

HERITAGE IMPACT ASSESSMENT

(REQUIRED UNDER SECTION 38(1) OF THE NHRA (No. 25 OF 1999))

FOR THE PROPOSED SANDVELD 22 KV POWER LINE UPGRADE NEAR HOPETOWN,
NORTHERN CAPE PROVINCE

Type of development:

Powerline Development

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APPROVAL PAGE

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Report Title	Heritage Impact Assessment for the Sandveld 22 kV powerline upgrade , Northern Cape Province
Authority Reference Number	TBC
Report Status	Final Report
Applicant Name	Eskom

Responsibility	Name	Qualifications and Certifications	Date
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Fieldwork	Ruan van der Merwe - Archaeologist	BA Hons Archaeology	September 2021

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21 September 2021	2172	Technical revision
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REPORT OUTLINE

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

Table 1. Specialist Report Requirements.

Requirement from Appendix 6 of GN 326 EIA Regulation 2017	Chapter
(a) Details of - (i) the specialist who prepared the report; and (ii) the expertise of that specialist to compile a specialist report including a curriculum vitae	Section a Section 12
(b) Declaration that the specialist is independent in a form as may be specified by the competent authority	<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 and 7.1.
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	9
(d) Duration, Date and season of the site investigation and the relevance of the season to the outcome of the assessment	Section 3.4
(e) Description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used	Section 3
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of 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
(l) 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 6
(p) A summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	NA
(q) Any other information requested by the competent authority	N.A

Executive Summary

1World Consultants was appointed by Eskom to the required Heritage Studies for the proposed Sandveld 22 kV powerline upgrade, near Hopetown, Northern Cape Province. Beyond Heritage was appointed to conduct a Heritage Impact Assessment (HIA) for the project and the study area was assessed on desktop level and by a non-intrusive pedestrian field survey. Key findings of the assessment include:


- The project is situated along an existing powerline, in an area characterised by Quaternary Aeolian sand and knee-high grass cover;
- Two low density scatters of Middle Stone Age lithics were recorded. The artefacts are out of context, scattered sparsely and of no significance apart from mentioning them in this report;
- Two deflated Stone Age sites (Sand 01 & Sand 02) consisting of Middle and Later Stone Age lithics are found where calcrete protrudes through the Quaternary sand cover. The first site (Sand 1) is located away from pylon positions and will not be directly impacted on. The second site (Sand 2) is located at an existing farmhouse and is disturbed from a heritage point of view;
- According to the South African Heritage Resource Information System (SAHRIS) the study area is of moderate paleontological sensitivity and an independent study was conducted by Prof Marion Bamford. The study concluded that there is a very small chance of fossils being disturbed;
- No other heritage features (archaeological, built environment or graves) of significance were recorded during the survey.

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

Recommendations:

- Implementation of a chance find procedure for the project.
- A buffer area of 15 meters around Sand 01 must be indicated on development maps and avoided during construction.

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 108 of 1998) and the associated 2014 Environmental Impact Assessment (EIA) Regulations, that I:</p> <ul style="list-style-type: none"> • I act as the independent specialist in this application; • I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant; • I declare that there are no circumstances that may compromise my objectivity in performing such work; • I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity; • I will comply with the Act, Regulations and all other applicable legislation; • I have no, and will not engage in, conflicting interests in the undertaking of the activity; • I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority; • All the particulars furnished by me in this form are true and correct; and • I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.
Signature	
Date	10/09/2021

a) Expertise of the specialist

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

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

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ABBREVIATIONS

ASAPA: Association of South African Professional Archaeologists
BGG Burial Ground and Graves
BIA: Basic Impact Assessment
CFPs: Chance Find Procedures
CMP: Conservation Management Plan
CRR: Comments and Response Report
CRM: Cultural Resource Management
DEA: Department of Environmental Affairs
EA: Environmental Authorisation
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EIA Practitioner: Environmental Impact 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 HIA for the proposed powerline upgrade of approximately 15 km in the Thembelihle local municipality, near Hopetown in the Northern Cape Province (Figure 1-1 to 1-4).

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, two Stone Age find spots and two locations with lithics in a deflated context 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 the following report. SAHRA as a commenting authority under section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) require all environmental documents to be submitted to SAHRA for commenting. Upon submission to SAHRA the project will be automatically given a case number as reference.

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

Eskom has submitted an application for a proposed 22kv powerline to be constructed on Ptn 4 and 6 of Jolmans Dam 51, Rem Of Verlaten Dam 69-FM, Ptn. 1 and 4 of Wiids Draai 53-FM, Ptn. 3 Rode Pan 52-FM near Hopetown, Northern Cape Province. Project components and the location is outlined under Table 2 and 3.

Table 2: Project Description

Project area	Ptn 4 and 6 of Jolmans Dam 51, Rem Of Verlaten Dam 69-FM, Ptn. 1 and 4 of Wiids Draai 53-FM, Ptn. 3 Rode Pan 52-FM near Hopetown
Magisterial District	Thembelihle local municipality.
Central co-ordinate of the development	29°29'19.31"S & 23°42'21.34"E
Topographic Map Number	2923 DA, DB & BC

Table 3: Infrastructure and project activities

Type of development	Powerline Upgrade
Size of development	15.306 km
Project Components	The proposed powerline will be 15.306 km long and constructed from 11 m wooden poles, adjacent to an existing powerline.

1.3 Alternatives

No alternatives were provided to be assessed although the extent of the area assessed allows for siting of pylons to minimise impacts to heritage resources.

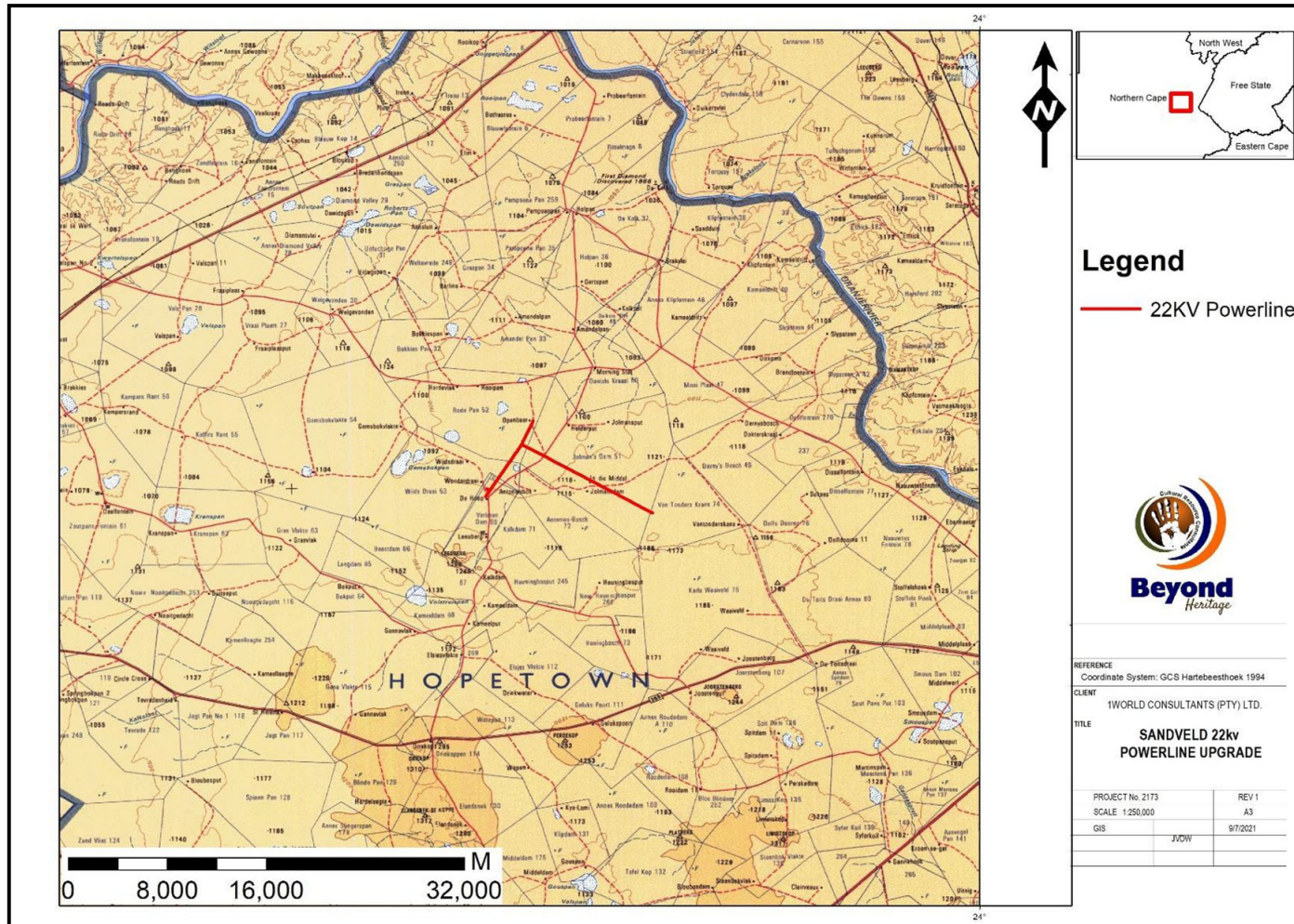


Figure 1.1. Regional setting (1: 250 000 topographical map) of the project.

BEYOND HERITAGE

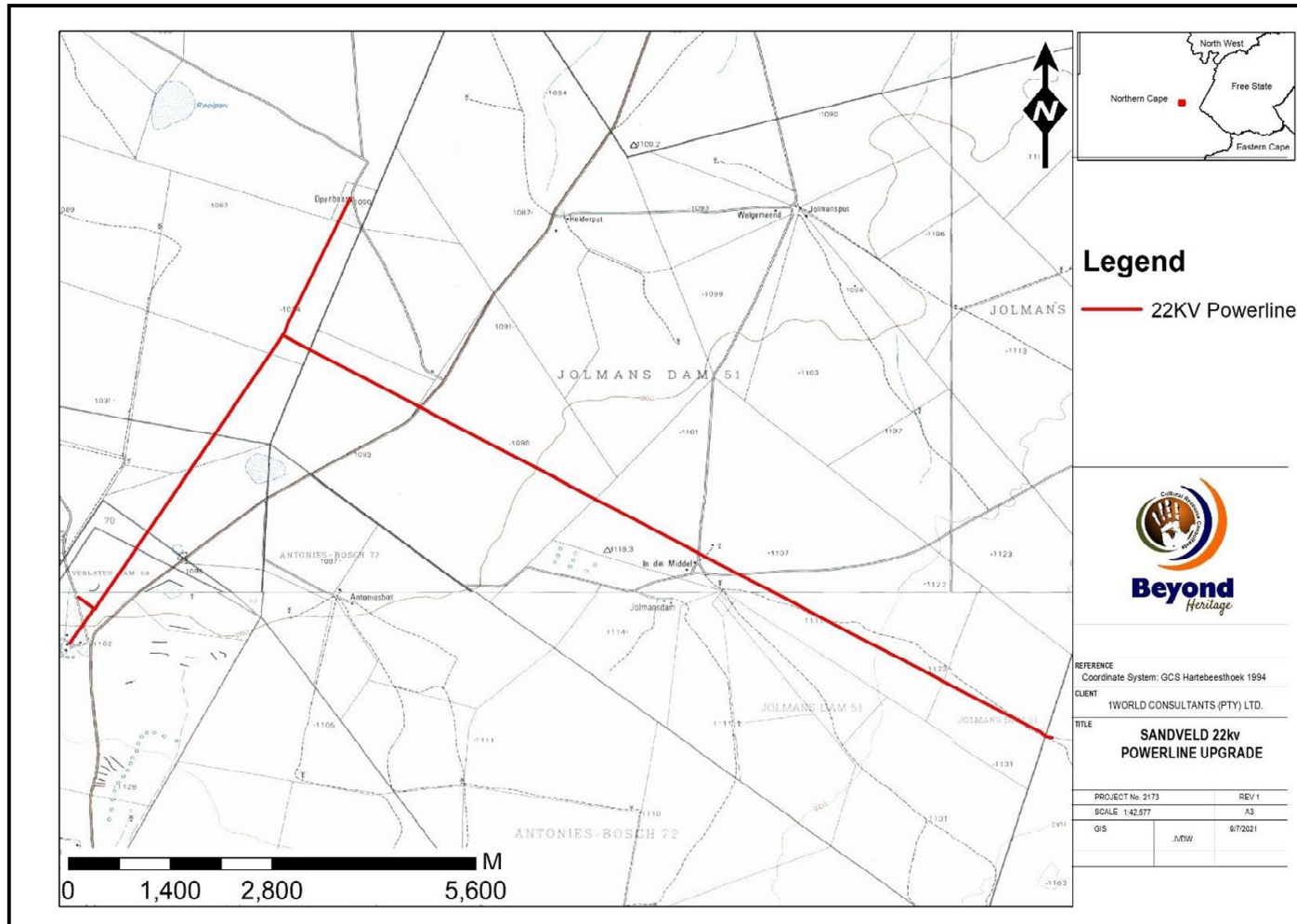


Figure 1.2. Local Setting of the project.

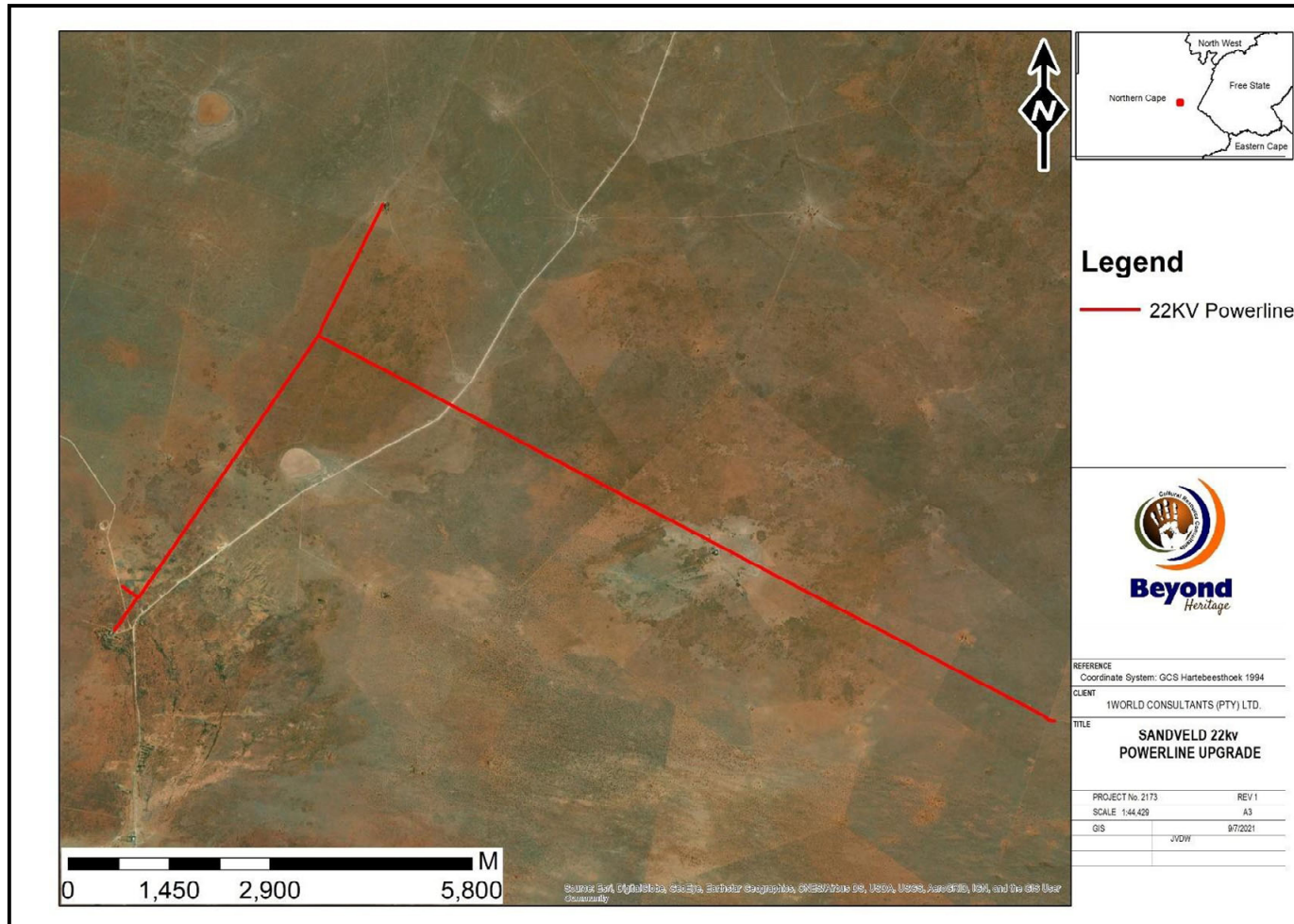


Figure 1.3. Aerial image of the development footprint.

2 Legislative Requirements

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

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

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

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

The HIA should be submitted 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 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:

No public consultation was conducted by the author of this report.

3.4 Site Investigation

The aim of the site visit was to:

a) survey the proposed project area to locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest;

- b) record GPS points of sites/areas identified as significant areas;
c) determine the levels of significance of the various types of heritage resources recorded in the project area.

Table 4: Site Investigation Details

	Site Investigation
Date	8 and 9 September 2021
Season	Spring – Aeolian sand and knee-high grass cover slightly hampers archaeological visibility but is still considered to be high. The project area was sufficiently covered to understand the heritage character of the area (Figure 3-1).

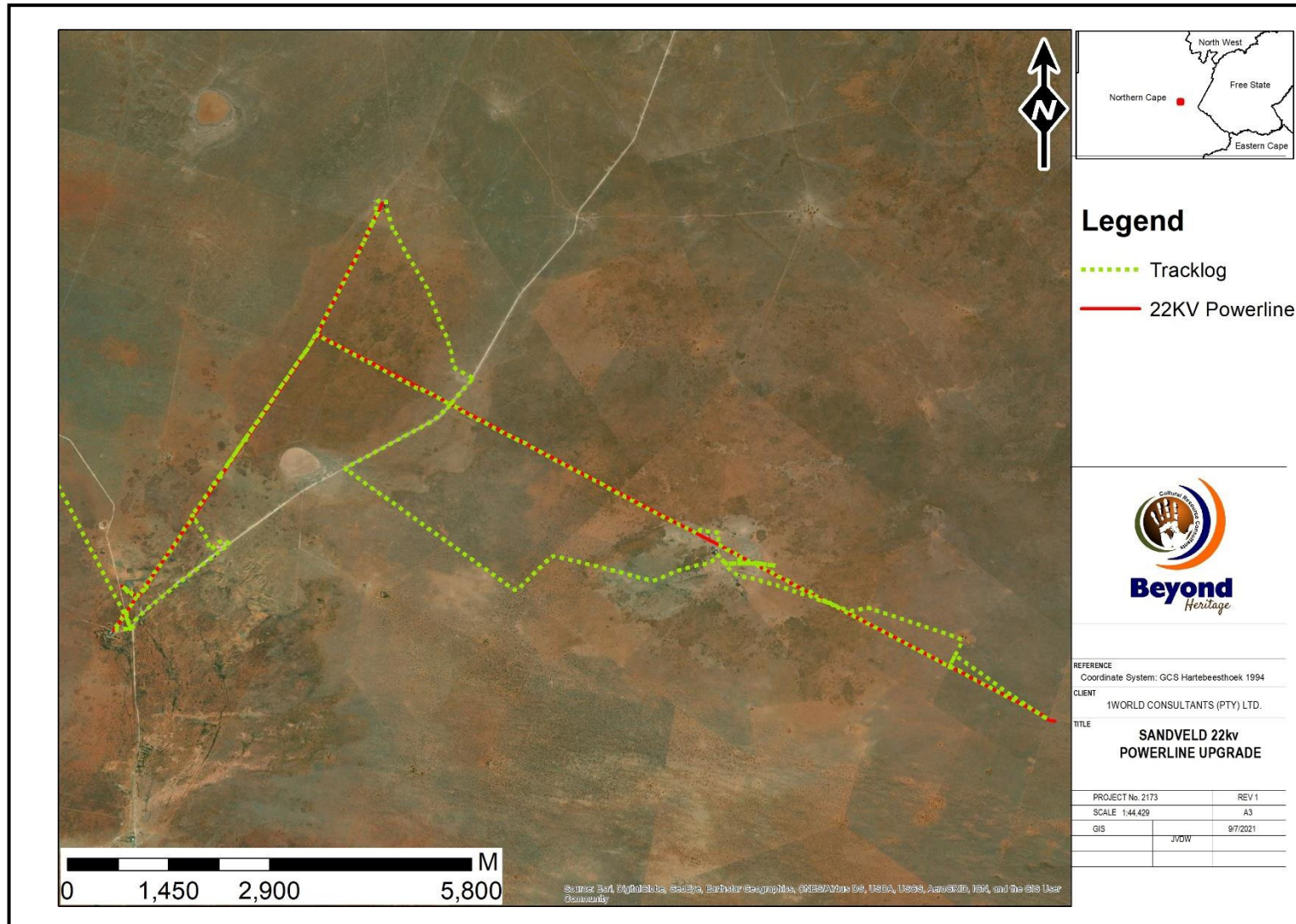


Figure 3.1: Tracklog of the survey in green.

3.5 Impact Assessment Methodology

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

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

The **significance** is calculated by combining the criteria in the following formula:

$$S=(E+D+M) P$$

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

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

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

3.6 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. Similarly, the depth of cultural deposits and the extent of heritage sites cannot be accurately determined due its subsurface nature. This report only deals with the footprint area of the proposed development and consisted of non-intrusive surface surveys. This study did not assess the impact on medicinal plants and intangible heritage as it is assumed that these components would have been highlighted through the public consultation process if relevant. It is possible that new information could come to light in future, which might change the results of this Impact Assessment.

4 Description of Socio-Economic Environment

The Thembelihle Local Municipality is a Category B municipality situated in the heart of the Karoo in the Pixley Ka Seme District of the Northern Cape Province. It is one of the smaller municipalities of the eight that make up the district, accounting for only 8% of its geographical area. The municipal area comprises 8 023km²

5 Results of Public Consultation and Stakeholder Engagement:

5.1.1 Stakeholder Identification

Landowners were informed of the proposed activity.

6 Literature / Background Study:

6.1 Literature Review (SAHRIS)

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where archaeological and historical sites might be located.

Few heritage assessments are conducted in close vicinity to the project area and the following Cultural Resources Management (CRM) assessments (Table 5) were consulted for this report. Known sites are indicated in Figure 6:

Table 5. CRM reports consulted for the study.

Author	Year	Project	Findings
Van Ryneveld, K.	2005	Cultural Heritage Site Inspection report for a prospecting right EMP portion of the De Kalk 37 Herbert District Northern Cape South Africa.	National Monuments Council Marker of the Eureka Diamond, Stone Age Artefacts and mining infrastructure.
Van Ryneveld, K.	2005	Cultural Resources Management Impact Assessment: (Portions Of) Ettrick 182; Hopetown District, Northern Cape, South Africa	MSA Site
Van Ryneveld, K.	2013	Phase 1 archaeological impact assessment the north hydroelectric power site, Orange River, Siyancuma Local Municipality, Northern Cape, South Africa	Livestock enclosures, Colonial Period. MSA and LSA sites.

Higgitt, N. & Nel, J.	2014	Slypsteen Bulk Sample Application, Slypsteen 41, Hopetown District, Northern Cape Heritage Impact Assessment	Stone Age Lithics
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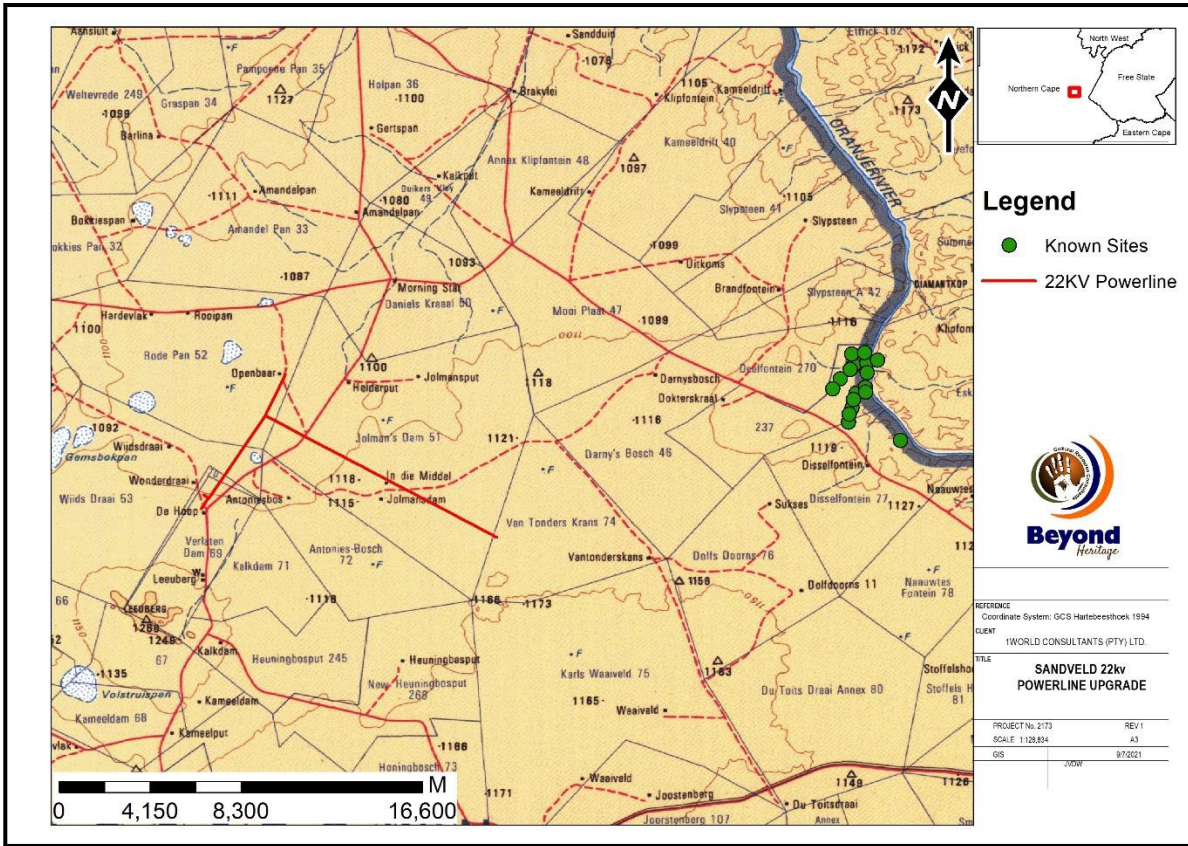


Figure 6.1. Known sites to the east of the proposed project are located close to the Orange River.

6.2 Genealogical Society and Google Earth Monuments

No known grave sites are indicated in the study area.

6.3 Background to the general area

6.3.1 Archaeology of the area

South Africa has a long and complex Stone Age sequence of more than 2 million years. The broad sequence includes the Later Stone Age, the Middle Stone Age and the Earlier Stone Age. Each of these phases contains sub-phases or industrial complexes, and within these we can expect regional variation regarding characteristics and time ranges. For CRM purposes it is often only expected/ possible to identify the presence of the three main phases. Yet sometimes the recognition of cultural groups, affinities or trends

in technology and/or subsistence practices, as represented by the sub-phases or industrial complexes, is achievable (Lombard 2011). The three main phases can be divided as follows;

- Later Stone Age; associated with Khoi and San societies and their immediate predecessors. Recently to ~30 thousand years ago.
- Middle Stone Age; associated with *Homo sapiens* and archaic modern humans. 30-300 thousand years ago.
- Earlier Stone Age; associated with early *Homo* groups such as *Homo habilis* and *Homo erectus*. 400 000-> 2 million years ago.

The general study area includes sites dating to all three periods. The Rietputs gravel complexes have produced *in situ* early Acheulean ESA lithics at the Rietputs type site at Windsorton approximately 160 km north east of the project area (Gibbon, Granger, Kuman, & Partridge, 2009 and Leader IV 2009). Artefacts such as handaxes, cleavers and cores were uncovered at depths between 6 m and 15 m below surface. ESA, MSA and LSA lithics are found throughout the larger area close to water sources (e.g., Higgitt & Nel 2014; Morris, 2005; 2009a & 2009b and van Ryneveld, 2005; 2013a & 2013b. Morris (2005) recorded ostrich eggshell containers on the farm Saratoga (away from the current project area) and LSA lithics including flakes and a hornfels pebble core (Morris 2009a and b) on the farm Bucklands. Morris concluded that the finds are representative of typical “low density distributions beneath the present surface” with very little archaeological significance (Morris 2009b). Van Ryneveld (2005) similarly identified MSA material on the farm Ettrick considered of low archaeological significance, although it extended “over a large area” (van Ryneveld 2005). Later Van Ryneveld (2013a; 2013b) recorded MSA and LSA ‘occurrences’ with varying artefact density ratios. These finds are in line with the expected regional archaeology as recorded at Dikbosch Shelter (Humphreys A. J., 1974) to the north and material recovered from Thomas Farm, (Henderson, 2002) to the east of the project area.

Maggs (1976) identified ‘Type R’ stone walled settlements along the Riet River, to the north of the project area, considered to date to the Iron Age period. These sites are unique to the region and are characterised by a single central enclosure with a few smaller enclosures located around it. Smaller enclosures have surrounding walls and secondary walling has been identified that link the primary to the secondary enclosures. Pottery associated with these settlements is distinct from Iron Age or LSA traditions and date to between the 16th and 19th centuries (Maggs, 1976). Type R Settlements have also been discovered at Driekopseiland (Humphreys A. B., 1982 and Mason, 1954). Burials have been located within these settlements which show evidence of potential coastal trading routes as some of the grave goods include cowrie shell (*Cypraea annulus*), South African abalone (*Haliotis midae*) pendants and South African scallop (*Pecten sulcicostatus*) pendants (Higgitt and Nel 2014).

6.3.2 Historical information

Roberts’ provides a lovely description of the Kimberley area: “The earth was grey, stony, cindery, carpeted in long silvery grass and dotted with thousands upon thousands of umbrella-shaped thorn trees...When it rained, the normally dry watercourses became raging torrents; when it blew, the dust was choking; when, as happened for most days of the year, the sun shone, it was like an oven. In more ways than one could it be described as a no-man’s-land; lying between the Great Karoo to the south, the undulating grasslands to the north-east and the Kalahari desert to the north-west.” (Roberts 1985: 3) The land was however all but uninhabited. Among the earliest inhabitants in the area were the Koranas, the Khoikhoi and the San. The latter existed as hunter-gatherers, whereas the Khoikhoi and Koranas grazed livestock. In other respects, their cultures were much alike.

A group known Griquas started to inhabit the area during the 19th century, and in due time the territory would become known as Griqualand West. The order however did not last long and the Griqua split into

factions and resumed their raiding expeditions. Boer farmers that moved inland from the Cape Colony during the 1830s and 1840s, further added to this arena of conflicting claims. The London Missionary Society, which arrived on the scene in the early nineteenth century, attempted to bring order to the Kimberley area and established a settlement in 1838 subsequently named Douglas, after Sir Percy Douglas, the Lieutenant-Governor of the Cape Colony (Raper, 1987). Colesberg, which came into being in the 1830s, was one of the earliest towns to develop in this area. The settlement of Hopetown was established in 1853 and became a municipality in 1858, but the area remained inhospitable and desolate. The Eureka Diamond was found near Hopetown on the Orange River on the farm De Kalk by a 15-year-old boy named Erasmus Stephanus Jacobs in 1867. Soon afterward, Schalk Van Niekerk entrusted the stone to John O'Reilly, who took it to Colesberg to inquire as to its nature and value. It was the first diamond discovered in South Africa. The ruins of the Jacobs family residence are declared a Grade II Provincial Heritage Site (GN 1705, 1980).

6.3.3 Anglo-Boer War

The discovery of diamonds and gold in the northern provinces also had other consequences. The British, who at the time had colonized the Cape and Natal, had intentions of expanding their territory into the northern Boer republics. This eventually led to the Anglo-Boer War, which took place between 1899 and 1902 in South Africa, and which 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 ZAR result in violence, it would mean the end of republican independence. This decision was not immediately publicized, and as a consequence republican leaders 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 on the basis of the status quo ante bellum. Salisbury's reply was, however, a clear statement of British war aims. (Du Preez 1977). Important events took place in the greater study area including General De Wet being attacked on Blaauw Kop Farm and fleeing to Slypsteen Farm to the northeast of the project area between October 1900 and February 1901 (Higgitt and Nel 2014). The Doornbult Concentration camp (and cemetery) was established from 1901 to 1902 south east from the project area (Wiid, 2011) as well as and a British military camp housing 16 000 British soldiers.

6.4 Cultural Landscape

Historical land use and the cultural landscape are linked since the cultural landscape is shaped to some extent by the history of the area. The general area is rural in character and infrastructure is limited to fences and infrastructure associated with sheep farming. The larger area is known for an extensive archaeological time depth spanning the past 1.6 million years, Historically the landscape is also significant as it is associated with diamond discoveries and war time events.

6.5 Graves and Burial Sites

No known graves are indicated for the study area on databases consulted but graves and cemeteries are widely distributed across the landscape and can be expected anywhere. Burials associated with Type R settlements were discovered around 30 km north from the project area on the farm St Clair, as well as at the Driekopseiland site (Humphreys A. B., 1982 and Mason, 1954).

6.6 Site Significance and Field Rating

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

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

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

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

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

Table 6. Heritage significance and field ratings

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

7 Description of the Physical Environment

The proposed line is situated within open farming land dominated by Aeolian sand cover with scattered calcrete outcrops. The area is characterised by wide open areas with knee-high grass cover and low growing shrubs. The topography is gently sloping from east to west. The proposed line follows an existing 22KV powerline that connects 3 farmsteads.



Figure 7.1. Existing Powerline infrastructure.

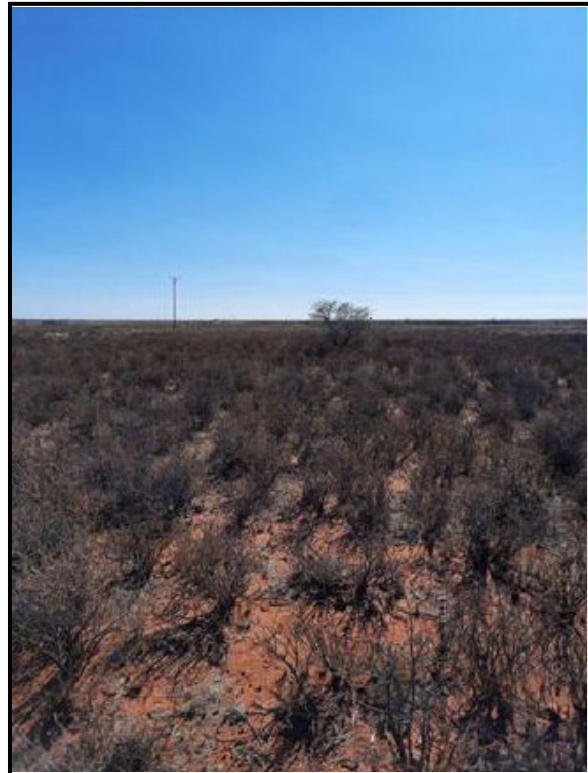


Figure 7.2. Vegetation in the study area.



Figure 7.3. General site conditions along the powerline route.



Figure 7.4. Wind-blown Aeolian sand cover characteristic of the area.

8 Findings of the Survey

It is important to note that only the development footprint was surveyed over two days by two archaeologists. Recorded finds were limited to widely scattered and isolated Stone Age artefacts. Isolated low-density scatters were recorded as Waypoints (Waypoint 108 and 109), two higher density scatters were noted, and these were recorded as sites with the abbreviation of “Sand” and numerically numbered (Sand 01 & Sand 02). Recorded features are spatially illustrated in Figure 8.1 and briefly described in Section 8.1 & 8.2.

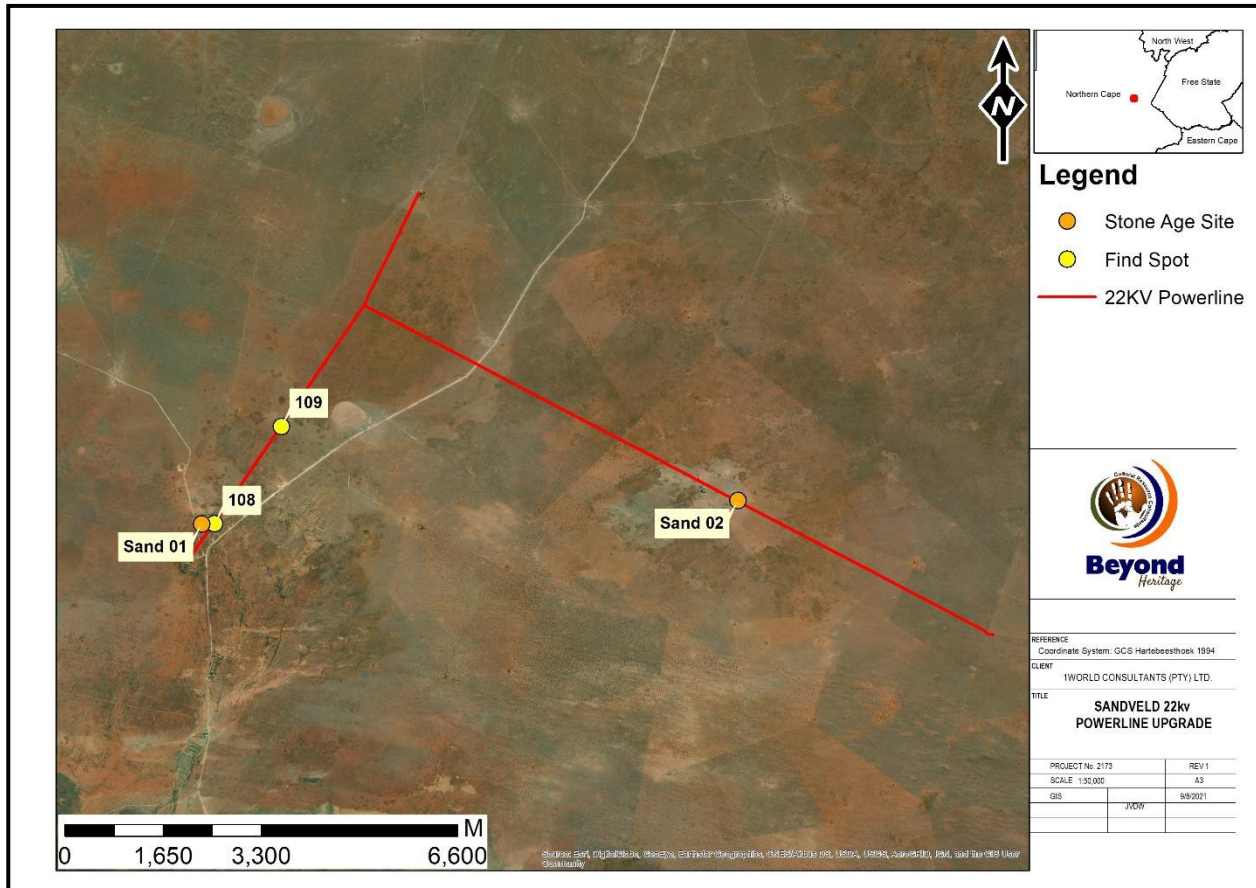


Figure 8.1. Recorded features in relation to the project.

8.1 Find Spots

Isolated artefacts occur sporadically throughout the southwestern section of the line where the sand cover is shallow with a calcrete substrata. Single occurring artefacts were therefore not recorded. Where two or more were noted, they were recorded as findspots. The stone tools are isolated, out of context and scattered too sparsely to be of significance apart from mentioning them in this report. The findspots are briefly described below.

8.1.1 Waypoint 108

Identification and Location

Site Type	Archaeological – MSA
Location	-29.50156, 23.6434668
Description	Low density lithic scatter located on a small calcrete outcrop. Typologically possibly dating to the MSA. Artefacts consists of a broken triangular flake and broken flake on hornfels and a miscellaneous flake (either MSA or LSA) on CCS.

Significance Rating

Statement of Significance - Field rating	Low - Generally Protected C (CP.C)
Significance Rational	Isolated finds of low significance



Figure 8.2. Dorsal view of lithics at Waypoint 108.

8.1.2 Waypoint 109

Site Type	Archaeological – MSA
Location	-29.4868087, 23.6543306 Isolated lithic artefacts that form part of the archaeological background scatter on weathered hornfel. Located at a calcrete outcrop lithics consist of flakes and broken blades with facteted platforms.
Description	

Significance Rating

Statement of Significance - Field rating	Low - Generally protected C (CP.C)
Significance Rational	Low density scatter of low significance.



Figure 8.3. Artefacts at Waypoint 109.

8.2 Stone Age sites

In addition, two sites were recorded as Sand 01 & Sand 02 where a higher density of artefacts occur. Sand 01 is situated under the existing powerline near the western end of the study area. The area consists of a large open area of sandy soil covered by low growing shrubs. Sand 02 is located at a farmstead with a lower density of artefacts but is distributed over a wide area. The sites are briefly described below.

8.2.1 Sand 01

Identification and Location

Site Type	Archaeological - Stone Age
Broad age category - Stone Age	Middle Stone Age, Later Stone Age
Topographic Location	Rocky Outcrop, large flat calcrete outcrop.
Location	-29.5016172, 23.6422545

Site Description

Site Dimensions	50m x 50m
Artifact Ratio	<15 Artifacts p.m2
Stratified?	No
Summary of Artifacts/Features	Lithics, MSA flakes and broken blades on Hornfels and Quartzite. LSA on CCS, formal tools consist of end and double-sided scrapers, chunks, and chips. Found in a deflated context on exposed calcrete substrata.
Site Condition Assessment	Fair = deflated context
Impact Agent(s)	Sheet erosion, Existing powerline traversing the site.
Environment Surrounding Site	Grazing, open sandy plain with shallow calcrete outcrops. Largely covered with shrubs
Notes	The site is situated under the existing powerline near the western end of the study area. The area consists of a large open area of sandy soil covered by low growing shrubs. The site is identified by a calcrete outcrop with a fair density of MSA artefacts scattered across a wide area.

Significance Rating

Statement of Significance	Medium
Field Rating	Generally Protected B (GP. B) - Medium significance Recording before destruction
Significance Rational	Artifact ratio is high
Recommendations	Avoidance 7 demarcate



Figure 8.4. Calcrete outcrop with lithic artefacts under existing power line at Sand 01.



Figure 8.5. Dorsal and ventral views of MSA & LSA lithics at Sand 01.

8.2.2 Sand 02

Identification and Location

Site Type	Archaeological - Stone Age
Broad age category - Stone Age	Middle Stone Age
Topographic Location	Rocky Outcrop, Calcrete outcrop within a large pan
Location	-29.4980381, 23.7234678

Site Description

Site Dimensions	50m x 50m
Artifact Ratio	<5 Artifacts p.m2
Stratified?	No
Summary of Artifacts/Features	Widespread low-density scatter of lithics
Site Condition Assessment	Fair = significant disturbance
Impact Agent(s)	Sheet erosion and disturbance from farming activities
Environment Surrounding Site	Calcrete, Grazing, Large open area covered with low growing shrubs. Site situated within a calcrete depression surrounding a farmstead with intensive agricultural activities.
Notes	Lithic artefacts exposed where calcrete is visible at the surface. MSA flakes on hornfels and quartzite scattered over a wide area.

Significance Rating

Statement of Significance	Low
Field Rating	Generally Protected C (GP. C) - Medium significance Recording before destruction
Significance Rational	Artifact ratio is low but scattered over a wide area. Intensive farming activities surrounding the farmstead resulted in disturbance of the artefacts that is found in a deflated context.
Recommendations	Avoidance



Figure 8.6. Large pan with calcrete outcrops at Sand 02.



Figure 8.7. Artefacts at Sand 02.



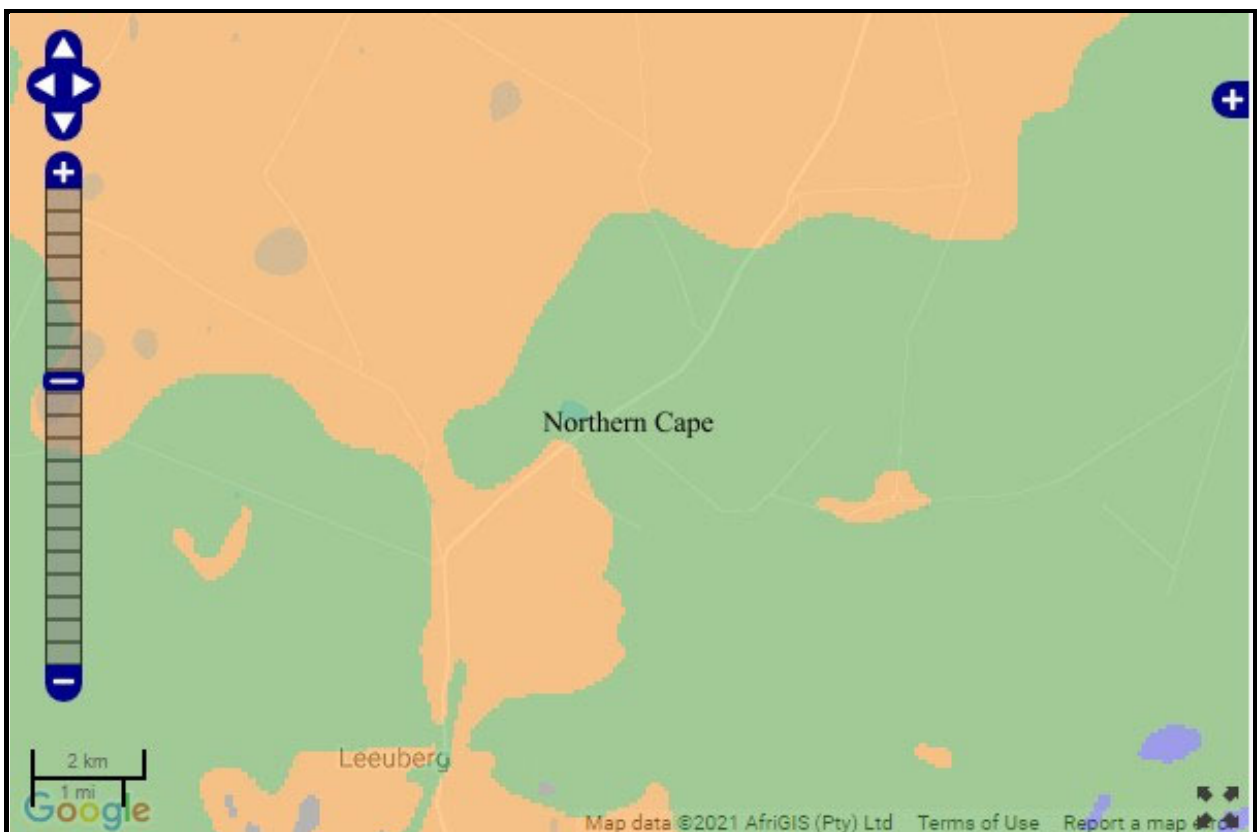
Figure 8.8. General site conditions at Sand02



Figure 8.9. General site conditions Sand02

8.3 Paleontological Heritage

Based on the SAHRA Paleontological map the study area is of moderate sensitivity (Figure 8.8) and an independent study was conducted by Prof Marion Bamford for this aspect. The study concluded that the route for the powerline overlies the ancient and non-fossiliferous strata of the Ventersdorp Supergroup, and on Tertiary calccrete and Quaternary aeolian sands that are potentially fossiliferous. Fossils do not occur in calccrete or sand but could be found in palaeo-spring and palaeo-pan sites, however, none is visible from the satellite imagery, however a Fossil Chance Find Protocol should be implemented. Based on this information it is recommended that no further palaeontological impact assessment is required unless fossils are found once construction commences. As far as the palaeontology is concerned, this project may be authorised.



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 8.10. Paleontological sensitivity of the study area as indicated on the SAHRA Palaeontological sensitivity map.

9 Potential Impact

The recorded findspots and Stone Age sites are all located close to or on the proposed alignment (Figure 9.1). The heritage value of the recorded findspots (Waypoint 108 & 109) are negligible while the slightly higher concentration of artefacts at site Sand 01 & Sand 02 have a marginally higher heritage value. The current pylon positions will not directly affect the deflated Stone Age scatter at site Sand 01 (Figure 9.2) while several pylons will be placed at site Sand 02 (Figure 9.3). The later have low densities of artefacts but are scattered over an aerially extensive area and is disturbed by the existing farming activities where the site is located. The findspots will not be directly impacted on by pylon positions (Figure 9.2 & 9.4). Impacts to heritage resources are permanent and irreversible, but power lines would have a relatively small impact on Stone Age sites as highlighted by Sampson (1985). Therefore, impacts can be mitigated to an acceptable level by ensuring that the areas around Sand 01 is indicated on development maps and avoided for pylon placement. Any additional effects to subsurface heritage resources can be successfully mitigated by implementing a chance find procedure. Mitigation measures as recommended in this report should be implemented during all phases of the project. Impacts of the project on heritage resources is expected to be low with the implementation of the mitigation measures in this report during all phases of the development (Table 7 and 8).

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 this phase.

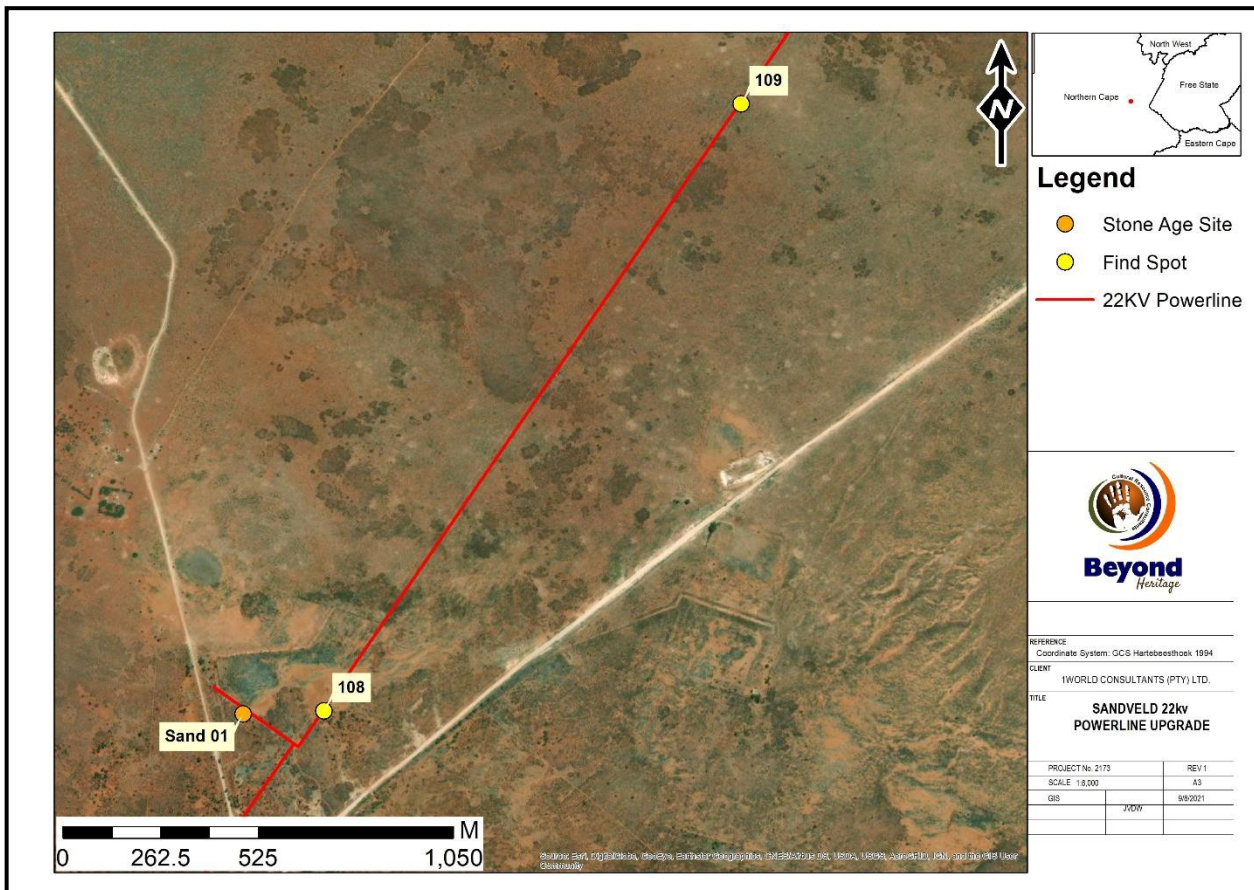


Figure 9.1. Findspots and Sand 01 in relation to the project.



Figure 9.2. Sand 01 and Waypoint 1082 in relation to the proposed pylons.

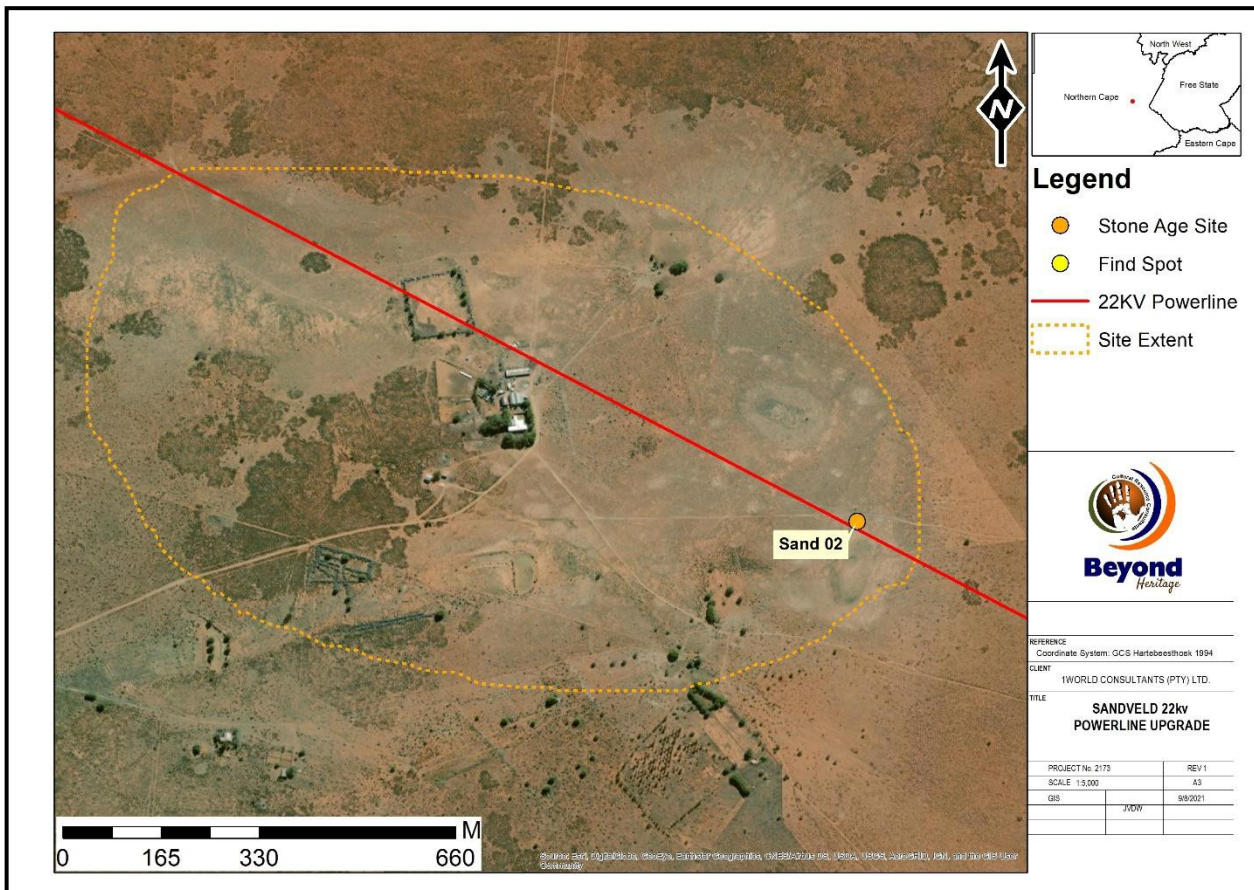


Figure 9.3. Sand 02 and site extent in relation to the project.

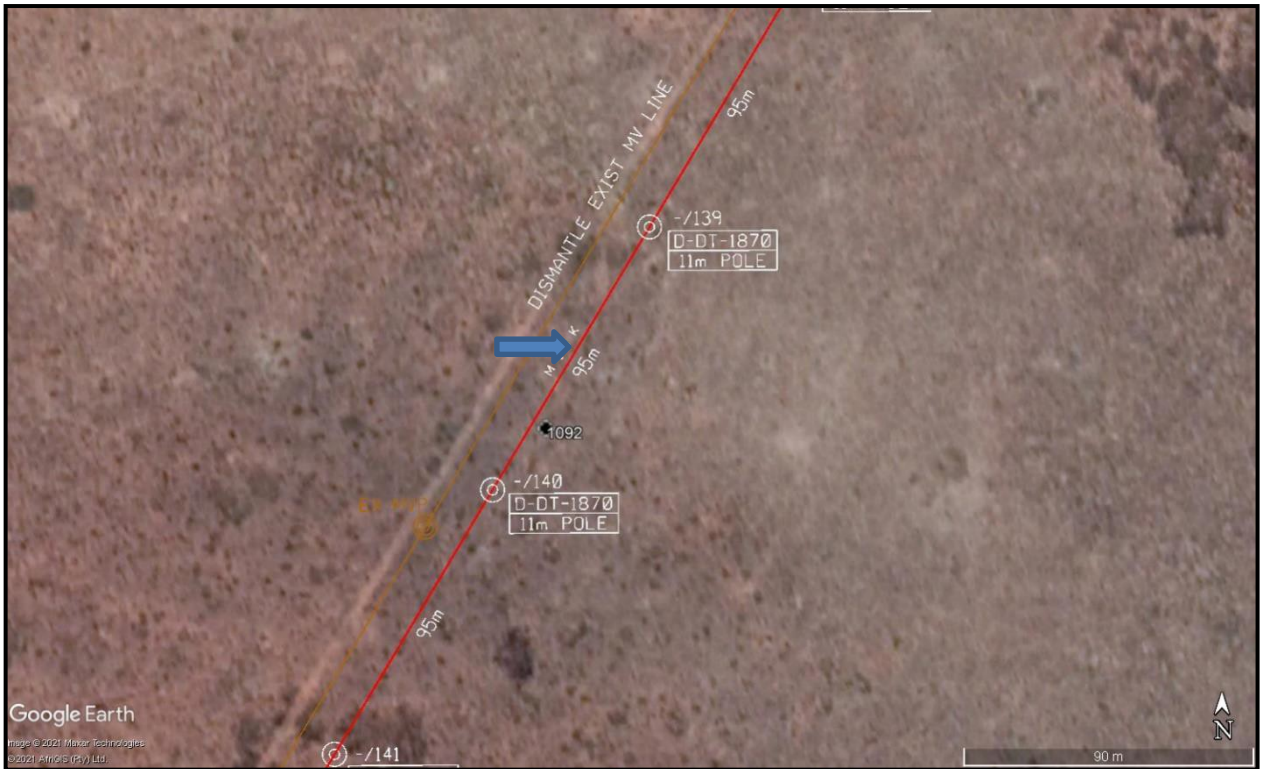


Figure 9.4. Waypoint 109 in relation to the proposed pylons.

9.1.4 Impact Assessment for the Project

Table 7. Impact assessment of the proposed project on Sand 01 and Sand 02.

Nature: During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological and paleontological material or objects.		
	Without mitigation	With mitigation (Preservation/ excavation of site)
Extent	Local (2)	Local (2)
Duration	Permanent (5)	Permanent (5)
Magnitude	Moderate (5)	Minor (2)
Probability	Probable (3)	Improbable (2)
Significance	36 (Medium)	18 (Low)
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	NA	NA
Mitigation: Implementation of a chance find procedure for the project. Areas around Sand 01 must be indicated on development maps and avoided for pylon placement.		
Cumulative impacts: The proposed project will have a low cumulative impact.		
Residual Impacts: Although surface sites can be avoided or mitigated, there is a chance that completely buried sites would still be impacted on, but this cannot be quantified.		

Table 8. Impact assessment for waypoint 108 and 109

Nature: During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological and paleontological material or objects.		
	Without mitigation	With mitigation (Preservation/excavation of site)
Extent	Local (2)	Local (2)
Duration	Permanent (5)	Permanent (5)
Magnitude	Minor (2)	Minor (2)
Probability	Probable (3)	Probable (3)
Significance	27 (Low)	27 (Low)
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	NA	NA
Mitigation: Recording of the features in this report is sufficient mitigation for the findspots. Implementation of a chance find procedure for the project.		
Cumulative impacts: The proposed project will have a low cumulative impact.		
Residual Impacts: Although surface sites can be avoided or mitigated, there is a chance that completely buried sites would still be impacted on, but this cannot be quantified.		

10 Conclusion and recommendations

The proposed project consists of the upgrade of an existing 22Kv powerline located close to Hopetown in the Northern Cape and recorded finds were limited to Stone Age artefacts. Isolated artefacts occur sporadically throughout the southwestern section of the line where the sand cover is shallow with a calcrete substrata. Single occurring artefacts were therefore not recorded. Where two or more were noted, they were recorded as findspots. The stone tools at the recorded findspots are isolated, out of context and scattered too sparsely to be of significance apart from mentioning them in this report and will not be directly impacted on by pylon positions (Figure 9.2 & 9.4).

In addition, two sites were recorded as Sand 01 & Sand 02 where a higher density of artefacts occur. Sand 01 is situated under the existing powerline near the western end of the study area. Sand 02 is located at a farmstead with a lower density of artefacts and is impacted on by existing farming activities. The current pylon positions will not directly affect the deflated Stone Age scatter at site Sand 01 (Figure 9.2) while several pylons will be placed at site Sand 02 (Figure 9.3). The later have low densities of artefacts but are scattered over an aerielly extensive area and is disturbed by the existing farming activities where the site is located. The impact footprint of the Sandveld project is small and as Sampson noted (1985) powerlines have little impact on Stone Age sites.

The study area is indicated as of moderate paleontological sensitivity and an independent study was conducted by Prof Marion Bamford. The study concluded that it is extremely unlikely that any fossils would be preserved in the Quaternary aeolian sands. There is a very small chance that fossils may occur in pans or springs, but none is evident. Nonetheless, a Fossil Chance Find Protocol should be implemented for the project.

The impact of the proposed project on heritage resources can be mitigated to an acceptable level and it is recommended that the proposed project can commence on the condition that the following recommendations (Section 10.1) are implemented and based on approval from SAHRA:

10.1 Recommendations for condition of authorisation

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

Recommendations:

- Implementation of a chance find procedure for the project (as outlined in Section 10.2).
- A buffer area of 15 meters around Sand 01 must be indicated on development maps and the area avoided during construction.

10.2 Chance Find Procedures

10.2.1 Heritage Resources

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

This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Construction crews must

be properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below.

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

10.2.2 Palaeontological resources

Monitoring Programme for Palaeontology – to commence once the excavations / drilling / mining activities begin.

1. The following procedure is only required if fossils are seen on the surface and when construction commences.
2. When excavations begin the rocks and must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, bone, stromatolites) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
3. Photographs of similar fossils must be provided to the developer to assist in recognizing the fossil plants, vertebrates, invertebrates or trace fossils in the shales and mudstones. This information will be built into the EMP's training and awareness plan and procedures.
4. Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
5. If there is any possible fossil material found by the developer/environmental officer/miners then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
6. Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
7. If no good fossil material is recovered, then no site inspections by the palaeontologist will be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.
8. If no fossils are found and the excavations have finished, then no further monitoring is required.

10.3 Reasoned Opinion

The overall impact of the project is considered to be low and the project can commence with the 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.

10.4 Potential risk

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

10.5 Monitoring Requirements

Ideally, site monitoring should be conducted by an experienced archaeologist or heritage specialist. Ongoing 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 the initial soil removal and subsequent earthworks during construction. The ECO should monitor all such activities biweekly. 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
Clearing activities and construction	Entire project area	ECO	Biweekly (Preconstruction 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 Sustainability Manager; 3. Contact an archaeologist/ palaeontologist to inspect the site; 4. Report incident to the competent authority; and

Heritage Monitoring					
Aspect	Area	Responsible for monitoring and measuring	Frequency	Proactive or reactive measurement	Method
					<p>5. Employ reasonable mitigation measures in accordance with the requirements of the relevant authorities.</p> <ul style="list-style-type: none"> • Only recommence operations once impacts have been mitigated.

10.6 Management Measures for the project.

Table 10. Heritage Management Plan for the project

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	Pre Construction and construction	Throughout the project	Applicant	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA	ECO Checklist/Report
Sand 01	Indicate on development plans and avoid area during construction	Pre Construction and construction	Throughout the project	Applicant	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35 and 38 of NHRA	ECO Checklist/Report

10.7 Knowledge Gaps

Due to the subsurface nature of heritage resources, the possibility of discovery of heritage resources during the construction phase cannot be excluded. This limitation is successfully mitigated with the implementation of a chance find procedure.

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