

# HERITAGE IMPACT ASSESSMENT

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

FOR THE PROPOSED HENDRINA SOUTH WIND ENERGY FACILITY, MPUMALANGA  
PROVINCE.

**Type of development:**

Renewable Energy (Wind)

**Client:**

Cabanga Environmental

**Developer:**

Hendrina South Wind Energy Facility (RF) Pty Ltd



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## APPROVAL PAGE

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<b>Report Title</b>	Heritage Impact Assessment for the Hendrina South Wind Energy Facility
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<b>Applicant Name</b>	Hendrina South Wind Energy Facility (RF) Pty Ltd

<b>Responsibility</b>	<b>Name</b>	<b>Qualifications and Certifications</b>	<b>Date</b>
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**Amendments on Document**

Date	Report Reference Number	Description of Amendment
23 May 2022	2239	Technical revisions
27 June 2022	2239	Inclusion of additional site

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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 and 10.5
(l) Conditions for inclusion in the environmental authorisation	Section 10. 1 and 10.5
(m) Monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 10. 4.
(n) Reasoned opinion - (i) as to whether the proposed activity, activities or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity or activities; and (ii) if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	Section 10.2
(o) Description of any consultation process that was undertaken during the course of preparing the specialist report	Section 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 requested at this time

## Executive Summary

Cabanga Environmental was appointed by Hendrina South Wind Energy Facility (RF) Pty Ltd to undertake an Environmental Impact Assessment (EIA) process for the proposed Hendrina South Wind Energy Facility on various Portions of the Farms Dunbar 189 IS, Halfgewonnen 190 IS and Weltevreden 193 IS. The Project is within the Steve Tshwete Local Municipality (Nkangala District Municipality) and the Govan Mbeki Local Municipality (Gert Sibande District Municipality), approximately 30 kilometres (km) northeast of Bethal and 15 km southwest of Hendrina, Mpumalanga. 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 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;
- 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 8.9) 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 Environmental Management Programme (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 (Waypoint 081 and 087) with a 50 m buffer and access for family members;
- WTG 15 will directly impact on the burial site at Waypoint 099 and it is recommended that this turbine should be moved to avoid the feature with a 50 m buffer zone;
- Identified ruins (Waypoint 067 – 072, 083 – 086 and 073 – 080) should be indicated on development plans and avoided during construction.
- Based on the potential risks associated with Construction Camp and Batching Plant Option 2 it is recommended that this option is avoided due to the presence of a burial site (Waypoint 081) and ruins (Waypoint 073 – 080);
- An access protocol must be developed for the project to ensure access to graves for family members;
- Pre-construction heritage walkdown of final layout.

**Declaration of Independence**

<b>Specialist Name</b>	Jaco van der Walt
<b>Declaration of Independence</b>	<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"> <li>• I act as an independent specialist in this application;</li> <li>• 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;</li> <li>• I declare that there are no circumstances that may compromise my objectivity in performing such work;</li> <li>• 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;</li> <li>• I will comply with the Act, Regulations and all other applicable legislation;</li> <li>• I have no, and will not engage in, conflicting interests in the undertaking of the activity;</li> <li>• 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;</li> <li>• All the particulars furnished by me in this form are true and correct; and</li> <li>• I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 49 A of the Act.</li> </ul>
<b>Signature</b>	
<b>Date</b>	08/04/2022

**a) Expertise of the specialist**

Jaco van der Walt has been practising as a Cultural Resource Management (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 South African Professional Archaeologists (ASAPA) (#159) and have conducted more than 500 impact assessments in Limpopo, Mpumalanga, North West, Free State, Gauteng, Kwa Zulu Natal (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, Democratic Republic of the Congo (DRC) Zambia, Guinea, Afghanistan and Tanzania. Through this, he has a sound understanding of the International Finance Corporations (IFC) Performance Standard requirements, with specific reference to Performance Standard 8 – Cultural Heritage

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**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
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 Wind Energy Facility on various Portions of the Farms Dunbar 189 IS, Halfgewonnen 190 IS and Weltevreden 193 IS. The Project is within the Steve Tshwete Local Municipality (Nkangala District Municipality) and the Govan Mbeki Local Municipality (Gert Sibande 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 and ruins 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. The South African Heritage Resources Agency (SAHRA) as a commenting authority under section 38(8) of NHRA 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 proposed Hendrina South Wind Energy Facility (WEF) are outlined under Table 2 and 3.

**Table 2: Project Description**

<b>Farm and Magisterial District</b>	<ul style="list-style-type: none"> <li>• Dunbar 189 IS (Portion 1, 3, 5, 6 and 7);</li> <li>• Halfgewonnen 190 IS (Portion 11, 14 and 15); and</li> <li>• Weltevreden 193 IS (Remaining extent and portions 2, 10, 11, 12, 13, 14, 15, 16, 17 and 18).</li> </ul> <p>The Project is within the Steve Tshwete Local Municipality (Nkangala District Municipality) and the Govan Mbeki Local Municipality (Gert Sibande District Municipality). The site is approximately 30 kilometres (km) north east of Bethal and 15 km south west of Hendrina, Mpumalanga.</p>
<b>Central co-ordinate of the development</b>	26°12'49.62"S 29°34'21.44"E
<b>Topographic Map Number</b>	2629BA

**Table 3: Infrastructure and project activities**

<b>Type of development</b>	Renewable Energy Facility (Wind)
<b>Size of development</b>	The extent of the development is 2900 ha with a buildable area of 200 ha
<b>Project Components</b>	<p>The Project will have up to 26 turbines and be up to 200MW over 3600 hectares. Turbines will have a rotor diameter of up to 200m with a hub height of up to 200m. The turbines will be connected via underground cables to the onsite substation and Battery Energy Storage System (BESS). Additional associated infrastructure will include:</p> <ul style="list-style-type: none"> <li>• Construction camps and temporary laydown areas;</li> <li>• Operations and maintenance (O&amp;M) Buildings (including offices, workshop, and stores);</li> <li>• Batching plant; and</li> <li>• internal roads and cables</li> </ul>

## 1.3 Alternatives

No alternatives were provided for assessment. The extent of the area assessed allows for siting of the development within this area to minimize impacts to heritage resources.

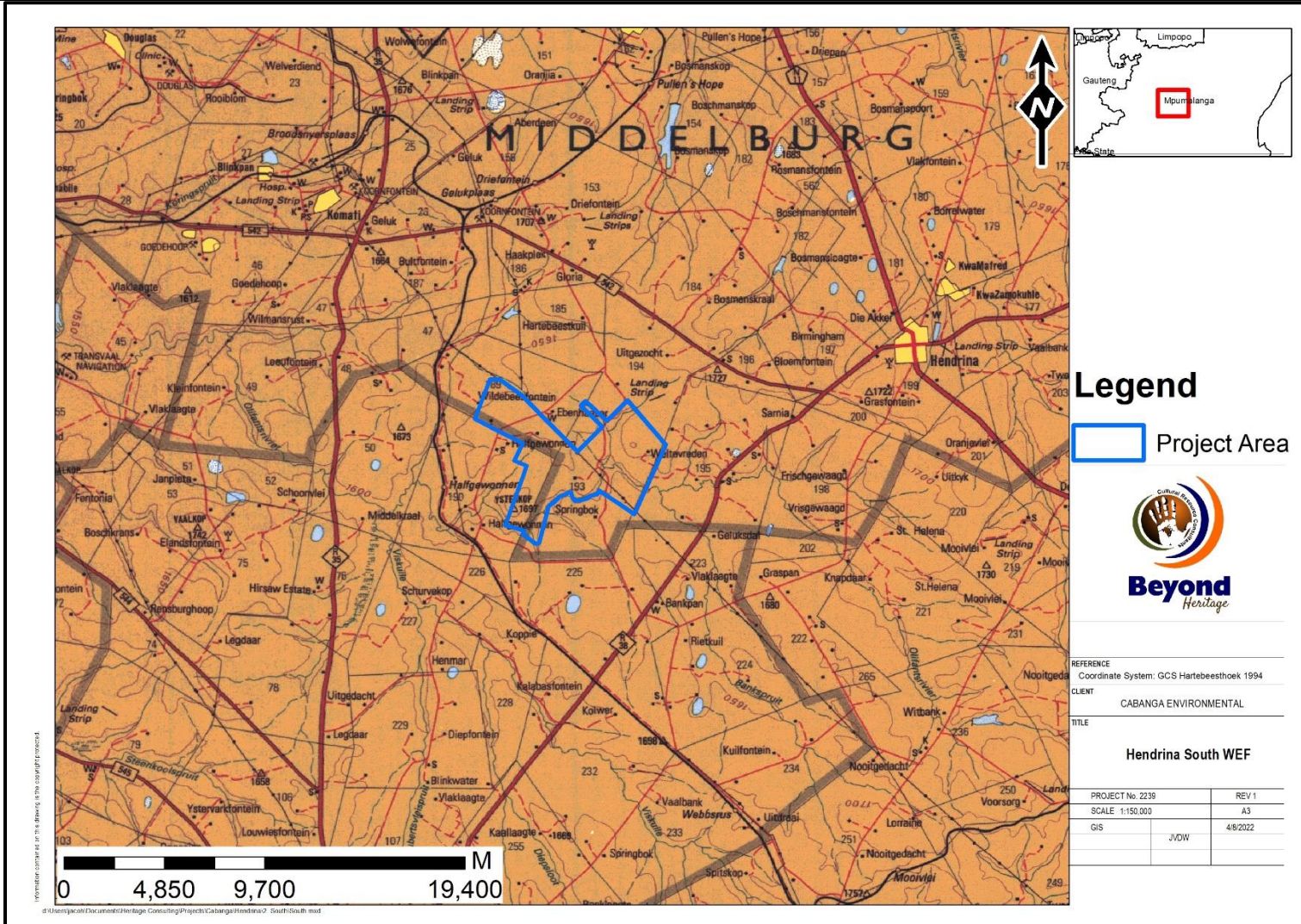


Figure 1.1. Regional setting of the Project (1: 250 000 topographical map).

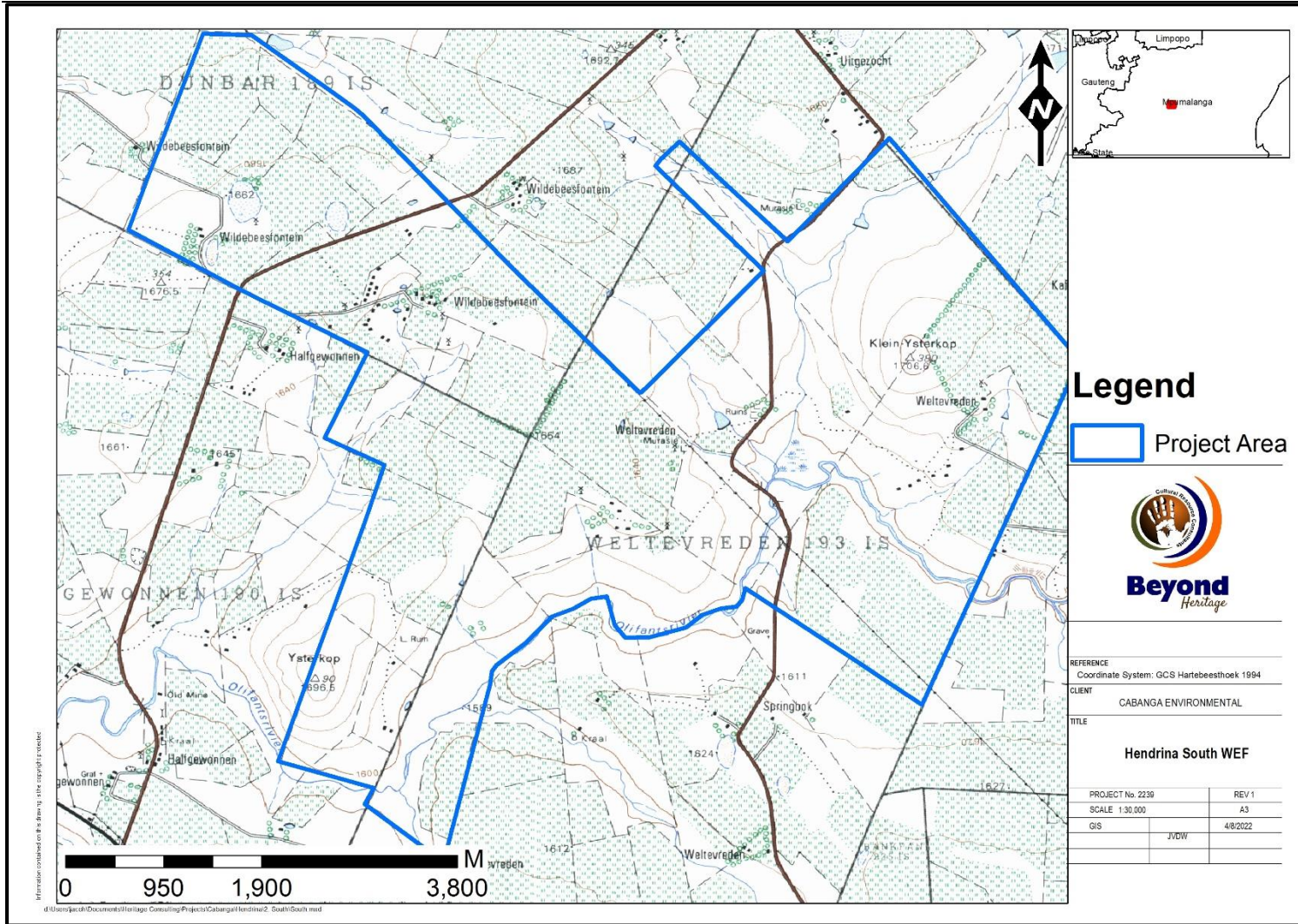


Figure 1.2. Local setting of the Project (1: 50 000 topographical map). Note the extensive cultivation in the Project Area.

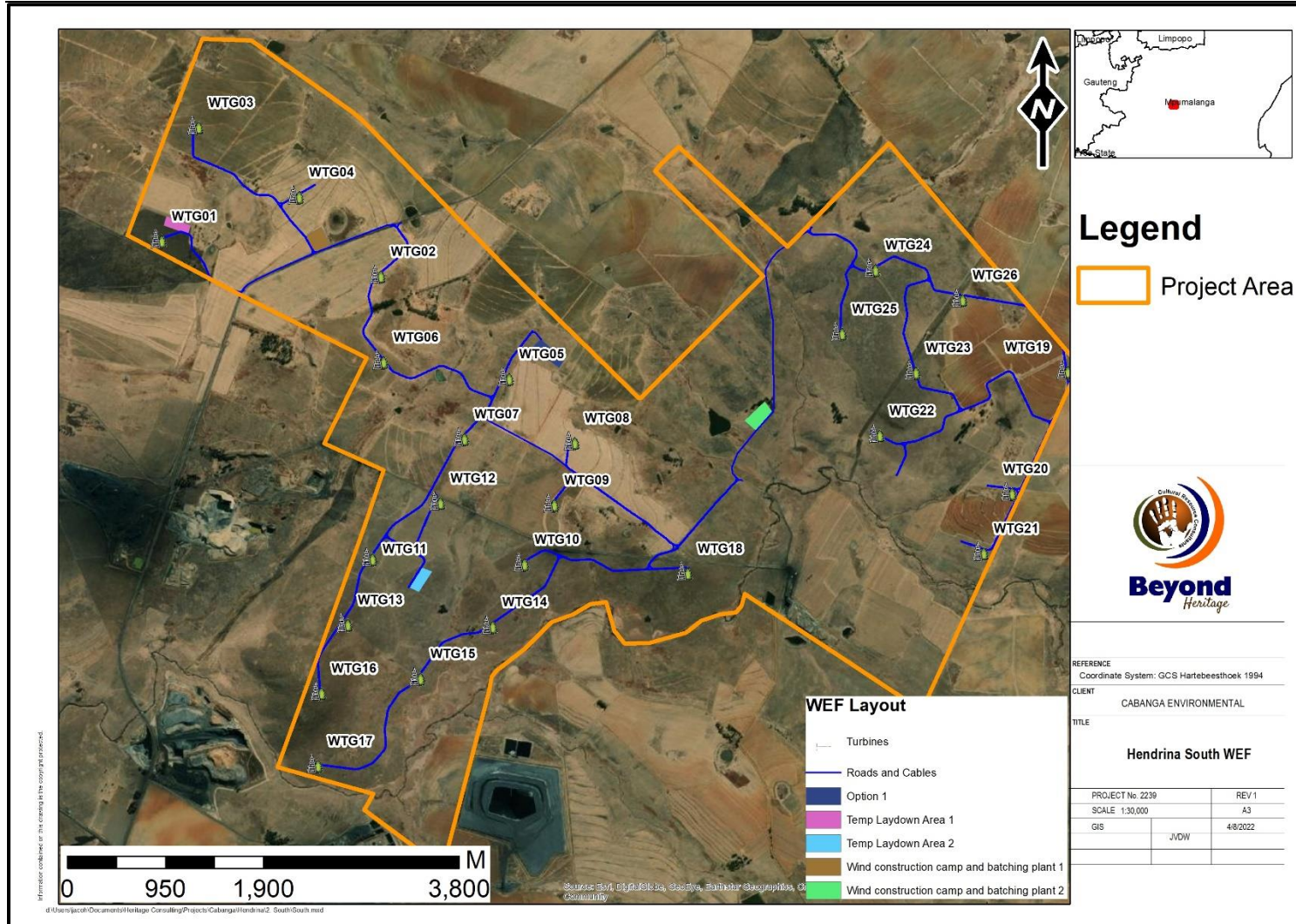


Figure 1.3. Aerial image of the proposed layout.



## 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 (or avoidance) 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 EIA process, it involves stakeholders interested in, or affected by the proposed development. Stakeholders are provided with an opportunity to raise issues of concern (for the purposes of this report only heritage related issues will be included). The aim of the public consultation process undertaken by the EAP 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**

	<b>Site Investigation</b>
Date	The week of 23 August 2021
Season	Summer – Heritage visibility was low in some areas due to cultivated fields with harvested crops. The layout was also slightly changed after the survey due to environmental constraints resulting in some areas not being physically surveyed. These areas are mostly of low heritage potential located in cultivated areas. The Project area was sufficiently covered to understand the heritage character of the area (Figure 3.1).

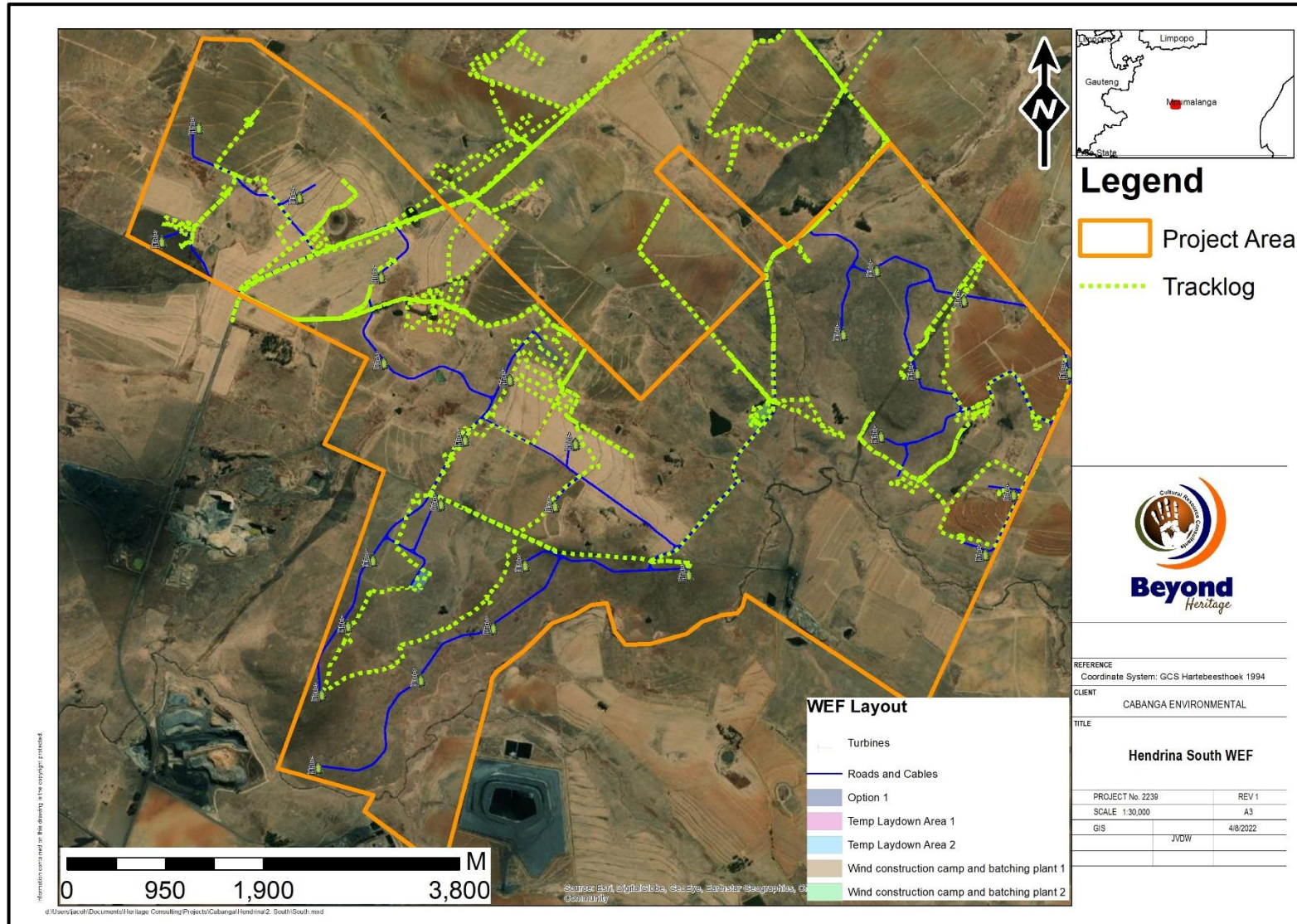


Figure 3.1. Tracklog of the survey path in green.

### 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**

<b>FIELD RATING</b>	<b>GRADE</b>	<b>SIGNIFICANCE</b>	<b>RECOMMENDED MITIGATION</b>
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																			
<b>Probability</b>	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.																			
<b>Duration</b>	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																			
<b>Scale / Extent</b>	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																			
<b>Magnitude/ Severity (Negative)</b>	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																			
<b>Sensitivity of the Aspect</b>	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																			
<b>Consequence</b>	4 to 19	Insignificant	Likelihood	5	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
		Low	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		
	40 to 59	Moderate	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	
	60 to 79	High		4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
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**

According to Census 2011, Steve Tshwete Local Municipality has a total population of 217 073 people, of whom 73,6% are black African, and 21,8% are white. The other population groups make up the remaining 4,6%. Of those aged 20 years and older, 3,4% have completed primary school, 30,8% have some secondary education, 35% have completed matric, and 14,4% have some form of higher education, while 7,4% of have no form of schooling.

According to Census 2011, Govan Mbeki Local Municipality has a total population of 294 538, of which 80,5% are black African, 16,0% are white, with the other population groups making up the remaining 3,5%. Of those 20 years and older, 3,9% completed primary school, 33,9% have some secondary education, 31,4% completed matric, and 12,6% have some form of higher education. The percentage of those aged 20 years and older with no form of schooling is 7,9%. 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 Forzano 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 on the farm Wilmansrust, some distance to the east, 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 with a rocky sub strata in the south (Figure 7.1 to 7.2).



Figure 7.1. Rocky areas not used for cultivation but for grazing.



Figure 7.2. Ploughed fields in the Project area.

## 8 Findings of the Survey

### 8.1 Heritage Resources

Heritage finds were limited to burial sites and the demolished remains of residential dwellings (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 Figure 8.2 – 8.15. Recorded observations are briefly described in Table 7.

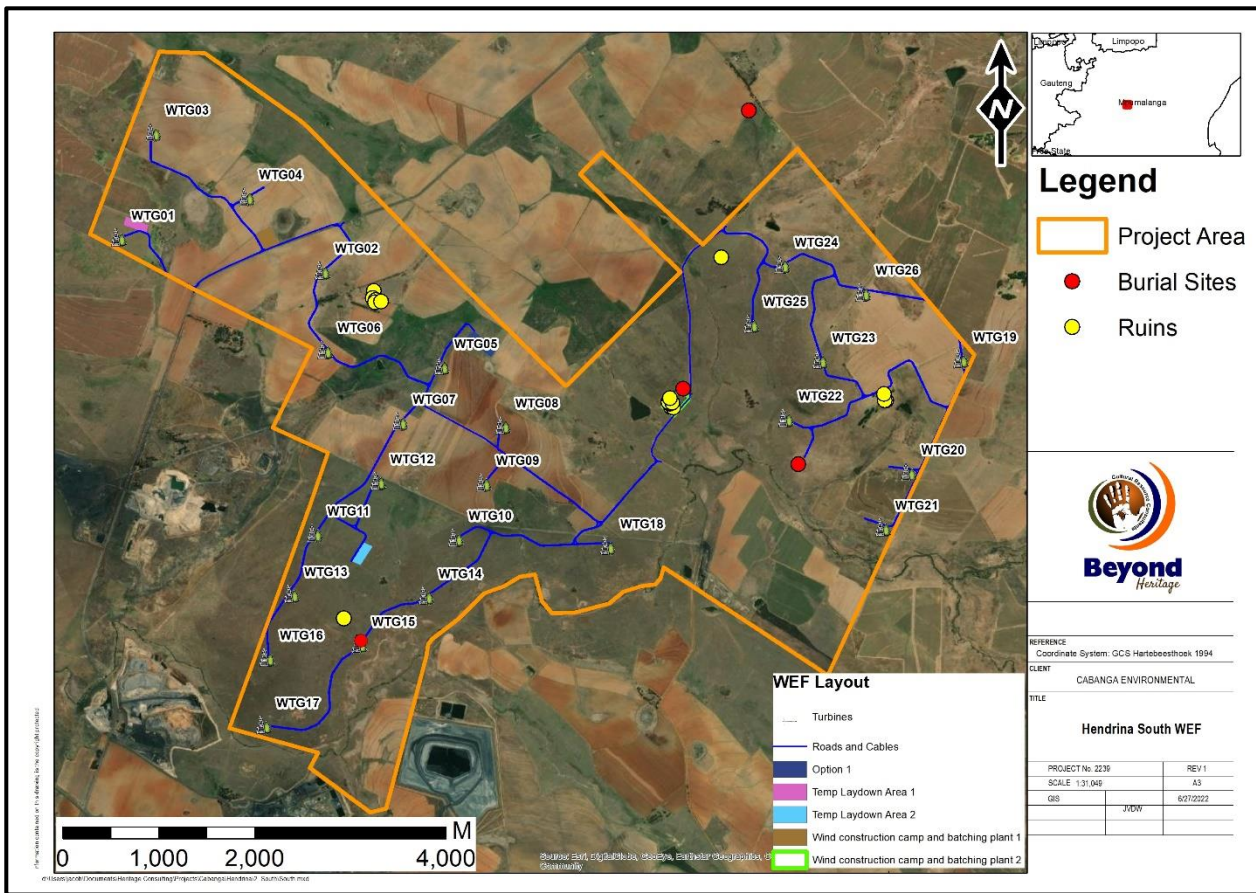


Figure 8.1. Site distribution in relation to the proposed layout.

Table 7. Sites recorded in the study area.

Label	Location	Type Site	Description	Significance and Field Rating
067, 068, 069, 070, 071.	-26.1966837, 29.5516095	Ruins	The site consists of multiple degraded and broken-down structures in an area of 100 x 100 m. These structures could possibly have been part of a farmstead with various buildings such as a house and accompanying infrastructure. The site is surrounded by large trees (pine and eucalyptus). The area is overgrown with grass and weeds.	The ruins potential to contribute to aesthetic, historic, scientific and social aspects are non-existent, and it is therefore of low heritage significance (GP C) unless associated with burial sites (e.g., still born graves) in which case the burial sites are of high social significance (GP A)
072	-26.227704 29.548641	Ruin	Rectangular sandstone dwelling with sandstone lintels. Doors, windows and roof have been removed. The feature is located away from the current development footprint and not further discussed in this report.	The ruins potential to contribute to aesthetic, historic, scientific and social aspects are non-existent, and it is therefore of low heritage significance (GP C) unless associated with burial sites (e.g., still born graves) in which case the burial sites are of high social significance (GP A)
073, 074, 075, 075, 076, 077, 078, 079, 080	-26.207423, 29.5796299	Ruins	The area of approximately 80 m by 80 m contains a historical farmstead with multiple structures that have been mostly destroyed or are degraded. These structures include a large stone build kraal, a stone-built house with multiple rooms as well as multiple smaller structures or remnants of structures. A row of large trees surrounds the area. A grave was also identified at Waypoint 081. The various structures at this location are possibly older than 60 years (Figure 8.8). Large portions of the structures are still intact.	The ruins potential to contribute to aesthetic, historic, scientific, and social aspects are non-existent, and it is therefore of low heritage significance (GP C) unless associated with burial sites (e.g., still born graves) in which case the burial sites are of high social significance (GP A)
081	-26.205861, 29.58073	Grave	Single granite grave of Lucas Viljoen dating to 1940 with a broken gravestone located near the farmstead at Waypoint 073 under a thicket of large trees.	GP A High social significance
082	-26.1934217, 29.5842555	Ruin	A 5 x 5m packed stone wall or square foundation. The remnants of a small, stone packed structure.	The ruins potential to contribute to aesthetic, historic, scientific and social aspects are non-existent, and it is therefore of low

				heritage significance (GP C) unless associated with burial sites (e.g., still born graves) in which case the burial sites are of high social significance (GP A)
083, 084, 085, 086	-26.2068038, 29.5996942	Ruins	A large farmstead with multiple degraded structures scattered across the site. The structures include a large broken-down farmhouse on top of a large stone-built foundation. A large sandstone-built structure near a large modern kraal. Multiple small brick structures occur across the site between the other structures. This farmstead could possibly be older than 60 years due to the architectural style and materials used to construct the site. Large parts of the site are still intact.	GP B Medium Significance
087	-26.212855, 29.591472	Burial site	Small cemetery with 4 graves located in an open field. The cemetery includes multiple packed stone graves as well as one grave with a cement headstone and skirting.	GP A High Social Significance
099	-26.229519, 29.550416	Burial Site	Three formal graves with cement grave dressings. The graves are fenced.	GP A High social Significance



Figure 8.2. Ruin at waypoint 067.

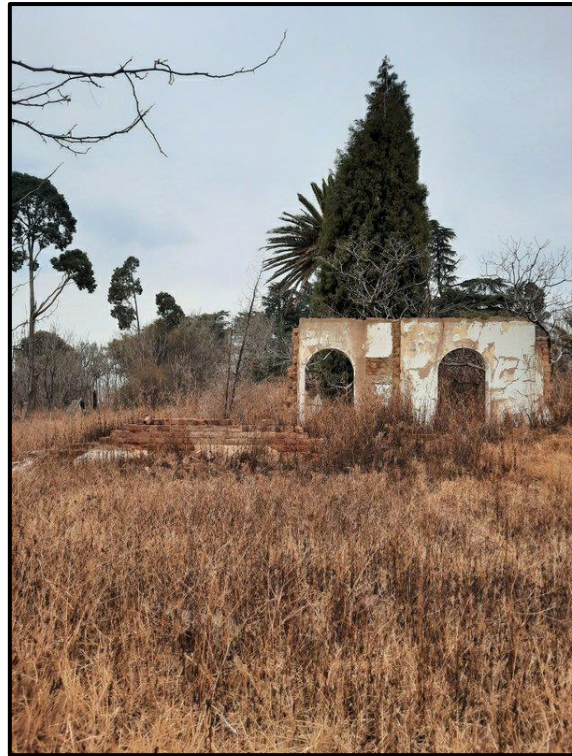


Figure 8.3. Partly demolished ruin at 070.



Figure 8.4 Sandstone walls at Waypoint 074.

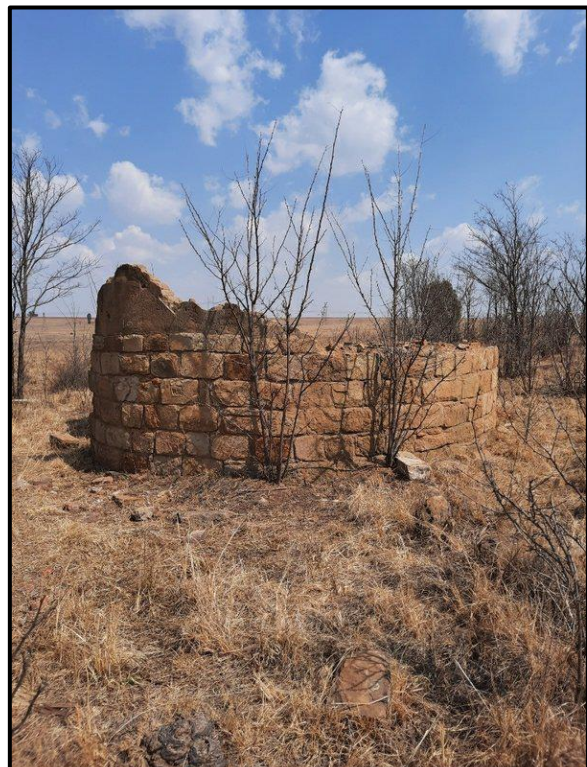


Figure 8.5. Sandstone rondavel at Waypoint 079.



Figure 8.6. Gravestone of Lucas Viljoen dating to 1940 at Waypoint 81.



Figure 8.7 Site conditions at burial site Waypoint 081.



Figure 8.8. Ephemeral stone packed foundations at Waypoint 082.

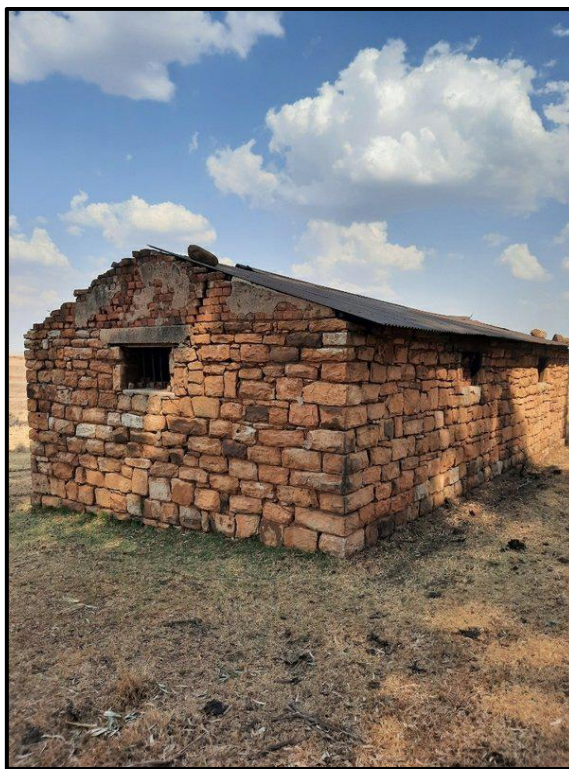


Figure 8.9. Structure at Waypoint 084.



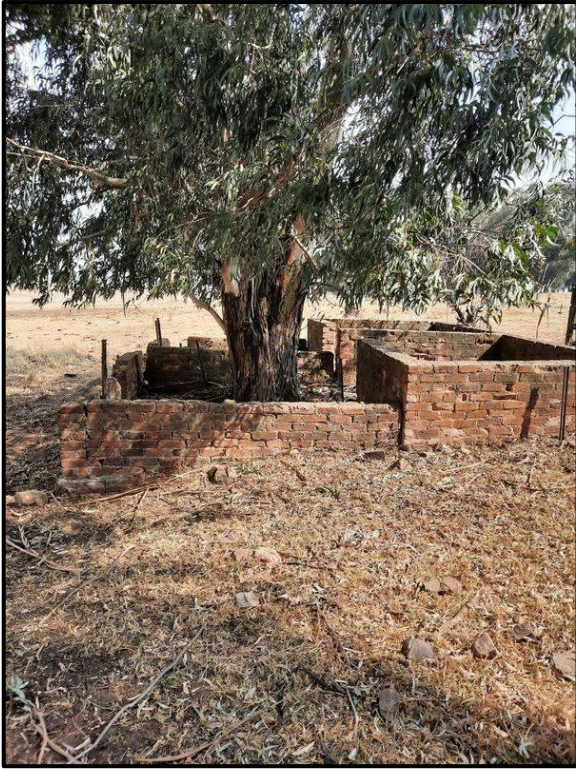


Figure 8.10. Farming infrastructure at Waypoint 085.



Figure 8.11. Old and modern kraal infrastructure at Waypoint 085.



Figure 8.12. Stone packed grave at Waypoint 087.



Figure 8.13. Grave with cement dressing at Waypoint 087.



Figure 8.14. Small, fenced cemetery at Waypoint 099.



Figure 8.15. Small, fenced cemetery at Waypoint 099.

Due to lay out changes after the completion of the field work some project components were not covered in the field work. The components and the potential heritage sensitivity is listed below in Table 8.

Table 8. Areas not covered during field work and potential heritage sensitivity.

Project Component	Heritage sensitivity	Motivation
WTG 03	Low	Located in cultivated field.
WTG 04	Low	Located in cultivated field.
WTG 06	Low	Located in cultivated field.
WTG 08	Low	Located in cultivated field.
WTG 10	Low	No features indicated on aerial photographs and historical maps.
WTG 11	Low	No features indicated on aerial photographs and historical maps.
WTG 12	Low	No features indicated on aerial photographs and historical maps.
WTG 14	Low	No features indicated on aerial photographs and historical maps.
WTG 17	Low	No features indicated on aerial photographs and historical maps.
WTG 22	Low	No features indicated on aerial photographs and historical maps.
WTG 24	Low	No features indicated on aerial photographs and historical maps.
WTG 25	Low	No features indicated on aerial photographs and historical maps.

### 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 dating from prior to 1965 (Figure 8.16 to 8.17).

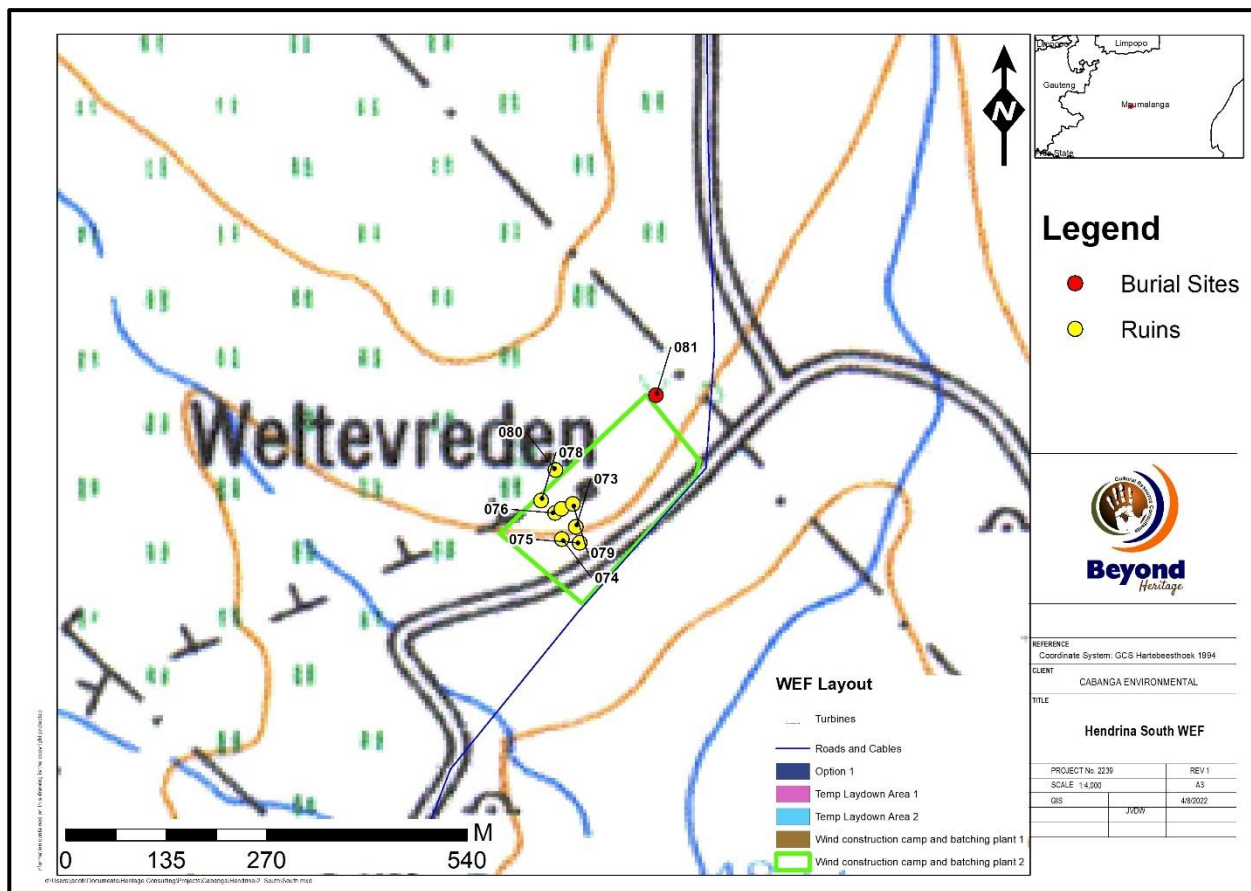


Figure 8.16. 1965 Topographic map of the area showing the structures and graves at Waypoint 073 to 081 were present prior to 1965.

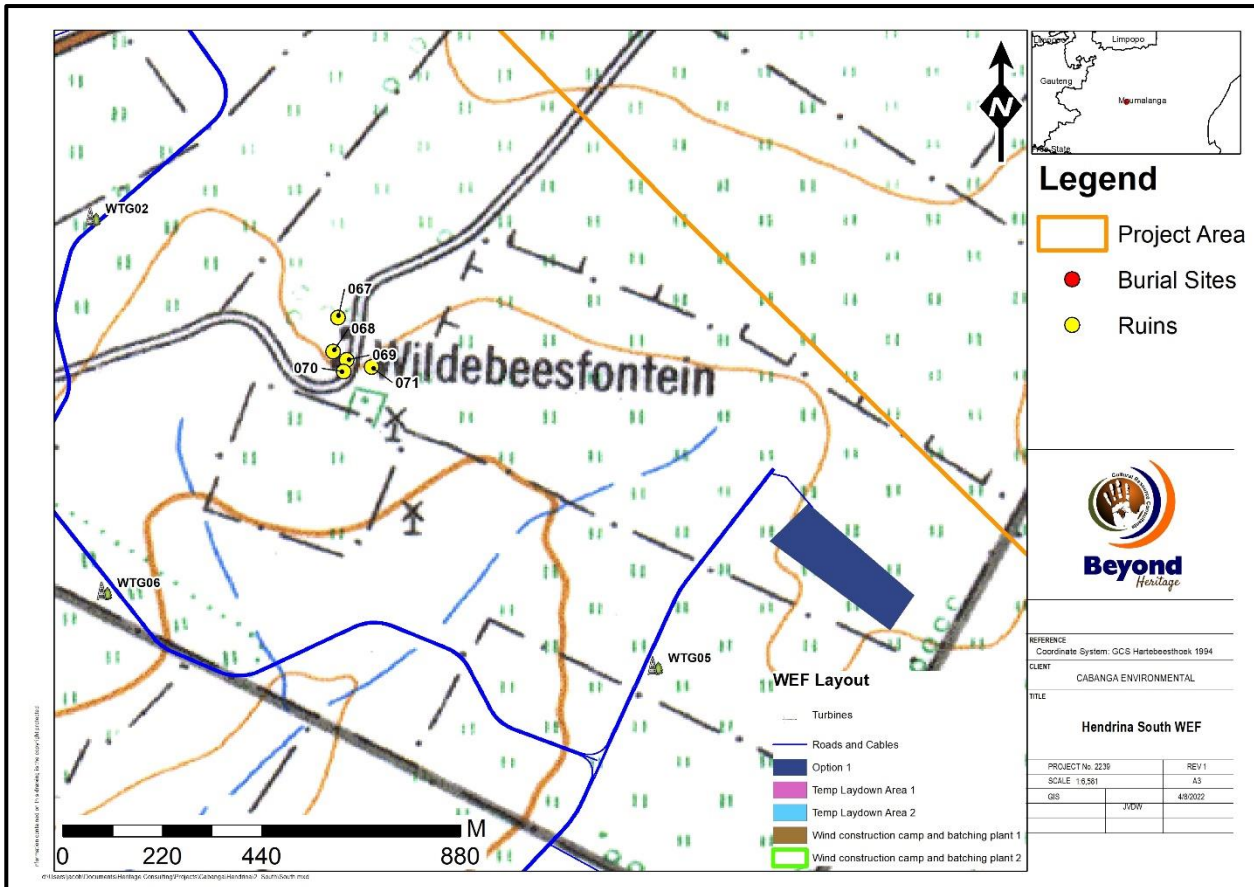
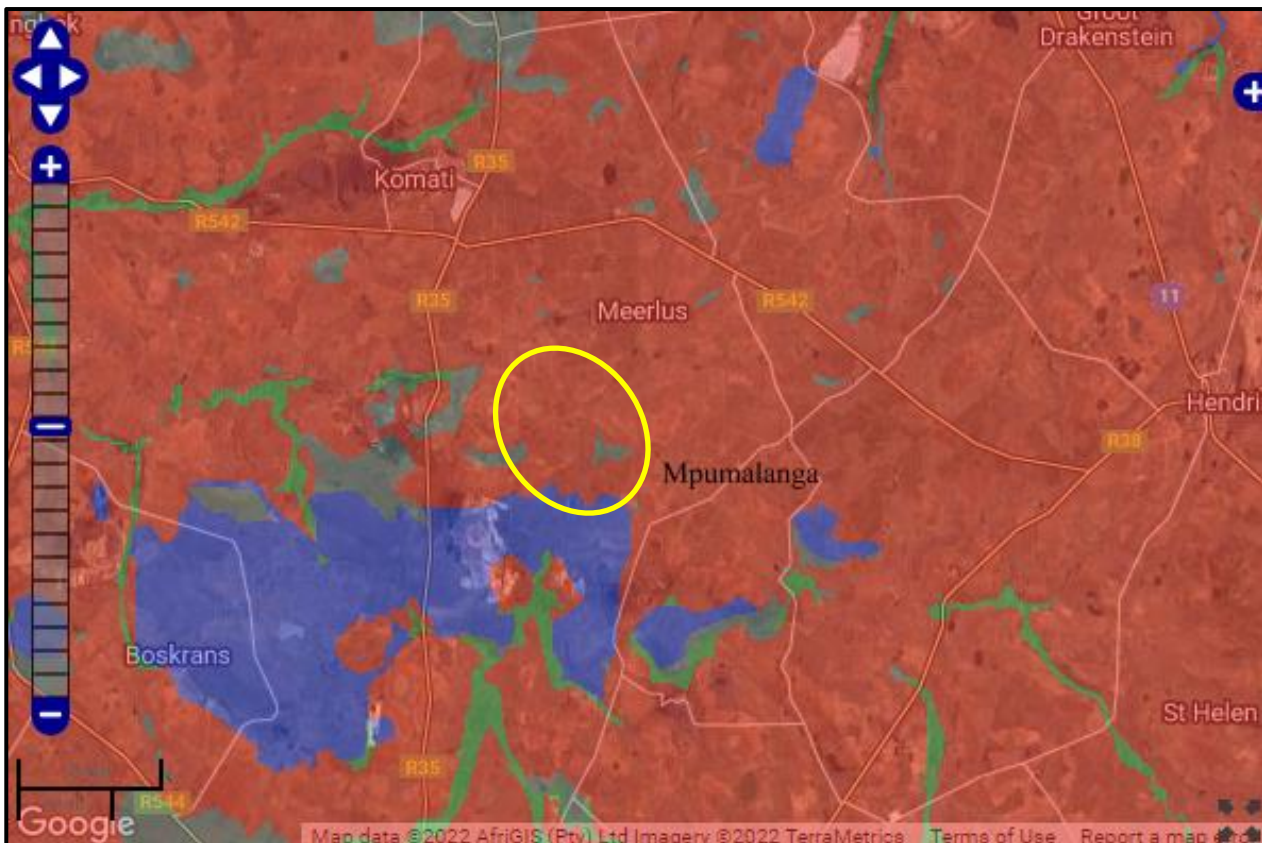


Figure 8.17.1965 Topographic map showing the structures at Waypoints 067 – 071 were present prior to 1965.

### 8.3 Paleontological Heritage

According to the SAHRA Paleontological map the study area is of very high paleontological significance (Figure 8.18) 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 EMP.



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

## 9 Potential Impact

Impacts to heritage resources without mitigation within the project footprint will be permanent and negative and occur during the pre-construction and construction activities. The recorded ruins (Waypoints 067 – 071 and 073 to 080) potential to contribute to aesthetic, historic, scientific and social aspects are non-existent, and it is therefore of low heritage significance unless associated with burial sites (e.g., still born graves) in which case the burial sites are of high social significance. The recorded burial sites (Waypoints 081) are of high social significance.

Based on the current lay out (Figure 9.1, 9.2, 9.3 and 9.4) the burial site at Waypoint 087 and the ruins at Waypoint 067 – 072 and 083 to 086 will not be impacted on and will be retained *in situ* and the impact on these features is expected to be low. However, the construction of the Construction Camp and Batching Plant Option 2 will directly impact on the ruins at Waypoint 073 - 080 and although of low significance the possible presence of graves is a risk and the impact prior to mitigation is high. This option is not preferred from a heritage point of view. A possible secondary impact is also expected at the grave at Waypoint 81 and this impact will be high due to the high social significance of grave sites. The construction of the WEF can limit access to ancestral burial grounds for families. The graves at waypoint 099 will be directly impacted on by WTG 15.

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 9 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 9).

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.

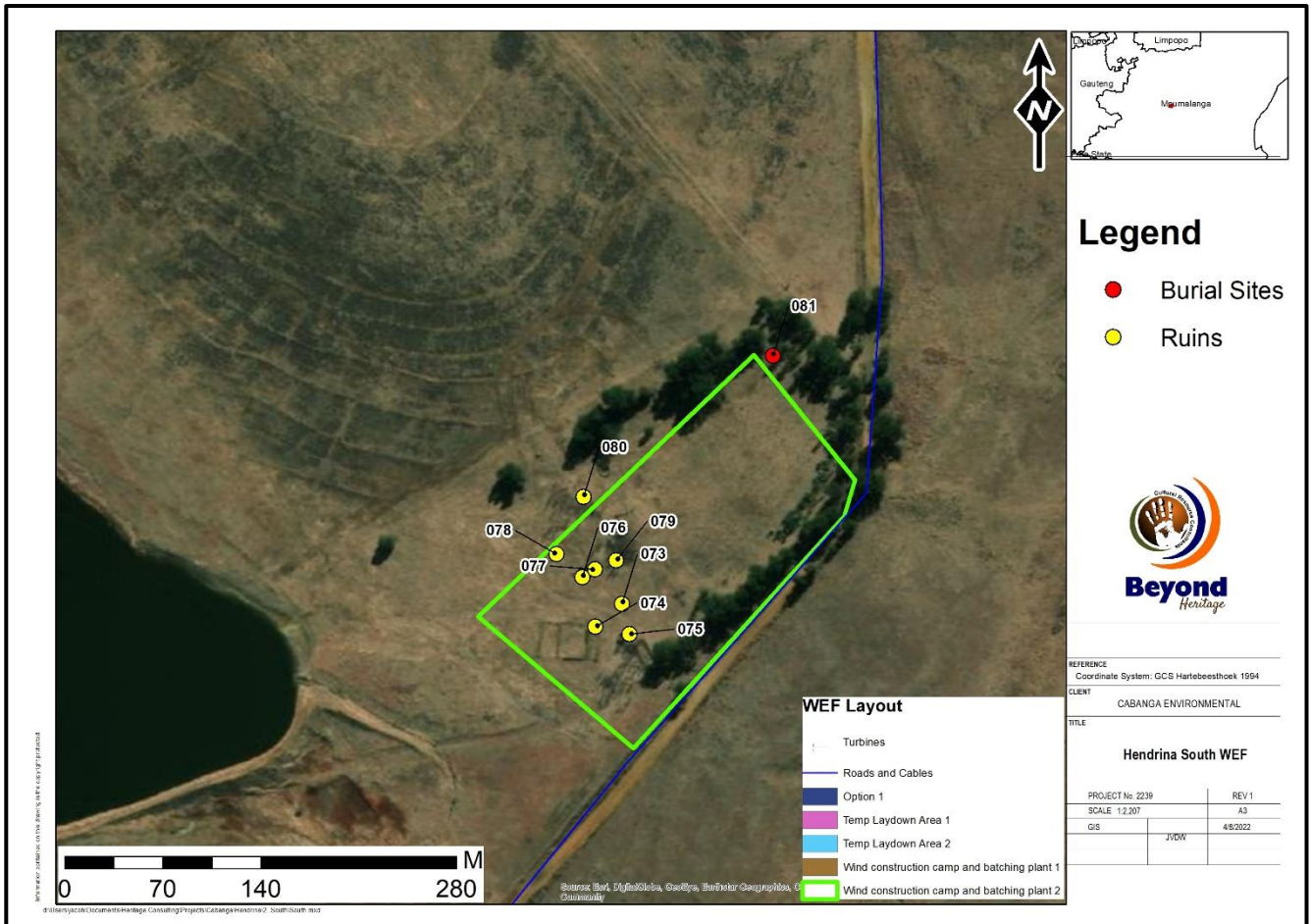


Figure 9.1. Direct impact to demolished ruins (073 – 081) and burial site 81 by the construction camp and batching plant 2.



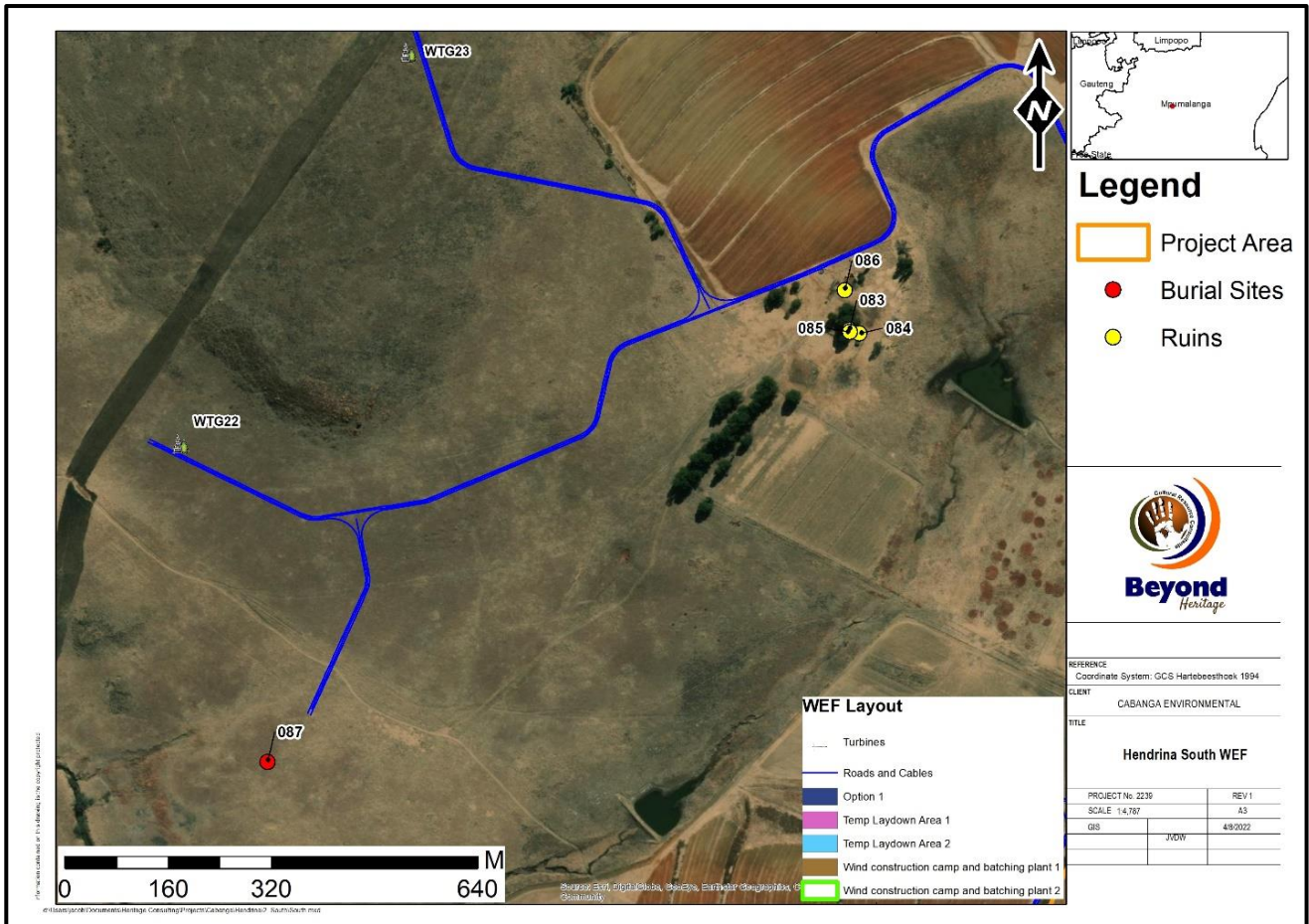


Figure 9.2. No direct impact is expected to the burial site Waypoint 87 and ruins (83 to 86).

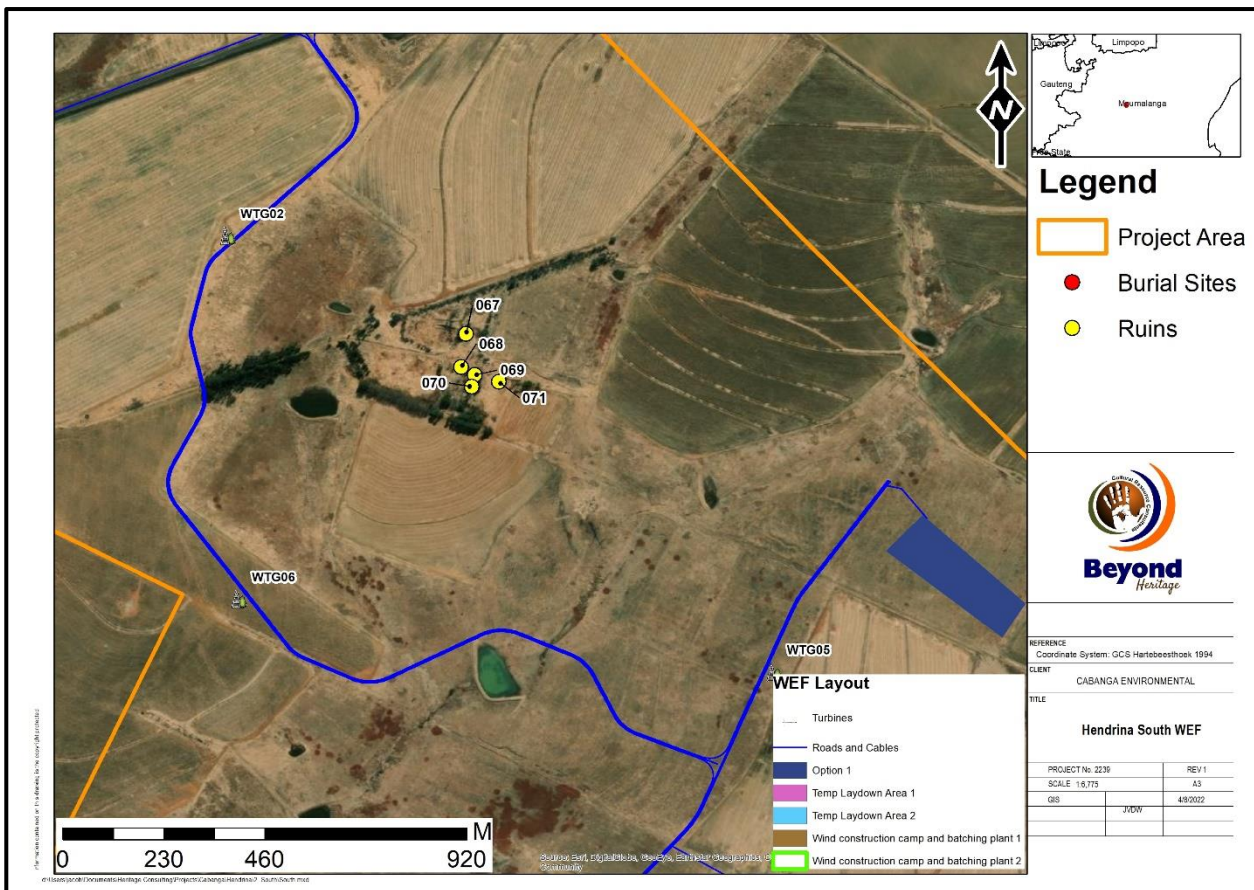


Figure 9.3. No direct impact is expected to the ruins at Waypoint 67 to 71.

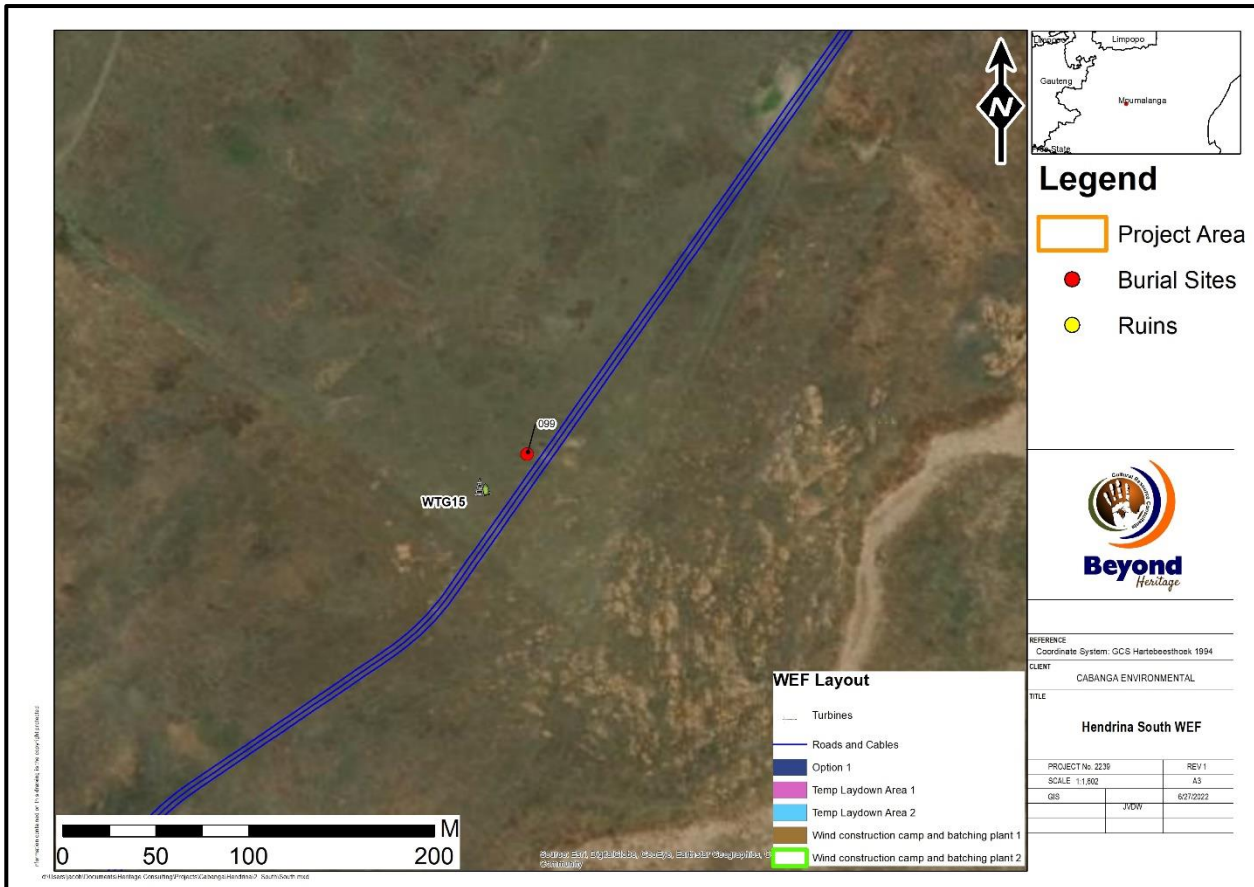


Figure 9.4. Waypoint 099 will be directly impacted on by WTG 15.

9.1.4 Impact Assessment for the Project

Table 9. 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 Camp and Batching Plant Option 2	Burial site at Waypoint 081	Clearing, levelling and construction activities	Negative	4 Highly Probable	4 Very sensitive	5 High	5 Permanent	3 Local	68 High	Avoidance of the graves and retaining the graves in situ with a 50 m buffer.	1 Unlikely	3 Sensitive	5 High	5 Permanent	2 Site	15 Insignificant
2	Construction Camp and Batching Plant Option 2	Ruins at Waypoint 073 - 080	Destruction of ruins	Negative	5 Definite	2 Somewhat sensitive	3 Moderate	5 Permanent	2 Site	60 High	The features can be associated with the graves of still borns and should be avoided during construction.	1 Unlikely	2 Somewhat sensitive	2 Slight to Moderate	5 Permanent	2 Site	11 Insignificant
3	Construction of infrastructure	Graves at 087	Clearing, levelling and construction activities will permanently destroy heritage features.	Negative	2 Possible	4 Very sensitive	5 High	5 Permanent	3 Local	34 Low	Graves should be avoided and demarcated.	1 Unlikely	4 Very sensitive	5 High	5 Permanent	2 Site	16 Insignificant
4	Construction of infrastructure	Ruins at Waypoint 067 – 071 and 083 to 086	Clearing, levelling and construction activities will permanently destroy heritage features.	Negative	2 Possible	2 Somewhat sensitive	3 Moderate	5 Permanent	2 Site	24 Low	The features can be associated with the graves of still borns and should be avoided during construction.	1 Unlikely	2 Somewhat sensitive	2 Slight to Moderate	5 Permanent	2 Site	11 Insignificant

5	Restriction of access	Ancestral burial grounds	Access restrictions to graves	Negative	3 Probable	4 Very sensitive	4 Moderate to High	4 Long Term	2 Site	42	Moderate	An access protocol must be developed for the project by the developer.	1 Unlikely	4 Very sensitive	4 Moderate to High	3 Medium Term	2 Site	13	Insignificant
6	WTP 099	Burial site at Waypoint 099	Clearing, levelling and construction activities	Negative	4 Highly Probable	4 Very sensitive	5 High	5 Permanent	3 Local	68	High	Avoidance of the graves and retaining the graves in situ with a 50 m buffer.	1 Unlikely	3 Sensitive	5 High	5 Permanent	2 Site	15	Insignificant

## 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 the ephemeral remains of demolished dwellings and burial sites.

The recorded ruins' potential to contribute to aesthetic, historic, scientific, and social aspects are non-existent, and it is therefore of low heritage significance, although the ruins fall under the ambit of the NHRA based on their age. If associated with burial sites (e.g., still born graves) the burial sites are of high social significance. The graves are of high significance and should be avoided.

Based on the current lay out (Figure 9.1, 9.2 and 9.3) the burial site at Waypoint 087 and the ruins at Waypoint 067 – 071 and 083 to 086 will not be impacted on and will be retained *in situ* and the impact on these features is expected to be low. However, the construction of the Construction Camp and Batching Plant Option 2 will directly impact on the ruins at Waypoint 073 - 080 and although of low significance the possible presence of graves is a risk, and the impact is high. This option is not preferred from a heritage point of view. A possible secondary impact is also expected at the grave at Waypoint 81 and this impact will be high due to the high significance of grave sites. The graves at waypoint 099 will be directly impacted on by WTG 15 and the turbine should be moved to avoid this.

According to the SAHRA Paleontological sensitivity map the study area is of very high paleontological significance (Figure 8.9) 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 (Waypoint 081 and 087) with a 50 m buffer and access for family members;
- WTG 15 will directly impact on the burial site at Waypoint 099 and it is recommended that this turbine should be moved to avoid the feature with a 50 m buffer zone;
- Identified ruins (Waypoint 067 – 072, 083 – 086 and 073 – 080) should be indicated on development plans and avoided during construction.
- Based on the potential risks associated with Construction Camp and Batching Plant Option 2 it is recommended that this option is avoided due to the presence of a burial site (Waypoint 081) and ruins (Waypoint 073 – 080);
- An access protocol must be developed for the project to ensure access to graves for family members;
- Pre-construction heritage walkdown of final layout.



**10.2 Reasoned Opinion**

The overall impact of the project is considered to be low 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 and possible layout changes.



**10.4 Monitoring Requirements**

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

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

**Table 10.** 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	EO & ECO	Weekly (Pre construction and construction phase)	Proactively	<ul style="list-style-type: none"> <li>• If risks are manifested (accidental discovery of heritage resources) the chance find procedure should be implemented:                             <ol style="list-style-type: none"> <li>1. Cease all works immediately;</li> <li>2. Report incident to Site Manager</li> <li>3. EPC (Engineering Procurement and Construction) Contractor to contact an archaeologist/ palaeontologist to inspect the site;</li> <li>4. Report incident to SAHRA; as advised by specialist and</li> <li>5. Employ site specific mitigation measures recommended by the specialist after</li> </ol> </li> </ul>

Heritage Monitoring					
Aspect	Area	Responsible for monitoring and measuring	Frequency	Proactive or reactive measurement	Method
					assessment in accordance with the requirements of the relevant authorities. <ul style="list-style-type: none"> <li>• Only recommence operations once impacts have been mitigated.</li> </ul>

## 10.5 Management Measures for inclusion in the EMPr

Table 11. 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	Applicant EPC Contractor	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA	ECO Checklist/Report
Graves at 081 and 087 as well as 099	Avoid and retain in situ with a 50 m buffer.	Pre-Construction	Throughout the project	Applicant/ EAP	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 of NHRA	ECO Checklist/Report
Graves as 099	Move WTG 15 to avoid the graves and retain in situ with a 50 m buffer.	Pre-Construction	Throughout the project	Applicant/ EAP	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 of NHRA	ECO Checklist/Report
Construction camps and Batching area option 2	Avoid this area for development alternatively mitigation measures will have to be employed including social consultation, monitoring and a development of a management plan.	Pre-Construction and during construction	Pre-Construction and construction	Applicant/ EAP	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 34 and 36 of NHRA	ECO Checklist/Report
Final Layout	Heritage walkthrough of final layout.	Pre-Construction	Pre-Construction	Applicant/ Developer to appoint suitably qualified archaeologist to undertake walk-through	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA	Heritage Statement
General project area: access restrictions to ancestral graves	An access protocol must be developed for family members to access their graves	Pre-Construction	Throughout the project	Applicant/developer	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 of NHRA	ECO Checklist/Report

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## **Appendix A**

# **ENERTRAG Chance Find Procedure**

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## **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**

### **3.1 Developer**

Developer shall:

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

### **3.2 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**

### **5.1 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:

#### **5.1.1 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.

#### **5.1.2 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.

#### **5.1.3 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.