PHASE 1 ARCHAEOLOGICAL AND HERITAGE IMPACT ASSESSMENT REPORT FOR THE PROPOSED 400KV POWERLINE FROM ARIES SUBSTATION TO UPINGTON SUBSTATION, KAI GARIB AND KHARA HAIS LOCAL MUNICIPALITY, MGCAWU DISTRICT MUNICIPALITY, NORTHERN CAPE PROVINCE.

DATE: SEPTEMBER 2021

Document Information

Item	Description
Proposed development and location	Proposed 400KV powerline from Aries Substation to Upington Substation, Kai Garib and Khara Hais Local Municipality, Mgcawu District Municipality, Northern Cape Province.
Purpose of the study	To carry out an archaeological and Heritage Impact Assessment to determine the presence/absence of cultural heritage sites and the impact of proposed powerline development.
Coordinates	See Table and Figure 1
Municipalities	Kai Garib and Khara Hais Local Municipality, Mgcawu District Municipality
Predominant land use of surrounding area	Agriculture and mining
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Author	Trust Mlilo (Archaeology and Heritage Specialist)
Date of Report	10/09/ 2021

NATIONAL LEGISLATION AND REGULATIONS GOVERNING THIS REPORT

This is a specialist report' and is compiled in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2014.

DECLARATION OF INDEPENDENCE

In terms of Chapter 5 of the National Environmental Management Act of 1998 specialists involved in Impact Assessment processes must declare their independence.

I, **Trust Mlilo**, do hereby declare that I am financially and otherwise independent of the client and their consultants, and that all opinions expressed in this document are substantially my own, notwithstanding the fact that I have received fair remuneration from the client for preparation of this report.

Expertise:

Trust Mlilo, MA. (Archaeology), BA Hons, PDGE and BA & (Univ. of Pretoria) ASAPA (Professional member) with more than 15 years of experience in archaeological and heritage impact assessment and management. Mlilo is an accredited member of the Association for Southern African Professional Archaeologists (ASAPA), Amafa akwaZulu Natali and Eastern Cape Heritage Resources Agency (ECPHRA). He has conducted more than hundred AIA/HIA Studies, heritage mitigation work and heritage development projects over the past 15 years of service. The completed projects vary from Phase 1 and Phase 2 as well as heritage management work for government, parastatals (Eskom) and several private companies such as BHP Billiton, Rhino Minerals.

Independence

The views expressed in this document are the objective, independent views of Mr Trust Mlilo and the survey was carried out under Vombe Consulting (Pty) Ltd. Integrated Specialist Services (Pty) Ltd has no business, personal, financial or other interest in the proposed development project apart from fair remuneration for the work performed.

Conditions relating to this report

The content of this report is based on the author's best scientific and professional knowledge as well as available information. Integrated Specialist Services (Pty) Ltd reserves the right to modify the report in any way deemed fit should new, relevant or previously unavailable or undisclosed information become known to the author from on-going research or further work in this field or pertaining to this investigation.

This report must not be altered or added to without the prior written consent of the author and Vombe Consulting (Pty) Ltd. This also refers to electronic copies of the report which are supplied for the purposes of inclusion as part of other reports, including main reports. Similarly, any recommendations, statements or conclusions drawn from or

based on this report must make reference to this report. If these form part of a main report relating to this investigation or report, this report must be included in its entirety as an appendix or separate section to the main report.

Authorship: This AIA/HIA Report has been prepared by Mr Trust Mlilo (Professional Archaeologist). The report is for the review of the Heritage Resources Agency (PHRA).

Geographic Co-ordinate Information: Geographic co-ordinates in this report were obtained using a hand-held Garmin Global Positioning System device. The manufacturer states that these devices are accurate to within +/- 5 m.

Maps: Maps included in this report use data extracted from the NTS Map and Google Earth Pro.

Disclaimer: The Authors are not responsible for omissions and inconsistencies that may result from information not available at the time this report was prepared.

The Archaeological and Heritage Impact Assessment Study was carried out within the context of tangible and intangible cultural heritage resources as defined by the SAHRA Regulations and Guidelines as to the authorisation of the proposed 400kv powerline from Aries substation to Upington substation being proposed by Eskom Holding SOC Limited

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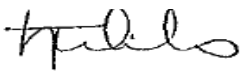
Signed by



10/ 09/ 2021

Acknowledgement

The author acknowledges Vombe Consulting (Pty) Ltd for their assistance with project information and responding to technical queries related to the project. Specials thanks go to landowners who provided access and vital information about the study area.

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EXECUTIVE SUMMARY

Eskom Holding SOC Limited is proposing a 400kV powerline from Aries Substation to Upington Substation, Kai Garib and Khara Hais Local Municipality, Mgcawu District Municipality, Northern Cape Province. The proposed powerline project will cover an area of 145km with 40km deviations located within Kai Garib and Khara Hais Local Municipality in Mgcawu District Municipality in Northern Cape Province. The powerline was authorised; however, this study was triggered by the 40km deviations on three sections of the approved powerline.

This Archaeological and Heritage Impact Assessment (AIA/HIA) report has been prepared to address requirements of Section 38 of the National Heritage Resources Act, Act 25 of 1999. Integrated Specialist Services (Pty) Ltd (ISS) was retained by Vombe Consulting Pty Ltd to conduct this Archaeological and Heritage Impact Assessment (AIA/HIA) Study for the proposed 400kv powerline from Aries substation to Upington substation, Kai Garib and Khara Hais Local Municipality, Mgcawu District Municipality, Northern Cape Province. This report includes an impact study on potential archaeological and cultural heritage resources that may be associated with the proposed powerline development. This study was conducted as part of the specialist input for the Environmental authorisation process. The project information has been passed to ISS research team by the project EAP. Analysis of the archaeological, cultural heritage, environmental and historic contexts of the study area predicted that archaeological sites, cultural heritage sites, burial grounds or isolated artefacts were likely to be present on the affected landscape. The field survey was conducted to test this hypothesis and verify this prediction within the proposed powerline route. The general project area is predominantly agriculture, residential and mining. The report makes the following observations:

- The findings of this report have been informed by desktop data review, field survey and impact assessment reporting which include recommendations to guide heritage authorities in making decisions with regards to the proposed development.
- The proposed powerline route is partially accessible, and the field survey was effective enough to cover most sections of the project receiving environs. However, dense vegetation cover compromised visibility of surface remains in parts of the proposed powerline deviations. In addition, access to farms was restricted which made it difficult access some sections directly.
- The immediate project area is predominantly agricultural, game farming and tourism.

The report sets out the potential impacts of the proposed powerline deviations on heritage matters and recommends appropriate safeguard and mitigation measures that are designed to reduce the impacts where appropriate. The report makes the following recommendations:

- ❖ The construction teams must be inducted on the possibility of encountering archaeological resources that may be accidentally exposed during clearance and digging at the site prior to

commencement of work on the site in order to ensure appropriate mitigation measures and that course of action is afforded to any chance finds.

- ❖ If archaeological materials are uncovered, work must cease immediately and the SAHRA/ Northern Cape PHRA be notified, and activity should not resume until appropriate management provisions are in place.
- ❖ The findings of this report, with approval of the SAHRA, may be classified as accessible to any interested and affected parties within the limits of the legislations.

This report concludes that the impacts of the proposed powerline deviations on the cultural environmental values are not likely to be significant on the entire development site if the EMP includes recommended safeguard and mitigation measures identified in this report.

The assessment reached the following conclusion:

1. The project area attracted prehistoric settlement due to availability of water resources (Orange River).

Recommendations

1. The proposed powerline may be approved subject to recommendations provided in this report and monitoring of the commencement of the project.
2. There is a possibility of encountering unknown burial sites along the proposed powerline route, it is thus advised to seek information about burial sites from farmers and farm workers during the site establishment phase of the project.
3. It is also advised that the Archaeology, Palaeontology and SAHRA Meteorites Unit is alerted when construction begins.
4. Strict and clear reporting procedures for chance findings must be followed by Eskom Holding SOC Limited and its contractors throughout the whole period of the powerline development.

ABBREVIATIONS

AIA	Archaeological Impact Assessment
ECO	Environmental Control Officer
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EM	Environmental Manager
EMP	Environmental Management Plan
HIA	Heritage Impact Assessment
LIA	Late Iron Age
NHRA	Nation Heritage Resources Act, Act 25 of 1999
PM	Project Manager
PHRA	Provincial Heritage Agency
SM	Site Manager
SAHRA	South African Heritage Resources Agency

KEY CONCEPTS AND TERMS

Periodization Archaeologists divide the different cultural epochs according to the dominant material finds for the different time periods. This periodization is usually region-specific, such that the same label can have different dates for different areas. This makes it important to clarify and declare the periodization of the area one is studying. These periods are nothing a little more than convenient time brackets because their terminal and commencement are not absolute and there are several instances of overlap. In the present study, relevant archaeological periods are given below;

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)

Early Iron Age (~ AD 200 to 1000)

Late Iron Age (~ AD1100-1840)

Historic (~ AD 1840 to 1950, but a Historic building is classified as over 60 years old)

Definitions Just like periodization, it is also critical to define key terms employed in this study. Most of these terms derive from South African heritage legislation and its ancillary laws, as well as international regulations and norms of best practice. The following aspects have a direct bearing on the investigation and the resulting report:

Cultural (heritage) resources are all non-physical and physical human-made occurrences, and natural features that are associated with human activity. These can be singular or in groups and include significant sites, structures, features, ecofacts and artefacts of importance associated with the history, architecture, or archaeology of human development.

Cultural significance is determined by means of aesthetic, historic, scientific, social, or spiritual values for past, present, or future generations.

Value is related to concepts such as worth, merit, attraction or appeal, concepts that are associated with the (current) usefulness and condition of a place or an object. Although significance and value are not mutually exclusive, in some cases the place may have a high level of significance but a lower level of value. Often, the evaluation of any feature is based on a combination or balance between the two.

Isolated finds are occurrences of artefacts or other remains that are not in-situ or are located apart from archaeological sites. Although these are noted and recorded, but do not usually constitute the core of an impact assessment, unless if they have intrinsic cultural significance and value.

In-situ refers to material culture and surrounding deposits in their original location and context, for example an archaeological site that has not been disturbed by farming.

Archaeological site/materials are remains or traces of human activity that are in a state of disuse and are in, or on, land and which are older than 100 years, including artefacts, human and hominid remains, and artificial features and structures. According to the National Heritage Resources Act (NHRA) (Act No. 25 of 1999), no archaeological artefact, assemblage, or settlement (site) and no historical building or structure older than 60 years may be altered, moved, or destroyed without the necessary authorisation from the South African Heritage Resources Agency (SAHRA) or a provincial heritage resources authority.

Historic material are remains resulting from human activities, which are younger than 100 years, but no longer in use, including artefacts, human remains and artificial features and structures.

Chance finds means archaeological artefacts, features, structures or historical remains accidentally found during development.

A grave is a place of interment (variably referred to as burial) and includes the contents, headstone, or other marker of such a place, and any other structure on or associated with such place. A grave may occur in isolation or in association with others where upon it is referred to as being situated in a cemetery (contemporary) or burial ground (historic).

A site is a distinct spatial cluster of artefacts, structures, organic and environmental remains, as residues of past human activity.

***Heritage Impact* Assessment (HIA)** refers to the process of identifying, predicting, and assessing the potential positive and negative cultural, social, economic, and biophysical impacts of any proposed project, which requires authorisation of permission by law, and which may significantly affect the cultural and natural heritage resources. Accordingly, an HIA must include recommendations for appropriate mitigation measures for minimising or circumventing negative impacts, measures enhancing the positive aspects of the proposal and heritage management and monitoring measures.

Impact is the positive or negative effects on human well-being and / or on the environment.

Mitigation is the implementation of practical measures to reduce and circumvent adverse impacts or enhance beneficial impacts of an action.

Mining heritage sites refer to old, abandoned mining activities, underground or on the surface, which may date from the prehistorical, historical or the relatively recent past.

Study area or 'project area' refers to the area where the developer wants to focus its development activities (refer to plan).

Phase I studies refer to surveys using various sources of data and limited field walking in order to establish the presence of all possible types of heritage resources in any given area

Assumptions and disclaimer

The investigation has been influenced by the unpredictability of buried archaeological remains (absence of evidence does not mean evidence of absence) and the difficulty in establishing intangible heritage values. It should be remembered that archaeological deposits (including graves and traces of mining heritage) usually occur below the ground level. Should artefacts or skeletal material be revealed at the site during clearance and construction, such activities should be halted immediately, and a competent heritage practitioner, SAHRA or PHRA must be notified in order for an investigation and evaluation of the find(s) to take place (see NHRA (Act No. 25 of 1999), Section 36 (6). Recommendations contained in this document do not exempt the applicant from complying with any national, provincial, and municipal legislation or other regulatory requirements, including any protection or management or general provision in terms of the NHRA. ISS assumes no responsibility for compliance with conditions that may be required by SAHRA in terms of this report.

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TERMS OF REFERENCE (ToR)

The author was retained to conduct an AIA/HIA study for the proposed 400kv powerline deviations addressing the following issues:

- Archaeological and heritage potential of the proposed powerline development route including any known data on affected areas;
- Provide details on methods of study; potential and recommendations to guide the SAHRA to make an informed decision in respect of authorisation of the proposed powerline development.
- Identify all objects, sites, occurrences, and structures of an archaeological or historical nature (cultural heritage sites) located in and around the proposed development site;
- Assess the significance of the cultural resources in terms of their archaeological, historical, scientific, social, religious, aesthetic and tourism value;
- Describe the possible impacts of the proposed powerline development on these cultural remains, according to a standard set of conventions;
- Propose sustainable- mitigation measures to minimize possible negative impacts on the cultural resources;
- Review applicable legislative requirements;

1 INTRODUCTION

Background

Most heritage sites occur within communities, whose development should not be neglected in the name of heritage preservation but should be encouraged and embraced within legal and adaptive management frameworks (Carter and Grimwade 1997; Salafsky *et al* 2001). This case is true for the entire project area, which may host palaeontological, archaeological, historical, natural, and contemporary heritage resources. Eskom Holding SOC Limited is proposing for a 400kv powerline development from Aries to Upington, Kai Garib and Khara Hais Local Municipality, Mgcawu District Municipality, Northern Cape Province. Previous heritage studies (Beaumont 1990, 2000, 2007, Bandama (2015), Mlilo (2016, 2017), Kruger (2015a, 2015b), Pelser, A. & van Vollenhoven, A.C. 2011, Pelser (2012), Van Schalkwyk (2010, 2015a, 2015b, 2016) mentioned significant heritage resources in parts of the region under which the proposed powerline route is located.

The purpose of this Archaeology and Heritage Study is to assess presence/absence of heritage resources on the proposed powerline development. The study was designed to ensure that any significant archaeological or cultural physical property or sites are located and recorded, and site significance is evaluated to assess the nature and extent of expected impacts from the proposed powerline. The assessment includes recommendations to manage the expected impact of the proposed powerline route. The report includes recommendations to guide heritage authorities in making appropriate decision with regards to the environmental approval process for the powerline development. The report concludes with detailed recommendations on heritage management associated with the proposed powerline development. Integrated Specialist Services (Pty) Ltd (ISS), an independent consulting firm, conducted an assessment; research and consultations required for the preparation of the archaeological and heritage impact report in accordance with its obligations set in the NHRA as well as the environmental management legislations.

In line with SAHRA guidelines, this report, not necessarily in that order, provides:

1) Management summary
2) Methodology
3) Information with reference to the desktop study
4) Map and relevant geodetic images and data
5) GPS co-ordinates
6) Directions to the site
7) Site description and interpretation of the cultural area where the project will take place
8) Management details, description of affected cultural environment, photographic records of the project area

9) Recommendations regarding the significance of the site and recommendations regarding further monitoring of the site.

10) Conclusion

Description of the proposed project

Eskom Holding SOC Limited is proposing to construct a 2x 400kV transmission and distribution powerline infrastructure from Aries substation near Kenhardt to Upington substation near Upington. The proposed powerline length is 145 km.

Location of the proposed development

The authorised powerline project covers 145km from Aries Substation to Upington Substation. The current study is for the approximately 40km deviations from the authorised route. The powerline development project is located within Kai Garib and Khara Hais Local Municipalities and will transverse through farms listed below (see Table 1)

Table 1: Location of the proposed development.

FARM NAME	PORTION
KLEIN ZWART BAST 188 36	1
KLEIN ZWART BAST 188 28	0
DE TUIN 163 36	3
DE TUIN ZUID 163 36	1
DE TUIN ZUID 163 36	2
DE TUIN ZUID 163 36	2
GROOT RIET 162 36	7
GROOT RIET 162 36	5
GROOT RIET 162 36	4
GROOT RIET 162 36	4
GROOT RIET 162 36	4
DE BANKEN 130 36	1
DE BANKEN 130 36	0
DE BANKEN 130 36	10
DE BANKEN 130 36	10
DE BANKEN 130 36	10
DE BANKEN 130 36	9
DE BANKEN 130 36	4
DE BANKEN 130 36	4
PYP KLIP WEST 129 36	2
PYP KLIP WEST 129 36	1
WITVLEI 103 36	2
WITVLEI 103 36	0
KLEIN GOEGAB 102 36	0
KOEGAB 102 36	4
KOEGAB 59 36	0
MIDDEL POST 60 36	0
MIDDEL POST 60 36	0
OMKYK 61 36	0
OMKYK 61 36	1
KAKEMAS SUID SETTLEMENT 1184 36	0
ERF 1738 1738 36	0
ERF 1486 1486 01	0
ERF 1219 1219 36	0
ZWART BOOIS BERG SUID 677 28	0
BAVIAANZ KRANTZ 474 28	10
ZWART BOOIS BERG ANNEX 475 28	7

PLAAS 584 584 28	0
PLAAS 585 585 28	0
DIE PLAAS 602 36	0
FRIERS DALE 466 28	27
LOXTON VALE 464 28	9
EENDUIN 465 36	39
EENDUIN 465 36	40
EENDUIN 465 36	40
TKABIES 461 36	51
PLAAS 616 616 36	0
PLAAS 616 616 36	0
PLAAS 616 616 36	0
PLAAS 616 616 36	0
ERF 1152 1152 28	0
ERF 1152 1152 28	0
ZOOVOORBY 458 36	5
ZOOVOORBY 458 36	5
CURRIES CAMP 457 36	1
GEEL KOP 456 28	0
BLOEMSMOND 455 28	5
BLOEMSMOND 455 28	14
BLOEMSMOND 455 28	14
BLOEMSMOND 455 28	14
DE BANKEN 130 36	4
DE BANKEN 130 36	4
ROOIPUNT 617 28	0
TUNGSTEN LODGE 638 36	0

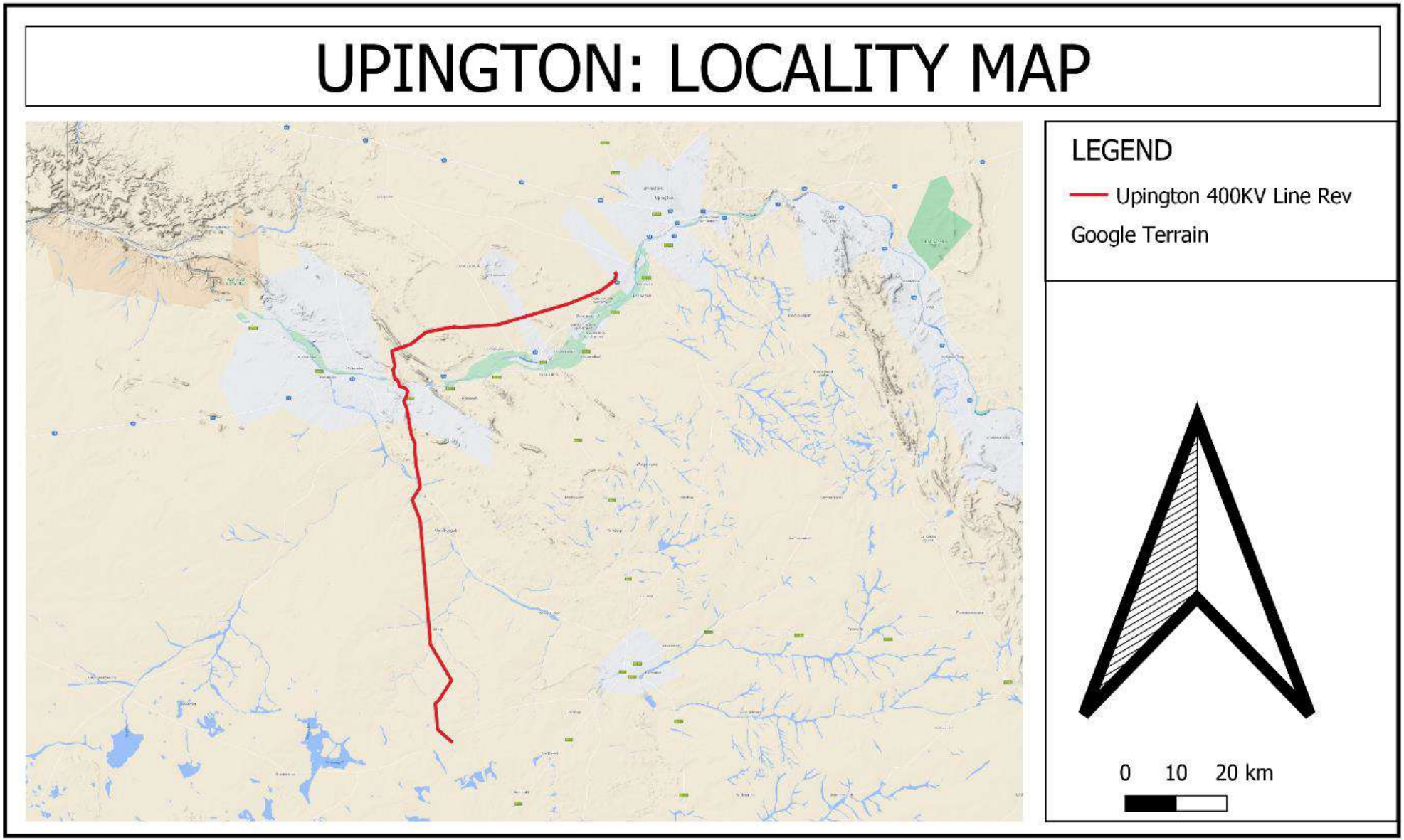

Figure 1: Proposed powerline route (Vombe Consulting (Pty) Ltd 2021)

Figure 2: Proposed powerline route showing deviations from the approved route (Vombe Consulting (Pty) Ltd 2021)

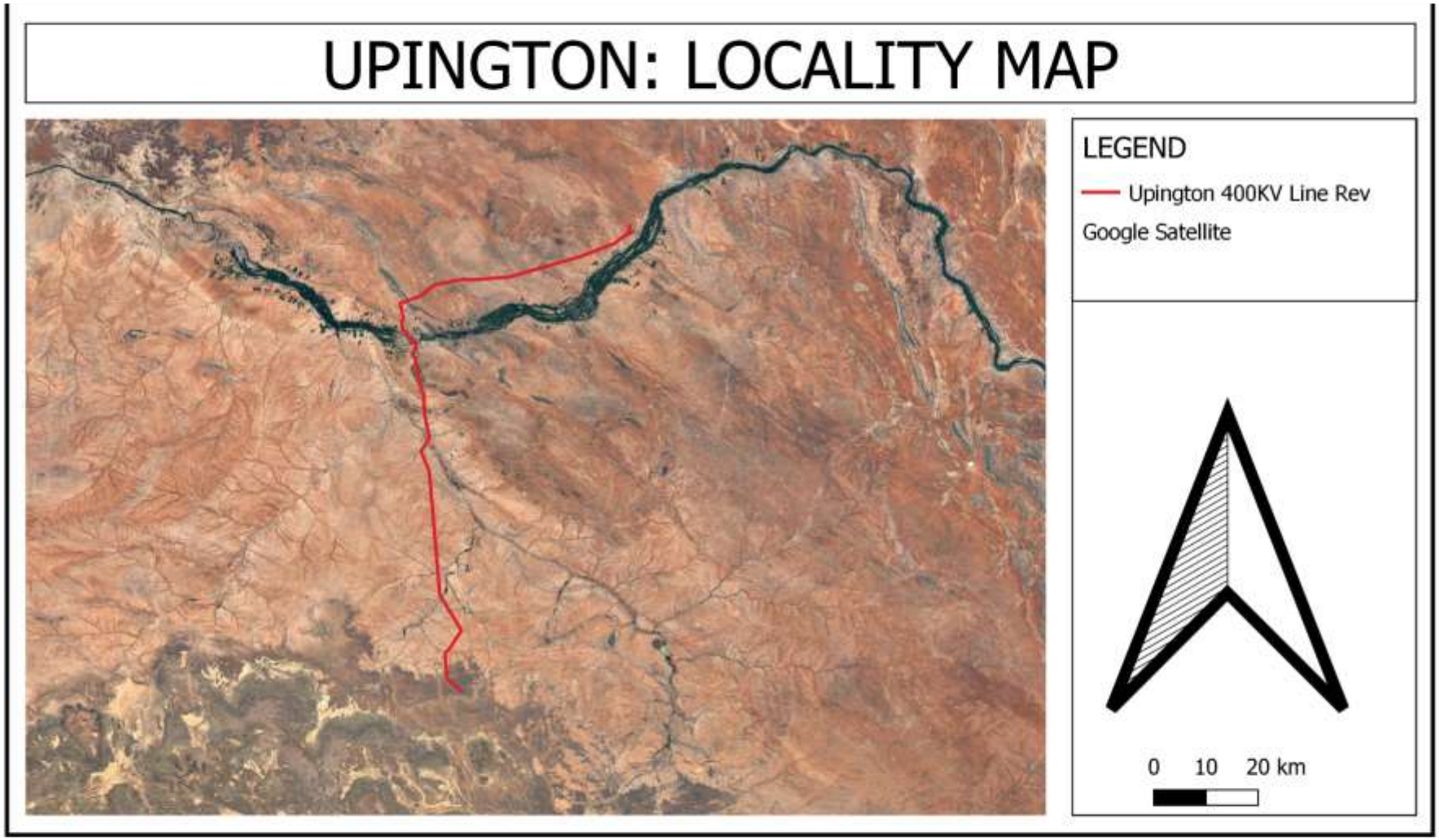

Figure 3: Proposed project area (Vombe Consulting (Pty) Ltd 2021)

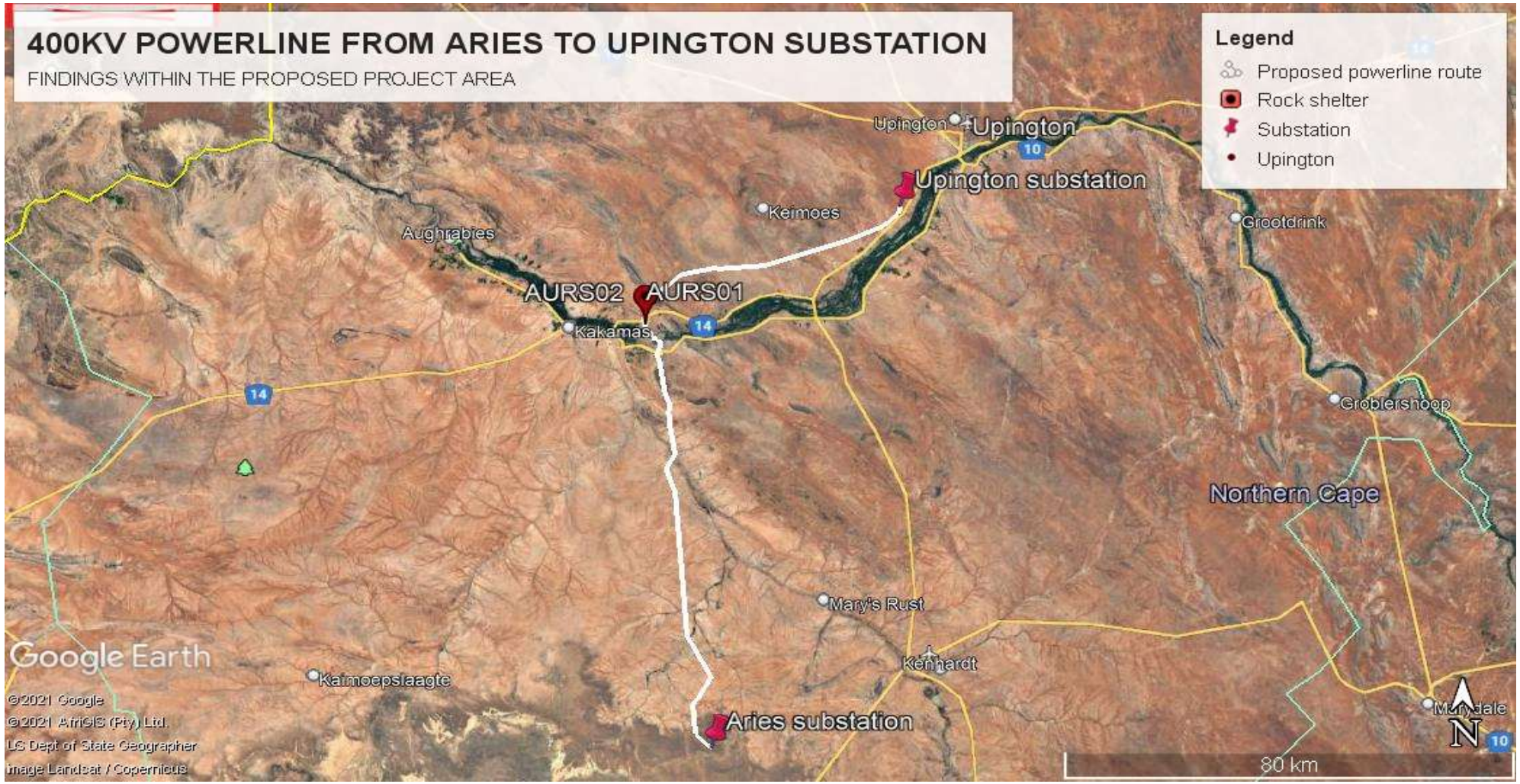

Figure 4: Proposed project area (ISS (Pty) Ltd 2021)

2 LEGAL REQUIREMENTS

Relevant pieces of legislations to the present study are presented here. Under the National Heritage Resources Act, 1999 (Act 25 of 1999) (NHRA), Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002), and the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) and 2014 Regulations, an AIA or HIA is required as a specialist sub-section of the EIA.

Heritage management and conservation in South Africa is governed by the NHRA and falls under the overall jurisdiction of the SAHRA and its PHRAs. There are different sections of the NHRA that are relevant to this study. The proposed development is a listed activity in terms of Section 38 of the NHRA which stipulates that the following development categories require a HIA to be conducted by an independent heritage management consultant:

- Construction of a road, wall, **powerline**, pipeline, canal or other linear form of development or barrier exceeding 300m in length
- Construction of bridge or similar structure exceeding 50m in length
- Development or other activity that will change the character of a site -
  - Exceeding 5000 sq. m
  - Involving three or more existing erven or subdivisions
  - Involving three or more erven or divisions that have been consolidated within past five years
  - Rezoning of site exceeding 10 000 sq. m
  - The costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority
- Any other development category, public open space, squares, parks, recreation grounds

Thus, any person undertaking any development in the above categories, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development. Section 38 (2) (a) of the NHRA also requires the submission of a heritage impact assessment report for authorization purposes to the responsible heritage resources agencies (SAHRA/PHRAs).

Related to Section 38 of the NHRA are Sections 34, 35, 36 and 37. Section 34 stipulates that no person may alter, damage, destroy, relocate etc. any building or structure older than 60 years, without a permit issued by SAHRA or a provincial heritage resources authority. Section 35 (4) of the NHRA stipulates that no person may, without a permit issued by SAHRA, destroy, damage, excavate, alter or remove from its original position, or collect, any archaeological material or object. This section may apply to any significant archaeological sites that may be discovered before or during construction. This means that any chance find must be reported to SAHRA or PHRA (the relevant PHRA), who will assist in investigating the extent and significance of the finds and inform about further

actions. Such actions may entail the removal of material after documenting the find site or mapping of larger sections before destruction. Section 36 (3) of the NHRA also stipulates that no person may, without a permit issued by the SAHRA, destroy, damage, alter, exhume or remove from its original position or otherwise disturb any grave or burial ground older than 60 years, which is situated outside a formal cemetery administered by a local authority. This section may apply in case of the discovery of chance burials, which is unlikely. The procedure for reporting chance finds also applies to the likely discovery of burials or graves by the developer or his contractors. Section 37 of the NHRA deals with public monuments and memorials which exist in the proposed project area.

In addition, the new EIA Regulations (4 December 2014) promulgated in terms of NEMA (Act 107 of 1998) determine that any environmental reports will include cultural (heritage) issues. The new regulations in terms of Chapter 5 of the NEMA provide for an assessment of development impacts on the cultural (heritage) and social environment and for Specialist Studies in this regard. The end purpose of such a report is to alert the applicant (Eskom Holding SOC Limited), SAHRA or PHRA and interested and affected parties about existing heritage resources that may be affected by the proposed transmission and distribution development, and to recommend mitigatory measures aimed at reducing the risks of any adverse impacts on these heritage resources.

Assessing the Significance of Heritage Resources

The appropriate management of cultural heritage resources is usually determined on the basis of their assessed significance as well as the likely impacts of any proposed development. Cultural significance is defined in the Burra Charter as meaning aesthetic, historic, scientific, or social value for past, present, or future generations (Article 1.2). Social, religious, cultural, and public significance are currently identified as baseline elements of this assessment, and it is through the combination of these elements that the overall cultural heritage values of the site of interest, associated place or area are resolved.

Not all sites are equally significant and not all are worthy of equal consideration and management. The significance of a place is not fixed for all time, and what is considered of significance at the time of assessment may change as similar items are located, more research is undertaken, and community values change. This does not lessen the value of the heritage approach but enriches both the process and the long-term outcomes for future generations as the nature of what is conserved and why, also changes over time (Pearson and Sullivan 1995:7). This assessment of the Indigenous cultural heritage significance of the Site of Interest as its environments of the study area will be based on the views expressed by the traditional authority and community representatives, consulted documentary review and physical integrity.

African indigenous cultural heritage significance is not limited to items, places or landscapes associated with pre-European contact. Indigenous cultural heritage significance is understood to encompass more than ancient

archaeological sites and deposits, broad landscapes, and environments. It also refers to sacred places and story sites, as well as historic sites, including mission sites, memorials, and contact sites. This can also refer to modern sites with resonance to the indigenous community. The site of interest considered in this project falls within this realm of broad significance.

Archaeological sites, as defined by the National Heritage Resources Act (Act 25 of 1999) are places in the landscape where people once lived in the past – generally more than 60 years ago – and have left traces of their presence behind. In South Africa, archaeological sites include hominid fossil sites, places where people of the Earlier, Middle and Later Stone Age lived in open sites, river gravels, rock shelters and caves, Iron Age sites, graves, and a variety of historical sites and structures in rural areas, towns and cities. Palaeontological sites are those with fossil remains of plants and animals where people were not involved in the accumulation of the deposits. The basic principle of cultural heritage conservation is that archaeological and other heritage sites are valuable, scarce and non-renewable. Many such sites are unfortunately lost daily through infrastructure developments such as powerlines, roads and other destructive economic activities such as mining and agriculture. This is true for the study areas whose main economic activities are agriculture and mining. It should be noted that once archaeological sites are destroyed, they cannot be replaced as site integrity and authenticity is permanently lost. Archaeological heritage contributes to our understanding of the history of the region and of our country and continent at large. By preserving links with our past, we may be able to appreciate the role past generations have played in the history of our country and the continent at large.

Categories of Significance

Rating the significance of archaeological sites, and consequently grading the potential impact on the resources is linked to the significance of the site itself. The significance of an archaeological site is based on the amount of deposit, the integrity of the context, the kind of deposit and the potential to help answer present research questions. Historical structures are defined by Section 34 of the National Heritage Resources Act, 1999, while other historical and cultural significant sites, places and features, are generally determined by community preferences. The guidelines as provided by the NHRA (Act No. 25 of 1999) in Section 3, with special reference to subsection 3 are used when determining the cultural significance or other special value of archaeological or historical sites. In addition, ICOMOS (the Australian Committee of the International Council on Monuments and Sites) highlights four cultural attributes, which are valuable to any given culture:

Aesthetic Value:

Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria include consideration of the form, scale, colour, texture and material of the fabric, the general atmosphere

associated with the place and its uses, and the aesthetic values commonly assessed in the analysis of landscapes and townscape.

Historical Value:

Historic value encompasses the history of aesthetics, science, and society and therefore to a large extent underlies all the attributes discussed here. Usually, a place has historical value because of some kind of influence by an event, person, phase or activity.

Scientific Value:

The scientific or research value of a place will depend upon the importance of the data involved, on its rarity, quality and on the degree to which the place may contribute further substantial information.

Social Value:

Social value includes the qualities for which a place has become a focus of spiritual, political, national or other cultural sentiment to a certain group. It is important for heritage specialist input in the EIA process to consider the heritage management structure set up by the NHR Act. It makes provision for a 3-tier system of management including the South Africa Heritage Resources Agency (SAHRA) at a national level, Provincial Heritage Resources Authorities (PHRAs) at a provincial and the local authority. The Act makes provision for two types or forms of protection of heritage resources, i.e., formally protected and generally protected sites:

Formally Protected Sites

- Grade 1 or national heritage sites, which are managed by SAHRA
- Grade 2 or provincial heritage sites, which are managed by the PHRA.
- Grade 3 or local heritage sites.

General Protection

- Human burials older than 60 years.
- Archaeological and palaeontological sites.
- Shipwrecks and associated remains older than 70 years.
- Structures older than 60 years.

The certainty of prediction is definite, unless stated otherwise and if the significance of the site is rated high, the significance of the impact will also result in a high rating. The same rule applies if the significance rating of the site is low. The significance of archaeological sites is generally ranked into the following categories:

Significance Rating Action

No significance: sites that do not require mitigation.

Low significance: sites, which may require mitigation.

2a. Recording and documentation (Phase 1) of site; no further action required

2b. Controlled sampling (shovel test pits, auguring), mapping and documentation (Phase 2 investigation); permit required for sampling and destruction

Medium significance: sites, which require mitigation.

3. Excavation of representative sample, C14 dating, mapping and documentation (Phase 2 investigation); permit required for sampling and destruction [including 2a & 2b]

High significance: sites, where disturbance should be avoided.

4a. Nomination for listing on Heritage Register (National, Provincial or Local) (Phase 2 & 3 investigation); site management plan; permit required if utilised for education or tourism

High significance: Graves and burial places

4b. Locate demonstrable descendants through social consulting; obtain permits from applicable legislation, ordinances, and regional by-laws; exhumation and reinternment [including 2a, 2b & 3]

Furthermore, the significance of archaeological sites was based on six main criteria:

- Site integrity (i.e. primary vs. secondary context),
- Amount of deposit, range of features (e.g., stonewalling, stone tools and enclosures),
- Density of scatter (dispersed scatter),
- Social value,
- Uniqueness, and
- Potential to answer current and future research questions.

An important aspect in assessing the significance and protection status of a heritage resource is often whether the sustainable social and economic benefits of a proposed powerline development outweigh the conservation issues at stake. When, for whatever reason the protection of a heritage site is not deemed necessary or practical, its research potential must be assessed and mitigated in order to gain data /information, which would otherwise be lost.

Table 2: Evaluation of the proposed development as guided by the criteria in NHRA, MPRDA and NEMA

ACT	Stipulation for developments	Requirement details
NHRA Section 38	Construction of road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length	Yes
	Construction of bridge or similar structure exceeding 50m in length	No
	Development exceeding 5000 sq. m	Yes
	Development involving three or more existing erven or subdivisions	No
	Development involving three or more erven or divisions that have been consolidated within past five years	No
	Rezoning of site exceeding 10 000 sq. m	No
	Any other development category, public open space, squares, parks, recreation grounds	No
NHRA Section 34	Impacts on buildings and structures older than 60 years	No
NHRA Section 35	Impacts on archaeological and paleontological heritage resources	Subject to identification during Phase 1 walk down survey
NHRA Section 36	Impacts on graves	Subject to identification during Phase 1
NHRA Section 37	Impacts on public monuments	No
Chapter 5 (21/04/2006) NEMA	HIA is required as part of an EIA	Yes
Section 39(3)(b) (iii) of the MPRDA	AIA/HIA is required as part of an EIA	No

Other relevant legislations

The Human Tissue Act

Human Tissue Act of 1983 and Ordinance on the Removal of Graves and Dead Bodies of 1925 Graves 60 years or older are heritage resources and fall under the jurisdiction of both the National Heritage Resources Act and the Human Tissues Act of 1983. However, graves younger than 60 years are specifically protected by the Human Tissues Act (Act 65 of 1983) and the Ordinance on the Removal of Graves and Dead Bodies (Ordinance 7 of 1925) as well as any local and regional provisions, laws and by-laws. Such burial places also fall under the jurisdiction of the National Department of Health and the Provincial Health Departments. Approval for the exhumation and re-burial must be obtained from the relevant Provincial Member of the Executive Committee (MEC) as well as the relevant Local Authorities.

Terms of Reference

The author was instructed to conduct an AIA/HIA study addressing the following issues:

- Archaeological and heritage potential of the proposed powerline route including any known data on affected areas;
- Provide details on methods of study; potential and recommendations to guide the PHRA/ SAHRA to make an informed decision in respect of authorisation of the proposed powerline deviation
- Identify all objects, sites, occurrences, and structures of an archaeological or historical nature (cultural heritage sites) located in and around the proposed transmission and distribution;
- Assess the significance of the cultural resources in terms of their archaeological, historical, scientific, social, religious, aesthetic and tourism value;
- Describe the possible impact of the proposed powerline development on these cultural remains, according to a standard set of conventions;
- Propose suitable mitigation measures to minimize possible negative impacts on the cultural resources;
- Review applicable legislative requirements;

PHOTOGRAPHIC PRESENTATION OF THE PROJECT SITE

Plate 1: Photo 1: View of Aries Substation where the powerline will start (Photograph © by Author 2021).

Plate 2: Photo 2: View of Upington Substation where the powerline will connect (Photograph © by Author 2021).

Plate 3: Photo 3: View of the proposed powerline route. Note the existing transmission and distribution powerlines (Photograph © by Author 2021).

Plate 4: Photo 4: View a rocky environment within the proposed development (Photograph © by Author 2021).

Plate 5: Photo 5: View of the powerline route (Photograph © by Author 2021).

Plate 6: Photo 6: View of the proposed powerline route (Photograph © by Author 2021).

Plate 7: Photo 7: View of the proposed transmission and distribution powerline route (Photograph © by Author 2021)

Plate 8: Photo 8: View of the proposed project site. Note that the environment is already disturbed (Photograph © by Author 2021).

Plate 9: Photo 9: View of proposed deviation route (Photograph © by Author 2021).

Plate 10: Photo 10: View of the proposed powerline deviation route (Photograph © by Author 2021).

Plate 11: Photo 11: View of the proposed powerline route (Photograph © by Author 2021).

Plate 12: Photo 12: View of patches of modified land along powerline route (Photograph © by Author 2021).

Plate 13: Photo 13: View of grave vineyards along powerline route (Photograph © by Author 2021).

Plate 14: Photo 14: View of the proposed powerline route. Note that the environment is rocky (Photograph © by Author 2021).

Plate 15: Photo 15: View of Orange River along the proposed project route (Photograph © by Author 2021).

Plate 16: Photo 16: View of where the proposed powerline route will cross the Orange River (Photograph © by Author 2021).

Plate 17: Photo 17: View of the proposed transmission and distribution powerline route (Photograph © by Author 2021).

Plate 18: Photo 18: View of proposed powerline route (Photograph © by Author 2021).

Plate 19: Photo 19: View of proposed powerline route (Photograph © by Author 2021).

Plate 20: Photo 20: View of the powerline route (Photograph © by Author 2021).

Plate 21: Photo 21: View of proposed powerline route (Photograph © by Author 2021).

Plate 22: Photo 22: View of proposed project route (Photograph © by Author 2021).

Plate 23: Photo 23: View of proposed transmission and distribution route Photograph © by Author 2021).

Plate 24: Photo 24: View of proposed powerline route (Photograph © by Author 2021).

3 METHODOLOGY

This document falls under the basic assessment phase of the HIA and therefore aims at providing an informed heritage-related opinion about the proposed powerline deviations. Our HIA study was structured in five phases, that is field survey, consultation, report compilation and report review. The methodology is informed by the SAHRA Guidelines on Impact assessment for development projects, as well as the relevant provisions of the local heritage and environmental legislation. We conducted desktop studies, field survey, consultation, report compilation and report review.

Phase I: Desktop studies

Desktop studies are very crucial for the success of any project because they determine not just what is known but also can identify gaps which must be closed during the study to meet the aims and objectives of the project. Literature on the archaeology and heritage character of the project was reviewed. A review of SAHRIS and other databases was conducted online. Further review of the relevant local and international legal frameworks was also done. Furthermore, relevant documents, databases such as Google Earth and any other available information were consulted. As part of the desktop study, published literature and cartographic data, as well as archival data on heritage legislation, the history and archaeology of the area were studied. The desktop studies were carried at university libraries, national libraries, local municipality libraries and archives. Electronic databases such as Google Earth, Google Map and Google Images were consulted as well. Special attention was given to provincial and local authority development plans so that the HIA contributes to the attainment of local objectives.

Relevant published and unpublished sources were consulted in generating desktop information for this report. This included online databases such as the UNESCO website, Google Earth, Google Scholar and SAHRIS. Previous HIA in the project area were also consulted (van Schalkwyk 2014, Mlilo 2016, 201, 2018, 2019). Several published works on the archaeology, history and palaeontology were also consulted. This included dedicated archaeological, paleontological and geological works by (Breutz 1956; 1968; 1987; Button 1971; Clarck 1971; Eriksson *et al*. 1975; Bertrand and Eriksson 1977; Humphreys 1978; Humphreys and Thackeray 1983; Beaumont and Vogel 1984; Beaumont and Morris 1990; Beaumont 1999; Holmgren *et al*. 1999; Johnson *et al.* 1997. Thus, the proposed powerline deviations proposed by Eskom Holding SOC Limited was considered in relation to the broader landscape, which is a key requirement of the ICOMOS and SAHRA Guidelines.

The literature survey suggests that prior to the 20th century modern agriculture and associated infrastructure; the general project area would have been a rewarding region to locate heritage resources related to Iron Age and historical sites (Bergh 1999). However, the situation today is completely different. The study area now lies on a clearly modified landscape by agriculture and mining activities. Several farming infrastructure developments such

access roads, dumping sites, high voltage and minor reticulation powerlines, pipelines and other infrastructure dominate the project area

Phase ii: Fieldwork

The aim of this report is to provide the client with an HIA that will support decision making in order to ensure protection of the heritage resource base of the project area. The heritage resources must be identified, assessed, and ranked. This enables a proper definition of the resource and its boundaries. This requires the participation of a multi-disciplinary team with experience in heritage management, heritage, palaeontology, planning and risk management fields. This fieldwork aimed at adding to the gaps identified during the review of the existing documentation. The field survey was undertaken on the 24th and 25th of August 2021 by a team comprising archaeologists. and other specialists. The study team covered significant percentage of the powerline route deviations because it is cleared and there are access roads. The proposed powerline route was surveyed through, access roads, tracks and footpaths which cut across the sites. The focus of the survey involved a pedestrian survey which was conducted across the proposed study route. The pedestrian survey focussed on parts of the project area where it seemed as if disturbances may have occurred in the past, for example bald spots in the grass veld; stands of grass which are taller than the surrounding grass veld; the presence of exotic trees; evidence for building rubble, and ecological indicators such as invader weeds.

Detailed photographic recording was also undertaken where relevant. The findings were then analysed in view of the proposed transmission and distribution in order to suggest further action. The result of this investigation is a report indicating the presence/absence of heritage resources and how to manage them in the context of the proposed powerline project.

The literature survey suggests that prior to the 20th century modern agriculture and associated infrastructure; the general project area would have been a rewarding region to locate heritage resources related to Stone Age and particularly Iron Age and historical sites (Bergh 1999). However, the situation today is completely different. The study area now lies on a clearly modified landscape that has previously been cleared for residential developments and associated infrastructure.

Phase iii: Consultation

The EIA Public Participation process will be conducted by the EAP and specialists. The EIA Public Participation Process will invite and address comments from affected communities and any registered heritage bodies on any matter related to the proposed powerline route including heritage concerns that may arise as a result of the project.

Phase iv: Report compilation

Report compilation and impact assessment.

Phase v: Report review, finalisation, and submission

Before the final draft of the HIA is submitted to the client, the report will be reviewed internally. The client will be provided with the opportunity make some inputs before the report is finalised.

Assumptions and Limitations

The investigation has been influenced by the unpredictability of buried archaeological remains (absence of evidence does not mean evidence of absence) and the difficulty in establishing intangible heritage values. It should be noted that archaeological deposits (including graves and traces of archaeological heritage) usually occur below the ground level. Should artefacts or skeletal material be revealed at the site during construction, such activities should be halted immediately, and a competent heritage practitioner, SAHRA must be notified in order for an investigation and evaluation of the find(s) to take place (see NHRA (Act No. 25 of 1999), Section 36 (6). Recommendations contained in this document do not exempt the applicant from complying with any national, provincial, and municipal legislation or other regulatory requirements, including any protection or management or general provision in terms of the NHRA. The author assumes no responsibility for compliance with conditions that may be required by SAHRA in terms of this report.

The field survey did not include any form of subsurface inspection beyond the inspection of burrows, road cut sections, and the sections exposed by erosion. The study area covers a hill complex which in some cases was not accessible. The study team observed that some sections of the powerline route might not have attracted sedentary human settlement although Orton & Webly (2013) identified a few scatters of lithic tools. Some assumptions were made as part of the study and therefore some limitations, uncertainties and gaps in information would apply. It should, however, be noted that these do not invalidate the findings of this study in any significant way:

- The proposed powerline construction will be limited to specific right of site as detailed in the development layout (Figure 1).
- The construction team to provide link and access to the proposed site by using the existing access roads and there will be no construction beyond the demarcated site.
- No excavations or sampling were undertaken since a permit from heritage authorities is required to disturb a heritage resource. As such the results herein discussed are based on surficially observed indicators. However, these surface observations concentrated on exposed sections such as road cuts and clear farmland.
- This study did not include any ethnographic and oral historical studies, nor did it investigate the settlement history of the area.

4 ARCHAEOLOGICAL AND HERITAGE CONTEXT OF THE STUDY AREA

Stone Age Archaeology

South Africa is one of the privileged countries in the world to have a very long and varied history of human occupation (Deacon and Deacon 1999). The Northern Cape is one of the regions in South Africa with the richest Stone Age scatters on the landscape, yet it remains poorly researched and understood (Lombard 2012). Stone Age archaeology is prevalent in the larger geographical area. Numerous sites, bearing Earlier, Middle and Later Stone Age habitation occur across the province, mostly in open air locales or in sediments alongside rivers or pans. In addition, a wealth of Later Stone Age rock art sites, most of which are in the form of rock engravings are found in the region. These LSA sites occur on hilltops, slopes, rock outcrops and occasionally in riverbeds. Sites dating to the Iron Age occur in the north-eastern part of the Province but environmental factors delegated that the spread of Iron Age farming westwards from the 17th century was constrained mainly to the area east of the Langeberg Mountains. However, evidence of an Iron Age presence as far as the Upington area in the eighteenth century occurs in this area. The Northern Cape also boast of colonial and mining heritage moving into recent times, the archaeological record reflects the development of a rich colonial influence, characterised by mostly isolated farmsteads, missionary establishments (Kuruman Mission) and mining developments at Kimberley and other smaller towns.

The ESA is generally associated with the earlier Oldowan industry (marked by crude choppers and other unifacial core tools), followed by the still large but better fashioned hand axes and cleavers of the Acheulean techno-complex (Deacon and Deacon 1999). The Fauresmith Industry is characterized by a prepared core technology that produced both blades and points, making it transitional between the ESA and the MSA (~ 250 000 to 40-25 000 years ago) (Porat *et al*. 2010; Wilkins and Chazan 2012; Walter et al. 2014). Until recently, the Fauresmith Industry was poorly defined, being mostly identified based on the co-occurrence of Levallois points and hand axes (Beaumont and Vogel 2006: 224), and prepared cores, blades, and 'side-scrapers on flakes' (Beaumont 1990:79).

In the Northern Cape ESA assemblages, including the Fauresmith, tend to occur as lag deposits on the margins of seasonal rivers, semi-permanent water holes or pans. Such assemblages commonly represent the accumulated remains of numerous reoccupations over possibly many thousands of years. In this region stone tools often occur within calcrete zones underlying the modern surface of unstratified red aeolian sands (Deacon 1988:643-647; Mason 1988:626-30). Previous research in the genera project area confirmed localised occurrences of low-density Stone Age scatters along the exposed calcrete areas in dry riverbeds (PGS Heritage Unit:2009).

Stone Age archaeology is prevalent in the larger geographical area, especially to the northwest of the study area but generally, elsewhere the Hotazel and Santoy area does not seem to have attracted much of habitation, save

for the two Late Stone Age rock shelters that occur north and south of GaMohaan hills and sites along the Gamogara ancient riverbed. Perhaps the lack of large rock-shelters, the domination of exposed environments and the lack of preferred stone raw materials for tools, dissuaded early man (ESA ~ 2.6 million to 250 000 years ago) from occupying this part of the area. Further to the southwest and southeast of this area, the ESA is very well represented at sites such as Kathu Pan 1, Kathu Townlands, Bestwood 1 (Wilkins and Chazan 2012; Chazan *et al.* 2012; Walker et al. 2014) and Wonderwerk Cave (Thackeray *et al.* 1981). All the above sites produced well-made Acheulean hand axes and cleavers, as well as Fauresmith lithic materials that are transitional between the Acheulean (ESA) and the MSA.

The MSA is better understood as a flake-technological stage characterized by faceted platforms, produced from prepared cores, as distinct from the core tool-based ESA technology (Barham and Mitchell 2008). In the area under study, MSA material mostly occur on the same sites with ESA material, suggesting longer sequences of occupation that have allowed researchers to probe into the behavioural changes that influenced these technological developments (Porat *et al.* 2010; Walker et al. 2014). Thus, characteristic MSA have been reported at sites such as Kathu Pan 1 (Wilkins and Chazan 2012), Wonderwerk Cave (Beaumont and Vogel 2006), but they also have been reported in isolated clusters (van Vollenhoven and Pelser 2012). At Wonderwerk Cave, the MSA component was associated with pieces of haematite and several incised stone slabs, most with curved parallel lines that add to the behavioural shifts that went beyond stone tools and ushered in the appreciation of art (Beaumont and Vogel 2006). In terms of characterization, the lithic succession at Wonderwerk Cave serves as a benchmark for the Stone Age sequence of the Northern Cape (Beaumont and Vogel 2006; Kusel *et al*. 2009). The sequence comprises an uppermost LSA sequence that contains Ceramic LSA, Wilton and Oakhurst industries. Some researchers have named the earlier LSA industry of the region as the Oakhurst industry (some have labelled this local variant the Kuruman), characterized by rare, retouched artefacts, most of which are large scrapers that are oblong with retouch on the side.

More technological and behavioural changes than those witnessed in the MSA, occurred during the LSA (~ 40-25 000, to recently, 100 years ago), which is also associated with Homo Sapiens (Barham and Mitchell 2008). For the first time there is evidence of people's activities derived from material other than stone tools (ostrich eggshell beads, ground bone arrowheads, small bored stones and wood fragments) (Deacon and Deacon 1999). The LSA people are also credited with the production of rock art (engravings and paintings), which is an expression of their complex social and spiritual beliefs (Parkington *et al.* 2008). In the area north of the study area, the two LSA rock shelters to the south and the north of GaMohaan Hill are the only known archaeological remains that are closer to the study area (van der Walt 2013). Not much is known about these rock shelters, save for the fact that they have LSA material that include rock paintings (Morris 2010; van der Walt 2013: 18).

The general study area received very systematic archaeological research (Morris 2010). However, several Heritage Impact Studies have been conducted in the area and these will form the bases of the study background for example Orton (2018), Morris 2010 and others. These studies identified scatters of ESA, MSA lithic tools including manufacturing sites in slopes of Gamsberg (Morris 2010). Pelser (2011) identified reported MSA and LSA in the area around Paulputs. He also found eggshells. Webley and Halket (2012) found scatter of predominantly quartz and some quartzite artefacts at Aggieneys (2012). The archaeological findings in the area are sparse (Orton and Webley 2013). Orton and Webley (2013) hunted the occurrence of bedrock exposing with grounding grooves in several locations throughout at the Namies wind Energy facility. Some of these bedrock grooves are found in the proximity of water holes in the bedrock (Orton and Webley 2013). According to Rudner & Rudner 91968) rock art is scarce in the study area. Engravings occur along the Orange River and rock paintings are very rare in the region. Rudner and Rudner recorded rock paintings at Kangras 60km southwest of Aggeneys. The site was re-recorded by Orton and Webley (2012) (Orton 2013) after querying with Rudner and Rudner 1968's descriptions. The art at the site is geometric tradition art, a style thought to have been painted by herders. Several rock engravings comprising of ground copulas were recorded by Orton and Webley (2012) at Kaignas and a similar engraving at Namies suggesting a common tradition in the Pofadder area of the Northern Cape.

According to Beaumont *et al* (1995) there are widespread low-density scatters of lithic artifacts in the project area often referred to as the Bushman land. Systematic collection of lithic tools at Olyvenkolk, southwest of Kanhardt and Maals Pannen and east of Gamoep yielded scatters of prepared cores, blades, and points as well as a large aggregated moderately to heavily weathered Early Stone Age lithic tools (Beaumont et al 1995, Morris 2010). Beaumont et al (1995) suggested that MSA sites are very scarce in the general project area. A few sites that have been systematically researched yielded small samples of MSA lithic tools (Morris & Beaumont 1991, Smith 1995). According to Morris (2010) the ESA in the area included Victoria West cores on dolerite, long blades, and a very low occurrence of hand axes and cleavers. The limited occurrence of ESA and MSA suggest that the study area might have been inhospitable and not preferred by the ESA and MSA communities. The limited findings (MSA) Pleistocene occupation of the region that those artefacts must have occurred at times when the environment was more hospitable than the present situation (Morris 2010). It is evident that Acheulean times people preferred to settle in the proximity of water sources (Morris 2010). Studies conducted in the area have recorded sparsely localized scatters of stone tools mainly in the hills or at the base of hills (Morris 2010). No significant ESA and LSA sites have been found in the study area (Morris 2010)

Archaeological surveys in the Kenhardt area have focused on two areas to the northeast of the town near the Niewehoop Substation and to the southwest near the Aries Substation. Halkett & Orton (2011) surveyed a site to the south of the power line route and found the landscape to be coated in stone artefacts in varying density. They

attributed the artefacts to the early (ESA), Middle (MSA) and Later (LSA) Stone Ages. The ESA and MSA material were widespread and not clustered into discrete scatters. The artefacts included 1 small hand axe and two possible but very weathered examples. Two scatters of LSA artefacts were found, however, and these included lower grindstones. The archaeology was deemed to be of low significance Pelser (2011) conducted Heritage Impact Assessment studies near the Aries Substation. His study recorded ESA and MSA stone artefacts to be widespread throughout his study area and found LSA material in one place only. He considered the very high density of artefacts to be important and suggested medium to high significance for most of his finds. Kaplan (2012a, 2012b) surveyed land to the north of the present study area and once again found stone artefacts to be common. He attributed most to the MSA with smaller numbers of ESA and LSA artefacts being present. Three significant sites were documented. One was an MSA site on a high point in the landscape. Large numbers of artefacts were present and outcrops of bedrock The entire study area was found to be coated in artefacts attributable to background scatter of varying age. The vast majority would appear to date to the MSA, although, aside from faceted platforms and some characteristic triangular flakes, diagnostic elements were rare or even absent.

More technological and behavioural changes than those witnessed in the MSA, occurred during the LSA (40-25 000, to recently, 100 years ago), which is also associated with Homo Sapiens (Barham and Mitchell 2008). For the first time there is evidence of people's activities derived from material other than stone tools (ostrich eggshell beads, ground bone arrowheads, small, bored stones and wood fragments) (Deacon and Deacon 1999). The LSA people are also credited with the production of rock art (engravings and paintings), which is an expression of their complex social and spiritual beliefs (Parkington *et al.* 2008). Not much is known about these rock shelters, save for the fact that they have LSA material that include rock paintings (Morris 2010; van der Walt 2013: 18).

Later stone age

In terms of characterization, the lithic succession at Wonderwerk Cave serves as a benchmark for the Stone Age sequence of the Northern Cape (Beaumont and Vogel 2006; Kusel *et al.* 2009). The sequence comprises an uppermost LSA sequence that contains Ceramic LSA, Wilton and Oakhurst industries. Some researchers have named the earlier LSA industry of the region as the Oakhurst industry (some have labelled this local variant the Kuruman), characterized by rare, retouched artefacts, most of which are large scrapers that are rectangular with retouch on the side. Several Stone Age sites and scattered finds of Stone Age material were identified by Küsel et.al. (2009) and Archaetnos close to the town of Hotazel and adjacent to the Gamagara River during 2011. All the same, variants of the LSA industries were located at other sites such as Kathu Pan 1 (Porat *et al.* 2013) have been reported. At this site, ostrich eggshell fragments, beads and lithic artifacts attributed to Wilton and Albany industries were found. It also important to note that, it is still possible to encounter isolated finds during construction and when this happens, the procedure (described in detail below) for reporting chance finds must be followed.

Other than the Wonder Cave the Northern Cape Province is characterized by a general scarcity of cave sites. There is an abundance of inherently short-term open-air sites (Parson 2003) These assemblages, all of which are associated with ceramics, are described as belonging to either the Swartkop (hunters) or the Doornfontein Industry (Herders) (Beaumont & Morris 1990; Beaumont et al. 1995). Most of these open-air sites consist of a collection of stone artefacts and it is difficult to distinguish if the sites belonged to herders or hunter gatherers. Beaumont *et al*. (1995) argues that the Swartkop Industry is characterized by a formal component almost identical to that of the preceding local Wilton Complex, namely the Springbokoog. All Swartkop sites occur close to pans for example the Bundu pan southeast of the project area, streambeds, or other potential water sources, on low kopjes or in deflation hollows (Beaumont *et al.* 1995). In contrast the contemporary Doomfontein Industry consists of mainly amorphous (shapeless) lithic artefacts, often manufactured on quartz and almost no formal tools (Beaumont *et al.* 1995). The implication is that the Wilton Complex gave direct rise to the Swartkop Industry approximately 2000 years ago. Swartkop assemblages are described as having the following elements in common: they are characterized by cryptocrystalline silicates, contain high frequencies of blade flakes, and backed blades and associated with undecorated, grass tempered ceramics (Beaumont & Vogel 1989).

The raw material used for stone tool production of the LSA industries constitute four basic types: chert, quartz, quartzite, and banded shale (Humphreys and Thackeray 1983). The chert includes siliceous types such as chert, agate, chalcedony, and jasper, which are essentially fine-grained raw materials. Quartz is equally fine grained but tends to be very brittle. The flake implements of the MSA were replaced by the long, small blades of the Later Stone Age (LSA) from 20 000 years onwards. However, the traditional lifestyle did not change significantly in a very long time (Deacon and Deacon 1999). Assemblages provisionally assigned to the Doornfontein Industry, are associated with groups of people practicing some form of herding during most of the last 2000 years (Beaumont et al. 1995: 247–8). Doornfontein assemblages are generally described as including predominantly shapeless lithic flakes, with a formal lithic component.

It is important to note that the LSA sites are prevalent in the Aggeneys-Pofadder Region (Morris 1919-b, 2000 a-c, 2001, 2010). According to Beaumont *et al* (1995) all LSA sites recorded within the area are scattered along both sides of the Orange River, these are sites of small bands of LSA communities. with evidence of larger herder sites along the Orange River flood plain (Morns and Beaumont 1990). According to Beaumont *et al* (1995) competition for resources along the Orange River flood plain might have marginalized and driven the hunter gathers into the less hospitable hinterland (Bushman land) with no water and sandy region. This therefore confined their hunting areas to limited number of water sources in the region (Morris 2010). Evidence of hunter gather community have been identified in rock shelters of granite Inselbergs on red dunes which provide clear land for sleeping and around the seasonal pans (Beaumont *et al* 1995). Rock shelter that had been the focus of occupation. During good rain

seasons herders might also have moved to the hinterland, and the environment was more hospitable than the present situation, this is evidenced by pottery recorded near Aggeneys and East of Pofadder at Schuitdrift South (Morns 1999, Morns 2010). Stronger springs such as Pella attracted herders who only moved away during drought seasons Dun (1972) mentions a place at Schuit.Klip (Schuit-Klup) where winter collected during rains, the water drains into and sometimes fills these most useful reservoirs in which it is stored up and lasts many months and lasted year without rains in the following season (see Robnson 1978).

Iron Age

While there is some evidence that the EIA continued into the 15th century in the South African Lowveld, on the escarpment it had ended by AD1100. The Highveld became active again from the 15th century onwards due to a gradually warmer and wetter climate. From here communities spread to other parts of the interior. This later phase, termed the Late Iron Age (LIA), was accompanied by extensive stonewalled settlements, such as the Thlaping capital Dithakong, 40 km north of Kuruman (De Jong 2010: 35-36).

Sotho-Tswana and Nguni societies, the descendants of the LIA mixed farming communities, found the region already sparsely inhabited by the Late Stone Age (LSA) Khoisan groups. Most of them were eventually assimilated by LIA communities and only a few managed to survive, such as the Korana and Griqua. This period of contact is sometimes known as the Ceramic Late Stone Age and is represented by sites such as the Blinkklipkop specularite mine near Postmasburg and finds at the Kathu Pan (De Jong 2010: 36). No known Iron Age archaeological sites were recorded within the study area.

Agriculturalist communities entered southern Africa from West and East Africa around AD 200 and brought with them settled agriculture, metal working, animal husbandry, pottery making and social stratification (Huffman 2007). The view that all of these activities were introduced to southern Africa by these agriculturalists communities is still contested. The movement and spread of these EIA (~ AD200-1000) people within southern Africa seem to have been restricted to the summer rainfall (because of sorghum and millet farming) and they did not occupy much of the central interior Highveld area in South Africa. This perhaps explains the paucity of EIA sites in the study area. Ecologically, EIA preferred to settle on the alluvial soils near rivers for agricultural purposes and access to water. It was not until the mid-second millennium AD that serious Iron Age occupation began in the larger geographical area (excluding the study area) of this part of the Northern Cape.

The study area falls known within the fringes of the distribution of LIA (~ AD1100-1840) people who made Olifantspoort facies (ancestral Sotho-Tswana speakers) dated between AD1500 and AD1700 (Huffman 2007: 191). Olifantspoort facies represents the second phase of the Moloko sequence and settlements with people that made this type of ceramics are distributed in the area to the northeast of the study area, between the Vaal River and

Pretoria. The people, just like the markers of Thabeng facies (third phase of the Moloko sequence AD1700-1840), settled in aggregated clusters where space was also demarcated by extensive stone walling. The extensive walled settlements around Kuruman are historically associated with the Tswana people such as the Rolong, Tlharo and Thlaping (De Jong 2010; Pelser 2012; Fourie 2013). Typologically, this type of walling is called Type Z, which is prevalent in the Free State and mark the most southerly expansion of Sotho-Tswana speakers, up to the edge of a viable farming environment (Nkhasi 2008). Type Z settlement units have large compact central primary enclosures, "usually from three to eight in number and often so close as to be touching' but they also have smaller primary enclosures which may be linked by secondary walling (Maggs, 1976: 40).

The nature of the interaction between the emigrant Tswana groups and Khoesan people who were already in this area is complex but there are indications of acculturation (Breutz 1981) and intensive trading (Goodwin 1956). Some of the activities that formed the locus for trade and interaction between the Tswanas and the Khoesan groups in this area are specularite mining and ivory hunting. For instance, at sites such Blinkklipkop (about 80km to the south of the study area), a Khoesan specularite mine sites dating to as early as AD800, there is evidence of either trade with or occupation of the mine by the Thlaping peoples around 1801 (Thackeray *et al*. 1983). Specularite was used for non-metallurgical purposes such as pottery decoration and bodily adornment (Hall 1985), and was a prized trade commodity, together with ivory and other items during the second millennium trade boom in this part of southern Africa. Thus, by the mid-19th century (and probably earlier), the Thlaping people were purchasing glass beads, iron, copper, tin and bronze wares from other northern Sotho-Tswana groups such as the Kwena and Hurutse and exchanging these items with the Khoesan groups to the southwest (Goodwin, 1956: 256).

Of the Tswana groups around the present study area, the Thlaping might be of interest because of their connections with the site of Dithakong near Kuruman (De Jong 2010: 35-36; Pelser 2012). This site, which at one point was a Thlaping capital, appears to be the only area in which there is direct archaeological evidence for settlement in the form of stone walling (Maggs 1972; Magoma 2013: 28). Socio-political tensions and permutations necessitated the shifting of most Tswana capital of which Dithakong was no exception. For instance, during the Batlhaping capital was first at Nokaneng around the year 1775, before it was moved to Dithakong on the Mashoweng River, and then at Kuruman in 1801. At around 1806 they returned to Dithakong but settled a short distance from the previous site. In 1812 people were contemplating returning to Nokaneng with an intermediate stop at Kuruman, where they re-established themselves in 1817. Thus in 1820 when Kuruman was the capital and comprised 25 wards, Dithakong was of similar size. Thus, the capital had moved three times in twenty years and suffered one major split which removed about half of its population. The reasons for these movements are not clear. This mobility presents a problem in the interpretation of the archaeological evidence, and it helps to explain why many Iron Age sites have shallow accumulation of waste material (Maggs 1972).

Nonetheless, in the 1920s, the capital of the Batlhaping was permanently moved to Kuruman. All the same, none of these LIA sites were identified in the study area.

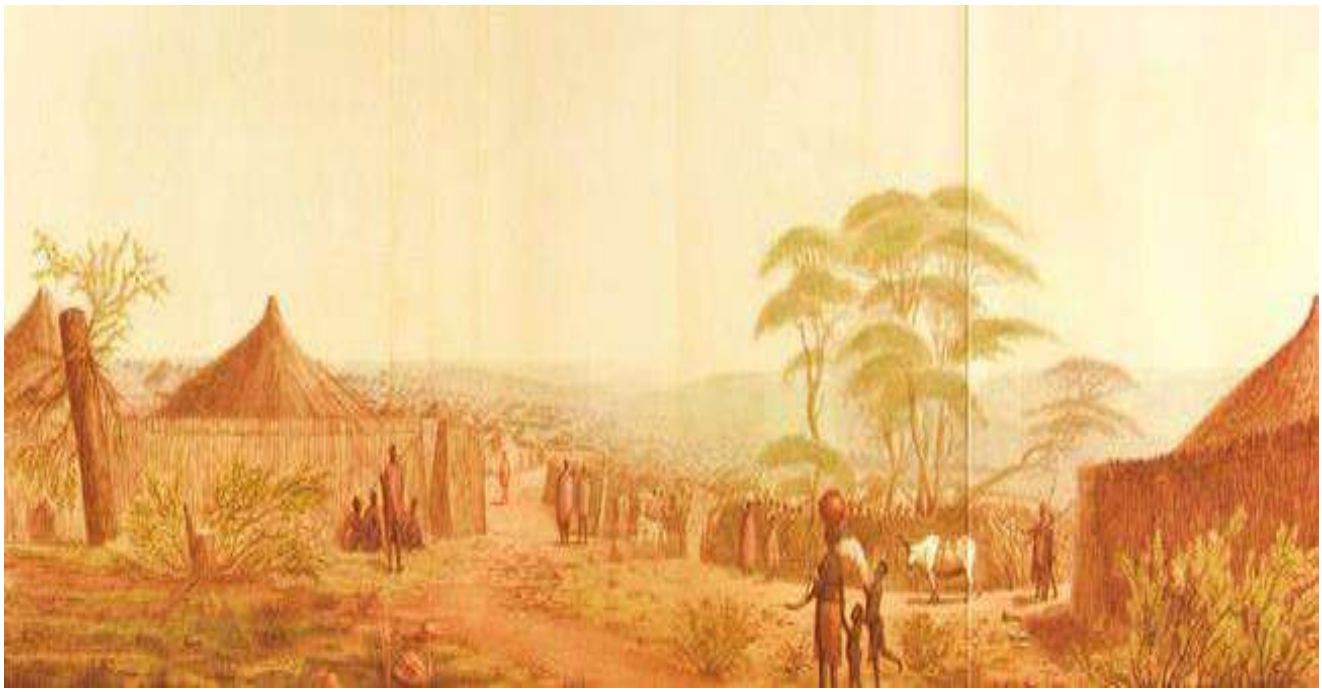

Plate 25: Photo 25: 'A view in the Town of Litakun' (Dithakong), a southern Tswana town near present-day Kuruman.

An engraved and coloured reproduction of an original drawing made by William Burchell in July 1812 (From Burchell, W.J., 1824, *Travels in the Interior of Southern Africa*. V II, London: Longman, Hurst, Orme, Brown and Green) http://www.apc.uct.ac.za/news/tuning-obo#sthash.PkrFm3EY.dpuf (accessed on 30 August 2015).

Historical period

This Middle Orange River was densely inhabited in pre and proto colonial times because it is made up of several islands that were preferred by the herders because of the natural protection from wild animals and stock thieves (Penn 1995; Smith and Metelerkamp1995).

In addition, the resources of the river were shared by hunter gatherers, while the area west of the Langeberg, (located to the east of Upington near the Orange River), was also occupied by Iron Age groups particularly the BaTlhaping, whose influence reached as far down the river as Upington (Morris 1992). By the early eighteenth century, the Khoekhoe and the San hunter gatherers had reached a form of stability in the region. As the colonial frontier expanded northwards during the eighteenth century, 'Bastaards' (persons of white/Khoe or white/slave parentage) and 'Bastaard Hottentots' (persons of slave/Khoe parentage) gradually moved away towards Namaqualand and eventually also focused on the Orange River as a sanctuary from colonial rule (Penn 1995: 48).

Due to the introduction of loan farms, the Orange River became increasingly complicated in the second half of the eighteenth by an influx of newcomers wishing to avoid the colonial powers at the Cape. By 1870 Trekboers had reached the Kalahari basin (Penn 1995). This marked a period of northward colonial invasion and disruption of the social and political fabric of the Orange River valley which previously had accommodated the herders and San hunter-gatherers. Other than Treboers, European game hunters and livestock thieves were extremely violent there by disrupting the stability along the Orange River valley (Penn 1995: 51–8). Consequently, such a state of contact and interaction inevitably lead to sociocultural stress and transformation (Webley 2009).

In terms of prehistoric mining in the general project area, radiocarbon dates indicate that specularite and red ochre mining at Blinkklipkop and Doornfontein near Postmansburg in the Northern Cape began some time before 1200 B P (Humphreys and Thackeray 1983). The evidence from Blinkklipkop indicates that pottery appeared in the Postmasburg area by this date (1200 BP). This is older than the previously suggested date of only 400 BP. The importance of Blinkklipkop in the context of the history of the Northern Cape is thus to provide evidence that domestic animals and pottery were present in the region by 1200 BP. It also serves to remind that historically in the last few hundred years in the Northern Cape involves a complex interaction of at least three different peoples in the region at the time of the arrival of Europeans in the eighteenth century.

According to Smith (1995), Gordonia and lower Orange River area was one of the last frontiers of resistance that faced European settlers who began to encroach into the remoter areas of the Northern Cape by the mid-18th century. As indicated the emergence of the Griquas and penetration of the Korana and early white communities from the south-west resulted in a period of instability in the Northern Cape that began in the late 18th century and effectively ended with the settlement of white farmers in the interior. This period is known as the Difaqane or Mfecane and the Northern Cape Province was not spared from the consequences of these upheavals, this however, occurred in the 1820s much later than the rest of Southern Africa. The Mfecane in the Northern Cape was triggered by the incursion of displaced refugees associated with the Tlokwa, Fokeng, Hlakwana and Phuting tribal groups consequently, Difaqane coincided with the infiltration of the interior of South Africa by white traders, hunters, explorers, and missionaries who eventually paved the way for colonists.

The Great Trek of the Boers from the Cape in 1836 brought large numbers of Voortrekkers up to the borders of large regions of Bechuanaland and Griqualand West, thereby clashing with many Tswana groups and also the missionaries of the London Mission Society. The conflict between Boer and Tswana communities escalated in the 1860s and 1870s when the Korana and Griqua communities became involved and later also the British government. The conflict mainly was centred on land claims by competing communities and the KhoiSan were and are still the losers.

In 1868 the first Korana war broke out which saw a detachment of professional soldiers along with locals and Bastard soldiers loyal to the government break up a number of dissident Korana gangs and see their leaders sent to Robben Island. The Chief of the Korana, Klaas Lukas who lived at what is now Upington requested that a Christian Mission be set up to bring some measure of political stability. This heralded the beginnings of the town of Upington. After a brief period of relative stability, the Korana reverted to their old ways having been left destitute by a serious drought in 1877. The entire Korana nation and allies led by Klaas Lucas rebelled against the government in a short and vigorous war. The colonial forces made use of artillery eventually breaking up the rebel forces. The leaders of the Korana nation were imprisoned on Robben Island where Klaas Lucas eventually died. By the time other Korana Chiefs had been released in 1883 they were elderly and no longer able to rally their communities who were mostly employed on the European farms or had trekked into Namibia to escape colonial rule. The islands were fully occupied and under cultivation by white farmers, the Korana communities were irrevocably fragmented (Smith AB 1996) and culturally extinct

The project area was visited by several travellers and explorers such as Gorge Thompson (1827), E J Dunn 1931, Robinson 1978. According to Penn (2005) the 18th and 19th century records provide us with a glimpse of the prehistory life of hunter gather and herder communities. Dunn (1931) mentions possible massacre sites during the genocide against Khoisan in the area (Anthing 1863). For example, Dunn (1931) refers to conflict on the Farm Zwart Modder (the current study site) where an isolated grave of a member of the Northern Border Police was recorded (Morns 2010). Another 20th Century grave was identified along the road from the Isterberg Ridge located on the Farm Scuit Klip (Morns 1999). Evidence of these graves presents the project site as a colonial frontier and genocide area directed at eliminating the hunter gathers. Key sites are found in the Pofadder Scuit Klip, Zwart Modder, Aggeneys, Gamberg and Namiesberg. Archaeologist working in the study area observed that sand spots near rock shelters yielded traces of past hunter gathers occupation for example Morris (1999) identified traces of hunter gather activities on the Farm Zwart Modder (the current study area). Morris (1999) also found that open planes have sparsely scattered artifacts such as Konkonsies near the Paulputs Substation. It is important to note that hills in the area have water pools which fill up during the rainy season and even ice during coldest months (see Figure). These pools might have attracted animals which intent attracted hunter gathers to exploit. Evidence of grinding grooves on the bed rock and lithic artifacts and pottery have been recorded elsewhere for example Schuitdrift area. Evidence of pools occurring on top of hills have been recorded by Dunn (Robinson 1978). Two holes occurring in the grass at the crest of a ridge, when heavy thunder rains sweep over this arid country the water drains into and sometimes fills these most useful reservoirs in which it is stored up and lasts many months.

John Barion (1801) observed that the number of herder groups was declining in the area. Thompson (1824) confirmed that the area between Garlped, and the Kamisberg is occupied with numerous people who possessed

large flocks and herds. He says most of them are confined to the Pella area. It is important to note that both Thompson (1824) and John Borrow (1801) confirm that these areas were inhabited by Indigenous people who were displaced by the colonial encroachment.

Intangible Heritage

As defined in terms of the UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage (2003) intangible heritage includes oral traditions, knowledge and practices concerning nature, traditional craftsmanship and rituals and festive events, as well as the instruments, objects, artefacts, and cultural spaces associated with group(s) of people. Thus, intangible heritage is better defined and understood by the group of people that uphold it. In the present study area, very little intangible heritage is anticipated on the development footprint because most historical knowledge does not suggest a relationship with the study area per se, even though several other places in the general area do have intangible heritage.

SAHRIS Database and Impact assessment reports in the proposed project area

Several archaeological and heritage impact studies were conducted for mining and infrastructure developments in the vicinity and within the proposed transmission and distribution powerline route. These studies include studies conducted by Beaumont (2000) and Dreyer (2010). Archaeological research and CRM studies in the general project confirmed that Stone Age tools occur in red sands deposits around the powerline route area (Beaumont 1990, 2000, 2007, Dreyer 2006, 2008, 2010). Although the studies confirmed abundance of ESA remains in Kathu area the Archaeological impact studies conducted by Beaumont (2000) and Dreyer (2010) (Demaneng Mine) did not record any archaeological sites. Desktop studies revealed that a small Iron Age specularite working on a hill flanking the Gamagara River, on Demaneng 546 was destroyed by previous mining activities. Beaumont (1990, 2007) for Kathu Cemetery, Dreyer (2006) for a development at Bestwood 459 RD yielded hand axes and pointed flakes.

Kusel *et al* (2009) Orton (2016 & 2017), Kruger (2015) and Hutten & Hutten (2013) have all identified a mix of ESA and MSA archaeological material along the Ga-Magara River in the Hotazel area west of the current project site. The formal ESA tools include Acheulian hand axes or large cutting tools (LCT's). The MSA flakes and blades are characterised by the faceted striking platforms that indicate the use of prepared cores. Kruger (2015) posits that the Ga-Magara River would have been an important source of water in this arid environment. The other studies include powerline and substation projects completed by Kaplan, J. (2009), Van der Walt (2013); Fourie, (2013b), Hutten, L. & Hutten, W. (2013) Magoma (2013), Bandama (2015), Mlilo (2016, 2019), Kruger (2015a, 2015b), Pelser, A. & van Vollenhoven, A.C. 2011, Pelser (2012), Van Schalkwyk (2010, 2015a, 2015b, 2016), Van Vollenhoven, A.C. (2012) and Webley, L & Halkett (2008). Van Schalkwyk (2010, 2016) examined sites west of Hotazel town and found no cultural resources to be present in either location. Other studies further afield (e.g.

Fourie 2013) have found a similar rareness of archaeological material in open, sandy areas. However, along the margins of the Kuruman River and Ga-Mogara River, stone artefacts have been reported (Hutten & Hutten 2013) and (Kusel *et al* 2009). These artefacts are low density and appear to be largely from the Middle Stone Age (MSA), although some may be Later Stone Age (LSA). Nilssen (2018) concludes that several of the heritage studies around Hotazel have commented on the almost total absence of heritage resources. Other studies further afield (e.g. Fourie 2013) have found a similar rareness of archaeological material in open, sandy areas. Later Stone Age (LSA). Surveys have revealed that there are large tracts of land where virtually no archaeological material occurs (Orton 2016, 2017; Van Schalkwyk 2010, 2016). Early Stone Age (ESA) material seems to be largely absent, despite how common it is at Kathu, 50 km to the south, where extensive research has been carried out (e.g. Chazan *et al.* 2012; Porat *et al.* 2010).

5 RESULTS OF THE ARCHAEOLOGICAL/HERITAGE ASSESSMENT STUDY

The main cause of impacts to archaeological sites is direct, physical disturbance of the archaeological remains themselves and their contexts. It is important to note that the heritage and scientific potential of an archaeological site is highly dependent on its geological and spatial context. This means that even though, for example a deep excavation may expose buried archaeological sites and artefacts, the artefacts are relatively meaningless once removed from their original position. The severe impacts are likely to occur during clearance, and construction, indirect impacts may occur during movement of construction equipment. Similarly, the clearing of access roads will impact material that lies buried in the surface sand. Since heritage sites, including archaeological sites, are non-renewable, it is important that they are identified, and their significance assessed prior to construction. It is important to note, that due to the localised nature of archaeological resources, that individual archaeological sites could be missed during the survey, although the probability of this is very low within the proposed transmission powerline route. Further, archaeological sites and unmarked graves may be buried beneath the surface and may only be exposed during clearing and construction. The purpose of this study is to assess the sensitivity of the area in terms of archaeology and to avoid or reduce the potential impacts of the proposed powerline by means of mitigation measures (see appended Chance Find Procedure). The study concludes that the impacts will be negligible since the powerline route points are spaced and smaller. The following section presents results of the archaeological and heritage survey conducted within the proposed development project site

Heritage resource	Status/Findings
Buildings, structures, places and equipment of cultural significance	None were recorded
Areas to which oral traditions are attached or which are associated with intangible heritage	None exists on the study area
Historical settlements and townscapes	None recorded on the study site
Landscapes and natural features of cultural significance	None
Archaeological sites	Rock shelters were recorded
Graves and burial grounds	None recorded within the proposed project site must be protected/
Movable objects	None
Overall comment	Although no burial site was recorded within the proposed powerline route, there is potential to encounter unmarked graves.

Archaeology

The study recorded modified sandstone rock shelters which are approximately 1.2m long and 0.7m high near Kakamas (see Plate 29 to 35). It is not clear if the rock shelters were modified by LSA communities or LIA Tswana groups. Six rock shelters of similar size and modification within an area of 2 hectares. The rock shelters are located at GPS Coordinates S 28° 45' 4.8" and E 22° 40' 40.56" (centre of site) on the powerline route but can be avoided by moving the line to the extreme end of the 2km corridor. The rock shelters are located at an area where there has been a lot of diggings which may be associated with prospecting in the Kakamas area. As such this has left some of the rock shelters partially disturbed with a lot of litter around the sites. Isolated lithic tools were recorded near rock shelters. These lithic were recorded mostly recorded in their secondary deposition sites, as such they lack provenance. Previous studies such as Morris (2010) and Orton and Webly (2010, 2013&2014) around project area recorded scatters of lithic remains. Most prehistoric settlements and farmsteads are clustered along Orange River because past communities preferred location near sources of water, however, none of them fall within the footprint of the proposed powerline development. The rock shelters need to be further investigated should any tower position fall within the proximity of the rock shelters.

Plate 26: Photo 26: View of a modified rock shelter within the proposed powerline route (Photograph © by Author 2021).

Plate 27: Photo 27: View of a modified rock shelter (Photograph © by Author 2021).

Plate 28: Photo 28: View of a cluster of modified rock shelters within the proposed powerline route. (Photograph © by Author 2021).

Plate 29: Photo 29: View of a modified rock shelter (Photograph © by Author 2021).

Plate 30: Photo 30: View of a modified rock shelter (Photograph © by Author 2021).

Plate 31: Photo 31: View of contemporary stone structure within the proposed powerline route (Photograph © by Author 2021).

Plate 32: Photo 32: View of lithic remains located near the rock shelters (Photograph © by Author 2021).

Plate 33: Photo 33: View of scrappers identified near rock shelters (Photograph © by Author 2021).

Plate 34: Photo 34: View of steel remains within the proposed development landscape (Photograph © by Author 2021).

Buildings and Structures older than 60 years

The study did not record any buildings and structures along the proposed powerline route deviations. As such the proposed powerline deviations do not trigger Section 34 of the NHRA which stipulates that buildings and structures older than 60 years must not be altered or destroyed without a permit.

Burial grounds and graves

Human remains and burials are commonly found close to archaeological sites; they may be found in abandoned and neglected burial sites or occur sporadically anywhere as a result of prehistoric activity, victims of conflict or crime. It is often difficult to detect the presence of archaeological human remains on the landscape as these burials, in most cases, are not marked at the surface. Archaeological and historical burials are usually identified when they are exposed through erosion and earth moving activities for infrastructure developments such as powerlines and roads. In some instances, packed stones or stones may indicate the presence of informal pre-colonial burials.

The study did not identify any graves or burial sites within the proposed powerline route however, the possibility of encountering previously unidentified burial sites is low within the proposed powerline route, should such sites be identified during construction, they are still protected by applicable legislations, and they should be protected (also see Appendixes for more details). Burial sites older than 60 years are protected by the NHRA and those younger than 60 years are protected by the Human Tissue Act. Exhumation of graves must confirm to the standards set out in the ordinance on excavation (Ordinance no.12 of 1980 which replaced the old Transvaal Ordinance no.7 of 1925.

Significance valuation for Burial Ground, Historic Cemeteries, and Individual Graves

The significance of burial grounds and gravesites is closely tied to their age and historical, cultural, and social context. Nonetheless, every burial should be considered as of high socio-cultural significance protected by practices, a series of legislations, and municipal ordinances.

Public Monuments and Memorials

The survey did not identify any historical monument and public memorials within the proposed development route. There are no monuments or plaques within the proposed powerline route that are on the National Heritage or provincial List. The proposed powerline project will not impact on any listed monuments and memorials in the project area.

Battle fields

No known battles or skirmishes associated with the Anglo-Boer war and the struggle against apartheid were fought on the proposed powerline route.

Archaeo-Metallurgy, Prehistoric Mining and Mining Heritage

There are historical and current mining activities in the entire Northern Cape Province, however none are located along the proposed powerline route.

Palaentology

It is well known that fossil resources are absent from granitic rocks, and this is expected to be the case here. Almond and Pether (2008) note the Namaqua-Natal Metamorphic rocks to have no palaeontological significance, since no fossils have yet been recorded in them. However, water-laid deposits around the granite outcrops can include relatively recent fossils.

Mitigation

The recorded rock shelters must be avoided or alternative the developer may use long spans at the area to avoid the rock shelters. A walk down survey is recommended with the 2km section of the recorded rock shelters. Mitigation is not required for the rest of the proposed powerline deviations from an archaeological perspective. The scatter of lithic tools were deemed to be of low significance and therefore the proposed project may be allowed to proceed as planned.

6 CUMMULATIVE IMPACTS

The European Union Guidelines define cumulative impacts as: “Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project. Therefore, the assessment of cumulative impacts for the proposed powerline project considered the total impact associated with the proposed project when combined with other past, present, and reasonably foreseeable future developments projects. An examination of the potential for other projects to contribute cumulatively to the impacts on heritage resources from this proposed powerline development was undertaken during the preparation of this report. The total impact arising from the proposed powerline (under the control of the applicant), other activities (that may be under the control of others, including other developers, local communities, government) and other background pressures and trends which may be unregulated. The project’s impact is therefore one part of the total cumulative impact on the environment. The analysis of a project’s incremental impacts combined with the effects of other projects can often give a more accurate understanding of the likely results of the project’s presence than just considering its impacts in isolation. The impacts of the proposed development were assessed by comparing the post-project situation to a pre-existing baseline. The proposed powerline will continue to add to the impacts in the area, it was deemed appropriate to consider the cumulative effects of proposed development.

This section considers the cumulative impacts that would result from the combination of the proposed powerline development project. As such increased development in the project area will have a number of cumulative impacts

on heritage resource whether known or covered in the ground. For example, during the construction phase they will be increase in human activity and movement of heavy construction equipment and vehicles that could change, alter or destroy heritage resources that may be buried beneath the surface. Cumulative impacts that could result from a combination of the proposed project and other actual or proposed future developments in the broader study area include site clearance and the removal of topsoil could result in damage to or the destruction of heritage resources that have not previously been recorded for example abandoned and unmarked graves. Heritage resources such as burial grounds and graves and archaeological and historical sites are common occurrences within the study area. These sites are often not visible and as a result, can be easily affected or lost. Vibrations and earth moving activities associated with construction has the potential to crack/damage graves marked by tombstones, which may occur in the greater study area. In addition, vibration from traffic has the potential to impact buildings and features of architectural and cultural significance.

No specific paleontological resources were found in the project area during the time of this study; however, this does not preclude the fact that paleontological resources may exist within the greater study area. As such, the proposed development has the potential to impact on possible paleontological resources in the area. Sites of archaeological, paleontological, or architectural significance were not specifically identified, and cumulative effects are not applicable. The nature and severity of the possible cumulative effects may differ from site to site depending on the characteristics of the sites and variables.

Cumulative impacts that need attention are related to the impacts of access roads and impacts to buried heritage resources. Allowing the impact of the proposed powerline to go beyond the surveyed area would result in a significant negative cumulative impact on sites outside the surveyed area. Movement of heavy construction vehicles must be monitored to ensure that they do not drive beyond the approved site. No significant cumulative impacts, over and above those already considered in the impact assessment, are foreseen at this stage of the assessment process. Cumulative impacts can be significant, if construction equipment and vehicles are not monitored to avoid driving through undetected heritage resources.

7 ASSESSMENT OF SIGNIFICANCE

The significance of the impacts will be assessed considering the following descriptors:

Table 3: Criteria Used for Rating of Impacts

Nature of the impact (N)		
Positive	+	Impact will be beneficial to the environment (a benefit).
Negative	-	Impact will not be beneficial to the environment (a cost).
Neutral	0	Where a negative impact is offset by a positive impact, or mitigation measures, to have no overall effect.
`Magnitude(M)		
Minor	2	Negligible effects on biophysical or social functions / processes. Includes areas / environmental aspects which have already been altered significantly and have little to no conservation importance (negligible sensitivity*).
Low	4	Minimal effects on biophysical or social functions / processes. Includes areas / environmental aspects which have been largely modified, and / or have a low conservation importance (low sensitivity*).
Moderate	6	Notable effects on biophysical or social functions / processes. Includes areas / environmental aspects which have already been moderately modified and have a medium conservation importance (medium sensitivity*).
High	8	Considerable effects on biophysical or social functions / processes. Includes areas / environmental aspects which have been slightly modified and have a high conservation importance (high sensitivity*).
Very high	10	Severe effects on biophysical or social functions / processes. Includes areas / environmental aspects which have not previously been impacted upon and are pristine, thus of very high conservation importance (very high sensitivity*).
Extent (E)		
Site only	1	Effect limited to the site and its immediate surroundings.
Local	2	Effect limited to within 3-5 km of the site.
Regional	3	Activity will have an impact on a regional scale.
National	4	Activity will have an impact on a national scale.
International	5	Activity will have an impact on an international scale.
Duration (D)		
Immediate	1	Effect occurs periodically throughout the life of the activity.
Short term	2	Effect lasts for a period 0 to 5 years.
Medium term	3	Effect continues for a period between 5 and 15 years.
Long term	4	Effect will cease after the operational life of the activity either because of natural process or by human intervention.
Permanent	5	Where mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.
Probability of occurrence (P)		

Improbable	1	Less than 30% chance of occurrence.
Low	2	Between 30 and 50% chance of occurrence.
Medium	3	Between 50 and 70% chance of occurrence.
High	4	Greater than 70% chance of occurrence.
Definite	5	Will occur, or where applicable has occurred, regardless or in spite of any mitigation measures.

Once the impact criteria have been ranked for each impact, the significance of the impacts will be calculated using the following formula:

Significance Points (SP) = (Magnitude + Duration + Extent) x Probability

The significance of the ecological impact is therefore calculated by multiplying the severity rating with the probability rating. The maximum value that can be reached through this impact evaluation process is 100 SP (points). The significance for each impact is rated as High (SP≥60), Medium (SP = 31-60) and Low (SP<30) significance as shown in the below.

Table 4: Criteria for Rating of Classified Impacts

Significance of predicted NEGATIVE impacts		
Low	0-30	Where the impact will have a relatively small effect on the environment and will require minimum or no mitigation and as such have a limited influence on the decision
Medium	31-60	Where the impact can have an influence on the environment and should be mitigated and as such could have an influence on the decision unless it is mitigated.
High	61-100	Where the impact will definitely have an influence on the environment and must be mitigated, where possible. This impact will influence the decision regardless of any possible mitigation.
Significance of predicted POSITIVE impacts		
Low	0-30	Where the impact will have a relatively small positive effect on the environment.
Medium	31-60	Where the positive impact will counteract an existing negative impact and result in an overall neutral effect on the environment.
High	61-100	Where the positive impact will improve the environment relative to baseline conditions.

Table 5: Operational Phase

Impacts and Mitigation measures relating to the proposed project during Operational Phase														
Activity/Aspect	**Impact /**	**Aspect**	**Nature**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Impact before mitigation**	**Mitigation measures**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Impact after mitigation**
Clearing and construction	Destruction of archaeological remains	Cultural heritage	-	6	2	4	3	36	• Mitigation required for modified rock shelters near N14 Road • The powerline route must be shifted further north of the shelters. • Walkdown survey required on the section near N14. • Use chance find procedure to cater for accidental finds	2	2	4	1	8
	Disturbance of graves	Cultural heritage	-	6	1	2	2	18	• None required	2	1	1	1	4
	Disturbance of buildings and structures older than 60 years old	Operational	-	2	1	1	1	4	• None required	2	1	1	1	4
Movement of equipment	Destruction public monuments and plaques	Operational	-	2	1	1	1	4	• Mitigation is not required because there are no public monuments within the proposed development.	2	1	1	4	4

Based on the results of the Impact Assessment Matrix the proposed powerline route is viable from a heritage perspective.

8 STATEMENT OF SIGNIFICANCE

Aesthetic Value

The aesthetic values of the AIA Study Area and the overall project area are contained in the valley bushveld environment and landscape typical of this part of the Northern Cape Province. The visual and physical relationship between AIA study area and the surrounding historical Cultural Landscape demonstrates the connection of place to the local and oral historical stories of the African communities who populated this region going back into prehistory.

The proposed powerline route will be situated within an environment and associated cultural landscape, which, although developed by existing settlements, remains representative of the original historical environment and cultural landscape of this part of Northern Cape. The local communities consider the project area a cultural landscape linked to their ancestors and history. However, the proposed development will not alter this aesthetic value in any radical way.

Historic Value

The Indigenous historic values of the Site of Interest and overall study area are contained in the claim of possible historic homesteads being located on the affected area. The history of generations of the Sotho-Tswana clans is tied to this geographical region. Such history goes back to the pre-colonial period, through the colonial era, the colonial wars and subsequent colonial rule up to modern-day Northern Cape Province.

Scientific value

Past settlements and associated roads and other auxiliary infrastructure developments and disturbance within the HIA Study Area associated with the proposed powerline has resulted in limited intact landscape with the potential to retain intact large scale or highly significant open archaeological site deposits.

Social Value

The project site falls within a larger and an extensive cultural landscape that is integrated with the wider inland. The overall area has social value for the local community, as is the case with any populated landscape. Literature review suggests that social value of the overall project area is also demonstrated through local history which associates the area with the coming of European missionaries, explorers and colonialists and the African struggle against settler colonialism in the second half of the 1800s and at the end of the 1800s, the colonial wars of resistance, the century long struggle for democracy that followed colonial subjugation. Several generations of communities originate from the project area and continue to call it home. As such, they have ancestral ties to the area. The land

also provides the canvas upon which daily socio-cultural activities are painted. All these factors put together confirms the social significance of the project area. However, this social significance is unlikely to be negatively impacted by the proposed powerline especially given the fact that the development will add value to the human settlements and activities already taking place. Some sections of development site are covered by thick bushes and vegetation retains social value as sources of important herbs and traditional medicines. As such, they must be considered as significant social value sites

9 DISCUSSION

Several Phase 1 Heritage studies for various infrastructure developments and mining developments were conducted since 2006 in the general project area. Although these studies recorded sites of significance for example Morris (2010) Orton and Webley, (2013), Pelser (2011); Kaplan (2012), Mlilo 2016, 2019 and Orton (2013), the recorded sites of varying significance. Orton &Webley (2013) recorded scatters of lithic tools which they rated low from a heritage perspective. However, they concluded that should no significant deviation from the areas already examined be apparent then it is likely that no further studies will be required. It is against this conclusion that our study mainly focused on the deviations. The archaeology of the Northern Cape is rich and varied, covering long spans of human history (Morris 2006). In the Northern Cape ESA assemblages, including the Fauresmith, tend to occur on the margins of seasonal rivers, semi-permanent water holes or pans (Pelser 2010) see Kusel *et al* (2009). The significance of sites so far recorded in the study compared to other sites indicate that they are of lesser importance because they are small scatters and confined pans and foothills of mountains (Morris 2010, Orton &Webley 2013). The region's remoteness of the Northern Cape may be a reason for the lack of archaeological research in the area. Probably because of its dryness, the area has probably been relatively marginal to human settlement for most of its history (Morris 2010, Pelser 2011). Some areas are richer than others, and not all sites are equally significant, and this is true for the current transmission and distribution powerline. The lack of significant archaeological sites recorded during the current survey is thought to be a result of two primary interrelated factors:

1. That proposed powerline route is located within heavily degraded grazing area and have reduced sensitivity for the presence of high significance physical cultural site remains, be they archaeological, historical or burial sites, due to stamping and overgrazing by livestock.

2. Limited ground surface visibility on sections of the proposed development site may have impended the detection of other physical cultural heritage site remains or archaeological signatures within the transmission and distribution infrastructure. This factor is exacerbated by the fact that the study was limited to general survey without necessarily conducting any detailed inspection of specific locations that will be affected by the proposed powerline development.

The absence of confirmable and significant archaeological cultural heritage site is not evidence that such sites do not exist in the proposed powerline route. Significance of the sites of Interest (proposed development route) is not limited to presence or absence of physical archaeological sites.

10 RECOMMENDATIONS

The study did not find any permanent barriers to the proposed powerline deviation routes. It is the considered opinion of the author that the proposed project may proceed from a heritage perspective, if mitigation measures are implemented if and when required. The following recommendations are based on the results of the AIA/HIA research, cultural heritage background review, site inspection and assessment of significance.

- The proposed powerline may be approved to proceed as planned under observation that project work does not extend beyond the surveyed site and rock shelters to be mapped and protected.
- The identified site with modified rock shelters must not be disturbed without a permit from SAHRA. The proposed powerline designers must shift the powerline route further south or further north to avoid the rock shelters. Alternatively, they must provide for long spans between towers to avoid the cluster of rock shelters.
- A professional archaeologist must be appointed to conduct a heritage walk down survey once the tower positions have been pegged.
- If the already known sites cannot be protected, then they should be mitigated prior to approval of proposed powerline
- A professional Archaeologist must be retained to conduct a walkdown survey especially on the section were modified rock shelters were recorded.
- Should chance archaeological materials or human burial remains be exposed during subsurface construction work on any section of the proposed development laydown sites, work should cease on the affected area and the discovery must be reported to the heritage authorities immediately so that an investigation and evaluation of the finds can be made. The overriding objective, where remedial action is warranted, is to minimize disruption in construction scheduling while recovering archaeological and any affected cultural heritage data as stipulated by the NHRA regulations.
- It is the responsibility of the applicant to protect the site from publicity (i.e., media) until a mutual agreement is reached.
- Noteworthy that any measures to cover up the suspected archaeological material or to collect any resources is illegal and punishable by law. In the same manner, no person may exhume or collect such remains, whether of recent origin or not, without the endorsement by SAHRA

- The applicant is reminded that unavailability of archaeological materials (e.g., stone tools and graves, etc) and fossils does not mean they do not occur, archaeological material might be hidden underground, and as such the client is reminded to take precautions during construction.
- The footprint impact of the proposed powerline development activities should be kept to minimal to limit the possibility of encountering chance finds within the proposed powerline route.
- Overall, impacts to heritage resources are not considered to be significant for the project receiving environment. It is thus concluded that the project may be cleared to proceed as planned subject to the Heritage Authority ensuring that detailed heritage monitoring procedures are included in the project EMP for the construction phase, include chance archaeological finds mitigation procedure in the project EMP (See Appendix 1).
- The chance finds process will be implemented, when necessary, especially when archaeological materials and burials are encountered during subsurface construction activities.
- The findings of this report, with approval of the SAHRA, may be classified as accessible to any interested and affected parties within the limits of the laws.
- Subject to the recommendations herein made and the implementation of the mitigation measures and adoption of the project EMP. The Heritage authority may approve the proposed powerline application to proceed as planned with special recommendations to implement the recommendations here in made.

11 CONCLUDING REMARKS

The literature review and field surveys confirmed that the project area is situated within a contemporary cultural landscape dotted with settlements with long local history. In terms of the archaeology and heritage in respect of the proposed powerline deviations, the are no 'Fatal Flaws' or 'No-Go' areas. The section where modified rock shelters were recorded is already altered by prospecting activities, the tower position at the section b. However, the potential for chance finds, remains and the applicant and contractors are advised to watch out for accidental exposure of significant archaeological remains should construction activities commence along the proposed powerline deviations The procedure for reporting chance finds has clearly been laid out (see Appendix 3). This report concludes that the proposed powerline may be approved by SAHRA to proceed as planned subject to recommendations herein made and heritage monitoring plan being incorporated into the EMP (also see Appendices). The mitigation measures are informed by the results of the AIA/HIA study and principles of heritage management enshrined in the NHRA, Act 25 of 1999.

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APPENDIX 1: CHANCE FIND PROCEDURE FOR THE PROPOSED 400KV POWERLINE FROM ARIES SUBSTATION TO UPINGTON SUBSTATION, KAI GARIB AND KHARA HAIS LOCAL MUNICIPALITY, MGCAWU DISTRICT MUNICIPALITY, NORTHERN CAPE PROVINCE.

August 2021

ACRONYMS

BGG	Burial Grounds and Graves
CFPs	Chance Find Procedures
ECO	Environmental Control Officer
HIA	Heritage Impact Assessment
ICOMOS	International Council on Monuments and Sites
NHRA	National Heritage Resources Act (Act No. 25 of 1999)
SAHRA	South African Heritage Resources Authority
SAPS	South African Police Service
UNESCO	United Nations Educational, Scientific and Cultural Organisation

CHANCE FIND PROCEDURE

Introduction

An Archaeological Chance Find Procedure (CFP) is a tool for the protection of previously unidentified cultural heritage resources during construction. The main purpose of a CFP is to raise awareness of all construction, mine workers and management on site regarding the potential for accidental discovery of cultural heritage resources and establish a procedure for the protection of these resources. Chance Finds are defined as potential cultural heritage (or paleontological) objects, features, or sites that are identified outside of or after Heritage Impact studies, normally as a result of construction monitoring. Chance Finds may be made by any member of the project team who may not necessarily be an archaeologist or even visitors. Appropriate application of a CFP on development projects has led to discovery of cultural heritage resources that were not identified during archaeological and heritage impact assessments. As such, it is considered to be a valuable instrument when properly implemented. For the CFP to be effective, the site manager must ensure that all personnel on the proposed development site understand the CFP and the importance of adhering to it if cultural heritage resources are encountered. In addition, training or induction on cultural heritage resources that might potentially be found on site should be provided. In short, the Chance find procedure details the necessary steps to be taken if any culturally significant artefacts are found during construction.

Definitions

In short, the term 'heritage resource' includes structures, archaeology, meteors, and public monuments as defined in the South African National Heritage Resources Act (Act No. 25 of 1999) (NHRA) Sections 34, 35, and 37. Procedures specific to burial grounds and graves (BGG) as defined under NHRA Section 36 will be discussed separately as this require the implementation of separate criteria for CFPs.

Background

The proposed 400kv powerline route is located on Portions within Kai Garib and Khara Hais Local Municipality, Northern Cape Province. The development site is subject to heritage survey and assessment at planning stage in accordance with the NHRA. These surveys are based on surface indications alone and it is therefore possible that sites or significant archaeological remains can be missed during surveys because they occur beneath the surface. These are often accidentally exposed during construction or any associated construction work and hence the need for a Chance Find Procedure to deal with accidental finds. In this case an extensive Archaeological Impact Assessment was completed by T. Mlilo (2021) on the proposed powerline route. The AIA/HIA conducted was very comprehensive covering the entire site.

Purpose

The purpose of this Chance Find Procedure is to ensure the protection of previously unrecorded heritage resources along the proposed project site. This Chance Find Procedure intends to provide the applicant and contractors with appropriate response in accordance with the NHRA and international best practice. The aim of this CFP is to avoid or reduce project risks that may occur as a result of accidental finds whilst considering international best practice. In addition, this document seeks to address the probability of archaeological remains finds and features becoming accidentally exposed during clearing, digging of foundations and movement of construction equipment. The proposed powerline has the potential to cause severe impacts on significant tangible and intangible cultural heritage resources buried beneath the surface or concealed by tall grass cover. Integrated Specialist Services and Environmental Consultants developed this Chance Find Procedure to define the process which govern the management of Chance Finds during construction. This ensures that appropriate treatment of chance finds while also minimizing disruption of the construction schedule. It also enables compliance with the NHRA and all relevant regulations. Archaeological Chance Find Procedures are to promote preservation of archaeological remains while minimizing disruption of construction scheduling. It is recommended that due to the low to moderate archaeological potential of the project area, all site personnel and contractors be informed of the Archaeological Chance Find procedure and have access to a copy while on site. This document has been prepared to define the avoidance, minimization, and mitigation measures necessary to ensure that negative impacts to known and unknown archaeological remains as a result of project activities and are prevented or where this is not possible, reduced to as low as reasonably practical during construction.

Thus, this Chance Finds Procedure covers the actions to be taken from the discovering of a heritage site or item to its investigation and assessment by a professional archaeologist or other appropriately qualified person to its rescue or salvage.

CHANCE FIND PROCEDURE

General

The following procedure is to be executed in the event that archaeological material is discovered:

- All construction/clearance activities in the vicinity of the accidental find/feature/site must cease immediately to avoid further damage to the find site.
- Briefly note the type of archaeological materials you think you have encountered, and their location, including, if possible, the depth below surface of the find
- Report your discovery to your supervisor or if they are unavailable, report to the project ECO who will provide further instructions.

- If the supervisor is not available, notify the Environmental Control Officer immediately. The Environmental Control Officer will then report the find to the Site Manager who will promptly notify the project archaeologist and SAHRA.
- Delineate the discovered find/ feature/ site and provide 25m buffer zone from all sides of the find.
- Record the find GPS location, if able.
- All remains are to be stabilised *in situ.*
- Secure the area to prevent any damage or loss of removable objects.
- Photograph the exposed materials, preferably with a scale (a yellow plastic field binder will suffice).
- The project archaeologist will undertake the inspection process in accordance with all project health and safety protocols under direction of the Health and Safety Officer.

- **Finds rescue strategy**: All investigation of archaeological soils will be undertaken by hand, all finds, remains and samples will be kept and submitted to a Museum as required by the heritage legislation. If any artefacts need to be conserved, the relevant permit will be sought from the SAHRA.
- An on-site office and finds storage area will be provided, allowing storage of any artefacts or other archaeological material recovered during the monitoring process.
- In the case of human remains, in addition, to the above, the SAHRA Burial Ground Unit will be contacted and the guidelines for the treatment of human remains will be adhered to. If skeletal remains are identified, an archaeological will be available to examine the remains.
- The project archaeologist will complete a report on the findings as part of the permit application process.
- Once authorisation has been given by SAHRA, the Applicant will be informed when construction activities can resume.

Management of chance finds

Should the Heritage specialist conclude that the find is a heritage resource protected in terms of the NRHA (1999) Sections 34, 36, 37 and NHRA (1999) Regulations (Regulation 38, 39, 40), ISS will notify SAHRA and/or PHRA on behalf of the applicant. SAHRA/PHRA may require that a search and rescue exercise be conducted in terms of NHRA Section 38, this may include rescue excavations, for which ISS will submit a rescue permit application having fulfilled all requirements of the permit application process.

In the event that human remains are accidently exposed, SAHRA Burial Ground Unit or ISS Heritage Specialist must immediately be notified of the discovery in order to take the required further steps:

a. Heritage Specialist to inspect, evaluate and document the exposed burial or skeletal remains and determine further action in consultation with the SAPS and Traditional authorities:

b. Heritage specialist will investigate the age of the accidental exposure in order to determine whether the find is a burial older than 60 years under the jurisdiction of SAHRA or that the exposed burial is younger than 60 years under the jurisdiction of the Department of Health in terms of the Human Tissue Act.

c. The local SAPS will be notified to inspect the accidental exposure in order to determine where the site is a scene of crime or not.

d. Having inspected and evaluated the accidental exposure of human remains, the project Archaeologist will then track and consult the potential descendants or custodians of the affected burial.

e. The project archaeologist will consult with the traditional authorities, local municipality, and SAPS to seek endorsement for the rescue of the remains. Consultation must be done in terms of NHRA (1999) Regulations 39, 40, 42.

f. Having obtained consent from affected families and stakeholders, the project archaeologist will then compile a Rescue Permit application and submit to SAHRA Burial Ground and Graves Unit.

g. As soon as the project archaeologist receives the rescue permit from SAHRA he will in collaboration with the company/contractor arrange for the relocation in terms of logistics and appointing of an experienced undertaker to conduct the relocation process.

h. The rescue process will be done under the supervision of the archaeologist, the site representative and affected family members. Retrieval of the remains shall be undertaken in such a manner as to reveal the stratigraphic and spatial relationship of the human skeletal remains with other archaeological features in the excavation (e.g., grave goods, hearths, burial pits, etc.). A catalogue and bagging system shall be utilised that will allow ready reassembly and relational analysis of all elements in a laboratory. The remains will not be touched with the naked hand; all Contractor personnel working on the excavation must wear clean cotton or non-powdered latex gloves when handling remains in order to minimise contamination of the remains with modern human DNA. The project archaeologist will document the process from exhumation to reburial.

i. Having fulfilled the requirements of the rescue/burial permit, the project archaeologist will compile a mitigation report which details the whole process from discovery to relocation. The report will be submitted to SAHRA and to the company.

Note that the relocation process will be informed by SAHRA Regulations and the wishes of the descendants of the affected burial.

Appendix 1: Heritage Management Plan Input into the Proposed Powerline development EMP

Objective	• Protection of archaeological sites and land considered to be of cultural value. • Protection of known physical cultural property sites against vandalism, destruction and theft; and • The preservation and appropriate management of new archaeological finds should these be discovered during construction.							
No.	Activity	Mitigation Measures	Duration	Frequency	Responsibility	Accountable	Contacted	Informed
Pre-Construction Phase								
1	Planning	Ensure all known sites of cultural, archaeological, and historical significance are demarcated on the site layout plan and marked as no-go areas.	Throughout Project	Weekly Inspection	Contractor [C] CECO	SM	ECO	EA EM PM
Construction Phase								
1	Emergency Response	Should any archaeological or physical cultural property heritage resources be exposed during excavation for the purpose of construction, construction in the vicinity of the finding must be stopped until heritage authority has cleared the development to continue.	N/A	Throughout	C CECO	SM	ECO	EA EM PM
		Should any archaeological, cultural property heritage resources be exposed during excavation or be found on development site, a registered heritage specialist or PHRA official must be called to site for inspection.		Throughout	C CECO	SM	ECO	EA EM PM
		Under no circumstances may any archaeological, historical or any physical cultural property heritage material be destroyed or removed form site;		Throughout	C CECO	SM	ECO	EA EM PM
		Should remains and/or artefacts be discovered on the development site during earthworks, all work will cease in the area affected and the Contractor will immediately inform the Construction Manager who in turn will inform PHRA.		When necessary	C CECO	SM	ECO	EA EM PM
		Should any remains be found on site that is potentially human remains, the PHRA and South African Police Service should be contacted.		When necessary	C CECO	SM	ECO	EA EM PM
Rehabilitation Phase								
		Same as construction phase.						
Operational Phase								
		Same as construction phase.						

Appendix 3: Legal background in South Africa

Extracts relevant to this report from the National Heritage Resources Act No. 25 of 1999, (Sections 5, 36 and 47):

General principles for heritage resources management

5. (1) All authorities, bodies and persons performing functions and exercising powers in terms of this Act for the management of heritage resources must recognise the following principles:

(a) Heritage resources have lasting value in their own right and provide evidence of the origins of South African society and as they are valuable, finite, non-renewable and irreplaceable they must be carefully managed to ensure their survival;

(b) every generation has a moral responsibility to act as trustee of the national heritage for succeeding generations and the State has an obligation to manage heritage resources in the interests of all South Africans;

(c) heritage resources have the capacity to promote reconciliation, understanding and respect, and contribute to the development of a unifying South African identity; and

(d) heritage resources management must guard against the use of heritage for sectarian purposes or political gain.

(2) To ensure that heritage resources are effectively managed—

(a) the skills and capacities of persons and communities involved in heritage resources management must be developed; and

(b) provision must be made for the ongoing education and training of existing and new heritage resources management workers.

(3) Laws, procedures and administrative practices must—

(a) be clear and generally available to those affected thereby;

(b) in addition to serving as regulatory measures, also provide guidance and information to those affected thereby; and

(c) give further content to the fundamental rights set out in the Constitution.

(4) Heritage resources form an important part of the history and beliefs of communities and must be managed in a way that acknowledges the right of affected communities to be consulted and to participate in their management.

(5) Heritage resources contribute significantly to research, education and tourism and they must be developed and presented for these purposes in a way that ensures dignity and respect for cultural values.

(6) Policy, administrative practice and legislation must promote the integration of heritage resources conservation in urban and rural planning and social and economic development.

(7) The identification, assessment and management of the heritage resources of South Africa must—

(a) take account of all relevant cultural values and indigenous knowledge systems;

(b) take account of material or cultural heritage value and involve the least possible alteration or loss of it;

(c) promote the use and enjoyment of and access to heritage resources, in a way consistent with their cultural significance and conservation needs;

(d) contribute to social and economic development;

(e) safeguard the options of present and future generations; and

(f) be fully researched, documented and recorded.

Burial grounds and graves

36. (1) Where it is not the responsibility of any other authority, SAHRA must conserve and generally care for burial grounds

and graves protected in terms of this section, and it may make such arrangements for their conservation as it sees fit.

(2) SAHRA must identify and record the graves of victims of conflict and any other graves which it deems to be of cultural significance and may erect memorials associated with the grave referred to in subsection (1), and must maintain such memorials.

(3) (a) No person may, without a permit issued by SAHRA or a provincial heritage resources authority—

(a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;

(b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or

(c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.

(4) SAHRA or a provincial heritage resources authority may not issue a permit for the destruction or damage of any burial ground or grave referred to in subsection (3)(a) unless it is satisfied that the applicant has made satisfactory arrangements for the exhumation and re-interment of the contents of such graves, at the cost of the applicant and in accordance with any regulations made by the responsible heritage resources
authority.

(5) SAHRA or a provincial heritage resources authority may not issue a permit for any activity under subsection (3)(b) unless it is satisfied that the applicant has, in accordance with regulations made by the responsible heritage resources authority—

(a) made a concerted effort to contact and consult communities and individuals who by tradition have an interest in such grave or burial ground; and

(b) reached agreements with such communities and individuals regarding the future of such grave or burial ground.

(6) Subject to the provision of any other law, any person who in the course of development or any other activity discovers the location of a grave, the existence of which was previously unknown, must immediately cease such activity and report the discovery to the responsible heritage resources authority which must, in co-operation with the South African Police Service and in accordance with regulations of the responsible heritage resources authority—

(a) carry out an investigation for the purpose of obtaining information on whether or not such grave is protected in terms of this Act or is of significance to any community; and

(b) if such grave is protected or is of significance, assist any person who or community which is a direct descendant to make arrangements for the exhumation and re-interment of the contents of such grave or, in the absence of such person or community, make any such arrangements as it deems fit.

(7) (a) SAHRA must, over a period of five years from the commencement of this Act, submit to the Minister for his or her approval lists of graves and burial grounds of persons connected with the liberation struggle and who died in exile or as a result of the action of State security forces or agents provocateur and which, after a process of public consultation, it believes should be included among those protected under this section.

(b) The Minister must publish such lists as he or she approves in the Gazette.

(8) Subject to section 56(2), SAHRA has the power, with respect to the graves of victims of conflict outside the Republic, to perform any function of a provincial heritage resources authority in terms of this section.

(9) SAHRA must assist other State Departments in identifying graves in a foreign country of victims of conflict connected with the liberation struggle and, following negotiations with the next of kin, or relevant authorities, it may re-inter the remains of that person in a prominent place in the capital of the Republic.

General policy

47. (1) SAHRA and a provincial heritage resources authority—

(a) must, within three years after the commencement of this Act, adopt statements of general policy for the management of all heritage resources owned or controlled by it or vested in it; and

(b) may from time to time amend such statements so that they are adapted to changing circumstances or in accordance with increased knowledge; and

(c) must review any such statement within 10 years after its adoption.

(2) Each heritage resources authority must adopt for any place which is protected in terms of this Act and is owned or controlled by it or vested in it, a plan for the management of such place in accordance with the best environmental, heritage conservation, scientific and educational principles that can reasonably be applied taking into account the location, size and nature of the place and the resources of the authority concerned, and may from time to time review any such plan.

(3) A conservation management plan may at the discretion of the heritage resources authority concerned and for a period not exceeding 10 years, be operated either solely by the heritage resources authority or in conjunction with an environmental or tourism authority or under contractual arrangements, on such terms and conditions as the heritage resources authority may determine.

(4) Regulations by the heritage resources authority concerned must provide for a process whereby, prior to the adoption or amendment of any statement of general policy or any conservation management plan, the public and interested organisations are notified of the availability of a draft statement or plan for inspection, and comment is invited and considered by the heritage resources authority concerned.

(5) A heritage resources authority may not act in any manner inconsistent with any statement of general policy or conservation management plan.

(6) All current statements of general policy and conservation management plans adopted by a heritage resources authority must be available for public inspection on request.