRA require all environmental documents, compiled in support of an Environmental Authorisation application as defined by NEMA EIA Regulations section 40 (1) and (2), to be submitted to SAHRA for commenting. Upon submission to SAHRA the project will be automatically given a case number as reference. As such the EIA report and its appendices must be submitted to the case as well as the EMPr, once it's completed by the Environmental Assessment Practitioner (EAP).

1.1 Terms of Reference

Field study

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

Reporting

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

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

1.2 Project Description

Project components and the location of the Hendrina South Grid Infrastructure are outlined under Table 2 and 3.

Table 2: Project Description

Farm and Magisterial District	<ul style="list-style-type: none"> • Broodsnyersplaats 25 IS 11 • Broodsnyersplaats 25 IS 7 • Bultfontein 187 IS 10 • Bultfontein 187 IS 14 • Bultfontein 187 IS 2 • Bultfontein 187 IS 3 • Bultfontein 187 IS 4 • Bultfontein 187 IS 6 • Dunbar 189 IS 1 • Dunbar 189 IS 3 • Dunbar 189 IS 4 • Dunbar 189 IS 5 • Dunbar 189 IS 6 • Dunbar 189 IS 7 • Geluk 26 IS 26 • Geluk 26 IS 6 • Geluk 26 IS 7 • Komati Power Station 56 IS • Wilmansrust 47 IS • Wilmansrust 47 IS 3 <p>The Project is within the Steve Tshwete Local Municipality (Nkangala District Municipality). The site is approximately 30 kilometres (km) northeast of Bethal and 15 km south west of Hendrina, Mpumalanga.</p>
Central co-ordinate of the development	26°12'49.62"S 29°34'21.44"E
Topographic Map Number	2629AB and BA

Table 3: Infrastructure and project activities

Type of development	Renewable Energy grid connection
Size of development	~ 16 km
Project Components	Powerline and substation

1.3 Alternatives

Two different grid solutions are being investigated:

1. Grid solution 1, mapped as option A (new substation and powerline):

The substation site comprises 3 Hectares (Ha).

The proposed powerline (up to and including 275kV) to the substation at the Komati Power Station will be approximately 16km long.

2. Grid solution 2, mapped as option B (new substation and LILO):

Conduct a Loop-in-Loop-Out (LILO) connection onto the existing Eskom transmission lines (275-400kV) and constructing a new substation (3 ha) at this connection point. This will include a short powerline of up to 250m connecting the new substation to the existing transmission line.

The extent of the area assessed allows for siting of the development within this area to minimize impacts to heritage resources.

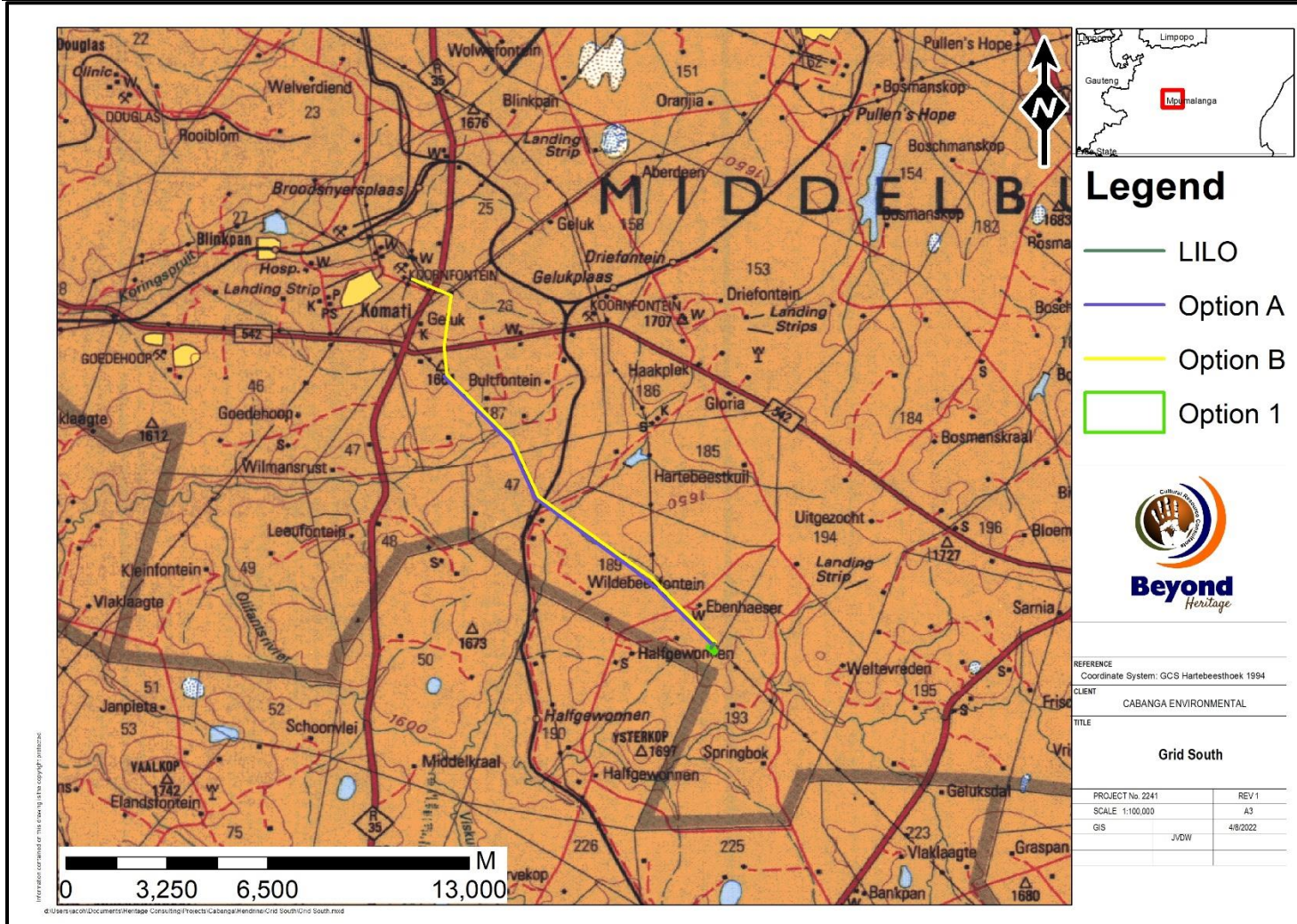


Figure 1.1. Regional setting of the Project (1: 250 000 topographical map).

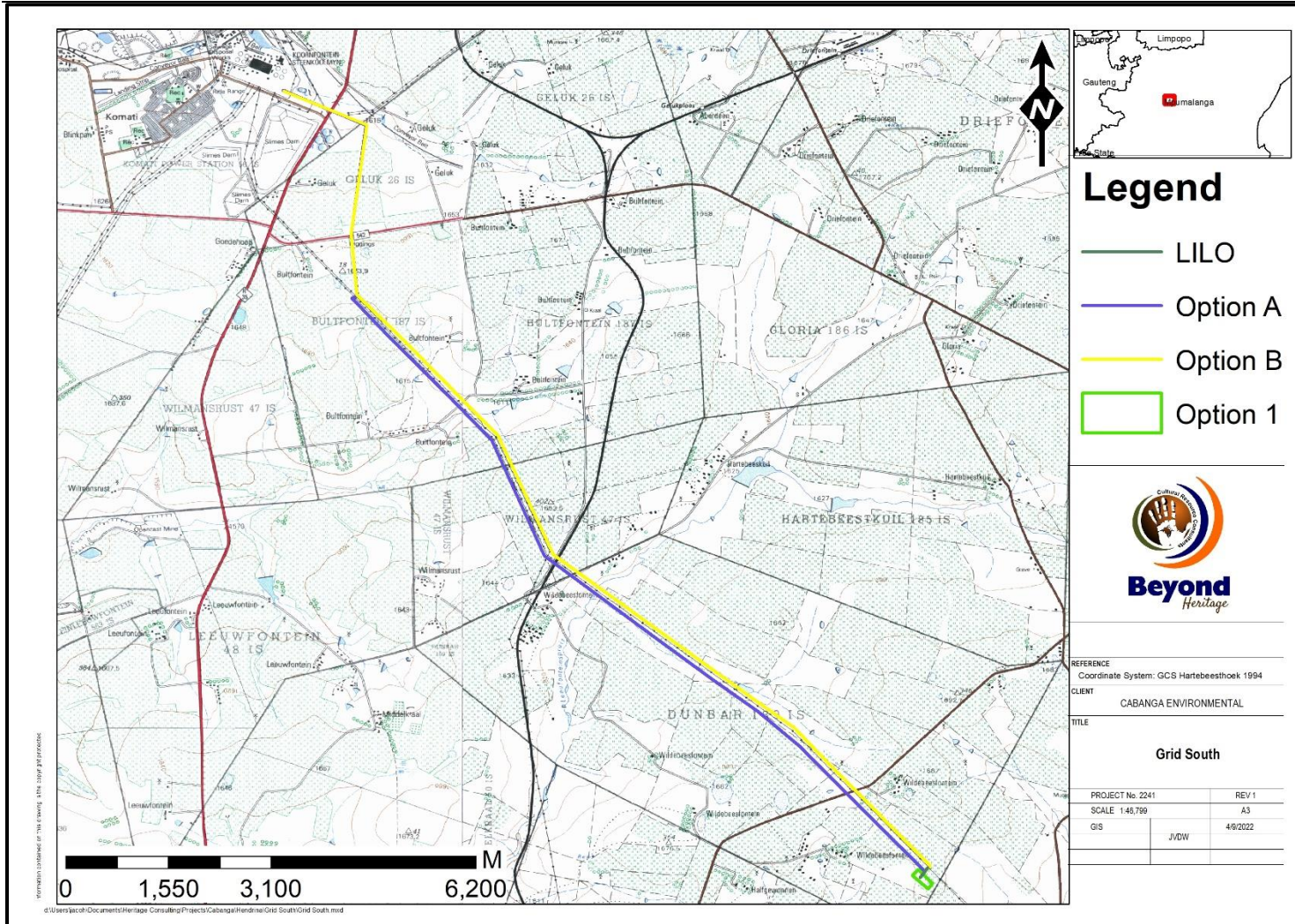


Figure 1.2. Local setting of the Project (1: 50 000 topographical map). Note the extensive cultivation in the Project area.

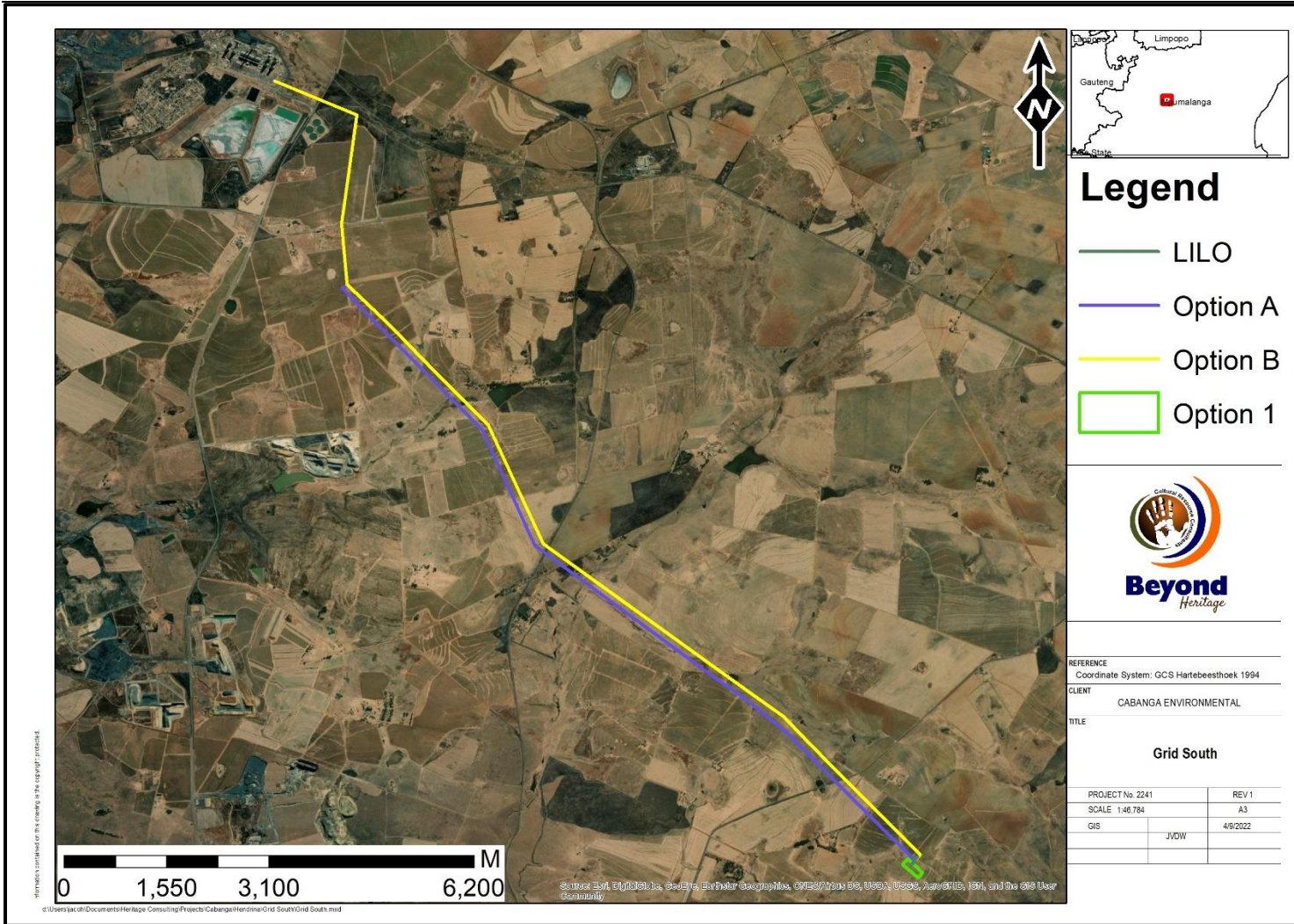


Figure 1.3. Aerial image of the proposed layout.

2 Legislative Requirements

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

- National Heritage Resources Act (NHRA), Act No. 25 of 1999)
- National Environmental Management Act (NEMA), Act No. 107 of 1998 - Section 23(2)(b)

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

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

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

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

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

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

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

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

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

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

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

3 METHODOLOGY

3.1 Literature Review

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

3.2 Genealogical Society and Google Earth Monuments

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

3.3 Public Consultation and Stakeholder Engagement:

Stakeholder engagement is a key component of any Environmental Impact Assessment (EIA) process, it involves stakeholders interested in, or affected by the proposed development. The Public Participation Process is undertaken by the Environmental Assessment Practitioner (EAP, Cabanga Environmental). Stakeholders are provided with an opportunity to raise issues of concern (for the purposes of this report only heritage related issues will be included). The aim of the public consultation process undertaken by Cabanga was to capture and address any issues raised by community members and other stakeholders.

3.4 Site Investigation

The aim of the site visit was to:

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

Table 4: Site Investigation Details

	Site Investigation
Date	The week of 23 August 2021, 18 and 20 May 2022
Season	Autumn - Heritage visibility was low in some areas due to cultivated fields with harvested crops. Waterlogged areas and access restrictions at the Eskom site resulted in small areas (considered of low heritage potential) not being physically surveyed. The Project area was sufficiently covered to understand the heritage character of the area and the range of heritage resources expected (Figure 3.1).

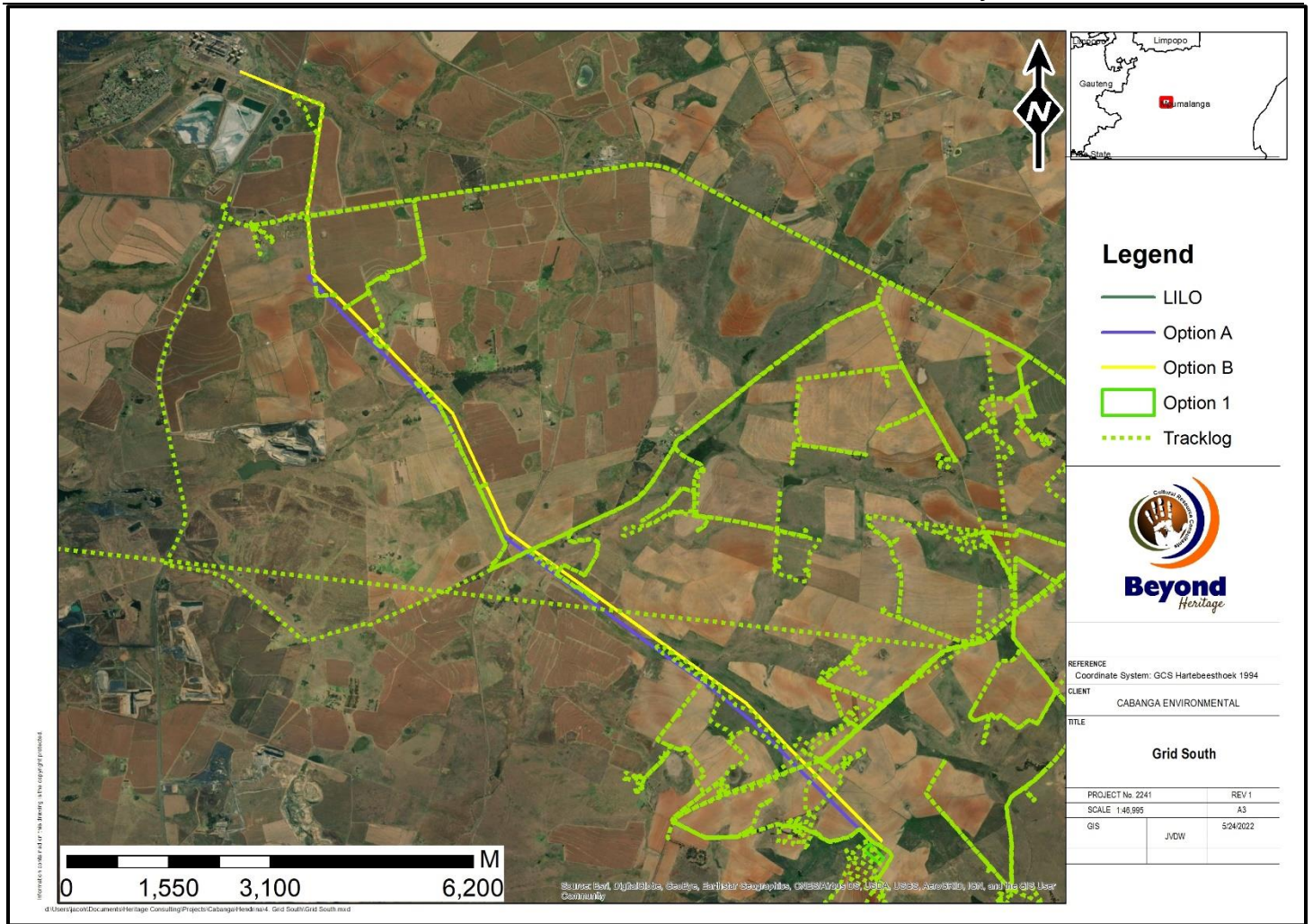


Figure 3.1. Tracklogs of the survey path in green.

3.5 Site Significance and Field Rating

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

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

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

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

In addition to this criteria field ratings prescribed by SAHRA (2007), and acknowledged by ASAPA for the SADC region, were used for the purpose of this report. The recommendations for each site should be read in conjunction with section 10 of this report.

Table 5: Heritage significance and field ratings

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

3.6 Impact Assessment Methodology

The following impact assessment rating was provided by the client and was used in this assessment.

	Weight	Description																																																																																																												
Probability	1	Unlikely: Impact Could occur in extreme events. Less than 15% chance of the impact ever occurring.																																																																																																												
	2	Possible: possibility of impact occurring is very low due to design or historic experience. Between 16% and 30% chance of the impact occurring.																																																																																																												
	3	Probable There is a distinct possibility of the impact occurring at least once during the project lifespan. 31% to 60% chance of the impact occurring.																																																																																																												
	4	Highly Probable: The impact is expected to occur. Between 61% and 85 % chance of the impact occurring.																																																																																																												
	5	Definite: There are sound scientific reasons to expect that the impact will occur and cannot be prevented.																																																																																																												
Duration	1	Short term: Less than 1 year																																																																																																												
	2	Short to medium term: 2 - 3 years																																																																																																												
	3	Medium term - 3 to 10 years																																																																																																												
	4	Long term: 11-20 years																																																																																																												
	5	Permanent: in excess of 20 years																																																																																																												
Scale / Extent	1	Isolated: Limited footprint within the site will be affected (less than 50% of the site)																																																																																																												
	2	Site Specific: The Entire Site will be affected																																																																																																												
	3	Local: Will affect the site and surrounding areas																																																																																																												
	4	Regional: Will affect the entire region / catchment / province																																																																																																												
	5	National: Will affect the country, and possibly beyond the borders of the country																																																																																																												
Magnitude/ Severity (Negative)	1	Slight: Little effect, negligible disturbance / benefit																																																																																																												
	2	Slight to Moderate: Effects are observable but natural process continue without significant alteration																																																																																																												
	3	Moderate: The effects of the impact change ecosystem processes / social dynamics and results in these processes being permanently altered, but functioning.																																																																																																												
	4	Moderate - High: The effects of the impact permanently alter natural / social processes to the point where function is limited																																																																																																												
	5	High: The aspect is affected to such an extent that its functioning is compromised and this effect is irreversible																																																																																																												
Sensitivity of the Aspect	1	Not sensitive: The affected aspect is not sensitive to change or of particular significance to people (No irreplaceable loss of resource)																																																																																																												
	2	Somewhat sensitive: The affected aspect is of not of significant value but is sensitive to change																																																																																																												
	3	Sensitive: The affected aspect is of moderate value and is slightly resilient to change																																																																																																												
	4	Very Sensitive: The affected aspect is of significant value and only slightly resilient to change																																																																																																												
	5	Irreplaceable: The affected aspect is of significant value and extremely sensitive to change. Direct irreplaceable loss of significant resource																																																																																																												
Consequence	4 to 19	Insignificant	<table border="1"> <tr> <td>Likelihood</td> <td>5</td><td>20</td><td>25</td><td>30</td><td>35</td><td>40</td><td>45</td><td>50</td><td>55</td><td>60</td><td>65</td><td>70</td><td>75</td><td>80</td><td>85</td><td>90</td><td>95</td><td>100</td> </tr> <tr> <td>4</td><td>16</td><td>20</td><td>24</td><td>28</td><td>32</td><td>36</td><td>40</td><td>44</td><td>48</td><td>52</td><td>56</td><td>60</td><td>64</td><td>68</td><td>72</td><td>76</td><td>80</td> </tr> <tr> <td>3</td><td>12</td><td>15</td><td>18</td><td>21</td><td>24</td><td>27</td><td>30</td><td>33</td><td>36</td><td>39</td><td>42</td><td>45</td><td>48</td><td>51</td><td>54</td><td>57</td><td>60</td> </tr> <tr> <td>2</td><td>8</td><td>10</td><td>12</td><td>14</td><td>16</td><td>18</td><td>20</td><td>22</td><td>24</td><td>26</td><td>28</td><td>30</td><td>32</td><td>34</td><td>36</td><td>38</td><td>40</td> </tr> <tr> <td>1</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td> </tr> </table>																	Likelihood	5	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	4	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	3	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	2	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	1	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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40 to 59	Moderate	<table border="1"> <tr> <td>Likelihood</td> <td>2</td><td>8</td><td>10</td><td>12</td><td>14</td><td>16</td><td>18</td><td>20</td><td>22</td><td>24</td><td>26</td><td>28</td><td>30</td><td>32</td><td>34</td><td>36</td><td>38</td><td>40</td> </tr> <tr> <td>1</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td> </tr> </table>																	Likelihood	2	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	1	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20																																																							
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60 to 79	High	<table border="1"> <tr> <td>Likelihood</td> <td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td> </tr> </table>																	Likelihood	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20																																																																										
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80 to 100	Significant	Consequence																																																																																																												

3.7 Limitations and Constraints of the study

The authors acknowledge that the brief literature review is not exhaustive on the literature of the area. Due to the nature of heritage resources and pedestrian surveys, the possibility exists that some features or artefacts may not have been discovered/recorded and the possible occurrence of graves and other cultural material cannot be excluded. This limitation is successfully mitigated with the implementation of a chance find procedure and monitoring of the study area by the Environmental Control Officer (ECO). This report only deals with the footprint area of the proposed development and consisted of non-intrusive surface surveys. This study did not assess the impact on medicinal plants and intangible heritage as it is assumed that these components will be highlighted through the public consultation process if relevant. It is possible that new information could come to light in future, which might change the results of this Impact Assessment.

4 Description of Socio-Economic Environment

Mpumalanga has a youthful population with approximately 64% of the population consisting of economically active people (15 to 34 years of age). This provides significant human resources for future economic growth and sustainability. The project will promote infrastructure and create employment opportunities.

5 Results of Public Consultation and Stakeholder Engagement:

5.1.1 Stakeholder Identification

Adjacent landowners and the public at large were informed of the proposed activity as part of the EIA process by the EAP. Site notices and advertisements notifying interested and affected parties were placed at strategic points and in local newspapers as part of the process. No heritage concerns have been raised thus far.

6 Literature / Background Study:

6.1 Literature Review (SAHRIS)

The area under investigation was not previously covered by heritage surveys and few HIA's was conducted in the immediate area. Studies conducted in the general area that were consulted is listed in Table 6.

Table 6. Studies conducted in the greater area.

Author	Year	Project	Findings
Huffman, T.N.	1995	Archaeological Survey of Forzando Coal Holdings	Homesteads and Cemeteries
Van Schalkwyk, J	1997	A Survey of Cultural Resources in The Proposed Kleinfontein Mining Area, Mpumalanga Province	Cemeteries and a farmhouse as well as Stone Age scatters
Van Schalkwyk, J.	2002	A Survey of Cultural Resources for the Koorfontein Mining Development, Middelburg District, Mpumalanga Province	Farmsteads and cemeteries
Van Schalkwyk, J.	2003	Goedehoop Mine, Mpumalanga: Archaeological and Cultural Historical Survey and Impact Assessment	No Sites
Van Vollenhoven, A.C.	2013	A Report on A Cultural Heritage Impact Assessment for A Proposed Mining Right Amendment Application at The Halfgewonnen Colliery, Between Bethal and Hendrina, Mpumalanga Province	No Sites
Van der Walt, J.	2019	Heritage Impact Assessment for The Proposed Dunbar Opencast Coal Mine Mpumalanga Province	Stone cairn, a farmstead and a structure

6.1.1 Google Earth and The Genealogical Society of South Africa (Graves and burial sites)

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where archaeological and historical sites might be located. The database of the Genealogical Society of South Africa indicated no known grave sites within the study area

6.2 Archaeological Background

6.2.1 Stone Age

The Stone Age is divided in Early; Middle and Late Stone Age and refers to the earliest people of South Africa who mainly relied on stone for their tools.

Very few Early Stone Age sites are on record for Mpumalanga and no sites dating to this period are expected for the study area. An example in Mpumalanga is Maleoskop on the farm Rietkloof where ESA tools have been found. This is one of only a handful of such sites in Mpumalanga.

The MSA has not been extensively studied in Mpumalanga, but evidence of this period has been excavated at Bushman Rock Shelter, a well-known site on the farm Klipfonteinhoek in the Ohrigstad district. This cave was excavated twice in the 1960's by Louw and later by Eloff. The MSA layers show that the cave was repeatedly visited over a long period. Lower layers have been dated to over 40 000 BP (Before Present)

while the top layers date to approximately 27 000 BP (Esterhuizen & Smith in Delius, 2007; Bergh, 1998). Some isolated finds were recorded close to Witbank as well by Huffman (1999) on the farm Rietfontein.

The Later phases of the Stone Age began at around 20 000 years BP. This period was marked by numerous technological innovations and social transformations within these early hunter-gatherer societies. These people may be regarded as the first modern inhabitants of Mpumalanga, known as the San or Bushmen. They were a nomadic people who lived together in small family groups and relied on hunting and gathering of food for survival. Evidence of their existence is to be found in numerous rock shelters throughout the Eastern Mpumalanga where some of their rock paintings are still visible. A number of these shelters have been documented throughout the Province (Bornman, 1995; Schoonraad in Barnard, 1975; Delius, 2007). These include areas such as Witbank, Ermelo, Barberton, Nelspruit, White River, Lydenburg and Ohrigstad.

Three late Stone Age sites are on record in the greater area. The sites are Welgelegen Skuiling close to Ermelo, Chrissiesmeer (also known for rock art) and lastly Groenvlei close to Carolina, this area is also known for rock art (Bergh 1999).

6.2.2 Iron Age

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

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

The Iron Age is characterised by the ability of these early people to manipulate and work Iron ore into implements that assisted them in creating a favourable environment to make a better living. No Early Iron Age sites are on record in the greater region. Around 220 Late Iron Age stone walled sites are on record to the east of the study area (Bergh 1999) and is also associated with numerous pre-*difaqane* and *difaqane* wars that took place during the last quarter of the 18th century and during the first three decades of the 19th century. The sites are located close to Bethal. The study area was most probably inhabited by the Phuting group (Berg 1999). Around the study area the Phuting moved south due to the Ndebele migration (Difaqane). These wars led to the displacement of large numbers of Tswana clans on the Highveld where Mzilikazi's Ndebele caused chaos and havoc.

Late Iron Age settlements are characterised by extensive dry stonewalls and dates back to the 17th century. Late Iron Age communities who contributed to this stone walled architecture were the Sotho, Pedi, Ndebele and Swazi. The stone building tradition that these indigenous groups established many decades before the first colonial settlers arrived, may have influenced the colonial farmers to utilize these same resources as building material for the first farmsteads which arose on the Eastern Highveld (Pistorius 2006). Late Iron Age sites that have been identified in the larger geographical area is to the west of Bronkhorstspuit and in the vicinity of Bethal (Bergh 1999).

6.2.3 Historical Background

Sites dating to the historic period occur sporadically in the study area. These are mostly farming related, although some mining sites also occur. The farming related sites are usually farmsteads and farm cemeteries, either belonging to the landowners or their labourers. Mining related sites are for example the old Albion Colliery, dating to the 1940's.

6.2.4 The Anglo-Boer War (1899-1902)

The Anglo-Boer War, which took place between 1899 and 1902 in South Africa, was one of the most turbulent times in South Africa's history. Even before the outbreak of war in October 1899 British politicians, including Sir Alfred Milner and Mr. Chamberlain, had declared that should Britain's differences with the Z.A.R. result in violence, it would mean the end of republican independence. This decision was not immediately publicized, and therefore republican leader based their assessment of British intentions on the more moderate public utterances of British leaders. Consequently, in March 1900, they asked Lord Salisbury to agree to peace based on the status quo ante bellum. Salisbury's reply was, however, a clear statement of British war aims (Du Preez 1977).

During the Anglo-Boer War, several battles took place in the region. The one closest to the study area took place at the battle of Wilmansrust, approximately 2,5 km to the west from the study area in June 1901. During this clash, more than 50 British troops were killed.

7 Description of the Physical Environment

The landscape consists of slightly to moderately undulating plains with some low hills and pan depressions. The vegetation is short dense grassland dominated by the usual highveld grass composition, including species from the genera *Aristida*, *Digitaria*, *Eragrostis*, *Themeda* and *Tristachya*, with small, scattered rocky outcrops of wiry, sour grasses and some woody species such as *Senegalia caffra*, *Celtis africana*, *Diospyros lycioide* subsp *lycioides*, *Parinari capensis*, *Protea caffra*, *P. welwitschia* and *Englerophytum magalimontanum* (Mucina & Rutherford, 2010). Large sections of the area consist of ploughed fields that have been extensively cultivated for several years and other areas are used for grazing, a section of the proposed powerline follows an existing powerline servitude (Figure 7.1 to 7.4).

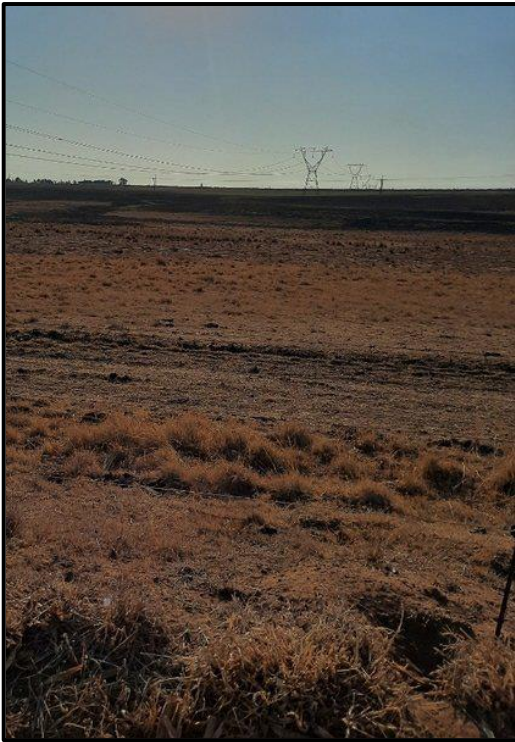


Figure 7.1. Areas used for grazing and cultivation.



Figure 7.2. Ploughed fields in the Project area.



Figure 7.3. Existing powerline next to cultivated area.



Figure 7.4. General site conditions under existing powerlines.

8 Findings of the Survey

8.1 Heritage Resources

This assessment focusses on the grid connection infrastructure and fieldwork was conducted for this Project and other Projects in the immediate vicinity that are being evaluated by ENERTRAG . The grid infrastructure mostly follows existing infrastructure like an existing powerline servitude and infrastructure like farm roads and farm fences.

Heritage finds are limited to burial sites (Waypoint 095 and 096) and the demolished remains of residential dwellings in the greater area (Figure 8.1). The recorded observations were given waypoint numbers recorded in the field. General site conditions, site distribution and selected features are illustrated in Figures 8.2 – 8.14. Recorded observations are briefly described in Table 7.



Figure 8.1. Site distribution in relation to the proposed layout.

Table 7. Recorded heritage features affected by the Project.

Label	Location	Type Site	Description	Significance
095	-26.0978544, 29.485609	Burial Sites	Two graves situated near the Komati power station. The graves are situated directly under an existing powerline. The graves both have granite headstones and grave dressings. The area measures 4 x 2 m. The graves date to 1965 and 1975 respectively.	GP A High social significance
096	-26.1139093, 29.4845727	Cemetery	Informal cemetery situated next to the main road. The	GP A High social significance

			<p>cemetery has recently been cleaned of most vegetation suggesting recent use. The cemetery is partially fenced off with a degraded wire fence. Various graves are found within the cemetery including infant and adult graves. Grave dressings consist of packed stone, cement, tiles and granite. The cemetery measures 25 x 15 m. Visible dates on the headstones include 1948 and 2011.</p>	
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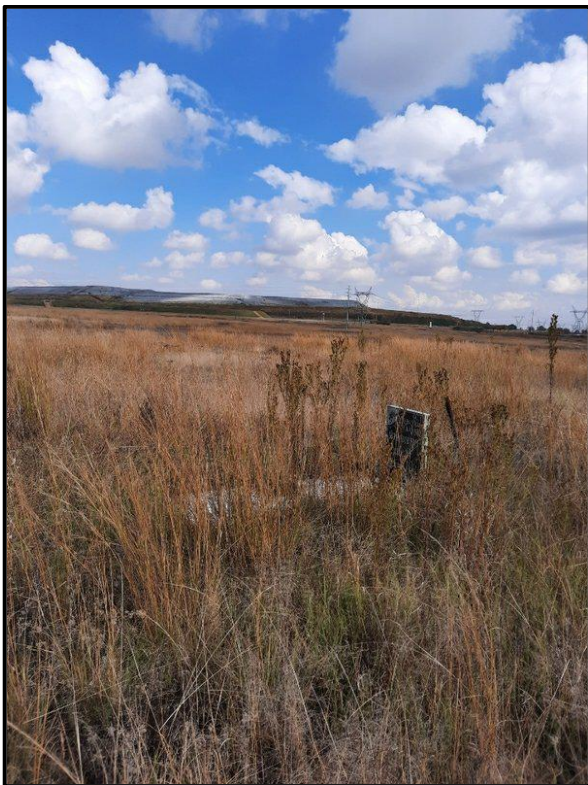


Figure 8.2. Graves recorded at Waypoint 95.



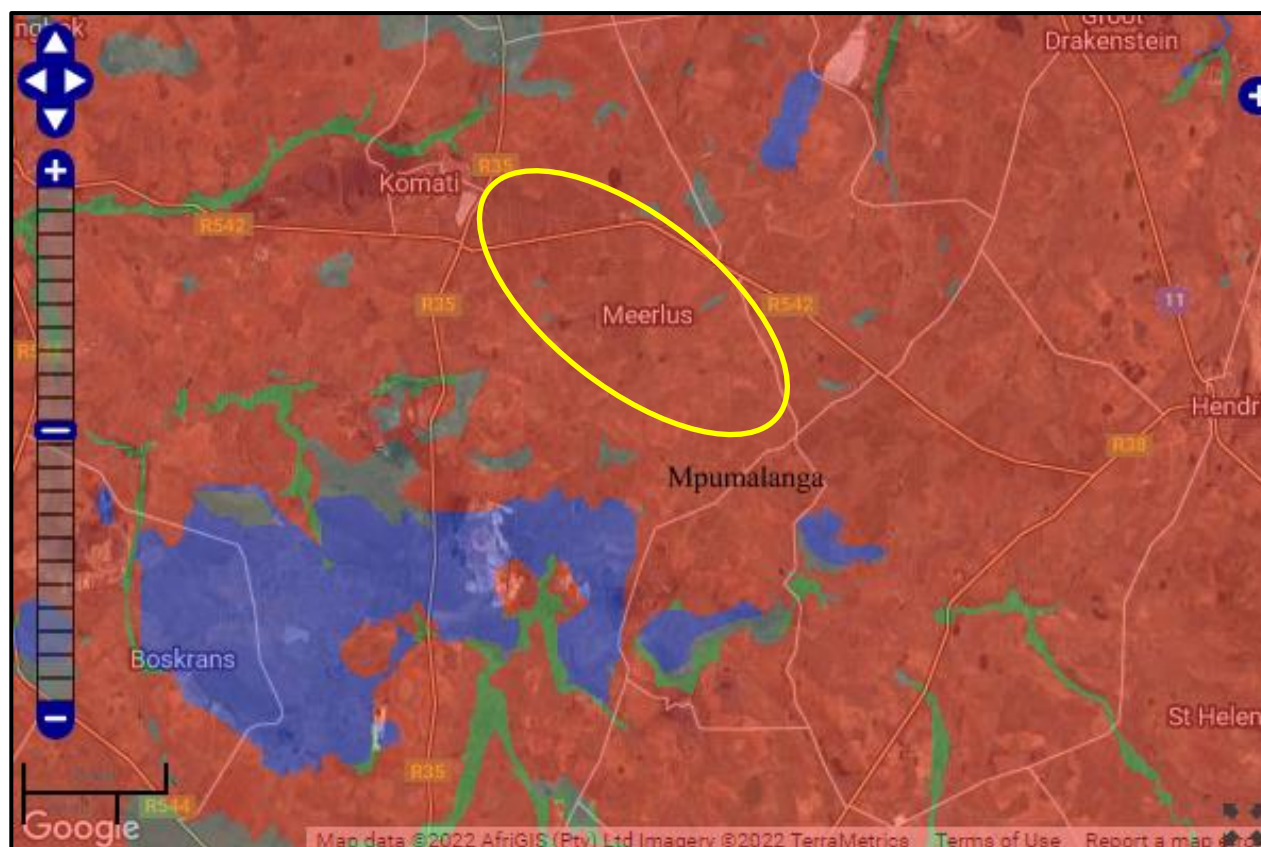
Figure 8.3. Graves recorded at Waypoint 96.

8.2 Cultural Landscape

The study area is in a rural setting and characterised by cultivation and agricultural activities with a historical layering consisting of burial sites and dwellings.

8.3 Paleontological Heritage

According to the SAHRA Paleontological map the study area is of very high paleontological significance (Figure 8.4) and an independent study was conducted for this aspect. Bamford (2022) concluded that it is extremely unlikely that any fossils would be preserved in the loose soils and sands of the Quaternary. There is a very small chance that fossils may occur in the shales and siltstones of the early Permian Vryheid Formation, but only more than 5m below the surface, therefore, a Fossil Chance Find Protocol should be added to the EMPr.



Colour	Sensitivity	Required Action
RED	VERY HIGH	Field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	Desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	Desktop study is required
BLUE	LOW	No palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	No palaeontological studies are required
WHITE/CLEAR	UNKNOWN	These areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map

Figure 8.4. Paleontological sensitivity of the approximate study area (yellow polygon) as indicated on the SAHRA Palaeontological sensitivity map.

9 Potential Impact

Both powerline Options A and B can have an indirect impact on the identified graves at Waypoint 095 and 096 (Figure 9.1 & 9.2). Waypoint 095 is located ~ 15 meters from Option A and ~ 17 meters from Option B. Waypoint 096 is located ~ 10 meters from Option A and ~ 14 meters from Option B. Waypoint 095 are located under an existing powerline and the sense of place already impacted on. These sites must be preserved in situ with a 30-meter buffer as mitigation measure, after mitigation the impact will be Low. Impacts to heritage resources without mitigation within the project footprint will be permanent and negative and occur during the pre-construction and construction activities.

Any additional effects to subsurface heritage resources can be successfully mitigated by implementing a Chance Find Procedure. Mitigation measures for specific sites as outlined under Table 7 and additional recommendations in this report should be implemented during all phases of the project. With the implementation of the recommended mitigation measures impacts of the project on heritage resources is acceptable (Table 8).

Cumulative impacts considered as an effect caused by the proposed action that results from the incremental impact of an action when added to other past, present, or reasonably foreseeable future actions. (Cornell Law School Information Institute, 2020). Cumulative impacts occur from the combination of effects of various impacts on heritage resources. The importance of identifying and assessing cumulative impacts is that the whole is greater than the sum of its parts. In the case of this project, impacts can be mitigated to an acceptable level. However, this and other projects in the area can have a negative impact on heritage sites in the area where these sites have been destroyed unknowingly.

9.1.1 Pre-Construction phase

It is assumed that the pre-construction phase involves the removal of topsoil and vegetation as well as the establishment of infrastructure. These activities can have a negative and irreversible impact on heritage features if any occur. Impacts include destruction or partial destruction of non-renewable heritage resources.

9.1.2 Construction Phase

During this phase, the impacts and effects are similar in nature but more extensive than the pre-construction phase. Potential impacts include destruction or partial destruction of non-renewable heritage resources.

9.1.3 Operation Phase

No impacts are expected during the operation phase.

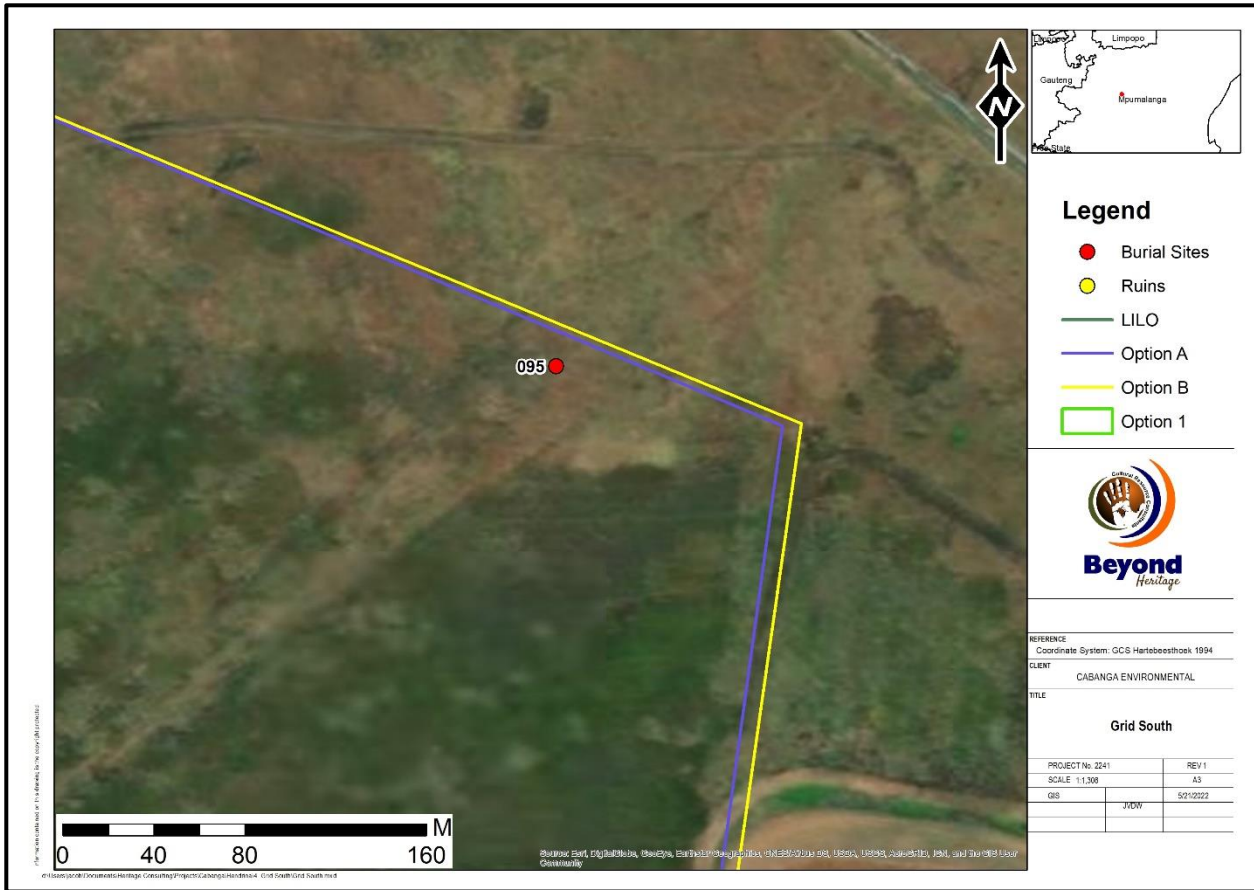


Figure 9.1. Project in relation to Waypoint 095.

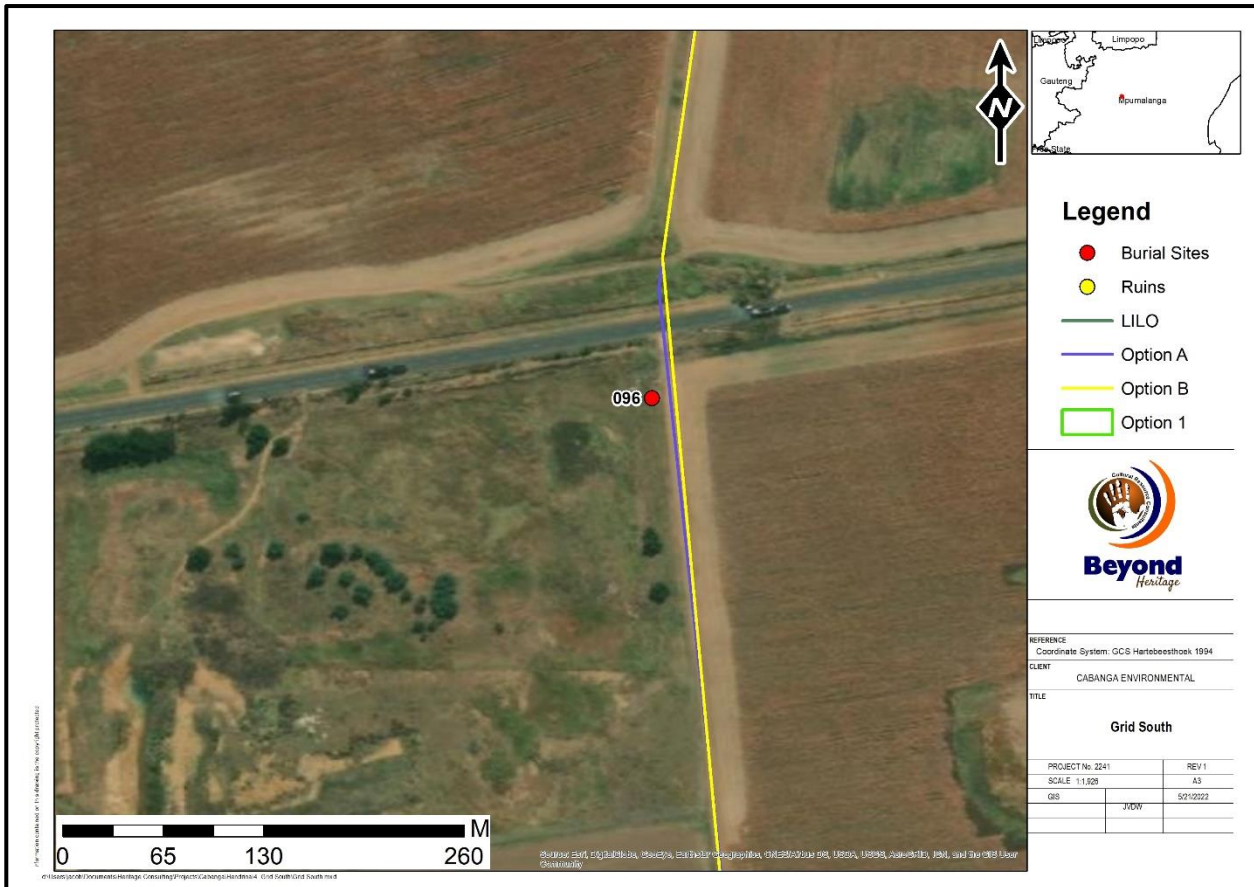


Figure 9.2. Project in relation to Waypoint 096.

9.1.4 Impact Assessment for the Project

Table 8. Impact assessment for the project.

No	Activity	Aspect	Impact / Risk Description	Nature of Impact	Probability	Sensitivity of the Aspect	Severity of the Impact (Magnitude)	Duration	Scale / Extent	Significance (without Mitigation)	Management Actions	Probability	Sensitivity of the Aspect	Severity of the Impact	Duration	Scale / Extent	Significance (with Mitigation)	
1	Construction of powerline	Graves at 095 and 096	Construction activities could permanently destroy heritage features.	Negative	5 Definite	4 Very sensitive	5 High	5 Permanent	3 Local	85 Significant	Avoidance of the graves and retaining the graves in situ with a 30 m buffer. - If this is not possible the graves can be relocated adhering to all legal requirements.	3 Probable	3 Sensitive	3 Moderate	5 Permanent	2 Site	39	Low

10 Conclusion and recommendations

The Project area is characterised by extensive cultivated fields and is considered to be of low archaeological potential. This was confirmed during the field survey and no archaeological sites of significance were noted and finds were limited to burial sites (Waypoint 095 & 096). Both powerline alternatives (Option A & B) will indirectly impact the sites. These sites can be mitigated through *in situ* preservation.

According to the SAHRA Paleontological sensitivity map the study area is of very high paleontological significance (Figure 8.4) and an independent study was conducted for this aspect. Bamford (2022) concluded that it is extremely unlikely that any fossils would be preserved in the loose soils and sands of the Quaternary. There is a very small chance that fossils may occur in the shales and siltstones of the early Permian Vryheid Formation, but only more than 5m below the surface, therefore, a Fossil Chance Find Protocol should be added to the EMPr.

The impact to heritage resources can be mitigated to an acceptable level provided that the recommendations in this report are adhered to, based on the South African Heritage Resource Authority (SAHRA) 's approval.

10.1 Recommendations for condition of authorisation

The following recommendations for Environmental Authorisation apply and the project may only proceed based on approval from SAHRA:

Recommendations:

- Implementation of the ENERTRAG Chance Find Procedure for the project (Appendix A);
- Avoidance of burial sites (095 & 096) with a 30 meter buffer;
- Pre-construction heritage walkdown of final pylon positions.

10.2. Reasoned Opinion

The overall impact of the project can be mitigated to an acceptable level and residual impacts can be managed to an acceptable level through implementation of the recommendations made in this report. The socio-economic benefits also outweigh the possible impacts of the development if the correct mitigation measures are implemented for the project.

10.3. Potential risk

Potential risks to the proposed project are the occurrence of intangible features and unrecorded cultural resources (of which graves and subsurface cultural material are the highest risk). This can cause delays during construction, as well as additional costs involved in mitigation, as well as possible layout changes.

10.4. Monitoring Requirements

Day to day monitoring can be conducted by the Environmental Officer and Environmental Control Officers (ECO). The ECO or other responsible persons should be trained along the following lines:

- *Induction training:* Responsible staff identified by the EPC should be trained heritage management and identification of heritage resources.
- *Site monitoring and watching brief:* As most heritage resources occur below surface, all earth-moving activities need to be routinely monitored in case of accidental discoveries. The greatest potential impacts are from pre-construction and construction activities. The EO and ECO should monitor all such activities. If any heritage resources are found, the chance finds procedure must be followed as outlined above.

Table 9. Monitoring requirements for the project

Heritage Monitoring					
Aspect	Area	Responsible for monitoring and measuring	Frequency	Proactive or reactive measurement	Method
Cultural Heritage Resources	Entire project area	ECO	Weekly (Pre construction and construction phase)	Proactively	<ul style="list-style-type: none"> • If risks are manifested (accidental discovery of heritage resources) the chance find procedure should be implemented: <ol style="list-style-type: none"> 1. Cease all works immediately; 2. Report incident to the Site Manager. 3. Contact an archaeologist/ palaeontologist to inspect the site; 4. Report incident to the SAHRA; and 5. Employ site specific mitigation measures recommended by the specialist after assessment in accordance with the requirements of the relevant authorities. • Only recommence operations once impacts have been mitigated.

10.5. Management Measures for inclusion in the EMPr

Table 10. Heritage Management Plan for EMPr implementation

Area	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Target	Performance indicators (Monitoring tool)
General project area	Implement chance find procedures in case possible heritage finds are uncovered	Construction	Throughout the project	EPC Contractor	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA	EO/ECO Checklist/Report
Graves at 095 and 096	Avoid and retain in situ with a 30 m buffer.	Pre Construction	Throughout the project	EPC Contractor	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 of NHRA	ECO Checklist/Report
Final Layout	Heritage walkdown of final pylon positions.	Pre-Construction	Pre-construction	Developer to appoint qualified archaeologist	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA	Heritage Statement

11. References

- Archaeological database, University of the Witwatersrand.
- Bamford, M. K. 2022. Palaeontological Impact Assessment for the proposed Hendrina Renewable Energy Complex, Hendrina, Mpumalanga Province.
- Barnard, C. 1975. Die Transvaalse Laeveld. Komee van 'n Kontrei.
- Bergh, J.S. 1999. Geskiedenisatlas van Suid-Afrika. Die vier noordelike provinsies. J. L. van Schaik Uitgewers.
- Bornman, H. (red.) 1979. Nelspruit: 75 in '80. Stadsraad van Nelspruit.
- <https://www.law.cornell.edu/cfr/text/40/1508.7> Cited 12 January 2021
- Delius, P. 2007. Mpumalanga History and Heritage. University of KwaZulu-Natal Press.
- Du Preez, S. J. 1977. Peace attempts during the Anglo Boer War until March 1901. Magister Artium thesis in History. Pretoria: University of Pretoria.
- Esterhuysen, A. & Smith, J. 2007. The Archaeology of Mpumalanga. In: Delius, P. (ed.) *Mpumalanga History and Heritage: Recapturing the Past, Defining the Future* pp: 7-18. KwaZulu-Natal: University of KwaZulu-Natal Press
- Huffman, T.N. 1995. Archaeological Survey of Forzano Coal Holdings
- Mucina, L. & Rutherford, M.C. 2006. The vegetation map of South Africa, Lesotho and Swaziland. SANBI, Pretoria.
- National Heritage Resources Act NHRA of 1999 (Act 25 of 1999)
- Pistorius, J.C.C. 2006. A Base Line Heritage Impact Assessment Study For X Strata Coal's Tweefontein Division On The Eastern Highveld In The Mpumalanga Province Of South Africa. Unpublished report done for X Strata Coal.
- SAHRA Report Mapping Project Version 1.0, 2009
- SAHRA. 2007. Minimum Standards: Archaeological And Palaeontological Components Of Impact Assessment Reports
- Van Schalkwyk, J. 1997. A Survey of Cultural Resources in The Proposed Kleinfontein Mining Area, Mpumalanga Province. Unpublished report.
- Van Schalkwyk, J. 2002. A Survey of Cultural Resources for the Koornfontein Mining Development, Middelburg District, Mpumalanga Province. Unpublished report.
- Van Schalkwyk, J. 2003. Goedehoop Mine, Mpumalanga: Archaeological and Cultural Historical Survey and Impact Assessment
- Van Vollenhoven, A.C. 2013. A Report on A Cultural Heritage Impact Assessment for A Proposed Mining Right Amendment Application at The Halfgewonnen Colliery, Between Bethal And Hendrina, Mpumalanga Province

Appendix A

ENERTRAG Chance Find Procedure

Contents

1.	INTRODUCTION	44
2.	OBJECTIVES	44
3.	RESPONSIBILITIES	44
3.1	DEVELOPER	44
3.2	CONTRACTOR	44
4.	TRAINING	44
5.	PROCEDURE	44
5.1	ARCHAEOLOGICAL HERITAGE AND PALAEOLOGICAL DISCOVERIES DURING WORKS	44
5.1.1	<i>Stop Work</i>	45
5.1.2	<i>Reporting</i>	45
5.1.3	<i>General Mitigation / Treatment Strategies</i>	45
6.	MONITORING	46

1 Introduction

Cultural heritage can represent irreplaceable sources of life and inspiration and should be safeguarded. Although there are always cultural heritage studies conducted in the Project and its area of influence, there is always potential for new discoveries to be made, especially during excavation activities. Finds can include fossils, archaeological, paleontological or sacred sites as well as more modern graves.

Heritage resources are protected in terms of the Heritage Resources Act (Act No 25 OF 1999). The Act usually sets out the overarching administrative processes for protecting and preserving cultural heritage and management by the Developer. Successful implementation requires everyone being alert to the possibility of finds, applying the specified measures and notifying immediate Site Supervisor, Environmental Officer, Environmental Control Officer (ECO) that should in turn inform relevant Authorities as appropriate.

2. Objectives

This Procedure aims to protect and preserve any cultural heritage discovery from potential adverse impacts associated with the construction and operation activities of the proposed Project.

3. Responsibilities

a. Developer

Developer shall:

- Ensure correct implementation of chance find procedure upon any chance finds or suspected discoveries.

b. Contractor

The Contractor shall:

- Oversee and provide resources for the implementation of this procedure;
- Co-ordinate the chance find with the Archaeologist / other Heritage Specialist.
- Inform relevant Authorities as appropriate in case of find; and
- Obtain any necessary permits if required

4. Training

Awareness training should be conducted by the EPC Environmental Officer (EO) for all Employees. The training should include, as a minimum, the following:

- Identifying potential features of heritage significance;
- Procedures for dealing with heritage resources discovered on site;
- Applicable Legislation pertaining to the protection of heritage resources; and
- The importance of protecting heritage resources.

Photographs of similar fossil plants must be provided to the EPC to assist in recognizing the fossil plants in the shales and mudstones. This information will be built into the EMP's training and awareness plan and procedures

5. Procedure

a. Archaeological Heritage and Palaeontological Discoveries during Works

Any archaeological or heritage site discoveries during works should be reported to immediate Supervisor, EO and/ECO and treated as an incident. Following the incident and within two hours the Contractor EO

notify Developer in writing. Work at the affected area should cease immediately, the area should be demarcated until further instructions by relevant Specialist and /or relevant Authorities. The EPC Contractor or other person discovering a potentially significant site or artefact should initiate the following actions:

i. Stop Work

- Inform the immediate Supervisor, EO, ECO and Developer;
- Stop work in the immediate area and take digital photographs to record the find; and
- Install temporary site protection measures (e.g. delineate a 'no-go' area using warning tape, stakes and signage / deploy worker and give instructions to prevent access or further disturbance) and take all reasonable steps to avoid any further disturbance or damage from excavation, vibration, plant or machinery.

ii. Reporting

- Inform all relevant Employees of the chance find and whether access to the work area is being restricted;
- EPC EO to consult with an Archaeologist / Palaeontologist Specialist, providing photographic records for a preliminary assessment.
- The specialist shall be responsible for evaluating whether the chance find needs to be classified as cultural heritage etc and if so, whether it is isolated or part of a larger site or feature;
- The specialist will be required to highlight the way forward
- EPC will notify the relevant Authorities
- Should any fossils or artefact need to be removed from the site a SAHRA permit must be obtained by the EPC.
- Annual reports must be submitted to SAHRA as required by the relevant permits.

iii. General Mitigation / Treatment Strategies

- Artefacts are to be left in place for recording by the specialist/archaeologist. It is important they are not disturbed or moved as their setting is as important as the artefact/fossil; if materials are to be collected they should be placed in bags and labelled by the Specialist /Archaeologist and forwarded to the Authorities in a manner that ensures the integrity of the 'chain of custody';
- Project personnel are not permitted to take or keep artefacts as personal possessions as that is a criminal offence;
- Any damage, accidental or otherwise, should be investigated by the EPC Contractor detailing corrective actions, with digital images, maps and plans showing any locations that are no-go, limited access or present risks of further chance finds;
- Stakeholder engagement may be needed with affected communities to determine the correct mitigation actions or, if applicable, suitable compensation (e.g. reburial costs). Site treatment scenarios may include:
 - Preservation in place through avoidance or re-routing or specialized construction techniques, and/or
 - Rescue excavations to remove, record and relocate in advance of further construction work if avoidance is not possible.
- If the chance find is an isolated artefact/site or is not classed as cultural heritage, the Site Supervisor should approve the removal of site protection measures and activity can resume only with consultation and approval of the Local Authorities;

- While required treatment is ongoing, EPC Contractor should coordinate with the relevant Employees keeping them informed as to the status and schedule of investigations / actions, and informing them when activities may resume;

6. Monitoring

Monitoring should be conducted as required to assess control success, to gauge the effectiveness of prevention plans. The Contractor should monitor their activities to prevent the damaging of heritage resources. Monitoring for heritage resources should be integrated into EO and ECO monitoring Programme.